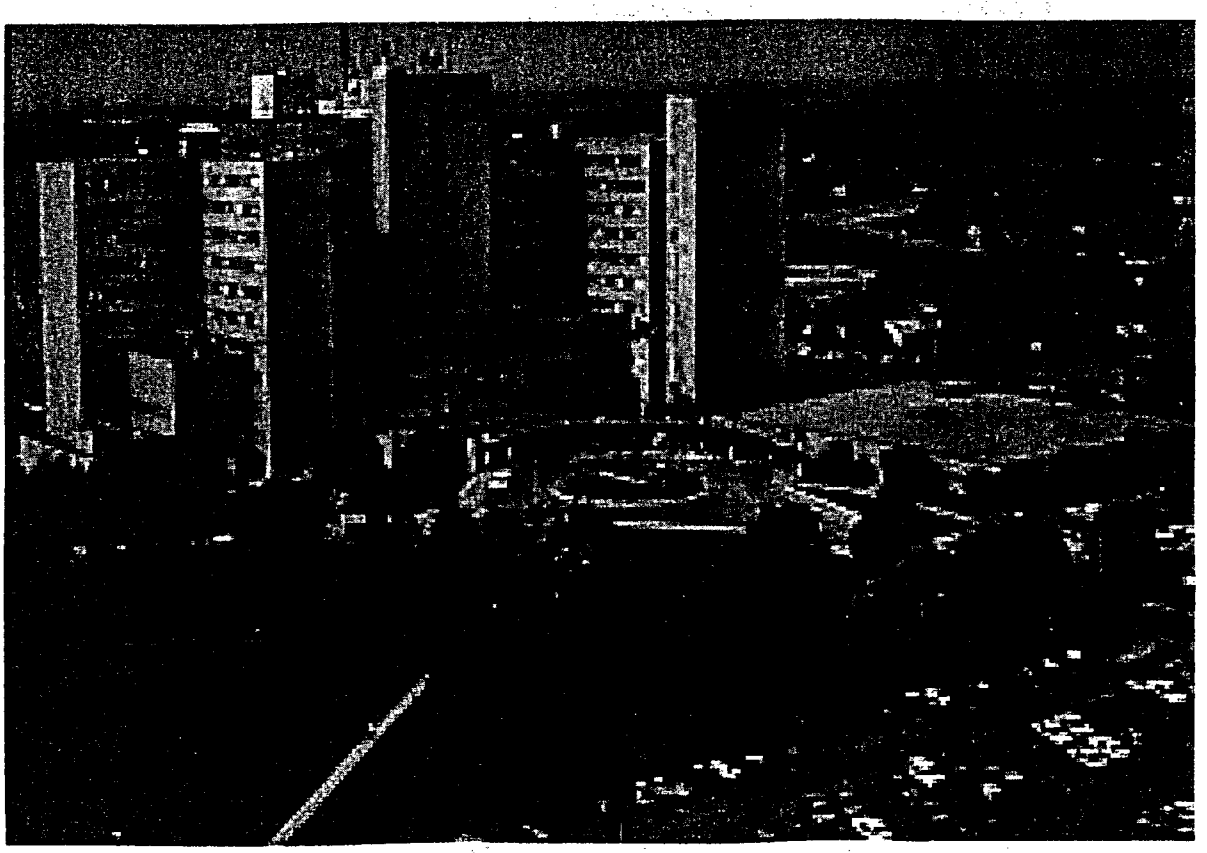
Alan J. Blotcky Reactor Facility
Omaha Veterans Administration Medical Center
Omaha, Nebraska

Eberline Services Analysis
Report Package

APPENDIX F



DURATEK

Veterans Affairs
Medical Center

STANDARD LEVEL IV
REPORT OF ANALYSIS

WORK ORDER #02-11141-OR

December 18, 2002

EBERLINE SERVICES/OAK RIDGE LABORATORY
OAK RIDGE, TN

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Eberline Services -- Oak Ridge Laboratory

LABORATORY DATA SUPPORT CHECKLIST
MP-001-4

Eberline Services Work Order # 02 11 141

The checklist items listed below are to be initialed by appropriate staff upon completion/verification.

DATE FOR PARTIAL	INITIALS	DATE	INITIALS	CHECKLIST ITEMS
		12-26-02	KAB	Sample Log-In
		12-16-02	[illegible]	Data Compilation
		12-17-02	MLT	Technical Data Review [illegible] 12/17/02
		12/18/02	DB	Data Entry/Electronic Deliverable
		12/18/02	DB	Case Narrative
		12/18/02	[illegible]	Electronic Deliverable Proof
		12/18/02	[illegible]	Samples Analyzed within Holding Time YES
		12/18/02	[illegible]	QA/QC Review
				Invoiced by Laboratory

TECHNICAL/CLERICAL CORRECTIONS, SIGNATURES NEEDED, PROBLEMS,ETC	DATE/INITIALS

Date package approved by: [illegible] Laboratory Manager 12/18/02 Date

-00003

SECTION I

CHAIN OF CUSTODY

Chain of Custody Record

02 1 141

№ 1379

Eberline Services
601 Scarboro Road
Oak Ridge, TN 37830
(865) 481-0683 Phone • (865) 483-4621 Fax

EBERLINE SERVICES

Project Name: Veterans Affairs Mtl Gate	Project Number: 106760.0030
Send Report To: Paul Jones	Sampler (Print Name): Paul Jones
Address: 628 Gallagher Rd.	Sampler (Print Name):
Kingston, TN 37763	Shipment Method: Fed Ex
	Airbill Number: 837547956730
Phone: (865) 376-8276	Laboratory Receiving: Eberline Oak Ridge
Fax: (865) 376-6247	

Page 1 of 1

Purchase Order #: 15255

Analysis Requested: 10CFR61 per guide #2037

Field Sample ID	Sample Date	Sample Time	Sample Matrix	Number of Containers	Comments, Special Instructions, etc.	Lab Sample ID (to be completed by lab)
VA-02-0176	11-25-02	1200	Resin	1	14 day turnaround.	

RECEIVED
NOV 26 2002
EMA - Eberline
OAK RIDGE LAB

Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Paul Jones	K. Bannister	11/26/02	0910
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:

Sample Custodian Remarks (Completed By Laboratory):

QA/QC Level		Turnaround		Sample Receipt	
				Total # Containers Received?	
Level I	☐	Routine	☐	COC Seals Present?	
Level II	☐	24 Hour	☐	COC Seals Intact?	
Level III	☐	1 Week	☐	Received Containers Intact?	
Other	☐	Other ____		Temperature?	

EBERLINE SERVICES Oak Ridge Laboratory	Internal Chain of Custody	Work Order #	02-11141
		Lab Deadline	12/5/2002
		Analysis	UUISO - Level 4
		Sample Matrix	Other Solid

Comments	Sample Fraction	HP 210 / 270 Detector Activity	Storage Location
	04	89	E1.4
	05		E1.4
See MRM for instructions; See subfile for aliquots;			

	Location (circle one)					Initials	Date
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Kenny Sallings	11-26-02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Kenny Sallings	11-26-02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	JBernard	11/26/02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	JBernard	12/3/02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	[illegible]	12/3/02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	[illegible]	12-5-02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	[illegible]	12-5-02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	[illegible]	12-5-02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		

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EBERLINE SERVICES Oak Ridge Laboratory	Internal Chain of Custody	Work Order #	02-11141
		Lab Deadline	12/5/2002
		Analysis	ThISO - Level 4
		Sample Matrix	Other Solid

Comments	Sample Fraction	HP 210 / 270 Detector Activity	Storage Location
	04	89	E1.4
	05		E1.4
See MRM for instructions; See subfile for aliquots;			

	Location (circle one)					Initials	Date
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Kenny Sallings	11-26-02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Kenny Sallings	11-26-02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	JBernard	11/26/02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	M. Haerer	12/3/02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	[illegible]	12-4-02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	[illegible]	12-5-02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	J. Price	12-5-02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	J. Price	12-5-02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		

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EBERLINE SERVICES Oak Ridge Laboratory	Internal Chain of Custody	Work Order #	02-11141
		Lab Deadline	See Comments
		Analysis	PuISO - Level 4
		Sample Matrix	OS

Comments	Sample Fraction	HP 210 / 270 Detector Activity	Storage Location
Re-Analysis: 2□#5 is Process Blank	04	89	E1.4
	05		E1.4
Original Lab Deadline: 12/10/02 Rerun Lab Deadline: 12/10/02□ See MRM for instructions; See subfile for aliquots;			

	Location (circle one)					Technician Initials	
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	JBarnard	12/6/02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	JBarnard	12/6/02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	BNewton	12/6/02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	[illegible]	12-11-02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Jay Price	12-11-02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Ashley Clark	12/11/02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		

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EBERLINE SERVICES Oak Ridge Laboratory	Internal Chain of Custody	Work Order #	02-11141
		Lab Deadline	12/5/2002
		Analysis	Pu4ISO - Level 4
		Sample Matrix	Other Solid

Comments	Sample Fraction	HP 210 / 270 Detector Activity	Storage Location
Use Pu236 tracer - Report Pu242/~~244~~ KBS 11/26/02	04	89	E1.4
	05		E1.4
See MRM for instructions; See subfile for aliquots;			

	Location (circle one)					Initials	Date
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Kenny Sellings	11-26-02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Kenny Sellings	11-26-02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	JBernard	11/26/02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	JBernard	12/3/02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	[illegible]	12/3/02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	[illegible]	12-5-02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	[illegible]	12-5-02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	[illegible]	12-5-02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		

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EBERLINE SERVICES Oak Ridge Laboratory	Internal Chain of Custody	Work Order #	02-11141
		Lab Deadline	See Comments
		Analysis	Pu241 - Level 4
		Sample Matrix	OS

Comments	Sample Fraction	HP 210 / 270 Detector Activity	Storage Location
Re-Analysis: 2 #5 is Process Blank	04	89	E1.4
	05		E1.4
Original Lab Deadline: 12/10/02 Rerun Lab Deadline: 12/10/02 See MRM for instructions; See subfile for aliquots;			

	Location (circle one)					Technician Initials	
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Bernard	12/6/02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Bernard	12/6/02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	BMeyers	12/6/02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	[illegible]	12-11-02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	[illegible]	12-11-02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Ashley Clark	12/11/02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	[illegible]	12/12/02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	[illegible]	12/12/02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Ashley Clark	12/12/02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Ashley Clark	12/14/02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		

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EBERLINE SERVICES Oak Ridge Laboratory	Internal Chain of Custody	Work Order #	02-11141
		Lab Deadline	12/5/2002
		Analysis	Np237EI - Level 4
		Sample Matrix	Other Solid

Comments	Sample Fraction	HP 210 / 270 Detector Activity	Storage Location
	04	89	E1.4
	05		E1.4
See MRM for instructions; See subfile for aliquots;			

	Location (circle one)					Initials	Date
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Kenny Sellings	11-26-02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Kenny Sellings	11-26-02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Barnard	11/26/02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Barnard	12/3/02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	[illegible]	12-3-02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	[illegible]	12-6-02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	[illegible]	12-6-02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	[illegible]	12-9-02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		

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EBERLINE SERVICES
Oak Ridge Laboratory

Internal Chain of Custody

Work Order #	02-11141
Lab Deadline	12/5/2002
Analysis	Am241 - Level 4
Sample Matrix	Other Solid

Comments	Sample Fraction	HP 210 / 270 Detector Activity	Storage Location
	04	89	E1.4
	05		E1.4
See MRM for instructions; See subfile for aliquots;			

	Location (circle one)					Initials	Date
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		11/25/02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		11/26/02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Jay Bernard	11/26/02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Bernard	12/3/02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	[illegible]	12/3/02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	[illegible]	12-6-02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	[illegible]	12-6-02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		

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EBERLINE SERVICES Oak Ridge Laboratory	Internal Chain of Custody	Work Order #	02-11141
		Lab Deadline	12/5/2002
		Analysis	CmISO - Level 4
		Sample Matrix	Other Solid

Comments	Sample Fraction	HP 210 / 270 Detector Activity	Storage Location
	04	89	E1.4
	05		E1.4
See MRM for instructions; See subfile for aliquots;			

	Location (circle one)					Initials	Date
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Kenny Sellings	11-26-02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Kenny Sellings	11-26-02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Bernard	11/26/02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Bernard	12/3/02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	BHatten	12/3/02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	[illegible]	12-6-02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	[illegible]	12-6-02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		

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EBERLINE SERVICES Oak Ridge Laboratory	Internal Chain of Custody	Work Order #	02-11141
		Lab Deadline	12/5/2002
		Analysis	SrTOT - Level 4
		Sample Matrix	Other Solid

Comments	Sample Fraction	HP 210 / 270 Detector Activity	Storage Location
If Strontium is positive see KBS to add Sr89/90	04	89	E1.4
	05		E1.4
See MRM for instructions; See subfile for aliquots;			

	Location (circle one)					Initials	Date
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Kenny Solling	11-26-02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Kenny Solling	11-26-02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	[illegible]	11-26-02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	[illegible]	12-5-02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	[illegible]	12/5/02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	[illegible]	12-6-02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		

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EBERLINE SERVICES Oak Ridge Laboratory	Internal Chain of Custody	Work Order #	02-11141
		Lab Deadline	12/5/2002
		Analysis	Tc099 - Level 4
		Sample Matrix	Other Solid

Comments	Sample Fraction	HP 210 / 270 Detector Activity	Storage Location
	04	89	E1.4
	05		E1.4
See MRM for instructions; See subfile for aliquots;			

	Location (circle one)					Initials	Date
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Kenny Collings	11-26-02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Kenny Collings	11-26-02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	[illegible]	11-26-02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	[illegible]	12-5-02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Ashley Clark	12/5/02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Jeff Price	12-7-02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		

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EBERLINE SERVICES Oak Ridge Laboratory	Internal Chain of Custody	Work Order #	02-11141
		Lab Deadline	12/5/2002
		Analysis	H0003 - Level 4
		Sample Matrix	Other Solid

Comments	Sample Fraction	HP 210 / 270 Detector Activity	Storage Location
	04	89	E1.4
	05		E1.4
Report Cs137/134,Co60,~~Eu152/154/155~~,Mn54,Zn65,Nb94, Ag110m, & positives RBS 11/26/02			
See MRM for instructions; See subfile for aliquots;			

	Location (circle one)					Initials	Date
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	P. Funo	11-27-02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	P Funo	11-27-02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Alan Fugh	11/27/02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		

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EBERLINE SERVICES Oak Ridge Laboratory	Internal Chain of Custody	Work Order #	02-11141
		Lab Deadline	12/5/2002
		Analysis	C0014 - Level 4
		Sample Matrix	Other Solid

Comments	Sample Fraction	HP 210 / 270 Detector Activity	Storage Location
	04	89	E1.4
	05		E1.4
See MRM for instructions; See subfile for aliquots;			

	Location (circle one)					Initials	Date
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Kenny Sallings	11-26-02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Kenny Sallings	11-26-02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Charlotte McMurray	12-12-02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Charlotte McMurray	12-12-02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Osie Clark	12/12/02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Jay Price	12-13-
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Charlotte McMurray	12-13-02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Charlotte McMurray	12-13-02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Osie Clark	12/13/02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Osie Clark	12/14/02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		

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EBERLINE SERVICES Oak Ridge Laboratory	Internal Chain of Custody	Work Order #	02-11141
		Lab Deadline	12/5/2002
		Analysis	Ni063 - Level 4
		Sample Matrix	Other Solid

Comments	Sample Fraction	HP 210 / 270 Detector Activity	Storage Location
~~Report Co57,I129, Fe55~~	04	89	E1.4
KBS 11/26/02	05		E1.4
See MRM for instructions; See subfile for aliquots;			

	Location (circle one)					Initials	Date
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Kenny Selling	11-26-02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Kenny Selling	11-26-02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Charlotte McMurray	11-26-02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Charlotte McMurray	12-3-02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Ashley Clark	12/3/02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Jay Rice	12-4-02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		

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EBERLINE SERVICES Oak Ridge Laboratory	Internal Chain of Custody	Work Order #	02-11141
		Lab Deadline	12/5/2002
		Analysis	Ni59 - Level 4
		Sample Matrix	Other Solid

Comments	Sample Fraction	HP 210 / 270 Detector Activity	Storage Location
	04	89	E1.4
	05		E1.4
See MRM for instructions; See subfile for aliquots;			

	Location (circle one)					Initials	Date
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Kenny Schling	11-26-02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Kenny Schling	11-26-02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Charlotte McCurry	11-26-02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Charlotte McCurry	12-5-02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	John Clark	12/5/02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Jess Price	12-6-02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		

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EBERLINE SERVICES Oak Ridge Laboratory	Internal Chain of Custody	Work Order #	02-11141
		Lab Deadline	12/5/2002
		Analysis	Pb210 - Level 4
		Sample Matrix	Other Solid

Comments	Sample Fraction	HP 210 / 270 Detector Activity	Storage Location
	04	89	E1.4
	05		E1.4
See MRM for instructions and aliquots			

	Location (circle one)					Initials	Date
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	[illegible]	12/4/02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	[illegible]	12/5/02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Vicki Clark	12/5/02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Vicki Clark	12/5/02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		

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EBERLINE SERVICES Oak Ridge Laboratory	Internal Chain of Custody	Work Order #	02-11141
		Lab Deadline	12/5/2002
		Analysis	GaGbT - Level 4
		Sample Matrix	Other Solid

Comments	Sample Fraction	HP 210 / 270 Detector Activity	Storage Location
	04	89	E1.4
	05		E1.4
See MRM for instructions; See subfile for aliquots;			

	Location (circle one)					Initials	Date
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Kenny Selling	11-26-02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Kenny Selling	11-26-02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Charlotte C McMurray	11-26-02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Charlotte C McMurray	11-27-02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Ashli Clare	11/27/02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		

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EBERLINE SERVICES Oak Ridge Laboratory	Internal Chain of Custody	Work Order #	02-11141
		Lab Deadline	12/5/2002
		Analysis	Gamma - Level 4
		Sample Matrix	Other Solid

Comments	Sample Fraction	HP 210 / 270 Detector Activity	Storage Location
Report Cs137/134,Co60,Eu152/154/155,Mn54,Zn65,Nb94, Ag110m, & positives	04	89	E1.4
	05		E1.4
See MRM for instructions; See subfile for aliquots;			

	Location (circle one)					Initials	Date
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Kenny Salling	11-26-02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Kenny Salling	11-26-02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Ashee Clark	11/26/02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Ashee Clark	11/27/02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		

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EBERLINE SERVICES Oak Ridge Laboratory	Internal Chain of Custody	Work Order #	02-11141
		Lab Deadline	12/5/2002
		Analysis	GLEPS - Level 4
		Sample Matrix	Other Solid

Comments	Sample Fraction	HP 210 / 270 Detector Activity	Storage Location
Report Co57,I129, Fe55	04	89	E1.4
	05		E1.4
See MRM for instructions; See subfile for aliquots;			

	Location (circle one)					Initials	Date
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Kenny Salling	11.26.02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Kenny Salling	11.26.02
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room	Jackie Clark	11/26/02
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Received by	Sample Storage	Rough Prep	Prep	Separations	Count Room		
Relinquished by	Sample Storage	Rough Prep	Prep	Separations	Count Room		

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Chain of Custody Record

№ 1379

Eberline Services
601 Scarboro Road
Oak Ridge, TN 37830
(865) 481-0683 Phone • (865) 483-4621 Fax

EBERLINE SERVICES

P-50

Project Name:	Project Number: 02-11-141
Send Report To: Eberline Services	Sampler (Print Name):
Address: 601 Scarboro Rd.	Sampler (Print Name):
Oak Ridge, TN 37830	Shipment Method:
	Airbill Number:
Phone:	Laboratory Receiving:
Fax:	

Page 1 of 1

L 19822

Purchase Order #: 9776

Field Sample ID	Sample Date	Sample Time	Sample Matrix	Number of Containers	Analysis Requested: C-14 Prep Only	Comments, Special Instructions, etc.	Lab Sample ID (to be completed by lab)
02-11-141-04-84081	11/25/02	1200	S	1	X	Please return samples	
DUP- 84082						by 12/5/02.	
						Oxidize minimum of 0.5g	
						Oxidation of samples + CO_2 trap only	
						No Beta LSC counting	
						Please include all paperwork	
						Please run a duplicate	
						Please send 2 vials of cocktail	

00024

11/27/02 8:20

Zacky Shaulis

Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
KBS 11/27/02	Monet Sorden	11/27/02	
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:
	Charlotte P. McMurray	12/2/02	12:05
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time:

Sample Custodian Remarks (Completed By Laboratory):

QA/QC Level		Turnaround		Sample Receipt	
Level I	☐	Routine	☐	Total # Containers Received?	
Level II	☐	24 Hour	☐	COC Seals Present?	
Level III	☐	1 Week	☐	COC Seals Intact?	
Other	☐	Other _____		Received Containers Intact?	
				Temperature?	

SECTION II

SAMPLE ACKNOWLEDGEMENT

Client Name	Contract/PO	Project Type	...te Received	Required Turnaround Days	Eberline Servi... ...rk Order
Duratek	15255	Environmental	11/26/2002	14	02-11141
Project Name	**Client WO**	**Sample Disp**	**Lab Deadline**	**Internal Deadline**	**Client Deadline**
106760.003	VA Medical Center	R	12/05/2002	12/09/2002	12/10/2002

Internal ID	Client ID	Sample Date	Matrix	Storage	Am241	C0014	CmISO	GaGbT	Gamma	GLEPS	H0003	Ni063	Ni59	Np237EI	Pu241	Pu4ISO	PuISO	SrTOT	Tc099	ThISO	UUISO	Pb210							Ttl
01	LCS	11/26/02	OS	E1.4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X							18
02	BLANK	11/26/02	OS	E1.4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X							18
03	DUP	11/26/02	OS	E1.4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X							18
04	VA-02-0176	11/25/02 12:00	OS	E1.4	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X							18
05	Process Blank	11/26/02 00:00	OS	E1.4											X		X												2
																													0
																													0
																													0
																													0
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																													0
																													0
	Totals Per Analysis (non QA samples)				1	1	1	1	1	1	1	1	1	1	2	1	2	1	1	1	1	1	0	0	0	0	0	0	

EBERLINE SERVICES

Sample Log In Report

Oak Ridge Laboratory
601 Scarboro Rd.
Oak Ridge, TN 37830

Voice: (865) 481-0683
Fax: (865) 483-4621

Invoice		Report Data	
	Accounts Payable Duratek 10100 Old Columbia Road Columbia, MD 21046		Paul Jones Duratek 628 Gallaher Road Kingston, TN 37763
Voice		Voice	865-376-8276
Fax		Fax	865-376-6247
Contact	Paul Jones		**Fax data to Paul Jones**
Voice	865-376-8276		
Fax	865-376-6247		

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Eberline Services – Oak Ridge Laboratory

SAMPLE RECEIPT CHECKLIST
MP-001-2

WORK ORDER# 02 11 141

SAMPLE MATRIX/MATRICES: (CIRCLE ONE OR BOTH)
AQUEOUS NON-AQUEOUS

(CIRCLE EITHER YES, NO, OR N/A)

WERE SAMPLES:

1) RECEIVED IN GOOD CONDITION? Y OR N
2) IF AQUEOUS, PROPERLY PRESERVED Y OR N N/A

WERE CHAIN OF CUSTODY SEALS:

1) PRESENT ON OUTSIDE OF PACKAGE? Y OR N
2) UNBROKEN ON OUTSIDE OF PACKAGE? Y OR N
3) PRESENT ON SAMPLES? Y OR N
4) UNBROKEN ON SAMPLES? Y OR N

WAS CHAIN OF CUSTODY PRESENT UPON SAMPLE RECEIPT? Y OR N

IF ANY OF THE ABOVE ARE CIRCLED "NO", A DISCREPANT SAMPLE RECEIPT REPORT (DSR) HAS BEEN ISSUED.

REMARKS:

SIGNATURE: K Bannister DATE: 11-26-02

Copy No. _____

SECTION III

CASE NARRATIVE

EBERLINE SERVICES

Oak Ridge Laboratory
601 Scarboro Road
Oak Ridge, TN 37830
Phone (865) 481-0683
Fax (865) 483-4621

EBS-OR-18150

December 18, 2002

Mr. Paul Jones
Duratek Federal Services
628 Gallaher Road
Kingston, TN 37763

CASE NARRATIVE
Work Order# 02-11141-OR

SAMPLE RECEIPT

This work order contains one solid sample received 11/26/2002. This sample was analyzed for Americium-241, Curium-243/244, Carbon-14, Gross Alpha/Beta, Lead-210, Nickel-59/63, Neptunium-237, Isotopic Plutonium, Plutonium-241, Technetium-99, Total Strontium, Isotopic Thorium, Tritium, Isotopic Uranium, by Gamma LEPS and by Gamma Spectroscopy.

CLIENT ID	LAB ID
VA-02-0176	02-11141-04

ANALYTICAL METHODS

Americium-241 and Curium-243/244 were analyzed using method EML Am-01 Modified. Carbon-14 was performed using EPA Method 520.0 Modified. Gross Alpha/Beta was performed by gas flow proportional counting using Method LANL MLR-100 Modified. Lead-210 was analyzed using Method EML Pb-01 Modified. Nickel-59/63 was analyzed using Method ASTM 3500-Ni Modified. Neptunium-237 was analyzed using EIChroM Method ACW08 Modified. Isotopic Plutonium and Plutonium-241 were analyzed using Method EML Pu-02 Modified. Technetium-99 was analyzed using EIChroM Method TCS01 Modified. Total Strontium was analyzed using EIChroM Method SRW01 Modified. Tritium was performed by beta liquid scintillation using Method LANL ER-210 Modified. Isotopic Thorium was analyzed using Method EML Th-01 Modified. Isotopic Uranium was analyzed using Method EML U-02 Modified. Gamma LEPS and Gamma Spectroscopy were performed using Method LANL ER-130 Modified.

ANALYTICAL RESULTS

ISOTOPIC URANIUM

Uranium samples were prepared by chemical digestion and ion exchange separation. The samples were mounted by micro-precipitation onto a micro-porous filter. The sample activities were then counted by semiconductor alpha spectroscopy.

Sample demonstrated non-detect or background equivalent results for Uranium-234, Uranium-235 and Uranium-238 activity. The chemical recovery was acceptable. Results for the Uranium-234, Uranium-235 and Uranium-238 method blanks demonstrated non-detect equivalent activity. Results for the Uranium-234 and Uranium-235 replicates demonstrated high relative percent difference; however,

ANALYTICAL RESULTS CONTINUED

ISOTOPIC URANIUM continued

normalized differences were within acceptable limits. Results for the Uranium-238 replicate demonstrated an acceptable relative percent difference and normalized difference. Results for the Uranium-234 and Uranium-238 laboratory control samples demonstrated acceptable percent recoveries and normalized differences. Results for the Uranium-235 laboratory control sample demonstrated a slightly high percent recovery; however, the normalized difference was within acceptable limits.

ISOTOPIC THORIUM

Thorium samples were prepared by chemical digestion and ion exchange separation. The samples were mounted by micro-precipitation onto a micro-porous filter. The samples were then counted by semiconductor alpha spectroscopy.

Sample demonstrated background equivalent results for Thorium-228, Thorium-230 and Thorium-232 activity. The chemical recovery was acceptable. Results for the Thorium-228, Thorium-230 and Thorium-232 method blanks demonstrated background equivalent activity. Results for the Thorium-228, Thorium-230 and Thorium-232 replicates demonstrated high relative percent differences; however, normalized differences were within acceptable limits. Results for the Thorium-228, Thorium-230 and Thorium-232 laboratory control samples demonstrated acceptable percent recoveries and normalized differences.

ISOTOPIC PLUTONIUM (Pu-238/239/240)

Plutonium samples were prepared by chemical digestion and ion exchange separation. The samples were mounted by micro-precipitation onto a micro-porous filter. The samples were then counted by semiconductor alpha spectroscopy. Samples were traced with Plutonium-242 for determination of Plutonium-238 and Plutonium-239/240 activity only. In the event Plutonium-242 was found to be positive within laboratory method code, Pu4ISO, results would have been calculated by normalization of results. In this case this was not required (see Pu-242/244).

2nd Analytical Attempt

Samples demonstrated non-detect equivalent results for Plutonium-238 and Plutonium-239/240 activity. The chemical recovery was acceptable. Results for the Plutonium-238 and Plutonium-239/240 method blanks demonstrated non-detect equivalent activity. Results for the Plutonium-238 and Plutonium-239/240 replicates demonstrated high relative percent differences; however, normalized differences were within acceptable limits. Results for the Plutonium-238 and Plutonium-239/240 laboratory control samples demonstrated acceptable percent recoveries and normalized differences.

ISOTOPIC PLUTONIUM (Pu-242/244)

A second set of Plutonium samples were prepared by chemical digestion using a Plutonium-236 tracer for reporting Plutonium-242 and Plutonium-244 only. The samples were mounted by micro-precipitation onto a micro-porous filter. The samples were then counted by semiconductor alpha spectroscopy.

Sample demonstrated non-detect equivalent results for Plutonium-242 and Plutonium-244 activity. The chemical recovery was acceptable. Results for the Plutonium-242 and Plutonium-244 method blanks

ANALYTICAL RESULTS CONTINUED

ISOTOPIC PLUTONIUM (Pu-242/244) continued

demonstrated non-detect equivalent activity. Results for the Plutonium-242 replicate demonstrated a high relative percent difference; however, the normalized difference was within acceptable limits. Results for the Plutonium-242 laboratory control sample demonstrated an acceptable percent recovery and normalized difference.

PLUTONIUM-241

Following the Isotopic Plutonium determination, the Cellulose Nitrate filter was dissolved and Plutonium-241 was determined by liquid scintillation counting.

2nd Analytical Attempt

Sample results demonstrated non-detect equivalent Plutonium-241 activity, but the replicate demonstrated slightly positive Plutonium-241 activity. Both the sample and the replicate results demonstrated slightly high detection limits. Results for the Plutonium-241 blank demonstrated slightly positive activity. This method was prone to slight false positives as a result of counting very low energy Beta emissions and potential interferences from the Plutonium-242 tracer. The evaluation of results should include subtraction of the method blank in order to correct for this phenomena. In the case of results for this sample, this causes results to be non-detect equivalent. Results for the Plutonium-241 replicate demonstrated a high relative percent difference and normalized difference. Results for the Plutonium-241 laboratory control sample demonstrated an acceptable percent recovery and a high normalized difference.

NEPTUNIUM-237 by EIChroM

Samples were prepared by chemical digestion, in the case of solids, or by acidic dry-down in the case of relative clean water samples. The sample residue was dissolved in dilute acid and the Neptunium separated using EIChroM stabilized selective chemistry. The eluted Neptunium was counted by alpha spectroscopy and the chemical yield determined by beta proportional counting.

Sample demonstrated non-detect equivalent results for Neptunium-237 activity. The chemical recovery was acceptable. Results for the Neptunium-237 method blank demonstrated non-detect equivalent activity. Results for the Neptunium-237 replicate demonstrated a high relative percent difference; however, the normalized difference was within acceptable limits. Results for the Neptunium-237 laboratory control sample demonstrated an acceptable percent recovery and normalized difference.

AMERICIUM/CURIUM

Americium/Curium samples were prepared by chemical digestion and ion exchange separation. The samples were mounted by micro-precipitation onto a micro-porous filter. The samples were then counted by semiconductor alpha spectroscopy.

Sample demonstrated non-detect equivalent results for Americium-241 and Curium-243/244 activity. The chemical recovery was acceptable. Results for the Americium-241 and Curium-243/244 method

ANALYTICAL RESULTS CONTINUED

AMERICIUM/CURIUM continued

blanks demonstrated non-detect equivalent activity. Results for the Americium-241 and Curium-243/244 replicates demonstrated high relative percent differences; however, normalized differences were within acceptable limits. Results for the Americium-241 and Curium-243/244 laboratory control samples demonstrated acceptable percent recoveries and normalized differences.

TOTAL STRONTIUM

Samples were prepared by acid digestion and chemical separation using EIChroM stabilized chemical reagents. The Strontium fraction of the sample was eluted onto a steel planchet. Chemical recovery was determined by use of a stable Strontium carrier. The samples were counted by gas flow proportional counting and corrected for ^{90}Yttrium ingrowth.

Sample demonstrated non-detect equivalent results for Total Strontium activity. The chemical recovery was acceptable. Results for the Total Strontium method blank demonstrated non-detect equivalent activity. Results for the Total Strontium replicate demonstrated a high relative percent difference; however, the normalized difference was within acceptable limits. Results for the Total Strontium laboratory control sample demonstrated an acceptable percent recovery and normalized difference.

TECHNETIUM-99

The samples were prepared by oxidative reaction with Nitric acid and Hydrogen Peroxide. After the samples were thoroughly oxidized, the Technetium was separated using EIChroM resin stabilized chemical reagents. The resin was then transferred to a liquid scintillation vial, cocktail was added and the sample was counted on a Packard 2550 TRLL beta liquid scintillation counter.

Sample results were calculated using Technetium-99 quench curve efficiency. Sample demonstrated non-detect equivalent results for Technetium-99 activity. Results for the Technetium-99 method blank demonstrated non-detect equivalent activity. Results for the Technetium-99 replicate demonstrated a high relative percent difference; however, the normalized difference was within acceptable limits. Results for the Technetium-99 laboratory control sample demonstrated an acceptable percent recovery and normalized difference.

TRITIUM

An aliquot of the solid sample material was equilibrated with a known volume of tritium-free water and added to a round-bottomed distillation flask. The aqueous portion of the mixture was distilled and a portion of the middle fraction of the distillate was transferred to a liquid scintillation vial and cocktail was added. The sample was then counted by beta liquid scintillation. A matrix-spiked sample was simultaneously prepared to determine chemical recovery and instrument efficiency.

Sample demonstrated only slightly positive results for Tritium activity. Results for the Tritium blank demonstrated non-detect equivalent activity. Results for the Tritium replicate demonstrated an acceptable relative percent difference and normalized difference. Results for the Tritium laboratory control sample demonstrated an acceptable percent recovery and normalized difference.

ANALYTICAL RESULTS CONTINUED

CARBON-14

The samples were oxidized and the Carbon-14 evolved as CO_2. This gas was trapped in a liquid absorbent solution, which was mixed with a liquid scintillation cocktail. The samples were counted by beta liquid scintillation using energy windows set to minimize the contribution from other potential contaminants.

Sample demonstrated slightly positive results for Carbon-14 activity. Results for the Carbon-14 blank demonstrated non-detect equivalent activity. Results for the Carbon-14 replicate demonstrated an acceptable relative percent difference and normalized difference. Results for the Carbon-14 laboratory control sample demonstrated an acceptable percent recovery and normalized difference.

NICKEL-63

An aliquot of stable Nickel carrier was added to each water sample or solid sample prior to digestion. After pH adjustment, Nicke-63 was precipitated selectively with Dimethylglyoxime. The precipitate was separated and the Nickel-63 activity was determined by beta liquid scintillation.

Sample results demonstrated non-detect equivalent Nickel-63 activity. Results for the Nickel-63 blank demonstrated non-detect equivalent activity. Results for the Nickel-63 replicate demonstrated a high relative percent difference and normalized difference. Results for the Nickel-63 laboratory control sample demonstrated a low percent recovery and acceptable normalized difference.

NICKEL-59

After the Nickel-63 had been counted, the samples were transferred to beakers and muffled. The Nickel-59 samples were transferred to planchets with 3-Molar nitric acid and dried. Upon drying, planchets were placed in wax envelopes and taken to the countroom.

Sample results demonstrated non-detect equivalent Nickel-59 activity. Results for the Nickel-59 blank demonstrated non-detect equivalent activity. Results for the Nickel-59 replicate demonstrated a high relative percent difference and an acceptable normalized difference. The Nickel-59 laboratory control sample was not available due to it being an artifact of calculations necessary to process the samples; therefore, percent recovery is not reported for the laboratory control sample.

LEAD-210

A standardized Bismuth carrier was added to the sample. Solid samples were digested and aqueous samples were acidified. The Lead and Bismuth are extracted by solvent extraction. After allowing for ingrowth of the Bismuth-210 daughter, the Bismuth was precipitated, the chemical recovery determined by the stable Bismuth carrier and the activity determined by using a gas flow proportional detector.

Sample results demonstrated slightly positive Lead-210 activity. The chemical recovery was acceptable. Results for the Lead-210 blank demonstrated slightly positive activity. Results for the Lead-210 replicate demonstrated an acceptable relative percent difference and normalized difference. Results for the Lead-210 laboratory control sample demonstrated an acceptable percent recovery and a slightly high normalized difference.

ANALYTICAL RESULTS CONTINUED

GROSS ALPHA/BETA

Solid samples for Gross Alpha/Beta analysis were dried, pulverized, and, several grams of the sample were digested under reflux. The digested sample was brought to a standard volume and a small aliquot equivalent to roughly 100 mg was transferred to the planchet for analysis. The samples were then counted by use of a gas proportional counter.

Sample demonstrated non-detect equivalent results for Gross Alpha activity and slightly positive results for Gross Beta activity. Results for the Gross Alpha and Gross Beta method blanks demonstrated non-detect equivalent activity. Results for the Gross Alpha replicate demonstrated a slightly high relative percent difference; however, the normalized difference was within acceptable limits. Results for the Gross Beta replicate demonstrated an acceptable relative percent difference and normalized difference. Results for the Gross Alpha and Gross Beta laboratory control samples demonstrated acceptable percent recoveries and normalized differences.

GAMMA SPECTRAL ANALYSIS

Gamma Spectroscopy samples were prepared by transferring a measured aliquot of the sample to a standard geometry container. The samples were counted on a High Purity Germanium (HPGe) gamma ray detector.

Sample demonstrated non-detect equivalent to only slightly positive results for gamma-emitting radionuclides as reported. Results for the method blank demonstrated non-detect equivalent activity for gamma-emitting radionuclides as reported. Results for the Cobalt-60 and Europium-152 replicates demonstrated acceptable relative percent differences and normalized differences. Results for the Zinc-65 replicate demonstrated a slightly high relative percent difference; however, the normalized difference was within acceptable limits. Results for the Cobalt-60 and Cesium-137 laboratory control samples demonstrated acceptable percent recoveries and normalized differences.

LOW ENERGY GAMMA SPECTROSCOPY (GAMMA LEPS)

The Gamma LEPS samples were prepared by transferring a measured aliquot of the sample to a standard geometry container. The samples were counted on a planar, High Purity Germanium gamma ray detector.

Sample results demonstrated slightly positive Cobalt-57 activity, and non-detect equivalent Iron-55 and Iodine-129 activity. Results for the Cobalt-57, Iron-55 and Iodine-129 method blanks demonstrated non-detect equivalent activity. Results for the Cobalt-57 replicate demonstrated an acceptable relative percent difference and normalized difference. Results for the Iodine-129 replicate demonstrated a high relative percent difference; however, the normalized difference was within acceptable limits. Results for the Americium-241 and Cobalt-57 laboratory control samples demonstrated acceptable percent recoveries and normalized differences.

CERTIFICATION OF ACCURACY

I certify that this data report was in compliance with the terms and conditions of the Purchase Order, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the cognizant project manager or his/her designee to be accurate as verified by the following signature.

M.R. McDougall
Laboratory Manager

Date: 12/18/2002

SECTION IV

ANALYTICAL RESULTS SUMMARY

Eberline Services
Final Report of Analysis

Report To:	
Paul Jones	
Duratek	
628 Gallaher Road	
Kingston, TN 37763	

Work Order Details:	
SDG:	02-11141
Purchase Order:	15255
Analysis Category:	ENVIRONMENTAL
Sample Matrix:	OS

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	TPU	MDA	Report Units
02-11141-01	LCS	KNOWN	11/26/02 00:00	11/26/2002	12/6/2002	02-11141	Americium-241	EML Am-01 Modified	5.64E+00	1.69E-01			pCi/g
02-11141-01	LCS	SPIKE	11/26/02 00:00	11/26/2002	12/6/2002	02-11141	Americium-241	EML Am-01 Modified	6.03E+00	1.06E+00	1.13E+00	1.09E-01	pCi/g
02-11141-02	MBL	BLANK	11/26/02 00:00	11/26/2002	12/6/2002	02-11141	Americium-241	EML Am-01 Modified	2.41E-02	4.78E-02	4.78E-02	1.04E-01	pCi/g
02-11141-03	DUP	VA-02-0176	11/25/02 12:00	11/26/2002	12/6/2002	02-11141	Americium-241	EML Am-01 Modified	3.41E-02	4.70E-02	4.71E-02	8.48E-02	pCi/g
02-11141-04	DO	VA-02-0176	11/25/02 12:00	11/26/2002	12/6/2002	02-11141	Americium-241	EML Am-01 Modified	1.36E-02	4.10E-02	4.10E-02	1.03E-01	pCi/g
02-11141-01	LCS	KNOWN	11/26/02 00:00	11/26/2002	12/6/2002	02-11141	Curium-243/244	EML Am-01 Modified	6.73E+00	9.42E-02			pCi/g
02-11141-01	LCS	SPIKE	11/26/02 00:00	11/26/2002	12/6/2002	02-11141	Curium-243/244	EML Am-01 Modified	6.21E+00	1.09E+00	1.25E+00	1.31E-01	pCi/g
02-11141-02	MBL	BLANK	11/26/02 00:00	11/26/2002	12/6/2002	02-11141	Curium-243/244	EML Am-01 Modified	-1.13E-02	1.03E-02	1.03E-02	9.32E-02	pCi/g
02-11141-03	DUP	VA-02-0176	11/25/02 12:00	11/26/2002	12/6/2002	02-11141	Curium-243/244	EML Am-01 Modified	9.50E-03	2.33E-02	2.33E-02	5.29E-02	pCi/g
02-11141-04	DO	VA-02-0176	11/25/02 12:00	11/26/2002	12/6/2002	02-11141	Curium-243/244	EML Am-01 Modified	3.70E-02	4.89E-02	4.90E-02	7.52E-02	pCi/g
02-11141-01	LCS	KNOWN	11/26/02 00:00	11/26/2002	12/12/2002	02-11141	Carbon-14	EPA 520.0 Modified	8.30E+02	2.91E+01			pCi/g
02-11141-01	LCS	SPIKE	11/26/02 00:00	11/26/2002	12/12/2002	02-11141	Carbon-14	EPA 520.0 Modified	8.56E+02	7.24E+00	3.48E+01	2.39E+00	pCi/g
02-11141-02	MBL	BLANK	11/26/02 00:00	11/26/2002	12/12/2002	02-11141	Carbon-14	EPA 520.0 Modified	0.00E+00	1.39E+00	0.00E+00	2.37E+00	pCi/g
02-11141-03	DUP	VA-02-0176	11/25/02 12:00	11/26/2002	12/12/2002	02-11141	Carbon-14	EPA 520.0 Modified	4.22E+02	6.26E+00	1.79E+01	3.38E+00	pCi/g
02-11141-04	DO	VA-02-0176	11/25/02 12:00	11/26/2002	12/12/2002	02-11141	Carbon-14	EPA 520.0 Modified	4.00E+02	5.94E+00	1.70E+01	3.22E+00	pCi/g
02-11141-01	LCS	KNOWN	11/26/02 00:00	11/26/2002	11/27/2002	02-11141	Gross Alpha	LANL MLR-100 Modified	3.29E+02	1.41E+01			pCi/g
02-11141-01	LCS	SPIKE	11/26/02 00:00	11/26/2002	11/27/2002	02-11141	Gross Alpha	LANL MLR-100 Modified	3.42E+02	6.87E+00	2.44E+01	5.46E-01	pCi/g
02-11141-02	MBL	BLANK	11/26/02 00:00	11/26/2002	11/27/2002	02-11141	Gross Alpha	LANL MLR-100 Modified	2.87E-02	2.74E-01	2.74E-01	5.46E-01	pCi/g
02-11141-03	DUP	VA-02-0176	11/25/02 12:00	11/26/2002	11/27/2002	02-11141	Gross Alpha	LANL MLR-100 Modified	1.23E+00	5.36E-01	5.43E-01	6.26E-01	pCi/g
02-11141-04	DO	VA-02-0176	11/25/02 12:00	11/26/2002	11/27/2002	02-11141	Gross Alpha	LANL MLR-100 Modified	9.60E-01	4.89E-01	4.93E-01	6.14E-01	pCi/g
02-11141-01	LCS	KNOWN	11/26/02 00:00	11/26/2002	11/27/2002	02-11141	Gross Beta	LANL MLR-100 Modified	2.94E+02	8.81E+00			pCi/g
02-11141-01	LCS	SPIKE	11/26/02 00:00	11/26/2002	11/27/2002	02-11141	Gross Beta	LANL MLR-100 Modified	2.98E+02	5.63E+00	1.50E+01	8.47E-01	pCi/g
02-11141-02	MBL	BLANK	11/26/02 00:00	11/26/2002	11/27/2002	02-11141	Gross Beta	LANL MLR-100 Modified	-3.06E-01	4.45E-01	4.45E-01	8.47E-01	pCi/g
02-11141-03	DUP	VA-02-0176	11/25/02 12:00	11/26/2002	11/27/2002	02-11141	Gross Beta	LANL MLR-100 Modified	2.48E+01	1.48E+00	1.88E+00	8.51E-01	pCi/g
02-11141-04	DO	VA-02-0176	11/25/02 12:00	11/26/2002	11/27/2002	02-11141	Gross Beta	LANL MLR-100 Modified	2.42E+01	1.47E+00	1.85E+00	8.48E-01	pCi/g

CU=Counting Uncertainty;TPU=Total Propagated Uncertainty;MDA=Minimal Detected Activity;LCS=Laboratory Control Sample; MBL=Blank; DUP=Duplicate; TRG=Normal Sample; DO=Duplicate Original

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601 Scarboro Road, Oak Ridge, TN 37830 865/481-0683 FAX 865/483-4621

Eberline Services
Final Report of Analysis

Report To:
Paul Jones
Duratek
628 Gallaher Road
Kingston, TN 37763

Work Order Details:
SDG: 02-11141
Purchase Order: 15255
Analysis Category: ENVIRONMENTAL
Sample Matrix: OS

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	TPU	MDA	Report Units
02-11141-01	LCS	KNOWN	11/26/02 00:00	11/26/2002	11/27/2002	02-11141	Americium-241	LANL ER-130 Modified	3.91E+03	1.95E+02			pCi/g
02-11141-01	LCS	KNOWN	11/26/02 00:00	11/26/2002	11/27/2002	02-11141	Cobalt-57	LANL ER-130 Modified	1.33E+03	5.46E+01			pCi/g
02-11141-01	LCS	SPIKE	11/26/02 00:00	11/26/2002	11/27/2002	02-11141	Americium-241	LANL ER-130 Modified	3.86E+03	4.21E+02	4.27E+02	5.37E+00	pCi/g
02-11141-01	LCS	SPIKE	11/26/02 00:00	11/26/2002	11/27/2002	02-11141	Cobalt-57	LANL ER-130 Modified	1.39E+03	1.29E+02	1.32E+02	4.07E+00	pCi/g
02-11141-02	MBL	BLANK	11/26/02 00:00	11/26/2002	11/26/2002	02-11141	Cobalt-57	LANL ER-130 Modified	4.16E-02	7.11E-02	7.11E-02	1.38E-01	pCi/g
02-11141-02	MBL	BLANK	11/26/02 00:00	11/26/2002	11/26/2002	02-11141	Iron-55	LANL ER-130 Modified	-3.66E+01	1.21E+03	1.21E+03	2.07E+02	pCi/g
02-11141-02	MBL	BLANK	11/26/02 00:00	11/26/2002	11/26/2002	02-11141	Iodine-129	LANL ER-130 Modified	1.59E-01	2.86E-01	2.86E-01	4.04E-01	pCi/g
02-11141-03	DUP	VA-02-0176	11/25/02 12:00	11/26/2002	11/26/2002	02-11141	Cobalt-57	LANL ER-130 Modified	1.23E+00	2.21E-01	2.22E-01	1.10E-01	pCi/g
02-11141-03	DUP	VA-02-0176	11/25/02 12:00	11/26/2002	11/26/2002	02-11141	Iron-55	LANL ER-130 Modified	4.81E+00	1.76E+02	1.76E+02	1.36E+02	pCi/g
02-11141-03	DUP	VA-02-0176	11/25/02 12:00	11/26/2002	11/26/2002	02-11141	Iodine-129	LANL ER-130 Modified	1.35E-01	2.43E-01	2.43E-01	2.55E-01	pCi/g
02-11141-04	DO	VA-02-0176	11/25/02 12:00	11/26/2002	11/26/2002	02-11141	Cobalt-57	LANL ER-130 Modified	1.02E+00	1.81E-01	1.82E-01	1.10E-01	pCi/g
02-11141-04	DO	VA-02-0176	11/25/02 12:00	11/26/2002	11/26/2002	02-11141	Iron-55	LANL ER-130 Modified	2.95E+01	9.73E+02	9.73E+02	1.36E+02	pCi/g
02-11141-04	DO	VA-02-0176	11/25/02 12:00	11/26/2002	11/26/2002	02-11141	Iodine-129	LANL ER-130 Modified	-5.72E-02	1.97E-01	1.97E-01	3.26E-01	pCi/g
02-11141-01	LCS	KNOWN	11/26/02 00:00	11/26/2002	12/5/2002	02-11141	Lead-210	EML Pb-01 Modified	2.11E+01	7.82E-01			pCi/g
02-11141-01	LCS	SPIKE	11/26/02 00:00	11/26/2002	12/5/2002	02-11141	Lead-210	EML Pb-01 Modified	2.44E+01	1.51E+00	1.67E+00	1.06E+00	pCi/g
02-11141-02	MBL	BLANK	11/26/02 00:00	11/26/2002	12/5/2002	02-11141	Lead-210	EML Pb-01 Modified	2.97E+00	7.85E-01	7.89E-01	1.09E+00	pCi/g
02-11141-03	DUP	VA-02-0176	11/25/02 12:00	11/26/2002	12/5/2002	02-11141	Lead-210	EML Pb-01 Modified	4.29E+00	8.17E-01	8.26E-01	9.86E-01	pCi/g
02-11141-04	DO	VA-02-0176	11/25/02 12:00	11/26/2002	12/5/2002	02-11141	Lead-210	EML Pb-01 Modified	3.79E+00	7.97E-01	8.04E-01	9.95E-01	pCi/g
02-11141-01	LCS	KNOWN	11/26/02 00:00	11/26/2002	12/6/2002	02-11141	Neptunium-237	EIChroM ACW08 Mod	9.80E+00	3.53E-01			pCi/g
02-11141-01	LCS	SPIKE	11/26/02 00:00	11/26/2002	12/6/2002	02-11141	Neptunium-237	EIChroM ACW08 Mod	1.01E+01	1.16E+00	2.13E+00	1.14E-01	pCi/g
02-11141-02	MBL	BLANK	11/26/02 00:00	11/26/2002	12/7/2002	02-11141	Neptunium-237	EIChroM ACW08 Mod	0.00E+00	0.00E+00	0.00E+00	4.69E-02	pCi/g
02-11141-03	DUP	VA-02-0176	11/25/02 12:00	11/26/2002	12/7/2002	02-11141	Neptunium-237	EIChroM ACW08 Mod	0.00E+00	0.00E+00	0.00E+00	6.25E-02	pCi/g
02-11141-04	DO	VA-02-0176	11/25/02 12:00	11/26/2002	12/7/2002	02-11141	Neptunium-237	EIChroM ACW08 Mod	2.33E-02	5.69E-02	5.70E-02	1.30E-01	pCi/g

CU=Counting Uncertainty;TPU=Total Propagated Uncertainty;MDA=Minimal Detected Activity;LCS=Laboratory Control Sample; MBL=Blank; DUP=Duplicate; TRG=Normal Sample; DO=Duplicate Original

EBERLINE SERVICES

Oak Ridge Laboratory
601 Scarboro Road, Oak Ridge, T[illegible]830 865/481-0683 FAX 865/483-4621

Eberline Services
Final Report of Analysis

Report To:	
Paul Jones	
Duratek	
628 Gallaher Road	
Kingston, TN 37763	

Work Order Details:	
SDG:	02-11141
Purchase Order:	15255
Analysis Category:	ENVIRONMENTAL
Sample Matrix:	OS

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	TPU	MDA	Report Units
02-11141-02	MBL	BLANK	11/26/02 00:00	11/26/2002	12/5/2002	02-11141	Nickel-59	ASTM 3500-Ni Modified	-7.53E+00	1.63E+01	1.63E+01	1.98E+01	pCi/g
02-11141-03	DUP	VA-02-0176	11/25/02 12:00	11/26/2002	12/5/2002	02-11141	Nickel-59	ASTM 3500-Ni Modified	-4.01E+00	1.19E+01	1.19E+01	1.77E+01	pCi/g
02-11141-04	DO	VA-02-0176	11/25/02 12:00	11/26/2002	12/6/2002	02-11141	Nickel-59	ASTM 3500-Ni Modified	-6.00E+00	1.39E+01	1.39E+01	1.80E+01	pCi/g
02-11141-01	LCS	KNOWN	11/26/02 00:00	11/26/2002	12/6/2002	02-11141	Nickel-63	ASTM 3500-Ni Modified	1.14E+03	2.51E+01			pCi/g
02-11141-01	LCS	SPIKE	11/26/02 00:00	11/26/2002	12/6/2002	02-11141	Nickel-63	ASTM 3500-Ni Modified	2.42E+02	3.32E+00	3.09E+01	1.50E+00	pCi/g
02-11141-02	MBL	BLANK	11/26/02 00:00	11/26/2002	12/5/2002	02-11141	Nickel-63	ASTM 3500-Ni Modified	0.00E+00	8.28E-01	0.00E+00	1.40E+00	pCi/g
02-11141-03	DUP	VA-02-0176	11/25/02 12:00	11/26/2002	12/5/2002	02-11141	Nickel-63	ASTM 3500-Ni Modified	6.13E-01	8.35E-01	8.39E-01	1.40E+00	pCi/g
02-11141-04	DO	VA-02-0176	11/25/02 12:00	11/26/2002	12/6/2002	02-11141	Nickel-63	ASTM 3500-Ni Modified	0.00E+00	8.33E-01	0.00E+00	1.40E+00	pCi/g
02-11141-01	LCS	KNOWN	11/26/02 00:00	11/26/2002	12/11/2002	02-11141	Plutonium-238	EML Pu-02 Modified	4.85E+00	1.36E-01			pCi/g
02-11141-01	LCS	SPIKE	11/26/02 00:00	11/26/2002	12/11/2002	02-11141	Plutonium-238	EML Pu-02 Modified	4.13E+00	8.10E-01	8.75E-01	8.63E-02	pCi/g
02-11141-02	MBL	BLANK	11/26/02 00:00	11/26/2002	12/11/2002	02-11141	Plutonium-238	EML Pu-02 Modified	-5.01E-03	7.13E-03	7.14E-03	7.98E-02	pCi/g
02-11141-03	DUP	VA-02-0176	11/25/02 12:00	11/26/2002	12/11/2002	02-11141	Plutonium-238	EML Pu-02 Modified	9.46E-03	4.42E-02	4.42E-02	1.20E-01	pCi/g
02-11141-04	DO	VA-02-0176	11/25/02 12:00	11/26/2002	12/11/2002	02-11141	Plutonium-238	EML Pu-02 Modified	-8.03E-03	9.37E-03	9.40E-03	9.49E-02	pCi/g
02-11141-01	LCS	KNOWN	11/26/02 00:00	11/26/2002	12/11/2002	02-11141	Plutonium-239/240	EML Pu-02 Modified	5.89E+00	1.83E-01			pCi/g
02-11141-01	LCS	SPIKE	11/26/02 00:00	11/26/2002	12/11/2002	02-11141	Plutonium-239/240	EML Pu-02 Modified	5.09E+00	9.69E-01	1.05E+00	3.34E-02	pCi/g
02-11141-02	MBL	BLANK	11/26/02 00:00	11/26/2002	12/11/2002	02-11141	Plutonium-239/240	EML Pu-02 Modified	0.00E+00	0.00E+00	0.00E+00	3.99E-02	pCi/g
02-11141-03	DUP	VA-02-0176	11/25/02 12:00	11/26/2002	12/11/2002	02-11141	Plutonium-239/240	EML Pu-02 Modified	0.00E+00	0.00E+00	0.00E+00	4.01E-02	pCi/g
02-11141-04	DO	VA-02-0176	11/25/02 12:00	11/26/2002	12/11/2002	02-11141	Plutonium-239/240	EML Pu-02 Modified	2.88E-02	4.51E-02	4.51E-02	7.28E-02	pCi/g
02-11141-01	LCS	KNOWN	11/26/02 00:00	11/26/2002	12/13/2002	02-11141	Plutonium-241	EML Pu-02 Modified	2.81E+02	1.29E+01			pCi/g
02-11141-01	LCS	SPIKE	11/26/02 00:00	11/26/2002	12/13/2002	02-11141	Plutonium-241	EML Pu-02 Modified	3.33E+02	6.51E+00	2.73E+01	4.53E+00	pCi/g
02-11141-02	MBL	BLANK	11/26/02 00:00	11/26/2002	12/13/2002	02-11141	Plutonium-241	EML Pu-02 Modified	1.16E+01	2.76E+00	2.91E+00	4.52E+00	pCi/g
02-11141-03	DUP	VA-02-0176	11/25/02 12:00	11/26/2002	12/13/2002	02-11141	Plutonium-241	EML Pu-02 Modified	1.37E+02	2.94E+01	3.13E+01	4.77E+01	pCi/g
02-11141-04	DO	VA-02-0176	11/25/02 12:00	11/26/2002	12/13/2002	02-11141	Plutonium-241	EML Pu-02 Modified	5.61E+01	2.96E+01	3.00E+01	5.11E+01	pCi/g

CU=Counting Uncertainty;TPU=Total Propagated Uncertainty;MDA=Minimal Detected Activity;LCS=Laboratory Control Sample; MBL=Blank; DUP=Duplicate; TRG=Normal Sample; DO=Duplicate Original

EBERLINE SERVICES

Oak Ridge Laboratory

601 Scarboro Road, Oak Ridge, TN 37830 865/481-0683 FAX 865/483-4621

Eberline Services
Final Report of Analysis

Report To:	
Paul Jones	
Duratek	
628 Gallaher Road	
Kingston, TN 37763	

Work Order Details:	
SDG:	02-11141
Purchase Order:	15255
Analysis Category:	ENVIRONMENTAL
Sample Matrix:	OS

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	TPU	MDA	Report Units
02-11141-01	LCS	KNOWN	11/26/02 00:00	11/26/2002	12/5/2002	02-11141	Plutonium-242	EML Pu-02 Modified	3.92E+00	2.90E-02			pCi/g
02-11141-01	LCS	SPIKE	11/26/02 00:00	11/26/2002	12/5/2002	02-11141	Plutonium-242	EML Pu-02 Modified	3.50E+00	7.17E-01	7.70E-01	3.97E-02	pCi/g
02-11141-02	MBL	BLANK	11/26/02 00:00	11/26/2002	12/5/2002	02-11141	Plutonium-242	EML Pu-02 Modified	2.98E-02	4.24E-02	4.25E-02	4.04E-02	pCi/g
02-11141-03	DUP	VA-02-0176	11/25/02 12:00	11/26/2002	12/5/2002	02-11141	Plutonium-242	EML Pu-02 Modified	8.34E-02	7.58E-02	7.61E-02	4.52E-02	pCi/g
02-11141-04	DO	VA-02-0176	11/25/02 12:00	11/26/2002	12/5/2002	02-11141	Plutonium-242	EML Pu-02 Modified	0.00E+00	0.00E+00	0.00E+00	5.85E-02	pCi/g
02-11141-02	MBL	BLANK	11/26/02 00:00	11/26/2002	12/5/2002	02-11141	Plutonium-244	EML Pu-02 Modified	0.00E+00	0.00E+00	0.00E+00	4.04E-02	pCi/g
02-11141-03	DUP	VA-02-0176	11/25/02 12:00	11/26/2002	12/5/2002	02-11141	Plutonium-244	EML Pu-02 Modified	0.00E+00	0.00E+00	0.00E+00	4.52E-02	pCi/g
02-11141-04	DO	VA-02-0176	11/25/02 12:00	11/26/2002	12/5/2002	02-11141	Plutonium-244	EML Pu-02 Modified	2.16E-02	4.34E-02	4.34E-02	5.86E-02	pCi/g
02-11141-01	LCS	KNOWN	11/26/02 00:00	11/26/2002	12/6/2002	02-11141	Technetium-99	ElChroM TCS01 Modified	9.95E+02	2.19E+01			pCi/g
02-11141-01	LCS	SPIKE	11/26/02 00:00	11/26/2002	12/6/2002	02-11141	Technetium-99	ElChroM TCS01 Modified	8.90E+02	5.38E+00	1.37E+02	1.35E+00	pCi/g
02-11141-02	MBL	BLANK	11/26/02 00:00	11/26/2002	12/6/2002	02-11141	Technetium-99	ElChroM TCS01 Modified	-1.38E-01	8.76E-01	8.76E-01	1.50E+00	pCi/g
02-11141-03	DUP	VA-02-0176	11/25/02 12:00	11/26/2002	12/6/2002	02-11141	Technetium-99	ElChroM TCS01 Modified	3.42E-01	9.61E-01	9.62E-01	1.63E+00	pCi/g
02-11141-04	DO	VA-02-0176	11/25/02 12:00	11/26/2002	12/6/2002	02-11141	Technetium-99	ElChroM TCS01 Modified	1.01E+00	9.81E-01	9.93E-01	1.64E+00	pCi/g
02-11141-01	LCS	KNOWN	11/26/02 00:00	11/26/2002	12/5/2002	02-11141	Thorium-228	EML Th-01 Modified	4.67E+00	1.68E-01			pCi/g
02-11141-01	LCS	SPIKE	11/26/02 00:00	11/26/2002	12/5/2002	02-11141	Thorium-228	EML Th-01 Modified	4.98E+00	9.86E-01	1.02E+00	1.26E-01	pCi/g
02-11141-02	MBL	BLANK	11/26/02 00:00	11/26/2002	12/5/2002	02-11141	Thorium-228	EML Th-01 Modified	-1.31E-02	1.20E-02	1.20E-02	1.08E-01	pCi/g
02-11141-03	DUP	VA-02-0176	11/25/02 12:00	11/26/2002	12/5/2002	02-11141	Thorium-228	EML Th-01 Modified	2.65E-02	7.06E-02	7.06E-02	1.64E-01	pCi/g
02-11141-04	DO	VA-02-0176	11/25/02 12:00	11/26/2002	12/5/2002	02-11141	Thorium-228	EML Th-01 Modified	-2.65E-04	2.79E-02	2.79E-02	9.44E-02	pCi/g
02-11141-01	LCS	KNOWN	11/26/02 00:00	11/26/2002	12/5/2002	02-11141	Thorium-230	EML Th-01 Modified	5.28E+00	1.43E-01			pCi/g
02-11141-01	LCS	SPIKE	11/26/02 00:00	11/26/2002	12/5/2002	02-11141	Thorium-230	EML Th-01 Modified	5.90E+00	1.14E+00	1.18E+00	1.11E-01	pCi/g
02-11141-02	MBL	BLANK	11/26/02 00:00	11/26/2002	12/5/2002	02-11141	Thorium-230	EML Th-01 Modified	9.49E-02	8.41E-02	8.43E-02	1.08E-01	pCi/g
02-11141-03	DUP	VA-02-0176	11/25/02 12:00	11/26/2002	12/5/2002	02-11141	Thorium-230	EML Th-01 Modified	2.02E-01	1.17E-01	1.17E-01	8.03E-02	pCi/g
02-11141-04	DO	VA-02-0176	11/25/02 12:00	11/26/2002	12/5/2002	02-11141	Thorium-230	EML Th-01 Modified	2.64E-01	1.25E-01	1.26E-01	6.92E-02	pCi/g

CU=Counting Uncertainty;TPU=Total Propagated Uncertainty;MDA=Minimal Detected Activity;LCS=Laboratory Control Sample; MBL=Blank; DUP=Duplicate; TRG=Normal Sample; DO=Duplicate Original

EBERLINE SERVICES

Oak Ridge Laboratory
601 Scarboro Road, Oak Ridge, T[illegible]830 865/481-0683 FAX 865/483-4621

Eberline Services
Final Report of Analysis

Report To:	
Paul Jones	
Duratek	
628 Gallaher Road	
Kingston, TN 37763	

Work Order Details:	
SDG:	02-11141
Purchase Order:	15255
Analysis Category:	ENVIRONMENTAL
Sample Matrix:	OS

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	TPU	MDA	Report Units
02-11141-01	LCS	KNOWN	11/26/02 00:00	11/26/2002	12/5/2002	02-11141	Thorium-232	EML Th-01 Modified	4.67E+00	1.68E-01			pCi/g
02-11141-01	LCS	SPIKE	11/26/02 00:00	11/26/2002	12/5/2002	02-11141	Thorium-232	EML Th-01 Modified	4.52E+00	9.06E-01	9.32E-01	7.08E-02	pCi/g
02-11141-02	MBL	BLANK	11/26/02 00:00	11/26/2002	12/5/2002	02-11141	Thorium-232	EML Th-01 Modified	-7.86E-03	9.18E-03	9.18E-03	9.29E-02	pCi/g
02-11141-03	DUP	VA-02-0176	11/25/02 12:00	11/26/2002	12/5/2002	02-11141	Thorium-232	EML Th-01 Modified	9.76E-03	3.05E-02	3.05E-02	8.02E-02	pCi/g
02-11141-04	DO	VA-02-0176	11/25/02 12:00	11/26/2002	12/5/2002	02-11141	Thorium-232	EML Th-01 Modified	1.91E-03	2.73E-02	2.73E-02	8.92E-02	pCi/g
02-11141-01	LCS	KNOWN	11/26/02 00:00	11/26/2002	12/6/2002	02-11141	Total Strontium	EIChroM SRW01 Modified	2.14E+01	4.49E-01			pCi/g
02-11141-01	LCS	SPIKE	11/26/02 00:00	11/26/2002	12/6/2002	02-11141	Total Strontium	EIChroM SRW01 Modified	1.89E+01	1.17E+00	2.31E+00	7.36E-01	pCi/g
02-11141-02	MBL	BLANK	11/26/02 00:00	11/26/2002	12/6/2002	02-11141	Total Strontium	EIChroM SRW01 Modified	1.29E-01	3.35E-01	3.35E-01	5.86E-01	pCi/g
02-11141-03	DUP	VA-02-0176	11/25/02 12:00	11/26/2002	12/6/2002	02-11141	Total Strontium	EIChroM SRW01 Modified	6.30E-01	4.11E-01	4.16E-01	6.42E-01	pCi/g
02-11141-04	DO	VA-02-0176	11/25/02 12:00	11/26/2002	12/6/2002	02-11141	Total Strontium	EIChroM SRW01 Modified	3.29E-01	4.12E-01	4.14E-01	6.92E-01	pCi/g
02-11141-01	LCS	KNOWN	11/26/02 00:00	11/26/2002	11/29/2002	02-11141	Tritium	LANL ER-210 Modified	1.02E+02	3.80E+01			pCi/g
02-11141-01	LCS	SPIKE	11/26/02 00:00	11/26/2002	11/29/2002	02-11141	Tritium	LANL ER-210 Modified	1.21E+02	4.71E+00	1.35E+01	4.14E+00	pCi/g
02-11141-02	MBL	BLANK	11/26/02 00:00	11/26/2002	11/29/2002	02-11141	Tritium	LANL ER-210 Modified	1.87E+00	2.45E+00	2.45E+00	4.11E+00	pCi/g
02-11141-03	DUP	VA-02-0176	11/25/02 12:00	11/26/2002	11/29/2002	02-11141	Tritium	LANL ER-210 Modified	9.17E+00	2.36E+00	2.55E+00	3.64E+00	pCi/g
02-11141-04	DO	VA-02-0176	11/25/02 12:00	11/26/2002	11/29/2002	02-11141	Tritium	LANL ER-210 Modified	7.79E+00	2.29E+00	2.44E+00	3.58E+00	pCi/g
02-11141-01	LCS	KNOWN	11/26/02 00:00	11/26/2002	12/5/2002	02-11141	Uranium-234	EML U-02 Modified	7.81E+00	2.81E-01			pCi/g
02-11141-01	LCS	SPIKE	11/26/02 00:00	11/26/2002	12/5/2002	02-11141	Uranium-234	EML U-02 Modified	7.70E+00	1.52E+00	1.60E+00	8.70E-02	pCi/g
02-11141-02	MBL	BLANK	11/26/02 00:00	11/26/2002	12/5/2002	02-11141	Uranium-234	EML U-02 Modified	8.78E-03	2.74E-02	2.74E-02	7.21E-02	pCi/g
02-11141-03	DUP	VA-02-0176	11/25/02 12:00	11/26/2002	12/5/2002	02-11141	Uranium-234	EML U-02 Modified	1.97E-02	3.42E-02	3.42E-02	6.43E-02	pCi/g
02-11141-04	DO	VA-02-0176	11/25/02 12:00	11/26/2002	12/5/2002	02-11141	Uranium-234	EML U-02 Modified	1.05E-02	2.58E-02	2.58E-02	5.87E-02	pCi/g
02-11141-01	LCS	KNOWN	11/26/02 00:00	11/26/2002	12/5/2002	02-11141	Uranium-235	EML U-02 Modified	3.54E-01	1.28E-02			pCi/g
02-11141-01	LCS	SPIKE	11/26/02 00:00	11/26/2002	12/5/2002	02-11141	Uranium-235	EML U-02 Modified	4.64E-01	2.22E-01	2.24E-01	6.28E-02	pCi/g
02-11141-02	MBL	BLANK	11/26/02 00:00	11/26/2002	12/5/2002	02-11141	Uranium-235	EML U-02 Modified	3.28E-02	4.67E-02	4.67E-02	4.45E-02	pCi/g
02-11141-03	DUP	VA-02-0176	11/25/02 12:00	11/26/2002	12/5/2002	02-11141	Uranium-235	EML U-02 Modified	0.00E+00	0.00E+00	0.00E+00	3.96E-02	pCi/g
02-11141-04	DO	VA-02-0176	11/25/02 12:00	11/26/2002	12/5/2002	02-11141	Uranium-235	EML U-02 Modified	-2.66E-03	5.34E-03	5.34E-03	7.24E-02	pCi/g

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Eberline Services
Final Report of Analysis

Report To:	
Paul Jones	
Duratek	
628 Gallaher Road	
Kingston, TN 37763	

Work Order Details:	
SDG:	02-11141
Purchase Order:	15255
Analysis Category:	ENVIRONMENTAL
Sample Matrix:	OS

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	TPU	MDA	Report Units
02-11141-01	LCS	KNOWN	11/26/02 00:00	11/26/2002	12/5/2002	02-11141	Uranium-238	EML U-02 Modified	7.61E+00	2.74E-01			pCi/g
02-11141-01	LCS	SPIKE	11/26/02 00:00	11/26/2002	12/5/2002	02-11141	Uranium-238	EML U-02 Modified	7.42E+00	1.48E+00	1.55E+00	1.02E-01	pCi/g
02-11141-02	MBL	BLANK	11/26/02 00:00	11/26/2002	12/5/2002	02-11141	Uranium-238	EML U-02 Modified	-2.25E-03	4.52E-03	4.52E-03	6.13E-02	pCi/g
02-11141-03	DUP	VA-02-0176	11/25/02 12:00	11/26/2002	12/5/2002	02-11141	Uranium-238	EML U-02 Modified	2.16E-02	3.38E-02	3.38E-02	5.46E-02	pCi/g
02-11141-04	DO	VA-02-0176	11/25/02 12:00	11/26/2002	12/5/2002	02-11141	Uranium-238	EML U-02 Modified	2.31E-02	3.62E-02	3.62E-02	5.85E-02	pCi/g
02-11141-01	LCS	KNOWN	11/26/02 00:00	11/26/2002	11/27/2002	02-11141	Cobalt-60	LANL ER-130 Modified	2.57E+02	1.17E+01			pCi/g
02-11141-01	LCS	KNOWN	11/26/02 00:00	11/26/2002	11/27/2002	02-11141	Cesium-137	LANL ER-130 Modified	1.53E+02	7.21E+00			pCi/g
02-11141-01	LCS	SPIKE	11/26/02 00:00	11/26/2002	11/27/2002	02-11141	Cobalt-60	LANL ER-130 Modified	2.59E+02	1.93E+01	1.98E+01	1.14E+00	pCi/g
02-11141-01	LCS	SPIKE	11/26/02 00:00	11/26/2002	11/27/2002	02-11141	Cesium-137	LANL ER-130 Modified	1.55E+02	1.65E+01	1.67E+01	9.95E-01	pCi/g
02-11141-02	MBL	BLANK	11/26/02 00:00	11/26/2002	11/27/2002	02-11141	Cesium-134	LANL ER-130 Modified	1.31E-02	1.27E-02	1.27E-02	2.63E-02	pCi/g
02-11141-02	MBL	BLANK	11/26/02 00:00	11/26/2002	11/27/2002	02-11141	Cesium-137	LANL ER-130 Modified	-3.17E-03	1.83E-02	1.83E-02	3.41E-02	pCi/g
02-11141-02	MBL	BLANK	11/26/02 00:00	11/26/2002	11/27/2002	02-11141	Cobalt-60	LANL ER-130 Modified	-1.06E-03	1.92E-02	1.92E-02	3.70E-02	pCi/g
02-11141-02	MBL	BLANK	11/26/02 00:00	11/26/2002	11/27/2002	02-11141	Europium-152	LANL ER-130 Modified	-3.83E-02	1.32E-01	1.32E-01	2.41E-01	pCi/g
02-11141-02	MBL	BLANK	11/26/02 00:00	11/26/2002	11/27/2002	02-11141	Europium-154	LANL ER-130 Modified	1.98E-02	4.57E-02	4.57E-02	1.04E-01	pCi/g
02-11141-02	MBL	BLANK	11/26/02 00:00	11/26/2002	11/27/2002	02-11141	Europium-155	LANL ER-130 Modified	1.76E-02	3.72E-02	3.72E-02	6.02E-02	pCi/g
02-11141-02	MBL	BLANK	11/26/02 00:00	11/26/2002	11/27/2002	02-11141	Manganese-54	LANL ER-130 Modified	-3.66E-03	2.20E-02	2.20E-02	3.57E-02	pCi/g
02-11141-02	MBL	BLANK	11/26/02 00:00	11/26/2002	11/27/2002	02-11141	Niobium-94	LANL ER-130 Modified	1.19E-02	1.73E-02	1.73E-02	3.73E-02	pCi/g
02-11141-02	MBL	BLANK	11/26/02 00:00	11/26/2002	11/27/2002	02-11141	Silver-110m	LANL ER-130 Modified	4.79E-03	1.72E-02	1.72E-02	3.40E-02	pCi/g
02-11141-02	MBL	BLANK	11/26/02 00:00	11/26/2002	11/27/2002	02-11141	Zinc-65	LANL ER-130 Modified	-1.31E-03	3.76E-02	3.76E-02	6.58E-02	pCi/g
02-11141-03	DUP	VA-02-0176	11/25/02 12:00	11/26/2002	11/27/2002	02-11141	Cesium-134	LANL ER-130 Modified	-4.82E-02	1.84E-01	1.84E-01	3.02E-01	pCi/g
02-11141-03	DUP	VA-02-0176	11/25/02 12:00	11/26/2002	11/27/2002	02-11141	Cesium-137	LANL ER-130 Modified	1.26E+00	3.86E-01	3.87E-01	3.56E-01	pCi/g
02-11141-03	DUP	VA-02-0176	11/25/02 12:00	11/26/2002	11/27/2002	02-11141	Cobalt-60	LANL ER-130 Modified	2.56E+01	1.99E+00	2.04E+00	3.86E-01	pCi/g
02-11141-03	DUP	VA-02-0176	11/25/02 12:00	11/26/2002	11/27/2002	02-11141	Europium-152	LANL ER-130 Modified	4.99E+00	1.08E+00	1.08E+00	8.55E-01	pCi/g
02-11141-03	DUP	VA-02-0176	11/25/02 12:00	11/26/2002	11/27/2002	02-11141	Europium-154	LANL ER-130 Modified	1.19E-01	3.66E-01	3.66E-01	6.68E-01	pCi/g
02-11141-03	DUP	VA-02-0176	11/25/02 12:00	11/26/2002	11/27/2002	02-11141	Europium-155	LANL ER-130 Modified	-3.33E-03	2.21E-01	2.21E-01	3.33E-01	pCi/g
02-11141-03	DUP	VA-02-0176	11/25/02 12:00	11/26/2002	11/27/2002	02-11141	Iodine-129	LANL ER-130 Modified	3.20E+01	5.36E+00	5.39E+00	2.40E+00	pCi/g

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Duratek	
628 Gallaher Road	
Kingston, TN 37763	

Work Order Details:	
SDG:	02-11141
Purchase Order:	15255
Analysis Category:	ENVIRONMENTAL
Sample Matrix:	OS

Lab ID	Sample Type	Client ID	Sample Date	Receipt Date	Analysis Date	Batch ID	Analyte	Method	Result	CU	TPU	MDA	Report Units
02-11141-03	DUP	VA-02-0176	11/25/02 12:00	11/26/2002	11/27/2002	02-11141	Lead-210	LANL ER-130 Modified	1.18E+01	3.16E+00	3.17E+00	3.02E+00	pCi/g
02-11141-03	DUP	VA-02-0176	11/25/02 12:00	11/26/2002	11/27/2002	02-11141	Manganese-54	LANL ER-130 Modified	1.25E-01	2.45E-01	2.45E-01	4.27E-01	pCi/g
02-11141-03	DUP	VA-02-0176	11/25/02 12:00	11/26/2002	11/27/2002	02-11141	Niobium-94	LANL ER-130 Modified	1.67E-01	2.74E-01	2.74E-01	4.32E-01	pCi/g
02-11141-03	DUP	VA-02-0176	11/25/02 12:00	11/26/2002	11/27/2002	02-11141	Silver-110m	LANL ER-130 Modified	9.93E-02	2.13E-01	2.13E-01	3.39E-01	pCi/g
02-11141-03	DUP	VA-02-0176	11/25/02 12:00	11/26/2002	11/27/2002	02-11141	Zinc-65	LANL ER-130 Modified	2.00E+00	8.98E-01	8.99E-01	8.98E-01	pCi/g
02-11141-04	DO	VA-02-0176	11/25/02 12:00	11/26/2002	11/27/2002	02-11141	Cesium-134	LANL ER-130 Modified	8.51E-02	1.75E-01	1.75E-01	2.96E-01	pCi/g
02-11141-04	DO	VA-02-0176	11/25/02 12:00	11/26/2002	11/27/2002	02-11141	Cesium-137	LANL ER-130 Modified	5.37E-01	3.52E-01	3.52E-01	3.74E-01	pCi/g
02-11141-04	DO	VA-02-0176	11/25/02 12:00	11/26/2002	11/27/2002	02-11141	Cobalt-60	LANL ER-130 Modified	2.61E+01	2.03E+00	2.09E+00	3.36E-01	pCi/g
02-11141-04	DO	VA-02-0176	11/25/02 12:00	11/26/2002	11/27/2002	02-11141	Europium-152	LANL ER-130 Modified	5.33E+00	9.91E-01	9.96E-01	1.08E+00	pCi/g
02-11141-04	DO	VA-02-0176	11/25/02 12:00	11/26/2002	11/27/2002	02-11141	Europium-154	LANL ER-130 Modified	2.29E-01	4.07E-01	4.07E-01	7.49E-01	pCi/g
02-11141-04	DO	VA-02-0176	11/25/02 12:00	11/26/2002	11/27/2002	02-11141	Europium-155	LANL ER-130 Modified	2.53E-01	2.08E-01	2.08E-01	3.48E-01	pCi/g
02-11141-04	DO	VA-02-0176	11/25/02 12:00	11/26/2002	11/27/2002	02-11141	Iodine-129	LANL ER-130 Modified	2.84E+01	4.93E+00	4.96E+00	2.62E+00	pCi/g
02-11141-04	DO	VA-02-0176	11/25/02 12:00	11/26/2002	11/27/2002	02-11141	Lead-210	LANL ER-130 Modified	1.17E+01	3.19E+00	3.20E+00	3.27E+00	pCi/g
02-11141-04	DO	VA-02-0176	11/25/02 12:00	11/26/2002	11/27/2002	02-11141	Manganese-54	LANL ER-130 Modified	1.54E-01	2.42E-01	2.42E-01	4.23E-01	pCi/g
02-11141-04	DO	VA-02-0176	11/25/02 12:00	11/26/2002	11/27/2002	02-11141	Niobium-94	LANL ER-130 Modified	3.91E-02	2.65E-01	2.65E-01	4.56E-01	pCi/g
02-11141-04	DO	VA-02-0176	11/25/02 12:00	11/26/2002	11/27/2002	02-11141	Silver-110m	LANL ER-130 Modified	2.39E-01	2.16E-01	2.16E-01	3.51E-01	pCi/g
02-11141-04	DO	VA-02-0176	11/25/02 12:00	11/26/2002	11/27/2002	02-11141	Zinc-65	LANL ER-130 Modified	1.61E+00	7.62E-01	7.62E-01	9.39E-01	pCi/g

CU=Counting Uncertainty;TPU=Total Propagated Uncertainty;MDA=Minimal Detected Activity;LCS=Laboratory Control Sample; MBL=Blank; DUP=Duplicate; TRG=Normal Sample; DO=Duplicate Original

EBERLINE SERVICES

Oak Ridge Laboratory

601 Scarboro Road, Oak Ridge, TN 37830 865/481-0683 FAX 865/483-4621

SECTION V

ANALYTICAL STANDARD

QA/QC REVIEWED
Date 1/16/95 Initials [illegible]

CERTIFICATE OF CALIBRATION
ALPHA STANDARD SOLUTION

Radionuclide:	U-238NAT	Customer:	TMA EBERLINE
Half Life:	(4.468 ± 0.005) x 10^9 years	P.O.No.:	OR2778
Catalog No.:	7338	Reference Date:	January 1 1995 12:00 PST.
Source No.:	479-50	Contained Radioactivity:	(Total U) 8.016 μCi
		Contained Radioactivity:	(Total U) 297 kBq

Description of Solution

a. Mass of solution: 65.2896 g in a 50 ml flame sealed ampoule

b. Chemical form: Uranyl Nitrate in H2O

c. Carrier content: None

d. Density: Approximately 1.3202 g/ml @ 20°C.

Radioimpurities

Refer to attached technical data sheet

Radioactive Daughters

Refer to attached technical data sheet

Radionuclide Concentration

(Total U) 0.1228 μCi/g.

Method of Calibration

Activity calculations are based upon known specific activity and mass.

Uncertainty of Measurement

a. Systematic uncertainty in instrument calibration:	±3.0%
b. Random uncertainty in assay:	±0.0%
c. Random uncertainty in weighing(s):	±2.0%
d. Total uncertainty at the 99% confidence level:	±3.6%

NIST Traceability

This calibration is implicitly traceable to the National Institute of Standards and Technology.

Leak Test(s)

See reverse side for Leak Test(s) applied to this source.

Notes

1. Nuclear data were taken from "Table of Radioactive Isotopes", edited by Virginia S. Shirley, 1986.
2. IPL participates in an NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay (and later NIST certification) of Standard Reference Materials (As in NRC Regulatory Guide 4.15).

ERIC ALLAS
QUALITY CONTROL

29 DECEMBER 1994
Date Signed

ISOTOPE PRODUCTS LABORATORIES

EBERLINE

QUALITY CONTROL PROGRAM

QCP-009

Rev.7; 9/29/99

Title: Radioactive Reference Standards Solutions & Records

THERMO NUTECH - OAK RIDGE LABORATORY
RADIOACTIVE REFERENCE STANDARD SOLUTIONS

QCP-009-1-A

SECONDARY DILUTION

DATE: 10/16/01 15:34

SOLUTION REFERENCE #: IPL 479-50

SOLUTION #: U-8A (1001)

Principal Radionuclide	Half Life, Years	Half Life, Days
U-234, 5 & 8	7.370E+03	2.692E+06

Radionuclide	U-234, 5 & 8	
Total Diluted Activity	1.780E+07	dpm
Diluted Activity/ml	1.780E+04	dpm
Volume	1000	

Reference Date: 1/1/95 0:00

Chemical Composition of Standard Solution

Uranyl Nitrate in 1 M HNO3

Dilution Instructions:

Dilution Solvent Used: 1M HNO3

SECONDARY VOLUMETRIC DILUTION

			Activity Decay Corrected to This Date	1/1/95 0:00	
Certified Activity	17795.5200	dpm	Total Activity, dpm	7.1182E+04	
Solution Net	4	Milliliters			
Final Dilution Volume	1000	Milliliters	Dilution Activity	7.1182E+01	dpm/ml

NOTES: THIS STANDARD IS A SECONDARY DILUTION FROM THE PRIMARY DILUTION OF U-8

Data sheet from manufacture given isotopic distribution as:

U-238 Atom % = 48.239 U-238 = 71.18 dpm/ml X 0.48249 = 34.345 dpm/ml

U-235 Atom % = 2.250 U-235 = 71.18 dpm/ml X 0.02250 = 1.602 dpm/ml

U-234 Atom % = 49.501 U-234 = 71.18 dpm/ml X 0.49501 = 35.236 dpm/ml

ALL VALUES ARE PLUS OR MINUS 3.6%

EXPIRATION DATE: October 10, 2003

Diluted By _____ Date: 10/16/01 15:34

Verified & Approved By _____ Date: 10/16/01 15:34

QC Approval _____ Date: 10/16/01 15:34

RECORD COPY

Tracer Solution for Environmental Analysis & Disequilibrium Studies

Product Description & Measurement Certificate

Description	Principal radionuclide:	**uranium 232** (U-232)	Product code: **UDP10050**
	Daughter Nuclide:	Th-228	Batch Number: 92/232/67

Measurement	Reference date:	01 March 2000
	Radioactive concentration U-232	6.739E+03 becquerels per gram of solution
	which is equivalent to	1.821E-01 microcuries per gram of solution
	Mass of solution	5.356 grams
	Volume of solution	5.035 millilitres
	Total activity of U-232	3.61E+04 becquerels
	which is equivalent to	9.76E-01 microcuries

Accuracy

Method of measurement (see reverse of this certificate)
Random uncertainty is: ± 0.7% Systematic uncertainty: ± 0.5%
Overall uncertainty in the radioactive concentration quoted above: ± 1.7%
Overall uncertainty is defined on the reverse of this certificate.

Radionuclidic Purity

Any radioactive impurities measured are listed below, expressed as percentages of the activity of the principle radionuclide at the reference date .

Th-228 and daughter activity removed 2 Feb 2000
U-232 daughters activity will increase with time. By alpha 88% U-232, 12% daughters on 1/3/00

Isotopic Purity

The isotopic composition, expressed as atom per cent at the reference date .

Not measured

Chemical Composition

Calculated weight of U-232, 4.42E-08 grams, as 2M HNO3 solution in a flame sealed glass vial.
This Tracer solution has been produced 'carrier free'.

Physical Data

Recommended half life of uranium 232: 6.980E+01 years
Principle energies of alpha emissions (MeV): 5.263 31.7%, 5.320 68.0%
Branching ratio for alpha emission: 100%
Calculated specific activity of uranium 232: 8.167E+05 Bq per microgram U-232.

Remarks

For safety information and notes to ensure correct usage by all persons handling this radioactive Tracer solution please read the instructions accompanying the package.

AEA Technology operates a quality management system which has been independently audited and approved to ISO 9001.

Approved Signatory

Roger Wiltshire

Project Ref. AE2315

Roger Wiltshire

Prepared and characterised in the UK, for world wide distribution by **Isotrak, AEA Technology, QSA.**

AEA Technology is the trading name of AEA Technology plc

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EBERLINE SERVICES

QUALITY CONTROL PROGRAM

QCP-009

Rev.7; 9/29/99
Title: Radioactive Reference Standards Solutions & Records

EBERLINE SERVICES - OAK RIDGE LABORATORY
RADIOACTIVE REFERENCE STANDARD SOLUTIONS
SECONDARY DILUTION

QCP-009-1-A

Solution Reference # AEA 92/232/67

Date 6/25/01 16:24

Solution # U-10a

Principal Radionuclide	Half Life, Years	Half Life, Days
^{232}Uranium	~~6.800E+01~~ 72 LER 7/13/01	~~2.517E+04~~ 2.63E4 LER 7/13/01

Radionuclide of Interest: ^{232}Uranium

Parent Solution Conc.: 2.17E+03 dpm/ml

Reference Date: 3/1/00 0:00

Chemical Composition of Standard Solution

$^{232}U(NO_3)_6$ in 2M HNO_3

Dilution Instructions:

Dilution Solvent Used: 2M HNO_3

SECONDARY VOLUMETRIC DILUTION

Vol. Parent Solution: 10.0000 ml

Total Activity: 2.1670E+04 dpm

Final Volume: 1000.00 ml

Final Activity Concentration: 2.1670E+01 dpm/ml

This activity concentration is based on the original reference date listed above. All activities are corrected to the date and time of analysis by the laboratory data processing software.

NOTES:

Expiration Date: June 25, 2003

Diluted By _____ Date: 6/25/01 16:24

Verified & Approved By _____ Date: 7/17/01

QC Approval _____ Date: 7/16/01

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QA/QC REVIEWED
Date 10/14/91 Initials WT

CERTIFICATE OF CALIBRATION
ALPHA STANDARD SOLUTION

Received
OCT 14 1991
TMA/Eberline
Oak Ridge Lab

Radionuclide	Th-230	Customer:	TMA EBERLINE
Half Life:	(7.54 ± 0.03) x 10^4 years	P.O.No.:	TT4944
Catalog No.:	7230	Reference Date:	November 1 1991 12:00 PST.
Source No.:	388-116	Contained Radioactivity:	1.036 µCi.

Description of Solution

a. Mass of solution: 5.0042 grams.
b. Chemical form: Th(NO3)4 in 0.1N HNO3
c. Carrier content: None added
d. Density: 1.0016 gram/ml @ 20°C.

Radioimpurities

See attached technical data sheet

Radioactive Daughters

See attached technical data sheet

Radionuclide Concentration

0.207 µCi/gram.

Method of Calibration

Weighed aliquots of the solution were assayed using a liquid scintillation counter.

Uncertainty of Measurement

a. Systematic uncertainty in instrument calibration: ±2.0%
b. Random uncertainty in assay: ±0.5%
c. Random uncertainty in weighing(s): ±0.2%
d. Total uncertainty at the 99% confidence level: ±2.7%

NIST Traceability

This calibration is implicitly traceable to the National Institute of Standards and Technology.

Notes

1. Nuclear data were taken from "Table of Isotopes", Seventh Edition, edited by Virginia S. Shirley.
2. IPL participates in an NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay(and later NIST certification) of Standard Reference Materials. (As in NRC Regulatory Guide 4.15)

QUALITY CONTROL

ISOTOPE PRODUCTS LABORATORIES
1800 No. Keystone Street.,
Burbank, California 91504
(818) 843 - 7000

00049

Eberline Services

EBERLINE SERVICES

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QCP-009

Rev.7; 9/29/99
Title: Radioactive Reference Standards Solutions & Records

Eberline Services - OAK RIDGE LABORATORY
RADIOACTIVE REFERENCE STANDARD SOLUTIONS
SECONDARY DILUTION

QCP-009-1-A
Solution Reference # IPL 388-116

Date 7/31/2002 13:34
Solution # TH-1B (1D01)

Principal Radionuclide	Half Life, Years	Half Life, Days
^{230}Th	7.540E+04	2.754E+07

Radionuclide of Interest ^{230}Th
Parent Solution Conc. 2.80E+03 dpm/ml

Reference Date 11/1/1991 0:00

Chemical Composition of Standard Solution
^{230}Th $(NO_3)_4$ in 2N HNO_3

Dilution Instructions:

Dilution Solvent Used 0.1N HNO_3

SECONDARY VOLUMETRIC DILUTION

Vol. Parent Solution: 10.0000 ml
Total Activity: 2.2999E+04 dpm
Final Volume: 1000.00 ml

Final Activity Concentration: 2.2999E+01 dpm/ml

NOTES:

Expiration Date: July 31, 2003

Diluted By [signature] Date: 7/31/2002 13:34

Verified & Approved By [signature] Date: 7/31/02

QC Approval [signature] Date: 7/31/02

Th-8

CERTIFICATE OF CALIBRATION
ALPHA STANDARD SOLUTION

Radionuclide:	Th-232	Customer:	TMA EBERLINE
Half Life:	(1.405± 0.006) x 10^10 years	P.O.No.:	VH1632
Catalog No.:	7232	Reference Date:	November 1 1993 12:00 PST.
Source No.:	435-104-2	Contained Radioactivity:	(Th-232) 0.0933 µCi.
		Contained Radioactivity:	(Th-232) 3.45 kBq.

Description of Solution

a. Mass of solution: 11.9712 g (in a 10 ml flame sealed ampoule)

b. Chemical form: Th(NO3)4 in water

c. Carrier content: None added

d. Density: Approx. 1.21 g/ml @ 20°C.

Radioimpurities None detected (other than daughters).

Radioactive Daughters

Ra-228, Ac-228, Th-228, Ra-224, Rn-220, Po-216, Pb-212, Bi-212, Po-212, Tl-208

Radionuclide Concentration

(Th-232) 0.00779 µCi/g.

Method of Calibration

Activity calculations are based upon known specific activity and mass.

Uncertainty of Measurement

a. Systematic uncertainty in instrument calibration: ±3.0%

b. Random uncertainty in assay: ±0.0%

c. Random uncertainty in weighing(s): ±2.0%

d. Total uncertainty at the 99% confidence level: ±3.6%

NIST Traceability

This calibration is implicitly traceable to the National Institute of Standards and Technology.

Leak Test(s)

See reverse side for Leak Test(s) applied to this source.

Notes

1. Nuclear data were taken from "Table of Radioactive Isotopes", edited by Virginia S. Shirley, 1986.
2. IPL participates in an NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay (and later NIST certification) of Standard Reference Materials (As in NRC Regulatory Guide 4.15).

Anna U. Pha
QUALITY CONTROL

Nov. 8, 1993
Date Signed

ISOTOPE PRODUCTS LABORATORIES
1800 North Keystone Street
Burbank, California 91504
(818) 843 - 7000

Eberline Services

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QUALITY CONTROL PROGRAM
QCP-009

Rev.7; 9/29/99
Title: Radioactive Reference Standards Solutions & Records

Eberline Services - OAK RIDGE LABORATORY
RADIOACTIVE REFERENCE STANDARD SOLUTIONS
SECONDARY DILUTION RECERTIFICATION

QCP-009-1-A

Solution Reference # JPL-435-104-2

Date 7/30/2002 15:08

Solution # TH-8B (1001)

Principal Radionuclide	Half Life, Years	Half Life, Days
$^{232\&228}$Th	1.400E+10 Based On ^{232}Th	5.114E+12

Radionuclide of interest $^{232\&228}$Th

Reference Date 11/1/1993 0:00

Parent Solution Conc. 2.07E+02 dpm/ml

Chemical Composition of Standard Solution

$Th(NO_3)_4$ in dilute HNO_3

Dilution Instructions:

Dilution Solvent Used 1% HNO_3

SECONDARY VOLUMETRIC DILUTION

Vol. Parent Solution: 500.0000 ml

Total Activity: 1.0356E+05 dpm

Final Volume: 1000.00 ml

Final Activity Concentration: 1.0356E+02 dpm/ml

NOTES:

Expiration Date: July 30, 2003

Diluted By _____ Date: 7/30/2002 15:08

Verified & Approved By _____ Date: 7/30/02

QC Approval _____ Date: 7/30/02

00052

Th-1B

Isotope Products Laboratories
An Eckert & Ziegler Company

24937 Avenue Tibbitts
Valencia, California 91355

Tel 661•309•1010
Fax 661•257•8303

CERTIFICATE OF CALIBRATION
ALPHA STANDARD SOLUTION

Radionuclide:	Th-229	**Customer:**	EBERLINE SERVICES
Half-life:	7340 ± 160 years	**P.O. No.:**	00009633
Catalog No.:	7229	**Reference Date:**	15-Jan-02 12:00 PST
Source No.:	867-54	**Contained Radioactivity: (Th-229 only)**	1.013 µCi 37.48 kBq

Physical Description:

A. Mass of solution: 5.0147 g in 5 mL flame-sealed ampoule
B. Chemical form: $Th(NO_3)_4$ in 0.1M HNO_3
C. Carrier content: 10µg Th/mL
D. Density: 1.0016 g/mL @ 20°C.

Radioimpurities:

None detected (daughters in equilibrium)

Radionuclide Concentration: 0.2020 µCi/g, 7.474 kBq/g

Method of Calibration:

This source was prepared from a weighed aliquot of solution whose activity in µCi/g was determined using gamma ray spectrometry.
Peak energy used for integration: 193.5 keV
Branching ratio used: 0.0441 gammas per decay

Uncertainty of Measurement:

A. Type A (random) uncertainty: ± 0.7 %
B. Type B (systematic) uncertainty: ± 3.0 %
C. Uncertainty in aliquot weighing: ± 0.0 %
D. Total uncertainty at the 99% confidence level: ± 3.1 %

Notes:

- See reverse side for leak test(s) performed on this source.
- IPL participates in a NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay (and later NIST certification) of Standard Reference Materials (As in NRC Regulatory Guide 4.15).
- Nuclear data was taken from IAEA Technical Report Series No. 261.
- This solution has a working life of 5 years.

[illegible] — Quality Control

9-Jan-02 — Date Signed

IPL Ref. No.: 867-54

Eberline Services

QUALITY CONTROL PROGRAM

QCP-009

EBERLINE SERVICES

Rev.7: 9/29/99

Title: Radioactive Reference Standards Solutions & Records

Eberline Services - OAK RIDGE LABORATORY
RADIOACTIVE REFERENCE STANDARD SOLUTIONS
SECONDARY DILUTION

QCP-009-1-A

Solution Reference # IPL 867-54

Date 1/25/2002 16:09

Solution # Th-18a

Principal Radionuclide	Half Life, Years	Half Life, Days
^{228}Thorium	7.340E+03	2.681E+06

Radionuclide of Interest ^{229}Thorium

Parent Solution Conc. 2.25E+03 dpm/ml

Reference Date 1/15/2002 12:00

Chemical Composition of Standard Solution

$Th(NO_3)_4$ in 0.1M HNO_3

Dilution Instructions:

Dilution Solvent Used 0.1M HNO3

SECONDARY VOLUMETRIC DILUTION

Vol. Parent Solution: 10.0000 ml

Total Activity: 2.2489E+04 dpm

Final Volume: 1000.00 ml

Final Activity Concentration: 2.2489E+01 dpm/ml

NOTES:

Expiration Date: January 25, 2004

Diluted By _____ Date: 1/25/2002 16:09

Verified & Approved By _____ Date: 1/28/02

QC Approval _____ Date: 2/16/02

Pu-1

QA/QC REVIEWED
Date 8/26/91 Initials WT

RECEIVED
AUG 2 6 1991

U.S. Environmental Protection Agency
Environmental Monitoring Systems Laboratory-Las Vegas
Nuclear Radiation Assessment Division

Calibration Certificate

Description

Principal radionuclide: PLUTONIUM-238 Half-life: 87.7 years

Nominal activity: 51 nano curies

Nominal volume: 5 ml in ampoule/bottle number: 921-3

Measurement Activity of principal radionuclide

Activity per gram of this solution

10.2 nano curies of Plutonium-238

at 0400 hours PST on October 17, 1990

Activity of daughter radionuclide

The principal activity was accompanied at the quoted time by

curies Per gram

of the daughter nuclide

Total mass of this solution

APPROX. 5.0 grams

Method of measurement

The activity of the Plutonium-238 was measured by liquid scintillation counting.

The activity of the Plutonium-239/240 activities was measured by electrodeposition and alpha spectrometry.

Useful Life

This radionuclide has decayed through half lives since it was obtained by EMSL-LV

We recommend that this solution should not be used after

Purity

The manufacturer states that activities other than that of the principal nuclide and of its daughter nuclides, if any, were estimated/known to be:

(1) Plutonium-239/240	less than	0.5 %	of the principal activity
(2)	less than equal to	%	of the principal activity
(3)	less than equal to	%	of the principal activity

The activity of impurity (1) is not (2) is not (3) is not included in the quoted figures of the principal activity.

Random Errors

The precision of this standard was such that the certified value of the radioactive concentration of the principal activity had a standard error (sm) not greater than ± 0.11%

(The 99.7% confidence limits are given by t(sm) where t is obtained from the student t factor for the degree of freedom (n-1)).

The maximum uncertainty due to the assessable systematic errors (dilution, counting, and known uncertainty of the standard) is obtained by the separate arithmetic summation of the positive and negative systematic error ($+\delta - \delta'$). These have been estimated not to exceed

+ 2.4% or - 2.4%

the overall uncertainty (often called accuracy) is an estimate of the possible divergence of the quoted result from the true value. It is a combination of random error [t(sm)] at the 99.7% confidence limits and the worst case estimate of the systematic errors ($+\delta, -\delta'$)
The overall uncertainty is therefore calculated on the basis of + [t(sm) $+\delta$], - [t(sm) $+\delta'$]
and is + 2.8 %, - 2.8 % of the quoted radioactive concentration.

Decay Schemes

This standardization is based on the following assumptions of the principle nuclide, its daughter nuclides and impurities (no allowance for error in these assumptions or the assumption of quoted half-life have been included in the statement of accuracy above).

Plutonium-238 and impurities were assumed to decay 100 percent by alpha emission.

Chemical Composition of Solution

Carrier content per gram of solution:

Other components:

2M nitric acid

Preservative:

Remarks

Date Certificate Prepared November 13, 1990

Approval Signature Paul B. Hahn

Eberline Services

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QUALITY CONTROL PROGRAM

QCP-009

Rev.7; 9/29/99

Title: Radioactive Reference Standards Solutions & Records

Eberline Services - OAK RIDGE LABORATORY
RADIOACTIVE REFERENCE SOLUTIONS
PRIMARY DILUTION
QCP 009-1

CURRENT DATE: 11/20/01 14:44

SOLUTION REFERENCE #: EPA 921-3

SOLUTION #: PU-1 (10/01)

Principal Radionuclide	Half Life, Years	Half Life, Days
^{238}Pu	8.770E+01	3.203E+04

Radionuclide: ^{238}Pu

Reference Date: 11/13/90 0:00

Certified Activity: 5.375E-02 µCi

Certified Concentration: 1.020E-02 µCi per gram

Ampoule /Solution Gross	9.7096	Weight, Grams
Empty Ampoule	4.4397	Weight, Grams
Solution Net	5.2699	Weight, Grams
Total Activity in Ampoule	0.0538	µCi

Chemical Composition of Standard Solution

$^{238}Pu(NO_3)$ in 2N HNO_3

Dilution Instructions:

Dilution Solvent Used: 2M HNO_3

Dilute to a volume of 1000.00 milliliters

Certified Total Activity of 0.0538 µCi

Which Equals 1.193E+05 dpm

And after dilution the activity of this solution is 1.193E+02 dpm/ml

This activity concentration is based on the original reference date listed above. All activities are corrected to the date and time of analysis by the laboratory data processing software.

Expiration Date: November 20, 2003

Diluted By _____ Date: 11/20/01 14:44

Verified & Approved By _____ Date: 11/20/01 14:44

QC Approval _____ Date: 11/20/01 14:44

Pu-2

QA/QC REVIEWED
Date 8/26/91 Initials WT

INTERNATIONAL
AUG 26 1991
RECEIVED

U.S. Environmental Protection Agency
Environmental Monitoring Systems Laboratory-Las Vegas
Nuclear Radiation Assessment Division

Calibration Certificate

Description

Principal radionuclide: PLUTONIUM-239 Half-life: 2.4×10^4 years

Nominal activity: 59 nano curies

Nominal volume: 5 ml in ampoule/bottle number: 2510-1

Measurement

Activity of principal radionuclide

Activity per gram of this solution

11.8 nano curies of Plutonium-239

at 0400 hours PST on December 13, 1990

Activity of daughter radionuclide

The principal activity was accompanied at the quoted time by

curies Per gram

of the daughter nuclide

Total mass of this solution

APPROX. 5.0 grams

Method of measurement

The activity of the primary solution was measured by an internal gas flow proportional counter.

The activity of the dilution was measured by liquid scintillation counting.

Useful Life

This radionuclide has decayed through half lives since it was obtained by EMSL-LV

We recommend that this solution should not be used after

Purity

The manufacturer states that activities other than that of the principal nuclide and of its daughter nuclides, if any, were estimated/known to be:

(1) see remarks	less than equal to	%	of the principal activity
(2)	less than equal to	%	of the principal activity
(3)	less than equal to	%	of the principal activity

The activity of impurity (1) is not (2) is not (3) is not included in the quoted figures of the principal activity.

Random Errors

The precision of this standard was such that the certified value of the radioactive concentration of the principal activity had a standard error (sm) not greater than ± 0.13 %

(The 99.7% confidence limits are given by t(sm) where t is obtained from the student t factor for the degree of freedom (n-1)).

The maximum uncertainty due to the assessable systematic errors (dilution, counting, and known uncertainty of the standard) is obtained by the separate arithmetic summation of the positive and negative systematic error ($+\delta - \delta'$). These have been estimated not to exceed

+2.7 % or - 2.7 %

the overall uncertainty (often called accuracy) is an estimate of the possible divergence of the quoted result from the true value. It is a combination of random error [t(sm)] at the 99.7% confidence limits and the worst case estimate of the systematic errors ($+\delta, -\delta'$)
The overall uncertainty is therefore calculated on the basis of + [t(sm) $+\delta$], - [t(sm) $+\delta'$]
and is + 3.1 %, - 3.1 % of the quoted radioactive concentration.

Decay Schemes

This standardization is based on the following assumptions of the principle nuclide, its daughter nuclides and impurities (no allowance for error in these assumptions or the assumption of quoted half-life have been included in the statement of accuracy above).

Plutonium-239 and impurities were assumed to decay 100 percent by alpha emission.

Chemical Composition of Solution

Carrier content per gram of solution:

Other components:

4M Nitric acid

Preservative:

Remarks

	Pu-238	0.033%	of the total activity
	Pu-240	4.6×10^{-5}%	of the total activity
IMPURITIES:	Pu-241	1.5×10^{-3}%	of the total activity
	Pu-242	8.8×10^{-6}%	of the total activity
	Pu-244	6.2×10^{-9}%	of the total activity

Date Certificate Prepared December 13, 1990

Approval Signature Paul B. Hahn

Revised 1/84

Pu-12

National Institute of Standards & Technology

Certificate

QA/QC REVIEWED
Date 11/23/99 Initials

Standard Reference Material 4334G
Plutonium-242 Radioactivity Standard

This Standard Reference Material (SRM) consists of radioactive plutonium-242 nitrate and nitric acid dissolved in 5 mL of distilled water. The solution is contained in a flame-sealed NIST borosilicate-glass ampoule. The SRM is intended for the calibration of alpha-particle counting instruments and for the monitoring of radiochemical procedures.

Radiological Hazard

The SRM ampoule contains plutonium-242 with a total activity of approximately 150 Bq. Plutonium-242 decays by alpha-particle emission. None of the alpha particles escape from the SRM ampoule. During the decay process, X-rays and gamma rays with energies from 10 keV to 160 keV are also emitted. Most of these photons escape from the SRM ampoule but their intensities are so small that they do not represent a radiation hazard. Approximate unshielded dose rates at several distances (as of the reference time) are given in note [a]*. The SRM should be used only by persons qualified to handle radioactive material.

Chemical Hazard

The SRM ampoule contains nitric acid (HNO_3) with a concentration of 3 moles per liter of water. The solution is corrosive and represents a health hazard if it comes in contact with eyes or skin. If the ampoule is to be opened to transfer the solution, the recommended procedure is given on page 2. The ampoule should be opened only by persons qualified to handle both radioactive material and strong acid solution.

Storage and Handling

The SRM should be stored and used at a temperature between 5 °C and 65 °C. The solution in an unopened ampoule should remain stable and homogeneous until at least June 2009.

The ampoule (or any subsequent container) should always be clearly marked as containing radioactive material. If the ampoule is transported it should be packed, marked, labeled, and shipped in accordance with the applicable national, international, and carrier regulations. The solution in the ampoule is a dangerous good (hazardous material) both because of the radioactivity and because of the strong acid.

Preparation

This Standard Reference Material was prepared in the Physics Laboratory, Ionizing Radiation Division, Radioactivity Group, L.R. Karam, Group Leader. The overall technical direction and physical measurements leading to certification were provided by L.L. Lucas of the Radioactivity Group.

The support aspects involved in the preparation, certification, and issuance of this SRM were coordinated through the Standard Reference Materials Program by J.W.L. Thomas.

Gaithersburg, Maryland 20899
August 1999

Thomas E. Gills, Chief
Standard Reference Materials Program

*Notes and references are on pages 5 to 7.

EBERLINE

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QCP-009

Rev.7; 9/29/99
Title: Radioactive Reference Standards Solutions & Records

Eberline Services - Oak Ridge Laboratory
RADIOACTIVE REFERENCE STANDARD SOLUTIONS

QCP-009-1

SOLUTION REFERENCE #	SRM 4334G	DATE	10/9/01 10:25
		SOLUTION #	PU-15 (10/01)

Principal Radionuclide	Half Life, Years	Half Life, Days
Pu-242	3.733E+05	1.363E+08

Radionuclide	Pu-242		Reference Date	6/7/94 0:00	
Certified Activity	3.844E-03	uCi	Certified Activity	1.422E+02	Bq
Certified Activity/ml or g	6.938E-04	uCi	Certified Activity	2.567E+01	Bq/g
Volume	5.5403				

Ampoule /Solution Gross	9.5870	Weight, Grams
Empty Ampoule	4.0467	Weight, Grams
Solution Net	5.5403	Weight, Grams

Chemical Composition of Standard Solution

Pu(NO3)4 in 2N HNO3

Dilution Instructions:

Dilution Solvent Used: 2M HNO3

GRAVIMETRIC/VOLUMETRIC DILUTION

Activity Decay Corrected to This Date: 6/7/94 0:00

Certified Activity	6.9378E-04	uCi/g	Total Activity, dpm	1.5402E+03	
Solution Net	5.5403	Grams	Total Activity (g.xdpm)	8.5332E+03	
Final Dilution Volume	1000	Milliliters	Dilution Activity	8.5332E+00	dpm/ml

TOTAL ACTIVITY DILUTION

Activity Decay Corrected to This Date: 6/7/94 0:00

Total Activity	3.8438E-03	uCi
Final Dilution Volume	1000	Milliliters
Total Activity	8533.161527	dpm
Dilution Activity	8.5332	dpm/ml

EXPIRATION DATE: October 9, 2003

Diluted By	[signature]	Date:	10/9/01 10:25
Verified & Approved By	[signature]	Date:	10/9/01 10:25
QC Approval	[signature]	Date:	10/9/01 10:25

QA/QC REVIEWED
Date 10/11/91

CERTIFICATE OF CALIBRATION
ALPHA STANDARD SOLUTION

RECEIVED
OCT 11 1991
TMA/Eberline
Oak Ridge Lab

Radionuclide	Np-237	Customer:	TMA EBERLINE
Half Life:	(2.140 ± 0.010) x 10^6 years	P.O.No.:	TT4961
Catalog No.:	7237	Reference Date:	November 1 1991 12:00 PST.
Source No.:	389-54-1	Contained Radioactivity:	1.059 µCi.

Description of Solution

a. Mass of solution: 5.1308 grams.
b. Chemical form: Np(NO3)4 in 4N HNO3
c. Carrier content: None added
d. Density: 1.1296 gram/ml @ 20°C.

Radioimpurities

See attached technical data sheet

Radioactive Daughters

See attached technical data sheet

Radionuclide Concentration

0.206 µCi/gram.

Method of Calibration

Weighed aliquots of the solution were assayed using gamma spectrometry:

Energy peak(s) integrated under: 87 KeV.

Branching ratio(s) used: 0.126 gamma rays per decay.

Uncertainty of Measurement

a. Systematic uncertainty in instrument calibration: ±3.0%
b. Random uncertainty in assay: ±0.6%
c. Random uncertainty in weighing(s): ±0.0%
d. Total uncertainty at the 99% confidence level: ±3.6%

NIST Traceability

This calibration is implicitly traceable to the National Institute of Standards and Technology.

Notes

1. Nuclear data were taken from "Table of Isotopes", Seventh Edition, edited by Virginia S. Shirley.
2. IPL participates in an NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay(and later NIST certification) of Standard Reference Materials. (As in NRC Regulatory Guide 4.15)

Gary A Gilmore
QUALITY CONTROL

ISOTOPE PRODUCTS LABORATORIES
1800 No. Keystone Street.,
Burbank, California 91504
(818) 843 - 7000

Eberline Services

QUALITY CONTROL PROGRAM

QCP-009

EBERLINE

Rev.7; 9/29/99

Title: Radioactive Reference Standards Solutions & Records

Eberline Services - OAK RIDGE LABORATORY
RADIOACTIVE REFERENCE STANDARD SOLUTIONS
SECONDARY DILUTION

QCP-009-1-A

Solution Reference # IPL 389-54-1

Date 11/19/01 10:22

Solution # NP-1A (10/01)

Principal Radionuclide	Half Life, Years	Half Life, Days
^{237}Np	2.140E+06	7.816E+08

Radionuclide of Interest ^{237}Np

Parent Solution Conc. 2.35E+03 dpm/ml

Reference Date 11/1/91 0:00

Chemical Composition of Standard Solution

$Np(NO_3)4$ in 4N HNO_3

Dilution Instructions:

Dilution Solvent Used 4N HNO_3

SECONDARY VOLUMETRIC DILUTION

Vol. Parent Solution: 10.0000 ml

Total Activity: 2.3465E+04 dpm

Final Volume: 1000.00 ml

Final Activity Concentration: 2.3465E+01 dpm/ml

NOTES:

Expiration Date: November 19, 2003

Diluted By William L McDonald Date: 11/19/01 10:22

Verified & Approved By [illegible] Date: 11/20/01

QC Approval [illegible] Date: 11/20/01

Isotope Products Laboratories
An Eckert & Ziegler Company

24937 Avenue Tibbitts
Valencia, California 91355

Tel 661·309·1010
Fax 661·257·8303

QA/QC RECEIVED
DATE 5/28/02 INITIALS

CERTIFICATE OF CALIBRATION
ALPHA STANDARD SOLUTION

Radionuclide:	Am-243	**Customer:**	EBERLINE SERVICES
Half-life:	(2.690 ± 0.008)E+06 days	**P.O. No.:**	00010026/R1781
Catalog No.:	7243	**Reference Date:**	1-Jun-02 12:00 PST
Source No.:	909-81	**Contained Radioactivity: (Am-243 only)**	1.028 µCi 38.04 kBq

Physical Description:

A. Mass of solution: 4.98627 g in 5 mL flame-sealed ampoule
B. Chemical form: $Am(NO_3)_3$ in 0.1M HNO_3
C. Carrier content: 10µg Eu/mL
D. Density: 1.0016 g/mL @ 20°C.

Radioimpurities:

None detected (Np-239 daughter in equilibrium)

Radionuclide Concentration: 0.2062 µCi/g, 7.629 kBq/g

Method of Calibration:

This source was prepared from a weighed aliquot of solution whose activity in µCi/g was determined using gamma ray spectrometry.
Peak energy used for integration: 74.7 keV
Branching ratio used: 0.674 gammas per decay

Uncertainty of Measurement:

A. Type A (random) uncertainty: ± 0.9 %
B. Type B (systematic) uncertainty: ± 3.0 %
C. Uncertainty in aliquot weighing: ± 0.0 %
D. Total uncertainty at the 99% confidence level: ± 3.1 %

Notes:

- See reverse side for leak test(s) performed on this source.
- IPL participates in a NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay (and later NIST certification) of Standard Reference Materials (As in NRC Regulatory Guide 4.15).
- Nuclear data was taken from IAEA-TECDOC-619, 1991.
- This solution has a working life of 5 years.

N Khan
Quality Control

22-May-02
Date Signed

IPL Ref. No.: 909-81

EBERLINE SERVICES

QUALITY CONTROL PROGRAM

QCP-009

Rev.7; 9/29/99
Title: Radioactive Reference Standards Solutions & Records

EBERLINE SERVICES - OAK RIDGE LABORATORY
RADIOACTIVE REFERENCE SOLUTIONS
PRIMARY DILUTION
QCP 009-1

CURRENT DATE: 7/30/2002 19:21

SOLUTION REFERENCE #: IPL 909-81 SOLUTION #: Am-10

Principal Radionuclide	Half Life, Years	Half Life, Days
^{243}Am	7.365E+03	2.690E+06

Radionuclide: ^{243}Am
Reference Date: 6/1/2002 0:00
Certified Activity: 1.028E+00 µCi
Certified Concentration: µCi per gram

Ampoule /Solution Gross: Weight, Grams
Empty Ampoule: Weight, Grams
Solution Net: Weight, Grams
Total Activity in Ampoule: 1.0280 µCi

Chemical Composition of Standard Solution
$Am(NO_3)_3$ in 0.1M HNO_3

Dilution Instructions: Dilution Solvent Used: 1% HNO_3

Dilute to a volume of 1000.00 milliliters

Certified Total Activity of 1.0280 µCi Which Equals 2.282E+06 dpm at the date listed above

And after dilution the activity of this solution is 2.282E+03 dpm/ml

This activity concentration is based on the original reference date listed above. All activities are corrected to the date and time of analysis by the laboratory data processing software.

Expiration Date: July 30, 2003

Diluted By: [signature] Date: 7/30/2002 19:21

Verified & Approved By: [signature] Date: 7/30/02

QC Approval: [signature] Date: 8/9/02

ANALYTICS

QA/QC REVIEWED
Date 4/30/96 Initials MT

Am-4

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318 · U.S.A.

Phone (404) 352-8677
Fax (404) 352-2837

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

52094-416

Am-241 10 mL Liquid in Flame Sealed Vial

This standard radionuclide source was prepared gravimetrically from a calibrated master liquid radionuclide solution source. The master source was calibrated by liquid scintillation counting.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

ISOTOPE:	Am-241
ACTIVITY (dps):	1.975 E+05
HALF-LIFE:	432.2 years
CALIBRATION DATE:	March 19, 1996 12:00 EST
TOTAL ERROR:	3.0%
SYSTEMATIC ERROR:	2.37%
RANDOM ERROR:	0.63%

10.01177 grams of solution 1M HCl.

P O NUMBER OR3830, Item 1

SOURCE PREPARED BY: Karen D'Brie Beverly
K. O. Beverly, Radiochemist

Q A APPROVED: D M. [illegible] 4-26-96

EBERLINE SERVICES

QUALITY CONTROL PROGRAM

QCP-009

Rev.7; 9/29/99
Title: Radioactive Reference Standards Solutions & Records

EBERLINE SERVICES - OAK RIDGE LABORATORY
RADIOACTIVE REFERENCE STANDARD SOLUTIONS
SECONDARY DILUTION

QCP-009-1-A

Solution Reference # Amersham 52094-416

Date 5/31/2002 10:43

Solution # Am-4a

Principal Radionuclide	Half Life, Years	Half Life, Days
^{241}Americium	4.322E+02	1.579E+05

Radionuclide of Interest ^{241}Am

Parent Solution Conc. 1.19E+04 dpm/ml

Reference Date 3/19/1996 0:00

Chemical Composition of Standard Solution

^{241}AmCl$_3$ in 1M HCl

Dilution Instructions:

Dilution Solvent Used 1M HCl

SECONDARY VOLUMETRIC DILUTION

Vol. Parent Solution: 4.0000 ml

Total Activity: 4.7400E+04 dpm

Final Volume: 1000.00 ml

Final Activity Concentration: 4.7400E+01 dpm/ml

This activity concentration is based on the original reference date listed above. All activities are corrected to the date and time of analysis by the laboratory data processing software.

NOTES:

Expiration Date: May 31, 2003

Diluted By _____ Date: 5/31/2002 10:43

Verified & Approved By _____ Date: 5/31/02

QC Approval _____ Date: 6/12/02

00068

QA/QC REVIEWED
Date 8/15/97 Initials WT

Am-6

Tracer Solution for Environmental Analysis & Disequilibrium Studies.

Product Description & Measurement Certificate

Description	Principal radionuclide:	**americium 243** (Am-243)	Product code: **ATP10020**
	Daughter Nuclide:	Np-239	Batch Number: 95/243/47

Measurement	Reference date:	30 April 1997
	Radioactive concentration Am-243	1.744E+03 becquerels per gram of solution
	which is equivalent to	4.714E-02 microcuries per gram of solution
	Mass of solution	5.37 grams
	Volume of solution	5.04 millilitres
	Total activity of Am-243	9.37E+03 becquerels
	which is equivalent to	2.53E-01 microcuries

Accuracy

Method of measurement (see reverse of this certificate)
Random uncertainty is: ± 0.2% Systematic uncertainty: ± 0.5%
Overall uncertainty in the radioactive concentration quoted above: ± 1.1%
Overall uncertainty is defined on the reverse of this certificate.

Radionuclidic Purity

Any radioactive impurities measured are listed below, expressed as percentages of the activity of the principle radionuclide at the reference date 30 April 1997.

Am-243 99.97, Am-241 0.03

Isotopic Purity

The elemental composition, expressed as atom per cent at the reference date 12 April 1984.

Am-243 99.998, Am-242<0.001, Am-241<0.001

Chemical Composition

Calculated weight of Am-243, 1.27E-06 grams, as 2M HNO3 solution in a flame sealed glass vial.
This Tracer solution has been produced 'carrier free'.

Physical Data

Recommended half life of americium 243: 7.370E+03 years
Principle energies of alpha emissions (MeV): 5.233 10.6%, 5.275 87.9%
Branching ratio for alpha emission: 100.0%
Calculated specific activity of americium 243: 7.384E+03 Bq per microgram Am-243.

Remarks

For safety information and notes to ensure correct usage by all persons handling this radioactive Tracer solution please read the instructions accompanying the package.

AEA Technology operates a quality management system which has been independently audited and approved to ISO 9001.

Approved Signatory

Roger Wiltshire

Project Ref. AE8148

Roger Wiltshire

Prepared and characterised at AEA Technology UK, world wide distribution by **Isotrak**, QSA Amersham International.

00069

AEA Technology is the trading name of AEA Technology plc

Eberline Services

QUALITY CONTROL PROGRAM

QCP-009

EBERLINE SERVICES

Rev.7; 9/29/99

Title: Radioactive Reference Standards Solutions & Records

Eberline Services - OAK RIDGE LABORATORY
RADIOACTIVE REFERENCE STANDARD SOLUTIONS
SECONDARY DILUTION

QCP-009-1-A

Solution Reference # Amersham ATP10020

Date 11/7/01 14:21

Solution # AM-6A (1001)

Principal Radionuclide	Half Life, Years	Half Life, Days
^{243}Americium	1.384E+02	5.055E+04

Radionuclide of Interest ^{243}Americium

Parent Solution Conc. 5.59E+02 dpm/ml

Reference Date 4/30/97 0:00

Chemical Composition of Standard Solution

$^{243}Am(NO_3)3$ in 2N HNO_3

Dilution Instructions:

Dilution Solvent Used 2N HNO_3

SECONDARY VOLUMETRIC DILUTION

Vol. Parent Solution: 250.0000 ml

Total Activity: 1.3986E+05 dpm

Final Volume: 500.00 ml

Final Activity Concentration: 2.7972E+02 dpm/ml

NOTES:

Expiration Date: November 7, 2003

Diluted By _____ Date: 11/7/01 14:21

Verified & Approved By _____ Date: 11/7/01

QC Approval _____ Date: 11/7/01

U. S. Department of Commerce
Malcolm Baldrige
Secretary

National Bureau of Standards
Ernest Ambler, Director

QA/QC REVIEWED
Date 10/26/92 Initials JM

Cm-1
RECEIVED
OCT 26 1992

National Bureau of Standards

Certificate

Standard Reference Material 4329

Radioactivity Standard

Radionuclide	Curium-243 (1)*
Source identification	4329
Source description	Liquid in a 5-mL, flame-sealed borosilicate-glass ampoule
Solution composition	Curium-243 in 1-molar nitric acid
Solution mass	5.156 ± 0.005 grams (2)
Reference time	1200 EST, June 13, 1984
Radioactivity concentration	69.50 Bq g^{-1}
Overall uncertainty	1.4 percent (3)
Alpha-particle-emitting impurities (Activity ratios at reference time)	$^{243}Am/^{243}Cm$: < 0.0008 (4) $^{244}Cm/^{243}Cm$: < 0.0008 (5)
Measuring instrument	NBS "0.8π" alpha and "0.1π" alpha defined-solid-angle counters with scintillation detectors
Half life	28.5 ± 0.2 years (6)

This Standard Reference Material was prepared in the Center for Radiation Research, Nuclear Radiation Division, Radioactivity Group, Dale D. Hoppes, Group Leader.

Gaithersburg, MD 20899
March, 1985

Stanley D. Rasberry, Chief
Office of Standard Reference Materials

*Notes on back

Eberline Services

QUALITY CONTROL PROGRAM

QCP-009

EBERLINE

Rev.7; 9/29/99

Title: Radioactive Reference Standards Solutions & Records

Eberline Services - OAK RIDGE LABORATORY
RADIOACTIVE REFERENCE SOLUTIONS
PRIMARY DILUTION
QCP 009-1

CURRENT DATE: 11/7/01 14:14

SOLUTION REFERENCE #: NIST SRM 4329

SOLUTION #: CM-1 (10/01)

Principal Radionuclide	Half Life, Years	Half Life, Days
^{243}Curium	2.850E+01	1.041E+04

Radionuclide: ^{243}Cm

Reference Date: 3/19/96 12:00

Certified Activity: 1.929E-02 µCi

Certified Concentration: 1.878E-03 µCi per gram

Ampoule /Solution Gross	25.5695	Weight, Grams
Empty Ampoule	15.3011	Weight, Grams
Solution Net	10.2684	Weight, Grams
Total Activity in Ampoule	0.0193	µCi

Chemical Composition of Standard Solution

$Cm(NO_3)3$ in 1N HNO_3

Dilution Instructions:

Dilution Solvent Used: 1N HNO_3

Dilute to a volume of 1000.00 milliliters

Certified Total Activity of 0.0193 µCi Which Equals 4.282E+04 dpm

And after dilution the activity of this solution is 4.282E+01 dpm/ml

This activity concentration is based on the original reference date listed above. All activities are corrected to the date and time of analysis by the laboratory data processing software.

Expiration Date: November 7, 2003

Diluted By _____ Date: 11/7/01 14:14

Verified & Approved By _____ Date: 11/7/01 14:14

QC Approval _____ Date: 11/7/01 14:14

Sr-4

QA/QC REVIEWED
Date 11 Nov 1993 Initials

CERTIFICATE OF CALIBRATION
BETA STANDARD SOLUTION

Radionuclide:	Sr-90	Customer:	TMA EBERLINE		
Half Life:	28.5 ± 0.2 years	P.O.No.:	VH1632		
Catalog No.:	7090	Reference Date:	November 1 1993	12:00 PST.	
Source No.:	435-104-1	Contained Radioactivity:	(Sr-90)	0.984	µCi.
		Contained Radioactivity:	(Sr-90)	36.4	kBq.

Description of Solution

a. Mass of solution: 5.0021g (in a 5mL Flame Sealed Ampoule)

b. Chemical form: SrCl2 in 0.1N HCl

c. Carrier content: None Added

d. Density: 0.9996 g/ml @ 20°C.

Radioimpurities: None detected

Radioactive Daughters: Y-90 daughter in equilibrium

Radionuclide Concentration: 0.1967 µCi/g.

Method of Calibration

The source was prepared from a weighed aliquot of solution whose concentration in µCi/gram was determined by a liquid scintillation counter.

— Consumed 11/12/01 with —

Uncertainty of Measurement

a. Systematic uncertainty in instrument calibration:	±2.1%
b. Random uncertainty in assay:	±0.4%
c. Random uncertainty in weighing(s):	±0.0%
d. Total uncertainty at the 99% confidence level:	±2.1%

NIST Traceability

This calibration is implicitly traceable to the National Institute of Standards and Technology.

Leak Test(s)

See reverse side for Leak Test(s) applied to this source.

Notes

1. Nuclear data were taken from "Table of Radioactive Isotopes", edited by Virginia S. Shirley, 1986.
2. IPL participates in an NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay (and later NIST certification) of Standard Reference Materials (As in NRC Regulatory Guide 4.15).

Anna U. Khan
QUALITY CONTROL

Nov. 8, 1993
Date Signed

ISOTOPE PRODUCTS LABORATORIES
1800 North Keystone Street
Burbank, California 91504
(818) 843 - 7000

EBERLINE SERVICES

QUALITY CONTROL PROGRAM
QCP-009

Rev.7; 9/29/99
Title: Radioactive Reference Standards Solutions & Records

EBERLINE SERVICES - OAK RIDGE LABORATORY
RADIOACTIVE REFERENCE STANDARD SOLUTIONS
SECONDARY DILUTION RECERTIFICATION

Solution Reference # QCP-009-1-A IPL 435-104-1
Date 11/21/2002 16:34
Solution # Sr-4a

Principal Radionuclide	Half Life, Years	Half Life, Days
$^{90}Sr/Y$	2.910E+01	1.063E+04

Radionuclide of Interest ^{90}Sr
Parent Solution Conc. 2.18E+03 dpm/ml
Reference Date 11/1/1993 0:00

Chemical Composition of Standard Solution
$^{90}SrCl_2$ in 0.1M HCl

Dilution Instructions:
Dilution Solvent Used 0.1 N HCl

SECONDARY VOLUMETRIC DILUTION

Vol. Parent Solution: 50.0000 ml
Total Activity: 1.0920E+05 dpm
Final Volume: 500.00 ml

Final Activity Concentration: 2.1840E+02 dpm/ml

NOTES:

This activity concentration is based on the original reference date listed above. All activities are corrected to the date and time of analysis by the laboratory data processing software.

Expiration Date: November 21, 2003

Recertified By Willie L McDonald Date: 11/21/2002 16:34
Verified & Approved By [illegible] Date: 11/21/02
QC Approval [illegible] Date: 11/21/02

Tc-2

CERTIFICATE OF CALIBRATION
BETA STANDARD SOLUTION

Radionuclide	Tc-99	Customer:	TMA EBERLINE (NEW MEXICO)	
Half Life:	(2.13 ± 0.05) x 10^5 years	P.O.No.:	LQ 9724	
Catalog No.:	7099-100U	Reference Date:	July 1 1995	12:00 PST.
Source No.:	499-15	Contained Radioactivity:	99.3	µCi.
		Contained Radioactivity:	3670	kBq

Description of Solution

a. Mass of solution: 5.06314 g in a 5 ml flame sealed ampoule

b. Chemical form: NH4TcO4 in H2O

c. Carrier content: None

d. Density: Approximately 0.9982 g/ml @ 20°C.

Radioimpurities None detected

Radioactive Daughters None

Radionuclide Concentration 19.61 µCi/g.

Method of Calibration

The source was prepared from a weighed aliquot of solution whose concentration in µCi/gram was determined by a liquid scintillation counter.

Uncertainty of Measurement

a. Systematic uncertainty in instrument calibration:	±	2.1%
b. Random uncertainty in assay:	±	0.7%
c. Random uncertainty in weighing(s):	±	0.1%
d. Total uncertainty at the 99% confidence level:	±	2.2%

NIST Traceability

This calibration is implicitly traceable to the National Institute of Standards and Technology.

Notes

1. IPL participates in an NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay(and later NIST certification) of Standard Reference Materials (As in NRC Regulatory Guide 4.15).

QA/QC REVIEWED
Date 1/24/96 Initials

ERIC ALLAS
QUALITY CONTROL

29 JUNE 1995
Date Signed

ISOTOPE PRODUCTS LABORATORIES
3017 N. SAN FERNANDO BLVD.
BURBANK, CALIFORNIA 91504
818·843·7000 FAX 818·843·6168

EBERLINE

QUALITY CONTROL PROGRAM

QCP-009

Rev.7; 9/29/99
Title: Radioactive Reference Standards Solutions & Records

EBERLINE SERVICES - OAK RIDGE LABORATORY
RADIOACTIVE REFERENCE STANDARD SOLUTIONS
SECONDARY DILUTION (Recertification)

QCP-009-1-A

Solution Reference # IPL 499-15

Date 1/29/01 15:33

Solution # Tc-2a

Principal Radionuclide	Half Life, Years	Half Life, Days
^{99}Technetium	2.130E+05	7.780E+07

Radionuclide of Interest ^{99}Tc

Parent Solution Conc. 2.20E+05 dpm/ml

Reference Date 7/1/95 0:00

Chemical Composition of Standard Solution

$NH_4{}^{99}TcO_4$ in H_2O

Dilution Instructions:

Dilution Solvent Used Tritium-free water

SECONDARY VOLUMETRIC DILUTION

Vol. Parent Solution: 100.0000 ml

Total Activity: 2.2040E+07 dpm

Final Volume: 1000.00 ml

Final Activity Concentration: 2.2040E+04 dpm/ml

NOTES:

Expiration Date: February 2, 2003

Diluted By _____ Date: 1/29/01 15:33

Verified & Approved By _____ Date: 1/29/01

QC Approval _____ Date: 2/2/01

QA/QC REVIEWED
Date 2/2/01 Initials

00076

(H-5)

CERTIFICATE OF CALIBRATION
BETA STANDARD SOLUTION

QA/QC REVIEWED
Date 4/26/99 Initials

Radionuclide	H-3	Customer:	THERMO NUTECH
Half Life:	12.35 ± 0.1 years	P.O.No.:	5108
Catalog No.:	7003	Reference Date:	15 Apr 99 12:00 PST.
Source No.:	660-25	Contained Radioactivity:	99.61 μCi (3686 kBq)

Description of Solution

a. Mass of solution: 4.91974 grams in 5 mL flame sealed ampoule

b. Chemical form: Tritiated water

c. Carrier content: Not applicable

d. Density: 0.9982 gram/ml @ 20°C.

Radioimpurities

None detected

Radioactive Daughters

None

Radionuclide Concentration

20.25 μCi/gram

Method of Calibration

This source was prepared from a weighed aliquot of solution whose concentration in μCi/gram was determined by a liquid scintillation counter.

Uncertainty of Measurement

a. Systematic uncertainty in instrument calibration: ±3.0%

b. Random uncertainty in assay: ±1.9%

c. Random uncertainty in weighing(s): ±0.0%

d. Total uncertainty at the 99% confidence level: ±3.6%

NIST Traceability

This calibration is implicitly traceable to the National Institute of Standards and Technology.

Leak Test(s)

See reverse side for Leak Test(s) applied to this source.

Notes

1. IPL participates in an NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay(and later NIST certification) of Standard Reference Materials. (As in NRC Regulatory Guide 4.15)

QUALITY CONTROL

2 Apr 99
Date Signed

ISOTOPE PRODUCTS LABORATORIES
1800 N. KEYSTONE STREET
BURBANK, CALIFORNIA 91504
818·843·7000 FAX 818·843·6168

00077

Eberline Services - OAK RIDGE LABORATORY
RADIOACTIVE REFERENCE STANDARD SOLUTIONS
SECONDARY DILUTION

Recertification — 4/10/02

QCP-009-1-A

Solution Reference #	IPL 660-25	Date	4/10/2002 10:48
		Solution #	H-5a

Principal Radionuclide	Half Life, Years	Half Life, Days
^{3}H	1.235E+01	4.511E+03

Radionuclide of Interest: ^{3}H
Parent Solution Conc.: 2.21E+05 dpm/ml

Reference Date: 4/15/1999 0:00

Chemical Composition of Standard Solution
$^{3}H_2O$ in water

Dilution Instructions:

Dilution Solvent Used: Water

SECONDARY VOLUMETRIC DILUTION

Vol. Parent Solution: 65.0000 ml
Total Activity: 1.4372E+07 dpm
Final Volume: 1000.00 ml

Final Activity Concentration: 1.4372E+04 dpm/ml

NOTES:

Expiration Date: April 10, 2003

Diluted By _____ Date: 4/10/2002 10:48

Verified & Approved By _____ Date: 4/10/02

QC Approval _____ Date: 4/10/02

C-6

Isotope Products Laboratories
An Eckert & Ziegler Company

24937 Avenue Tibbitts
Valencia, California 91355

Tel 661·309·1010
Fax 661·257·8303

CERTIFICATE OF CALIBRATION
BETA STANDARD SOLUTION

Radionuclide:	C-14	**Customer:**	THERMO NUTECH
Half-life:	5730 ± 40 years	**P.O. No.:**	00009770
Catalog No.:	7014	**Reference Date:**	15-Feb-02 12:00 PST
Source No.:	904-1	**Contained Radioactivity:**	1.846 µCi 68.30 kBq

Physical Description:

A. Mass of solution: 4.96455 g in 5 mL flame-sealed ampoule
B. Chemical form: Benzoic acid in Toluene
C. Carrier content: None
D. Density: 0.865 g/mL @ 20°C.

Radioimpurities:

None detected

Radionuclide Concentration: 0.3718 µCi/g, 13.76 kBq/g

Method of Calibration:

This source was prepared from a weighed aliquot of solution whose activity in µCi/g was determined using a liquid scintillation counter.

Uncertainty of Measurement:

A. Type A (random) uncertainty: ± 1.8 %
B. Type B (systematic) uncertainty: ± 3.0 %
C. Uncertainty in aliquot weighing: ± 0.1 %
D. Total uncertainty at the 99% confidence level: ± 3.5 %

Notes:

- See reverse side for leak test(s) performed on this source.
- IPL participates in a NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay (and later NIST certification) of Standard Reference Materials (As in NRC Regulatory Guide 4.15).
- Nuclear data was taken from NCRP Report No. 58, 1985.
- This solution has a working life of 5 years.

Daniel James Van Dalsem — 6-Feb-02
Quality Control — Date Signed

IPL Ref. No.: 904-1

EBERLINE SERVICES

QUALITY CONTROL PROGRAM

QCP-009

Rev.7; 9/29/99
Title: Radioactive Reference Standards Solutions & Records

EBERLINE SERVICES - OAK RIDGE LABORATORY
RADIOACTIVE REFERENCE SOLUTIONS
PRIMARY DILUTION
QCP 009-1

IPL 904-1

SOLUTION REFERENCE # ~~1051-4222-B~~ 6/11/02 CURRENT DATE 5/29/2002 15:13
SOLUTION # C-6

Principal Radionuclide	Half Life, Years	Half Life, Days
^{14}Carbon	5.760E+03	2.104E+06

Radionuclide ^{14}Carbon
Reference Date 2/15/2002 0:00
Certified Activity 1.846E+00 µCi
Certified Concentration µCi per gram

Ampoule /Solution Gross Weight, Grams
Empty Ampoule Weight, Grams
Solution Net Weight, Grams
Total Activity in Ampoule 1.8460 µCi

Chemical Composition of Standard Solution
^{14}Carbon - Benzoic Acid in Toluene

Dilution Instructions: Dilution Solvent Used Toluene

Dilute to a volume of 1000.00 milliliters

Certified Total Activity of 1.8460 µCi Which Equals 4.098E+06 dpm at the date listed above

And after dilution the activity of this solution is 4.098E+03 dpm/ml

This activity concentration is based on the original reference date listed above. All activities are corrected to the date and time of analysis by the laboratory data processing software.

Samples are aliquoted by mass. Density of Toluene is 0.8669 g/ml.

$$\frac{4098 \times 3 \text{ dpm/ml}}{0.8669 \text{ g/ml}} = 4.7237 \times 10^3 \text{ dpm/ml}$$

Expiration Date: May 29, 2003

Gen 5/29/02

Diluted By _____ Date: 5/29/2002 15:13

Verified & Approved By _____ Date: 5/29/02

QC Approval _____ Date: 6/11/02

00030

Fe-1

QA/QC REVIEWED
Date 1/10/97 Initials

CERTIFICATE OF CALIBRATION
BETA STANDARD SOLUTION

Radionuclide:	Fe-55	Customer:	TMA EBERLINE	
Half Life:	2.73 ± 0.03 years	P.O.No.:	VH1685	
Catalog No.:	7055	Reference Date:	November 15 1993	12:00 PST.
Source No.:	445-13	Contained Radioactivity:	11.16	µCi.
		Contained Radioactivity:	413	kBq.

Description of Solution

a. Mass of solution: 4.86879 g (in a 5 mL Flame Sealed Ampoule)

b. Chemical form: FeCl3 in 1 N HCl

c. Carrier content: None Added

d. Density: 1.0171 g/ml @ 20°C.

Radioimpurities

None detected

Radioactive Daughters

None

Radionuclide Concentration

2.29 µCi/g.

Method of Calibration

Weighed aliquots of the solution were assayed using a liquid scintillation counter.

Uncertainty of Measurement

a. Systematic uncertainty in instrument calibration: ±4.0%

b. Random uncertainty in assay: ±0.7%

c. Random uncertainty in weighing(s): ±1.0%

d. Total uncertainty at the 99% confidence level: ±4.2%

NIST Traceability

This calibration is implicitly traceable to the National Institute of Standards and Technology.

Leak Test(s)

See reverse side for Leak Test(s) applied to this source.

Notes

1. Nuclear data were taken from "Table of Radioactive Isotopes", edited by Virginia S. Shirley, 1986.
2. IPL participates in an NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay (and later NIST certification) of Standard Reference Materials (As in NRC Regulatory Guide 4.15).

Aman U. Khan
QUALITY CONTROL

Nov. 8, 1993
Date Signed

ISOTOPE PRODUCTS LABORATORIES
1800 North Keystone Street
Burbank, California 91504
(818) 843 - 7000

Eberline Services

EBERLINE SERVICES

QUALITY CONTROL PROGRAM

QCP-009

Rev.7; 9/29/99

Title: Radioactive Reference Standards Solutions & Records

Eberline Services - OAK RIDGE LABORATORY
RADIOACTIVE REFERENCE SOLUTIONS
PRIMARY DILUTION
QCP 009-1

CURRENT DATE: 3/28/2002 0:00

SOLUTION REFERENCE #: IPL 445-13

SOLUTION #: Fe-1

Principal Radionuclide	Half Life, Years	Half Life, Days
^{55}Iron	2.730E+00	9.971E+02

Radionuclide: ^{55}Iron

Reference Date: 11/15/1993 0:00

Certified Activity: 1.116E+01 µCi

Certified Concentration: µCi per gram

Ampoule /Solution Gross: Weight, Grams

Empty Ampoule: Weight, Grams

Solution Net: Weight, Grams

Total Activity in Ampoule: 11.1600 µCi

Chemical Composition of Standard Solution

$^{55}FeCl_3$ in 1M HCl

Dilution Instructions:

Dilution Solvent Used: 1M HCl

Dilute to a volume of 1000.00 milliliters

Certified Total Activity of 11.1600 µCi Which Equals 2.478E+07 dpm

And after dilution the activity of this solution is 2.478E+04 dpm/ml

This activity concentration is based on the original reference date listed above. All activities are corrected to the date and time of analysis by the laboratory data processing software.

Expiration Date: March 28, 2003

Diluted By: [signature] Date: 7/31/2002 15:00

Verified & Approved By: [signature] Date: 7/31/02

QC Approval: [signature] Date: 7/31/02

Pb-3

NIST TRACEABLE CERTIFICATE
GAMMA STANDARD SOLUTION

QA/QC REVIEWED
8/17/00 Initials

Radionuclide:	Pb-210	**Customer:**	THERMO NUTECH
Half-life:	22.3 ± 0.2 years	**P.O. No.:**	00007582
Catalog No.:	7210	**Reference Date:**	15-Aug-00 12:00 PST
Source No.:	707-28-2	**Contained Radioactivity:**	10.06 µCi 372.2 kBq

Physical description:

A. Mass of solution:	4.44237 g in 5 mL flame-sealed ampoule
B. Chemical form:	$Pb(NO_3)_2$ in 1M HNO_3
C. Carrier content:	None
D. Density:	1.0318 g/mL @ 20°C.

Radioimpurities: Ra-226 = 2.27% on 15 Aug 00; daughters not in equilibrium
Bi-210 in equilibrium with Pb-210; Po-210 not in equilibrium

Radionuclide concentration: 2.265 µCi/g, 83.81 kBq/g

Method of Calibration:

This source was prepared from a weighed aliquot of solution whose activity in µCi/g was determined using gamma ray spectrometry.

Peak energy used for integration:	46.5 keV
Branching ratio used:	0.0418 gammas per decay

Uncertainty of Measurement:

A. Type A (random) uncertainty:	± 1.2 %
B. Type B (systematic) uncertainty:	± 3.5 %
C. Uncertainty in aliquot weighing:	± 0.0 %
D. Total uncertainty at the 99% confidence level:	± 3.7 %

Notes:

- See reverse side for leak tests performed on this source.
- IPL participates in an NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay (and later NIST certification) of Standard Reference Materials (As in NRC Regulatory Guide 4.15).
- Nuclear data was taken from NCRP Report No. 58, 1985.
- This solution has a working life of 5 years.

ISOTOPE PRODUCTS LABORATORIES
1800 N. KEYSTONE ST.
BURBANK, CALIFORNIA 91504
818-843-7000 FAX 818-843-6168

ISO 9001 CERTIFIED

Daniel James Van Dalsem
Quality Control

14-Aug-00
Date Signed

IPL Reference Number: 707-28

00083

Thermo Retec

QUALITY CONTROL PROGRAM

QCP-009

Rev.7; 9/29/99

Title: Radioactive Reference Standards Solutions & Records

THERMO NUTECH - OAK RIDGE LABORATORY
RADIOACTIVE REFERENCE STANDARD SOLUTIONS
SECONDARY DILUTION

QCP-009-1-A

Solution Reference # IPL 707-28-2

Date 10/23/00 15:31

Solution # Pb-3a

Principal Radionuclide	Half Life, Years	Half Life, Days
^{210}Lead	2.226E+01	8.130E+03

Radionuclide of Interest ^{210}Lead

Parent Solution Conc. 2.23E+04 dpm/ml

Reference Date 08/15/00 12:00

Chemical Composition of Standard Solution

$Pb(NO^3)^2$ in 1.0 M HNO_3

Dilution Instructions:

Dilution Solvent Used D.I. Water & HNO3

SECONDARY VOLUMETRIC DILUTION

Vol. Parent Solution: 10.0000 ml

Total Activity: 2.2339E+05 dpm

Final Volume: 1000.00 ml

Final Activity Concentration: 2.2339E+02 dpm/ml

NOTES:

Expiration Date: October 23, 2002

Diluted By _____ Date: 10/23/00 15:31

Verified & Approved By _____ Date: 10/23/00

QC Approval _____ Date: 10/24/00

00084

ANALYTICS

QA/QC REVIEWED
Date 4/30/96 Initials WT

Am-4

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318 · U.S.A.

Phone (404) 352-8677
Fax (404) 352-2837

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

52094-416

Am-241 10 mL Liquid in Flame Sealed Vial

This standard radionuclide source was prepared gravimetrically from a calibrated master liquid radionuclide solution source. The master source was calibrated by liquid scintillation counting.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

ISOTOPE:	Am-241
ACTIVITY (dps):	1.975 E+05
HALF-LIFE:	432.2 years
CALIBRATION DATE:	March 19, 1996 12:00 EST
TOTAL ERROR:	3.0%
SYSTEMATIC ERROR:	2.37%
RANDOM ERROR:	0.63%

10.01177 grams of solution 1M HCl.

P O NUMBER OR3830, Item 1

SOURCE PREPARED BY: Kare O'Brie Beverly
K. O. Beverly, Radiochemist

Q A APPROVED: D.M. [illegible] 4-26-96

EBERLINE

QUALITY CONTROL PROGRAM

QCP-009

Rev.7; 9/29/99
Title: Radioactive Reference Standards Solutions & Records

EBERLINE SERVICES - OAK RIDGE LABORATORY
RADIOACTIVE REFERENCE STANDARD SOLUTIONS
SECONDARY DILUTION

QCP-009-1-A

Solution Reference # Analytics 52490-416

Date 11/13/01 10:25

Solution # A/B-7 (alpha)

Principal Radionuclide	Half Life, Years	Half Life, Days
^{241}Americium	4.322E+02	1.579E+05

Radionuclide of Interest ^{241}Am

Parent Solution Conc. 1.19E+04 dpm/ml

Reference Date 3/19/96 0:00

Chemical Composition of Standard Solution

$^{241}AmCl_3$ in 1M HCL

Dilution Instructions:

Dilution Solvent Used 1 M HNO_3

SECONDARY VOLUMETRIC DILUTION

Vol. Parent Solution: 60.0000 ml

Total Activity: 7.1100E+05 dpm

Final Volume: 1000.00 ml

Final Activity Concentration: 7.1100E+02 dpm/ml

This activity concentration is based on the original reference date listed above. All activities are corrected to the date and time of analysis by the laboratory data processing software.

NOTES:

Expiration Date: November 13, 2003

Diluted By _____ Date: 11/13/01 10:25

Verified & Approved By _____ Date: 11/13/01

QC Approval _____ Date: 11/13/01

National Institute of Standards & Technology

Certificate

Standard Reference Material 4234A
Strontium-90 Radioactivity Standard

This Standard Reference Material (SRM) consists of radioactive strontium-90 chloride, non-radioactive strontium chloride, non-radioactive yttrium chloride, and hydrochloric acid dissolved in 5 mL of distilled water. The solution is contained in a flame-sealed NIST borosilicate-glass ampoule. The SRM is intended for the calibration of beta-particle counting instruments and for the monitoring of radiochemical procedures.

Radiological Hazard

The SRM ampoule contains strontium-90 with a total activity of approximately 13 MBq. Strontium-90 decays by beta-particle emission to yttrium-90, which also decays by beta-particle emission. None of the beta particles escape from the SRM ampoule. The beta particles emitted from strontium-90 and yttrium-90 produce bremsstrahlung photons with energies up to 2 MeV. Most of these photons escape from the SRM ampoule and can represent a radiation hazard. Approximate unshielded dose rates at several distances (as of the reference time) are given in note [a]*. Appropriate shielding and/or distance should be used to minimize personnel exposure. The SRM should be used only by persons qualified to handle radioactive material.

Chemical Hazard

The SRM ampoule contains hydrochloric acid (HCl) with a concentration of 1 mole per liter of water. The solution is corrosive and represents a health hazard if it comes in contact with eyes or skin. If the ampoule is to be opened to transfer the solution, the recommended procedure is given on page 2. The ampoule should be opened only by persons qualified to handle both radioactive material and strong acid solution.

Storage and Handling

The SRM should be stored and used at a temperature between 5 and 65 °C. The solution in an unopened ampoule should remain stable and homogeneous until at least March 2005.

The ampoule (or any subsequent container) should always be clearly marked as containing radioactive material. If the ampoule is transported it should be packed, marked, labeled, and shipped in accordance with the applicable national, international, and carrier regulations. The solution in the ampoule is a dangerous good (hazardous material) both because of the radioactivity and because of the strong acid.

Preparation

This Standard Reference Material was prepared in the Physics Laboratory, Ionizing Radiation Division, Radioactivity Group, J.M.R. Hutchinson, Group Leader. The overall technical direction and physical measurements leading to certification were provided by L.L. Lucas of the Radioactivity Group and D.B. Golas, Nuclear Energy Institute Research Associate.

The support aspects involved in the preparation, certification, and issuance of this SRM were coordinated through the Standard Reference Materials Program by N.M. Trahey.

Gaithersburg, Maryland 20899
May 1995 (Text only revised November 1997)

Thomas E. Gills, Chief
Standard Reference Materials Program

*Notes and references are on pages 5 and 6.

EBERLINE

QUALITY CONTROL PROGRAM

QCP-009

Rev.7; 9/29/99
Title: Radioactive Reference Standards Solutions & Records

EBERLINE SERVICES - OAK RIDGE LABORATORY
RADIOACTIVE REFERENCE STANDARD SOLUTIONS
SECONDARY DILUTION

QCP-009-1-A

Solution Reference # NIST 4234A

Date 11/13/01 10:33

Solution # A/B-7 (beta)

Principal Radionuclide	Half Life, Years	Half Life, Days
^{90}Strontium	2.878E+01	1.051E+04

Radionuclide of Interest ^{90}Sr

Parent Solution Conc. 1.52E+06 dpm/ml

Reference Date 3/13/95 0:00

The beta activity of solution reflects the original ^{90}Strontium concentration and an equal concentration of ^{90}Yttrium.

Chemical Composition of Standard Solution

$^{90}SrCl_2$ in 1 M HCl

Dilution Instructions:

Dilution Solvent Used 1 M HNO_3

SECONDARY VOLUMETRIC DILUTION

Vol. Parent Solution: 0.5000 ml

Total Activity: 7.5764E+05 dpm

Final Volume: 1000.00 ml

Final Activity Concentration: 7.5764E+02 dpm/ml

NOTES:

This activity concentration is based on the original reference date listed above. All activities are corrected to the date and time of analysis by the laboratory data processing software.

Expiration Date: November 13, 2003

Diluted By: [signature] Date: 11/13/01 10:33

Verified & Approved By: [signature] Date: 11/13/01

QC Approval: [signature] Date: 11/13/01

ANALYTICS

1380 Seaboard Industrial Blvd
Atlanta, Georgia 30318 U.S.A.

Phone (404) 352-8677
Fax (404) 352-2837

QA/QC RECEIVED
DATE 11/27/01 INITIALS Q.H

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

62569-416

Sand in 480 mL PP Delta Jar Half-Filled

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solution sources. The Am-241 was calibrated by 4 pi alpha liquid scintillation counting. All other radionuclides were calibrated using a germanium gamma spectrometer system. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Analytics maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Rev. 1, February, 1979.

Calibration date: October 1, 2001 12:00 EST

ISOTOPE	GAMMA-RAY ENERGY	HALF-LIFE		GAMMA-RAYS PER SECOND	TOTAL UNCERTAINTY %
Am-241	59.5	432	y	2003	5.0
Cd-109	88	462.6	d	2763	4.8
Co-57	122	271.79	d	1614	4.1
Ce-139	166	137.6	d	2134	4.2
Hg-203	279	46.61	d	5051	4.0
Sn-113	392	115.1	d	2925	4.4
Cs-137	662	30.07	y	1856	4.7
Y-88	898	106.6	d	7221	4.2
Co-60	1173	5.2714	y	3632	4.7
Co-60	1332	5.2714	y	3661	4.4
Y-88	1836	106.6	d	7553	4.2

240 mL / 384 grams of sand.
P O NUMBER 9377, Item 2

SOURCE PREPARED BY: M Taskaeva
M. Taskaeva Radiochemist

Q A APPROVED: W.M. Mty 11-26-01

This standard will expire one year after the calibration date.

6-42-5

ANALYTICS

QA/QC RECEIVED
DATE 11/27/01 INITIALS

1380 Seaboard Industrial Blvd
Atlanta, Georgia 30318 U.S.A.

Phone (404) 352-8677
Fax (404) 352-2837

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

62572B-416

Sand in Falcon Petri Filled to Top

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solution sources. The Am-241 was calibrated by 4 pi alpha liquid scintillation counting. All other radionuclides were calibrated using a germanium gamma spectrometer system. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Analytics maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Rev. 1, February, 1979.

Calibration date: October 1, 2001 12:00 EST

ISOTOPE	GAMMA-RAY ENERGY	HALF-LIFE		GAMMA-RAYS PER SECOND	TOTAL UNCERTAINTY %
Am-241	59.5	432	y	2012	5.0
Cd-109	88	462.6	d	2794	4.8
Co-57	122	271.79	d	1632	4.1
Ce-139	166	137.6	d	2158	4.2
Hg-203	279	46.61	d	5109	4.0
Sn-113	392	115.1	d	2958	4.4
Cs-137	662	30.07	y	1877	4.7
Y-88	898	106.6	d	7302	4.2
Co-60	1173	5.2714	y	3674	4.7
Co-60	1332	5.2714	y	3703	4.4
Y-88	1836	106.6	d	7638	4.2

Tall loose petri. 25 mL / 38.75 grams of sand.
P O NUMBER 9377, Item 2

SOURCE PREPARED BY: M Taskaeva
M. Taskaeva Radiochemist

Q A APPROVED: DM. Mty 11-26-01

This standard will expire one year after the calibration date.

SECTION VI

QUALITY CONTROL SAMPLE RESULTS SUMMARY

WO	Analysis	Run	Activity Units	Aliquot Units	Client Name
02-11141	UUISO	1	pCi	g	Duratek

Laboratory Control Sample

Analyte	Normalized Difference	LCS Measured	TPU Measured	LCS Expected	Uncert. Expected	Known	Known Error	Result	TPU	Standard ID	Standard ACT (dpm)	Standard Error	Standard Added (g)
U-234	0.12	98.68%	20.82%	100.00%	3.60%	7.81E+00	2.81E-01	7.70E+00	1.60E+00	U-8a	3.52E+01	3.60E+00	4.92E-01
U-235	0.96	130.85%	48.34%	100.00%	3.60%	3.54E-01	1.28E-02	4.64E-01	2.24E-01	U-8a	1.60E+00	3.60E+00	4.92E-01
U-238	0.23	97.57%	20.90%	100.00%	3.60%	7.61E+00	2.74E-01	7.42E+00	1.55E+00	U-8a	3.44E+01	3.60E+00	4.92E-01

Matrix Spike

Analyte	Normalized Difference	MS Actual % Rec	Expected MS Result	Expected MS Uncert	Actual MS Result	Actual MS TPU	Sample Result	Sample TPU	Sample Aliquot	Standard ID	Standard ACT (dpm)	Standard Error %	Standard Added (g)

Replicate Sample

Analyte	Normalized Difference	RPD	Original Result	Original TPU	Replicate Result	Replicate TPU
U-234	0.42	60.58	1.05E-02	2.58E-02	1.97E-02	3.42E-02
U-235	0.98	200.00	-2.66E-03	5.34E-03	0.00E+00	0.00E+00
U-238	0.06	6.75	2.31E-02	3.62E-02	2.16E-02	3.38E-02

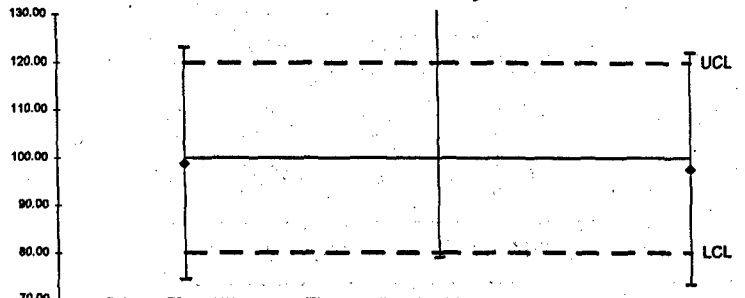
QC Summary

LCS Relative Bias	LCS % R	LCS ND	MS % R	MS ND	Rep RPD	Rep ND
0.99	OK	OK			INV	OK
1.31	INV	OK			OK	OK
0.98	OK	OK			OK	OK

00092

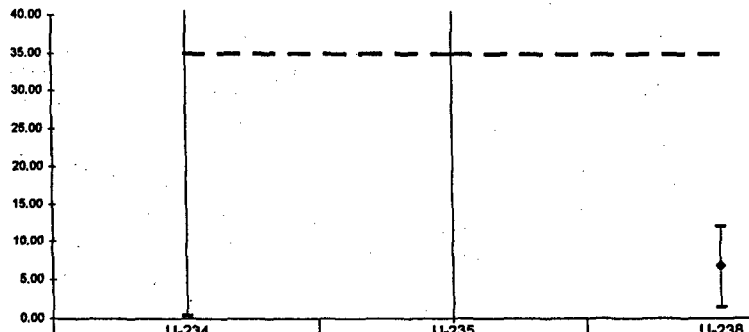
WO	Analysis	Run	Activity Units	Aliquot Units	Client Name
02-11141	UUISO	1	pCi	g	Duratek

LCS % Recovery



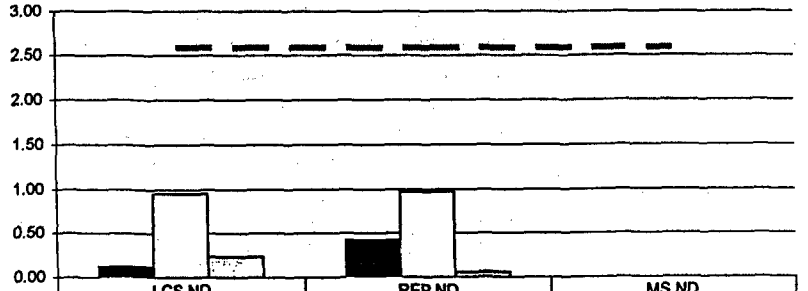
	U-234	U-235	U-238
Lower Error	74.25	78.91	73.06
Upper Error	123.10	182.78	122.07
%R	98.68	130.85	97.57
LCL	80	80	80
Mean	100	100	100
UCL	120	120	120

Replicate Sample RPD



	U-234	U-235	U-238
Lower Error	120.71	-0.74	12.04
Upper Error	0.44	400.74	1.47
RPD	60.58	200.00	6.75
CL	35	35	35

Normalized Difference



	LCS ND	REP ND	MS ND
U-234	0.12	0.42	0.00
U-235	0.96	0.98	0.00
U-238	0.23	0.06	0.00
UCL	2.58	2.58	2.58

No Matrix Spike

00093

WO	Analysis	Run	Activity Units	Aliquot Units	Client Name
02-11141	ThISO	1	pCi	g	Duratek

Laboratory Control Sample

Analyte	Normalized Difference	LCS Measured	TPU Measured	LCS Expected	Uncert. Expected	Known	Known Error	Result	TPU	Standard ID	Standard ACT (dpm)	Standard Error	Standard Added (g)
TH-228	0.59	106.54%	20.39%	100.00%	3.60%	4.67E+00	1.68E-01	4.98E+00	1.02E+00	Th-8b	1.04E+02	3.60E+00	1.00E-01
TH-230	1.01	111.58%	19.97%	100.00%	2.70%	5.28E+00	1.43E-01	5.90E+00	1.18E+00	Th-1b	2.35E+01	2.70E+00	4.99E-01
TH-232	0.33	96.62%	20.63%	100.00%	3.60%	4.67E+00	1.68E-01	4.52E+00	9.32E-01	Th-8b	1.04E+02	3.60E+00	1.00E-01

Matrix Spike

Analyte	Normalized Difference	MS Actual % Rec	Expected MS Result	Expected MS Uncert	Actual MS Result	Actual MS TPU	Sample Result	Sample TPU	Sample Aliquot	Standard ID	Standard ACT (dpm)	Standard Error %	Standard Added (g)

Replicate Sample

Analyte	Normalized Difference	RPD	Original Result	Original TPU	Replicate Result	Replicate TPU
TH-228	0.69	204.04	-2.65E-04	2.79E-02	2.65E-02	7.06E-02
TH-230	0.70	26.30	2.64E-01	1.26E-01	2.02E-01	1.17E-01
TH-232	0.38	134.68	1.91E-03	2.73E-02	9.76E-03	3.05E-02

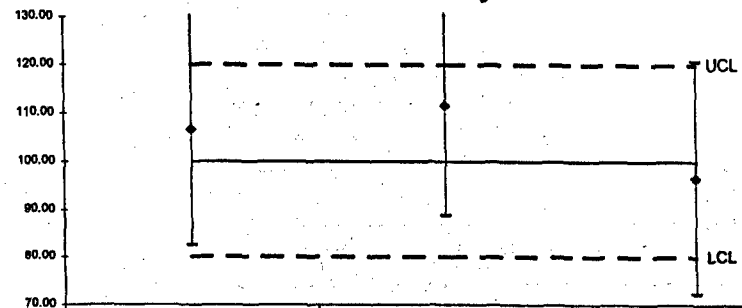
QC Summary

LCS Relative Bias	LCS % R	LCS ND	MS % R	MS ND	Rep RPD	Rep ND
1.07	OK	OK			INV	OK
1.12	OK	OK			INV	OK
0.97	OK	OK			INV	OK

000094

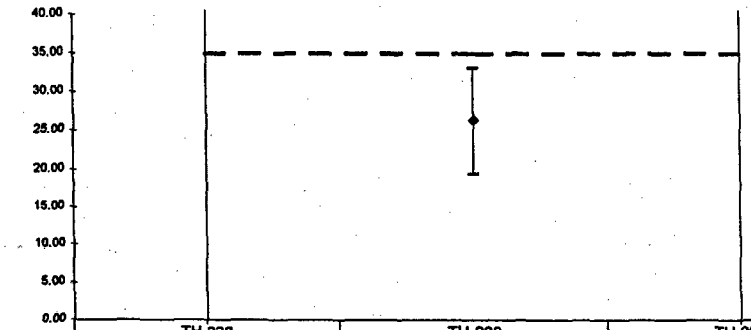
WO	Analysis	Run	Activity Units	Aliquot Units	Client Name
02-11141	ThISO	1	pCi	g	Duratek

LCS % Recovery



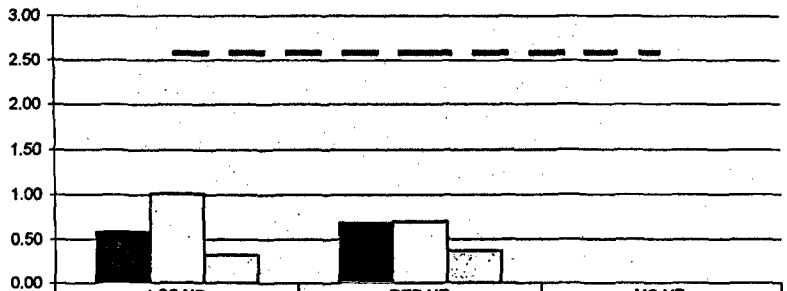
	TH-228	TH-230	TH-232
Lower Error	82.56	88.90	72.38
Upper Error	130.53	134.25	120.85
%R	106.54	111.58	96.62
LCL	80	80	80
Mean	100	100	100
UCL	120	120	120

Replicate Sample RPD



	TH-228	TH-230	TH-232
Lower Error	587.74	33.16	467.95
Upper Error	-179.66	19.45	-198.58
RPD	204.04	26.30	134.68
CL	35	35	35

Normalized Difference



	LCS ND	REP ND	MS ND
TH-228	0.59	0.69	0.00
TH-230	1.01	0.70	0.00
TH-232	0.33	0.38	0.00
UCL	2.58	2.58	2.58

No Matrix Spike

WO	Analysis	Run	Activity Units	Aliquot Units	Client Name
02-11141	PulSO	2	pCi	g	Duratek

Laboratory Control Sample

Analyte	Normalized Difference	LCS Measured	TPU Measured	LCS Expected	Uncert. Expected	Known	Known Error	Result	TPU	Standard ID	Standard ACT (dpm)	Standard Error	Standard Added (g)
PU-238	1.61	85.11%	21.17%	100.00%	2.80%	4.85E+00	1.36E-01	4.13E+00	8.75E-01	Pu-1	1.08E+02	2.80E+00	9.94E-02
PU-239	1.48	86.40%	20.63%	100.00%	3.10%	5.89E+00	1.83E-01	5.09E+00	1.05E+00	Pu-2	1.31E+02	3.10E+00	9.99E-02

Matrix Spike

Analyte	Normalized Difference	MS Actual % Rec	Expected MS Result	Expected MS Uncert	Actual MS Result	Actual MS TPU	Sample Result	Sample TPU	Sample Aliquot	Standard ID	Standard ACT (dpm)	Standard Error %	Standard Added (g)

Replicate Sample / QC Summary

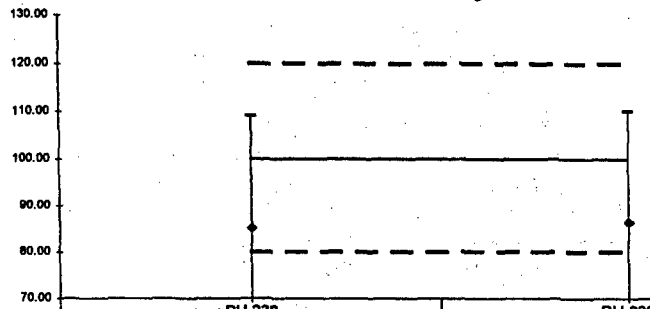
Analyte	Normalized Difference	RPD	Original Result	Original TPU	Replicate Result	Replicate TPU	LCS Relative Bias	LCS % R	LCS ND	MS % R	MS ND	Rep RPD	Rep ND
PU-238	0.76	2442.18	-8.03E-03	9.40E-03	9.46E-03	4.42E-02	0.85	OK	OK			INV	OK
PU-239	1.25	200.00	2.88E-02	4.51E-02	0.00E+00	0.00E+00	0.86	OK	OK			OK	OK

00096

Version

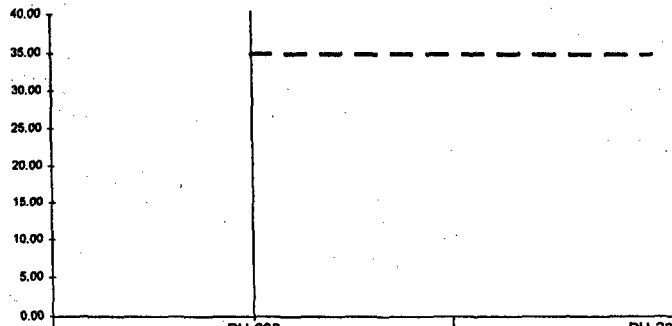
WO	Analysis	Run	Activity Units	Aliquot Units	Client Name
02-11141	PulSO	2	pCi	g	Duratek

LCS % Recovery



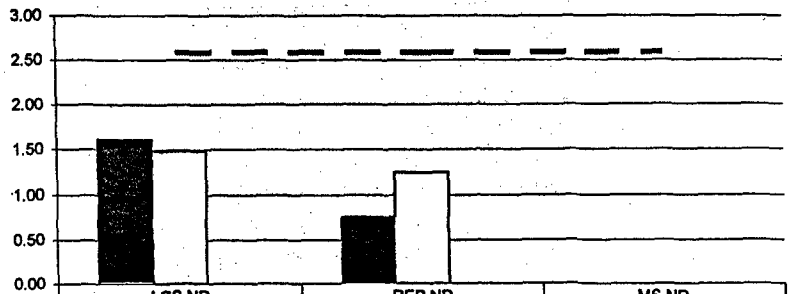
	PU-238	PU-239
Lower Error	61.13	62.68
Upper Error	109.08	110.13
%R	85.11	86.40
LCL	80	80
Mean	100	100
UCL	120	120

Replicate Sample RPD



	PU-238	PU-239
Lower Error	48149.66	356.82
Upper Error	-43265.31	43.18
RPD	2442.18	200.00
CL	35	35

Normalized Difference



	LCS ND	REP ND	MS ND
PU-238	1.61	0.76	0.00
PU-239	1.48	1.25	0.00
	0.00	0.00	0.00
UCL	2.58	2.58	2.58

No Matrix Spike

WO	Analysis	Run	Activity Units	Aliquot Units	Client Name
02-11141	Pu4ISO	1	pCi	g	Duratek

Laboratory Control Sample

Analyte	Normalized Difference	LCS Measured	TPU Measured	LCS Expected	Uncert. Expected	Known	Known Error	Result	TPU	Standard ID	Standard ACT (dpm)	Standard Error	Standard Added (g)
PU-238	1.53	85.65%	21.32%	100.00%	2.80%	4.96E+00	1.39E-01	4.25E+00	9.05E-01	Pu-1	1.08E+02	2.80E+00	1.02E-01
PU-239	0.46	95.42%	20.50%	100.00%	3.10%	5.93E+00	1.84E-01	5.66E+00	1.16E+00	Pu-2	1.31E+02	3.10E+00	1.01E-01
PU242	1.08	89.19%	21.99%	100.00%	0.74%	3.92E+00	2.90E-02	3.50E+00	7.70E-01	Pu-15 10/01	8.53E+00	7.40E-01	1.02E+00

Matrix Spike

Analyte	Normalized Difference	MS Actual % Rec	Expected MS Result	Expected MS Uncert	Actual MS Result	Actual MS TPU	Sample Result	Sample TPU	Sample Aliquot	Standard ID	Standard ACT (dpm)	Standard Error %	Standard Added (g)

Replicate Sample

Analyte	Normalized Difference	RPD	Original Result	Original TPU	Replicate Result	Replicate TPU
PU-238	0.06	2.34	3.21E-01	1.79E-01	3.28E-01	1.61E-01
PU-239	1.11	126.14	6.12E-02	7.61E-02	1.39E-02	3.40E-02
PU242	2.15	200.00	0.00E+00	0.00E+00	8.34E-02	7.61E-02

QC Summary

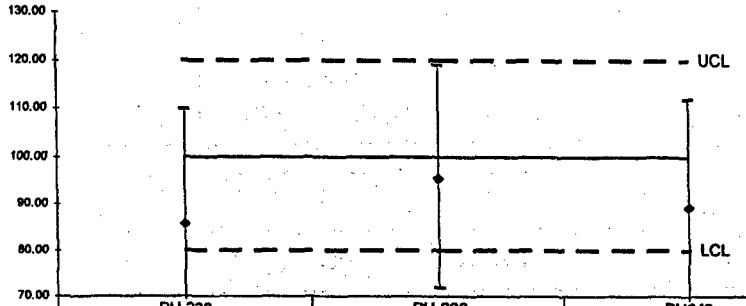
Analyte	LCS Relative Bias	LCS % R	LCS ND	MS % R	MS ND	Rep RPD	Rep ND
PU-238	0.86	OK	OK			OK	OK
PU-239	0.95	OK	OK			INV	OK
PU242	0.89	OK	OK			OK	OK

000098

Version

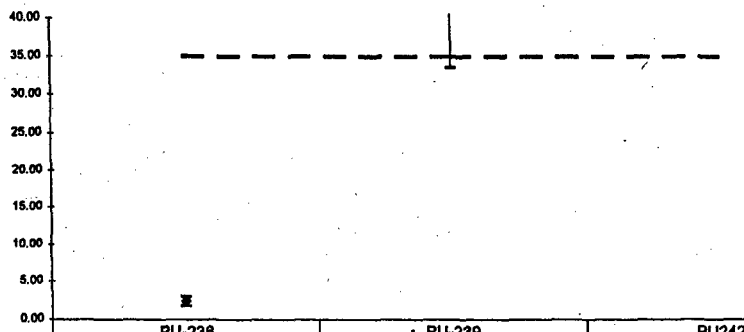
WO	Analysis	Run	Activity Units	Aliquot Units	Client Name
02-11141	Pu4ISO	1	pCi	g	Duratek

LCS % Recovery



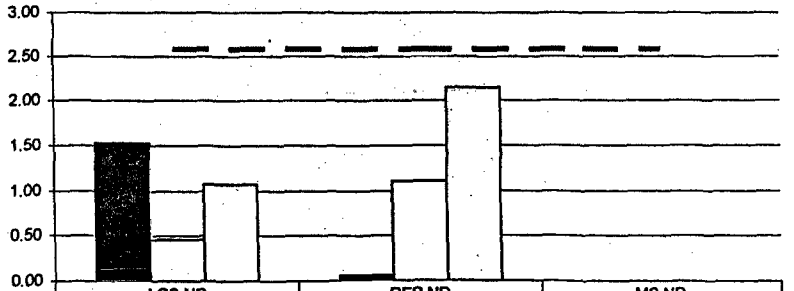
	PU-238	PU-239	PU242
Lower Error	61.53	71.82	66.45
Upper Error	109.77	119.02	111.92
%R	85.65	95.42	89.19
LCL	80	80	80
Mean	100	100	100
UCL	120	120	120

Replicate Sample RPD



	PU-238	PU-239	PU242
Lower Error	2.96	218.72	291.28
Upper Error	1.73	33.57	108.72
RPD	2.34	126.14	200.00
CL	35	35	35

Normalized Difference



	LCS ND	REP ND	MS ND
PU-238	1.53	0.06	0.00
PU-239	0.46	1.11	0.00
PU242	1.08	2.15	0.00
UCL	2.58	2.58	2.58

No Matrix Spike

WO	Analysis	Run	Activity Units	Aliquot Units	Client Name
02-11141	Pu241	2	pCi	g	Duratek

Laboratory Control Sample

Analyte	Normalized Difference	LCS Measured	TPU Measured	LCS Expected	Uncert. Expected	Known	Known Error	Result	TPU	Standard ID	Standard ACT (dpm)	Standard Error	Standard Added (g)
Pu-241	3.50	118.46%	8.21%	100.00%	4.60%	2.81E+02	1.29E+01	3.33E+02	2.73E+01	Pu-17a	1.23E+03	4.60E+00	5.07E-01

Matrix Spike

Analyte	Normalized Difference	MS Actual % Rec	Expected MS Result	Expected MS Uncert	Actual MS Result	Actual MS TPU	Sample Result	Sample TPU	Sample Aliquot	Standard ID	Standard ACT (dpm)	Standard Error %	Standard Added (g)

Replicate Sample

Analyte	Normalized Difference	RPD	Original Result	Original TPU	Replicate Result	Replicate TPU
Pu-241	3.65	83.71	5.61E+00	3.00E+00	1.37E+01	3.13E+00

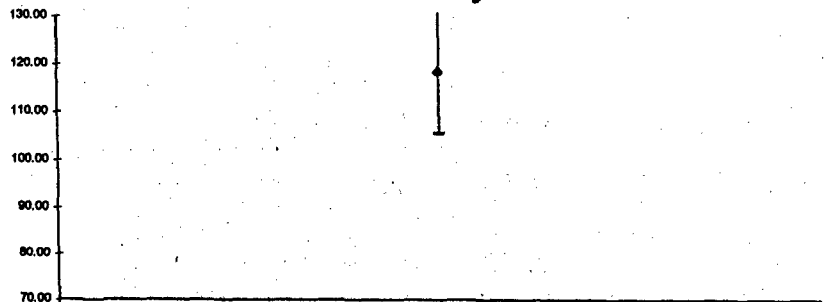
QC Summary

LCS Relative Bias	LCS % R	LCS ND	MS % R	MS ND	Rep RPD	Rep ND
1.18	OK	INV			INV	INV

00130

WO	Analysis	Run	Activity Units	Aliquot Units	Client Name
02-11141	Pu241	2	pCi	g	Duratek

LCS % Recovery

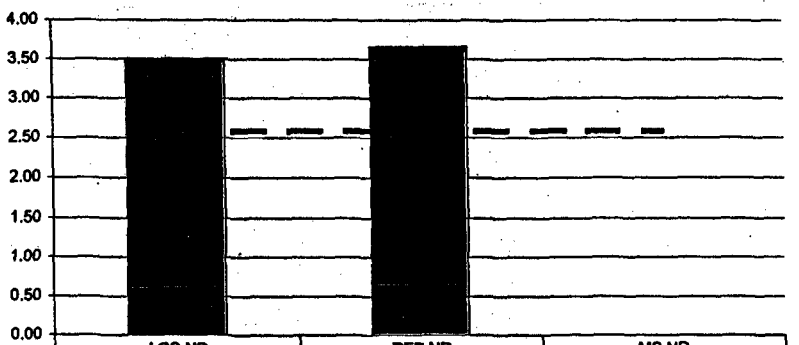


	Pu-241
Lower Error	105.65
Upper Error	131.27
%R	118.46
LCL	80
Mean	100
UCL	120

Replicate Sample RPD

	Pu-241
Lower Error	97.01
Upper Error	70.42
RPD	83.71
CL	35

Normalized Difference



	LCS ND	REP ND	MS ND
Pu-241	3.50	3.65	0.00
UCL	2.58	2.58	2.58

No Matrix Spike

001101

Version

WO	Analysis	Run	Activity Units	Aliquot Units	Client Name
02-11141	Np237EI	1	pCi	g	Duratek

Laboratory Control Sample

Analyte	Normalized Difference	LCS Measured	TPU Measured	LCS Expected	Uncert. Expected	Known	Known Error	Result	TPU	Standard ID	Standard ACT (dpm)	Standard Error	Standard Added (g)
NP-237	0.27	102.98%	21.11%	100.00%	3.60%	9.80E+00	3.53E-01	1.01E+01	2.13E+00	Np-1a	2.35E+01	3.60E+00	9.25E-01

Matrix Spike

Analyte	Normalized Difference	MS Actual % Rec	Expected MS Result	Expected MS Uncert	Actual MS Result	Actual MS TPU	Sample Result	Sample TPU	Sample Aliquot	Standard ID	Standard ACT (dpm)	Standard Error %	Standard Added (g)

Replicate Sample

Analyte	Normalized Difference	RPD	Original Result	Original TPU	Replicate Result	Replicate TPU
NP-237	0.80	200.00	2.33E-02	5.70E-02	0.00E+00	0.00E+00

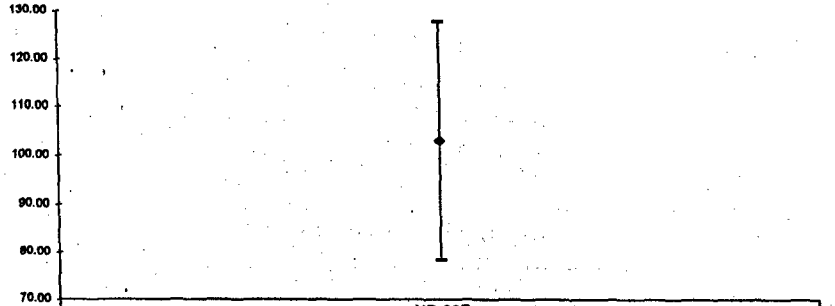
QC Summary

LCS Relative Bias	LCS % R	LCS ND	MS % R	MS ND	Rep RPD	Rep ND
1.03	OK	OK			OK	OK

00102

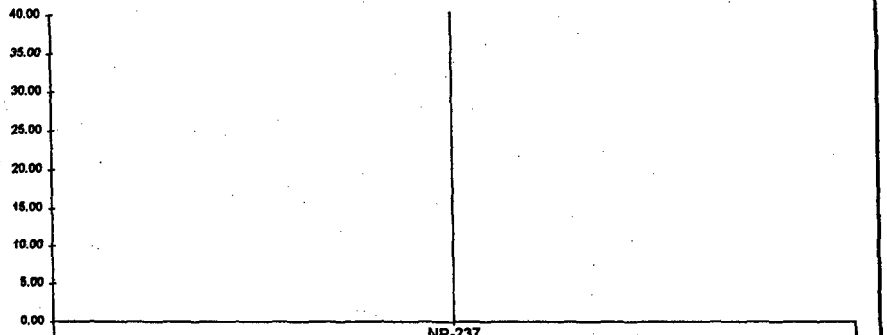
WO	Analysis	Run	Activity Units	Aliquot Units	Client Name
02-11141	Np237EI	1	pCi	g	Duratek

LCS % Recovery



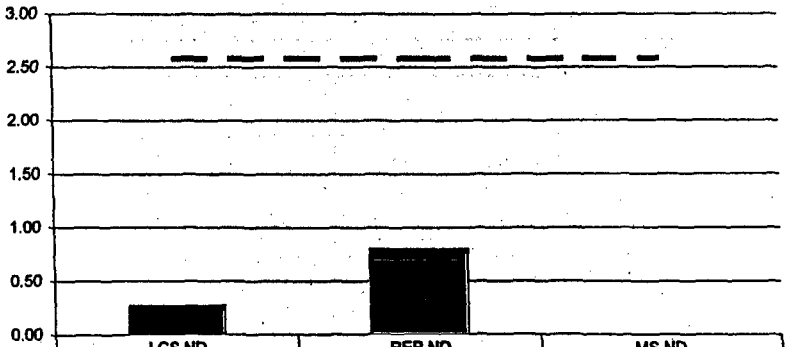
	NP-237
Lower Error	78.27
Upper Error	127.69
%R	102.98
LCL	80
Mean	100
UCL	120

Replicate Sample RPD



	NP-237
Lower Error	445.16
Upper Error	-45.16
RPD	200.00
CL	35

Normalized Difference



	LCS ND	REP ND	MS ND
NP-237	0.27	0.80	0.00
UCL	2.58	2.58	2.58

No Matrix Spike

WO	Analysis	Run	Activity Units	Aliquot Units	Client Name
02-11141	Am241	1	pCi	g	Duratek

Laboratory Control Sample

Analyte	Normalized Difference	LCS Measured	TPU Measured	LCS Expected	Uncert. Expected	Known	Known Error	Result	TPU	Standard ID	Standard ACT (dpm)	Standard Error	Standard Added (g)
AM-241	0.67	106.93%	18.74%	100.00%	3.00%	5.64E+00	1.69E-01	6.03E+00	1.13E+00	Am-4a	4.70E+01	3.00E+00	2.67E-01
CM-244	0.82	92.24%	20.08%	100.00%	1.40%	6.73E+00	9.42E-02	6.21E+00	1.25E+00	Cm-1	2.73E+01	1.40E+00	5.46E-01

Matrix Spike

Analyte	Normalized Difference	MS Actual % Rec	Expected MS Result	Expected MS Uncert	Actual MS Result	Actual MS TPU	Sample Result	Sample TPU	Sample Aliquot	Standard ID	Standard ACT (dpm)	Standard Error %	Standard Added (g)

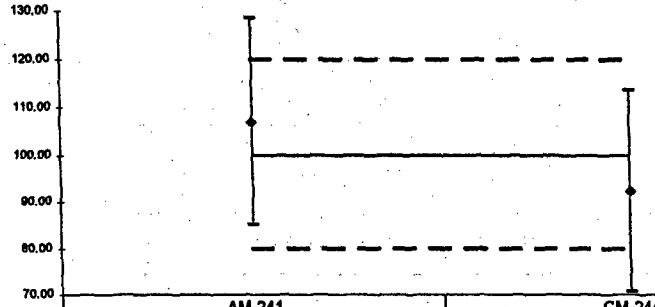
Replicate Sample / QC Summary

Analyte	Normalized Difference	RPD	Original Result	Original TPU	Replicate Result	Replicate TPU	LCS Relative Bias	LCS % R	LCS ND	MS % R	MS ND	Rep RPD	Rep ND
AM-241	0.64	85.89	1.36E-02	4.10E-02	3.41E-02	4.71E-02	1.07	OK	OK			INV	OK
CM-244	0.99	118.16	3.70E-02	4.90E-02	9.50E-03	2.33E-02	0.92	OK	OK			INV	OK

00104

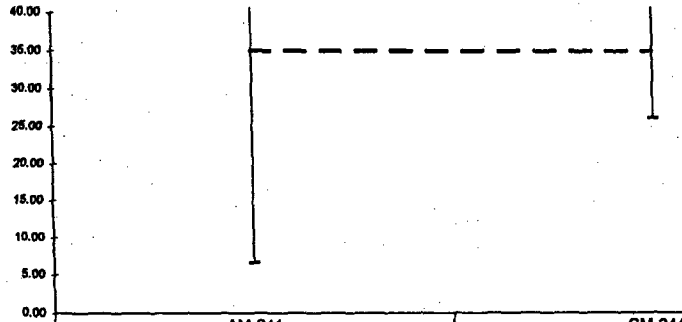
WO	Analysis	Run	Activity Units	Aliquot Units	Client Name
02-11141	Am241	1	pCi	g	Duratek

LCS % Recovery



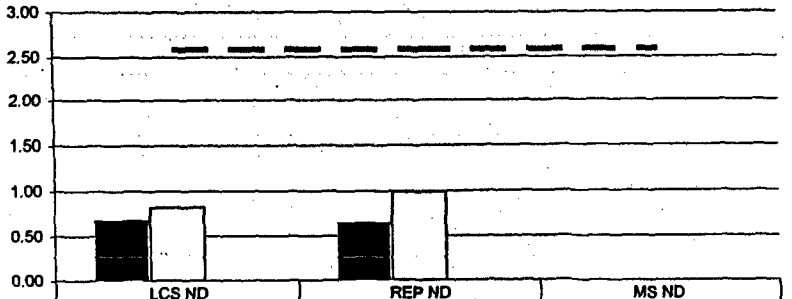
	AM-241	CM-244
Lower Error	85.18	70.77
Upper Error	128.67	113.72
%R	106.93	92.24
LCL	80	80
Mean	100	100
UCL	120	120

Replicate Sample RPD



	AM-241	CM-244
Lower Error	165.19	210.17
Upper Error	6.60	26.16
RPD	85.89	118.16
CL	35	35

Normalized Difference



	LCS ND	REP ND	MS ND
AM-241	0.67	0.64	0.00
CM-244	0.82	0.99	0.00
	0.00	0.00	0.00
UCL	2.58	2.58	2.58

No Matrix Spike

WO	Analysis	Run	Activity Units	Aliquot Units	Client Name
02-11141	SrTOT	1	pCi	g	Duratek

Laboratory Control Sample

Analyte	Normalized Difference	LCS Measured	TPU Measured	LCS Expected	Uncert. Expected	Known	Known Error	Result	TPU	Standard ID	Standard ACT (dpm)	Standard Error	Standard Added (g)
TOTAL SR	2.11	88.27%	12.22%	100.00%	2.10%	2.14E+01	4.49E-01	1.89E+01	2.31E+00	Sr-4a	1.75E+02	2.10E+00	2.71E-01

Matrix Spike

Analyte	Normalized Difference	MS Actual % Rec	Expected MS Result	Expected MS Uncert	Actual MS Result	Actual MS TPU	Sample Result	Sample TPU	Sample Aliquot	Standard ID	Standard ACT (dpm)	Standard Error %	Standard Added (g)

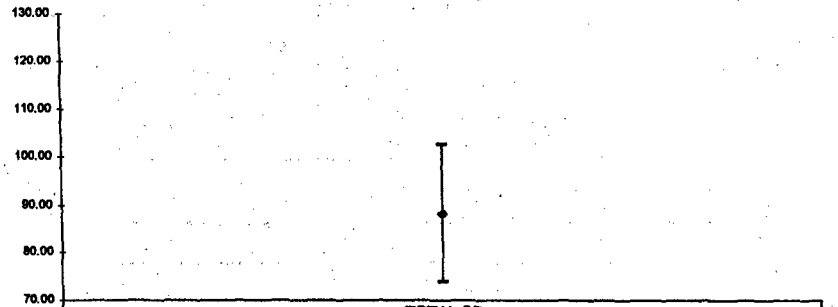
Replicate Sample / QC Summary

Analyte	Normalized Difference	RPD	Original Result	Original TPU	Replicate Result	Replicate TPU	LCS Relative Bias	LCS % R	LCS ND	MS % R	MS ND	Rep RPD	Rep ND
TOTAL SR	1.00	62.71	3.29E-01	4.14E-01	6.30E-01	4.16E-01	0.88	OK	OK			INV	OK

00106

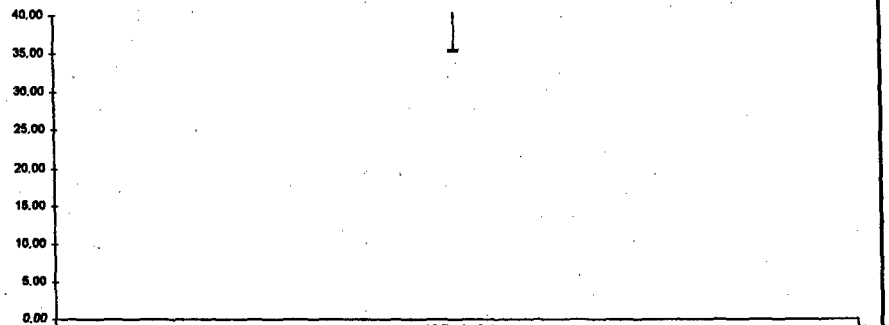
WO	Analysis	Run	Activity Units	Aliquot Units	Client Name
02-11141	SrTOT	1	pCi	g	Duratek

LCS % Recovery



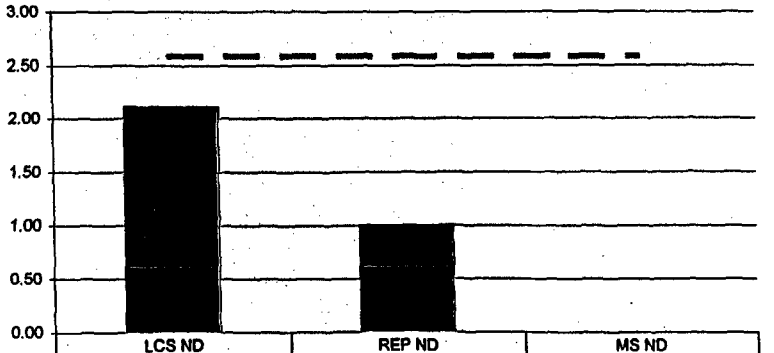
	TOTAL SR
Lower Error	73.94
Upper Error	102.59
%R	88.27
LCL	80
Mean	100
UCL	120

Replicate Sample RPD



	TOTAL SR
Lower Error	89.82
Upper Error	35.59
RPD	62.71
CL	35

Normalized Difference



	LCS ND	REP ND	MS ND
TOTAL SR	2.11	1.00	0.00
UCL	2.58	2.58	2.58

No Matrix Spike

00107

Version

WO	Analysis	Run	Activity Units	Aliquot Units	Client Name
02-11141	Tc099	1	pCi	g	Duratek

Laboratory Control Sample

Analyte	Normalized Difference	LCS Measured	TPU Measured	LCS Expected	Uncert. Expected	Known	Known Error	Result	TPU	Standard ID	Standard ACT (dpm)	Standard Error	Standard Added (g)
TC-99	1.50	89.45%	15.34%	100.00%	2.20%	9.95E+02	2.19E+01	8.90E+02	1.37E+02	Tc-2a	2.20E+04	2.20E+00	1.00E-01

Matrix Spike

Analyte	Normalized Difference	MS Actual % Rec	Expected MS Result	Expected MS Uncert	Actual MS Result	Actual MS TPU	Sample Result	Sample TPU	Sample Aliquot	Standard ID	Standard ACT (dpm)	Standard Error %	Standard Added (g)

Replicate Sample

Analyte	Normalized Difference	RPD	Original Result	Original TPU	Replicate Result	Replicate TPU
TC-99	0.95	99.21	1.01E+00	9.93E-01	3.42E-01	9.62E-01

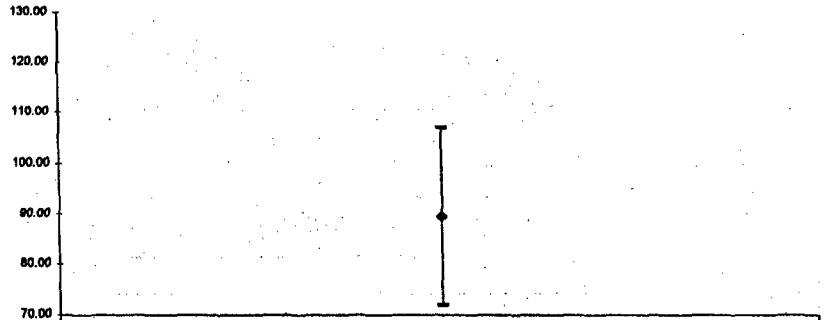
QC Summary

LCS Relative Bias	LCS % R	LCS ND	MS % R	MS ND	Rep RPD	Rep ND
0.89	OK	OK			INV	OK

00108

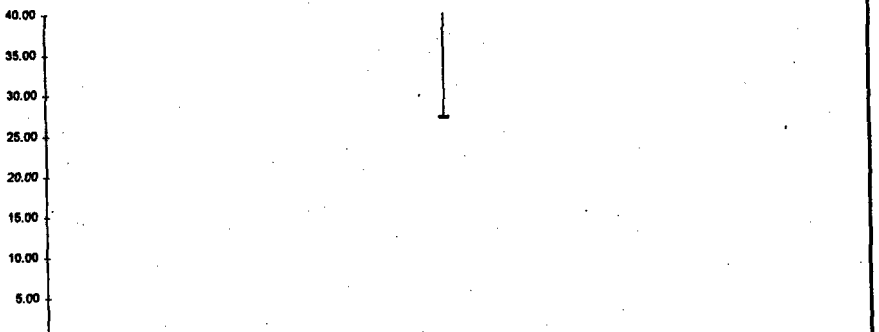
WO	Analysis	Run	Activity Units	Aliquot Units	Client Name
02-11141	Tc099	1	pCi	g	Duratek

LCS % Recovery



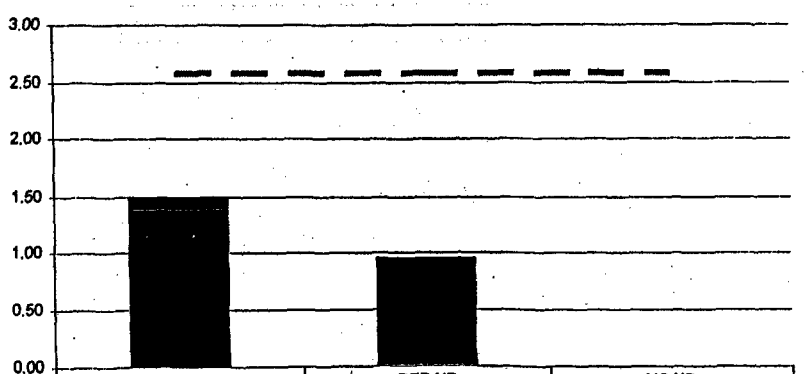
	TC-99
Lower Error	71.91
Upper Error	106.99
%R	89.45
LCL	80
Mean	100
UCL	120

Replicate Sample RPD



	TC-99
Lower Error	170.78
Upper Error	27.63
RPD	99.21
CL	35

Normalized Difference



	LCS ND	REP ND	MS ND
TC-99	1.50	0.95	0.00
UCL	2.58	2.58	2.58

No Matrix Spike

WO	Analysis	Run	Activity Units	Aliquot Units	Client Name
02-11141	H0003	1	pCi	g	Duratek

Laboratory Control Sample

Analyte	Normalized Difference	LCS Measured	TPU Measured	LCS Expected	Uncert. Expected	Known	Known Error	Result	TPU	Standard ID	Standard ACT (dpm)	Standard Error	Standard Added (g)
H-3	1.12	117.77%	11.23%	100.00%	37.11%	1.02E+02	3.80E+01	1.21E+02	1.35E+01	H-5a	1.17E+04	3.60E+00	2.00E-01

Matrix Spike

Analyte	Normalized Difference	MS Actual % Rec	Expected MS Result	Expected MS Uncert	Actual MS Result	Actual MS TPU	Sample Result	Sample TPU	Sample Aliquot	Standard ID	Standard ACT (dpm)	Standard Error %	Standard Added (g)

Replicate Sample

Analyte	Normalized Difference	RPD	Original Result	Original TPU	Replicate Result	Replicate TPU
H-3	0.77	16.31	7.79E+00	2.44E+00	9.17E+00	2.55E+00

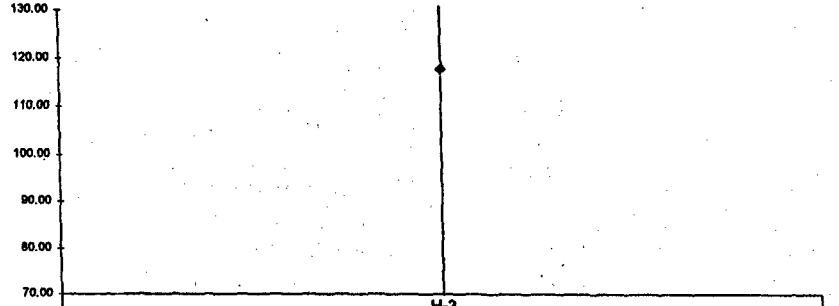
QC Summary

LCS Relative Bias	LCS % R	LCS ND	MS % R	MS ND	Rep RPD	Rep ND
1.18	OK	OK			OK	OK

00110

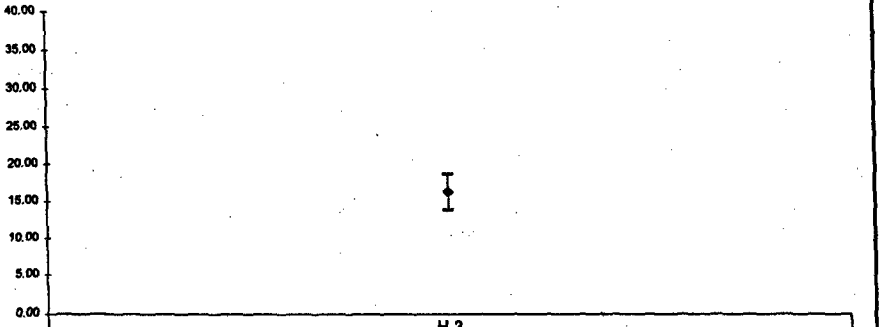
WO	Analysis	Run	Activity Units	Aliquot Units	Client Name
02-11141	H0003	1	pCi	g	Duratek

LCS % Recovery



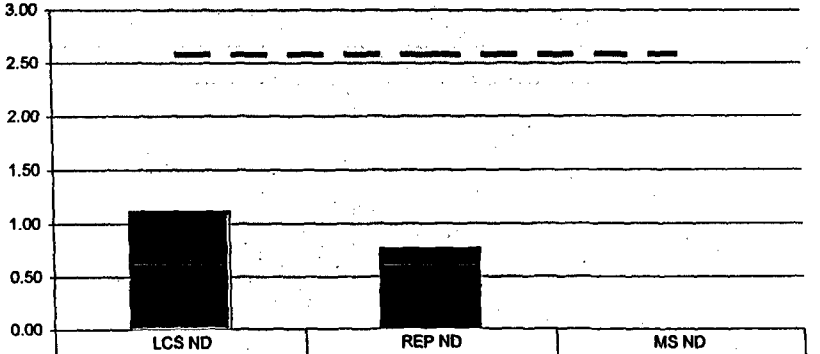
	H-3
Lower Error	69.43
Upper Error	166.11
%R	117.77
LCL	80
Mean	100
UCL	120

Replicate Sample RPD



	H-3
Lower Error	16.71
Upper Error	13.91
RPD	16.31
CL	35

Normalized Difference



	LCS ND	REP ND	MS ND
H-3	1.12	0.77	0.00
UCL	2.58	2.58	2.58

No Matrix Spike

00111

Version

WO	Analysis	Run	Activity Units	Aliquot Units	Client Name
02-11141	C0014	1	pCi	g	Duratek

Laboratory Control Sample

Analyte	Normalized Difference	LCS Measured	TPU Measured	LCS Expected	Uncert. Expected	Known	Known Error	Result	TPU	Standard ID	Standard ACT (dpm)	Standard Error	Standard Added (g)
C-14	1.22	103.08%	4.07%	100.00%	3.50%	8.30E+02	2.91E+01	8.56E+02	3.48E+01	C-6	4.73E+03	3.50E+00	3.90E-01

Matrix Spike

Analyte	Normalized Difference	MS Actual % Rec	Expected MS Result	Expected MS Uncert	Actual MS Result	Actual MS TPU	Sample Result	Sample TPU	Sample Aliquot	Standard ID	Standard ACT (dpm)	Standard Error %	Standard Added (g)

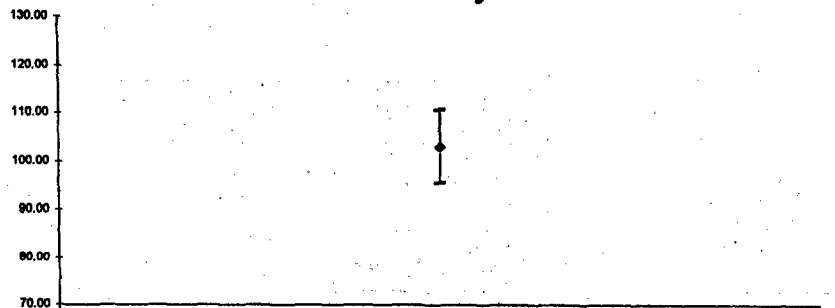
Replicate Sample / QC Summary

Analyte	Normalized Difference	RPD	Original Result	Original TPU	Replicate Result	Replicate TPU	LCS Relative Bias	LCS % R	LCS ND	MS % R	MS ND	Rep RPD	Rep ND
C-14	1.81	5.54	4.00E+02	1.70E+01	4.22E+02	1.79E+01	1.03	OK	OK			OK	OK

00112

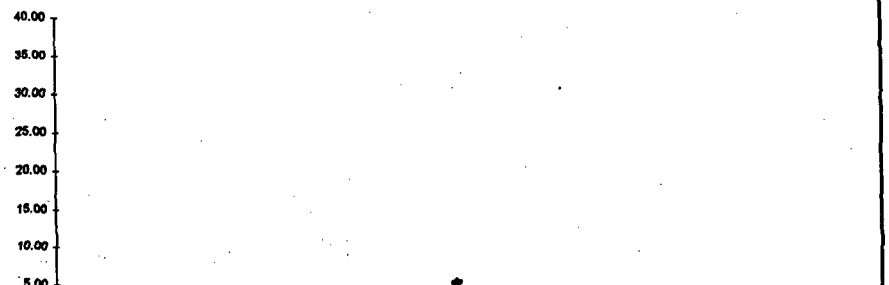
WO	Analysis	Run	Activity Units	Aliquot Units	Client Name
02-11141	C0014	1	pCi	g	Duratek

LCS % Recovery



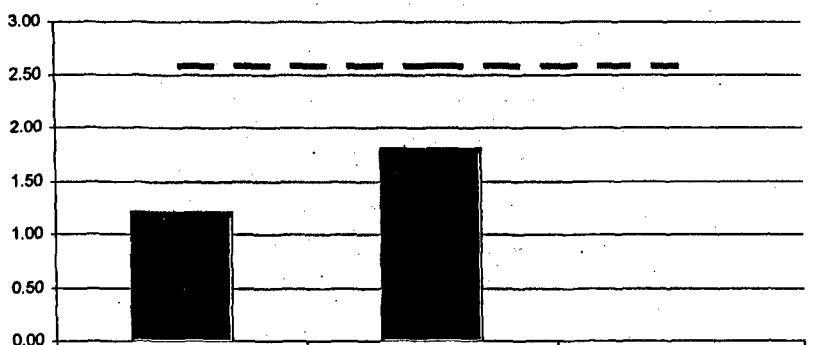
	C-14
Lower Error	95.51
Upper Error	110.65
%R	103.08
LCL	80
Mean	100
UCL	120

Replicate Sample RPD



	C-14
Lower Error	5.65
Upper Error	5.42
RPD	5.54
CL	35

Normalized Difference



	LCS ND	REP ND	MS ND
C-14	1.22	1.81	0.00
UCL	2.58	2.58	2.58

No Matrix Spike

00113

Version

WO	Analysis	Run	Activity Units	Aliquot Units	Client Name
02-11141	Pb210	1	pCi	g	Duratek

Laboratory Control Sample

Analyte	Normalized Difference	LCS Measured	TPU Measured	LCS Expected	Uncert. Expected	Known	Known Error	Result	TPU	Standard ID	Standard ACT (dpm)	Standard Error	Standard Added (g)
PB-210	3.58	115.28%	6.84%	100.00%	3.70%	2.11E+01	7.82E-01	2.44E+01	1.67E+00	Pb-3a	2.08E+02	3.70E+00	2.26E-01

Matrix Spike

Analyte	Normalized Difference	MS Actual % Rec	Expected MS Result	Expected MS Uncert	Actual MS Result	Actual MS TPU	Sample Result	Sample TPU	Sample Aliquot	Standard ID	Standard ACT (dpm)	Standard Error %	Standard Added (g)

Replicate Sample

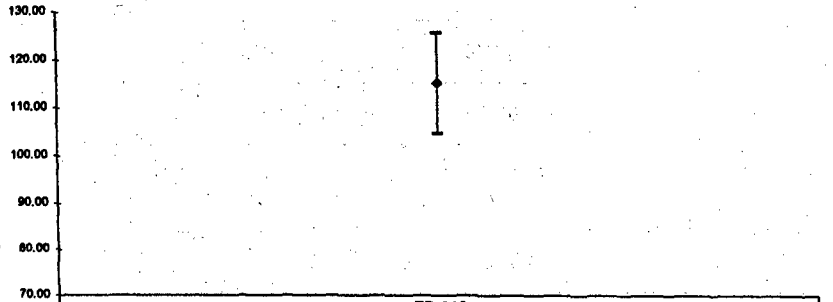
Analyte	Normalized Difference	RPD	Original Result	Original TPU	Replicate Result	Replicate TPU
PB-210	0.84	12.30	3.79E+00	8.04E-01	4.29E+00	8.26E-01

QC Summary

LCS Relative Bias	LCS % R	LCS ND	MS % R	MS ND	Rep RPD	Rep ND
1.15	OK	INV			OK	OK

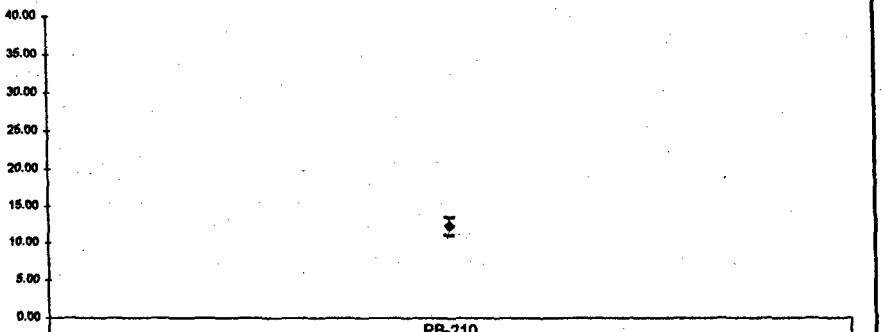
WO	Analysis	Run	Activity Units	Aliquot Units	Client Name
02-11141	Pb210	1	pCi	g	Duratek

LCS % Recovery



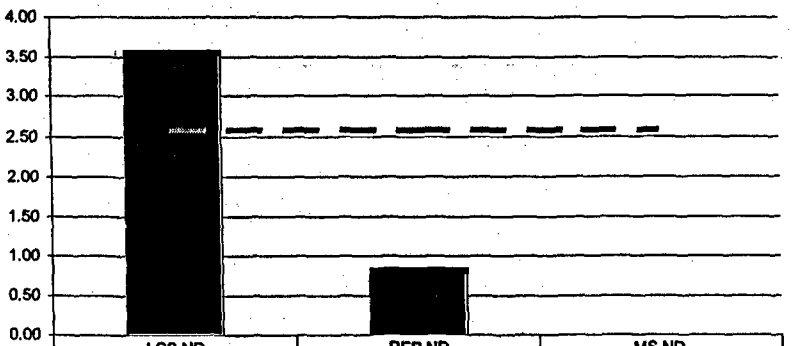
	PB-210
Lower Error	104.74
Upper Error	125.82
%R	115.28
LCL	80
Mean	100
UCL	120

Replicate Sample RPD



	PB-210
Lower Error	13.54
Upper Error	11.06
RPD	12.30
CL	35

Normalized Difference



	LCS ND	REP ND	MS ND
PB-210	3.58	0.84	0.00
UCL	2.58	2.58	2.58

No Matrix Spike

00115

Version

WO	Analysis	Run	Activity Units	Aliquot Units	Client Name
02-11141	GaGbT	1	pCi	g	Duratek

Laboratory Control Sample

Analyte	Normalized Difference	LCS Measured	TPU Measured	LCS Expected	Uncert. Expected	Known	Known Error	Result	TPU	Standard ID	Standard ACT (dpm)	Standard Error	Standard Added (g)
GROSS ALPHA	0.99	104.10%	7.14%	100.00%	4.30%	3.29E+02	1.41E+01	3.42E+02	2.44E+01	A/B-07	7.03E+02	4.30E+00	1.04E+00
GROSS BETA	0.54	101.53%	5.02%	100.00%	3.00%	2.94E+02	8.81E+00	2.98E+02	1.50E+01	A/B-07	6.29E+02	3.00E+00	1.04E+00

Matrix Spike

Analyte	Normalized Difference	MS Actual % Rec	Expected MS Result	Expected MS Uncert	Actual MS Result	Actual MS TPU	Sample Result	Sample TPU	Sample Aliquot	Standard ID	Standard ACT (dpm)	Standard Error %	Standard Added (g)

Replicate Sample

Analyte	Normalized Difference	RPD	Original Result	Original TPU	Replicate Result	Replicate TPU
GROSS ALPHA	0.71	24.33	9.60E-01	4.93E-01	1.23E+00	5.43E-01
GROSS BETA	0.43	2.33	2.42E+01	1.85E+00	2.48E+01	1.88E+00

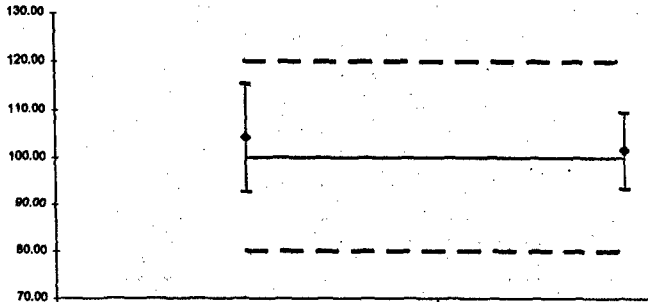
QC Summary

LCS Relative Bias	LCS % R	LCS ND	MS % R	MS ND	Rep RPD	Rep ND
1.04	OK	OK			INV	OK
1.02	OK	OK			OK	OK

00116

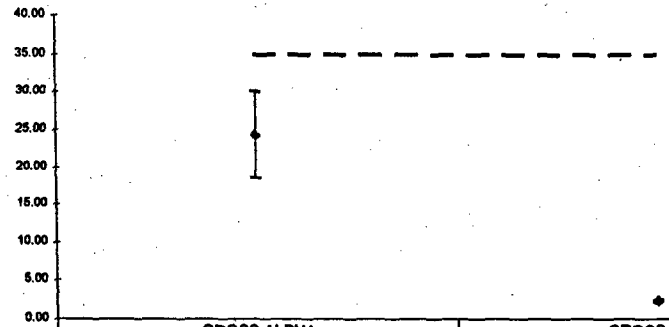
WO	Analysis	Run	Activity Units	Aliquot Units	Client Name
02-11141	GaGbT	1	pCi	g	Duratek

LCS % Recovery



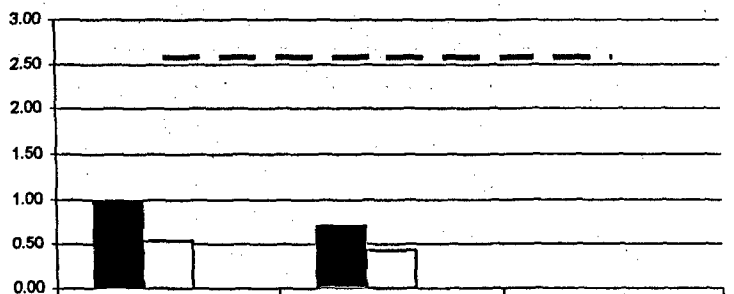
	GROSS ALPHA	GROSS BETA
Lower Error	92.66	93.51
Upper Error	115.54	109.55
%R	104.10	101.53
LCL	80	80
Mean	100	100
UCL	120	120

Replicate Sample RPD



	GROSS ALPHA	GROSS BETA
Lower Error	30.10	2.42
Upper Error	18.57	2.24
RPD	24.33	2.33
CL	35	35

Normalized Difference



	LCS ND	REP ND	MS ND
GROSS ALPHA	0.99	0.71	0.00
GROSS BETA	0.54	0.43	0.00
	0.00	0.00	0.00
UCL	2.58	2.58	2.58

No Matrix Spike

WO	Analysis	Run	Activity Units	Aliquot Units	Client Name
02-11141	Gamma	1	pCi	g	Duratek

Laboratory Control Sample

Analyte	Normalized Difference	LCS Measured	TPU Measured	LCS Expected	Uncert. Expected	Known	Known Error	Result	TPU	Standard ID	Standard ACT (dpm)	Standard Error	Standard Added (g)
CO-60	0.22	100.95%	7.66%	100.00%	4.55%	2.57E+02	1.17E+01	2.59E+02	1.98E+01	GAS-2	2.57E+02	1.17E+01	3.84E+02
CS-137	0.18	101.06%	10.78%	100.00%	4.70%	1.53E+02	7.21E+00	1.55E+02	1.67E+01	GAS-2	1.53E+02	7.21E+00	3.84E+02

Matrix Spike

Analyte	Normalized Difference	MS Actual % Rec	Expected MS Result	Expected MS Uncert	Actual MS Result	Actual MS TPU	Sample Result	Sample TPU	Sample Aliquot	Standard ID	Standard ACT (dpm)	Standard Error %	Standard Added (g)

Replicate Sample

Analyte	Normalized Difference	RPD	Original Result	Original TPU	Replicate Result	Replicate TPU
CO-60	0.40	2.28	2.61E+01	2.09E+00	2.56E+01	2.04E+00
EU-152	0.45	6.50	5.33E+00	9.96E-01	4.99E+00	1.08E+00
ZN-65	0.66	21.89	1.61E+00	7.62E-01	2.00E+00	8.99E-01

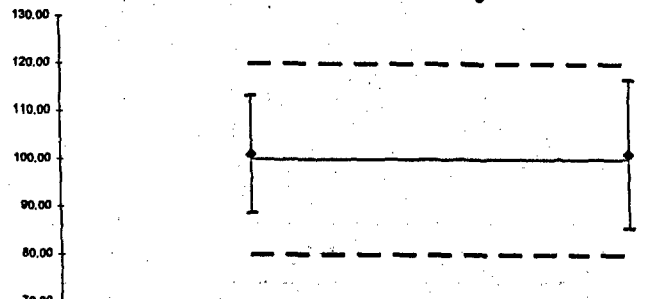
QC Summary

LCS Relative Bias	LCS % R	LCS ND	MS % R	MS ND	Rep RPD	Rep ND
1.01	OK	OK	<CS-137	CO-60>	OK	OK
				EU-152>		
				ZN-65>		

00118

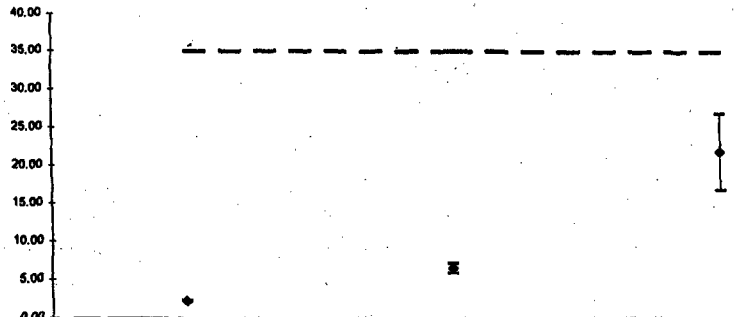
WO	Analysis	Run	Activity Units	Aliquot Units	Client Name
02-11141	Gamma	1	pCi	g	Duratek

LCS % Recovery



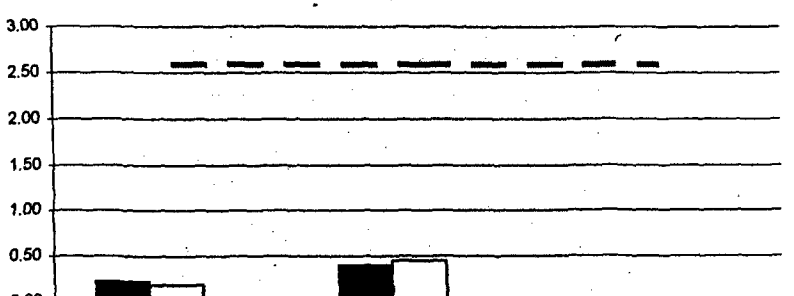
	CO-60	CS-137
Lower Error	88.75	85.58
Upper Error	113.16	116.54
%R	100.95	101.06
LCL	80	80
Mean	100	100
UCL	120	120

Replicate Sample RPD



	CO-60	EU-152	ZN-65
Lower Error	2.37	7.15	26.93
Upper Error	2.19	5.84	16.85
RPD	2.28	6.50	21.89
CL	35	35	35

Normalized Difference



	LCS ND	REP ND	MS ND
CO-60	0.22	0.40	0.00
CS-137	0.18	0.45	0.00
	0.00	0.00	0.00
UCL	2.58	2.58	2.58

No Matrix Spike

Version

WO	Analysis	Run	Activity Units	Aliquot Units	Client Name
02-11141	GLEPS	1	pCi	g	Duratek

Laboratory Control Sample

Analyte	Normalized Difference	LCS Measured	TPU Measured	LCS Expected	Uncert. Expected	Known	Known Error	Result	TPU	Standard ID	Standard ACT (dpm)	Standard Error	Standard Added (g)
AM-241	0.20	98.82%	11.04%	100.00%	5.00%	3.91E+03	1.95E+02	3.86E+03	4.27E+02	LPGAS5	3.91E+03	1.95E+02	3.88E+01
CO-57	0.85	104.50%	9.49%	100.00%	4.10%	1.33E+03	5.46E+01	1.39E+03	1.32E+02	LPGAS5	1.33E+03	5.46E+01	3.88E+01

Matrix Spike

Analyte	Normalized Difference	MS Actual % Rec	Expected MS Result	Expected MS Uncert	Actual MS Result	Actual MS TPU	Sample Result	Sample TPU	Sample Aliquot	Standard ID	Standard ACT (dpm)	Standard Error %	Standard Added (g)

Replicate Sample

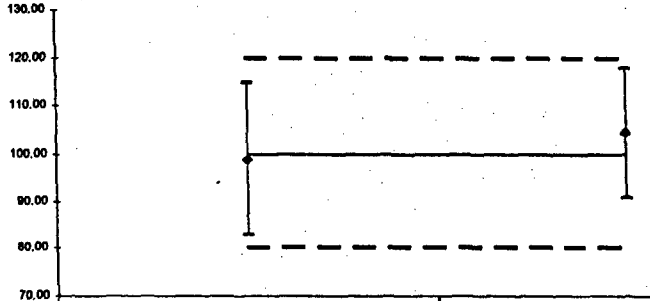
Analyte	Normalized Difference	RPD	Original Result	Original TPU	Replicate Result	Replicate TPU
CO-57	1.47	19.09	1.02E+00	1.82E-01	1.23E+00	2.22E-01
I-129	1.20	494.76	-5.72E-02	1.97E-01	1.35E-01	2.43E-01

QC Summary

LCS Relative Bias	LCS % R	LCS ND	MS % R	MS ND	Rep RPD	Rep ND
0.99	OK	OK	<AM-241	CO-57>	INV	OK
				I-129>		

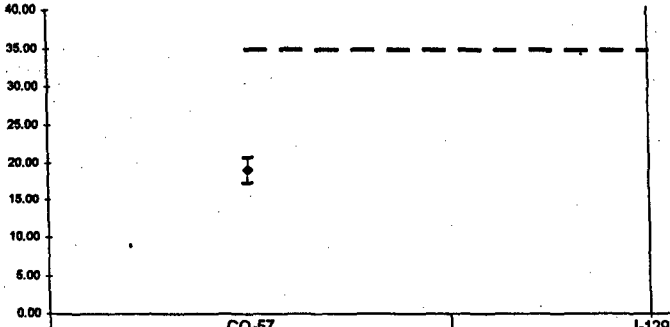
WO	Analysis	Run	Activity Units	Aliquot Units	Client Name
02-11141	GLEPS	1	pCi	g	Duratek

LCS % Recovery



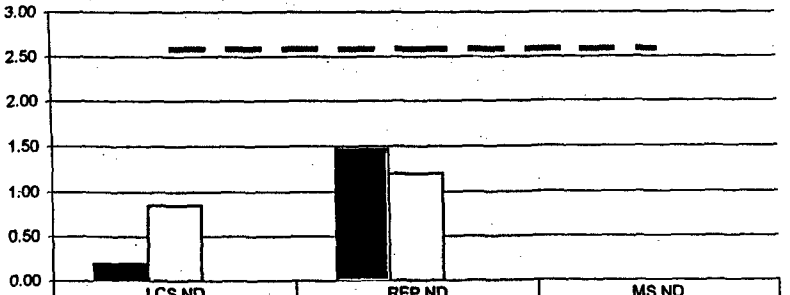
	AM-241	CO-57
Lower Error	82.78	90.91
Upper Error	114.87	118.08
%R	98.82	104.50
LCL	80	80
Mean	100	100
UCL	120	120

Replicate Sample RPD



	CO-57	I-129
Lower Error	20.80	1897.60
Upper Error	17.37	-908.09
RPD	19.09	494.76
CL	35	35

Normalized Difference



	LCS ND	REP ND	MS ND
AM-241	0.20	1.47	0.00
CO-57	0.85	1.20	0.00
	0.00	0.00	0.00
UCL	2.58	2.58	2.58

No Matrix Spike

SECTION VII

LABORATORY TECHNICIAN'S NOTES & RUN LOGS

ISO-U NOTES

EBERLINE SERVICES Work Order Analysis Notes	Oak Ridge Laboratory 601 Scarboro Rd. Oak Ridge, TN 37830 Voice: 865.481.0683 www.eberlineservices.com	Internal Work Order	02-11141
		Analysis Code	UUISO
		Run Number	1

#	Date	Dept	User	Notes
1	12/03/02 09:46	PREP	JBARNARD	LEACHED SAMPLE AND DILUTED LEACHATE- ALIQUOTED FROM DILUTION AND ADDED SPIKES AN TRACERS- DRIED SAMPLES DOWN

Joe Barnard
12/3/02

EBERLINE SERVICES

Work Order Analysis Notes

Oak Ridge Laboratory
601 Scarboro Rd.
Oak Ridge, TN 37830
Voice: 865.481.0683
www.eberlineservices.com

Internal Work Order	02-11141
Analysis Code	UUISO
Run Number	1

#	Date	Dept	User	Notes
1	12/03/02 09:46	PREP	JBARNARD	LEACHED SAMPLE AND DILUTED LEACHATE- ALIQUOTED FROM DILUTION AND ADDED SPIKES AN TRACERS- DRIED SAMPLES DOWN
2	12/04/02 10:24	CHEM	TSMITH	Followed steps 8.2 to 8.2.6 in AP-005 rev. 7 . (Column seperation for Uranium)
3	12/05/02 04:48	CHEM	TSMITH	Followed steps 8.2.7 to 8.6.5 in AP-005 rev. 7 . (Precipitated and filtered samples)

12-5-02

DATE	SAMPLE #	CLIENT	LOAD TIME	CT. TIME	ANALYSIS	TECH
11/27/02	0210154B(1,2)	EBS	1400	2150	Am	AC
11/27/02	Backgrounds	lab	1918	16'40	alpha	AC
11/29/02	DAILY PULSER	LAB	13:00	10 min	NA	AC
11/29/02	CALIBRATION (34,35,39)	LAB	13:51	1 HR 30 MIN	α	AC
12-2-02	DAILY PULSER	LAB	0027	10 min.	NA	JDP
12-2-02	0211027B(1-3,5-8)	NFT	0123	2HR. 50 min.	Am	JDP
12-2-02	0211065B(1-4)	PARSONS	0123	5HR. 35 min.	Am	JDP
12-02-02	0211051B(1-3)	PCC	0123	2HR. 50 min.	Th	JDP
12-02-02	0211021B(6-8)	NYS	0415	2HR. 50 min.	Th	JDP
12-02-02	TEST AA (1,2)	LAB	0415	2HR. 50 min.	Th	JDP
12-02-02	0211132A(5)	SHAW	0745	2HR. 50 min.	U	JDP
12-02-02	0211126A(1-12)	SHAW	0854	2HR. 50 min.	Th	JDP
12-02-02	0211132A(1)	SHAW	0854	2HR. 50 min.	Th	JDP
12-3-02	DAILY PULSER	LAB	0018	10 min.	NA	JDP
12-3-02	0211054A(15,7-11,13,15,16)	NWE	0826	2HR. 50 min.	Pa	JDP
12-3-02	0211081A(1)	SHAW	0826	2HR. 50 min.	Pa	JDP
12-3-02	0211079A(8,9,11,13,14)	BJC	1129	2HR. 50 min.	U	JDP
12-3-02	0211109A(1-5)	BJC	1129	2HR. 50 min.	U	JDP
12-3-02	0211107A(1-4)	DURATEK	1129	2HR. 50 min.	Th	JDP
12-4-02	DAILY PULSER	LAB	0025	10 min.	NA	JDP
12-4-02	0211113AA(1-7)	NFT	0702	2HR. 50 min.	Pu 4	JDP
12-4-02	0211055A(1-4,6,7)	NWE	0702	2HR. 50 min.	Pa	JDP
12-4-02	0211077A(1)	IES	0702	2HR. 50 min.	Pa	JDP
12-4-02	0211111A(4-6,8-11)	BJC	1017	2HR. 50 min.	U	JDP
12-4-02	0211077A(1-4)	IES	1017	2HR. 50 min.	Am	JDP
12-4-02	0211078A(1-3)	IES	1017	2HR. 50 min.	Am	JDP
12/4/02	0211043AA(1)	NFT	1529	2'50	Pu 4 (2)	AC
12-5-02	DAILY PULSER	LAB	0035	10 min.	NA	JDP
12-5-02	0211043AAA(1)	NFT	0100	2HR. 50 min.	Pu 4	JDP
12-5-02	0211130A(8)	MACTEC	0714	5HR. 35 min.	Pa	JDP
12-5-02	0211141A(1-4)	DURATEK	0743	2HR. 50 min.	U	JDP
12-5-02	0211141AA(1-4)	DURATEK	0743	2HR. 50 min.	Pu 4	JDP
12-5-02	0211124A(1-5)	MSA	0743	2HR. 50 min.	Th	JDP

ISO-TH NOTES

EBERLINE SERVICES Work Order Analysis Notes	Oak Ridge Laboratory 601 Scarboro Rd. Oak Ridge, TN 37830 Voice: 865.481.0683 www.eberlineservices.com	Internal Work Order	02-11141
		Analysis Code	ThISO
		Run Number	1

#	Date	Dept	User	Notes
1	12/03/02 09:44	PREP	JBARNARD	LEACHED SAMPLE AND DILUTED LEACHATE- ALIQUOTED FROM DILUTION AND ADDED SPIKES AN TRACERS- PRECIPITATED WITH POTASSIUM SULFATE AND BA CARRIER

Jay Barnard
12/3/02

EBERLINE SERVICES

Work Order Analysis Notes

Oak Ridge Laboratory
601 Scarboro Rd.
Oak Ridge, TN 37830
Voice: 865.481.0683
www.eberlineservices.com

Internal Work Order	02-11141
Analysis Code	ThISO
Run Number	1

#	Date	Dept	User	Notes
1	12/03/02 09:44	PREP	JBARNARD	LEACHED SAMPLE AND DILUTED LEACHATE- ALIQUOTED FROM DILUTION AND ADDED SPIKES AN TRACERS- PRECIPITATED WITH POTASSIUM SULFATE AND BA CARRIER
2	12/03/02 19:14	PREP	MHAERER	DECANTED SAMPLES AND CENTRIFUGED, ADDED EDTA AND PUT INTO HOT WATER BATH, ADDED KOH AND TICL3 AND PUT BACK INTO HOT WATER BATH, CENTRIFUGED AND ADDED 8M HNO3, VORTEXED AND GAVE TO SEPARATIONS

MacKenzie D. Haerer
12/3/02

EBERLINE SERVICES

Work Order Analysis Notes

Oak Ridge Laboratory
601 Scarboro Rd.
Oak Ridge, TN 37830
Voice: 865.481.0683
www.eberlineservices.com

Internal Work Order	02-11141
Analysis Code	ThISO
Run Number	1

#	Date	Dept	User	Notes
1	12/03/02 09:44	PREP	JBARNARD	LEACHED SAMPLE AND DILUTED LEACHATE- ALIQUOTED FROM DILUTION AND ADDED SPIKES AN TRACERS- PRECIPITATED WITH POTASSIUM SULFATE AND BA CARRIER
2	12/03/02 19:14	PREP	MHAERER	DECANTED SAMPLES AND CENTRIFUGED, ADDED EDTA AND PUT INTO HOT WATER BATH, ADDED KOH AND TICL3 AND PUT BACK INTO HOT WATER BATH, CENTRIFUGED AND ADDED 8M HNO3, VORTEXED AND GAVE TO SEPARATIONS
3	12/04/02 15:05	CHEM	BNEWTON	Used column separation technique to elute Thorium fraction (steps 8.4 to 8.4.4 in AP-005 Rev. 7).

Bobby Newton 12/4/02

EBERLINE SERVICES

Work Order Analysis Notes

Oak Ridge Laboratory
601 Scarboro Rd.
Oak Ridge, TN 37830
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Internal Work Order	02-11141
Analysis Code	ThISO
Run Number	1

#	Date	Dept	User	Notes
1	12/03/02 09:44	PREP	JBARNARD	LEACHED SAMPLE AND DILUTED LEACHATE- ALIQUOTED FROM DILUTION AND ADDED SPIKES AN TRACERS- PRECIPITATED WITH POTASSIUM SULFATE AND BA CARRIER
2	12/03/02 19:14	PREP	MHAERER	DECANTED SAMPLES AND CENTRIFUGED, ADDED EDTA AND PUT INTO HOT WATER BATH, ADDED KOH AND TICL3 AND PUT BACK INTO HOT WATER BATH, CENTRIFUGED AND ADDED 8M HNO3, VORTEXED AND GAVE TO SEPARATIONS
3	12/04/02 15:05	CHEM	BNEWTON	Used column separation technique to elute Thorium fraction (steps 8.4 to 8.4.4 in AP-005 Rev. 7).
4	12/05/02 04:54	CHEM	TSMITH	Followed steps 8.4.5 to 8.6.5 in AP-005 rev. 7 . (Precipitated and filtered samples)

12-5-02

Date	Sample #	Client	Load Time	Ct. Time	Analysis	Tech
11/26/02	0211126A(1-12)	SHAW	1933	2'50	Ra	AC
11/27/02	Daily Pulser	LAB	07:17	10 min	NA	AG
11/27/02	Calibrations	LAB	07:57	1/2 HR	AC α	AG
11/27/02	0210082A	DOE	11:05	Sh	Ra. 226	AG
11/27/02	0211127A(4-7)	SHAW	1310	2'50	U	AC
11/27/02	0211113A(1-4)	SHAW	1310	2'50	Ra	AC
11/27/02	Backgrounds	lab	1910	16'40	Lucy	
11/29/02	Daily Pulser	LAB	13:00	10 MIN	NA	AG
11/29/02	0211043A (1-12)	NFT	14:00	16 HRS	iso-U	AG
11/29/02	0211043A (9)	NFT	14:00	16 HRS	iso-Th	AG
12-2-02	Daily Pulser	LAB	0026	10min.	NA	JSP
12-2-02	0211051B(4-11)	PCC	0123	2HR. 50min.	Th	JSP
12-2-02	0211021B(1-5)	NYS	0123	2HR. 50min.	Th	JSP
12-2-02	0211132A(2-5)	SHAW	0924	2HR. 50min.	Th	JSP
12-2-02	0211127A(1-9)	SHAW	0924	2HR. 50min.	Th	JSP
12-3-02	Daily Pulser	LAB	0017	10min.	NA	JSP
12-3-02	0211054A(15-16)	NWE	0946	2HR. 50min.	UU	JSP
12-3-02	0211055A (1-4,6,7)	NWE	0946	2HR. 50min.	UU	JSP
12-3-02	0211079A (1-3,6,7)	BJC	0946	2HR. 50min.	UU	JSP
12-4-02	Daily Pulser	LAB	0024	10min.	NA	JSP
12-4-02	0211080A (2-7)	URS	0819	2HR. 50min.	UU	JSP
12-4-02	0211133A(1-4)	SHAW	0819	2HR. 50min.	UU	JSP
12-4-02	0211111A(1-3)	BJC	0819	2HR. 50min.	UU	JSP
12-5-02	Daily Pulser	LAB	0032	10min.	NA	JSP
12-5-02	~~0211141A (1-4)~~	DURATEK	0743	2HR.		
12-5-02	0211141AA (1-4)	DURATEK	0743	1010	ON α 3	
12-5-02	0211124A(1-5)	MSA	0743		JSP 12-5-02	
12-5-02	0211133A(1-4)	SHAW	0828	2HR. 50min.	Th	JSP
12-5-02	0211134A(1-5)	DURATEK	0828	2HR. 50min.	Th	JSP
12-5-02	0211141A(1-4)	DURATEK	0828	2HR. 50min.	Th	JSP

ISO-PU NOTES
238/239/240

EBERLINE SERVICES

Work Order Analysis Notes

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Internal Work Order	02-11141
Analysis Code	PuISO
Run Number	2

#	Date	Dept	User	Notes
1	12/06/02 13:26	PREP	JBARNARD	ALIQUOTED FROM PREVIOUS DILUTIONS AND ADDED SPIKES AND TRACERS- DRIED SAMPLES DOWN

Jay Barnard
12/6/02

EBERLINE SERVICES

Work Order Analysis Notes

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Internal Work Order	02-11141
Analysis Code	PulSO
Run Number	2

#	Date	Dept	User	Notes
1	12/06/02 13:26	PREP	JBARNARD	ALIQUOTED FROM PREVIOUS DILUTIONS AND ADDED SPIKES AND TRACERS- DRIED SAMPLES DOWN
2	12/10/02 09:41	CHEM	TSMITH	Followed steps 8.5 to 8.5.6 in AP-005 rev. 7 . (Column seperation for Plutonium)
3	12/11/02 05:17	CHEM	TSMITH	Followed steps 8.5.7 to 8.6.5 in AP-005 rev. 7 . (Precipitated and filtered samples)

12-11-02

DATE	SAMPLE #	CLIENT	LOAD TIME	CT. TIME	ANALYSIS	TECH
12-6-02	CALIBRATIONS	LAB	0414	1½ HR	α ISO	JSP
12-6-02	0211108A(5)	BJC	0759	2HR. 50min.	Pu	JSP
12-6-02	0212012A(1-5)	USG	0759	2HR. 50min.	uu	JSP
12-6-02	0211097A(1-4,6-8)	NWE	0759	2HR. 50min.	uu	JSP
12-6-02	0211141A (4)	DURATEK	1116	2HR. 50min.	AM/Cm	JSP
12-6-02	0211108A(1-5)	BJC	1116	2HR. 50min.	uu	JSP
12-6-02	0211096A (1-4,6,8)	BJC	1116	2HR. 50 min.	uu	JSP
12-6-02	0211141A(1)	DURATEK	1116	2HR. 50min.	NP	JSP
12/6/02	BACKGROUNDS	LAB	15:42	16HR 90min	α	AG
12-7-02	DAILY PULSER	LAB	1207	10min.	NA	JSP
12-9-02	DAILY PULSER	LAB	0016	10min.	NA	JSP
12-9-02	0211118A(6,8,10,14,16,18,19)	BJC	0807	2HR. 50min.	uu	JSP
12-9-02	0211103A (1,2)	NYS	0807	2HR. 50min.	uu	JSP
12/9/02	0211101A(1-9)	LTL	1206	2150	Ra	AC
12/9/02	0211043AA(1-3,8-12)	WFT	1555	16hr	Am/Cm	AC
12/9/02	0211043AA2(1,3,4,9)	WPT	1555	16hr	Pu	AC
12/10-02	DAILY PULSER	LAB 0813	0813	10min.	NA	JSP
12-10-02	0211129A (1-12)	LIONVILLE	0919	2HR. 50min.	Am	JSP
12-11-02	DAILY PULSER	LAB	0018	10min.	NA	JSP
12-11-02	0211151A(8,9)	PCC	0825	2HR. 50min.	Th	JSP
12-11-02	0212019A(1-4)	USG	0825	2HR. 50min.	Th	JSP
12-11-02	0212027A(1-5)	SHAW	0825	2HR. 50min.	Th	JSP
12-11-02	0211103A(1)	NYS	0825	2HR. 50min.	Th	JSP
12/11/02	0211141B(1-5)	DURATEK	1218	2150	Pu	AC
12/12/02	0211119A(1-5)	USG	1218	2150	Pu	AC
12/11/02	0211046B(1-3)	MDNR	1218	2150	Ra	AC

ISO-PU NOTES
242/244

EBERLINE SERVICES

Work Order Analysis Notes

Oak Ridge Laboratory
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Internal Work Order	02-11141
Analysis Code	Pu4ISO
Run Number	1

#	Date	Dept	User	Notes
1	12/03/02 09:43	PREP	JBARNARD	LEACHED SAMPLE AND DILUTED LEACHATE- ALIQUOTED FROM DILUTION AND ADDED SPIKES AN TRACERS- DRIED SAMPLES DOWN

Joy Barnard
12/3/02

EBERLINE SERVICES

Work Order Analysis Notes

Oak Ridge Laboratory
601 Scarboro Rd.
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Internal Work Order	02-11141
Analysis Code	Pu4ISO
Run Number	1

#	Date	Dept	User	Notes
1	12/03/02 09:43	PREP	JBARNARD	LEACHED SAMPLE AND DILUTED LEACHATE- ALIQUOTED FROM DILUTION AND ADDED SPIKES AN TRACERS- DRIED SAMPLES DOWN
2	12/04/02 10:27	CHEM	TSMITH	Followed steps 8.5 to 8.5.6 in AQP-005 rev. 7 . (Column seperation for Plutonium)
3	12/05/02 04:49	CHEM	TSMITH	Followed steps 8.5.7 to 8.6.5 in AP-005 rev. 7 . (Precipitated and filtered samples)

Jill Ott
12-5-02

DATE	SAMPLE #	CLIENT	LOAD TIME	CT. TIME	ANALYSIS	TECH
11/27/02	0210154B(1,2)	EBS	1400	2150	Am	AC
11/27/02	Backgrounds	lab	1918	16:40	also	AC
11/29/02	DAILY PULSER	LAB	13:00	10 min	NA	AC
11/29/02	CALIBRATION (34,35,39)	LAB	13:51	1 HR 30 MIN	α	AC
12-2-02	DAILY PULSER	LAB	0027	10 min.	NA	JSP
12-2-02	0211027B(1-3,5-8)	NFT	0123	2HR. 50min	Am	JSP
12-2-02	0211065B(1-4)	PARSONS	0123	5HR. 35min	Am	JSP
12-02-02	0211051B(1-3)	PCC	0123	2HR. 50min	Th	JSP
12-02-02	0211021B(6-8)	NYS	0415	2HR. 50min	Th	JSP
12-02-02	TEST AA (1,2)	LAB	0415	2HR. 50min	Th	JSP
12-02-02	0211132A (5)	SHAW	0745	2HR. 50min.	UU	JSP
12-02-02	0211126A (1-12)	SHAW	0854	2HR. 50min.	Th	JSP
12-02-02	0211132A (1)	SHAW	0854	2HR. 50min.	Th	JSP
12-3-02	DAILY PULSER	LAB	0018	10min.	NA	JSP
12-3-02	0211054A (1-5,7-11,13,15,16)	NWE	0826	2HR. 50min.	Am	JSP
12-3-02	0211081A (1)	SHAW	0826	2HR. 50min.	Pu	JSP
12-3-02	0211079A (8,9,11,13,14)	BJC	1129	2HR. 50min.	UU	JSP
12-3-02	0211109A (1-5)	BJC	1129	2HR. 50min.	UU	JSP
12-3-02	0211107A (1-4)	DURATEK	1129	2HR. 50min.	Th	JSP
12-4-02	DAILY PULSER	LAB	0025	10min.	NA	JSP
12-4-02	0211113AA(1-7)	NFT	0702	2HR. 50min.	Pu 4	JSP
12-4-02	0211055A(1-4,6,7)	NWE	0702	2HR. 50min.	Pu	JSP
12-4-02	0211077A (1)	IES	0702	2HR. 50min.	Pu	JSP
12-4-02	0211111A(4-6,8-11)	BJC	1017	2HR. 50min.	UU	JSP
12-4-02	0211077A (1-4)	IES	1017	2HR. 50min	Am	JSP
12-4-02	0211078A (1-3)	IES	1017	2HR. 50min	Am	JSP
12/4/02	0211043AA(1)	NFT	1529	2'50	Pu 4	AC
12-5-02	DAILY PULSER	LAB	0035	10min.	NA	JSP
12-5-02	0211043AAA(1)	NFT	0100	2HR. 50min	Pu 4	JSP
12-5-02	0211130A (8)	MACTEC	0714	5HR. 35min	Pu	JSP
12-5-02	0211141A (1-4)	DURATEK	0743	2HR. 50min.	UU	JSP
12-5-02	0211141AA (1-4)	DURATEK	0743	2HR. 50min.	Pu 4	JSP
12-5-02	0211124A (1-5)	MSA	0743	2HR. 50min.	Th	JSP

PU-241 NOTES

EBERLINE SERVICES

Work Order Analysis Notes

Oak Ridge Laboratory
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Internal Work Order	02-11141
Analysis Code	Pu241
Run Number	2

#	Date	Dept	User	Notes
1	12/06/02 13:27	PREP	JBARNARD	ALIQUOTED FROM PREVIOUS DILUTIONS AND ADDED SPIKES AND TRACERS- DRIED SAMPLES DOWN

Jay Barnard
12/6/02

EBERLINE SERVICES

Work Order Analysis Notes

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Internal Work Order	02-11141
Analysis Code	Pu241
Run Number	2

#	Date	Dept	User	Notes
1	12/06/02 13:27	PREP	JBARNARD	ALIQUOTED FROM PREVIOUS DILUTIONS AND ADDED SPIKES AND TRACERS- DRIED SAMPLES DOWN
2	12/10/02 09:42	CHEM	TSMITH	Followed steps 8.5 to 8.5.6 in AP-005 rev. 7 . (Column seperation for Plutonium)
3	12/11/02 05:18	CHEM	TSMITH	Followed steps 8.5.7 to 8.6.5 in AP-005 rev. 7 . (Precipitated and filtered samples)

12-11-02

EBERLINE SERVICES

Work Order Analysis Notes

Oak Ridge Laboratory
601 Scarboro Rd.
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Voice: 865.481.0683
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Internal Work Order	02-11141
Analysis Code	Pu241
Run Number	1

#	Date	Dept	User	Notes
1	12/03/02 09:42	PREP	JBARNARD	LEACHED SAMPLE AND DILUTED LEACHATE- ALIQUOTED FROM DILUTION AND ADDED SPIKES AN TRACERS- DRIED SAMPLES DOWN
2	12/04/02 10:26	CHEM	TSMITH	Followed steps 8.5 to 8.5.6 in AP-005 rev. 7 . (Column seperation for Plutonium)
3	12/05/02 04:58	CHEM	TSMITH	Followed steps 8.5.7 to 8.6.5 in AP-005 rev. 7 . (Precipitated and filtered samples)
4	12/05/02 08:04	CHEM	TSMITH	Spike (Frac # 1) went through filter very fast .
5	12/12/02 15:20	PREP	ECALZADILLA	Placed filters in scintillation vials and added enough conc. HNO3 to dissolve filters and evaporated to near dryness. Added 2 mL of D.I. H2O and evaporated to near dryness. Repeated, then added 2 mL of D.I. H2O and 18 mL of scintillation cocktail and sent
6	12/12/02 15:20	PREP	ECALZADILLA	samples to count room.

Calzadilla 12/12/02

DATE	SAMPLE #	KOTOBEL	CLIENT	LOAD TIME	CT. TIME	ANALYSIS	TECH
11/22/02	0211004A(1-4)B	2	EBERLINE	10:30	2 HR 15 MIN	H-3	AC
[illegible]/02	0211616B(1-3,6,9,B)	3/4	BJC	1545	13'15"	H3	AC
11/22/02	0211060A(1-5)(B)	5	USG	1545	7'45"	H3	AC
11/22/02	0211066A(1-5)	25	NFT	1930	7 1/2 hr	Pu 241	AC
11/24/02	0211033A(1-12B)	13	SHAW	1900	13 hr	Tc99	AC
11/25/02	0211034A(1-5,B)	15	SHAW	1900	6 hr	Tc99	AC
11/25/02	0211043A(1-7,B)	6	NFT	1900	9 hr	Tc99	AC
11/25/02	0211033A(1-12,B)	19/20	SHAW	1900	29 hr	TOTAC	AC
11/27/02	0211141A(1-4,B)	3/4	DURATEK	1330	6 hr	H3	AC
11/27/02	0211080A(1-3&B)	5/6	URS	1330	6 hr	H3	AC
12/2/02	0211078A(1-4,B)	19/20	IES	1445	11 hr	TOTACT	AC
12-3-02	DAILYS	1	LAB	0245	1 1/2	QC	JOP
12-3-02	0211077A(1-4,B)	19/20	IES	0810	11 HR	TOTACT	JOP
12/3/02	0211130A(1-8,B)	21/22	MACTEC	1445	20 hr	TOTACT	AC
12-4-02	DAILYS	1	LAB	1600	1 1/2 HR	QC	JOP
12-5-02	DAILYS	1	LAB	0040	1 1/2 HR	QC	JOP
12/5/02	0211113A(1-8)	21	NFT	1700	12 hr	Pu 241	AC
12/5/02	0211078A(1-4B)	13	IES	1700	5 hr	Tc 99	AC
12/5/02	0211077A(1-4,B)	13	IES	1700	5 hr	Tc99	AC
12/5/02	0211117A(1-8,B)	5/6	BJC	1700	17'45"	H3	AC
12/5/02	0211149A(1-4,B)	3	NFT	1700	2'15"	H3	AC
12/5/02	0211141A(1-4,B)	14	DURATEK	1930	5 hr	Tc99	AC
12/5/02	0211084A(1-5,B)	16/17	BJC	1930	7'15"	Tc99	AC
12-6-02	DAILYS	1	LAB	0730	1 1/2 HR	QC	JOP
12-6-02	0212019A(1-4,B)	4	USG	1134	2 HR 15 min	H-3	JOP
12-9-02	DAILYS	1	LAB	0115	1 1/2 HR	QC	JOP
12-10-02	DAILYS	1	LAB	1140	1 1/2 HR	QC	JOP
12-11-02	0212019A(1-4,B)	23	USG	1031	5 HR	Ni-63	JOP
12/11/02	0211142A(1-3,8,B)	31/32	SHAW	1700	7'15"	C14	AC
12/11/02	0212019A(1-5)	25	USG	1920	5 hr	Pu 241	AC
12/12/02	0212022A(1-4,B)	13/14	NFT	1530	6 hr	Tc99	AC
12/12/02	0212019A(1-4,B)	15	USG	1536	5 hr	Tc99	AC
12/12/02	0211141A(1-5)	28	DURATEK	1600	5 hr	Pu 241	AC

NP-237 NOTES

EBERLINE SERVICES Work Order Analysis Notes	Oak Ridge Laboratory 601 Scarboro Rd. Oak Ridge, TN 37830 Voice: 865.481.0683 www.eberlineservices.com	Internal Work Order	02-11141
		Analysis Code	Np237EI
		Run Number	1

#	Date	Dept	User	Notes
1	12/03/02 09:41	PREP	JBARNARD	LEACHED SAMPLE AND DILUTED LEACHATE- ALIQUOTED FROM DILUTION AND ADDED SPIKES AN TRACERS- DRIED SAMPLES DOWN UNTIL NEAR DRY- ADDED 2MLS OF HNO3 AND DRIED SAMPLES DOWN UNTIL NEAR DRY- REPEATED THE ADDITION OF ACID 2 MORE TIMES

JBarnard
12/3/02

EBERLINE SERVICES

Work Order Analysis Notes

Oak Ridge Laboratory
601 Scarboro Rd.
Oak Ridge, TN 37830
Voice: 865.481.0683
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Internal Work Order	02-11141
Analysis Code	Np237EI
Run Number	1

#	Date	Dept	User	Notes
1	12/03/02 09:41	PREP	JBARNARD	LEACHED SAMPLE AND DILUTED LEACHATE- ALIQUOTED FROM DILUTION AND ADDED SPIKES AN TRACERS- DRIED SAMPLES DOWN UNTIL NEAR DRY- ADDED 2MLS OF HNO3 AND DRIED SAMPLES DOWN UNTIL NEAR DRY- REPEATED THE ADDITION OF ACID 2 MORE TIMES
2	12/05/02 10:23	CHEM	TSMITH	Followed steps 8.3 to 8.3.10 in AP-010 rev. 1 . (Column seperation for Neptunium by Eicrom TEVA resin)
3	12/06/02 04:39	CHEM	TSMITH	Followed steps 8.4 to 8.5 in AP-010 rev. 1 . (Precipitated and filtered samples)

12-6-02

DATE	SAMPLE #	CLIENT	LOAD TIME	CT. TIME	ANALYSIS	TECH
3-02	0211083RA (1-7)	SC DHEC	1005	2HR	Ra^{228}	JS
12/3/02	0211130A (1-8)	MACTEC	1400	1hr	LB	RC
12/3/02	0211105A (1-9)	NUP	1530	90m	LB	RC
12-4-02	Daily Bkgd	LAB	0005	1HR	Bkgd	JS
12-4-02	QC	LAB	1115	30min	Sr-90	JS
12-4-02	0211073RA (1-13)	SC DHEC	0953	2HR	Ra^{228}	JS
12/4/02	0211073A (14-16)	SCDhec	1200	2hr	Ra^{228}	RC
12/4/02	0211145A (3-5)	Duratek	1200	3hr	LB	RC
12/4/02	0211111A (3,6,7)	BSC	1200	3hr	LB	RC
12/4/02	0211131A (1-4)	NFT	1200	1hr	LB	RC
12/4/02	0211145A (1,2)	BSC	1300	30m	LB	RC
12/4/02	0211111A (2)	Duratek	1300	30m	LB	RC
12/4/02	0211086B (1-13)	MMC	1700	5hr	LB	RC
12-5-02	Daily Bkgd	LAB	0010	1HR	Bkgd	JS
12-5-02	QC	LAB	0115	30min	Sr-90	JS
12-5-02	0211072NPA (1-4)	IES	0800	10min	NP	JS
12-5-02	0211078NPA (1-4)	IES	0820	10min	NP	JS
12-5-02	0211130NPA (1-8)	MACTEC	0845	10min	NP	JS
12-5-02	0211046RA (1-10)	MDNR	0913	2HR	Ra^{228}	JS
12-5-02	0211046RA1 (1)	MDNR	1117	2HR	Ra^{228}	JS
12/5/02	0211084A (7-9)	ARCADIS	1333	30m	TOTRa	RC
12/5/02	0211084A (1-6)	ARCADIS	~~1402~~ 1402	30m	TOTRa	RC
12/5/02	0211141A (1-4)	Duratek	1325	1hr	Pb^{210}	RC
12/5/02	0211097A (1-12)	DWT	1430	1hr	SR	RC
12/5/02	0211097A (13-18,20)	DWT	1540	1hr	SR	RC
12/5/02	0211125A (1-10)	Lionville	1830	1hr	SR	RC
12-6-02	Daily Bkgd	LAB	0005	1HR	Bkgd	JS
12-6-02	QC	LAB	0110	30min	Sr-90	JS
12-6-02	0211128SA1 (11-14)	LIONVILLE ~~NYS~~ JS 12-6-02	0150	1HR	Sr	JS
12-6-02	0211141SA (1-4)	DURATEK	0150	1HR	Sr	JS
12-6-02	0211129SA (1-13)	LIONVILLE	0300	1HR	Sr	JS
12-6-02	0211087TRA (1-15)	BEC	0813	30min	TOTRa	JS
12-6-02	0211087TRA1 (16-20)	BEC	0819	30min	TOTRa	JS
12-6-02	0211141NPA (1-4)	DURATEK	1010	10min	NP	JS

DATE	SAMPLE #	CLIENT	LOAD TIME	CT. TIME	ANALYSIS	TECH
12-6-02	CALIBRATIONS	LAB	0414	1½ HR	α/iso	JB
12-6-02	0211108A(5)	BJC	0759	2HR. 50min.	Pu	JB
12-6-02	0212012A(1-5)	USG	0759	2HR. 50min.	"	JB
12-6-02	0211097A(1-4,6-8)	NWE	0759	2HR. 50min.	"	JB
12-6-02	0211141A (4)	DURATEK	1116	2HR. 50min.	AM/Cm	JB
12-6-02	0211108A(1-5)	BJC	1116	2HR. 50min.	"	JB
12-6-02	0211096A (1-4,6,8)	BJC	1116	2HR. 50min.	"	JB
12-6-02	0211141A(1)	DURATEK	1116	2HR. 50min.	NP	JB

DATE	SAMPLE #	CLIENT	LOAD TIME	CT. TIME	ANALYSIS	TECH
12-5-02	0211130A (1-8)	MACTEC	1053	5HR 35 min.	NP	JP
12-5-02	0211077A (1-4)	TES	1056	2HR. 50min.	NP	JP
12-5-02	0211077A (1-3)	TES	1057	2HR 50min.	NP	JP
12/5/02	0211086A (1-13)	NMLL	1830	2'50	Ra	Ra
12-6-02	DAILY PULSER	LAB	0024	10min.	NA	JP
12-6-02	CALIBRATIONS	LAB	0049	1½ HR	α ISO	JP
12-6-02	0211149A (1-3,5)	NFT	0645	5HR. 35min.	Pu	JP
12-6-02	0211149A (1-3,5)	NFT	0645	2HR. 50min.	U	JP
12-6-02	0211097A (1-4,6,7)	NWE	0645	2HR. 50min.	Pu	JP
12-6-02	0211065C (1-4)	PARSONS	0954	5HR. 35min.	Am	JP
12-6-02	0211097A (9,11-15)	NWE	0954	2HR. 50min.	U	JP
12/6/02	BACKGROUNDS	LAB	15:42	16HR 40min	α	AG
12-7-02	DAILY PULSER	LAB	1207	10min.	NA	JP
12-7-02	0211043A (11)	NFT	1255	16 HR	Th	JP
12-7-02	0211141A (2-4)	DURATEK	1255	2HR. 50min.	NP	JP
12-7-02	0211149A (1-3,5)	NFT	1255	5HR. 35min.	NP	JP

AM-241/CM NOTES

EBERLINE SERVICES Work Order Analysis Notes	Oak Ridge Laboratory 601 Scarboro Rd. Oak Ridge, TN 37830 Voice: 865.481.0683 www.eberlineservices.com	Internal Work Order	02-11141
		Analysis Code	Am241
		Run Number	1

#	Date	Dept	User	Notes
1	12/03/02 09:39	PREP	JBARNARD	LEACHED SAMPLE AND DILUTED LEACHATE- ALIQUOTED FROM DILUTION AND ADDED SPIKES AN TRACERS- DRIED SAMPLES DOWN UNTIL NEAR DRY- ADDED HCL AND DRIED SAMPLES TO APPROXIMATELY 1ML

Jeff Barnard
12/3/02

EBERLINE SERVICES

Work Order Analysis Notes

Oak Ridge Laboratory
601 Scarboro Rd.
Oak Ridge, TN 37830
Voice: 865.481.0683
www.eberlineservices.com

Internal Work Order	02-11141
Analysis Code	CmISO
Run Number	1

#	Date	Dept	User	Notes
1	12/03/02 09:40	PREP	JBARNARD	LEACHED SAMPLE AND DILUTED LEACHATE- ALIQUOTED FROM DILUTION AND ADDED SPIKES AN TRACERS- DRIED SAMPLES DOWN UNTIL NEAR DRY- ADDED HCL AND DRIED SAMPLES TO APPROXIMATELY 1ML

Joy Barnard
12/3/02

EBERLINE SERVICES Work Order Analysis Notes	Oak Ridge Laboratory 601 Scarboro Rd. Oak Ridge, TN 37830 Voice: 865.481.0683 www.eberlineservices.com	Internal Work Order	02-11141
		Analysis Code	Am241
		Run Number	1

#	Date	Dept	User	Notes
1	12/03/02 09:39	PREP	JBARNARD	LEACHED SAMPLE AND DILUTED LEACHATE- ALIQUOTED FROM DILUTION AND ADDED SPIKES AN TRACERS- DRIED SAMPLES DOWN UNTIL NEAR DRY- ADDED HCL AND DRIED SAMPLES TO APPROXIMATELY 1ML
2	12/04/02 15:02	CHEM	BNEWTON	Used column separation technique to elute first Americium fraction (steps 8.3 to 8.3.7 in AP-005 Rev. 7).

Bobby Newton 12/4/02

EBERLINE SERVICES

Work Order Analysis Notes

Oak Ridge Laboratory
601 Scarboro Rd.
Oak Ridge, TN 37830
Voice: 865.481.0683
www.eberlineservices.com

Internal Work Order	02-11141
Analysis Code	CmISO
Run Number	1

#	Date	Dept	User	Notes
1	12/03/02 09:40	PREP	JBARNARD	LEACHED SAMPLE AND DILUTED LEACHATE- ALIQUOTED FROM DILUTION AND ADDED SPIKES AN TRACERS- DRIED SAMPLES DOWN UNTIL NEAR DRY- ADDED HCL AND DRIED SAMPLES TO APPROXIMATELY 1ML
2	12/04/02 15:03	CHEM	BNEWTON	Used column separation technique to elute first Curium fraction (steps 8.3 to 8.3.7 in AP-005 Rev. 7).

Bobby Newton 12/4/02

EBERLINE SERVICES

Work Order Analysis Notes

Oak Ridge Laboratory
601 Scarboro Rd.
Oak Ridge, TN 37830
Voice: 865.481.0683
www.eberlineservices.com

Internal Work Order	02-11141
Analysis Code	Am241
Run Number	1

#	Date	Dept	User	Notes
1	12/03/02 09:39	PREP	JBARNARD	LEACHED SAMPLE AND DILUTED LEACHATE- ALIQUOTED FROM DILUTION AND ADDED SPIKES AN TRACERS- DRIED SAMPLES DOWN UNTIL NEAR DRY- ADDED HCL AND DRIED SAMPLES TO APPROXIMATELY 1ML
2	12/04/02 15:02	CHEM	BNEWTON	Used column separation technique to elute first Americium fraction (steps 8.3 to 8.3.7 in AP-005 Rev. 7).
3	12/05/02 09:54	CHEM	TSMITH	Followed steps 8.3.7 to 8.3.10 in AP-005 rev. 7 . (2nd column seperation for Americium)
4	12/06/02 04:37	CHEM	TSMITH	Followed steps 8.3.11 to 8.6.5 in AP-005 rev. 7 . (Precipitated and filtered samples)

12-6-02

EBERLINE SERVICES

Work Order Analysis Notes

Oak Ridge Laboratory
601 Scarboro Rd.
Oak Ridge, TN 37830
Voice: 865.481.0683
www.eberlineservices.com

Internal Work Order	02-11141
Analysis Code	CmISO
Run Number	1

#	Date	Dept	User	Notes
1	12/03/02 09:40	PREP	JBARNARD	LEACHED SAMPLE AND DILUTED LEACHATE- ALIQUOTED FROM DILUTION AND ADDED SPIKES AN TRACERS- DRIED SAMPLES DOWN UNTIL NEAR DRY- ADDED HCL AND DRIED SAMPLES TO APPROXIMATELY 1ML
2	12/04/02 15:03	CHEM	BNEWTON	Used column separation technique to elute first Curium fraction (steps 8.3 to 8.3.7 in AP-005 Rev. 7).
3	12/05/02 09:55	CHEM	TSMITH	Followed steps 8.3.7 to 8.3.10 in AP-005 rev. 7 . (2nd column seperation for Curium)
4	12/06/02 04:38	CHEM	TSMITH	Followed steps 8.3.11 to 8.6.5 in AP-005 rev. 7 . (Precipitated and filtered samples)

12-6-02

DATE	SAMPLE #	CLIENT	LOAD TIME	CT. TIME	ANALYSIS	TECH
12-2-02	0211127A (10-12)	SHAW	1104	2HR. 50min.	Th	JDP
12-3-02	DAILY PULSER	LAB	0018	10min.	NA	JDP
12-3-02	0211081A (2-5)	SHAW	0907	2HR. 50min.	Pu	JDP
12-3-02	0211054A (1-5, 7-11, 13) JDP 12-3-02 15:40	NWE	0907	2HR. 50min.	UU	JDP
12/3/02	0211109A (3,4)	BJC	1208	2150	U	HC
12/3/02	0211109A (5)	Duratek	1208	2150	Th	HC
12-4-02	DAILY PULSER	LAB	0025	10min.	NA	JDP
12-4-02	0211077A (2-4)	IES	0753	2HR 50min.	Pu	JDP
12-04-02	0211078A (1-4)	IES	0753	2HR. 50min.	Pu	JDP
12-4-02	0211113A (1-7)	NFT	0753	2HR. 50min.	UU	JDP
12-4-02	0211080A (1)	URS	0753	2HR. 50min.	UU	JDP
12-4-02	0211078A (4)	IES	1118	2HR. 50min.	Am	JDP
12-4-02	0211113A (1-8)	NFT	1118	2HR. 50min.	Pu	JDP
12-5-02	DAILY PULSER	LAB	0032	10min.	NA	JDP
12-5-02	0211130A (1-8)	MACTEC	0714	5HR. 35min.	UU	JDP
12-5-02	0211130A (1-7)	MACTEC	0714	5HR. 35min.	Pu	JDP
12-6-02	DAILY PULSER	LAB	0024	10min.	NA	JDP
12-6-02	CALIBRATIONS	LAB	0235	1½HR	α iso	JDP
12-6-02	0211097A (8-19)	NWE	0723	2HR. 50min.	Pu	JDP
12-6-02	0211108A (1-4)	BJC	0723	2HR. 50min.	Pu	JDP
12-6-02	0211097A (16-19)	NWE	1040	2HR. 50min.	UU	JDP
12-6-02	0211045B (1-3, 8)	BJC	1040	2HR. 50min.	Am/Cm	JDP
12-6-02	0211149A (1-3, 5)	NFT	1040	2HR. 50min.	Am	JDP
12-6-02	0211141A (1-3)	DURATEK	1040	2HR. 50min.	Am/Cm	JDP

DATE	SAMPLE #	CLIENT	LOAD TIME	CT. TIME	ANALYSIS	TECH
12-6-02	CALIBRATIONS	LAB	0414	1½ HR	α/ISO	JP
12-6-02	0211108A(5)	BJC	0759	2HR. 50min.	Pu	JP
12-6-02	0212012A(1-5)	USG	0759	2HR. 50min.	UU	JP
12-6-02	0211097A(1-4,6-8)	NWE	0759	2HR. 50min.	UU	JP
12-6-02	0211141A (4)	DURATEK	1116	2HR. 50min.	AM/Cm	JP
12-6-02	0211108A(1-5)	BJC	1116	2HR. 50min.	UU	JP
12-6-02	0211096A(1-4,6,8)	BJC	1116	2HR. 50min.	UU	JP
12-6-02	0211141A(1)	DURATEK	1116	2HR. 50min.	NP	JP

TOT-SR NOTES

EBERLINE SERVICES

Work Order Analysis Notes

Oak Ridge Laboratory
601 Scarboro Rd.
Oak Ridge, TN 37830
Voice: 865.481.0683
www.eberlineservices.com

Internal Work Order	02-11141
Analysis Code	SrTOT
Run Number	1

#	Date	Dept	User	Notes
1	12/04/02 19:49	CHEM	MROGERS	Aliquoted samples. Added spikes and tracers. Added Sr carrier. Added 10mL conc HNO3 and took to drynes Added 10mL conc HNO3 and 2mL 50% H2O2 and took to near dryness.
2	12/05/02 19:30	CHEM	MROGERS	Added 10mL 8M HNO3, warmed, and transferred to c-tubes. Conditioned Sr columns with 5mL 8M HNO3. Added samples. Washed with 5mL 8M HNO3, three times. Eluted with 10mL 0.05M HNO3. Dried on planchets. Prepared for count room.

Meredith Rogers 12-5-02

DATE	SAMPLE #	CLIENT	LOAD TIME	CT. TIME	ANALYSIS	TECH
12-3-02	0211083RA(1-7)	SC DHEC	1005	2HR	Ra^{228}	JS
12/3/02	0211130A(1-8)	MACTEC	1400	1hr	LB	AC
12/3/02	0211105A(1-9)	NUP	1530	90m	LB	AC
12-4-02	Daily BKGD	LAB	0005	1HR	BKGD	JS
12-4-02	QC	LAB	1115	30min	Sr-90	JS
12-4-02	0211023RA(1-13)	SC DHEC	0953	2HR	Ra^{228}	JS
12/4/02	0211073A(14-16)	SCDhec	1200	2hr	Ra^{228}	AC
12/4/02	0211145A(3-5)	Duratek	1200	3hr	LB	AC
12/4/02	0211111A(3,6,7)	BSC	1200	3hr	LB	AC
12/4/02	0211131A(1-4)	NFT	1200	1hr	LB	AC
12/4/02	0211145A(1,2)	BSC5	1300	30m	LB	AC
12/4/02	0211111A(12)	Duratek	1300	30m	LB	AC
12/4/02	0211086B(1-13)	MML	1700	5hr	LB	AC
12-5-02	Daily BKGD	LAB	0010	1HR	BKGD	JS
12-5-02	QC	LAB	0115	30min	Sr-90	JS
12-5-02	0211077NPA(1-4)	IES	0800	10min	NP	JS
12-5-02	0211078NPA(1-4)	IES	0820	10min	NP	JS
12-5-02	0211130NPA(1-8)	MACTEC	0845	10min	NP	JS
12-5-02	0211046RA(1-10)	MDNR	0913	2HR	Ra^{228}	JS
12-5-02	0211046RA(11)	MDNR	1117	2HR	Ra^{228}	JS
12/5/02	0211084A(7-9)	ARCADIS	1333	30m	TDRa	AC
12/5/02	0211084A(1-6)	ARCADIS	~~1402~~ 1402	30m	TDRa	AC
12/5/02	0211141A(1-8)	Duratek	1325	1hr	Pb210	AC
12/5/02	0211097A(1-12)	DWT	1430	1hr	SR	AC
12/5/02	0211097A(13-16,20)	DWT	1540	1hr	SR	AC
12/5/02	0211125A(1-10)	Lancaster	1830	1hr	SR	AC
12-6-02	Daily BKGD	LAB	0005	1HR	BKGD	JS
12-6-02	QC	LAB	0110	30min	Sr-90	JS
12-6-02	0211128SA1(11-14)	NYS	0150	1HR	Sr	JS
12-6-02	0211141SA(1-4)	DURATEK	0150	1HR	Sr	JS

TC-99 NOTES

EBERLINE SERVICES

Work Order Analysis Notes

Oak Ridge Laboratory
601 Scarboro Rd.
Oak Ridge, TN 37830
Voice: 865.481.0683
www.eberlineservices.com

Internal Work Order	02-11141
Analysis Code	Tc099
Run Number	1

#	Date	Dept	User	Notes
1	12/04/02 19:34	CHEM	MROGERS	Aliquoted samples. Added spikes and tracers. Added 5mL conc HNO3 and 1mL 30% H2O2. Covered and heated on low 1 hour.
2	12/05/02 18:48	CHEM	MROGERS	Conditioned Tc columns with 5mL 0.1M HNO3. Added samples. Washed with 50mL 0.5M HF/0.02M HNO3, 50mL 1M HNO3, and 2mL 0.1M HNO3. Prepared for count room.

Meredith Rogers 12-5-02

DATE	SAMPLE#	TOTAL	CLIENT	LOAD TIME	CT. TIME	ANALYSIS	TECH
11/22/02	0211004A(1-4)B	2	EBERLINE	10:30	2 HR 15 MIN	H-3	AG
11/22/02	0211616B(1-3,6,9,B)	3/4	BJC	1545	13'15"	H3	AC
11/22/02	0211060A(1-5,B)	5	USG	1545	7'45"	H3	AC
11/24/02	0211066A(1-5)	25	NFT	1930	7 1/2 hr	Pu241	AC
11/25/02	0211033A(1-12,B)	13	SHAW	1900	13 hr	Tc99	AC
11/25/02	0211034A(1-5,B)	15	SHAW	1900	6 hr	Tc99	AC
11/25/02	0211043A(1-7,B)	6	NFT	1900	9 hr	Tc99	AC
11/25/02	0211033A(1-12,B)	19/20	SHAW	1900	29 hr	TOTAC	AC
11/27/02	0211141A(1-4,B)	3/4	Duratek	1330	6 hr	H3	AC
11/27/02	0211080A(1-8,B)	5/6	URS	1330	6 hr	H3	AC
12/2/02	0211078A(1-4,B)	19/20	IES	1445	11 hr	TOTAC	AC
12-3-02	DAILYS	1	LAB	0245	1 1/2	QC	JOP
12-3-02	0211077A(1-4,B)	19/20	IES	0810	11 HR	TOTACT	JOP
12/3/02	0211130A(1-8,B)	9/10	MACTEC	1445	20 hr	TOTACT	AC
12-4-02	DAILYS	1	LAB	1600	1 1/2 HR	QC	JOP
12-5-02	DAILYS	1	LAB	0040	1 1/2 HR	QC	JOP
12/5/02	0211113A(1-8)	17	NFT	1700	12 hr	Pu241	AC
12/5/02	0211078A(1-4,B)	13	IES	1700	5 hr	Tc99	AC
12/5/02	0211077A(1-4,B)	13	IES	1700	5 hr	Tc99	AC
12/5/02	0211117A(1-8,B)	5/6	BJC	1700	17'45"	H3	AC
12/5/02	0211149A(1-4,B)	3	NFT	1700	2'15"	H3	AC
12/5/02	0211141A(1-4,B)	14	Duratek	1930	5 hr	Tc99	AC
12/5/02	0211084A(1-5,B)	16/17	BJC	1930	7'15"	Tc99	AC

H-3 NOTES

EBERLINE SERVICES Work Order Analysis Notes	Oak Ridge Laboratory 601 Scarboro Rd. Oak Ridge, TN 37830 Voice: 865.481.0683 www.eberlineservices.com	Internal Work Order	02-11141
		Analysis Code	H0003
		Run Number	1

#	Date	Dept	User	Notes
1	~~11/27/02 08:31~~	~~PREP~~	~~PFARRELL~~	~~samples processed according to procedure sop # 13 as aqueous samples~~ PF 11-27-02
2	11/27/02 08:40	PREP	PFARRELL	sample processed according to procedure sop # 12 as soil/solid sample

P. Farrell

SAMPLE #	CONTAINER	CLIENT	LOAD TIME	CT. TIME	ANALYSIS	TECH
0211004A(1-4)B	2	EBERLINE	10:30	2 HR 15 MIN	H-3	AG
0211016B(1-3,6,9,B)	3/4	BJC	1545	13'15"	H3	AC
0211060A(1-5,B)	5	USG	1545	7'45"	H3	AC
0211066A(1-5)	25	NFT	1930	17 1/2 hr	Pu 241	AC
0211033A(1-12,B)	13	SHAW	1900	13 hr	Tc 99	AC
0211034A(1-5,B)	15	SHAW	1900	6 hr	Tc 99	AC
0211043A(1-7,12,B)	16	NFT	1900	9 hr	Tc 99	AC
0211033A(1-12,B)	19 30	SHAW	1900	29 hr	TOTAC	AC
0211041A(1-4,B)	3/4	Duratek	1330	6 hr	H3	AC
0211080A(1-3,8,B)	5/6	URS	1330	6 hr	H3	AC

C-14 NOTES

EBERLINE SERVICES Work Order Analysis Notes	Oak Ridge Laboratory 601 Scarboro Rd. Oak Ridge, TN 37830 Voice: 865.481.0683 www.eberlineservices.com	Internal Work Order	02-11141
		Analysis Code	C0014
		Run Number	1

#	Date	Dept	User	Notes
1	12/12/02 12:39	PREP	CMCMURRAY	The samples were prepped on 12-10-02. The samples were received here 0n 12-12-02.The LCS was spiked The samples were taken to the countroom.
2	12/13/02 13:05	PREP	CMCMURRAY	The samples were received back from the countroom. All the samples were spiked for matrix counting. The samples were taken back to the countroom.

Charlotte P. McMurray
12-13-02

DATE	SAMPLE #	CLIENT	BOTTLE #	LOAD TIME	CT. TIME	ANALYSIS	TECH
12-12-02	DAILYS	LAB	1	0905	1 1/2 HR	QC	JP
12/12/02	0211143A(1,3,8,9)	SHAW	39/33	1530	7'15"	C14	AC
12/12/02	0210019A(1-4 B)	USG	8	1530	5 hr	C14	AC
12/12/02	0211141A(1-4 B)	Duratek	7	1600	5 hr	C14	AC
12-13-02	DAILYS	LAB	1	0821	1 1/2 HR	QC	JP
12-13-02	0211142A(1-12,B)	SHAW	22/13	0900	29 HR	TOT ACT	JP
12/13/02	0211141A(1-4)	Duratek	8	1980	1 hr	C14	AC
12/13/02	0210019A(1-4)	USG	7	1980	1 hr	C14	AC

00172

DATE	SAMPLE #	CLIENT	FOLIO	LOAD TIME	CT. TIME	ANALYSIS	TECH
12-12-02	DAILYS	LAB	1	0905	1½ HR	QC	JB
12/12/02	0211143A(1-3,8,9)	SHAW	3/3	1530	7'15"	C14	AC
12/12/02	0212019A(1-4,B)	USG	8	1530	5hr	C14	AC
12/12/02	0211141A(1-4,B)	DUALEX	7	1500	5hr	C14	AC

NI-63 NOTES

EBERLINE SERVICES **Work Order Analysis Notes**	**Oak Ridge Laboratory** **601 Scarboro Rd.** **Oak Ridge, TN 37830** **Voice: 865.481.0683** **www.eberlineservices.com**	Internal Work Order	02-11141
		Analysis Code	Ni063
		Run Number	1

#	Date	Dept	User	Notes
1	11/26/02 18:24	PREP	CMCMURRAY	The sample was aliquoted and leached in 4 M HNO3 over night. A LCS and Blank was prepared.

to	Sam#	# & Client	Load Time	Count Time	Analysis	Tech
5/02	0211014 A(1-5,B)	16/17 BSC	1935	7'15"	Tc99	AC
	0211042A(1-9,B)	18/19 NFT	1935	12'15"	Tc99	AC
2/02	0211034A(1-5,B)	22/23 Shaw	1445	13'15"	TOTAC	AC
2/02	0211026A(1-5,B)	16/17 BSC	1445	7'15"	Tc99	AC
2/02	0211027A(1-4,B)	18/19 NFT	1445	6hr	Tc99	AC
2/02	0211066A(1-4,B)	20/21 NFT	1445	6hr	Tc99	AO
25/02	0211037A(1-3,5,7,9,11,13,15,17,19,B)	1/2 BJC	12:00	24 1/2 HR	H-3	AG
26/02	0211038A(1-5,7,9,11,13,15,17,19,B)	1/2 BSC	1800	26'45"	H3	AC
26/02	0211045A(1-3,5,7,9,11,B)	5/6 BSC	1800	24hr	H3	AC
26/02	0211026A(1-5,B)	7 BSC	1800	6hr	~~AC~~ C14	AC
26/02	0211026A(1-5)	7 BJC	1700	1'15"	C14	AC
26/02	0211105A(A(1-9,B)	31/33 Lionville	1700	12'15"	C14	AC
26/02	0211152A(1-11,B)	24/25 NFT	1700	5'45"	TOTACT	AO
5/02	0211149A(1-4,B)	32/33 NFT	1600	6hr	C14	AC
2/02	0211106A(1-11,B)	33/34 NLD	1800	14'45"	C14	AC
2/3/02	0211169A(1-4,B)	1/2 NFT	1400	21'15"	H3	AC
2/3/02	0211141A(1-4,B)	24 Duralect	1900	5hr	Dios	AC

NI-59 NOTES

EBERLINE SERVICES Work Order Analysis Notes	Oak Ridge Laboratory 601 Scarboro Rd. Oak Ridge, TN 37830 Voice: 865.481.0683 www.eberlineservices.com	Internal Work Order	02-11141
		Analysis Code	Ni59
		Run Number	1

#	Date	Dept	User	Notes
1	12/05/02 13:42	PREP	CMCMURRAY	On 12-4-02 the Ni 63 samples were received back from the countroom. The samples were transferred to beakers and muffled. On 12-5-02 the Ni 59 samples were transferred to planchets with 3 M HNO3 and dried. The planchets were put in wax envelopes and taken
2	12/05/02 13:42	PREP	CMCMURRAY	to the countroom.

Charlotte P. McMurray
12-5-02

DATE	SAMPLE#	CLIENT	LOAD TIME	CT. TIME	ANALYSIS	TECH
12/5/02	0211086-02	mml	1423	10m	Ba	K
	0211086-03		1434			
	0211086-04		1446			
	0211086-05		1457			
	0211086-06		1507			
	0211086-07		1518			
	0211086-08		1529			
	0211086-09		1540			
	0211086-10		1556			
	0211086-11		1625			
	0211086-12		1638			
	0211086-13		1648			
12/5/02	0211141-02	Duratek	1802	1hr	DISR	K
12/5/02	0211141-03	Duratek	1916	1hr	DISR	K
12-6-02	Daily Blks	LAB	0015	15min.	γ	25
12-6-02	LPGAS-5	LAB	0034	30min.	γ	25
12-6-02	LPGAS-5	LAB	0110	30min.	γ	25
12-6-02	LPGAS-5	LAB	0145	30min.	γ	25
12-6-02	LPGAS-5	LAB	0226	30min.	γ	25
12-6-02	LPGAS-5	LAB	0302	30min.	γ	25
12-6-02	FE55	LAB	0339	30min.	FE55	25
12-6-02	FE-55	LAB	0440	30min.	FE55	25
12-6-02	0211141-01	Duratek	0544	1HR	FE55	25
12-6-02	0211141-01	Duratek	0649	1HR	FE55	25
12-6-02	0211141-04	Duratek	0751	1HR	FE55	25

PB-210 NOTES

EBERLINE SERVICES

Work Order Analysis Notes

Oak Ridge Laboratory
601 Scarboro Rd.
Oak Ridge, TN 37830
Voice: 865.481.0683
www.eberlineservices.com

Internal Work Order	02-11141
Analysis Code	Pb210
Run Number	1

#	Date	Dept	User	Notes
1	12/04/02 13:24	PREP	DJOHNSON	Samples came from prep lab in dilution. Aliquoted samples directly into separatory funnels and added 1 ml of 1.0 mg/ml each Bismuth and Lead carriers to each sample. Then added dih20 to bring volume to 40mls total.
2	12/04/02 13:25	PREP	DJOHNSON	Then added 10mls of con HCl acid to samples. Prepared a blank and spike the same way also.
3	12/04/02 13:26	PREP	DJOHNSON	Added 20mls of extractant and shook for one minute. Allowed to settle and drew off bottom yellow phase. Repeated extractions until bottom phase was clear. Placed samples on hot plate to dry down.
4	12/04/02 13:30	CHEM	DJOHNSON	Added 5mls of con HNO3 to beakers and destroyed organics on hot plates, being careful not to take to dryness. Transferred to 50ml c-tubes with diH2O. Added 5mls of 1mg/ml Bismuth carrier to each c-tube. Adjusted PH to 8.0 range with con NH4OH. Hot bathed
5	12/05/02 13:30	CHEM	DJOHNSON	and centrifuged, discarding supernates. Dissolved precipitate with 4 drops con HCl acid. Then water-equilibrated to 40mls total with diH2O. Hot bathed and filtered onto tarred filters. Dried, reweighed and mounted. Covered in aluminum foil and submitted t
6	12/05/02 13:30	CHEM	DJOHNSON	o the count room.

12/5/02

DATE	SAMPLE*	CLIENT	LOAD TIME	CT. TIME	ANALYSIS	TECH
12-3-02	0211083RA(1-7)	SC DHEC	1005	2HR	Ra^{228}	JS
12/3/02	0211130A(1-8)	MACTEC	1400	1hr	LB	AC
12/3/02	0211105A(1-9)	NYP	1530	90m	LB	AC
12-4-02	Daily BKGD	LAB	0005	1HR	BKGD	JS
12-4-02	QC	LAB	1115	30min	Sr-90	JS
12-4-02	0211073RA(1-13)	SC DHEC	0953	2HR	Ra^{228}	JS
12/4/02	0211073A(14-16)	SCDhec	1200	2hr	Ra^{228}	AC
12/4/02	0211145A(3-5)	Duratek	1200	3hr	LB	AC
12/4/02	0211111A(3,6,7)	BSC	1200	3hr	LB	AC
12/4/02	0211131A(1-4)	NFT	1200	1hr	LB	AC
12/4/02	0211145A(1,2)	BSCS	1300	30m	LB	AC
12/4/02	0211111A(2)	Duratek	1300	30m	LB	AC
12/4/02	0211086B(1-13)	MMC	1700	5hr	LB	AC
12-5-02	Daily BKGD	LAB	0010	1HR	BKGD	JS
12-5-02	QC	LAB	0115	30min	Sr-90	JS
12-5-02	0211077NPA(1-4)	IES	0800	10min	NP	JS
12-5-02	0211078NPA(1-4)	IES	0820	10min	NP	JS
12-5-02	0211130NPA(1-8)	MACTEC	0845	10min	NP	JS
12-5-02	0211046RA(1-10)	MDNR	0913	2HR	Ra^{228}	JS
12-5-02	0211046RA(11)	MDNR	1117	2HR	Ra^{228}	JS
12/5/02	0211084A(1-9)	ARCADIS	1333	30m	TOTRa	AC
12/5/02	0211084A(1-6)	ARCADIS	~~1402~~ 1402	30m	TOTRa	AC
12/5/02	0211141A(1-8)	Duratek	1325	1hr	Pb210	AC
12/5/02	0211097A(1-12)	DWT	1430	1hr	SR	AC
12/5/02	0211097A(13-20)	DWT	1540	1hr	SR	AC

GROSS A/B NOTES

EBERLINE SERVICES

Work Order Analysis Notes

Oak Ridge Laboratory
601 Scarboro Rd.
Oak Ridge, TN 37830
Voice: 865.481.0683
www.eberlineservices.com

Internal Work Order	02-11141
Analysis Code	GaGbT
Run Number	1

#	Date	Dept	User	Notes
1	11/26/02 18:23	PREP	CMCMURRAY	The sample was aliquoted and leached overnight in 4 M HNO3. A LCS and blank was prepared.
2	11/27/02 15:28	PREP	CMCMURRAY	The samples were transferred to tared planchets, dried down, flamed, had a final weight obtained then taken to the countroom.

DATE	SAMPLE #	GROUP	CLIENT	LOAD TIME	CT. TIME	ANALYSIS	TECH
11/20/02	0211069A(11,13,14)	B	BSC	1745	9hr	2B	AC
[illegible]/02	0211069A(3,10,12)	C	BSC	0245	15hr	2B	AC
11-21-02	DAILYS	/	LAB	0030	2HR	2B	[illegible]
11/22/02	0211079B(1,2)	A	BSC	1400	1hr	2B	AC
11/22/02	0211079B(3-5)	B	BSC	1500	15hr	2B	AC
11/25/02	DAILYS	/	LAB	07:05	2HR	2B	AC
11/25/02	0211107A(1,2)	A	Duratek	1500	1hr	2B	AC
11/25/02	0211107A(3,4)	B	Duratek	1600	6hr	2B	AC
11/25/02	0211107A(5)	C	Duratek	2200	5hr	2B	AC
11/26/02	DAILYS	/	LAB	06:50	2HR	2B	AC
11/26/02	0211128A(1,2)	A	Lionville	1710	1hr	2B	AC
11/26/02	0211128A(3-14)	B	Lionville	1810	12hr	2B	AC
11/27/02	DAILYS	/	LAB	07:30	2HR	2B	AC
11/27/02	0211141A(1-4)	A	Duratt	1645	4hr	2B	AC

GAMM SPEC NOTES

Date	Sample#	Client	Load Time	Ct. Time	Analysis	Tech
27/n	6211130-05	MACte	1453	2h	γ	Ae
7/n	GAS-3	lab	1655	30m	γ	Ae
7/n	6211141-01	Duratt	1751	30m	γ	Ae

DATE	SAMPLE#	CLIENT	LOAD TIME	CT. TIME	ANALYSIS TECH.	
5/7	C211141-02	Direct	1748	1hr	[illegible]	

DATE	SAMPLE#	CLIENT	LOAD TIME	CT. TIME	ANALYSIS	TECH
11/25/02	GAS-2	LAB	12:27	30 MIN	γ	AG
[illegible]/25/02	QAP-56-V	LAB	13:01	1 HR	γ	AG
11/25/02	QAP-56-V	LAB	14:37	1 HR	γ	AG
11/25/02	GAS2	Lab	1601	30m	γ	AG
11/25/02	0210180-07	Chevron	1651	1hr	γ	AG
11/25/02	0210180-09	Chevron	1753	1hr	γ	AG
11/25/02	0211616-12	BSC	2003	4hr	γ	AG
11/26/02	DAILY BKGD	LAB	07:20	15 MIN	γ	AG
11/26/02	GAW-1	LAB	07:43	30 MIN	γ	AG
11/26/02	GAW-1	LAB	08:46	30 MIN	γ	AG
11/26/02	GAW-1	LAB	09:51	30 MIN	γ	AG
11/26/02	GAS-2	LAB	10:27	30 MIN	γ	AG
11/26/02	GAS-3	LAB	11:04	30 MIN	γ	AG
11/26/02	0210180-10	Chevron	1215	1hr	γ	AG
11/26/02	0210180-11	Chevron	1318	1hr	γ	AG
11/26/02	0210180-12	Chevron	1427	1hr	γ	AG
11/26/02	0210181-03	Chevron	1530	1hr	γ	AG
11/26/02	0210181-04	Chevron	1634	1hr	γ	AG
11/26/02	0210181-09	Chevron	1737	1hr	γ	AG
11/26/02	0210181-10	Chevron	1841	1hr	γ	AG
11/26/02	0211054-03	Kwt	1944	8hr	γ	AG
11/27/02	DAILY BKGD	LAB	06:59	15 MIN	γ	AG
11/27/02	GAS-2	LAB	08:56	30 MIN	γ	AG
11/27/02	GAW-1	LAB	09:32	30 MIN	γ	AG
11/27/02	0210181-11	CHEVRON	10:10	1 HR	γ	AG
11/27/02	0210181-13	CHEVRON	11:20	1 HR	γ	AG
11/27/02	0210181-14	CHEVRON	12:24	1 HR	γ	AG
11/27/02	0210181-15	Chevron	1325	1hr	γ	AG
11/27/02	0210181-02	Chevron	1428	1hr	γ	AG
11/27/02	0210181-01	Chevron	1531	30m	γ	AG
11/27/02	0211141-03	Duratek	1608	1hr	γ	AG
11/27/02	0211141-04	Duratek	1713	1hr	γ	AG

SECTION VIII

ANALYTICAL DATA (ISOTOPIC URANIUM)

Work Order	02-11141
Analysis Code	UUISO
Run	1
Date Received	11/26/2002
Lab Deadline	12/5/2002
Client	Duratek
Project	106760.003
Report Level	4
Activity Units	pCi
Aliquot Units	g
Matrix	OS
Method	EML U-02 Modified
Instrument Type	Alpha Spectroscopy
Radiometric Tracer	U-232
Radiometric Sol#	U-10a
Tracer Act (dpm/g)	21.31
Carrier	
Carrier Conc (mg/ml)	

Internal Fraction	Sample Desc	Client ID	Login CPM	Sample Date	Sample Aliquot
01	LCS	LCS		11/26/02 00:00	1.0000E+00
02	MBL	BLANK		11/26/02 00:00	1.0000E+00
03	DUP	VA-02-0176	89	11/25/02 12:00	1.0035E+00
04	DO	VA-02-0176	89	11/25/02 12:00	1.0035E+00

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

Internal Fraction	Sample Desc	Tracer Aliquot (g)	Tracer Total ACT (dpm)	Radiometric Tracer (pCi)	Radiometric % Rec	Grav Carrier Added (ml)	Grav Filter Tare (g)	Grav Filter Final (g)	Grav Filter Net (g)	Grav % Rec	Mean % Rec	SAF 1*	SAF 2*
01	LCS	0.5640	12.0										
02	MBL	0.5666	12.1										
03	DUP	0.5629	12.0										
04	DO	0.5622	12.0										

00192

* SAF1 is used for Gross Alpha and all other radionuclides. SAF2 is used for Gross Beta only. ** [illegible]al mass exceeded the calibration curve range. Results should be qualified as appropr[illegible]

Internal Fraction	Sample Desc	Rough Prep Date	Rough Prep By	Prep Date	Prep By	Sep t0 Date/Time	Sep t0 By	Sep t1 Date/Time	Sep t1 By
01	LCS			11/27/02 12:15	JBARNARD	12/05/02 05:07	TSMITH		
02	MBL			11/27/02 12:15	JBARNARD	12/05/02 05:07	TSMITH		
03	DUP			11/27/02 12:15	JBARNARD	12/05/02 05:07	TSMITH		
04	DO			11/27/02 12:15	JBARNARD	12/05/02 05:07	TSMITH		

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

Client: Duratek
Eberline Services Work Order: 02-11141
Analysis Code: UUISO
Run: 1

Lab Fraction	Nuclide	Sample Desc	Client Identification	Activity Units	Results	Error Estimate	MDA	LCS Known	LCS %R	LCS Flag	RPD Flag	MDA Flag	Blank Flag
01	U-234	LCS	LCS	pCi/g	7.70E+00	1.52E+00	8.70E-02	7.81E+00	98.68	OK		OK	
02	U-234	MBL	BLANK	pCi/g	8.78E-03	2.74E-02	7.21E-02					OK	OK
03	U-234	DUP	VA-02-0176	pCi/g	1.97E-02	3.42E-02	6.43E-02				INV	OK	
04	U-234	DO	VA-02-0176	pCi/g	1.05E-02	2.58E-02	5.87E-02					OK	

12-5-02

Post-it® Fax Note 7671

Date 12-5-02	# of pages ▶ 8
To Paul Jones	From Judy Michelle
Co./Dept.	Co.
Phone #	Phone #
Fax # (865) 376-6247	Fax #

Work Order: 02-11141-UUISO-1

Client: Duratek
Eberline Services Work Order: 02-11141
Analysis Code: UUISO
Run: 1

Lab Fraction	Nuclide	Sample Desc	Sample Date	Sample Aliquot	Radiometric % Rec	Grav % Rec	Mean % Rec	SAF	Sep t0 Date/Time	Sep t1 Date/Time
01	U-234	LCS	11/26/02 00:00	1.00E+00	75.44				12/5/2002 5:07	
02	U-234	MBL	11/26/02 00:00	1.00E+00	101.38				12/5/2002 5:07	
03	U-234	DUP	11/25/02 12:00	1.00E+00	122.28				12/5/2002 5:07	
04	U-234	DO	11/25/02 12:00	1.00E+00	106.15				12/5/2002 5:07	

Work Order: 02-11141-UUISO-1

Run: 1
Analysis Code: UUISO
Eberline Services Work Order: 02-11141
Client: Duratek

Lab Fraction	Nuclide	Sample Desc	Counting Date/Time	Halflife (days)	Detect	Carrier	Count Time	Counts	Bkg CPM	Eff
01	U-234	LCS	12/05/02 07:38		A_Spec	35	170	4.10 E+02	1.00 E-03	18.7
02	U-234	MBL	12/05/02 07:38		A_Spec	36	170	6.60 E-01	2.00 E-03	19.7
03	U-234	DUP	12/05/02 07:38		A_Spec	37	170	1.66 E+00	2.00 E-03	18.2
04	U-234	DO	12/05/02 07:39		A_Spec	38	170	8.30 E-01	1.00 E-03	19.6

Client: Duratek
Eberline Services Work Order: 02-11141
Analysis Code: UUISO
Run: 1

Lab Fraction	Nuclide	Sample Desc	Client Identification	Activity Units	Results	Error Estimate	MDA	LCS Known	LCS %R	LCS Flag	RPD Flag	MDA Flag	Blank Flag
01	U-235	LCS	LCS	pCi/g	4.64E-01	2.22E-01	6.28E-02	3.54E-01	130.85	INV		OK	
02	U-235	MBL	BLANK	pCi/g	3.28E-02	4.67E-02	4.45E-02					OK	OK
03	U-235	DUP	VA-02-0176	pCi/g	0.00E+00	0.00E+00	3.96E-02				OK	OK	
04	U-235	DO	VA-02-0176	pCi/g	-2.66E-03	5.34E-03	7.24E-02					OK	

00197

Run: 1
Analysis Code: UUISO
Eberline Services Work Order: 02-11141
Client: Duratek

Lab Fraction	Nuclide	Sample Desc	Sample Date	Sample Aliquot	Radiometric % Rec	Grav % Rec	Mean % Rec	SAF	Sep t0 Date/Time	Sep t1 Date/Time
01	U-235	LCS	11/26/02 00:00	1.00E+00	75.44				12/5/2002 5:07	
02	U-235	MBL	11/26/02 00:00	1.00E+00	101.38				12/5/2002 5:07	
03	U-235	DUP	11/25/02 12:00	1.00E+00	122.28				12/5/2002 5:07	
04	U-235	DO	11/25/02 12:00	1.00E+00	106.15				12/5/2002 5:07	

Client: Duratek
Eberline Services Work Order: 02-11141
Analysis Code: UUISO
Run: 1

Lab Fraction	Nuclide	Sample Desc	Counting Date/Time	Halflife (days)	Detect	Carrier	Count Time	Counts	Bkg CPM	Eff
01	U-235	LCS	12/05/02 07:38		A_Spec	35	170	2.00 E+01	0.00 E+00	18.7
02	U-235	MBL	12/05/02 07:38		A_Spec	36	170	2.00 E+00	0.00 E+00	19.7
03	U-235	DUP	12/05/02 07:38		A_Spec	37	170	0.00 E+00	0.00 E+00	18.2
04	U-235	DO	12/05/02 07:39		A_Spec	38	170	-1.70 E-01	1.00 E-03	19.6

00199

Work Order: 02-11141-UUISO-1

Client: Duratek
Eberline Services Work Order: 02-11141
Analysis Code: UUISO
Run: 1

Lab Fraction	Nuclide	Sample Desc	Client Identification	Activity Units	Results	Error Estimate	MDA	LCS Known	LCS %R	LCS Flag	RPD Flag	MDA Flag	Blank Flag
01	U-238	LCS	LCS	pCi/g	7.42E+00	1.48E+00	1.02E-01	7.61E+00	97.57	OK		OK	
02	U-238	MBL	BLANK	pCi/g	-2.25E-03	4.52E-03	6.13E-02					OK	OK
03	U-238	DUP	VA-02-0176	pCi/g	2.16E-02	3.38E-02	5.46E-02				OK	OK	
04	U-238	DO	VA-02-0176	pCi/g	2.31E-02	3.62E-02	5.85E-02					OK	

00200

Client: Duratek
Eberline Services Work Order: 02-11141
Analysis Code: UUISO
Run: 1

Lab Fraction	Nuclide	Sample Desc	Sample Date	Sample Aliquot	Radiometric % Rec	Grav % Rec	Mean % Rec	SAF	Sep t0 Date/Time	Sep t1 Date/Time
01	U-238	LCS	11/26/02 00:00	1.00E+00	75.44				12/5/2002 5:07	
02	U-238	MBL	11/26/02 00:00	1.00E+00	101.38				12/5/2002 5:07	
03	U-238	DUP	11/25/02 12:00	1.00E+00	122.28				12/5/2002 5:07	
04	U-238	DO	11/25/02 12:00	1.00E+00	106.15				12/5/2002 5:07	

Client: Duratek
Eberline Services Work Order: 02-11141
Analysis Code: UUISO
Run: 1

Lab Fraction	Nuclide	Sample Desc	Counting Date/Time	Halflife (days)	Detect	Carrier	Count Time	Counts	Bkg CPM	Eff
01	U-238	LCS	12/05/02 07:38		A_Spec	35	170	3.97 E+02	2.00 E-03	18.7
02	U-238	MBL	12/05/02 07:38		A_Spec	36	170	-1.70 E-01	1.00 E-03	19.7
03	U-238	DUP	12/05/02 07:38		A_Spec	37	170	1.83 E+00	1.00 E-03	18.2
04	U-238	DO	12/05/02 07:39		A_Spec	38	170	1.83 E+00	1.00 E-03	19.6

00202

Client: Duratek
Eberline Services Work Order: 02-11141
Analysis Code: UUISO
Run: 1

Lab Fraction	Nuclide	Sample Desc	Client Identification	Activity Units	Results	Error Estimate	MDA	LCS Known	LCS %R	LCS Flag	RPD Flag	MDA Flag	Blank Flag
02	U-236	MBL	BLANK	pCi/g	2.95E-02	4.19E-02	3.99E-02					OK	OK
03	U-236	DUP	VA-02-0176	pCi/g	1.31E-02	2.64E-02	3.56E-02				OK	OK	
04	U-236	DO	VA-02-0176	pCi/g	0.00E+00	0.00E+00	3.81E-02					OK	

00203

Client: Duratek
Eberline Services Work Order: 02-11141
Analysis Code: UUISO
Run: 1

Lab Fraction	Nuclide	Sample Desc	Sample Date	Sample Aliquot	Radiometric % Rec	Grav % Rec	Mean % Rec	SAF	Sep t0 Date/Time	Sep t1 Date/Time
02	U-236	MBL	11/26/02 00:00	1.00E+00	101.38				12/5/2002 5:07	
03	U-236	DUP	11/25/02 12:00	1.00E+00	122.28				12/5/2002 5:07	
04	U-236	DO	11/25/02 12:00	1.00E+00	106.15				12/5/2002 5:07	

Client: Duratek
Eberline Services Work Order: 02-11141
Analysis Code: UUISO
Run: 1

Lab Fraction	Nuclide	Sample Desc	Counting Date/Time	Halflife (days)	Detect	Carrier	Count Time	Counts	Bkg CPM	Eff
02	U-236	MBL	12/05/02 07:38		A_Spec	36	170	2.00 E+00	0.00 E+00	19.7
03	U-236	DUP	12/05/02 07:38		A_Spec	37	170	1.00 E+00	0.00 E+00	18.2
04	U-236	DO	12/05/02 07:39		A_Spec	38	170	0.00 E+00	0.00 E+00	19.6

00205

35-38

Internal Fraction	Sample Desc	Client ID	Sample Date	Sample Aliquot	Tracer Aliquot (g)	Tracer ACT (dpm)	Radiometric Tracer (pCi)	Radiometric % Rec	SAF 1*	SAF 2*
01	LCS	LCS	11/26/02 00:00	1.0000	0.5640	12.0188				
02	MBL	BLANK	11/26/02 00:00	1.0000	0.5666	12.0742				
03	DUP	VA-02-0176	11/25/02 12:00	1.0035	0.5629	11.9954				
04	DO	VA-02-0176	11/25/02 12:00	1.0035	0.5622	11.9805				

Eberline Services
Oak Ridge Laboratory

Spike and Tracer Worksheet

Printed: 11/27/02 2:15 PM

Internal Work Order	Run	Analysis Code	Date	Technician	Technician Initials	Witness Initials
02-11141	1	UUISO	11/27/2002 12:11	JBARNARD	JBarnard	

LCS & Matrix Spikes					LCS	MS	LCSD	MSD	LCS		MS		LCSD		MSD	
Isotope	Sol #	Activity dpm/ml	Solution Date	Approx Addition	Volume Used (ml)	Volume Used (ml)	Volume Used (ml)	Volume Used (ml)	Known pCi	Error Estimate	Added pCi	Error Estimate	Known pCi	Error Estimate	Added pCi	Error Estimate
U-234	U-8a	35.240	11/27/2002	0.500	0.4917				7.81	0.281	0.00	0.000	0.00	0.000	0.00	0.000
U-235	U-8a	1.600	11/27/2002	0.500	0.4917				0.35	0.013	0.00	0.000	0.00	0.000	0.00	0.000
U-238	U-8a	34.350	11/27/2002	0.500	0.4917				7.61	0.274	0.00	0.000	0.00	0.000	0.00	0.000

Tracers						
fraction	Isotope	Sol #	Activity dpm/ml	Solution Date	Volume Used (ml)	Approx Addition
01	U-232	U-10a	21.310	11/27/2002	0.5640	0.5700
02	U-232	U-10a	21.310	11/27/2002	0.5666	0.5700
03	U-232	U-10a	21.310	11/27/2002	0.5629	0.5700
04	U-232	U-10a	21.310	11/27/2002	0.5622	0.5700

Balance Printer Tapes

Tracer	LCS
0.5640 g 0.5666 g 0.5629 g 0.5622 g	0.4917 g

Matrix Spike

00207

Version 2.0 08/99

Eberline Services - Oak Ridge
Version 2.0 8/1999

Aliquot Worksheet

Work Order	Run	Analysis Code	Aliquot Units	Lab Deadline	Technician
02-11141	1	UUISO	grams	12/5/2002	JBARNARD

Lab Fraction	Duratek Client ID	Sample Type	Muffle Data Ratio Post/Pre	Dilution Data Aliquot	Dilution Data Final (ml)	Dilution Data Ratio	Aliquot Data Aliquot	Aliquot Data Net Equiv	MS Aliquot Data Aliquot	MS Aliquot Data Net Equiv	H-3 Solids Only Water Added (ml)	H-3 Solids Only H3 Dist Aliq
01	LCS	LCS					1.0000E+00	1.0000E+00				
02	BLANK	MBL					1.0000E+00	1.0000E+00				
03	VA-02-0176	DUP		2.5089E+01	100.0000	2.51E-01	4.0000E+00	1.0035E+00				
04	VA-02-0176	DO		2.5089E+01	100.0000	2.51E-01	4.0000E+00	1.0035E+00				

Comments	

00208

Technician: Jay Barnard Date: 12-3-02

Eberline Services
Oak Ridge Laboratory

ALPHA SPECTROMETRY REPORT
5-DEC-2002 10:59:59

****
Spectral File: ND_AMS_ARCHIVE_C:C_0211141A-UU$01_UU.CNF
****

BATCH ID:	0211141A-UU	SAMPLE ID:	01
SAMPLE DATE:	5-DEC-2002 00:00	ALIQUOT:	1.000E+00 gram
SAMPLE TITLE:	SPIKE	DETECTOR NUMBER:	035
ACQ DATE:	5-DEC-2002 07:38	AVERAGE EFFICIENCY:	18.73%
ELAPSED LIVE TIME:	10200.	RECOVERY:	75.44%
TRACER ID:	UU-10A	TRACER FWHM (kev):	140.26
LAMBDA VALUE:	564.	ROI TYPE:	STANDARD
TRACER DPM AT SAMPLE DATE:	12.016	CONFIDENCE FACTOR:	4.65
SAMPLE MATRIX:	SOIL	LLD CONSTANT:	2.71
ENERGY CAL DATE:	29-NOV-2002 13:51	EFF CAL DATE:	29-NOV-2002 13:51
BKG FILENAME:	B_035_27NOV02	BKG ELAPSED TIME:	60000.

****

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	NET AREA	BKG	%ABN	ACTIVITY pCi/ gram	TPU/ERROR 2-SIGMA	MDC pCi/ gram
U232	5302.5	288.00	0.00	99.8	5.413E+00	8.153E-01	5.093E-02
U-234	4761.5	409.83	0.17	99.8	7.702E+00	1.524E+00	8.696E-02
U-235	4385.5	20.00	0.00	80.9	4.637E-01	2.221E-01	6.283E-02
U-236	4485.2	14.83	0.17	90.1	3.087E-01	1.699E-01	9.633E-02
U-238	4184.4	396.66	0.34	100.2	7.423E+00	1.475E+00	1.015E-01

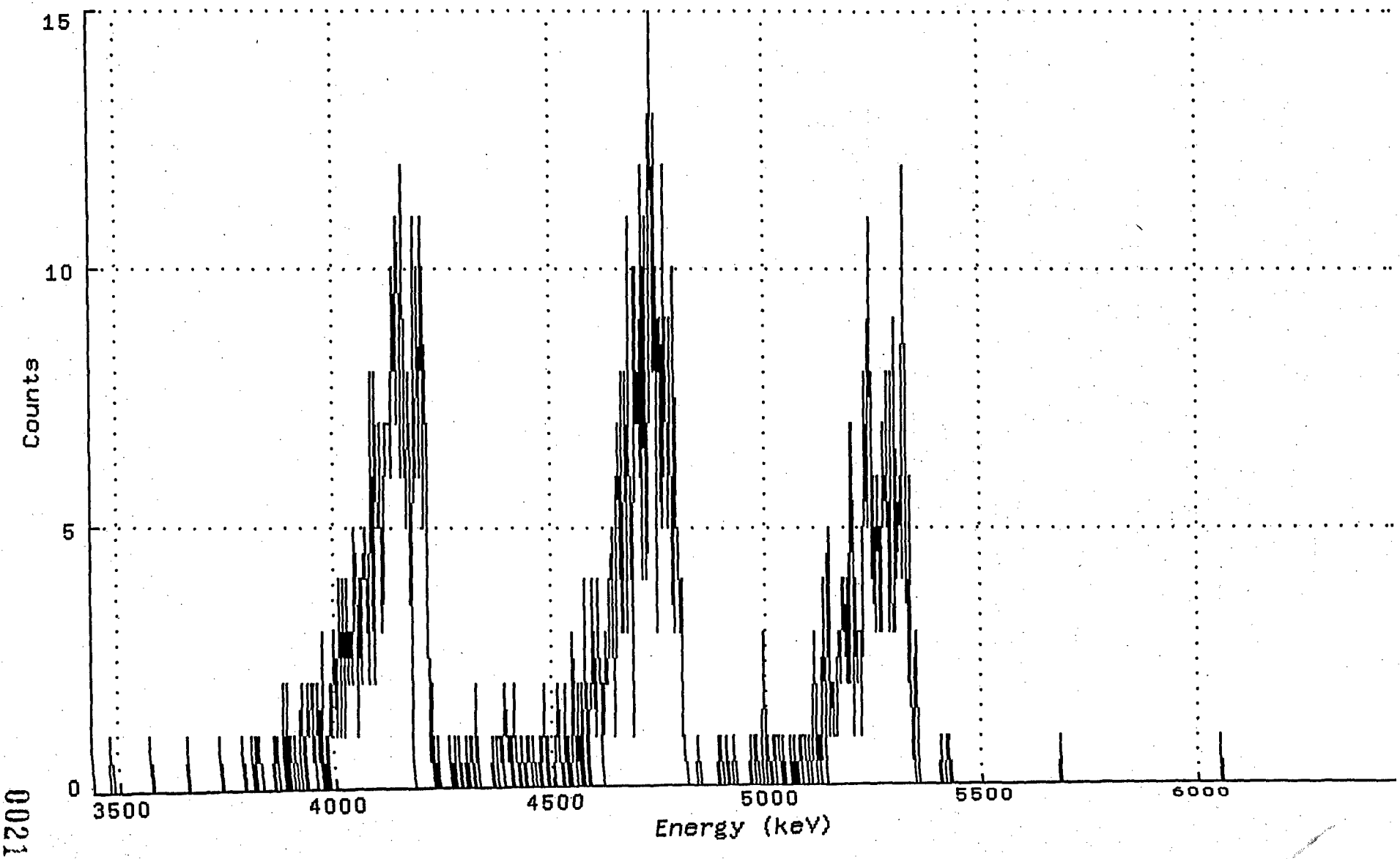
****

*** Tracer FWHM > 80.0 Kev ***

Jay Price — 12-5-02
Analyst — Date

Alan Gregory — 12/5/02
Reviewer — Date

Spectr[illegible] : DKA100:[ALPHA.ALUSR.ARCHIVE.C]C_[illegible]1141A-UU$01_UU.CNF;1
Title : 035
Sample Title: SPIKE
Start Time: 5-DEC-2002 07:38: Sample Time: 5-DEC-2002 00:00: Energy Offset: 3.43016E+03
Real Time : 0 02:50:00.40 Sample ID : 01 Energy Slope : 3.11287E+00
Live Time : 0 02:50:00.00 Sample Type: UU Energy Quad : -1.65671E-04



00210

Channel Contents for ND_AMS_ARCHIVE_C:C_0211141A-UU$01_UU

Channel														
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	1	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43:	0	0	0	0	1	0	0	0	0	0	0	0	0	0
57:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71:	0	0	0	1	0	0	0	0	0	0	0	0	0	0
85:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99:	1	0	0	0	0	0	0	0	0	0	0	0	0	0
113:	0	0	0	1	0	0	0	0	0	0	1	0	1	0
127:	1	1	0	0	0	0	0	0	0	0	0	0	1	0
141:	1	1	0	0	0	0	2	0	0	2	0	1	1	0
155:	1	0	0	0	0	1	2	0	0	0	2	1	1	2
169:	2	1	0	2	1	1	0	3	0	0	1	0	0	2
183:	1	1	3	2	2	1	4	2	1	4	2	1	4	2
197:	2	3	2	4	5	4	3	1	4	2	4	4	5	3
211:	4	2	7	8	4	2	8	6	5	5	7	3	4	5
225:	7	7	7	7	7	6	10	9	7	11	10	9	6	12
239:	6	8	5	8	5	7	0	11	8	6	9	10	6	11
253:	5	10	7	7	4	1	0	2	0	0	1	0	0	0
267:	0	0	0	0	0	0	1	0	0	1	0	0	0	1
281:	0	0	0	0	1	0	0	1	0	1	0	1	2	0
295:	0	0	0	0	0	0	0	0	0	0	1	0	0	0
309:	1	1	1	0	0	2	1	1	1	0	1	0	2	1
323:	1	0	0	0	1	0	0	0	1	1	1	0	0	1
337:	0	0	0	0	1	0	1	1	2	0	1	0	0	0
351:	0	0	1	1	2	1	0	0	0	1	2	0	1	0
365:	0	1	3	2	0	2	1	0	2	0	0	3	4	0
379:	0	1	2	2	4	2	1	4	3	2	2	0	2	2
393:	3	2	3	4	4	5	4	1	4	5	7	4	8	3
407:	3	8	8	3	11	8	4	4	1	10	10	7	8	6
421:	12	4	9	11	4	5	9	11	15	8	11	13	3	10
435:	8	9	6	5	12	6	9	5	9	8	4	3	10	5
449:	5	5	3	4	1	1	0	0	0	0	0	0	0	0
[illegible]:	0	1	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	1	0	1	0	0	0	0	1	0	0	0
[illegible]:	0	1	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	1	0	0	0	1	1	0	0	0	0	0	3	0	0
519:	1	0	0	0	1	0	1	1	1	1	0	0	1	0
533:	0	0	0	0	1	0	0	1	0	0	0	1	0	1
547:	1	1	1	0	1	1	0	1	1	3	1	0	1	1
561:	0	1	4	0	1	4	5	1	2	2	1	1	1	2
575:	3	2	2	4	3	4	3	2	4	2	7	2	7	4
589:	1	4	2	3	3	3	1	4	6	8	6	5	7	11
603:	4	8	4	3	4	6	3	5	3	7	5	6	5	8
617:	3	8	4	3	3	9	4	5	5	6	4	5	12	5
631:	5	2	6	2	1	0	2	3	0	0	0	0	0	0
645:	0	0	0	0	0	0	0	0	0	0	0	0	1	0
659:	0	0	0	1	0	1	0	0	0	0	0	0	0	0
673:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
687:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
701:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
715:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
729:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
743:	0	0	0	0	0	0	0	0	0	1	0	0	0	0
757:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
771:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
785:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
799:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
813:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
827:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
855:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
869:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
883:	1	0	0	0	0	0	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
911:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
925:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
995:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1023:	0	0												

VMS Nuclide Identification Report V3.0 Generated 5-DEC-2002 10:59:57

Configuration	: MCA0:[AMSCOUNT]00000125$1		
Analyses by	: ROIPEAK V1.2,PEAKEFF V2.2,ENBACK V1.6,NID V3.3		
Sample title	: SPIKE		
Sample date	: 5-DEC-2002 00:00:00	Acquisition date	: 5-DEC-2002 07:38:12
Sample ID	: 01	Sample quantity	: 1.0000 gram
Sample type	: UU	Sample geometry	:
Detector name	: 035	Detector geometry	:
Elapsed live time	: 0 02:50:00.00	Elapsed real time	: 0 02:50:00.40 0.0%
Energy tolerance	: 100.00 keV	Half life ratio	: 8.00
Errors propagated	: Yes	Systematic Error	: 3.00 %
Efficiency type	: Average value	Efficiencies at	: Peak Energy
Abundance limit	: 75.00		

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity pCi/gram
0	4134.63*	397135.51	229.10	185	90	10.0			U-238	5.60
0	4372.91*	20 93.26	307.90	284	42	44.7			U-235	0.350
0	4483.38*	15 37.22	344.67	329	29	52.3			U-236	0.233
0	4718.58*	410132.61	423.44	384	81	9.9			U-234	5.81
0	5258.65*	288140.26	607.01	570	76	11.8			U232	4.08

Channel Contents for ND_AMS_ARCHIVE_C:C_0211141A-UU$01_UU

Channel														
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	1	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43:	0	0	0	0	1	0	0	0	0	0	0	0	0	0
57:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71:	0	0	0	1	0	0	0	0	0	0	0	0	0	0
85:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99:	1	0	0	0	0	0	0	0	0	0	0	0	0	0
113:	0	0	0	1	0	0	0	0	0	0	1	0	1	0
127:	1	1	0	0	0	0	0	0	0	0	0	0	1	0
141:	1	1	0	0	0	0	2	0	0	2	0	1	1	0
155:	1	0	0	0	0	1	2	0	0	0	2	1	1	2
169:	2	1	0	2	1	1	0	3	0	0	1	0	0	2
183:	1	1	3	2	2	1	4	2	1	4	2	1	4	2
197:	2	3	2	4	5	4	3	1	4	2	4	4	5	3
211:	4	2	7	8	4	2	8	6	5	5	7	3	4	5
225:	7	7	7	7	7	6	10	9	7	11	10	9	6	12
239:	6	8	5	8	5	7	0	11	8	6	9	10	6	11
253:	5	10	7	7	4	1	0	2	0	0	1	0	0	0
267:	0	0	0	0	0	0	1	0	0	1	0	0	0	1
281:	0	0	0	0	1	0	0	1	0	1	0	1	2	0
295:	0	0	0	0	0	0	0	0	0	0	1	0	0	0
309:	1	1	1	0	0	2	1	1	1	0	1	0	2	1
323:	1	0	0	0	1	0	0	0	1	1	1	0	0	1
337:	0	0	0	0	1	0	1	1	2	0	1	0	0	0
351:	0	0	1	1	2	1	0	0	0	1	2	0	1	0
365:	0	1	3	2	0	2	1	0	2	0	0	3	4	0
379:	0	1	2	2	4	2	1	4	3	2	2	0	2	2
393:	3	2	3	4	4	5	4	1	4	5	7	4	8	3
407:	3	8	8	3	11	8	4	4	1	10	10	7	8	6
421:	12	4	9	11	4	5	9	11	15	8	11	13	3	10
435:	8	9	6	5	12	6	9	5	9	8	4	3	10	5
449:	5	5	3	4	1	1	0	0	0	0	0	0	0	0
[illegible]:	0	1	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	1	0	1	0	0	0	0	1	0	0	0
[illegible]:	0	1	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	1	0	0	0	1	1	0	0	0	0	0	3	0	0
519:	1	0	0	0	1	0	1	1	1	1	0	0	1	0
533:	0	0	0	0	1	0	0	1	0	0	0	1	0	1
547:	1	1	1	0	1	1	0	1	1	3	1	0	1	1
561:	0	1	4	0	1	4	5	1	2	2	1	1	1	2
575:	3	2	2	4	3	4	3	2	4	2	7	2	7	4
589:	1	4	2	3	3	3	1	4	6	8	6	5	7	11
603:	4	8	4	3	4	6	3	5	3	7	5	6	5	8
617:	3	8	4	3	3	9	4	5	5	6	4	5	12	5
631:	5	2	6	2	1	0	2	3	0	0	0	0	0	0
645:	0	0	0	0	0	0	0	0	0	0	0	0	1	0
659:	0	0	0	1	0	1	0	0	0	0	0	0	0	0
673:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
687:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
701:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
715:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
729:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
743:	0	0	0	0	0	0	0	0	0	1	0	0	0	0
757:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
771:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
785:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
799:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
813:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
827:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
855:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
869:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
883:	1	0	0	0	0	0	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
911:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
925:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
995:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1023:	0	0												

Eberline Services
Oak Ridge Laboratory

Gross Sample Counts Within Peak Regions Generated: 5-DEC-2002 10:59:36.24

Detector ID: 35 Acquisition Start: 5-DEC-2002 07:38:12.0
Live Time: 0 02:50:00.00 Real Time: 0 02:50:00.40
Batch Id: 0211141A-UU Sample Id: 01
Sample Type: UU

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4134.63	397	0	135.51	229.10	185	90	3.89E-02	5.0	
2	0	4372.91	20	0	93.26	307.90	284	42	1.96E-03	22.4	
3	0	4483.38	15	0	37.22	344.67	329	29	1.47E-03	25.8	
4	0	4718.58	410	0	132.61	423.44	384	81	4.02E-02	4.9	
5	0	5258.65	288	0	140.26	607.01	570	76	2.82E-02	5.9	

Background Counts Within Peak Regions Generated: 5-DEC-2002 10:59:54.07

Acquisition Start: 27-NOV-2002 19:11:58.01
Live Time: 0 16:40:00.00 Real Time: 0 16:40:00.10

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4137.02	2	0	155.65	229.50	185	90	3.33E-05	70.7	
2	0	4363.72	0	0	0.00	304.50	284	42	0.00E+00	0.0	
3	0	4479.36	1	0	3.11	343.00	329	29	1.67E-05	100.0	
4	0	4721.00	1	0	3.11	424.00	384	81	1.67E-05	100.0	
5	0	5260.22	0	0	0.00	607.50	570	76	0.00E+00	0.0	

Net Sample Counts Within Peak Regions Generated: 5-DEC-2002 10:59:55.32

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4134.63*	397	0	135.51	229.10	185	90	3.89E-02	5.0	
2	0	4372.91*	20	0	93.26	307.90	284	42	1.96E-03	22.4	
3	0	4483.38*	15	0	37.22	344.67	329	29	1.45E-03	26.1	
4	0	4718.58*	410	0	132.61	423.44	384	81	4.02E-02	4.9	
5	0	5258.65*	288	0	140.26	607.01	570	76	2.82E-02	5.9	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.0 Generated 5-DEC-2002 10:59:57

Configuration	: MCA0:[AMSCOUNT]00000125$1		
Analyses by	: ROIPEAK V1.2,PEAKEFF V2.2,ENBACK V1.6,NID V3.3		
Sample title	: SPIKE		
Sample date	: 5-DEC-2002 00:00:00	Acquisition date	: 5-DEC-2002 07:38:12
Sample ID	: 01	Sample quantity	: 1.0000 gram
Sample type	: UU	Sample geometry	:
Detector name	: 035	Detector geometry	:
Elapsed live time	: 0 02:50:00.00	Elapsed real time	: 0 02:50:00.40 0.0%
Energy tolerance	: 100.00 keV	Half life ratio	: 8.00
Errors propagated	: Yes	Systematic Error	: 3.00 %
Efficiency type	: Average value	Efficiencies at	: Peak Energy
Abundance limit	: 75.00		

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity pCi/gram
0	4134.63*	397135.51		229.10	185	90	10.0		U-238	5.60
0	4372.91*	20 93.26		307.90	284	42	44.7		U-235	0.350
0	4483.38*	15 37.22		344.67	329	29	52.3		U-236	0.233
0	4718.58*	410132.61		423.44	384	81	9.9		U-234	5.81
0	5258.65*	288140.26		607.01	570	76	11.8		U232	4.08

Eberline Services
Oak Ridge Laboratory

ALPHA SPECTROMETRY REPORT
5-DEC-2002 11:00:31

****
Spectral File: ND_AMS_ARCHIVE_R:R_0211141A-UU$02_UU.CNF
****

BATCH ID:	0211141A-UU	SAMPLE ID:	02
SAMPLE DATE:	5-DEC-2002 00:00	ALIQUOT:	1.000E+00 gram
SAMPLE TITLE:	BLANK	DETECTOR NUMBER:	036
ACQ DATE:	5-DEC-2002 07:38	AVERAGE EFFICIENCY:	19.70%
ELAPSED LIVE TIME:	10200.	RECOVERY:	101.38%
TRACER ID:	UU-10A	TRACER FWHM (kev):	63.59
LAMBDA VALUE:	567.	ROI TYPE:	STANDARD
TRACER DPM AT SAMPLE DATE:	12.072	CONFIDENCE FACTOR:	4.65
SAMPLE MATRIX:	SOIL	LLD CONSTANT:	2.71
ENERGY CAL DATE:	27-NOV-2002 12:12	EFF CAL DATE:	27-NOV-2002 12:12
BKG FILENAME:	B_036_27NOV02	BKG ELAPSED TIME:	60000.

****

NUCLIDE ACTIVITY SUMMARY

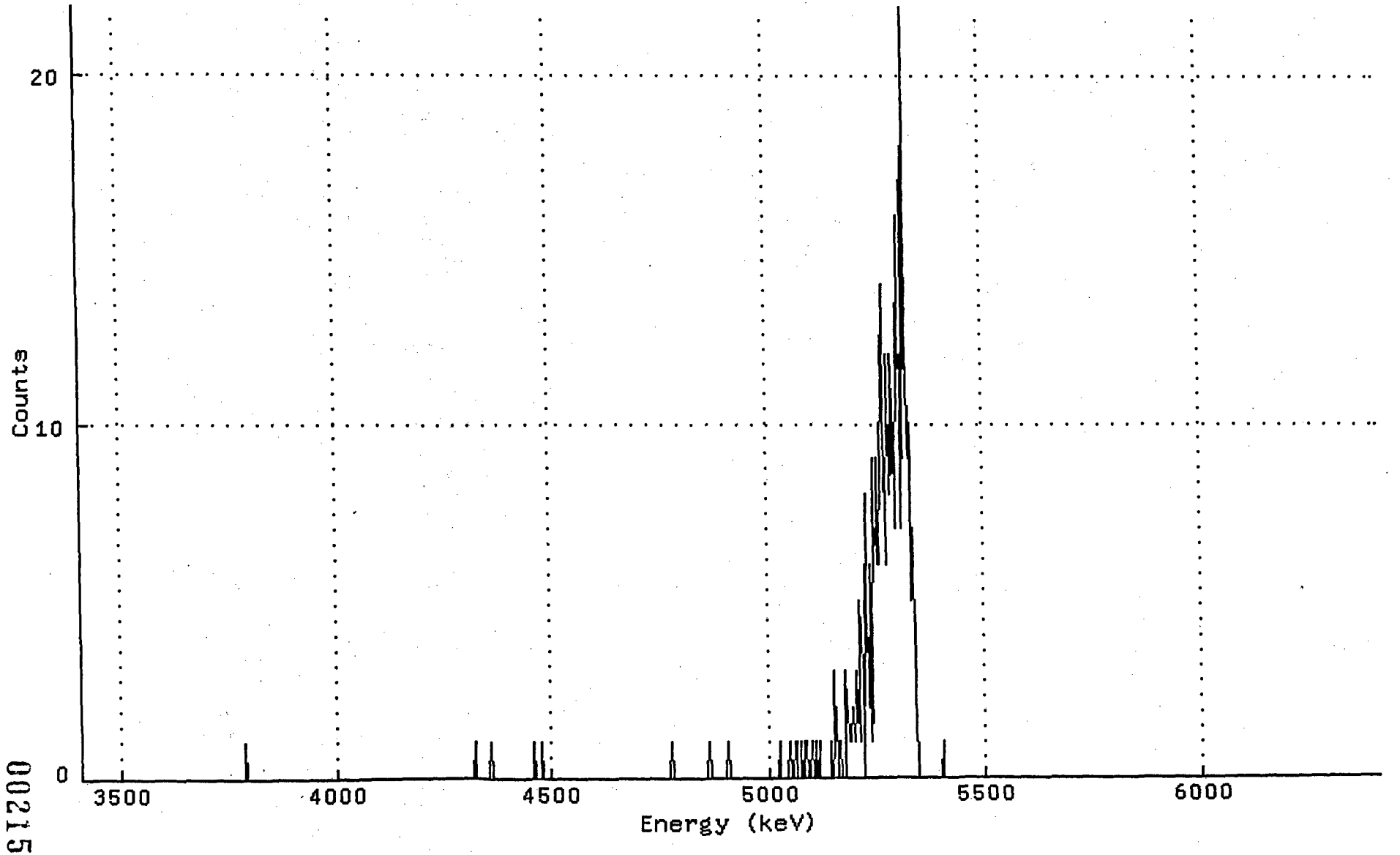
NUCLIDE	ENERGY	NET AREA	BKG	%ABN	ACTIVITY pCi/ gram	TPU/ERROR 2-SIGMA	MDC pCi/ gram
[illegible]32	5302.5	409.00	0.00	99.8	5.438E+00	7.405E-01	3.603E-02
U-234	4761.5	0.66	0.34	99.8	8.775E-03	2.738E-02	7.208E-02
U-235	4385.5	2.00	0.00	80.9	3.280E-02	4.668E-02	4.445E-02
U-236	4485.2	2.00	0.00	90.1	2.945E-02	4.191E-02	3.991E-02
U-238	4184.4	-0.17	0.17	100.2	-2.250E-03	4.515E-03	6.125E-02

****

Analyst: [signature] Date: 12-5-02

Reviewer: [signature] Date: 12/5/02

Spect : DKA100:[ALPHA.ALUSR.ARCHIVE.R] 11141A-UU$02_UU.CNF;1
Title : 036
Sample Title: BLANK
Start Time: 5-DEC-2002 07:38: Sample Time: 5-DEC-2002 00:00: Energy Offset: 3.39917E+03
Real Time : 0 02:50:00.30 Sample ID : 02 Energy Slope : 3.12862E+00
Live Time : 0 02:50:00.00 Sample Type: UU Energy Quad : -1.89044E-04



00215

Channel Contents for ND_AMS_ARCHIVE_R:R_0211141A-UU$02_UU

Channel														
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]5:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
113:	0	0	0	0	0	0	0	0	0	0	0	0	1	0
127:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
141:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
155:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
169:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
183:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
197:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
211:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
225:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
239:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
253:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
267:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
281:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
295:	0	0	0	0	1	0	0	0	0	0	0	0	0	0
309:	0	0	1	0	0	0	0	0	0	0	0	0	0	0
323:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
337:	0	0	0	0	0	0	0	0	0	1	0	0	0	0
351:	0	1	0	0	0	0	0	0	0	0	0	0	0	0
365:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
379:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
393:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
407:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
421:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
435:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
449:	0	0	0	1	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	1	0	0	0	0	0	0	0	0	0
491:	0	0	0	0	0	1	0	0	0	0	0	0	0	0
505:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
519:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
533:	0	0	0	0	1	0	0	0	0	0	0	0	1	0
547:	0	0	1	1	0	0	0	1	0	1	0	1	0	0
561:	0	1	1	0	0	1	0	1	0	0	0	0	0	0
575:	0	0	0	1	0	1	3	1	1	0	1	0	0	0
589:	0	3	2	1	1	1	2	2	1	2	3	2	1	5
603:	4	3	0	4	8	5	2	6	1	2	9	6	7	6
617:	9	6	9	9	11	14	10	6	12	12	8	9	12	10
631:	7	9	11	16	16	7	17	9	14	22	12	9	10	5
645:	7	3	2	0	0	0	0	0	0	0	0	0	0	0
659:	0	0	0	0	0	0	0	0	1	0	0	0	0	0
673:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
687:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
701:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
715:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
729:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
743:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
757:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
771:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
785:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
799:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
813:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
827:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
855:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
869:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
883:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
911:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
925:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
967:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
981:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
995:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1023:	0	0												

Eberline Services
Oak Ridge Laboratory

Gross Sample Counts Within Peak Regions Generated: 5-DEC-2002 11:00:24.41

Detector ID: 36 Acquisition Start: 5-DEC-2002 07:38:30.01
Live Time: 0 02:50:00.00 Real Time: 0 02:50:00.30
Batch Id: 0211141A-UU Sample Id: 02
Sample Type: UU

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4134.59	0	0	0.00	238.50	194	90	0.00E+00	0.0	
2	0	4335.81	2	0	40.67	305.00	293	43	1.96E-04	70.7	
3	0	4468.03	2	0	21.90	349.00	338	29	1.96E-04	70.7	
4	0	4774.68	1	0	3.13	452.00	393	82	9.80E-05	100.0	
5	0	5281.86	409	0	63.59	625.40	580	76	4.01E-02	4.9	

Background Counts Within Peak Regions Generated: 5-DEC-2002 11:00:28.25

Acquisition Start: 27-NOV-2002 19:12:02.01
Live Time: 0 16:40:00.00 Real Time: 0 16:40:00.10

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4139.01	1	0	3.09	238.50	194	90	1.67E-05	100.0	
2	0	4366.01	0	0	0.00	314.00	293	43	0.00E+00	0.0	
[illegible]	0	4479.61	0	0	0.00	352.00	338	29	0.00E+00	0.0	
[illegible]	0	4721.77	2	0	101.99	433.50	393	82	3.33E-05	70.7	
[illegible]	0	5261.06	0	0	0.00	617.50	580	76	0.00E+00	0.0	

Net Sample Counts Within Peak Regions Generated: 5-DEC-2002 11:00:28.76

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4134.59*	0	0	0.00	238.50	194	90	-1.67E-05	100.0	
2	0	4335.81*	2	0	40.67	305.00	293	43	1.96E-04	70.7	
3	0	4468.03*	2	0	21.90	349.00	338	29	1.96E-04	70.7	
4	0	4774.68*	1	0	3.13	452.00	393	82	6.47E-05	155.8	
5	0	5281.86*	409	0	63.59	625.40	580	76	4.01E-02	4.9	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.0 Generated 5-DEC-2002 11:00:29

Configuration : MCA0:[AMSCOUNT]00000125$1
Analyses by : ROIPEAK V1.2,PEAKEFF V2.2,ENBACK V1.6,NID V3.3
Sample title : BLANK
Sample date : 5-DEC-2002 00:00:00 Acquisition date : 5-DEC-2002 07:38:30
Sample ID : 02 Sample quantity : 1.0000 gram
Sample type : UU Sample geometry :
Detector name : 036 Detector geometry:
Elapsed live time: 0 02:50:00.00 Elapsed real time: 0 02:50:00.30 0.0%
Energy tolerance : 100.00 keV Half life ratio : 8.00
Errors propagated: Yes Systematic Error : 3.00 %
Efficiency type : Average value Efficiencies at : Peak Energy
Abundance limit : 75.00

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity pCi/gram
0	4134.59*	0	0.00	238.50	194	90200.0			U-238	-2.282E-03
0	4335.81*	2	40.67	305.00	293	43141.4			U-235	3.325E-02
0	4468.03*	2	21.90	349.00	338	29141.4			U-236	2.986E-02
0	4774.68*	1	3.13	452.00	393	82311.7			U-234	8.896E-03
0	5281.86*	409	63.59	625.40	580	76	9.9		U232	5.51

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Oak Ridge Laboratory

ALPHA SPECTROMETRY REPORT
5-DEC-2002 11:01:26

****
Spectral File: ND_AMS_ARCHIVE_S:S_0211141A-UU$03_UU.CNF
****

BATCH ID:	0211141A-UU	SAMPLE ID:	03
SAMPLE DATE:	25-NOV-2002 00:00	ALIQUOT:	1.003E+00 gram
SAMPLE TITLE:	VA-02-0176	DETECTOR NUMBER:	037
ACQ DATE:	5-DEC-2002 07:38	AVERAGE EFFICIENCY:	18.25%
ELAPSED LIVE TIME:	10200.	RECOVERY:	122.28%
TRACER ID:	UU-10A	TRACER FWHM (kev):	81.58
LAMBDA VALUE:	563.	ROI TYPE:	STANDARD
TRACER DPM AT SAMPLE DATE:	11.996	CONFIDENCE FACTOR:	4.65
SAMPLE MATRIX:	SOIL	LLD CONSTANT:	2.71
ENERGY CAL DATE:	27-NOV-2002 12:12	EFF CAL DATE:	27-NOV-2002 12:12
BKG FILENAME:	B_037_27NOV02	BKG ELAPSED TIME:	60000.

****

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	NET AREA	BKG	%ABN	ACTIVITY pCi/ gram	TPU/ERROR 2-SIGMA	MDC pCi/ gram
U-232	5302.5	454.00	0.00	99.8	5.385E+00	7.149E-01	3.213E-02
U-234	4761.5	1.66	0.34	99.8	1.968E-02	3.416E-02	6.428E-02
U-235	4385.5	0.00	0.00	80.9	0.000E+00	0.000E+00	3.964E-02
U-236	4485.2	1.00	0.00	90.1	1.313E-02	2.635E-02	3.559E-02
U-238	4184.4	1.83	0.17	100.2	2.161E-02	3.380E-02	5.463E-02

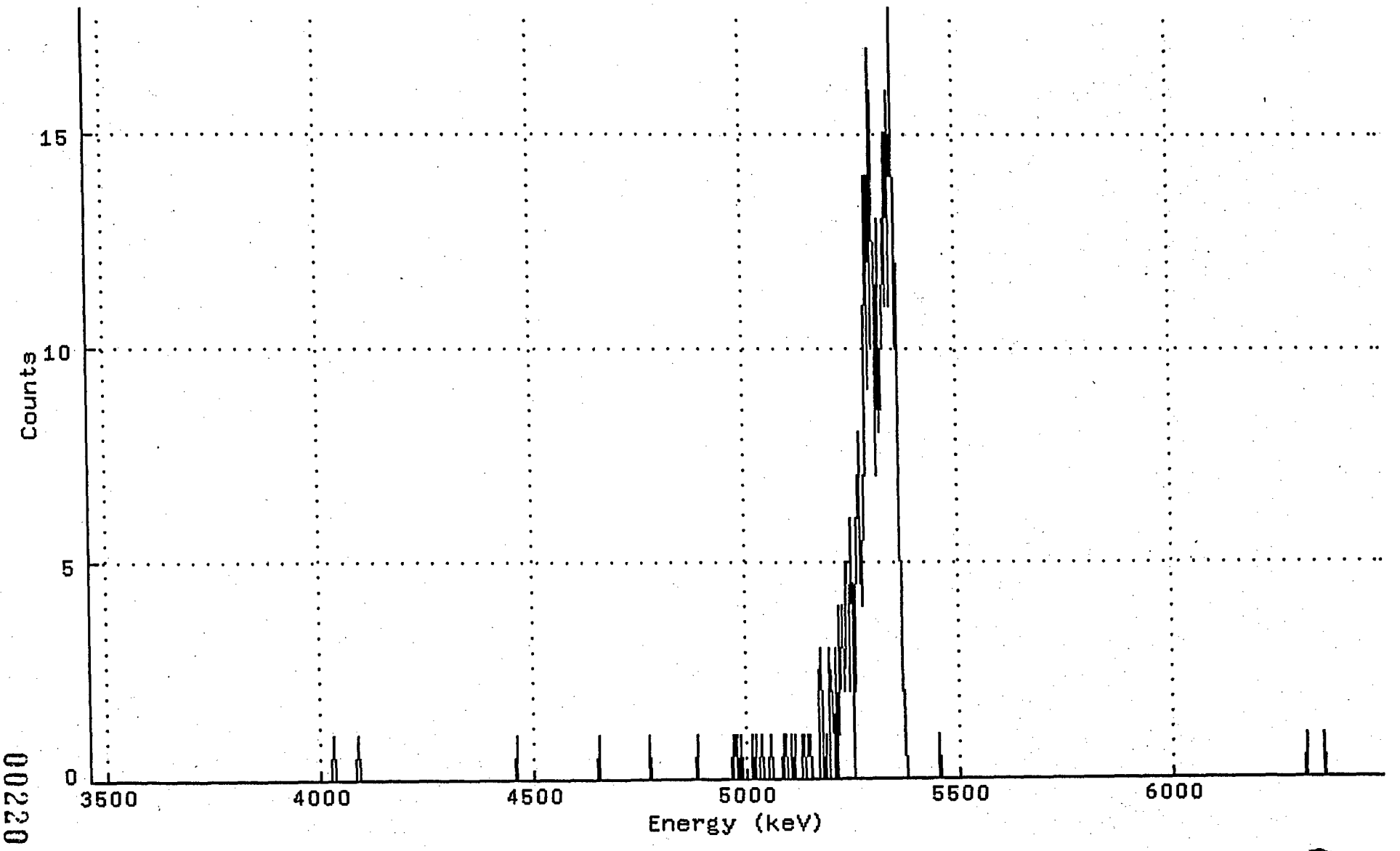
****

*** Tracer FWHM > 80.0 Kev ***
*** Chemical Recovery > 115.0% ***

Jay Price — 12-5-02
Analyst — Date

Alan Gregley — 12/5/02
Reviewer — Date

Spectr[illegible] : DKA100:[ALPHA.ALUSR.ARCHIVE.S]S_[illegible]11141A-UU$03_UU.CNF;1
Title : 037
Sample Title: VA-02-0176
Start Time: 5-DEC-2002 07:38: Sample Time: 25-NOV-2002 00:00 Energy Offset: 3.45229E+03
Real Time : 0 02:50:00.40 Sample ID : 03 Energy Slope : 3.07294E+00
Live Time : 0 02:50:00.00 Sample Type: UU Energy Quad : -1.10738E-04



00220

Channel Contents for ND_AMS_ARCHIVE_S:S_0211141A-UU$03_UU

Channel														
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
113:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
127:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
141:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
155:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
169:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
183:	0	0	0	0	0	0	1	0	0	0	0	0	0	0
197:	0	0	0	0	0	0	0	0	0	0	0	1	0	0
211:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
225:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
239:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
253:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
267:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
281:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
295:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
309:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
323:	0	0	0	0	0	0	0	0	1	0	0	0	0	0
337:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
351:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
365:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
379:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
393:	0	0	1	0	0	0	0	0	0	0	0	0	0	0
407:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
421:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
435:	0	1	0	0	0	0	0	0	0	0	0	0	0	0
449:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	1	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	1	0	1	0
[illegible]:	1	0	0	1	0	0	0	0	0	0	0	0	1	0
519:	1	0	0	0	1	1	0	0	0	0	0	0	1	0
533:	0	0	0	0	0	0	0	0	1	0	1	0	0	0
547:	0	1	0	1	0	0	0	0	0	0	1	1	0	1
561:	1	1	0	0	0	0	0	0	0	2	3	1	0	0
575:	1	0	0	0	3	2	2	2	0	3	0	0	4	1
589:	3	3	4	2	3	5	5	4	2	6	3	0	4	5
603:	6	6	8	5	4	7	7	8	14	9	14	14	10	17
617:	15	10	7	10	13	8	9	11	10	13	11	15	15	11
631:	16	14	14	18	10	12	8	2	2	1	0	0	0	0
645:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
659:	0	0	0	0	0	0	0	0	1	0	0	0	0	0
673:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
687:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
701:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
715:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
729:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
743:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
757:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
771:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
785:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
799:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
813:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
827:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
855:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
869:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
883:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
911:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
925:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	1	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	1	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
995:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1023:	0	0												

Eberline Services
Oak Ridge Laboratory

Gross Sample Counts Within Peak Regions Generated: 5-DEC-2002 11:01:13.87

Detector ID: 37 Acquisition Start: 5-DEC-2002 07:38:52.01
Live Time: 0 02:50:00.00 Real Time: 0 02:50:00.40
Batch Id: 0211141A-UU Sample Id: 03
Sample Type: UU

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4057.91	2	0	61.46	198.50	179	91	1.96E-04	70.7	
2	0	4362.70	0	0	0.00	299.50	279	42	0.00E+00	0.0	
3	0	4457.30	1	0	3.07	331.00	324	29	9.80E-05	100.0	
4	0	4709.98	2	0	129.06	415.50	379	81	1.96E-04	70.7	
5	0	5305.56	454	0	81.58	616.80	564	75	4.45E-02	4.7	

Background Counts Within Peak Regions Generated: 5-DEC-2002 11:01:23.01

Acquisition Start: 27-NOV-2002 19:12:05.01
Live Time: 0 16:40:00.00 Real Time: 0 16:40:00.10

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4134.08	1	0	3.14	224.00	179	91	1.67E-05	100.0	
2	0	4363.78	0	0	0.00	299.50	279	42	0.00E+00	0.0	
[illegible]	0	4480.09	0	0	0.00	338.00	324	29	0.00E+00	0.0	
[illegible]	0	4723.02	2	0	34.53	419.00	379	81	3.33E-05	70.7	
5	0	5260.02	0	0	0.00	601.00	564	75	0.00E+00	0.0	

Net Sample Counts Within Peak Regions Generated: 5-DEC-2002 11:01:23.78

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4057.91*	2	0	61.46	198.50	179	91	1.79E-04	77.8	
2	0	4362.70*	0	0	0.00	299.50	279	42	0.00E+00	0.0	
3	0	4457.30*	1	0	3.07	331.00	324	29	9.80E-05	100.0	
4	0	4709.98*	2	0	129.06	415.50	379	81	1.63E-04	86.4	
5	0	5305.56*	454	0	81.58	616.80	564	75	4.45E-02	4.7	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.0 Generated 5-DEC-2002 11:01:24

Configuration : MCA0:[AMSCOUNT]00000125$1
Analyses by : ROIPEAK V1.2,PEAKEFF V2.2,ENBACK V1.6,NID V3.3
Sample title : VA-02-0176
Sample date : 25-NOV-2002 00:00:00 Acquisition date : 5-DEC-2002 07:38:52
Sample ID : 03 Sample quantity : 1.0035 gram
Sample type : UU Sample geometry :
Detector name : 037 Detector geometry:
Elapsed live time: 0 02:50:00.00 Elapsed real time: 0 02:50:00.40 0.0%
Energy tolerance : 100.00 keV Half life ratio : 8.00
Errors propagated: Yes Systematic Error : 3.00 %
Efficiency type : Average value Efficiencies at : Peak Energy
Abundance limit : 75.00

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity pCi/gram
0	4057.91*	2	61.46	198.50	179	91	155.7		U-238	2.642E-02
0	4362.70*	0	0.00	299.50	279	42	0.0		U-235	0.000E+00
0	4457.30*	1	3.07	331.00	324	29	200.0		U-236	1.606E-02
0	4709.98*	2	129.06	415.50	379	81	172.8		U-234	2.407E-02
0	5305.56*	454	81.58	616.80	564	75	9.4		U232	6.58

Eberline Services
Oak Ridge Laboratory

ALPHA SPECTROMETRY REPORT
5-DEC-2002 11:02:50

****
Spectral File: ND_AMS_ARCHIVE_S:S_0211141A-UU$04_UU.CNF
****

BATCH ID:	0211141A-UU	SAMPLE ID:	04
SAMPLE DATE:	25-NOV-2002 00:00	ALIQUOT:	1.003E+00 gram
SAMPLE TITLE:	VA-02-0176	DETECTOR NUMBER:	038
ACQ DATE:	5-DEC-2002 07:39	AVERAGE EFFICIENCY:	19.65%
ELAPSED LIVE TIME:	10200.	RECOVERY:	106.15%
TRACER ID:	UU-10A	TRACER FWHM (kev):	72.27
LAMBDA VALUE:	562.	ROI TYPE:	STANDARD
TRACER DPM AT SAMPLE DATE:	11.981	CONFIDENCE FACTOR:	4.65
SAMPLE MATRIX:	SOIL	LLD CONSTANT:	2.71
ENERGY CAL DATE:	27-NOV-2002 12:13	EFF CAL DATE:	27-NOV-2002 12:13
BKG FILENAME:	B_038_27NOV02	BKG ELAPSED TIME:	60000.

****

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	NET AREA	BKG	%ABN	ACTIVITY pCi/ gram	TPU/ERROR 2-SIGMA	MDC pCi/ gram
[illegible]32	5302.5	423.83	0.17	99.8	5.378E+00	7.256E-01	5.870E-02
U-234	4761.5	0.83	0.17	99.8	1.053E-02	2.579E-02	5.870E-02
U-235	4385.5	-0.17	0.17	80.9	-2.660E-03	5.337E-03	7.241E-02
U-236	4485.2	0.00	0.00	90.1	0.000E+00	0.000E+00	3.808E-02
U-238	4184.4	1.83	0.17	100.2	2.312E-02	3.617E-02	5.845E-02

****

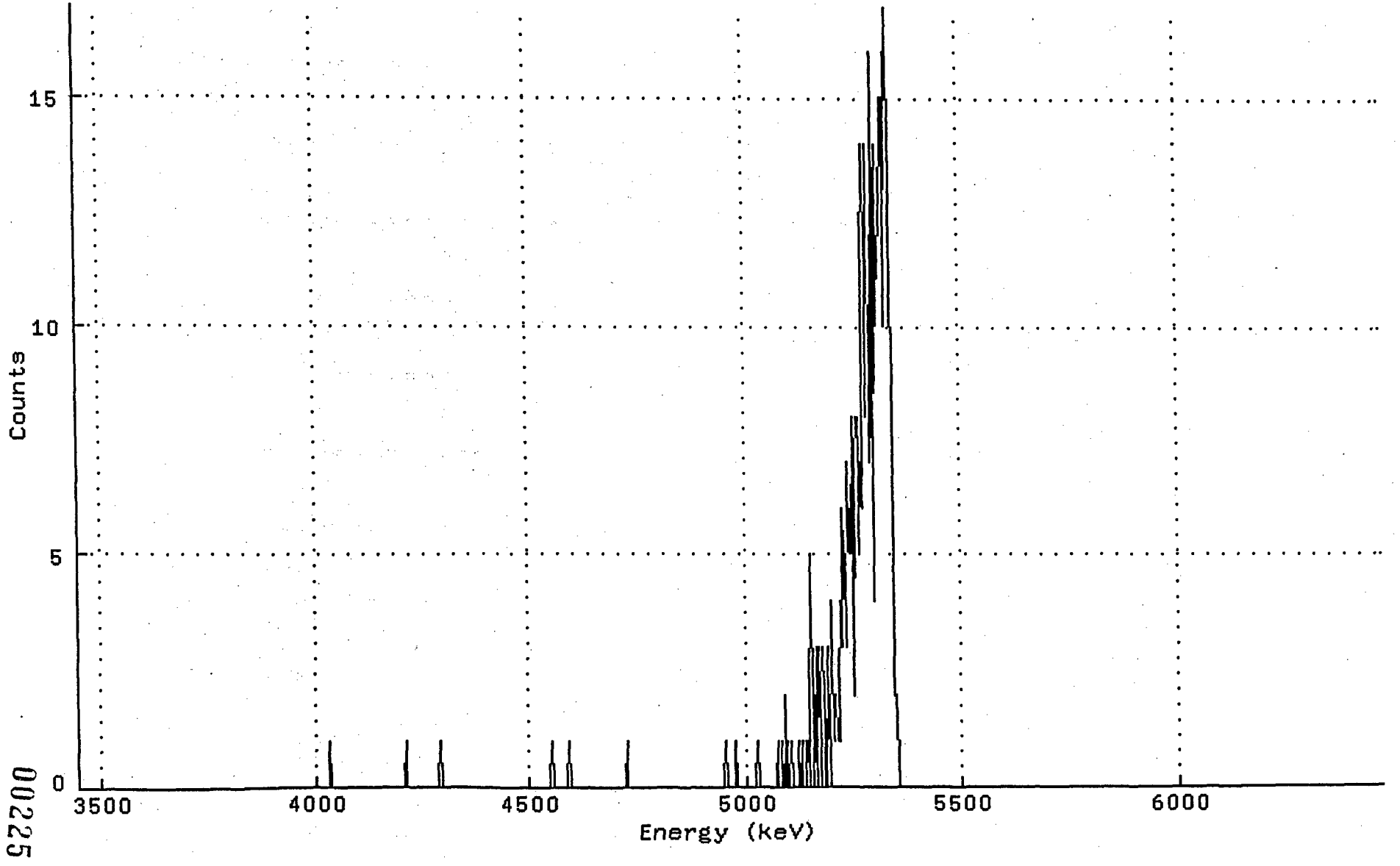
Jay Price
Analyst

12-5-02
Date

Dave Gregley
Reviewer

12/5/02
Date

Spect : DKA100:[ALPHA.ALUSR.ARCHIVE.S]S 1141A-UU$04_UU.CNF;1
Title : 038
Sample Title: VA-02-0176
Start Time: 5-DEC-2002 07:39: Sample Time: 25-NOV-2002 00:00 Energy Offset: 3.43921E+03
Real Time : 0 02:50:00.30 Sample ID : 04 Energy Slope : 3.11022E+00
Live Time : 0 02:50:00.00 Sample Type: UU Energy Quad : -1.51368E-04



00225

nnel Contents for ND_AMS_ARCHIVE_S:S_0211141A-UU$04_UU

nnel														
:	0	0	0	0	0	0	0	0	0	0	0	0	0	
15:	0	0	0	0	0	0	0	0	0	0	0	0	0	
29:	0	0	0	0	0	0	0	0	0	0	0	0	0	
43:	0	0	0	0	0	0	0	0	0	0	0	0	0	
57:	0	0	0	0	0	0	0	0	0	0	0	0	0	
71:	0	0	0	0	0	0	0	0	0	0	0	0	0	
85:	0	0	0	0	0	0	0	0	0	0	0	0	0	
99:	0	0	0	0	0	0	0	0	0	0	0	0	0	
13:	0	0	0	0	0	0	0	0	0	0	0	0	0	
27:	0	0	0	0	0	0	0	0	0	0	0	0	0	
41:	0	0	0	0	0	0	0	0	0	0	0	0	0	
55:	0	0	0	0	0	0	0	0	0	0	0	0	0	
69:	0	0	0	0	0	0	0	0	0	0	0	0	0	
83:	0	0	0	0	0	0	0	0	0	1	0	0	0	
97:	0	0	0	0	0	0	0	0	0	0	0	0	0	
11:	0	0	0	0	0	0	0	0	0	0	0	0	0	
25:	0	0	0	0	0	0	0	0	0	0	0	0	0	
39:	0	0	0	0	0	0	0	0	0	0	0	1	0	
53:	0	0	0	0	0	0	0	0	0	0	0	0	0	
67:	0	0	0	0	0	0	0	0	0	1	0	0	0	
81:	0	0	0	0	0	0	0	0	0	0	0	0	0	
95:	0	0	0	0	0	0	0	0	0	0	0	0	0	
09:	0	0	0	0	0	0	0	0	0	0	0	0	0	
23:	0	0	0	0	0	0	0	0	0	0	0	0	0	
37:	0	0	0	0	0	0	0	0	0	0	0	0	0	
51:	0	0	0	0	0	0	0	0	0	0	0	0	1	0
65:	0	0	0	0	0	0	0	0	0	0	0	1	0	0
79:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
93:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21:	1	0	0	0	0	0	0	0	0	0	0	0	0	0
35:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
49:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
91:	0	0	0	0	0	0	0	1	0	0	0	0	0	0
505:	0	1	0	0	0	0	0	0	0	0	0	0	0	0
519:	0	0	0	0	1	0	0	0	0	0	0	0	0	0
533:	0	0	0	0	0	0	1	0	0	0	1	0	0	2
547:	0	0	1	1	0	0	0	0	0	1	0	1	0	0
561:	0	1	1	0	1	5	1	0	1	3	0	3	0	2
575:	3	2	0	0	3	2	0	4	3	1	2	2	1	1
589:	2	4	3	6	5	3	3	7	5	6	5	8	2	7
603:	8	8	5	7	6	11	14	11	8	14	7	7	8	16
617:	4	13	14	10	12	12	12	15	15	10	16	15	17	13
631:	7	2	2	0	0	0	0	0	0	0	0	0	0	0
645:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
659:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
673:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
687:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
701:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
715:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
729:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
743:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
757:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
771:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
785:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
799:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
813:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
827:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
855:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
869:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
883:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
911:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
925:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0
967:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
981:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
995:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1023:	0	0												

Eberline Services
Oak Ridge Laboratory

Gross Sample Counts Within Peak Regions Generated: 5-DEC-2002 11:01:44.50

Detector ID: 38 Acquisition Start: 5-DEC-2002 07:39:13.01
Live Time: 0 02:50:00.00 Real Time: 0 02:50:00.30
Batch Id: 0211141A-UU Sample Id: 04
Sample Type: UU

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4119.18	2	0	183.50	221.00	182	90	1.96E-04	70.7	
2	0	4363.19	0	0	0.00	301.50	281	42	0.00E+00	0.0	
3	0	4477.69	0	0	0.00	339.50	325	30	0.00E+00	0.0	
4	0	4721.79	1	0	3.11	421.00	380	82	9.80E-05	100.0	
5	0	5283.92	424	0	72.27	611.30	566	75	4.16E-02	4.9	

Background Counts Within Peak Regions Generated: 5-DEC-2002 11:02:47.69

Acquisition Start: 27-NOV-2002 19:12:08.01
Live Time: 0 16:40:00.00 Real Time: 0 16:40:00.00

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4136.22	1	0	3.10	226.50	182	90	1.67E-05	100.0	
2	0	4363.17	1	0	3.10	301.50	281	42	1.67E-05	100.0	
	0	4477.59	0	0	0.00	339.50	325	30	0.00E+00	0.0	
	0	4720.22	1	0	3.10	420.50	380	82	1.67E-05	100.0	
	0	5260.56	1	0	3.10	603.00	566	75	1.67E-05	100.0	

Net Sample Counts Within Peak Regions Generated: 5-DEC-2002 11:02:48.26

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4119.18*	2	0	183.50	221.00	182	90	1.79E-04	77.8	
2	0	4363.19*	0	0	0.00	301.50	281	42	-1.67E-05	100.0	
3	0	4477.69*	0	0	0.00	339.50	325	30	0.00E+00	0.0	
4	0	4721.79*	1	0	3.11	421.00	380	82	8.14E-05	122.2	
5	0	5283.92*	424	0	72.27	611.30	566	75	4.16E-02	4.9	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.0 Generated 5-DEC-2002 11:02:49

Configuration	: MCA0:[AMSCOUNT]00000125$1		
Analyses by	: ROIPEAK V1.2,PEAKEFF V2.2,ENBACK V1.6,NID V3.3		
Sample title	: VA-02-0176		
Sample date	: 25-NOV-2002 00:00:00	Acquisition date	: 5-DEC-2002 07:39:13
Sample ID	: 04	Sample quantity	: 1.0035 gram
Sample type	: UU	Sample geometry	:
Detector name	: 038	Detector geometry	:
Elapsed live time	: 0 02:50:00.00	Elapsed real time	: 0 02:50:00.30 0.0%
Energy tolerance	: 100.00 keV	Half life ratio	: 8.00
Errors propagated	: Yes	Systematic Error	: 3.00 %
Efficiency type	: Average value	Efficiencies at	: Peak Energy
Abundance limit	: 75.00		

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity pCi/gram
0	4119.18*	2183.50		221.00	182	90155.7			U-238	2.454E-02
0	4363.19*	0	0.00	301.50	281	42200.0			U-235	-2.824E-03
0	4477.69*	0	0.00	339.50	325	30	0.0		U-236	0.000E+00
0	4721.79*	1	3.11	421.00	380	82244.4			U-234	1.118E-02
0	5283.92*	424	72.27	611.30	566	75	9.7		U232	5.71

SECTION IX

ANALYTICAL DATA (ISOTOPIC THORIUM)

Work Order	02-11141
Analysis Code	ThISO
Run	1
Date Received	11/26/2002
Lab Deadline	12/5/2002
Client	Duratek
Project	106760.003
Report Level	4
Activity Units	pCi
Aliquot Units	g
Matrix	OS
Method	EML Th-01 Modified
Instrument Type	Alpha Spectroscopy
Radiometric Tracer	Th-229
Radiometric Sol#	Th-18a
Tracer Act (dpm/g)	22.487
Carrier	
Carrier Conc (mg/ml)	

Internal Fraction	Sample Desc	Client ID	Login CPM	Sample Date	Sample Aliquot
01	LCS	LCS		11/26/02 00:00	1.0000E+00
02	MBL	BLANK		11/26/02 00:00	1.0000E+00
03	DUP	VA-02-0176	89	11/25/02 12:00	1.0035E+00
04	DO	VA-02-0176	89	11/25/02 12:00	1.0035E+00

0023

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

Internal Fraction	Sample Desc	Tracer Aliquot (g)	Tracer Total ACT (dpm)	Radiometric Tracer (pCi)	Radiometric % Rec	Grav Carrier Added (ml)	Grav Filter Tare (g)	Grav Filter Final (g)	Grav Filter Net (g)	Grav % Rec	Mean % Rec	SAF 1*	SAF 2*
01	LCS	0.4523	10.2										
02	MBL	0.4532	10.2										
03	DUP	0.4532	10.2										
04	DO	0.4534	10.2										

00231

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

Internal Fraction	Sample Desc	Rough Prep Date	Rough Prep By	Prep Date	Prep By	Sep t0 Date/Time	Sep t0 By	Sep t1 Date/Time	Sep t1 By
01	LCS			11/27/02 12:10	JBARNARD	12/05/02 05:10	TSMITH		
02	MBL			11/27/02 12:10	JBARNARD	12/05/02 05:10	TSMITH		
03	DUP			11/27/02 12:10	JBARNARD	12/05/02 05:10	TSMITH		
04	DO			11/27/02 12:10	JBARNARD	12/05/02 05:10	TSMITH		

00232

* SAF1 [illegible]d for Gross Alpha and all other radionuclides. SAF2 is used for Gross Beta only. [illegible]ual mass exceeded the calibration curve range. Results should be qualified as appropr[illegible].

Preliminary Data Report - Analytical Calculations
Work Order: 02-11141-ThISO-1

Client: Duratek
Eberline Services Work Order: 02-11141
Analysis Code: ThISO
Run: 1

Lab Fraction	Nuclide	Sample Desc	Client Identification	Activity Units	Results	Error Estimate	MDA	LCS Known	LCS %R	LCS Flag	RPD Flag	MDA Flag	Blank Flag
01	TH-228	LCS	LCS	pCi/g	4.98E+00	9.86E-01	1.26E-01	4.67E+00	106.54	OK		OK	
02	TH-228	MBL	BLANK	pCi/g	-1.31E-02	1.20E-02	1.08E-01					OK	OK
03	TH-228	DUP	VA-02-0176	pCi/g	2.65E-02	7.06E-02	1.64E-01				INV	OK	
04	TH-228	DO	VA-02-0176	pCi/g	-2.65E-04	2.79E-02	9.44E-02					OK	

125-02

00233

Client: Duratek
Eberline Services Work Order: 02-11141
Analysis Code: ThISO
Run: 1

Lab Fraction	Nuclide	Sample Desc	Sample Date	Sample Aliquot	Radiometric % Rec	Grav % Rec	Mean % Rec	SAF	Sep t0 Date/Time	Sep t1 Date/Time
01	TH-228	LCS	11/26/02 00:00	1.00E+00	101.99				12/5/2002 5:10	
02	TH-228	MBL	11/26/02 00:00	1.00E+00	80.09				12/5/2002 5:10	
03	TH-228	DUP	11/25/02 12:00	1.00E+00	82.85				12/5/2002 5:10	
04	TH-228	DO	11/25/02 12:00	1.00E+00	97.25				12/5/2002 5:10	

00234

Client: Duratek
Eberline Services Work Order: 02-11141
Analysis Code: ThISO
Run: 1

Lab Fraction	Nuclide	Sample Desc	Counting Date/Time	Halflife (days)	Detect	Carrier	Count Time	Counts	Bkg CPM	Eff
01	TH-228	LCS	12/05/02 08:27		A_Spec	12	170.07	3.81 E+02	1.30 E-02	19.9
02	TH-228	MBL	12/05/02 08:28		A_Spec	13	170.07	-8.50 E-01	5.00 E-03	21.5
03	TH-228	DUP	12/05/02 08:28		A_Spec	14	170.03	1.77 E+00	1.90 E-02	21.5
04	TH-228	DO	12/05/02 08:28		A_Spec	16	170.1	-2.05 E-02	6.00 E-03	21.3

Work Order: 02-11141-ThISO-1

Client: Duratek
Eberline Services Work Order: 02-11141
Analysis Code: ThISO
Run: 1

Lab Fraction	Nuclide	Sample Desc	Client Identification	Activity Units	Results	Error Estimate	MDA	LCS Known	LCS %R	LCS Flag	RPD Flag	MDA Flag	Blank Flag
01	TH-230	LCS	LCS	pCi/g	5.90E+00	1.14E+00	1.11E-01	5.28E+00	111.58	OK		OK	
02	TH-230	MBL	BLANK	pCi/g	9.49E-02	8.41E-02	1.08E-01					OK	OK
03	TH-230	DUP	VA-02-0176	pCi/g	2.02E-01	1.17E-01	8.03E-02				INV	OK	
04	TH-230	DO	VA-02-0176	pCi/g	2.64E-01	1.25E-01	6.92E-02					OK	

00236

Client: Duratek
Eberline Services Work Order: 02-11141
Analysis Code: ThISO
Run: 1

Lab Fraction	Nuclide	Sample Desc	Sample Date	Sample Aliquot	Radiometric % Rec	Grav % Rec	Mean % Rec	SAF	Sep t0 Date/Time	Sep t1 Date/Time
01	TH-230	LCS	11/26/02 00:00	1.00E+00	101.99				12/5/2002 5:10	
02	TH-230	MBL	11/26/02 00:00	1.00E+00	80.09				12/5/2002 5:10	
03	TH-230	DUP	11/25/02 12:00	1.00E+00	82.85				12/5/2002 5:10	
04	TH-230	DO	11/25/02 12:00	1.00E+00	97.25				12/5/2002 5:10	

00237

Work Order: 02-11141-ThISO-1

Run: 1
Analysis Code: ThISO
Eberline Services Work Order: 02-11141
Client: Duratek

Lab Fraction	Nuclide	Sample Desc	Counting Date/Time	Halflife (days)	Detect	Carrier	Count Time	Counts	Bkg CPM	Eff
01	TH-230	LCS	12/05/02 08:27		A_Spec	12	170.07	4.51 E+02	9.00 E-03	19.9
02	TH-230	MBL	12/05/02 08:28		A_Spec	13	170.07	6.15 E+00	5.00 E-03	21.5
03	TH-230	DUP	12/05/02 08:28		A_Spec	14	170.03	1.37 E+01	2.00 E-03	21.5
04	TH-230	DO	12/05/02 08:28		A_Spec	16	170.1	2.07 E+01	2.00 E-03	21.3

00238

Work Order: 02-11141-ThISO-1

Client: Duratek
Eberline Services Work Order: 02-11141
Analysis Code: ThISO
Run: 1

Lab Fraction	Nuclide	Sample Desc	Client Identification	Activity Units	Results	Error Estimate	MDA	LCS Known	LCS %R	LCS Flag	RPD Flag	MDA Flag	Blank Flag
01	TH-232	LCS	LCS	pCi/g	4.52E+00	9.06E-01	7.08E-02	4.67E+00	96.62	OK		OK	
02	TH-232	MBL	BLANK	pCi/g	-7.86E-03	9.18E-03	9.29E-02					OK	OK
03	TH-232	DUP	VA-02-0176	pCi/g	9.76E-03	3.05E-02	8.02E-02				INV	OK	
04	TH-232	DO	VA-02-0176	pCi/g	1.91E-03	2.73E-02	8.92E-02					OK	

Work Order: 02-11141-ThISO-1

Run: 1
Analysis Code: ThISO
Eberline Services Work Order: 02-11141
Client: Duratek

Lab Fraction	Nuclide	Sample Desc	Sample Date	Sample Aliquot	Radiometric % Rec	Grav % Rec	Mean % Rec	SAF	Sep t0 Date/Time	Sep t1 Date/Time
01	TH-232	LCS	11/26/02 00:00	1.00E+00	101.99				12/5/2002 5:10	
02	TH-232	MBL	11/26/02 00:00	1.00E+00	80.09				12/5/2002 5:10	
03	TH-232	DUP	11/25/02 12:00	1.00E+00	82.85				12/5/2002 5:10	
04	TH-232	DO	11/25/02 12:00	1.00E+00	97.25				12/5/2002 5:10	

002 x 0

Work Order: 02-11141-ThISO-1

Client: Duratek

Eberline Services Work Order: 02-11141

Analysis Code: ThISO

Run: 1

Lab Fraction	Nuclide	Sample Desc	Counting Date/Time	Halflife (days)	Detect	Carrier	Count Time	Counts	Bkg CPM	Eff
01	TH-232	LCS	12/05/02 08:27		A_Spec	12	170.07	3.46 E+02	2.00 E-03	19.9
02	TH-232	MBL	12/05/02 08:28		A_Spec	13	170.07	-5.10 E-01	3.00 E-03	21.5
03	TH-232	DUP	12/05/02 08:28		A_Spec	14	170.03	6.60 E-01	2.00 E-03	21.5
04	TH-232	DO	12/05/02 08:28		A_Spec	16	170.1	1.50 E-01	5.00 E-03	21.3

00241

12-16

Internal Fraction	Sample Desc	Client ID	Sample Date	Sample Aliquot	Tracer Aliquot (g)	Tracer ACT (dpm)	Radiometric Tracer (pCi)	Radiometric % Rec	SAF 1*	SAF 2*
01	LCS	LCS	11/26/02 00:00	1.0000	0.4523	10.1709				
02	MBL	BLANK	11/26/02 00:00	1.0000	0.4532	10.1911				
03	DUP	VA-02-0176	11/25/02 12:00	1.0035	0.4532	10.1911				
04	DO	VA-02-0176	11/25/02 12:00	1.0035	0.4534	10.1956				

00242

Eberline Services
Oak R[illegible]oratory

Spike and T[illegible]r Worksheet

Printed: 11/27/[illegible] [illegible]:11 PM

Internal Work Order	Run	Analysis Code	Date	Technician	Technician Initials	Witness Initials
02-11141	1	ThISO	11/27/2002 12:05	JBARNARD	JBarnard	

LCS & Matrix Spikes					LCS	MS	LCSD	MSD	LCS		MS		LCSD		MSD	
Isotope	Sol #	Activity dpm/ml	Solution Date	Approx Addition	Volume Used (ml)	Volume Used (ml)	Volume Used (ml)	Volume Used (ml)	Known pCi	Error Estimate	Added pCi	Error Estimate	Known pCi	Error Estimate	Added pCi	Error Estimate
Th-228	Th-8b	103.560	11/27/2002	0.100	0.1002				4.67	0.168	0.00	0.000	0.00	0.000	0.00	0.000
Th-230	Th-1b	23.528	11/27/2002	0.500	0.4986				5.28	0.143	0.00	0.000	0.00	0.000	0.00	0.000
Th-232	Th-8b	103.560	11/27/2002	0.100	0.1002				4.67	0.168	0.00	0.000	0.00	0.000	0.00	0.000

Tracers

fraction	Isotope	Sol #	Activity dpm/ml	Solution Date	Volume Used (ml)	Approx Addition
01	Th-229	Th-18a	22.487	11/27/2002	0.4523	0.4600
02	Th-229	Th-18a	22.487	11/27/2002	0.4532	0.4600
03	Th-229	Th-18a	22.487	11/27/2002	0.4532	0.4600
04	Th-229	Th-18a	22.487	11/27/2002	0.4534	0.4600

Balance Printer Tapes

Tracer

0.4523 g
0.4532 g
0.4532 g
0.4534 g

11-141-4

25.0887 g
[redacted]

LCS

0.4986 g
0.1002 g

Matrix Spike

00243

Eberline Services - Oak Ridge
Version 2.0 8/1999

Aliquot Worksheet

Work Order	Run	Analysis Code	Aliquot Units	Lab Deadline	Technician
02-11141	1	ThISO	grams	12/5/2002	JBARNARD

Lab Fraction	Duratek Client ID	Sample Type	Muffle Data Ratio Post/Pre	Dilution Data Aliquot	Dilution Data Final (ml)	Dilution Data Ratio	Aliquot Data Aliquot	Aliquot Data Net Equiv	MS Aliquot Data Aliquot	MS Aliquot Data Net Equiv	H-3 Solids Only Water Added (ml)	H-3 Solids Only H3 Dist Aliq
01	LCS	LCS					1.0000E+00	1.0000E+00				
02	BLANK	MBL					1.0000E+00	1.0000E+00				
03	VA-02-0176	DUP		2.5089E+01	100.0000	2.51E-01	4.0000E+00	1.0035E+00				
04	VA-02-0176	DO		2.5089E+01	100.0000	2.51E-01	4.0000E+00	1.0035E+00				

Comments	

00244

Technician: Jay Barnard Date: 12/3/02

Eberline Services
Oak Ridge Laboratory

ALPHA SPECTROMETRY REPORT
5-DEC-2002 11:49:10

****
Spectral File: ND_AMS_ARCHIVE_C:C_0211141A-TH$01_TH.CNF
****

BATCH ID:	0211141A-TH	SAMPLE ID:	01
SAMPLE DATE:	5-DEC-2002 00:00	ALIQUOT:	1.000E+00 gram
SAMPLE TITLE:	SPIKE	DETECTOR NUMBER:	012
ACQ DATE:	5-DEC-2002 08:27	AVERAGE EFFICIENCY:	19.88%
ELAPSED LIVE TIME:	10204.	RECOVERY:	101.99%
TRACER ID:	TH-18A	TRACER FWHM (kev):	235.36
LAMBDA VALUE:	452.	ROI TYPE:	STANDARD
TRACER DPM AT SAMPLE DATE:	10.171	CONFIDENCE FACTOR:	4.65
SAMPLE MATRIX:	SOIL	LLD CONSTANT:	2.71
ENERGY CAL DATE:	27-NOV-2002 07:57	EFF CAL DATE:	27-NOV-2002 07:57
BKG FILENAME:	B_012_27NOV02	BKG ELAPSED TIME:	60004.

****

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	NET AREA	BKG	%ABN	ACTIVITY pCi/ gram	TPU/ERROR 2-SIGMA	MDC pCi/ gram
TH-227	5850.0	4.62	2.38	97.5	6.285E-02	7.481E-02	1.325E-01
TH-228	5400.0	380.79	2.21	99.9	4.980E+00	9.859E-01	1.258E-01
TH229	4872.0	348.98	1.02	99.5	4.581E+00	6.792E-01	9.724E-02
TH-230	4672.0	450.47	1.53	99.8	5.896E+00	1.142E+00	1.108E-01
TH-232	3997.0	345.66	0.34	100.0	4.516E+00	9.055E-01	7.084E-02

****

*** Tracer FWHM > 80.0 Kev ***

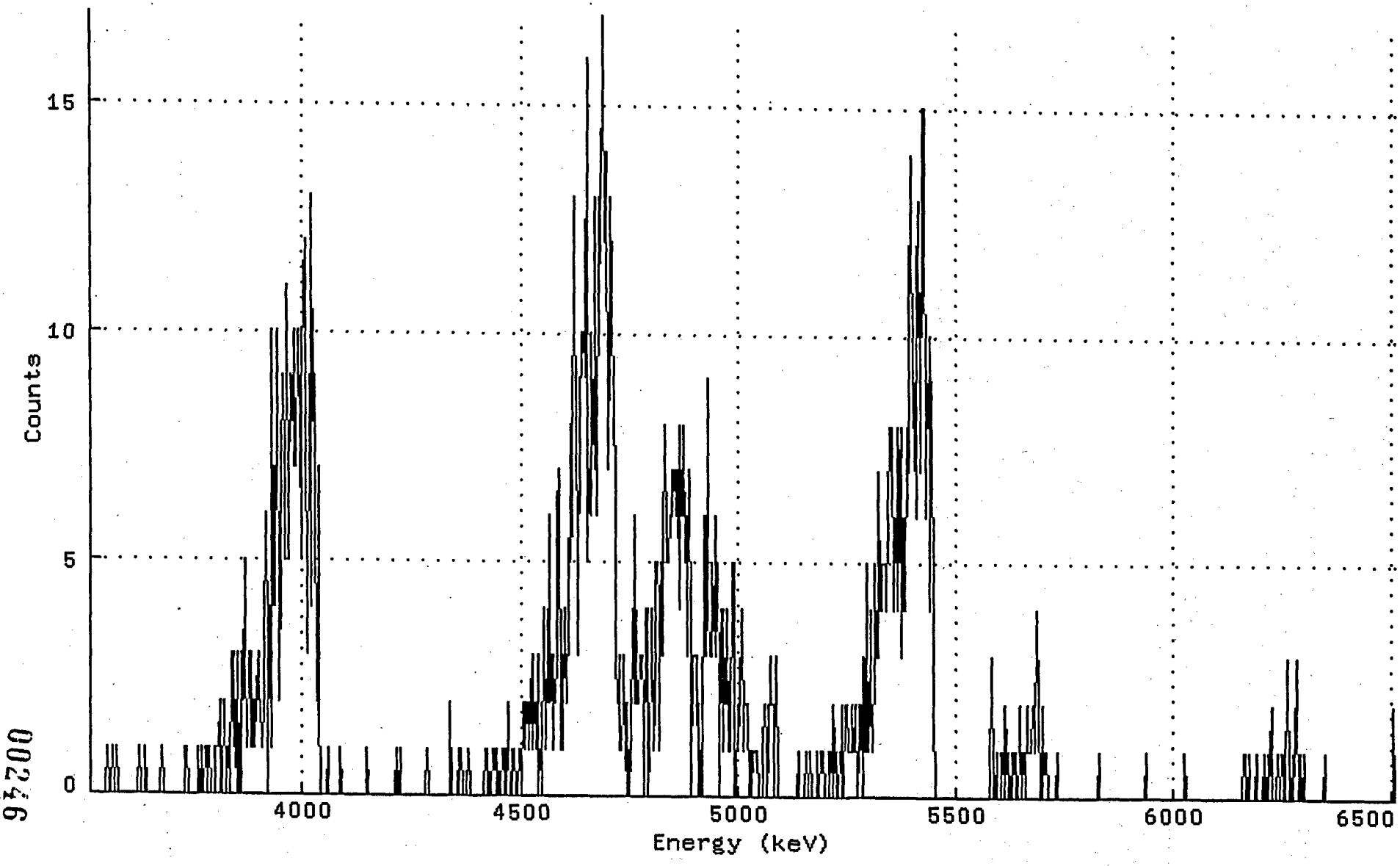
Analyst: Jay Price — Date: 12-5-02

Reviewer: Glen Gregory — Date: 12/5/02

Spectrum : DKA100:[ALPHA.ALUSR.ARCHIVE.C]C_0[illegible]1141A-TH$01_TH.CNF;1
Title : 012
Sample Title: SPIKE
Start Time: 5-DEC-2002 08:27:
Real Time : 0 02:50:04.00
Live Time : 0 02:50:04.00

Sample Time: 5-DEC-2002 00:00:
Sample ID : 01
Sample Type: TH

Energy Offset: 3.50364E+03
Energy Slope : 3.03802E+00
Energy Quad : -1.06899E-04



00246

Channel Contents for ND_AMS_ARCHIVE_C:C_0211141A-TH$01_TH

Channel														
[illegible]:	10204	10204	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	1	0	0	0	1	0	0	1	0	0	0	0	0
29:	0	0	0	0	0	0	0	0	0	0	0	1	0	0
43:	0	0	1	0	0	0	0	0	0	0	0	0	0	0
57:	1	0	0	0	0	0	0	0	0	0	0	0	0	0
71:	0	0	0	0	1	1	0	0	0	0	0	0	0	0
85:	1	0	1	0	0	1	1	0	1	0	0	0	0	1
99:	1	1	2	0	0	2	2	0	1	1	0	3	1	3
113:	1	0	3	0	0	3	2	5	3	1	3	1	3	1
127:	2	1	2	3	2	2	1	2	3	6	3	0	4	1
141:	10	4	4	4	10	2	5	7	9	7	5	11	5	6
155:	9	8	10	7	7	10	10	8	5	9	11	12	9	3
169:	9	4	13	8	9	7	2	7	2	0	0	0	0	0
183:	1	0	0	0	0	0	0	0	0	0	1	0	0	0
197:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
211:	0	0	1	0	0	0	0	0	0	0	0	0	0	0
225:	0	0	0	0	0	0	0	0	0	0	1	0	0	1
239:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
253:	0	0	0	0	0	0	1	0	0	0	0	0	0	0
267:	0	0	0	0	0	0	0	0	0	0	2	0	0	0
281:	0	0	1	0	1	0	0	0	0	0	1	0	0	0
295:	0	0	0	0	0	0	0	0	0	1	0	1	0	0
309:	1	1	1	0	1	0	0	0	1	0	1	0	2	1
323:	0	1	0	1	0	0	0	1	1	0	2	2	1	2
337:	2	1	2	3	1	2	1	3	0	1	1	0	4	1
351:	2	2	6	2	3	1	3	2	3	6	7	1	3	1
365:	4	2	3	3	8	5	6	13	11	8	5	3	9	9
379:	10	10	9	16	5	7	6	10	8	7	13	6	13	11
393:	12	17	16	12	12	14	7	10	13	11	8	7	3	2
407:	3	1	1	2	3	1	0	2	0	1	1	4	2	6
421:	2	2	2	3	3	2	0	4	4	0	1	3	4	1
435:	2	5	5	4	1	5	3	5	8	5	5	5	6	6
449:	7	7	6	7	7	4	8	6	6	8	5	6	3	7
[illegible]:	3	0	3	3	3	3	0	2	0	2	0	6	3	9
[illegible]:	4	3	3	5	4	3	6	4	3	0	4	1	4	2
[illegible]:	2	4	1	2	1	5	5	0	0	2	1	2	4	1
505:	2	2	2	2	0	1	0	1	1	1	1	0	0	0
519:	0	1	2	1	0	1	3	2	2	2	0	3	0	0
533:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
547:	1	0	0	0	0	0	1	1	0	1	1	0	0	0
561:	0	0	1	0	1	1	1	0	0	0	0	1	1	0
575:	2	1	0	1	0	1	0	2	0	2	2	2	1	1
589:	1	1	2	1	1	2	0	1	2	2	0	3	1	5
603:	1	1	4	2	1	3	5	3	3	7	4	4	5	5
617:	5	4	6	8	8	8	4	4	6	4	8	7	3	8
631:	4	4	4	8	7	10	14	8	10	8	6	11	13	7
645:	15	10	15	6	9	8	10	4	9	3	2	0	0	0
659:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
673:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
687:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
701:	3	0	0	0	1	0	0	0	1	1	0	2	1	0
715:	1	0	0	1	1	0	1	0	1	2	0	1	1	0
729:	2	1	1	1	1	2	2	1	4	2	2	0	2	0
743:	1	1	1	0	0	0	0	0	0	0	1	0	0	0
757:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
771:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
785:	0	1	0	0	0	0	0	0	0	0	0	0	0	0
799:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
813:	0	0	0	0	0	0	0	0	0	0	0	1	0	0
827:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
855:	1	0	0	0	0	0	0	0	0	0	0	0	0	0
869:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
883:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	1	1	0	0	1	0	0	0	0
911:	0	1	0	0	0	0	0	1	0	0	1	0	1	2
925:	0	0	0	0	1	0	0	1	1	0	0	0	3	0
[illegible]:	1	0	1	0	1	3	2	0	1	0	0	1	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	1	0	0	0	0	0	0	0	0	0	0	0	0	0
981:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
995:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1023:	0	0												

Eberline Services
Oak Ridge Laboratory

Gross Sample Counts Within Peak Regions Generated: 5-DEC-2002 11:49:00.85

Detector ID: 12 Acquisition Start: 5-DEC-2002 08:27:56.01
Live Time: 0 02:50:04.00 Real Time: 0 02:50:04.00
Batch Id: 0211141A-TH Sample Id: 01
Sample Type: TH

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	3961.27	346	0	107.75	151.44	98	101	3.39E-02	5.4	
2	0	4642.15	452	0	95.38	379.83	307	102	4.43E-02	4.7	
3	0	4884.17	350	0	235.36	461.93	408	129	3.43E-02	5.3	
4	0	5368.23	383	0	101.69	627.61	553	104	3.75E-02	5.1	
5	0	5804.15	7	0	342.92	778.57	742	123	6.86E-04	37.8	

Background Counts Within Peak Regions Generated: 5-DEC-2002 11:49:05.65

Acquisition Start: 27-NOV-2002 19:10:58.01
Live Time: 0 16:40:04.00 Real Time: 0 16:40:04.00

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	3947.27	2	0	91.53	148.00	98	101	3.33E-05	70.7	
2	0	4573.98	9	0	4.48	357.50	307	102	1.50E-04	33.3	
3	0	4912.14	6	0	310.81	472.00	408	129	1.00E-04	40.8	
4	0	5299.61	13	0	5.72	604.50	553	104	2.17E-04	27.7	
5	0	5872.35	14	0	3.05	803.00	742	123	2.33E-04	26.7	

Net Sample Counts Within Peak Regions Generated: 5-DEC-2002 11:49:06.13

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	3961.27*	346	0	107.75	151.44	98	101	3.39E-02	5.4	
2	0	4642.15*	450	0	95.38	379.83	307	102	4.41E-02	4.7	
3	0	4884.17*	349	0	235.36	461.93	408	129	3.42E-02	5.4	
4	0	5368.23*	381	0	101.69	627.61	553	104	3.73E-02	5.1	
5	0	5804.15*	5	0	342.92	778.57	742	123	4.53E-04	58.9	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.0 Generated 5-DEC-2002 11:49:08

Configuration : MCA0:[AMSCOUNT]00000125$1
Analyses by : ROIPEAK V1.2,PEAKEFF V2.2,ENBACK V1.6,NID V3.3
Sample title : SPIKE
Sample date : 5-DEC-2002 00:00:00 Acquisition date : 5-DEC-2002 08:27:56
Sample ID : 01 Sample quantity : 1.0000 gram
Sample type : TH Sample geometry :
Detector name : 012 Detector geometry:
Elapsed live time: 0 02:50:04.00 Elapsed real time: 0 02:50:04.00 0.0%
Energy tolerance : 100.00 keV Half life ratio : 8.00
Errors propagated: Yes Systematic Error : 3.00 %
Efficiency type : Average value Efficiencies at : Peak Energy
Abundance limit : 75.00

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity pCi/gram
0	3961.27*	346107.75	151.44		98	101	10.8		TH-232	4.61
0	4642.15*	450 95.38	379.83		307	102	9.4		TH-230	6.01
0	4884.17*	349235.36	461.93		408	129	10.7		TH229	4.67
0	5368.23*	381101.69	627.61		553	104	10.3		TH-228	5.08
0	5804.15*	5342.92	778.57		742	123	117.8		TH-227	6.410E-02

Eberline Services
Oak Ridge Laboratory

ALPHA SPECTROMETRY REPORT
5-DEC-2002 11:50:01

****
Spectral File: ND_AMS_ARCHIVE_R:R_0211141A-TH$02_TH.CNF
****

BATCH ID:	0211141A-TH	SAMPLE ID:	02
SAMPLE DATE:	5-DEC-2002 00:00	ALIQUOT:	1.000E+00 gram
SAMPLE TITLE:	BLANK	DETECTOR NUMBER:	013
ACQ DATE:	5-DEC-2002 08:28	AVERAGE EFFICIENCY:	21.47%
ELAPSED LIVE TIME:	10204.	RECOVERY:	80.09%
TRACER ID:	TH-18A	TRACER FWHM (kev):	70.55
LAMBDA VALUE:	453.	ROI TYPE:	STANDARD
TRACER DPM AT SAMPLE DATE:	10.191	CONFIDENCE FACTOR:	4.65
SAMPLE MATRIX:	SOIL	LLD CONSTANT:	2.71
ENERGY CAL DATE:	27-NOV-2002 07:57	EFF CAL DATE:	27-NOV-2002 07:57
BKG FILENAME:	B_013_27NOV02	BKG ELAPSED TIME:	60001.

****

NUCLIDE ACTIVITY SUMMARY

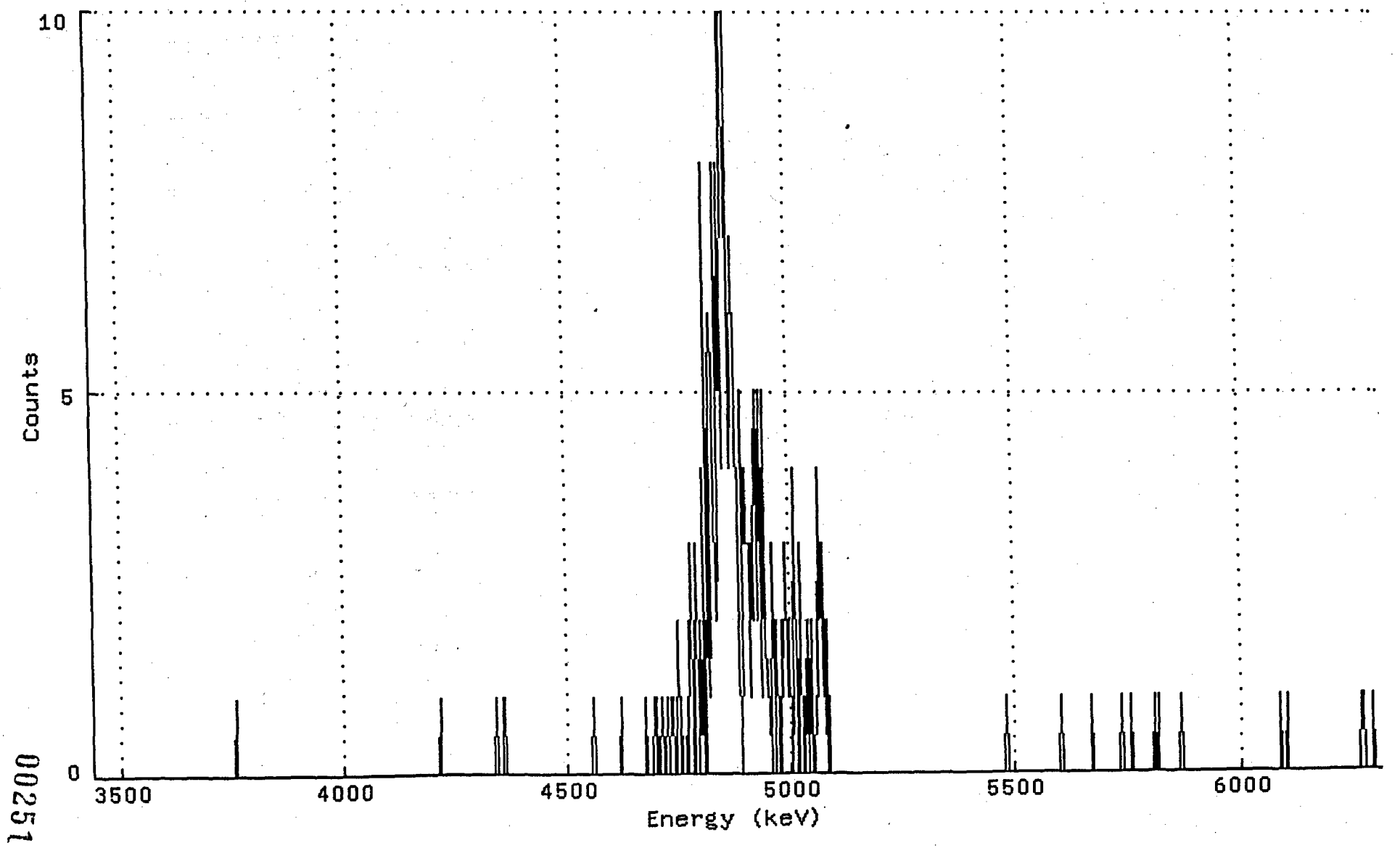
NUCLIDE	ENERGY	NET AREA	BKG	%ABN	ACTIVITY pCi/ gram	TPU/ERROR 2-SIGMA	MDC pCi/ gram
[illegible]-227	5850.0	4.49	0.51	97.5	7.201E-02	7.343E-02	9.527E-02
TH-228	5400.0	-0.85	0.85	99.9	-1.311E-02	1.195E-02	1.078E-01
TH229	4872.0	296.66	0.34	99.5	4.591E+00	7.110E-01	8.390E-02
TH-230	4672.0	6.15	0.85	99.8	9.488E-02	8.413E-02	1.080E-01
TH-232	3997.0	-0.51	0.51	100.0	-7.857E-03	9.176E-03	9.288E-02

****

Analyst: [signature] Date: 12-5-02

Reviewer: [signature] Date: 12/5/02

Spect : DKA100:[ALPHA.ALUSR.ARCHIVE.R]R 1141A-TH$02_TH.CNF;1
Title : 013
Sample Title: BLANK
Start Time: 5-DEC-2002 08:28: Sample Time: 5-DEC-2002 00:00: Energy Offset: 3.42799E+03
Real Time : 0 02:50:04.00 Sample ID : 02 Energy Slope : 2.96504E+00
Live Time : 0 02:50:04.00 Sample Type: TH Energy Quad : -1.51325E-04



00251

Channel Contents for ND_AMS_ARCHIVE_R:R_0211141A-TH$02_TH

Channel														
[illegible]:	10204	10204	0	0	0	0	0	0	0	0	0	0	0	0
15:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99:	0	0	0	0	0	0	0	0	0	0	0	0	1	0
113:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
127:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
141:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
155:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
169:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
183:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
197:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
211:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
225:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
239:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
253:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
267:	0	1	0	0	0	0	0	0	0	0	0	0	0	0
281:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
295:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
309:	0	0	0	1	0	0	0	0	0	1	1	0	0	0
323:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
337:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
351:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
365:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
379:	0	0	0	0	0	0	0	0	0	0	1	0	0	0
393:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
407:	0	0	0	1	0	0	0	0	0	0	0	0	0	0
421:	0	0	0	0	0	0	0	0	0	1	0	0	0	0
435:	0	0	1	0	1	0	0	0	1	0	0	0	1	0
[illegible]:	0	1	1	1	0	0	0	2	0	1	0	0	0	0
[illegible]:	1	0	2	2	3	0	0	1	3	0	1	2	1	0
[illegible]:	4	0	3	8	1	2	5	6	5	4	2	3	8	5
491:	8	6	4	10	8	10	7	10	4	5	7	6	6	2
505:	2	0	2	5	3	4	3	3	3	1	3	2	3	4
519:	5	2	4	5	1	3	5	2	1	1	1	0	3	0
533:	2	2	0	0	0	2	1	2	2	3	1	1	2	0
547:	1	1	4	0	0	0	3	2	0	1	0	1	2	0
561:	1	2	0	0	1	1	1	4	2	3	1	3	1	0
575:	2	0	0	0	0	0	0	0	0	0	0	0	0	0
589:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
603:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
617:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
631:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
645:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
659:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
673:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
687:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
701:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
715:	0	0	0	1	0	0	0	0	0	0	0	0	0	0
729:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
743:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
757:	0	0	0	0	0	1	0	0	0	0	0	0	0	0
771:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
785:	0	0	1	0	0	0	0	0	0	0	0	0	0	0
799:	0	0	0	0	0	0	0	0	0	0	0	0	1	0
813:	0	0	0	0	0	0	1	0	0	0	0	0	0	0
827:	0	0	0	0	0	0	0	0	0	0	0	1	0	0
841:	1	0	0	0	0	0	0	0	0	0	0	0	0	0
855:	0	0	0	0	0	1	0	0	0	0	0	0	0	0
869:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
883:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
911:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	1	0	0	0	0	1	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
967:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
981:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
995:	0	0	0	0	0	0	0	0	0	0	0	0	0	1
1009:	1	1	0	0	0	0	0	0	0	1	0	0	0	0
1023:	0	0												

Eberline Services
Oak Ridge Laboratory

Gross Sample Counts Within Peak Regions Generated: 5-DEC-2002 11:49:52.22

Detector ID: 13 Acquisition Start: 5-DEC-2002 08:28:13.01
Live Time: 0 02:50:04.00 Real Time: 0 02:50:04.00
Batch Id: 0211141A-TH Sample Id: 02
Sample Type: TH

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	3949.52	0	0	0.00	177.50	126	104	0.00E+00	0.0	
2	0	4668.90	7	0	174.94	427.86	342	107	6.86E-04	37.8	
3	0	4894.51	297	0	70.55	507.76	448	134	2.91E-02	5.8	
4	0	5299.63	0	0	0.00	653.00	599	109	0.00E+00	0.0	
5	0	5795.03	5	0	148.25	833.80	799	130	4.90E-04	44.7	

Background Counts Within Peak Regions Generated: 5-DEC-2002 11:49:58.24

Acquisition Start: 27-NOV-2002 19:11:01.01
Live Time: 0 16:40:01.00 Real Time: 0 16:40:01.00

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	3946.96	3	0	83.10	177.50	126	104	5.00E-05	57.7	
2	0	4573.71	5	0	154.32	395.00	342	107	8.33E-05	44.7	
[illegible]	0	4912.00	2	0	106.84	514.50	448	134	3.33E-05	70.7	
[illegible]	0	5298.71	5	0	198.84	653.00	599	109	8.33E-05	44.7	
5	0	5875.39	3	0	225.55	863.50	799	130	5.00E-05	57.7	

Net Sample Counts Within Peak Regions Generated: 5-DEC-2002 11:49:58.76

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	3949.52*	-1	0	0.00	177.50	126	104	-5.00E-05	57.7	
2	0	4668.90*	6	0	174.94	427.86	342	107	6.03E-04	43.5	
3	0	4894.51*	297	0	70.55	507.76	448	134	2.91E-02	5.8	
4	0	5299.63*	-1	0	0.00	653.00	599	109	-8.33E-05	44.7	
5	0	5795.03*	4	0	148.25	833.80	799	130	4.40E-04	50.2	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.0 Generated 5-DEC-2002 11:49:59

Configuration	: MCA0:[AMSCOUNT]00000125$1		
Analyses by	: ROIPEAK V1.2,PEAKEFF V2.2,ENBACK V1.6,NID V3.3		
Sample title	: BLANK		
Sample date	: 5-DEC-2002 00:00:00	Acquisition date	: 5-DEC-2002 08:28:13
Sample ID	: 02	Sample quantity	: 1.0000 gram
Sample type	: TH	Sample geometry	:
Detector name	: 013	Detector geometry	:
Elapsed live time	: 0 02:50:04.00	Elapsed real time	: 0 02:50:04.00 0.0%
Energy tolerance	: 100.00 keV	Half life ratio	: 8.00
Errors propagated	: Yes	Systematic Error	: 3.00 %
Efficiency type	: Average value	Efficiencies at	: Peak Energy
Abundance limit	: 75.00		

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity pCi/gram
0	3949.52*	-1	0.00	177.50	126	104	115.5		TH-232	-6.293E-03
0	4668.90*	6	174.94	427.86	342	107	86.9		TH-230	7.599E-02
0	4894.51*	297	70.55	507.76	448	134	11.6		TH229	3.68
0	5299.63*	-1	0.00	653.00	599	109	89.4		TH-228	-1.050E-02
0	5795.03*	4	148.25	833.80	799	130	100.5		TH-227	5.767E-02

Eberline Services
Oak Ridge Laboratory

ALPHA SPECTROMETRY REPORT
5-DEC-2002 11:51:43

****
Spectral File: ND_AMS_ARCHIVE_S:S_0211141A-TH$03_TH.CNF
****

BATCH ID:	0211141A-TH	SAMPLE ID:	03
SAMPLE DATE:	25-NOV-2002 00:00	ALIQUOT:	1.003E+00 gram
SAMPLE TITLE:	VA-02-0176	DETECTOR NUMBER:	014
ACQ DATE:	5-DEC-2002 08:28	AVERAGE EFFICIENCY:	21.54%
ELAPSED LIVE TIME:	10202.	RECOVERY:	82.85%
TRACER ID:	TH-18A	TRACER FWHM (kev):	192.66
LAMBDA VALUE:	453.	ROI TYPE:	STANDARD
TRACER DPM AT SAMPLE DATE:	10.191	CONFIDENCE FACTOR:	4.65
SAMPLE MATRIX:	SOIL	LLD CONSTANT:	2.71
ENERGY CAL DATE:	27-NOV-2002 07:58	EFF CAL DATE:	27-NOV-2002 07:58
BKG FILENAME:	B_014_27NOV02	BKG ELAPSED TIME:	60006.

****

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	NET AREA	BKG	%ABN	ACTIVITY pCi/ gram	TPU/ERROR 2-SIGMA	MDC pCi/ gram
[illegible]-227	5850.0	1.64	1.36	97.5	3.658E-02	8.044E-02	1.234E-01
[illegible]-228	5400.0	1.77	3.23	99.9	2.646E-02	7.060E-02	1.638E-01
TH229	4872.0	307.81	1.19	99.5	4.575E+00	7.020E-01	1.157E-01
TH-230	4672.0	13.66	0.34	99.8	2.024E-01	1.165E-01	8.033E-02
TH-232	3997.0	0.66	0.34	100.0	9.761E-03	3.047E-02	8.019E-02

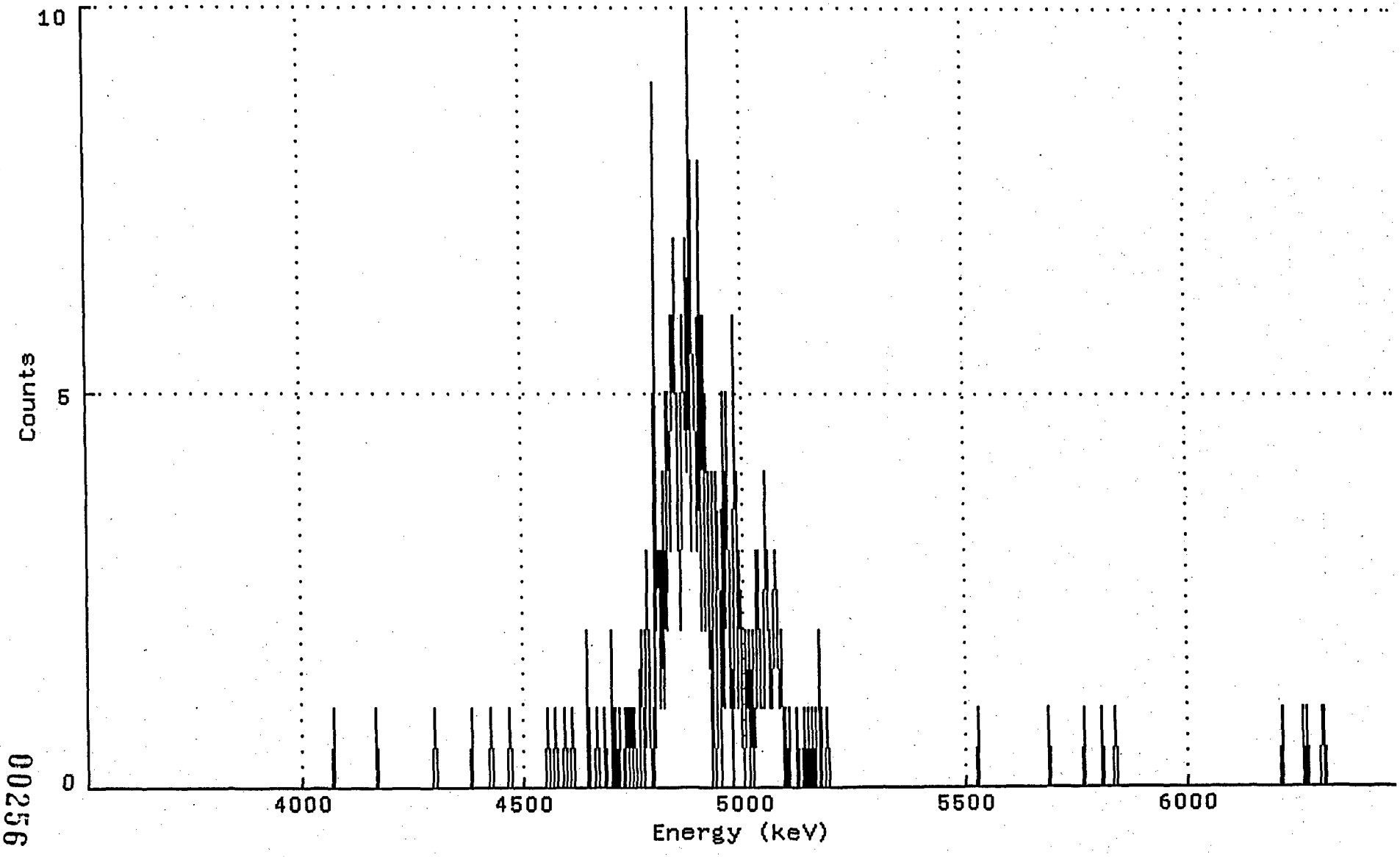
****

*** Tracer FWHM > 80.0 Kev ***

Jeff Price — Analyst — 12-5-02 Date

Alan Gregley — Reviewer — 12/5/02 Date

Spectrum : DKA100:[ALPHA.ALUSR.ARCHIVE.S]S_0[illegible]1141A-TH$03_TH.CNF;1
Title : 014
Sample Title: VA-02-0176
Start Time: 5-DEC-2002 08:28: Sample Time: 25-NOV-2002 00:00 Energy Offset: 3.50997E+03
Real Time : 0 02:50:02.00 Sample ID : 03 Energy Slope : 3.07123E+00
Live Time : 0 02:50:02.00 Sample Type: TH Energy Quad : -1.84538E-04



00256

Channel Contents for ND_AMS_ARCHIVE_S:S_0211141A-TH$03_TH

Channel														
[illegible]:	10202	10202	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
113:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
127:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
141:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
155:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
169:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
183:	0	0	1	0	0	0	0	0	0	0	0	0	0	0
197:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
211:	0	0	0	0	0	0	1	0	0	0	0	0	0	0
225:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
239:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
253:	0	0	0	0	0	0	0	0	1	0	0	0	0	0
267:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
281:	0	0	0	0	0	0	0	0	1	0	0	0	0	0
295:	0	0	0	0	0	0	0	0	0	1	0	0	0	0
309:	0	0	0	0	0	0	0	0	0	1	0	0	0	0
323:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
337:	0	0	0	0	0	0	0	0	0	0	1	0	0	0
351:	0	0	1	0	0	0	0	0	0	1	0	0	0	0
365:	0	1	0	0	0	0	0	0	0	0	0	0	0	2
379:	0	0	0	0	0	0	1	0	0	0	0	0	1	0
393:	0	0	0	0	2	0	0	1	0	1	0	0	0	1
407:	0	1	1	0	1	0	1	1	0	0	0	0	1	2
421:	0	1	1	3	1	1	0	1	0	1	9	2	3	3
435:	1	2	4	1	3	2	5	5	3	6	5	5	7	7
[illegible]9:	3	3	2	4	6	5	5	4	7	6	3	10	6	5
[illegible]:	4	3	4	8	2	6	2	6	4	4	3	0	4	1
[illegible]:	0	1	4	3	2	0	2	5	1	3	5	1	3	0
[illegible]:	2	1	6	2	1	3	2	1	0	1	2	1	2	0
505:	1	2	0	1	1	3	3	1	1	1	1	1	4	2
519:	2	1	1	2	2	3	2	2	1	2	2	0	1	0
533:	0	1	0	0	0	0	0	0	1	0	0	0	0	1
547:	0	0	1	0	0	1	0	0	1	0	0	0	2	0
561:	0	0	0	1	0	0	0	0	0	0	0	0	0	0
575:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
589:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
603:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
617:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
631:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
645:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
659:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
673:	0	0	0	0	0	0	0	0	0	0	0	0	1	0
687:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
701:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
715:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
729:	0	0	0	0	0	0	0	0	0	0	0	0	0	1
743:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
757:	0	0	0	0	0	0	0	0	0	0	0	0	0	1
771:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
785:	1	0	0	0	0	0	0	0	0	0	1	0	0	0
799:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
813:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
827:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
855:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
869:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
883:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
911:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]5:	0	0	0	0	0	0	1	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	1	0	0	1
[illegible]	0	0	0	0	0	0	0	0	0	0	0	1	0	1
[illegible]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
981:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
995:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1023:	0	0												

Eberline Services
Oak Ridge Laboratory

Gross Sample Counts Within Peak Regions Generated: 5-DEC-2002 11:50:44.05

Detector ID: 14 Acquisition Start: 5-DEC-2002 08:28:31.01
Live Time: 0 02:50:02.00 Real Time: 0 02:50:02.00
Batch Id: 0211141A-TH Sample Id: 03
Sample Type: TH

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4071.84	1	0	3.07	185.00	95	100	9.80E-05	100.0	
2	0	4620.23	14	0	61.42	369.71	303	103	1.37E-03	26.7	
3	0	4904.35	309	0	192.66	467.12	406	130	3.03E-02	5.7	
4	0	5165.69	5	0	3.07	557.80	552	107	4.90E-04	44.7	
5	0	5802.54	3	0	79.85	783.33	747	127	2.94E-04	57.7	

Background Counts Within Peak Regions Generated: 5-DEC-2002 11:51:39.38

Acquisition Start: 27-NOV-2002 19:11:04.01
Live Time: 0 16:40:06.00 Real Time: 0 16:40:06.00

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	3952.63	2	0	100.14	144.50	95	100	3.33E-05	70.7	
2	0	4573.05	2	0	42.48	354.00	303	103	3.33E-05	70.7	
[illegible]	0	4912.49	7	0	251.87	470.50	406	130	1.17E-04	37.8	
[illegible]	0	5299.41	19	0	0.00	605.00	552	107	3.17E-04	22.9	
5	0	5878.94	8	0	3.03	810.00	747	127	1.33E-04	35.4	

Net Sample Counts Within Peak Regions Generated: 5-DEC-2002 11:51:40.08

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4071.84*	1	0	3.07	185.00	95	100	6.47E-05	155.8	
2	0	4620.23*	14	0	61.42	369.71	303	103	1.34E-03	27.4	
3	0	4904.35*	308	0	192.66	467.12	406	130	3.02E-02	5.7	
4	0	5165.69*	2	0	3.07	557.80	552	107	1.73E-04	133.1	
5	0	5802.54*	2	0	79.85	783.33	747	127	1.61E-04	109.6	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.0 Generated 5-DEC-2002 11:51:41

Configuration	: MCA0:[AMSCOUNT]00000125$1		
Analyses by	: ROIPEAK V1.2,PEAKEFF V2.2,ENBACK V1.6,NID V3.3		
Sample title	: VA-02-0176		
Sample date	: 25-NOV-2002 00:00:00	Acquisition date	: 5-DEC-2002 08:28:31
Sample ID	: 03	Sample quantity	: 1.0035 gram
Sample type	: TH	Sample geometry	:
Detector name	: 014	Detector geometry	:
Elapsed live time	: 0 02:50:02.00	Elapsed real time	: 0 02:50:02.00 0.0%
Energy tolerance	: 100.00 keV	Half life ratio	: 8.00
Errors propagated	: Yes	Systematic Error	: 3.00 %
Efficiency type	: Average value	Efficiencies at	: Peak Energy
Abundance limit	: 75.00		

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity pCi/gram
0	4071.84*	1	3.07	185.00	95	100	311.7		TH-232	8.087E-03
0	4620.23*	14	61.42	369.71	303	103	54.9		TH-230	0.168
0	4904.35*	308	192.66	467.12	406	130	11.4		TH229	3.79
0	5165.69*	2	3.07	557.80	552	107	266.2		TH-228	2.192E-02
0	5802.54*	2	79.85	783.33	747	127	219.2		TH-227	3.030E-02

Eberline Services
Oak Ridge Laboratory

ALPHA SPECTROMETRY REPORT
5-DEC-2002 11:52:14

****
Spectral File: ND_AMS_ARCHIVE_S:S_0211141A-TH$04_TH.CNF
****

BATCH ID:	0211141A-TH	SAMPLE ID:	04
SAMPLE DATE:	25-NOV-2002 00:00	ALIQUOT:	1.003E+00 gram
SAMPLE TITLE:	VA-02-0176	DETECTOR NUMBER:	016
ACQ DATE:	5-DEC-2002 08:28	AVERAGE EFFICIENCY:	21.30%
ELAPSED LIVE TIME:	10206.	RECOVERY:	97.25%
TRACER ID:	TH-18A	TRACER FWHM (kev):	163.78
LAMBDA VALUE:	453.	ROI TYPE:	STANDARD
TRACER DPM AT SAMPLE DATE:	10.196	CONFIDENCE FACTOR:	4.65
SAMPLE MATRIX:	SOIL	LLD CONSTANT:	2.71
ENERGY CAL DATE:	27-NOV-2002 07:58	EFF CAL DATE:	27-NOV-2002 07:58
BKG FILENAME:	B_016_27NOV02	BKG ELAPSED TIME:	60004.

****

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	NET AREA	BKG	%ABN	ACTIVITY pCi/ gram	TPU/ERROR 2-SIGMA	MDC pCi/ gram
[illegible]-227	5850.0	4.47	1.53	97.5	8.587E-02	9.723E-02	1.106E-01
TH-228	5400.0	-0.02	1.02	99.9	-2.645E-04	2.791E-02	9.443E-02
TH229	4872.0	357.49	0.51	99.5	4.577E+00	6.743E-01	7.722E-02
TH-230	4672.0	20.66	0.34	99.8	2.637E-01	1.253E-01	6.921E-02
TH-232	3997.0	0.15	0.85	100.0	1.905E-03	2.726E-02	8.916E-02

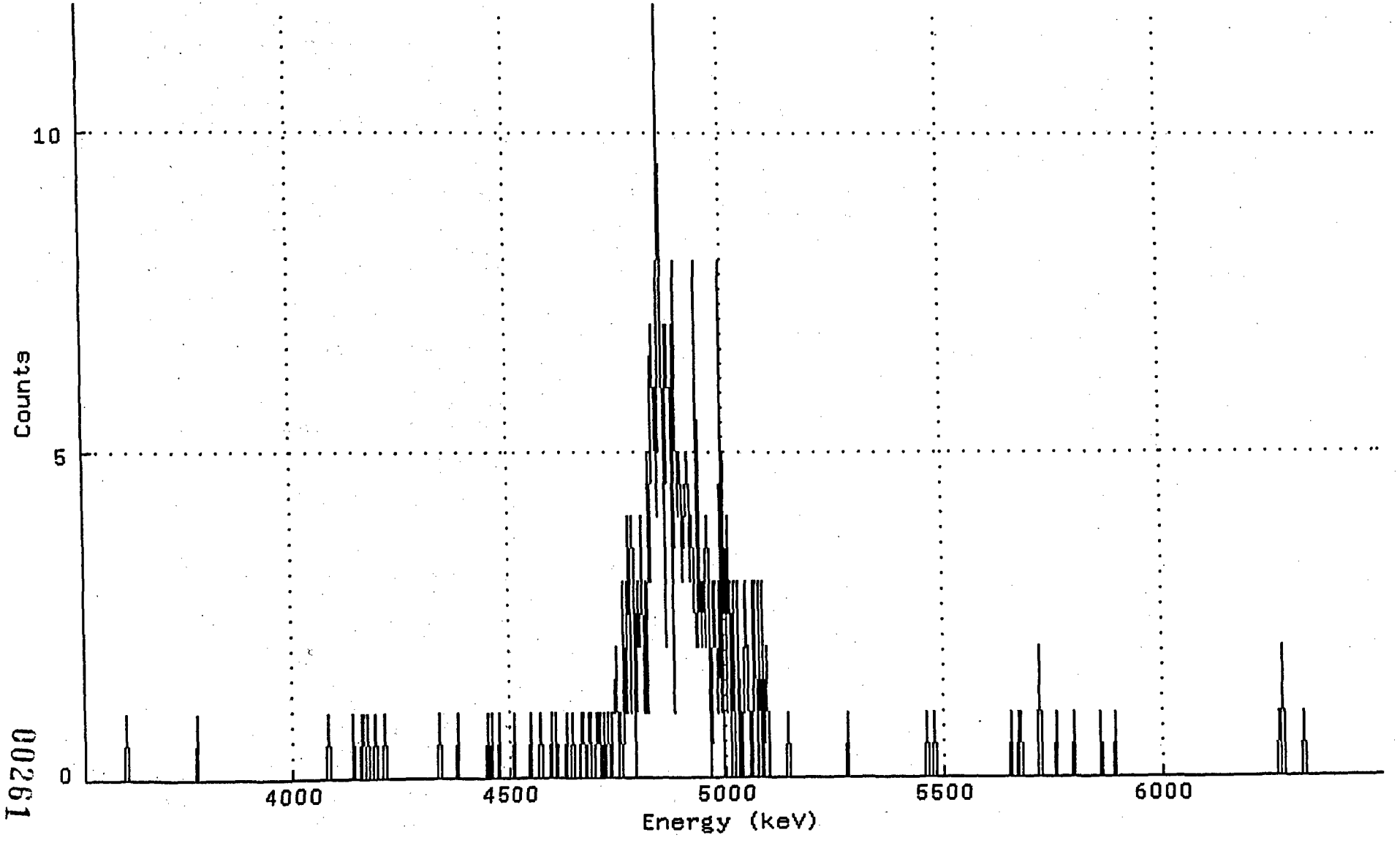
****

*** Tracer FWHM > 80.0 Kev ***

Jan Price — Analyst — 12-5-02 Date

Alan Gregley — Reviewer — 12/5/02 Date

Spectr : DKA100:[ALPHA.ALUSR.ARCHIVE.S]S 1141A-TH$04_TH.CNF;1
Title : 016
Sample Title: VA-02-0176
Start Time: 5-DEC-2002 08:28: Sample Time: 25-NOV-2002 00:00 Energy Offset: 3.51537E+03
Real Time : 0 02:50:06.00 Sample ID : 04 Energy Slope : 3.02949E+00
Live Time : 0 02:50:06.00 Sample Type: TH Energy Quad : -1.19020E-04



00261

Channel Contents for ND_AMS_ARCHIVE_S:S_0211141A-TH$04_TH

Channel														
[illegible]:	10206	10206	0	0	0	0	0	0	0	0	0	0	0	0
15:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29:	0	0	0	0	0	1	0	0	0	0	0	0	0	0
43:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85:	0	0	0	1	0	0	0	0	0	0	0	0	0	0
99:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
113:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
127:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
141:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
155:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
169:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
183:	0	0	0	0	0	0	1	0	0	0	0	0	0	0
197:	0	0	0	0	0	0	0	0	0	0	0	1	0	0
211:	0	0	0	1	0	1	0	0	1	0	0	0	0	0
225:	1	0	0	0	0	0	0	1	0	0	0	0	0	0
239:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
253:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
267:	0	0	0	0	0	0	0	1	0	0	0	0	0	0
281:	0	0	0	0	0	0	0	1	0	0	0	0	0	0
295:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
309:	0	0	1	0	0	1	0	0	0	0	0	1	0	0
323:	0	0	0	0	0	0	0	0	0	0	1	0	0	0
337:	0	0	0	0	0	0	0	0	0	1	0	0	0	0
351:	0	0	0	1	0	0	0	0	0	0	0	1	0	0
365:	0	1	0	0	0	0	0	0	0	1	0	0	0	1
379:	1	0	0	0	0	0	0	1	1	1	0	0	0	1
393:	1	0	0	0	0	1	1	0	1	0	1	0	0	1
407:	1	0	0	1	1	1	1	2	0	0	1	0	1	3
421:	1	3	1	4	1	3	4	3	0	2	3	2	2	3
435:	4	1	3	1	1	5	3	3	6	7	6	6	4	6
[illegible]:	5	11	12	7	5	2	7	7	6	6	6	1	6	8
[illegible]:	6	4	5	4	3	4	4	4	5	4	3	4	3	[illegible]
[illegible]:	2	2	8	3	2	3	3	2	3	4	3	0	1	[illegible]
491:	3	3	1	2	3	1	8	0	5	2	1	4	2	0
505:	2	3	0	0	0	3	0	0	1	1	3	2	2	0
519:	0	0	2	3	3	0	2	3	0	3	0	1	2	2
533:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
547:	0	1	0	0	0	0	0	0	0	0	0	0	0	0
561:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
575:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
589:	0	0	0	0	0	0	1	0	0	0	0	0	0	0
603:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
617:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
631:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
645:	0	0	0	0	0	0	0	0	0	0	0	0	0	1
659:	0	0	0	0	0	1	0	0	0	0	0	0	0	0
673:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
687:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
701:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
715:	0	0	0	0	0	0	0	0	0	0	1	0	0	0
729:	0	0	1	0	1	0	0	0	0	0	0	0	0	0
743:	0	0	0	0	0	2	0	0	0	0	0	0	0	0
757:	0	0	0	0	1	0	0	0	0	0	0	0	0	0
771:	0	0	0	0	1	0	0	0	0	0	0	0	0	0
785:	0	0	0	0	0	0	0	0	0	0	0	0	1	0
799:	0	0	0	0	0	0	0	0	0	1	0	0	0	0
813:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
827:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
855:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
869:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
883:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
911:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	1	0	0	2	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	1	0	0	0	0	0
967:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
981:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
995:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1023:	0	0												

Eberline Services
Oak Ridge Laboratory

Gross Sample Counts Within Peak Regions Generated: 5-DEC-2002 11:52:06.17

Detector ID: 16 Acquisition Start: 5-DEC-2002 08:28:51.01
Live Time: 0 02:50:06.00 Real Time: 0 02:50:06.00
Batch Id: 0211141A-TH Sample Id: 04
Sample Type: TH

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4083.69	1	0	3.03	189.00	94	101	9.80E-05	100.0	
2	0	4622.79	21	0	0.00	370.95	304	103	2.06E-03	21.8	
3	0	4899.28	358	0	163.78	465.32	406	129	3.51E-02	5.3	
4	0	5275.78	1	0	3.03	595.00	552	104	9.80E-05	100.0	
5	0	5785.58	6	0	3.03	772.83	743	124	5.88E-04	40.8	

Background Counts Within Peak Regions Generated: 5-DEC-2002 11:52:11.34

Acquisition Start: 27-NOV-2002 19:11:07.01
Live Time: 0 16:40:04.00 Real Time: 0 16:40:04.00

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	3948.83	5	0	275.03	144.00	94	101	8.33E-05	44.7	
2	0	4574.43	2	0	42.31	355.00	304	103	3.33E-05	70.7	
[illegible]	0	4911.08	3	0	205.52	470.00	406	129	5.00E-05	57.7	
[illegible]	0	5298.07	6	0	241.79	603.50	552	104	1.00E-04	40.8	
[illegible]	0	5872.99	9	0	3.02	804.50	743	124	1.50E-04	33.3	

Net Sample Counts Within Peak Regions Generated: 5-DEC-2002 11:52:11.78

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4083.69*	0	0	3.03	189.00	94	101	1.47E-05	715.4	
2	0	4622.79*	21	0	0.00	370.95	304	103	2.02E-03	22.2	
3	0	4899.28*	357	0	163.78	465.32	406	129	3.50E-02	5.3	
4	0	5275.78*	0	0	3.03	595.00	552	104	-2.01E-06	*****	
5	0	5785.58*	4	0	3.03	772.83	743	124	4.38E-04	56.0	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.0 Generated 5-DEC-2002 11:52:12

Configuration	: MCA0:[AMSCOUNT]00000125$1		
Analyses by	: ROIPEAK V1.2,PEAKEFF V2.2,ENBACK V1.6,NID V3.3		
Sample title	: VA-02-0176		
Sample date	: 25-NOV-2002 00:00:00	Acquisition date	: 5-DEC-2002 08:28:51
Sample ID	: 04	Sample quantity	: 1.0035 gram
Sample type	: TH	Sample geometry	:
Detector name	: 016	Detector geometry	:
Elapsed live time	: 0 02:50:06.00	Elapsed real time	: 0 02:50:06.00 0.0%
Energy tolerance	: 100.00 keV	Half life ratio	: 8.00
Errors propagated	: Yes	Systematic Error	: 3.00 %
Efficiency type	: Average value	Efficiencies at	: Peak Energy
Abundance limit	: 75.00		

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity pCi/gram
0	4083.69*	0	3.03	189.00	94	101	*****		TH-232	1.853E-03
0	4622.79*	21	0.00	370.95	304	103	44.4		TH-230	0.256
0	4899.28*	357	163.78	465.32	406	129	10.6		TH229	4.45
0	5275.78*	0	3.03	595.00	552	104	*****		TH-228	-2.572E-04
0	5785.58*	4	3.03	772.83	743	124	112.0		TH-227	8.351E-02

SECTION X

ANALYTICAL DATA (ISOTOPIC PLUTONIUM)
PU-238/239/240

Work Order	02-11141
Analysis Code	PuISO
Run	2
Date Received	11/26/2002
Lab Deadline	12/5/2002
Client	Duratek
Project	106760.003
Report Level	4
Activity Units	pCi
Aliquot Units	g
Matrix	OS
Method	EML Pu-02 Modified
Instrument Type	Alpha Spectroscopy
Radiometric Tracer	Pu242
Radiometric Sol#	Pu-15 10/01
Tracer Act (dpm/g)	8.533
Carrier	
Carrier Conc (mg/ml)	

Internal Fraction	Sample Desc	Client ID	Login CPM	Sample Date	Sample Aliquot
01	LCS	LCS		11/26/02 00:00	1.0000E+00
02	MBL	BLANK		11/26/02 00:00	1.0000E+00
03	DUP	VA-02-0176	89	11/25/02 12:00	1.0036E+00
04	DO	VA-02-0176	89	11/25/02 12:00	1.0036E+00
05	TRG	Process Blank		11/26/02 00:00	1.0000E+00

00266

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

Internal Fraction	Sample Desc	Tracer Aliquot (g)	Tracer Total ACT (dpm)	Radiometric Tracer (pCi)	Radiometric % Rec	Grav Carrier Added (ml)	Grav Filter Tare (g)	Grav Filter Final (g)	Grav Filter Net (g)	Grav % Rec	Mean % Rec	SAF 1*	SAF 2*
01	LCS	0.9803	8.4										
02	MBL	0.9793	8.4										
03	DUP	0.9753	8.3										
04	DO	0.9744	8.3										
05	TRG	0.0000	0.0										

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

Internal Fraction	Sample Desc	Rough Prep Date	Rough Prep By	Prep Date	Prep By	Sep t0 Date/Time	Sep t0 By	Sep t1 Date/Time	Sep t1 By
01	LCS			12/06/02 13:24	JBARNARD	12/11/02 05:24	TSMITH		
02	MBL			12/06/02 13:24	JBARNARD	12/11/02 05:24	TSMITH		
03	DUP			12/06/02 13:24	JBARNARD	12/11/02 05:24	TSMITH		
04	DO			12/06/02 13:24	JBARNARD	12/11/02 05:24	TSMITH		
05	TRG			12/06/02 13:24	JBARNARD	12/11/02 05:24	TSMITH		

* SAF1 i[illegible]d for Gross Alpha and all other radionuclides. SAF2 is used for Gross Beta only. *[illegible]al mass exceeded the calibration curve range. Results should be qualified as approp[illegible].

Work Order: 02-11141-PuISO-2

Client: Duratek
Eberline Services Work Order: 02-11141
Analysis Code: PuISO
Run: 2

Lab Fraction	Nuclide	Sample Desc	Client Identification	Activity Units	Results	Error Estimate	MDA	LCS Known	LCS %R	LCS Flag	RPD Flag	MDA Flag	Blank Flag
01	PU-238	LCS	LCS	pCi/g	4.13E+00	8.10E-01	8.63E-02	4.85E+00	85.11	OK		OK	
02	PU-238	MBL	BLANK	pCi/g	-5.01E-03	7.13E-03	7.98E-02					OK	OK
03	PU-238	DUP	VA-02-0176	pCi/g	9.46E-03	4.42E-02	1.20E-01				INV	OK	
04	PU-238	DO	VA-02-0176	pCi/g	-8.03E-03	9.37E-03	9.49E-02					OK	
05	PU-238	TRG	Process Blank	pCi/g	3.96E-03	2.62E-02	8.10E-02					OK	

00269

Client: Duratek
Eberline Services Work Order: 02-11141
Analysis Code: PuISO
Run: 2

Lab Fraction	Nuclide	Sample Desc	Sample Date	Sample Aliquot	Radiometric % Rec	Grav % Rec	Mean % Rec	SAF	Sep t0 Date/Time	Sep t1 Date/Time
01	PU-238	LCS	11/26/02 00:00	1.00E+00	95.66				12/11/2002 5:24	
02	PU-238	MBL	11/26/02 00:00	1.00E+00	92.98				12/11/2002 5:24	
03	PU-238	DUP	11/25/02 12:00	1.00E+00	84.63				12/11/2002 5:24	
04	PU-238	DO	11/25/02 12:00	1.00E+00	78.37				12/11/2002 5:24	
05	PU-238	TRG	11/26/02 00:00	1.00E+00	100.00				12/11/2002 5:24	

00271

Client: Duratek
Eberline Services Work Order: 02-11141
Analysis Code: PulSO
Run: 2

Lab Fraction	Nuclide	Sample Desc	Counting Date/Time	Halflife (days)	Detect	Carrier	Count Time	Counts	Bkg CPM	Eff
01	PU-238	LCS	12/11/02 12:10		A_Spec	1	170.17	3.35 E+02	5.00 E-03	22.5
02	PU-238	MBL	12/11/02 12:10		A_Spec	2	170.12	-3.40 E-01	2.00 E-03	19.4
03	PU-238	DUP	12/11/02 12:10		A_Spec	3	170.03	6.40 E-01	8.00 E-03	21.1
04	PU-238	DO	12/11/02 12:10		A_Spec	4	170.05	-5.10 E-01	3.00 E-03	21.4
05	PU-238	TRG	12/11/02 12:11		A_Spec	5	170.08	3.20 E-01	4.00 E-03	21.4

Work Order: 02-11141-PulSO-2

Client: Duratek
Eberline Services Work Order: 02-11141
Analysis Code: PulSO
Run: 2

Lab Fraction	Nuclide	Sample Desc	Client Identification	Activity Units	Results	Error Estimate	MDA	LCS Known	LCS %R	LCS Flag	RPD Flag	MDA Flag	Blank Flag
01	PU-239	LCS	LCS	pCi/g	5.09E+00	9.69E-01	3.34E-02	5.89E+00	86.40	OK		OK	
02	PU-239	MBL	BLANK	pCi/g	0.00E+00	0.00E+00	3.99E-02					OK	OK
03	PU-239	DUP	VA-02-0176	pCi/g	0.00E+00	0.00E+00	4.01E-02				OK	OK	
04	PU-239	DO	VA-02-0176	pCi/g	2.88E-02	4.51E-02	7.28E-02					OK	
05	PU-239	TRG	Process Blank	pCi/g	3.71E-02	4.30E-02	3.36E-02					OK	

00272

Work Order: 02-11141-PulSO-2

Client: Duratek
Eberline Services Work Order: 02-11141
Analysis Code: PulSO
Run: 2

Lab Fraction	Nuclide	Sample Desc	Sample Date	Sample Aliquot	Radiometric % Rec	Grav % Rec	Mean % Rec	SAF	Sep t0 Date/Time	Sep t1 Date/Time
01	PU-239	LCS	11/26/02 00:00	1.00E+00	95.66				12/11/2002 5:24	
02	PU-239	MBL	11/26/02 00:00	1.00E+00	92.98				12/11/2002 5:24	
03	PU-239	DUP	11/25/02 12:00	1.00E+00	84.63				12/11/2002 5:24	
04	PU-239	DO	11/25/02 12:00	1.00E+00	78.37				12/11/2002 5:24	
05	PU-239	TRG	11/26/02 00:00	1.00E+00	100.00				12/11/2002 5:24	

00273

Work Order: 02-11141-PuISO-2

Client: Duratek

Eberline Services Work Order: 02-11141

Analysis Code: PuISO

Run: 2

Lab Fraction	Nuclide	Sample Desc	Counting Date/Time	Halflife (days)	Detect	Carrier	Count Time	Counts	Bkg CPM	Eff
01	PU-239	LCS	12/11/02 12:10		A_Spec	1	170.17	4.13 E+02	0.00 E+00	22.5
02	PU-239	MBL	12/11/02 12:10		A_Spec	2	170.12	0.00 E+00	0.00 E+00	19.4
03	PU-239	DUP	12/11/02 12:10		A_Spec	3	170.03	0.00 E+00	0.00 E+00	21.1
04	PU-239	DO	12/11/02 12:10		A_Spec	4	170.05	1.83 E+00	1.00 E-03	21.4
05	PU-239	TRG	12/11/02 12:11		A_Spec	5	170.08	3.00 E+00	0.00 E+00	21.4

00274

1-5

Internal Fraction	Sample Desc	Client ID	Sample Date	Sample Aliquot	Tracer Aliquot (g)	Tracer ACT (dpm)	Radiometric Tracer (pCi)	Radiometric % Rec	SAF 1*	SAF 2*
01	LCS	LCS	11/26/02 00:00	1.0000	0.9803	8.3649				
02	MBL	BLANK	11/26/02 00:00	1.0000	0.9793	8.3564				
03	DUP	VA-02-0176	11/25/02 12:00	1.0036	0.9753	8.3222				
04	DO	VA-02-0176	11/25/02 12:00	1.0036	0.9744	8.3146				
05	TRG	Process Blank	11/26/02 00:00	1.0000	0.0000	0.0000				

Eberline Services
Oak Ridge Laboratory

Spike and Tracer Worksheet

Printed: 12/6/2002 1:24 PM

Internal Work Order	Run	Analysis Code	Date	Technician	Technician Initials	Witness Initials
02-11141	2	PulSO	12/6/2002 13:23	JBARNARD	JBarnard	

LCS & Matrix Spikes					LCS	MS	LCSD	MSD	LCS		MS		LCSD		MSD	
Isotope	Sol #	Activity dpm/ml	Solution Date	Approx Addition	Volume Used (ml)	Volume Used (ml)	Volume Used (ml)	Volume Used (ml)	Known pCi	Error Estimate	Added pCi	Error Estimate	Known pCi	Error Estimate	Added pCi	Error Estimate
Pu-238	Pu-1	108.405	12/6/2002	0.100	0.0994				4.85	0.136	0.00	0.000	0.00	0.000	0.00	0.000
Pu-239	Pu-2	130.935	12/6/2002	0.100	0.0999				5.89	0.183	0.00	0.000	0.00	0.000	0.00	0.000

Tracers						
fraction	Isotope	Sol #	Activity dpm/ml	Solution Date	Volume Used (ml)	Approx Addition
01	Pu242	Pu-15 10/01	8.533	12/6/2002	0.9803	1.2900
02	Pu242	Pu-15 10/01	8.533	12/6/2002	0.9793	1.2900
03	Pu242	Pu-15 10/01	8.533	12/6/2002	0.9753	1.2900
04	Pu242	Pu-15 10/01	8.533	12/6/2002	0.9744	1.2900
05	Pu242	Pu-15 10/01	8.533	12/6/2002	0.0000	1.2900

Balance Printer Tapes

Tracer	LCS
0.9803 g 0.9793 g 0.9753 g 0.9744 g	0.0994 g 0.0999 g

Matrix Spike

00276

Version 2.0 08/99

Eberline Services - Oak Ridge
Version 2.0 8/1999

Aliquot Worksheet

Work Order	Run	Analysis Code	Aliquot Units	Lab Deadline	Technician
02-11141	2	PuISO	grams	12/5/2002	JBARNARD

Lab Fraction	Duratek Client ID	Sample Type	Muffle Data	Dilution Data			Aliquot Data		MS Aliquot Data		H-3 Solids Only	
			Ratio Post/Pre	Aliquot	Final (ml)	Ratio	Aliquot	Net Equiv	Aliquot	Net Equiv	Water Added (ml)	H3 Dist Aliq
01	LCS	LCS					1.0000E+00	1.0000E+00				
02	BLANK	MBL					1.0000E+00	1.0000E+00				
03	VA-02-0176	DUP		2.5089E+01	100.0000	2.51E-01	4.0000E+00	1.0036E+00				
04	VA-02-0176	DO		2.5089E+01	100.0000	2.51E-01	4.0000E+00	1.0036E+00				
05	Process Blank	TRG					1.0000E+00	1.0000E+00				

Comments	

00277

Technician: JBarnard Date: 12/6/02

Eberline Services
Oak Ridge Laboratory

ALPHA SPECTROMETRY REPORT
11-DEC-2002 18:04:14

****
Spectral File: ND_AMS_ARCHIVE_C:C_0211141B-PU$01_PU.CNF
****

BATCH ID:	0211141B-PU	SAMPLE ID:	01
SAMPLE DATE:	11-DEC-2002 00:00	ALIQUOT:	1.000E+00 gram
SAMPLE TITLE:	SPIKE	DETECTOR NUMBER:	001
ACQ DATE:	11-DEC-2002 12:10	AVERAGE EFFICIENCY:	22.47%
ELAPSED LIVE TIME:	10210.	RECOVERY:	95.66%
TRACER ID:	PU-15	TRACER FWHM (kev):	25.11
LAMBDA VALUE:	980.	ROI TYPE:	STANDARD
TRACER DPM AT SAMPLE DATE:	8.365	CONFIDENCE FACTOR:	4.65
SAMPLE MATRIX:	SOIL	LLD CONSTANT:	2.71
ENERGY CAL DATE:	6-DEC-2002 04:14	EFF CAL DATE:	6-DEC-2002 04:14
BKG FILENAME:	B_001_6DEC02	BKG ELAPSED TIME:	60006.

****

NUCLIDE ACTIVITY SUMMARY

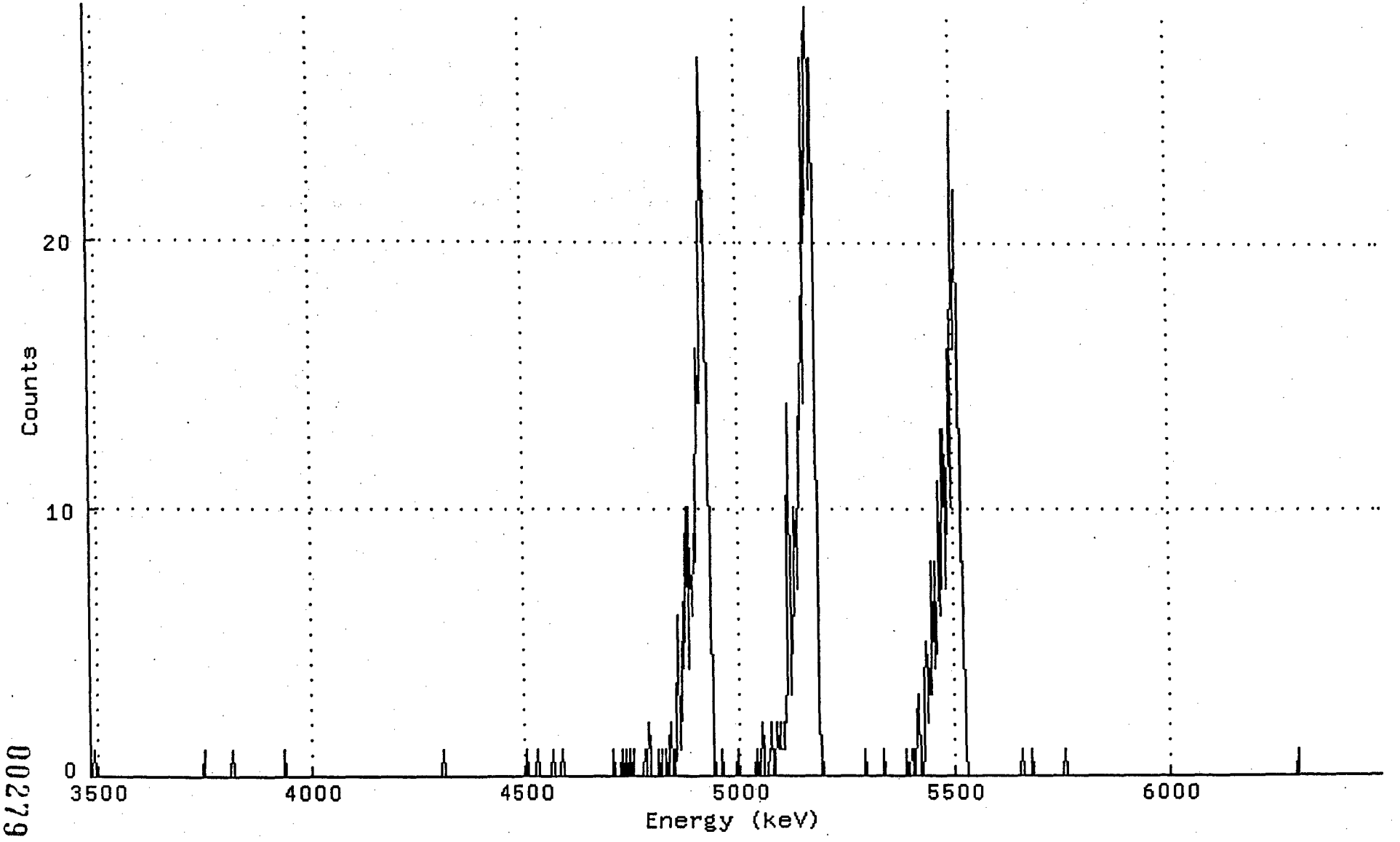
NUCLIDE	ENERGY	NET AREA	BKG	%ABN	ACTIVITY pCi/ gram	TPU/ERROR 2-SIGMA	MDC pCi/ gram
[illegible]-236	5755.0	1.64	1.36	100.0	2.019E-02	4.441E-02	1.002E-01
PU-238	5487.1	335.15	0.85	99.9	4.131E+00	8.104E-01	8.628E-02
PU-239	5147.7	413.00	0.00	99.9	5.091E+00	9.686E-01	3.341E-02
PU242	4890.7	305.98	1.02	100.0	3.768E+00	5.319E-01	9.123E-02
PU-244	4580.6	3.66	0.34	99.9	4.511E-02	5.020E-02	6.684E-02

****

Analyst — Date 12/10/02

Reviewer — Date 12/12/02

Spect : DKA100:[ALPHA.ALUSR.ARCHIVE.C]D 1141B-PU$01_PU.CNF;1
Title : 001
Sample Title: SPIKE
Start Time: 11-DEC-2002 12:10 Sample Time: 11-DEC-2002 00:00 Energy Offset: 3.47127E+03
Real Time : 0 02:50:10.00 Sample ID : 01 Energy Slope : 3.10600E+00
Live Time : 0 02:50:10.00 Sample Type: PU Energy Quad : -1.63302E-04



00279

Channel Contents for ND_AMS_ARCHIVE_C:C_0211141B-PU$01_PU

Channel														
[illegible]:	10210	10210	0	0	0	1	0	0	0	0	0	0	0	0
15:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85:	0	0	0	1	0	0	0	0	0	0	0	0	0	0
99:	0	0	0	0	0	0	0	0	0	0	0	1	0	0
113:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
127:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
141:	0	0	0	0	0	0	0	0	0	1	0	0	0	0
155:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
169:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
183:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
197:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
211:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
225:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
239:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
253:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
267:	0	0	0	0	1	0	0	0	0	0	0	0	0	0
281:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
295:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
309:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
323:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
337:	0	1	0	0	0	0	0	0	0	1	0	0	0	0
351:	0	0	0	0	0	0	0	1	0	0	0	0	0	0
365:	1	0	0	0	0	0	0	0	0	0	0	0	0	0
379:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
393:	0	0	0	0	0	0	0	0	0	0	0	0	1	0
407:	0	0	0	0	1	0	0	1	0	0	1	0	0	1
421:	0	0	0	0	0	0	0	0	1	0	0	2	1	0
435:	0	0	0	0	0	1	0	1	0	0	0	1	0	0
449:	1	2	0	1	0	1	6	5	1	3	5	4	9	5
[illegible]:	10	4	10	7	7	6	9	9	8	16	14	14	16	[illegible]
[illegible]:	20	25	19	12	11	9	0	1	0	0	0	0	0	[illegible]
491:	0	0	0	0	0	0	0	0	0	0	0	1	0	0
505:	0	0	0	0	0	0	0	0	0	0	0	0	1	0
519:	0	1	0	2	1	0	0	0	0	1	1	2	0	0
533:	0	2	1	2	1	1	1	2	2	4	7	14	4	3
547:	6	6	10	9	8	7	13	14	13	18	14	27	20	22
561:	27	29	25	22	27	19	19	3	0	1	0	0	0	0
575:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
589:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
603:	0	1	0	0	0	0	0	0	0	0	0	0	0	0
617:	0	0	1	0	0	0	0	0	0	0	0	0	0	0
631:	0	0	0	0	0	0	1	0	0	0	1	1	0	0
645:	2	2	3	0	1	0	1	3	5	4	2	4	3	8
659:	5	8	4	5	8	11	6	13	7	13	7	12	9	14
673:	16	10	25	21	16	22	19	18	8	10	6	2	1	0
687:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
701:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
715:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
729:	0	1	0	0	0	0	0	0	0	1	0	0	0	0
743:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
757:	0	0	0	0	0	0	0	0	1	0	0	0	0	0
771:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
785:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
799:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
813:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
827:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
855:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
869:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
883:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
911:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
925:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]	0	0	0	0	0	0	0	0	0	0	0	0	0	[illegible]
[illegible]	0	0	1	0	0	0	0	0	0	0	0	0	0	0
967:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
981:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
995:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1023:	0	0												

Eberline Services
Oak Ridge Laboratory

Gross Sample Counts Within Peak Regions Generated: 11-DEC-2002 18:04:09.67

Detector ID: 1 Acquisition Start: 11-DEC-2002 12:10:02.01
Live Time: 0 02:50:10.00 Real Time: 0 02:50:10.00
Batch Id: 0211141B-PU Sample Id: 01
Sample Type: PU

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4543.60	4	0	86.97	351.75	321	51	3.92E-04	50.0	
2	0	4896.22	307	0	25.11	470.41	414	74	3.01E-02	5.7	
3	0	5149.47	413	0	37.18	556.60	495	78	4.05E-02	4.9	
4	0	5480.59	336	0	45.11	670.56	638	75	3.29E-02	5.5	
5	0	5692.70	3	0	111.82	744.33	729	66	2.94E-04	57.7	

Background Counts Within Peak Regions Generated: 11-DEC-2002 18:04:11.81

Acquisition Start: 6-DEC-2002 15:42:26.01
Live Time: 0 16:40:06.00 Real Time: 0 16:40:06.00

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4526.70	2	0	5.73	346.00	321	51	3.33E-05	70.7	
2	0	4836.83	6	0	180.42	450.50	414	74	1.00E-04	40.8	
	0	5081.38	0	0	0.00	533.50	495	78	0.00E+00	0.0	
	0	5494.70	5	0	0.00	675.00	638	75	8.33E-05	44.7	
	0	5745.12	8	0	10.42	761.50	729	66	1.33E-04	35.4	

Net Sample Counts Within Peak Regions Generated: 11-DEC-2002 18:04:12.15

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4543.60*	4	0	86.97	351.75	321	51	3.58E-04	55.0	
2	0	4896.22*	306	0	25.11	470.41	414	74	3.00E-02	5.7	
3	0	5149.47*	413	0	37.18	556.60	495	78	4.05E-02	4.9	
4	0	5480.59*	335	0	45.11	670.56	638	75	3.28E-02	5.5	
5	0	5692.70*	2	0	111.82	744.33	729	66	1.61E-04	109.7	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.0 Generated 11-DEC-2002 18:04:13

Configuration	: MCA0:[AMSCOUNT]00000125$1		
Analyses by	: ROIPEAK V1.2,PEAKEFF V2.2,ENBACK V1.6,NID V3.3		
Sample title	: SPIKE		
Sample date	: 11-DEC-2002 00:00:00	Acquisition date	: 11-DEC-2002 12:10:02
Sample ID	: 01	Sample quantity	: 1.0000 gram
Sample type	: PU	Sample geometry	:
Detector name	: 001	Detector geometry	:
Elapsed live time	: 0 02:50:10.00	Elapsed real time	: 0 02:50:10.00 0.0%
Energy tolerance	: 100.00 keV	Half life ratio	: 8.00
Errors propagated	: Yes	Systematic Error	: 3.00 %
Efficiency type	: Average value	Efficiencies at	: Peak Energy
Abundance limit	: 75.00		

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity pCi/gram
0	4543.60*	4	86.97	351.75	321	51	110.1		PU-244	4.316E-02
0	4896.22*	306	25.11	470.41	414	74	11.5		PU242	3.60
0	5149.47*	413	37.18	556.60	495	78	9.8		PU-239	4.87
0	5480.59*	335	45.11	670.56	638	75	10.9		PU-238	3.95
0	5692.70*	2	111.82	744.33	729	66	219.4		PU-236	1.931E-02

Eberline Services
Oak Ridge Laboratory

ALPHA SPECTROMETRY REPORT
11-DEC-2002 18:04:33

****
Spectral File: ND_AMS_ARCHIVE_R:R_0211141B-PU$02_PU.CNF
****

BATCH ID:	0211141B-PU	SAMPLE ID:	02
SAMPLE DATE:	11-DEC-2002 00:00	ALIQUOT:	1.000E+00 gram
SAMPLE TITLE:	BLANK	DETECTOR NUMBER:	002
ACQ DATE:	11-DEC-2002 12:10	AVERAGE EFFICIENCY:	19.37%
ELAPSED LIVE TIME:	10207.	RECOVERY:	92.98%
TRACER ID:	PU-15	TRACER FWHM (kev):	79.86
LAMBDA VALUE:	979.	ROI TYPE:	STANDARD
TRACER DPM AT SAMPLE DATE:	8.356	CONFIDENCE FACTOR:	4.65
SAMPLE MATRIX:	SOIL	LLD CONSTANT:	2.71
ENERGY CAL DATE:	6-DEC-2002 04:14	EFF CAL DATE:	6-DEC-2002 04:14
BKG FILENAME:	B_002_6DEC02	BKG ELAPSED TIME:	60003.

****

NUCLIDE ACTIVITY SUMMARY

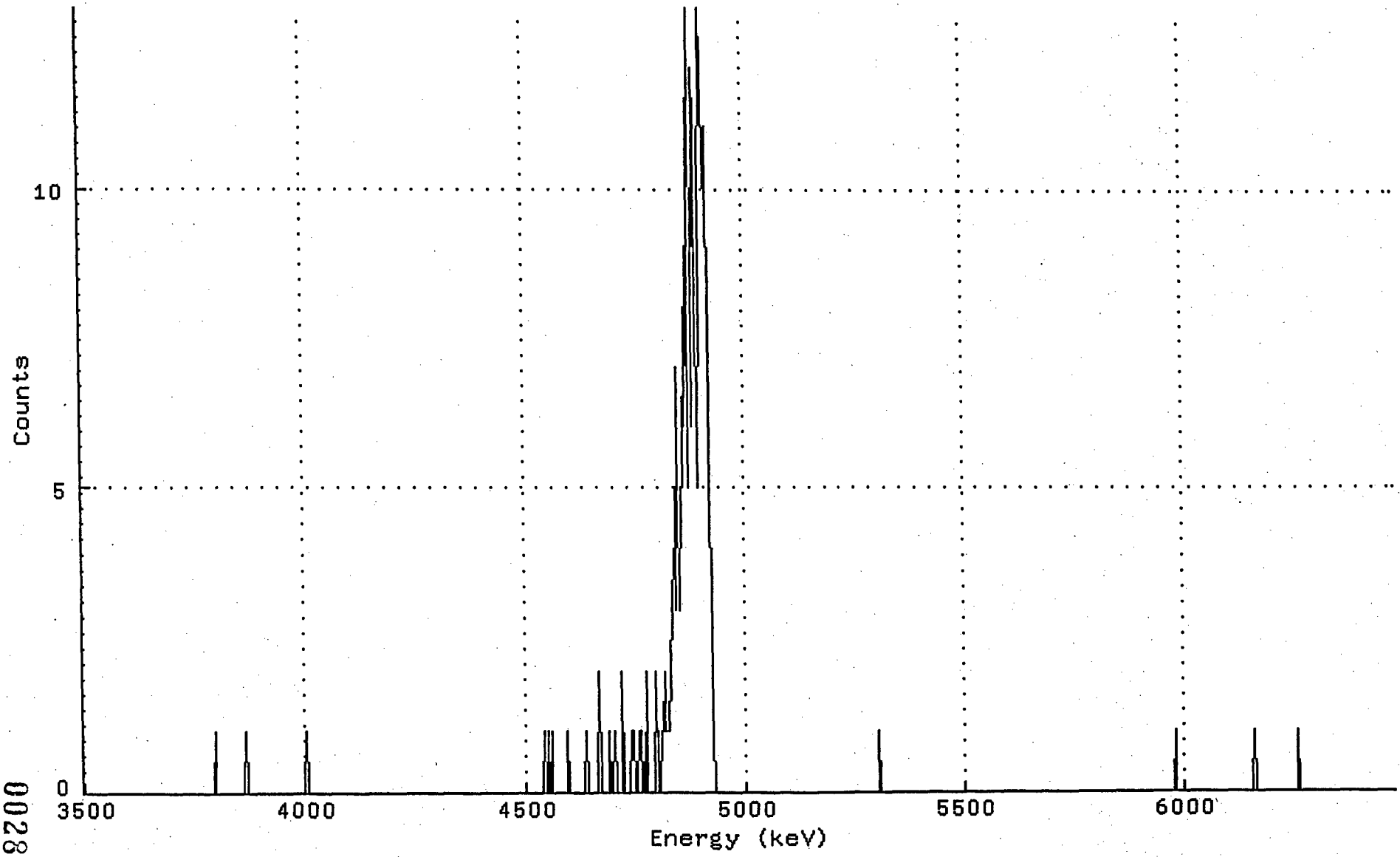
NUCLIDE	ENERGY	NET AREA	BKG	%ABN	ACTIVITY pCi/ gram	TPU/ERROR 2-SIGMA	MDC pCi/ gram
PU-236	5755.0	-0.51	0.51	100.0	-7.506E-03	8.762E-03	8.869E-02
PU-238	5487.1	-0.34	0.34	99.9	-5.007E-03	7.133E-03	7.981E-02
PU-239	5147.7	0.00	0.00	99.9	0.000E+00	0.000E+00	3.989E-02
PU242	4890.7	256.00	0.00	100.0	3.764E+00	5.645E-01	3.985E-02
PU-244	4580.6	3.32	0.68	99.9	4.886E-02	6.030E-02	9.634E-02

****

Ashley Clark — Analyst — 12/11/02 Date

Alan Gregley — Reviewer — 12/12/02 Date

Spectr : DKA100:[ALPHA.ALUSR.ARCHIVE.R]R_ 1141B-PU$02_PU.CNF;1
Title : 002
Sample Title: BLANK
Start Time: 11-DEC-2002 12:10 Sample Time: 11-DEC-2002 00:00 Energy Offset: 3.48443E+03
Real Time : 0 02:50:07.00 Sample ID : 02 Energy Slope : 3.05016E+00
Live Time : 0 02:50:07.00 Sample Type: PU Energy Quad : -1.27790E-04



00284

Channel Contents for ND_AMS_ARCHIVE_R:R_0211141B-PU$02_PU

Channel														
[illegible]	10207	10207	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99:	0	0	0	1	0	0	0	0	0	0	0	0	0	0
113:	0	0	0	0	0	0	0	0	0	0	0	0	1	0
127:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
141:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
155:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
169:	0	0	1	0	0	0	0	0	0	0	0	0	0	0
183:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
197:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
211:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
225:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
239:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
253:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
267:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
281:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
295:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
309:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
323:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
337:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
351:	0	1	0	0	1	0	1	0	0	0	0	0	0	0
365:	0	0	0	0	0	1	0	0	0	0	0	0	0	0
379:	0	0	0	0	0	1	0	0	0	0	0	0	0	0
393:	0	2	0	0	0	0	0	0	0	1	0	0	0	1
407:	0	0	0	0	0	2	0	0	0	0	0	0	1	1
421:	1	0	0	0	1	0	1	0	0	2	0	0	0	0
435:	0	0	0	2	0	1	0	1	1	1	2	1	1	1
449:	1	2	3	3	4	3	7	5	3	5	5	5	8	6
[illegible]	9	5	10	13	7	6	12	11	9	5	9	9	13	12
[illegible]	12	10	11	7	7	1	0	0	0	0	0	0	0	0
[illegible]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
505:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
519:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
533:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
547:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
561:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
575:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
589:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
603:	0	0	0	0	0	0	0	0	0	0	1	0	0	0
617:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
631:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
645:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
659:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
673:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
687:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
701:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
715:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
729:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
743:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
757:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
771:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
785:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
799:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
813:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
827:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	1	0	0	0	0	0	0	0
855:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
869:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
883:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	0	0	0	0	0	0	0	1
911:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
925:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]	0	0	0	0	0	0	0	1	0	0	0	0	0	0
[illegible]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
981:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
995:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1023:	0	0												

Eberline Services
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Gross Sample Counts Within Peak Regions Generated: 11-DEC-2002 18:04:24.[illegible]

Detector ID: 2 Acquisition Start: 11-DEC-2002 12:10:15.01
Live Time: 0 02:50:07.00 Real Time: 0 02:50:07.00
Batch Id: 0211141B-PU Sample Id: 02
Sample Type: PU

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4561.48	4	0	57.95	358.50	321	52	3.92E-04	50.0	
2	0	4878.35	256	0	79.86	466.10	416	74	2.51E-02	6.3	
3	0	5082.60	0	0	0.00	536.00	497	79	0.00E+00	0.0	
4	0	5492.25	0	0	0.00	677.50	640	76	0.00E+00	0.0	
5	0	5741.59	0	0	0.00	764.50	732	66	0.00E+00	0.0	

Background Counts Within Peak Regions Generated: 11-DEC-2002 18:04:31.97

Acquisition Start: 6-DEC-2002 15:42:29.01
Live Time: 0 16:40:03.00 Real Time: 0 16:40:03.00

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4528.82	4	0	104.59	346.50	321	52	6.67E-05	50.0	
2	0	4841.94	0	0	0.00	452.50	416	74	0.00E+00	0.0	
[illegible]	0	5086.17	0	0	0.00	536.00	497	79	0.00E+00	0.0	
[illegible]	0	5495.19	2	0	9.23	677.50	640	76	3.33E-05	70.7	
5	0	5743.63	3	0	116.89	764.50	732	66	5.00E-05	57.7	

Net Sample Counts Within Peak Regions Generated: 11-DEC-2002 18:04:32.23

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4561.48*	3	0	57.95	358.50	321	52	3.25E-04	61.1	
2	0	4878.35*	256	0	79.86	466.10	416	74	2.51E-02	6.3	
3	0	5082.60*	0	0	0.00	536.00	497	79	0.00E+00	0.0	
4	0	5492.25*	0	0	0.00	677.50	640	76	-3.33E-05	70.7	
5	0	5741.59*	-1	0	0.00	764.50	732	66	-5.00E-05	57.7	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.0 Generated 11-DEC-2002 18:04:33

Configuration	: MCA0:[AMSCOUNT]00000125$1		
Analyses by	: ROIPEAK V1.2,PEAKEFF V2.2,ENBACK V1.6,NID V3.3		
Sample title	: BLANK		
Sample date	: 11-DEC-2002 00:00:00	Acquisition date	: 11-DEC-2002 12:10:15
Sample ID	: 02	Sample quantity	: 1.0000 gram
Sample type	: PU	Sample geometry	:
Detector name	: 002	Detector geometry	:
Elapsed live time	: 0 02:50:07.00	Elapsed real time	: 0 02:50:07.00 0.0%
Energy tolerance	: 100.00 keV	Half life ratio	: 8.00
Errors propagated	: Yes	Systematic Error	: 3.00 %
Efficiency type	: Average value	Efficiencies at	: Peak Energy
Abundance limit	: 75.00		

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity pCi/gram
0	4561.48*	3	57.95	358.50	321	52	122.2		PU-244	4.543E-02
0	4878.35*	256	79.86	466.10	416	74	12.5		PU242	3.50
0	5082.60*	0	0.00	536.00	497	79	0.0		PU-239	0.000E+00
0	5492.25*	0	0.00	677.50	640	76	141.4		PU-238	-4.656E-03
0	5741.59*	-1	0.00	764.50	732	66	115.5		PU-236	-6.980E-03

Eberline Services
Oak Ridge Laboratory

ALPHA SPECTROMETRY REPORT
11-DEC-2002 18:04:44

****
Spectral File: ND_AMS_ARCHIVE_S:S_0211141B-PU$03_PU.CNF
****

BATCH ID:	0211141B-PU	SAMPLE ID:	03
SAMPLE DATE:	25-NOV-2002 00:00	ALIQUOT:	1.004E+00 gram
SAMPLE TITLE:	VA-02-0176	DETECTOR NUMBER:	003
ACQ DATE:	11-DEC-2002 12:10	AVERAGE EFFICIENCY:	21.12%
ELAPSED LIVE TIME:	10202.	RECOVERY:	84.63%
TRACER ID:	PU-15	TRACER FWHM (kev):	64.89
LAMBDA VALUE:	975.	ROI TYPE:	STANDARD
TRACER DPM AT SAMPLE DATE:	8.322	CONFIDENCE FACTOR:	4.65
SAMPLE MATRIX:	SOIL	LLD CONSTANT:	2.71
ENERGY CAL DATE:	6-DEC-2002 04:14	EFF CAL DATE:	6-DEC-2002 04:14
BKG FILENAME:	B_003_6DEC02	BKG ELAPSED TIME:	60000.

****

NUCLIDE ACTIVITY SUMMARY

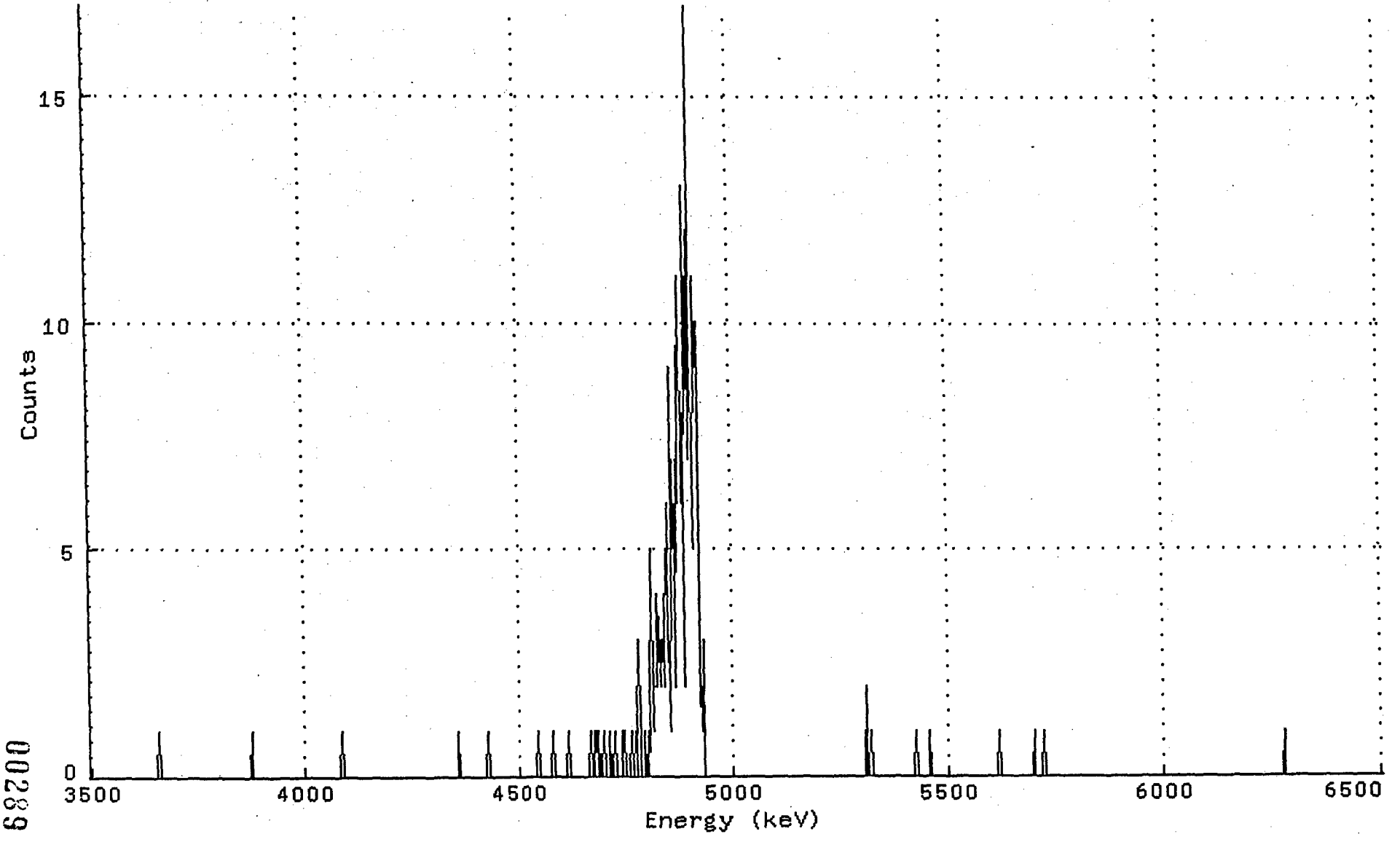
NUCLIDE	ENERGY	NET AREA	BKG	%ABN	ACTIVITY pCi/ gram	TPU/ERROR 2-SIGMA	MDC pCi/ gram
PU-236	5755.0	1.15	0.85	100.0	1.717E-02	4.382E-02	1.033E-01
PU-238	5487.1	0.64	1.36	99.9	9.459E-03	4.420E-02	1.202E-01
PU-239	5147.7	0.00	0.00	99.9	0.000E+00	0.000E+00	4.005E-02
PU242	4890.7	252.98	1.02	100.0	3.735E+00	5.630E-01	1.094E-01
PU-244	4580.6	2.66	0.34	99.9	3.931E-02	5.213E-02	8.013E-02

****

Ashley Clark 12/11/02
Analyst Date

Dan Gregory 12/12/02
Reviewer Date

Spectru : DKA100:[ALPHA.ALUSR.ARCHIVE.S]S_ 141B-PU$03_PU.CNF;1
Title : 003
Sample Title: VA-02-0176
Start Time: 11-DEC-2002 12:10 Sample Time: 25-NOV-2002 00:00 Energy Offset: 3.48860E+03
Real Time : 0 02:50:02.00 Sample ID : 03 Energy Slope : 3.04822E+00
Live Time : 0 02:50:02.00 Sample Type: PU Energy Quad : -1.03874E-04



00289

Channel Contents for ND_AMS_ARCHIVE_S:S_0211141B-PU$03_PU

el														
:	10202	10202	0	0	0	0	0	0	0	0	0	0	0	0
15:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43:	0	0	0	0	0	0	0	0	0	0	0	0	0	1
57:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
113:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
127:	1	0	0	0	0	0	0	0	0	0	0	0	0	0
141:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
155:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
169:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
183:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
197:	1	0	0	0	0	0	0	0	0	0	0	0	0	0
211:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
225:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
239:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
253:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
267:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
281:	0	0	0	0	0	0	1	0	0	0	0	0	0	0
295:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
309:	0	1	0	0	0	0	0	0	0	0	0	0	0	0
323:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
337:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
351:	1	0	0	0	0	0	0	0	0	0	0	1	1	0
365:	0	0	0	0	0	0	0	0	0	1	0	0	0	0
379:	0	0	0	0	0	0	0	0	0	0	0	0	0	1
393:	0	1	0	1	0	1	0	0	0	1	0	0	0	0
407:	1	0	0	0	1	0	0	0	0	0	1	1	0	0
421:	0	0	0	1	0	0	1	0	1	3	1	0	0	0
[illegible]:	1	0	1	0	1	5	1	2	2	2	4	3	2	3
[illegible]:	3	2	4	4	6	4	1	5	9	5	6	2	7	6
[illegible]:	8	11	6	8	2	13	9	10	7	17	11	5	11	[illegible]
:	9	10	2	1	3	0	0	0	0	0	0	0	0	0
491:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
505:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
519:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
533:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
547:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
561:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
575:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
589:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
603:	0	0	0	0	0	0	0	2	0	0	1	0	0	0
617:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
631:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
645:	0	0	0	0	1	0	0	0	0	0	0	0	0	0
659:	0	1	0	0	0	0	0	0	0	0	0	0	0	0
673:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
687:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
701:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
715:	1	0	0	0	0	0	0	0	0	0	0	0	0	0
729:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
743:	1	0	0	0	0	0	0	0	1	0	0	0	0	0
757:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
771:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
785:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
799:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
813:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
827:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
855:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
869:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
883:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	1	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
967:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
981:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
995:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1023:	0	0												

Eberline Services
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Gross Sample Counts Within Peak Regions Generated: 11-DEC-2002 18:04:38.54

Detector ID: 3 Acquisition Start: 11-DEC-2002 12:10:30.01
Live Time: 0 02:50:02.00 Real Time: 0 02:50:02.00
Batch Id: 0211141B-PU Sample Id: 03
Sample Type: PU

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4568.53	3	0	39.63	358.67	319	51	2.94E-04	57.7	
2	0	4877.40	254	0	64.89	462.91	413	74	2.49E-02	6.3	
3	0	5082.32	0	0	0.00	532.50	494	78	0.00E+00	0.0	
4	0	5439.16	2	0	36.58	654.50	636	75	1.96E-04	70.7	
5	0	5707.66	2	0	27.43	747.00	727	65	1.96E-04	70.7	

Background Counts Within Peak Regions Generated: 11-DEC-2002 18:04:40.74

Acquisition Start: 6-DEC-2002 15:42:32.01
Live Time: 0 16:40:00.00 Real Time: 0 16:40:00.00

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4527.56	2	0	67.25	344.00	319	51	3.33E-05	70.7	
[illegible]	0	4840.02	6	0	201.74	449.50	413	74	1.00E-04	40.8	
[illegible]	0	5083.96	0	0	0.00	532.50	494	78	0.00E+00	0.0	
[illegible]	0	5493.15	8	0	3.06	673.00	636	75	1.33E-04	35.4	
5	0	5741.28	5	0	140.22	759.00	727	65	8.33E-05	44.7	

Net Sample Counts Within Peak Regions Generated: 11-DEC-2002 18:04:41.01

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4568.53*	3	0	39.63	358.67	319	51	2.61E-04	65.7	
2	0	4877.40*	253	0	64.89	462.91	413	74	2.48E-02	6.3	
3	0	5082.32*	0	0	0.00	532.50	494	78	0.00E+00	0.0	
4	0	5439.16*	1	0	36.58	654.50	636	75	6.27E-05	233.5	
5	0	5707.66*	1	0	27.43	747.00	727	65	1.13E-04	127.4	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.0 Generated 11-DEC-2002 18:04:43

Configuration	: MCA0:[AMSCOUNT]00000125$1		
Analyses by	: ROIPEAK V1.2,PEAKEFF V2.2,ENBACK V1.6,NID V3.3		
Sample title	: VA-02-0176		
Sample date	: 25-NOV-2002 00:00:00	Acquisition date	: 11-DEC-2002 12:10:30
Sample ID	: 03	Sample quantity	: 1.0036 gram
Sample type	: PU	Sample geometry	:
Detector name	: 003	Detector geometry	:
Elapsed live time	: 0 02:50:02.00	Elapsed real time	: 0 02:50:02.00 0.0%
Energy tolerance	: 100.00 keV	Half life ratio	: 8.00
Errors propagated	: Yes	Systematic Error	: 3.00 %
Efficiency type	: Average value	Efficiencies at	: Peak Energy
Abundance limit	: 75.00		

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity pCi/gram
0	4568.53*	3	39.63	358.67	319	51	131.5		PU-244	3.327E-02
0	4877.40*	253	64.89	462.91	413	74	12.6		PU242	3.16
0	5082.32*	0	0.00	532.50	494	78	0.0		PU-239	0.000E+00
0	5439.16*	1	36.58	654.50	636	75	467.0		PU-238	8.005E-03
0	5707.66*	1	27.43	747.00	727	65	254.7		PU-236	1.453E-02

Eberline Services
Oak Ridge Laboratory

ALPHA SPECTROMETRY REPORT
11-DEC-2002 18:04:54

****
Spectral File: ND_AMS_ARCHIVE_S:S_0211141B-PU$04_PU.CNF
****

BATCH ID:	0211141B-PU	SAMPLE ID:	04
SAMPLE DATE:	25-NOV-2002 00:00	ALIQUOT:	1.004E+00 gram
SAMPLE TITLE:	VA-02-0176	DETECTOR NUMBER:	004
ACQ DATE:	11-DEC-2002 12:10	AVERAGE EFFICIENCY:	21.43%
ELAPSED LIVE TIME:	10203.	RECOVERY:	78.37%
TRACER ID:	PU-15	TRACER FWHM (kev):	61.23
LAMBDA VALUE:	974.	ROI TYPE:	STANDARD
TRACER DPM AT SAMPLE DATE:	8.315	CONFIDENCE FACTOR:	4.65
SAMPLE MATRIX:	SOIL	LLD CONSTANT:	2.71
ENERGY CAL DATE:	6-DEC-2002 04:14	EFF CAL DATE:	6-DEC-2002 04:14
BKG FILENAME:	B_004_6DEC02	BKG ELAPSED TIME:	60008.

****

NUCLIDE ACTIVITY SUMMARY

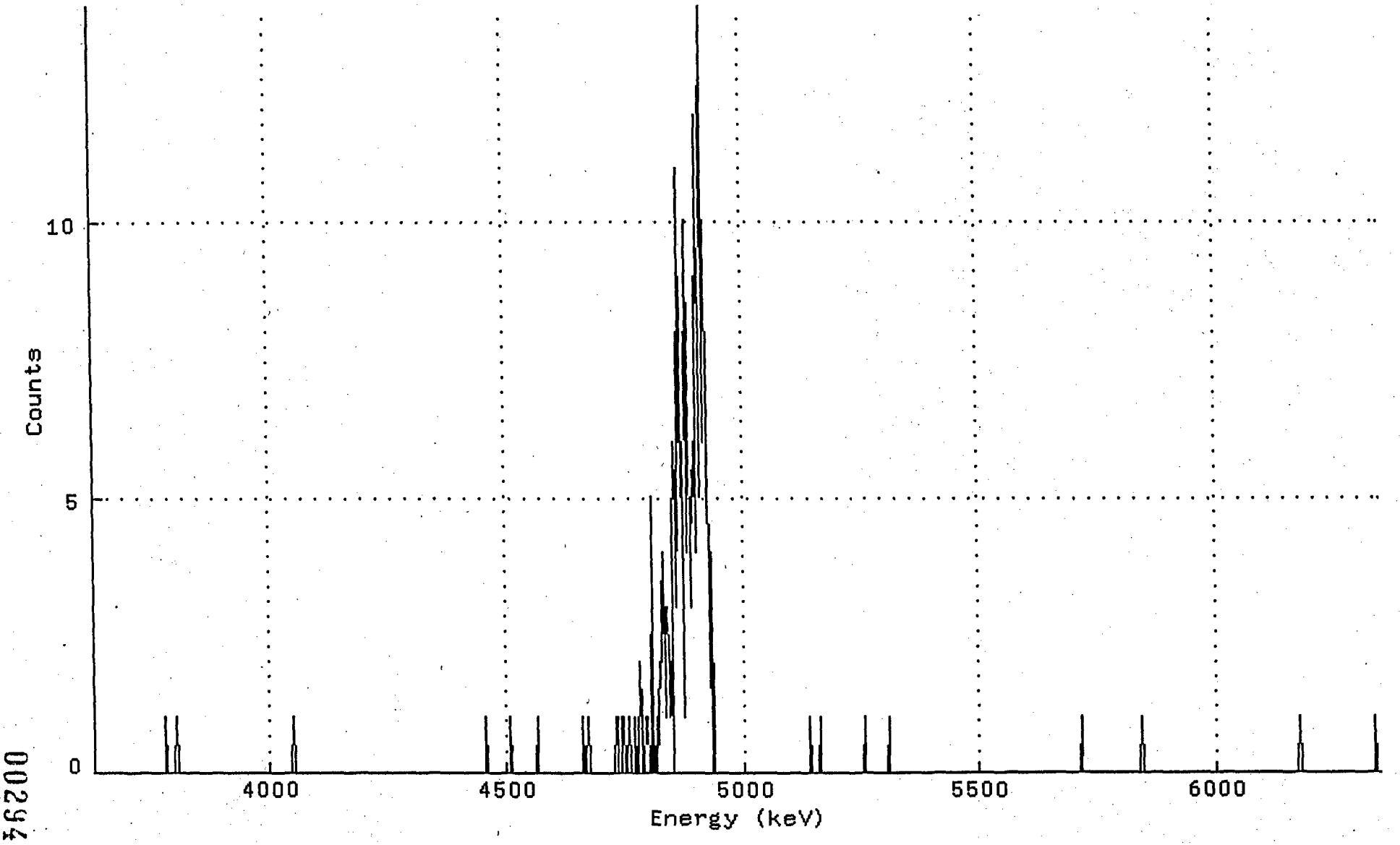
NUCLIDE	ENERGY	NET AREA	BKG	%ABN	ACTIVITY pCi/ gram	TPU/ERROR 2-SIGMA	MDC pCi/ gram
-236	5755.0	0.15	0.85	100.0	2.381E-03	3.400E-02	1.100E-01
PU-238	5487.1	-0.51	0.51	99.9	-8.027E-03	9.374E-03	9.487E-02
PU-239	5147.7	1.83	0.17	99.9	2.879E-02	4.509E-02	7.279E-02
PU242	4890.7	237.47	1.53	100.0	3.732E+00	5.756E-01	1.330E-01
PU-244	4580.6	2.15	0.85	99.9	3.382E-02	5.610E-02	1.101E-01

****

Ashley Clark — Analyst — 12/11/02 Date

Alan Fugley — Reviewer — 12/12/02 Date

Spectru : DKA100:[ALPHA.ALUSR.ARCHIVE.S]S_ 1141B-PU$04_PU.CNF;1
Title : 004
Sample Title: VA-02-0176
Start Time: 11-DEC-2002 12:10 Sample Time: 25-NOV-2002 00:00 Energy Offset: 3.62256E+03
Real Time : 0 02:50:03.00 Sample ID : 04 Energy Slope : 2.73881E+00
Live Time : 0 02:50:03.00 Sample Type: PU Energy Quad : -8.22464E-05



00294

Channel Contents for ND_AMS_ARCHIVE_S:S_0211141B-PU$04_PU

Channel														
[illegible]	10203	10203	0	0	0	0	0	0	0	0	0	0	0	0
15:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57:	0	1	0	0	0	0	0	0	0	1	0	0	0	0
71:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
113:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
127:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
141:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
155:	0	0	1	0	0	0	0	0	0	0	0	0	0	0
169:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
183:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
197:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
211:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
225:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
239:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
253:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
267:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
281:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
295:	0	0	0	0	0	0	0	0	0	0	0	0	1	0
309:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
323:	0	0	0	1	0	0	0	0	0	0	0	0	0	0
337:	0	0	0	0	0	0	0	0	0	0	1	0	0	0
351:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
365:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
379:	0	0	0	0	1	0	0	0	1	0	0	0	0	0
393:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
407:	0	0	1	1	0	0	0	1	1	0	0	0	1	0
421:	0	0	0	1	0	1	0	2	1	0	0	1	1	1
435:	0	0	0	5	0	0	1	0	1	2	2	3	4	1
[illegible]9:	3	3	2	1	2	0	4	6	5	3	5	11	6	9
[illegible]:	1	4	8	4	10	7	3	4	5	6	4	6	12	5
[illegible]:	8	11	14	6	10	6	6	3	0	4	0	0	0	0
491:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
505:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
519:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
533:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
547:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
561:	0	0	1	0	0	0	0	0	0	0	1	0	0	0
575:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
589:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
603:	0	0	0	0	0	1	0	0	0	0	0	0	0	0
617:	0	0	0	0	0	0	0	0	0	0	1	0	0	0
631:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
645:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
659:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
673:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
687:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
701:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
715:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
729:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
743:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
757:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
771:	0	0	0	0	0	0	0	0	0	0	1	0	0	0
785:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
799:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
813:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
827:	0	0	0	1	0	0	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
855:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
869:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
883:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
911:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]5:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	1	1	0	0	0	0	0	0	0
967:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
981:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
995:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0	0	0	0	1	0	0
1023:	0	0												

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Gross Sample Counts Within Peak Regions Generated: 11-DEC-2002 18:04:47.63

Detector ID: 4 Acquisition Start: 11-DEC-2002 12:10:46.01
Live Time: 0 02:50:03.00 Real Time: 0 02:50:03.00
Batch Id: 0211141B-PU Sample Id: 04
Sample Type: PU

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4508.46	3	0	112.29	326.67	305	57	2.94E-04	57.7	
2	0	4878.75	239	0	61.23	465.16	409	82	2.34E-02	6.5	
3	0	5149.03	2	0	24.65	567.00	499	86	1.96E-04	70.7	
4	0	5491.56	0	0	0.00	697.00	656	83	0.00E+00	0.0	
5	0	5711.41	1	0	2.74	781.00	757	72	9.80E-05	100.0	

Background Counts Within Peak Regions Generated: 11-DEC-2002 18:04:52.30

Acquisition Start: 6-DEC-2002 15:42:35.01
Live Time: 0 16:40:08.00 Real Time: 0 16:40:08.00

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4528.23	5	0	115.69	333.00	305	57	8.33E-05	44.7	
2	0	4839.83	9	0	165.28	449.50	409	82	1.50E-04	33.3	
[illegible]	0	5083.94	1	0	2.75	541.50	499	86	1.67E-05	100.0	
[illegible]	0	5492.61	3	0	10.67	697.00	656	83	5.00E-05	57.7	
5	0	5741.15	5	0	129.47	792.50	757	72	8.33E-05	44.7	

Net Sample Counts Within Peak Regions Generated: 11-DEC-2002 18:04:52.56

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4508.46*	2	0	112.29	326.67	305	57	2.11E-04	82.5	
2	0	4878.75*	237	0	61.23	465.16	409	82	2.33E-02	6.5	
3	0	5149.03*	2	0	24.65	567.00	499	86	1.79E-04	77.8	
4	0	5491.56*	-1	0	0.00	697.00	656	83	-5.00E-05	57.7	
5	0	5711.41*	0	0	2.74	781.00	757	72	1.47E-05	713.9	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.0 Generated 11-DEC-2002 18:04:53

Configuration	: MCA0:[AMSCOUNT]00000125$1		
Analyses by	: ROIPEAK V1.2,PEAKEFF V2.2,ENBACK V1.6,NID V3.3		
Sample title	: VA-02-0176		
Sample date	: 25-NOV-2002 00:00:00	Acquisition date	: 11-DEC-2002 12:10:46
Sample ID	: 04	Sample quantity	: 1.0036 gram
Sample type	: PU	Sample geometry	:
Detector name	: 004	Detector geometry	:
Elapsed live time	: 0 02:50:03.00	Elapsed real time	: 0 02:50:03.00 0.0%
Energy tolerance	: 100.00 keV	Half life ratio	: 8.00
Errors propagated	: Yes	Systematic Error	: 3.00 %
Efficiency type	: Average value	Efficiencies at	: Peak Energy
Abundance limit	: 75.00		

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw %Err	Fit	Nuclides	Activity pCi/gram
0	4508.46*	2112.29	326.67	305	57165.0			PU-244	2.650E-02
0	4878.75*	237 61.23	465.16	409	82 13.0			PU242	2.92
0	5149.03*	2 24.65	567.00	499	86155.7			PU-239	2.256E-02
0	5491.56*	-1 0.00	697.00	656	83115.5			PU-238	-6.291E-03
0	5711.41*	0 2.74	781.00	757	72*****			PU-236	1.866E-03

Eberline Services
Oak Ridge Laboratory

ALPHA SPECTROMETRY REPORT
11-DEC-2002 18:05:01

****
Spectral File: ND_AMS_ARCHIVE_S:S_0211141B-PU$05_PU.CNF
****

BATCH ID:	0211141B-PU	SAMPLE ID:	05
SAMPLE DATE:	26-NOV-2002 00:00	ALIQUOT:	1.000E+00 gram
SAMPLE TITLE:	PROCESS BLANK	DETECTOR NUMBER:	005
ACQ DATE:	11-DEC-2002 12:11	AVERAGE EFFICIENCY:	21.41%
ELAPSED LIVE TIME:	10205.	RECOVERY:	100.00%
TRACER ID:	PU-15	TRACER FWHM (kev):	0.00
LAMBDA VALUE:	0.	ROI TYPE:	STANDARD
TRACER DPM AT SAMPLE DATE:	0.000	CONFIDENCE FACTOR:	4.65
SAMPLE MATRIX:	SOIL	LLD CONSTANT:	2.71
ENERGY CAL DATE:	6-DEC-2002 04:14	EFF CAL DATE:	6-DEC-2002 04:14
BKG FILENAME:	B_005_6DEC02	BKG ELAPSED TIME:	60005.

****

NUCLIDE ACTIVITY SUMMARY

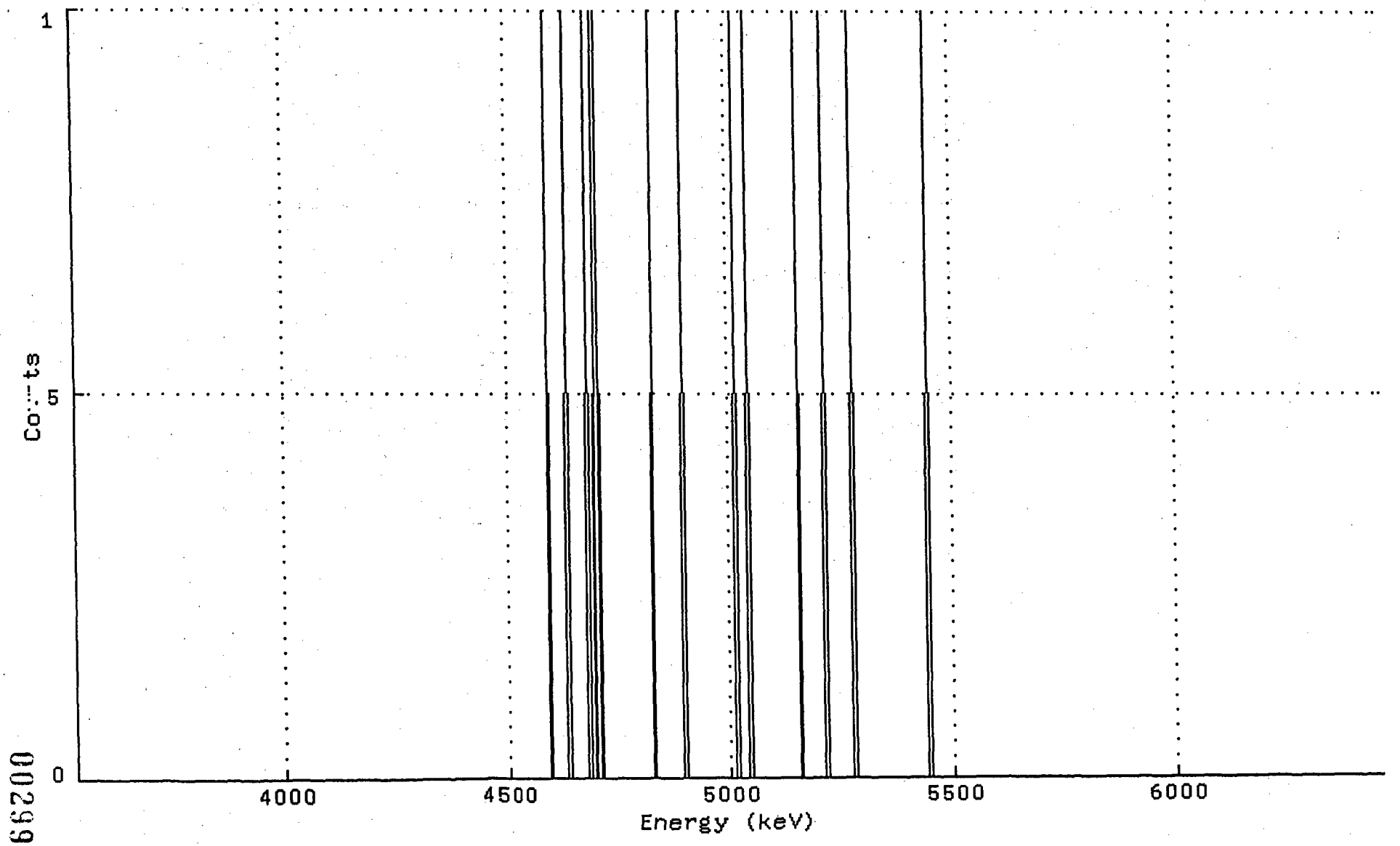
NUCLIDE	ENERGY	NET AREA	BKG	%ABN	ACTIVITY pCi/ gram	TPU/ERROR 2-SIGMA	MDC pCi/ gram
PU-236	5755.0	-1.87	1.87	100.0	-2.338E-02	1.422E-02	1.122E-01
PU-238	5487.1	0.32	0.68	99.9	3.959E-03	2.616E-02	8.103E-02
PU-239	5147.7	3.00	0.00	99.9	3.714E-02	4.299E-02	3.355E-02
PU242	4890.7	2.00	0.00	100.0	2.473E-02	3.504E-02	3.352E-02
PU-244	4580.6	0.83	0.17	99.9	1.027E-02	2.513E-02	5.729E-02

****

Ashley Clark — Analyst — 12/11/02 Date

Alan Gregley — Reviewer — 12/12/02 Date

Spectr[illegible] : DKA100:[ALPHA.ALUSR.ARCHIVE.S]S[illegible]11141B-PU$05_PU.CNF;1
Title : 005
Sample Title: PROCESS BLANK
Start Time: 11-DEC-2002 12:11 Sample Time: 26-NOV-2002 00:00 Energy Offset: 3.52053E+03
Real Time : 0 02:50:05.00 Sample ID : 05 Energy Slope : 2.94773E+00
Live Time : 0 02:50:05.00 Sample Type: PU Energy Quad : -8.44915E-05



002299

Channel Contents for ND_AMS_ARCHIVE_S:S_0211141B-PU$05_PU

Channel														
[illegible]	10205	10205	0	0	0	0	0	0	0	0	0	0	0	[illegible]
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
113:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
127:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
141:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
155:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
169:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
183:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
197:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
211:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
225:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
239:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
253:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
267:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
281:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
295:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
309:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
323:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
337:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
351:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
365:	0	0	0	0	1	0	0	0	0	0	0	0	0	0
379:	0	0	0	0	1	0	0	0	0	0	0	0	0	0
393:	0	0	0	0	0	0	1	0	0	0	0	1	0	0
407:	0	1	0	0	0	0	0	0	0	0	0	0	0	0
421:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
435:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
449:	1	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	1	0	0	[illegible]
[illegible]	0	0	0	0	0	0	0	0	0	0	0	0	0	[illegible]
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
505:	0	0	0	0	0	0	0	0	0	1	0	0	0	0
519:	0	0	0	0	0	1	0	0	0	0	0	0	0	0
533:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
547:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
561:	0	0	0	1	0	0	0	0	0	0	0	0	0	0
575:	0	0	0	0	0	0	0	0	0	1	0	0	0	0
589:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
603:	0	0	0	1	0	0	0	0	0	0	0	0	0	0
617:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
631:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
645:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
659:	0	0	0	0	0	0	1	0	0	0	0	0	0	0
673:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
687:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
701:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
715:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
729:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
743:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
757:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
771:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
785:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
799:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
813:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
827:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
855:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
869:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
883:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
911:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
925:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]	0	0	0	0	0	0	0	0	0	0	0	0	0	[illegible]
[illegible]	0	0	0	0	0	0	0	0	0	0	0	0	0	[illegible]
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
981:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
995:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1023:	0	0												

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Oak Ridge Laboratory

Gross Sample Counts Within Peak Regions Generated: 11-DEC-2002 18:04:58.04

Detector ID: 5 Acquisition Start: 11-DEC-2002 12:11:07.01
Live Time: 0 02:50:05.00 Real Time: 0 02:50:05.00
Batch Id: 0211141B-PU Sample Id: 05
Sample Type: PU

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4596.74	1	0	2.95	369.00	318	53	9.80E-05	100.0	
2	0	4861.48	2	0	73.69	461.00	415	76	1.96E-04	70.7	
3	0	5070.52	3	0	150.33	534.00	499	80	2.94E-04	57.7	
4	0	5443.41	1	0	2.95	665.00	644	77	9.80E-05	100.0	
5	0	5743.00	0	0	0.00	771.00	738	67	0.00E+00	0.0	

Background Counts Within Peak Regions Generated: 11-DEC-2002 18:04:59.86

Acquisition Start: 6-DEC-2002 15:42:38.01
Live Time: 0 16:40:05.00 Real Time: 0 16:40:05.00

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4531.72	1	0	2.99	344.00	318	53	1.67E-05	100.0	
2	0	4844.66	0	0	0.00	452.50	415	76	0.00E+00	0.0	
3	0	5090.42	0	0	0.00	538.50	499	80	0.00E+00	0.0	
[illegible]	0	5496.02	4	0	122.71	682.00	644	77	6.67E-05	50.0	
[illegible]	0	5744.74	11	0	4.40	771.00	738	67	1.83E-04	30.2	

Net Sample Counts Within Peak Regions Generated: 11-DEC-2002 18:05:00.13

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4596.74*	1	0	2.95	369.00	318	53	8.13E-05	122.2	
2	0	4861.48*	2	0	73.69	461.00	415	76	1.96E-04	70.7	
3	0	5070.52*	3	0	150.33	534.00	499	80	2.94E-04	57.7	
4	0	5443.41*	0	0	2.95	665.00	644	77	3.13E-05	330.4	
5	0	5743.00*	-2	0	0.00	771.00	738	67	-1.83E-04	30.2	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.0 Generated 11-DEC-2002 18:05:00

Configuration	: MCA0:[AMSCOUNT]00000125$1		
Analyses by	: ROIPEAK V1.2,PEAKEFF V2.2,ENBACK V1.6,NID V3.3		
Sample title	: PROCESS BLANK		
Sample date	: 26-NOV-2002 00:00:00	Acquisition date	: 11-DEC-2002 12:11:07
Sample ID	: 05	Sample quantity	: 1.0000 gram
Sample type	: PU	Sample geometry	:
Detector name	: 005	Detector geometry	:
Elapsed live time	: 0 02:50:05.00	Elapsed real time	: 0 02:50:05.00 0.0%
Energy tolerance	: 100.00 keV	Half life ratio	: 8.00
Errors propagated	: Yes	Systematic Error	: 3.00 %
Efficiency type	: Average value	Efficiencies at	: Peak Energy
Abundance limit	: 75.00		

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity pCi/gram
0	4596.74*	1	2.95	369.00	318	53244.4			PU-244	1.027E-02
0	4861.48*	2	73.69	461.00	415	76141.4			PU242	2.473E-02
0	5070.52*	3	150.33	534.00	499	80115.5			PU-239	3.714E-02
0	5443.41*	0	2.95	665.00	644	77660.7			PU-238	3.959E-03
0	5743.00*	-2	0.00	771.00	738	67	60.3		PU-236	-2.338E-02

EBERLINE SERVICES
Oak Ridge Laboratory

Non-Conformance Report

Action
RERUN

Work Order #	Run	Analysis
02-11141	**2**	**PulSO**

QC Level	4	Client	DURATEK
Sample Location	E1.4	Sample Matrix	OS
Original Deadline	December 10, 2002	ReRun Deadline	December 10, 2002

Applicable Samples

Fraction	Client ID	Comments Per Fraction
04	VA-02-0176	
05	Process Blank	

Special Instructions	Reanalyze the entire set because of LCS failure. The LCS has a 3.2% chemical recovery.	
Initiated Date/By	December 6, 2002	AGRIGSBY
Approval Date/By	December 6, 2002	Signature:

00303

QCP-008
Rev: 3
Date Revised: 27 August 1999

Printed: 12/6/2002 11:59 AM

SECTION XI

ANALYTICAL DATA (ISOTOPIC PLUTONIUM)
PU-242/244

Work Order	02-11141
Analysis Code	Pu4ISO
Run	1
Date Received	11/26/2002
Lab Deadline	12/5/2002
Client	Duratek
Project	106760.003
Report Level	4
Activity Units	pCi
Aliquot Units	g
Matrix	OS
Method	EML Pu-02 Modified
Instrument Type	Alpha Spectroscopy
Radiometric Tracer	Pu-236
Radiometric Sol#	Pu-16
Tracer Act (dpm/g)	26.189
Carrier	
Carrier Conc (mg/ml)	

Internal Fraction	Sample Desc	Client ID	Login CPM	Sample Date	Sample Aliquot
01	LCS	LCS		11/26/02 00:00	1.0000E+00
02	MBL	BLANK		11/26/02 00:00	1.0000E+00
03	DUP	VA-02-0176	89	11/25/02 12:00	1.0035E+00
04	DO	VA-02-0176	89	11/25/02 12:00	1.0035E+00

00305

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

Internal Fraction	Sample Desc	Tracer Aliquot (g)	Tracer Total ACT (dpm)	Radiometric Tracer (pCi)	Radiometric % Rec	Grav Carrier Added (ml)	Grav Filter Tare (g)	Grav Filter Final (g)	Grav Filter Net (g)	Grav % Rec	Mean % Rec	SAF 1*	SAF 2*
01	LCS	0.4314	11.3										
02	MBL	0.4324	11.3										
03	DUP	0.4304	11.3										
04	DO	0.4314	11.3										

* SAF1 is [illegible]d for Gross Alpha and all other radionuclides. SAF2 is used for Gross Beta only. ** [illegible]al mass exceeded the calibration curve range. Results should be qualified as approp[illegible].

Internal Fraction	Sample Desc	Rough Prep Date	Rough Prep By	Prep Date	Prep By	Sep t0 Date/Time	Sep t0 By	Sep t1 Date/Time	Sep t1 By
01	LCS			11/27/02 12:21	JBARNARD	12/05/02 05:08	TSMITH		
02	MBL			11/27/02 12:21	JBARNARD	12/05/02 05:08	TSMITH		
03	DUP			11/27/02 12:21	JBARNARD	12/05/02 05:08	TSMITH		
04	DO			11/27/02 12:21	JBARNARD	12/05/02 05:08	TSMITH		

00307

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

Work Order: 02-11141-Pu4ISO-1

Client: Duratek
Eberline Services Work Order: 02-11141
Analysis Code: Pu4ISO
Run: 1

Lab Fraction	Nuclide	Sample Desc	Client Identification	Activity Units	Results	Error Estimate	MDA	LCS Known	LCS %R	LCS Flag	RPD Flag	MDA Flag	Blank Flag
01	PU242	LCS	LCS	pCi/g	3.50E+00	7.17E-01	3.97E-02	3.92E+00	89.19	OK		OK	
02	PU242	MBL	BLANK	pCi/g	2.98E-02	4.24E-02	4.04E-02					OK	OK
03	PU242	DUP	VA-02-0176	pCi/g	8.34E-02	7.58E-02	4.52E-02				OK	OK	
04	PU242	DO	VA-02-0176	pCi/g	0.00E+00	0.00E+00	5.85E-02					OK	

12-50x

00308

Work Order: 02-11141-Pu4ISO-1

Client: Duratek
Eberline Services Work Order: 02-11141
Analysis Code: Pu4ISO
Run: 1

Lab Fraction	Nuclide	Sample Desc	Sample Date	Sample Aliquot	Radiometric % Rec	Grav % Rec	Mean % Rec	SAF	Sep t0 Date/Time	Sep t1 Date/Time
01	PU242	LCS	11/26/02 00:00	1.00E+00	91.74				12/5/2002 5:08	
02	PU242	MBL	11/26/02 00:00	1.00E+00	87.68				12/5/2002 5:08	
03	PU242	DUP	11/25/02 12:00	1.00E+00	80.45				12/5/2002 5:08	
04	PU242	DO	11/25/02 12:00	1.00E+00	61.94				12/5/2002 5:08	

00309

Work Order: 02-11141-Pu4ISO-1

Run: 1
Analysis Code: Pu4ISO
Eberline Services Work Order: 02-11141
Client: Duratek

Lab Fraction	Nuclide	Sample Desc	Counting Date/Time	Halflife (days)	Detect	Carrier	Count Time	Counts	Bkg CPM	Eff
01	PU242	LCS	12/05/02 07:40		A_Spec	39	170	2.39 E+02	0.00 E+00	19.7
02	PU242	MBL	12/05/02 07:40		A_Spec	40	170	2.00 E+00	0.00 E+00	20.3
03	PU242	DUP	12/05/02 07:40		A_Spec	41	170	5.00 E+00	0.00 E+00	19.7
04	PU242	DO	12/05/02 07:41		A_Spec	42	170	0.00 E+00	0.00 E+00	19.7

Work Order: 02-11141-Pu4ISO-1

Client: Duratek
Eberline Services Work Order: 02-11141
Analysis Code: Pu4ISO
Run: 1

Lab Fraction	Nuclide	Sample Desc	Client Identification	Activity Units	Results	Error Estimate	MDA	LCS Known	LCS %R	LCS Flag	RPD Flag	MDA Flag	Blank Flag
02	PU-244	MBL	BLANK	pCi/g	0.00E+00	0.00E+00	4.04E-02					OK	OK
03	PU-244	DUP	VA-02-0176	pCi/g	0.00E+00	0.00E+00	4.52E-02				OK	OK	
04	PU-244	DO	VA-02-0176	pCi/g	2.16E-02	4.34E-02	5.86E-02					OK	

00311

Work Order: 02-11141-Pu4ISO-1

Client: Duratek
Eberline Services Work Order: 02-11141
Analysis Code: Pu4ISO
Run: 1

Lab Fraction	Nuclide	Sample Desc	Sample Date	Sample Aliquot	Radiometric % Rec	Grav % Rec	Mean % Rec	SAF	Sep t0 Date/Time	Sep t1 Date/Time
02	PU-244	MBL	11/26/02 00:00	1.00E+00	87.68				12/5/2002 5:08	
03	PU-244	DUP	11/25/02 12:00	1.00E+00	80.45				12/5/2002 5:08	
04	PU-244	DO	11/25/02 12:00	1.00E+00	61.94				12/5/2002 5:08	

0312

Preliminary Data Report - Analytical Calculations

Work Order: 02-11141-Pu4ISO-1

Client: Duratek
Eberline Services Work Order: 02-11141
Analysis Code: Pu4ISO
Run: 1

Lab Fraction	Nuclide	Sample Desc	Counting Date/Time	Halflife (days)	Detect	Carrier	Count Time	Counts	Bkg CPM	Eff
02	PU-244	MBL	12/05/02 07:40		A_Spec	40	170	0.00 E+00	0.00 E+00	20.3
03	PU-244	DUP	12/05/02 07:40		A_Spec	41	170	0.00 E+00	0.00 E+00	19.7
04	PU-244	DO	12/05/02 07:41		A_Spec	42	170	1.00 E+00	0.00 E+00	19.7

39-42

Internal Fraction	Sample Desc	Client ID	Sample Date	Sample Aliquot	Tracer Aliquot (g)	Tracer ACT (dpm)	Radiometric Tracer (pCi)	Radiometric % Rec	SAF 1*	SAF 2*
01	LCS	LCS	11/26/02 00:00	1.0000	0.4314	11.2979				
02	MBL	BLANK	11/26/02 00:00	1.0000	0.4324	11.3241				
03	DUP	VA-02-0176	11/25/02 12:00	1.0035	0.4304	11.2717				
04	DO	VA-02-0176	11/25/02 12:00	1.0035	0.4314	11.2979				

00314

Eberline Services
Oak [illegible] boratory

Spike and [illegible]r Worksheet

Printed: 11/2[illegible] [illegible]:21 PM

Internal Work Order	Run	Analysis Code	Date	Technician	Technician Initials	Witness Initials
02-11141	1	Pu4ISO	11/27/2002 12:15	JBARNARD	Barnard	

LCS & Matrix Spikes					LCS	MS	LCSD	MSD	LCS		MS		LCSD		MSD	
Isotope	Sol #	Activity dpm/ml	Solution Date	Approx Addition	Volume Used (ml)	Volume Used (ml)	Volume Used (ml)	Volume Used (ml)	Known pCi	Error Estimate	Added pCi	Error Estimate	Known pCi	Error Estimate	Added pCi	Error Estimate
Pu-238	Pu-1	108.426	11/27/2002	0.100	0.1015				4.96	0.139	0.00	0.000	0.00	0.000	0.00	0.000
Pu-239	Pu-2	130.935	11/27/2002	0.100	0.1005				5.93	0.184	0.00	0.000	0.00	0.000	0.00	0.000
Pu242	Pu-15 10/01	8.533	11/27/2002	1.290	1.0210				3.92	0.029	0.00	0.000	0.00	0.000	0.00	0.000

Tracers

fraction	Isotope	Sol #	Activity dpm/ml	Solution Date	Volume Used (ml)	Approx Addition
01	Pu-236	Pu-16	26.189	11/27/2002	0.4314	0.4200
02	Pu-236	Pu-16	26.189	11/27/2002	0.4324	0.4200
03	Pu-236	Pu-16	26.189	11/27/2002	0.4304	0.4200
04	Pu-236	Pu-16	26.189	11/27/2002	0.4314	0.4200

Balance Printer Tapes

Tracer

0.4314 g
0.4324 g
0.4304 g
0.4314 g

LCS

0.1015 g
0.1005 g
1.0210 g

Matrix Spike

00315

Version 2.0 08/99

Eberline Services - Oak Ridge
Version 2.0 8/1999

Aliquot Worksheet

Work Order	Run	Analysis Code	Aliquot Units	Lab Deadline	Technician
02-11141	1	Pu4ISO	grams	12/5/2002	JBARNARD

Lab Fraction	Duratek	Sample	Muffle Data	Dilution Data			Aliquot Data		MS Aliquot Data		H-3 Solids Only	
	Client ID	Type	Ratio Pos/Pre	Aliquot	Final (ml)	Ratio	Aliquot	Net Equiv	Aliquot	Net Equiv	Water Added (ml)	H3 Dist Aliq
01	LCS	LCS					1.0000E+00	1.0000E+00				
02	BLANK	MBL					1.0000E+00	1.0000E+00				
03	VA-02-0176	DUP		2.5089E+01	100.0000	2.51E-01	4.0000E+00	1.0035E+00				
04	VA-02-0176	DO		2.5089E+01	100.0000	2.51E-01	4.0000E+00	1.0035E+00				

Comments	

00316

Technician: Jay Barnard Date: 12/3/02

Eberline Services
Oak Ridge Laboratory

ALPHA SPECTROMETRY REPORT
5-DEC-2002 11:04:30

****
Spectral File: ND_AMS_ARCHIVE_C:C_0211141AA-PU$01_PU.CNF
****

BATCH ID:	0211141AA-PU	SAMPLE ID:	01
SAMPLE DATE:	5-DEC-2002 00:00	ALIQUOT:	1.000E+00 gram
SAMPLE TITLE:	SPIKE	DETECTOR NUMBER:	039
ACQ DATE:	5-DEC-2002 07:40	AVERAGE EFFICIENCY:	19.72%
ELAPSED LIVE TIME:	10200.	RECOVERY:	91.74%
TRACER ID:	PU-16	TRACER FWHM (kev):	82.03
LAMBDA VALUE:	431.	ROI TYPE:	STANDARD
TRACER DPM AT SAMPLE DATE:	11.241	CONFIDENCE FACTOR:	4.65
SAMPLE MATRIX:	SOIL	LLD CONSTANT:	2.71
ENERGY CAL DATE:	29-NOV-2002 13:51	EFF CAL DATE:	29-NOV-2002 13:51
BKG FILENAME:	B_039_27NOV02	BKG ELAPSED TIME:	60000.

****

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	NET AREA	BKG	%ABN	ACTIVITY pCi/ gram	TPU/ERROR 2-SIGMA	MDC pCi/ gram
PU236	5755.0	345.66	0.34	100.0	5.063E+00	6.911E-01	7.939E-02
PU-238	5487.1	289.66	0.34	99.9	4.246E+00	8.397E-01	7.947E-02
PU-239	5147.7	385.83	0.17	99.9	5.656E+00	1.068E+00	6.783E-02
PU242	4890.7	239.00	0.00	100.0	3.500E+00	7.174E-01	3.969E-02
PU-244	4580.6	1.00	0.00	99.9	1.466E-02	2.941E-02	3.973E-02

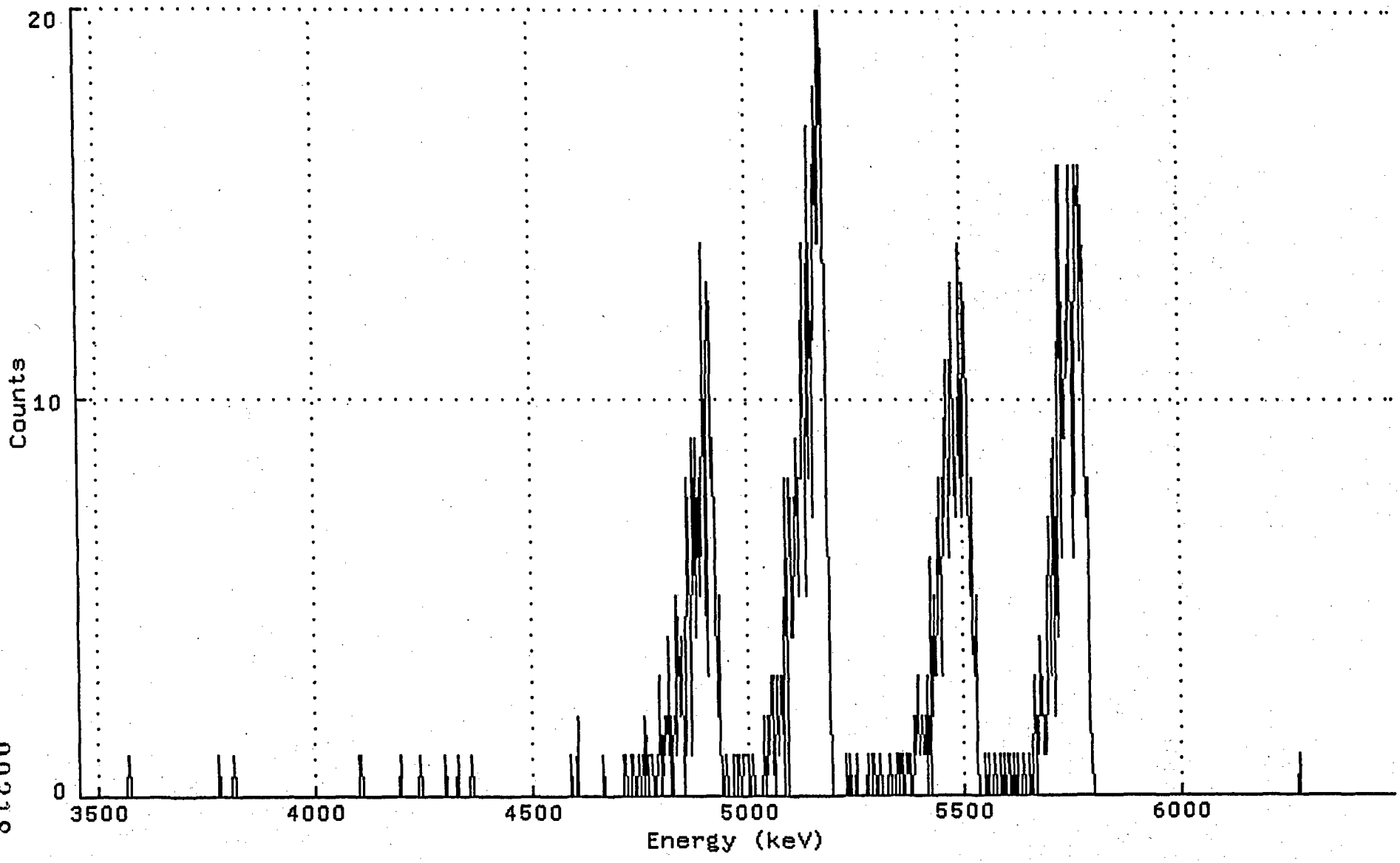
****

*** Tracer FWHM > 80.0 Kev ***

Jay Price — Analyst — 12-5-02 Date

Alan Fraylin — Reviewer — 12/5/02 Date

Spectrum : DKA100:[ALPHA.ALUSR.ARCHIVE.C]C_[illegible]11141AA-PU$01_PU.CNF;1
Title : 039
Sample Title: SPIKE
Start Time: 5-DEC-2002 07:40: Sample Time: 5-DEC-2002 00:00: Energy Offset: 3.44774E+03
Real Time : 0 02:50:00.40 Sample ID : 01 Energy Slope : 3.09610E+00
Live Time : 0 02:50:00.00 Sample Type: PU Energy Quad : -1.31778E-04



Channel Contents for ND_AMS_ARCHIVE_C:C_0211141AA-PU$01_PU

Channel

[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29:	0	0	0	0	0	0	0	0	0	0	0	1	0	0
43:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99:	0	0	0	0	0	0	0	0	1	0	0	0	0	0
113:	0	0	0	0	0	1	0	0	0	0	0	0	0	0
127:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
141:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
155:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
169:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
183:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
197:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
211:	0	0	1	1	0	0	0	0	0	0	0	0	0	0
225:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
239:	0	0	0	0	0	1	0	0	0	0	0	0	0	0
253:	0	0	0	0	0	0	1	0	0	0	0	0	0	0
267:	0	0	0	0	0	0	0	0	0	0	0	1	0	0
281:	0	0	0	0	0	0	1	0	0	0	0	0	0	0
295:	0	0	0	1	0	0	0	0	0	0	0	0	0	0
309:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
323:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
337:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
351:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
365:	0	0	0	0	0	0	0	0	0	1	0	0	0	0
379:	2	0	0	0	0	0	0	0	0	0	0	0	0	0
393:	0	0	0	0	0	0	1	0	0	0	0	0	0	0
407:	0	0	0	0	0	0	0	0	1	1	0	0	0	0
421:	1	1	0	0	0	1	0	0	1	0	2	1	0	1
435:	1	1	1	0	0	0	1	1	3	0	1	2	1	2
449:	1	4	0	0	1	2	1	5	4	2	3	4	0	1
[illegible]:	1	8	8	7	3	1	9	7	4	9	6	8	5	7
[illegible]:	10	14	6	3	10	13	12	8	9	6	6	2	5	2
[illegible]:	0	0	0	1	0	0	0	0	0	1	1	1	0	1
[illegible]:	0	0	1	1	1	1	1	0	0	1	1	0	0	0
519:	0	0	0	0	1	2	0	1	2	1	3	3	1	0
533:	3	3	1	3	3	3	0	2	8	0	4	8	7	4
547:	4	7	6	9	5	8	8	8	10	14	5	8	10	17
561:	8	14	10	7	16	15	18	14	20	14	20	18	9	9
575:	3	0	0	0	0	0	0	0	0	0	0	0	0	0
589:	1	0	0	1	0	0	0	0	1	0	0	0	0	0
603:	0	0	0	1	0	0	0	1	1	0	0	0	1	1
617:	0	0	0	0	0	0	1	0	0	0	0	0	1	1
631:	0	1	0	1	0	1	1	1	0	1	0	1	2	1
645:	3	2	1	2	1	1	1	3	0	2	0	6	2	4
659:	5	3	5	6	8	3	4	8	7	8	11	6	6	9
673:	13	12	8	7	7	10	8	14	7	9	13	12	9	9
687:	5	8	4	3	5	1	0	0	0	0	0	1	0	1
701:	0	0	0	0	1	0	0	0	0	1	0	1	0	0
715:	0	1	0	1	0	1	0	0	1	0	0	0	0	1
729:	0	0	0	0	1	0	1	0	3	1	0	2	2	4
743:	2	2	1	1	3	4	7	4	3	8	9	2	7	4
757:	7	16	6	16	9	10	9	12	11	11	16	9	6	9
771:	16	16	15	16	11	15	13	9	7	8	2	1	0	0
785:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
799:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
813:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
827:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
855:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
869:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
883:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
911:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
925:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	1	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
981:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
995:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1023:	0	0												

Eberline Services
Oak Ridge Laboratory

Gross Sample Counts Within Peak Regions Generated: 5-DEC-2002 11:04:17.07

Detector ID: 39 Acquisition Start: 5-DEC-2002 07:40:13.01
Live Time: 0 02:50:00.00 Real Time: 0 02:50:00.40
Batch Id: 0211141AA-PU Sample Id: 01
Sample Type: PU

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4587.25	1	0	3.10	374.00	328	51	9.80E-05	100.0	
2	0	4877.12	239	0	67.40	471.12	422	73	2.34E-02	6.5	
3	0	5132.91	386	0	55.39	557.52	502	78	3.78E-02	5.1	
4	0	5474.27	290	0	79.71	673.87	643	75	2.84E-02	5.9	
5	0	5738.42	346	0	82.03	764.75	734	65	3.39E-02	5.4	

Background Counts Within Peak Regions Generated: 5-DEC-2002 11:04:24.61

Acquisition Start: 27-NOV-2002 19:12:11.01
Live Time: 0 16:40:00.00 Real Time: 0 16:40:00.10

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4526.22	0	0	0.00	353.00	328	51	0.00E+00	0.0	
2	0	4840.72	0	0	0.00	458.00	422	73	0.00E+00	0.0	
3	0	5085.73	1	0	3.11	540.50	502	78	1.67E-05	100.0	
4	0	5495.81	2	0	102.47	680.00	643	75	3.33E-05	70.7	
5	0	5746.00	2	0	121.10	766.00	734	65	3.33E-05	70.7	

Net Sample Counts Within Peak Regions Generated: 5-DEC-2002 11:04:26.03

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4587.25*	1	0	3.10	374.00	328	51	9.80E-05	100.0	
2	0	4877.12*	239	0	67.40	471.12	422	73	2.34E-02	6.5	
3	0	5132.91*	386	0	55.39	557.52	502	78	3.78E-02	5.1	
4	0	5474.27*	290	0	79.71	673.87	643	75	2.84E-02	5.9	
5	0	5738.42*	346	0	82.03	764.75	734	65	3.39E-02	5.4	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.0 Generated 5-DEC-2002 11:04:28

Configuration	: MCA0:[AMSCOUNT]00000125$1		
Analyses by	: ROIPEAK V1.2,PEAKEFF V2.2,ENBACK V1.6,NID V3.3		
Sample title	: SPIKE		
Sample date	: 5-DEC-2002 00:00:00	Acquisition date	: 5-DEC-2002 07:40:13
Sample ID	: 01	Sample quantity	: 1.0000 gram
Sample type	: PU	Sample geometry	:
Detector name	: 039	Detector geometry	:
Elapsed live time	: 0 02:50:00.00	Elapsed real time	: 0 02:50:00.40 0.0%
Energy tolerance	: 100.00 keV	Half life ratio	: 8.00
Errors propagated	: Yes	Systematic Error	: 3.00 %
Efficiency type	: Average value	Efficiencies at	: Peak Energy
Abundance limit	: 75.00		

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity pCi/gram
0	4587.25*	1	3.10	374.00	328	51200.0			PU-244	1.345E-02
0	4877.12*	239	67.40	471.12	422	73	12.9		PU242	3.21
0	5132.91*	386	55.39	557.52	502	78	10.2		PU-239	5.19
0	5474.27*	290	79.71	673.87	643	75	11.8		PU-238	3.90
0	5738.42*	346	82.03	764.75	734	65	10.8		PU-236	4.65

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Oak Ridge Laboratory

ALPHA SPECTROMETRY REPORT
5-DEC-2002 11:05:03

****
Spectral File: ND_AMS_ARCHIVE_R:R_0211141AA-PU$02_PU.CNF
****

BATCH ID:	0211141AA-PU	SAMPLE ID:	02
SAMPLE DATE:	5-DEC-2002 00:00	ALIQUOT:	1.000E+00 gram
SAMPLE TITLE:	BLANK	DETECTOR NUMBER:	040
ACQ DATE:	5-DEC-2002 07:40	AVERAGE EFFICIENCY:	20.28%
ELAPSED LIVE TIME:	10200.	RECOVERY:	87.68%
TRACER ID:	PU-16	TRACER FWHM (kev):	51.09
LAMBDA VALUE:	432.	ROI TYPE:	STANDARD
TRACER DPM AT SAMPLE DATE:	11.267	CONFIDENCE FACTOR:	4.65
SAMPLE MATRIX:	SOIL	LLD CONSTANT:	2.71
ENERGY CAL DATE:	27-NOV-2002 12:13	EFF CAL DATE:	27-NOV-2002 12:13
BKG FILENAME:	B_040_27NOV02	BKG ELAPSED TIME:	60000.

****

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	NET AREA	BKG	%ABN	ACTIVITY pCi/ gram	TPU/ERROR 2-SIGMA	MDC pCi/ gram
PU236	5755.0	340.49	0.51	100.0	5.075E+00	6.958E-01	8.987E-02
PU-238	5487.1	8.00	0.00	99.9	1.193E-01	8.650E-02	4.042E-02
PU-239	5147.7	2.00	0.00	99.9	2.983E-02	4.246E-02	4.042E-02
PU242	4890.7	2.00	0.00	100.0	2.980E-02	4.242E-02	4.038E-02
PU-244	4580.6	0.00	0.00	99.9	0.000E+00	0.000E+00	4.042E-02

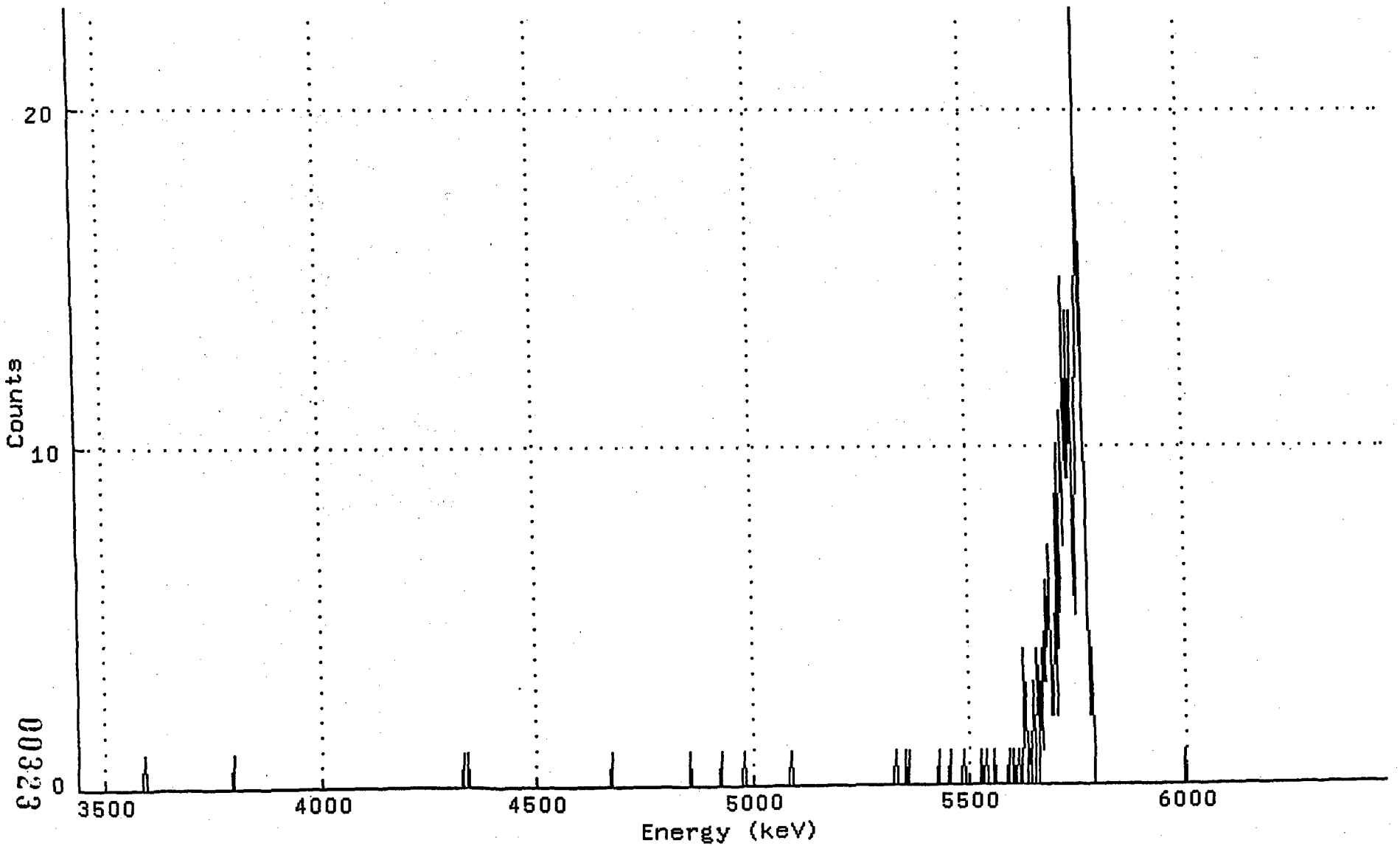
****

Analyst: Jay Price Date: 12-15-02

Reviewer: Alan Gregory Date: 12/5/02

Spectr : DKA100:[ALPHA.ALUSR.ARCHIVE.R]R_11141AA-PU$02_PU.CNF;1
Title : 040
Sample Title: BLANK

Start Time: 5-DEC-2002 07:40:	Sample Time: 5-DEC-2002 00:00:	Energy Offset: 3.42786E+03
Real Time : 0 02:50:00.30	Sample ID : 02	Energy Slope : 3.12165E+00
Live Time : 0 02:50:00.00	Sample Type: PU	Energy Quad : -1.63676E-04



00323

Channel Contents for ND_AMS_ARCHIVE_R:R_0211141AA-PU$02_PU

Channel														
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	[illegible]
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	[illegible]
29:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43:	0	0	0	0	0	0	0	0	0	1	0	0	0	0
57:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
113:	0	0	0	0	0	1	0	0	0	0	0	0	0	0
127:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
141:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
155:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
169:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
183:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
197:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
211:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
225:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
239:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
253:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
267:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
281:	0	0	0	0	0	0	0	0	0	0	0	1	0	0
295:	0	1	0	0	0	0	0	0	0	0	0	0	0	0
309:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
323:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
337:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
351:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
365:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
379:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
393:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
407:	1	0	0	0	0	0	0	0	0	0	0	0	0	0
421:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
435:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
449:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	1	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	[illegible]
[illegible]:	0	1	0	0	0	0	0	0	0	0	0	0	0	0
505:	0	0	0	0	0	1	0	0	0	0	0	0	0	0
519:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
533:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
547:	1	0	0	0	0	0	0	0	0	0	0	0	0	0
561:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
575:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
589:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
603:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
617:	0	0	0	0	0	0	0	0	0	0	0	0	1	0
631:	0	0	0	0	0	0	1	0	1	0	0	0	0	0
645:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
659:	0	0	0	0	1	0	0	0	0	0	0	0	0	1
673:	0	0	0	0	0	0	0	0	0	0	1	0	0	0
687:	0	0	0	0	0	0	0	0	0	0	1	0	0	0
701:	1	0	0	0	0	0	0	1	0	0	0	0	0	0
715:	0	0	0	0	1	0	0	0	1	0	0	0	1	0
729:	0	0	2	4	2	1	0	1	0	0	3	1	0	4
743:	3	0	3	1	4	3	6	3	5	6	7	2	3	2
757:	5	2	7	10	4	6	11	10	7	12	15	9	9	14
771:	10	14	6	5	12	10	14	16	23	13	16	14	5	4
785:	2	4	0	0	0	0	0	0	0	0	0	0	0	0
799:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
813:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
827:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
855:	0	0	0	0	0	1	0	0	0	0	0	0	0	0
869:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
883:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
911:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
925:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	[illegible]
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
981:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
995:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1023:	0	0												

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Gross Sample Counts Within Peak Regions Generated: 5-DEC-2002 11:04:56.63

Detector ID: 40 Acquisition Start: 5-DEC-2002 07:40:35.01
Live Time: 0 02:50:00.00 Real Time: 0 02:50:00.30
Batch Id: 0211141AA-PU Sample Id: 02
Sample Type: PU

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4524.43	0	0	0.00	358.00	333	51	0.00E+00	0.0	
2	0	4888.53	2	0	78.04	480.00	427	73	1.96E-04	70.7	
3	0	5031.93	2	0	118.62	528.50	508	77	1.96E-04	70.7	
4	0	5520.51	8	0	0.00	695.75	649	75	7.84E-04	35.4	
5	0	5731.22	341	0	51.09	768.87	741	65	3.34E-02	5.4	

Background Counts Within Peak Regions Generated: 5-DEC-2002 11:05:00.62

Acquisition Start: 27-NOV-2002 19:12:15.01
Live Time: 0 16:40:00.00 Real Time: 0 16:40:00.10

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4526.01	0	0	0.00	358.00	333	51	0.00E+00	0.0	
2	0	4839.96	0	0	0.00	463.00	427	73	0.00E+00	0.0	
3	0	5085.82	0	0	0.00	546.00	508	77	0.00E+00	0.0	
4	0	5495.87	0	0	0.00	686.00	649	75	0.00E+00	0.0	
5	0	5747.75	3	0	52.90	773.00	741	65	5.00E-05	57.7	

Net Sample Counts Within Peak Regions Generated: 5-DEC-2002 11:05:01.09

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4524.43*	0	0	0.00	358.00	333	51	0.00E+00	0.0	
2	0	4888.53*	2	0	78.04	480.00	427	73	1.96E-04	70.7	
3	0	5031.93*	2	0	118.62	528.50	508	77	1.96E-04	70.7	
4	0	5520.51*	8	0	0.00	695.75	649	75	7.84E-04	35.4	
5	0	5731.22*	340	0	51.09	768.87	741	65	3.34E-02	5.4	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.0 Generated 5-DEC-2002 11:05:02

Configuration	: MCA0:[AMSCOUNT]00000125$1		
Analyses by	: ROIPEAK V1.2,PEAKEFF V2.2,ENBACK V1.6,NID V3.3		
Sample title	: BLANK		
Sample date	: 5-DEC-2002 00:00:00	Acquisition date	: 5-DEC-2002 07:40:35
Sample ID	: 02	Sample quantity	: 1.0000 gram
Sample type	: PU	Sample geometry	:
Detector name	: 040	Detector geometry	:
Elapsed live time	: 0 02:50:00.00	Elapsed real time	: 0 02:50:00.30 0.0%
Energy tolerance	: 100.00 keV	Half life ratio	: 8.00
Errors propagated	: Yes	Systematic Error	: 3.00 %
Efficiency type	: Average value	Efficiencies at	: Peak Energy
Abundance limit	: 75.00		

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity pCi/gram
0	4524.43*	0	0.00	358.00	333	51	0.0		PU-244	0.000E+00
0	4888.53*	2	78.04	480.00	427	73	141.4		PU242	2.613E-02
0	5031.93*	2	118.62	528.50	508	77	141.4		PU-239	2.616E-02
0	5520.51*	8	0.00	695.75	649	75	70.7		PU-238	0.105
0	5731.22*	340	51.09	768.87	741	65	10.8		PU-236	4.45

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Oak Ridge Laboratory

ALPHA SPECTROMETRY REPORT
5-DEC-2002 11:06:01

****
Spectral File: ND_AMS_ARCHIVE_S:S_0211141AA-PU$03_PU.CNF
****

BATCH ID:	0211141AA-PU	SAMPLE ID:	03
SAMPLE DATE:	25-NOV-2002 00:00	ALIQUOT:	1.003E+00 gram
SAMPLE TITLE:	VA-02-0176	DETECTOR NUMBER:	041
ACQ DATE:	5-DEC-2002 07:40	AVERAGE EFFICIENCY:	19.68%
ELAPSED LIVE TIME:	10200.	RECOVERY:	80.45%
TRACER ID:	PU-16	TRACER FWHM (kev):	82.95
LAMBDA VALUE:	430.	ROI TYPE:	STANDARD
TRACER DPM AT SAMPLE DATE:	11.290	CONFIDENCE FACTOR:	4.65
SAMPLE MATRIX:	SOIL	LLD CONSTANT:	2.71
ENERGY CAL DATE:	27-NOV-2002 12:13	EFF CAL DATE:	27-NOV-2002 12:13
BKG FILENAME:	B_041_27NOV02	BKG ELAPSED TIME:	60000.

****

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	NET AREA	BKG	%ABN	ACTIVITY pCi/ gram	TPU/ERROR 2-SIGMA	MDC pCi/ gram
PU236	5755.0	301.83	0.17	100.0	5.068E+00	7.222E-01	7.716E-02
PU-238	5487.1	19.66	0.34	99.9	3.282E-01	1.589E-01	9.049E-02
PU-239	5147.7	0.83	0.17	99.9	1.385E-02	3.394E-02	7.723E-02
PU242	4890.7	5.00	0.00	100.0	8.337E-02	7.581E-02	4.519E-02
PU-244	4580.6	0.00	0.00	99.9	0.000E+00	0.000E+00	4.523E-02

****

*** Tracer FWHM > 80.0 Kev ***

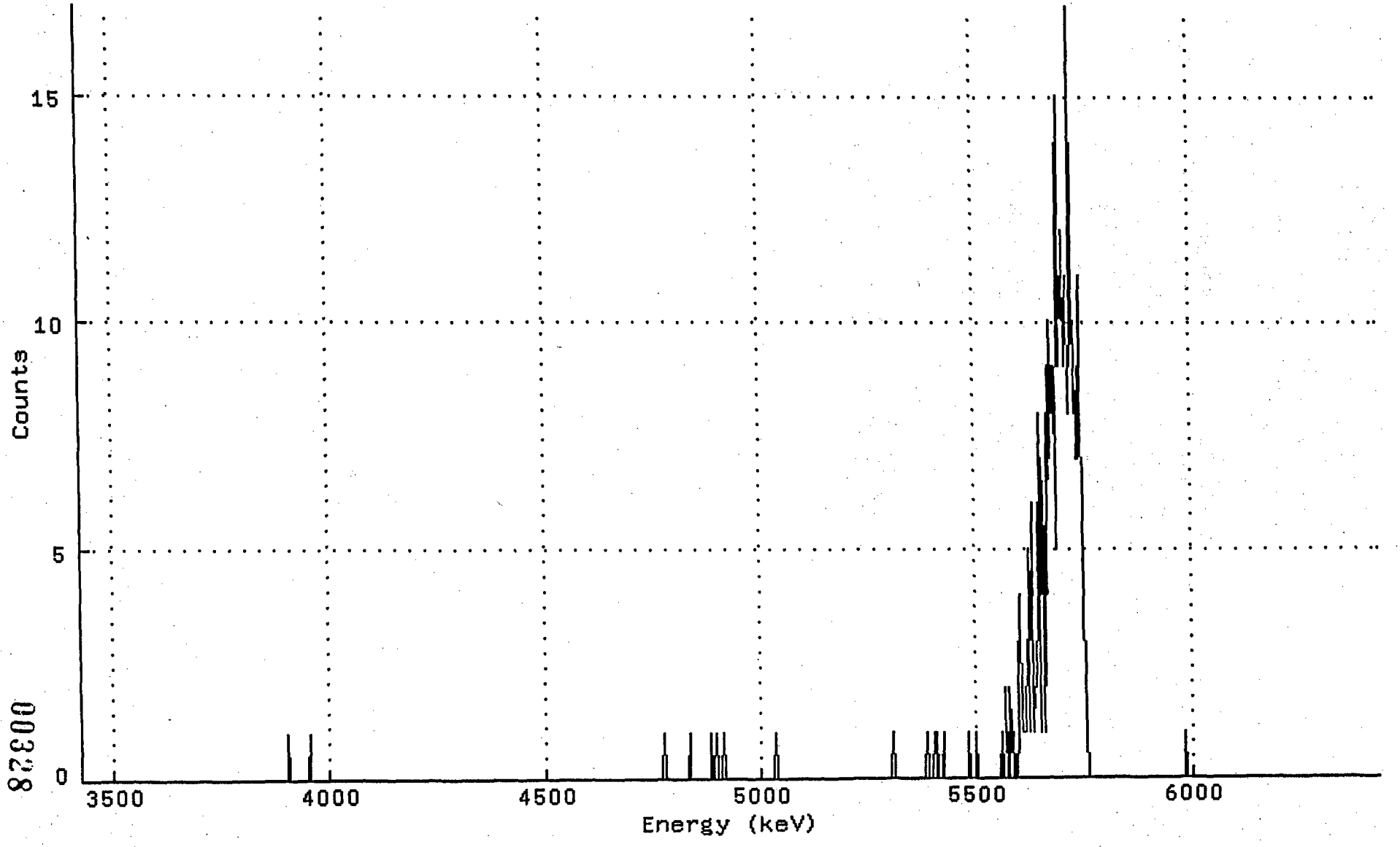
Jay Price
Analyst

12-5-02
Date

Reviewer

12/5/02
Date

Spectr : DKA100:[ALPHA.ALUSR.ARCHIVE.S]S_11141AA-PU$03_PU.CNF;1
Title : 041
Sample Title: VA-02-0176
Start Time: 5-DEC-2002 07:40: Sample Time: 25-NOV-2002 00:00 Energy Offset: 3.41574E+03
Real Time : 0 02:50:00.40 Sample ID : 03 Energy Slope : 3.14076E+00
Live Time : 0 02:50:00.00 Sample Type: PU Energy Quad : -1.97746E-04



00328

Channel Contents for ND_AMS_ARCHIVE_S:S_0211141AA-PU$03_PU

Channel														
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
113:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
127:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
141:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
155:	0	0	1	0	0	0	0	0	0	0	0	0	0	0
169:	0	0	0	0	1	0	0	0	0	0	0	0	0	0
183:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
197:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
211:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
225:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
239:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
253:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
267:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
281:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
295:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
309:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
323:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
337:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
351:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
365:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
379:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
393:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
407:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
421:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
435:	0	0	0	0	0	0	0	0	0	1	0	0	0	0
449:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	1	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	1	0	0	0	1	0	0	0	0	0
[illegible]:	1	0	0	0	0	0	0	0	0	0	0	0	0	0
505:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
519:	0	0	0	0	0	0	0	0	0	0	0	0	0	1
533:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
547:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
561:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
575:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
589:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
603:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
617:	0	0	0	0	0	0	0	0	0	1	0	0	0	0
631:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
645:	0	0	0	0	0	0	0	0	1	0	0	0	0	0
659:	1	0	1	0	0	0	0	1	0	0	0	0	0	0
673:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
687:	1	0	0	0	0	0	1	0	0	0	0	0	0	0
701:	0	0	0	0	0	0	0	0	0	0	0	0	1	0
715:	0	1	2	0	0	2	1	0	1	0	0	0	1	2
729:	4	1	1	1	1	1	3	1	5	3	6	1	2	2
743:	2	4	8	1	7	6	1	3	8	4	9	7	10	8
757:	9	9	6	5	13	15	9	11	10	12	9	11	11	8
771:	10	17	11	8	10	7	9	7	11	3	5	1	1	0
785:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
799:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
813:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
827:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
855:	0	0	0	0	0	0	0	0	1	0	0	0	0	0
869:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
883:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
911:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
925:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
981:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
995:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1023:	0	0												

Eberline Services
Oak Ridge Laboratory

Gross Sample Counts Within Peak Regions Generated: 5-DEC-2002 11:05:49.91

Detector ID: 41 Acquisition Start: 5-DEC-2002 07:40:55.01
Live Time: 0 02:50:00.00 Real Time: 0 02:50:00.40
Batch Id: 0211141AA-PU Sample Id: 03
Sample Type: PU

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4523.79	0	0	0.00	361.00	336	51	0.00E+00	0.0	
2	0	4857.08	5	0	150.76	473.00	430	74	4.90E-04	44.7	
3	0	5030.66	1	0	3.14	532.00	511	78	9.80E-05	100.0	
4	0	5547.71	20	0	0.00	710.60	654	76	1.96E-03	22.4	
5	0	5702.93	302	0	82.95	765.08	746	67	2.96E-02	5.8	

Background Counts Within Peak Regions Generated: 5-DEC-2002 11:05:57.60

Acquisition Start: 27-NOV-2002 19:12:18.01
Live Time: 0 16:40:00.00 Real Time: 0 16:40:00.10

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4541.70	0	0	0.00	361.00	336	51	0.00E+00	0.0	
2	0	4856.87	0	0	0.00	466.50	430	74	0.00E+00	0.0	
3	0	5101.88	1	0	3.14	549.50	511	78	1.67E-05	100.0	
4	0	5515.06	2	0	44.00	691.50	654	76	3.33E-05	70.7	
5	0	5765.89	1	0	3.14	779.00	746	67	1.67E-05	100.0	

Net Sample Counts Within Peak Regions Generated: 5-DEC-2002 11:05:58.10

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4523.79*	0	0	0.00	361.00	336	51	0.00E+00	0.0	
2	0	4857.08*	5	0	150.76	473.00	430	74	4.90E-04	44.7	
3	0	5030.66*	1	0	3.14	532.00	511	78	8.14E-05	122.2	
4	0	5547.71*	20	0	0.00	710.60	654	76	1.93E-03	22.8	
5	0	5702.93*	302	0	82.95	765.08	746	67	2.96E-02	5.8	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.0 Generated 5-DEC-2002 11:05:59

Configuration	: MCA0:[AMSCOUNT]00000125$1		
Analyses by	: ROIPEAK V1.2,PEAKEFF V2.2,ENBACK V1.6,NID V3.3		
Sample title	: VA-02-0176		
Sample date	: 25-NOV-2002 00:00:00	Acquisition date	: 5-DEC-2002 07:40:55
Sample ID	: 03	Sample quantity	: 1.0035 gram
Sample type	: PU	Sample geometry	:
Detector name	: 041	Detector geometry	:
Elapsed live time	: 0 02:50:00.00	Elapsed real time	: 0 02:50:00.40 0.0%
Energy tolerance	: 100.00 keV	Half life ratio	: 8.00
Errors propagated	: Yes	Systematic Error	: 3.00 %
Efficiency type	: Average value	Efficiencies at	: Peak Energy
Abundance limit	: 75.00		

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity pCi/gram
0	4523.79*	0	0.00	361.00	336	51	0.0		PU-244	0.000E+00
0	4857.08*	5	150.76	473.00	430	74	89.4		PU242	6.707E-02
0	5030.66*	1	3.14	532.00	511	78	244.4		PU-239	1.114E-02
0	5547.71*	20	0.00	710.60	654	76	45.6		PU-238	0.264
0	5702.93*	302	82.95	765.08	746	67	11.5		PU-236	4.08

Eberline Services
Oak Ridge Laboratory

ALPHA SPECTROMETRY REPORT
5-DEC-2002 11:06:40

****
Spectral File: ND_AMS_ARCHIVE_S:S_0211141AA-PU$04_PU.CNF
****

BATCH ID:	0211141AA-PU	SAMPLE ID:	04
SAMPLE DATE:	25-NOV-2002 00:00	ALIQUOT:	1.003E+00 gram
SAMPLE TITLE:	VA-02-0176	DETECTOR NUMBER:	042
ACQ DATE:	5-DEC-2002 07:41	AVERAGE EFFICIENCY:	19.75%
ELAPSED LIVE TIME:	10200.	RECOVERY:	61.94%
TRACER ID:	PU-16	TRACER FWHM (kev):	86.69
LAMBDA VALUE:	431.	ROI TYPE:	STANDARD
TRACER DPM AT SAMPLE DATE:	11.316	CONFIDENCE FACTOR:	4.65
SAMPLE MATRIX:	SOIL	LLD CONSTANT:	2.71
ENERGY CAL DATE:	27-NOV-2002 12:13	EFF CAL DATE:	27-NOV-2002 12:13
BKG FILENAME:	B_042_27NOV02	BKG ELAPSED TIME:	60000.

****

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	NET AREA	BKG	%ABN	ACTIVITY pCi/ gram	TPU/ERROR 2-SIGMA	MDC pCi/ gram
PU236	5755.0	233.66	0.34	100.0	5.079E+00	7.899E-01	1.170E-01
PU-238	5487.1	14.83	0.17	99.9	3.206E-01	1.768E-01	1.000E-01
PU-239	5147.7	2.83	0.17	99.9	6.116E-02	7.598E-02	1.000E-01
PU242	4890.7	0.00	0.00	100.0	0.000E+00	0.000E+00	5.851E-02
PU-244	4580.6	1.00	0.00	99.9	2.161E-02	4.339E-02	5.856E-02

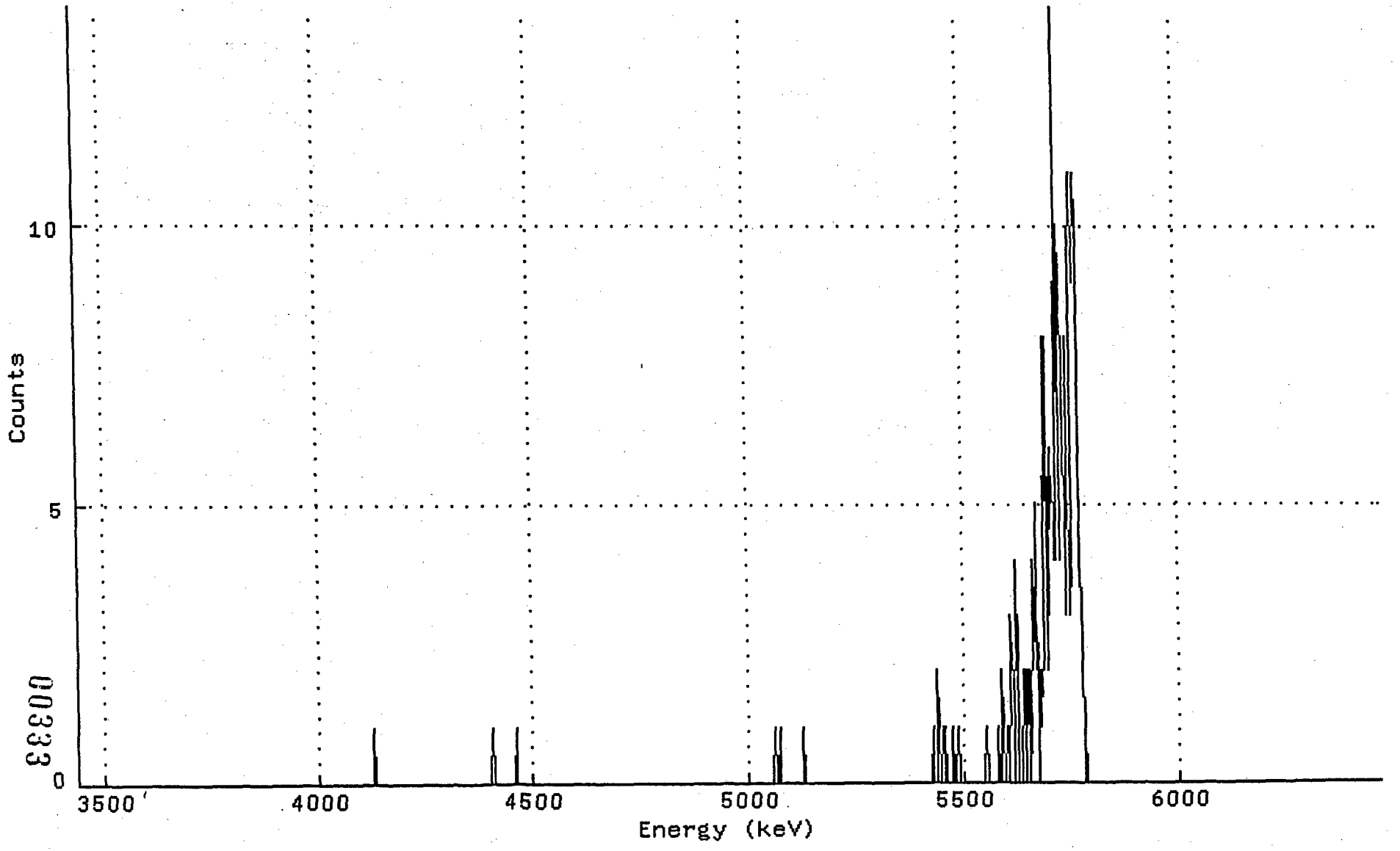
****

*** Tracer FWHM > 80.0 Kev ***

Jay Price — 12-5-02
Analyst — Date

Dan Fegley — 12/5/02
Reviewer — Date

Spectr : DKA100:[ALPHA.ALUSR.ARCHIVE.S]S_11141AA-PU$04_PU.CNF;1
Title : 042
Sample Title: VA-02-0176
Start Time: 5-DEC-2002 07:41: Sample Time: 25-NOV-2002 00:00 Energy Offset: 3.42882E+03
Real Time : 0 02:50:00.30 Sample ID : 04 Energy Slope : 3.13620E+00
Live Time : 0 02:50:00.00 Sample Type: PU Energy Quad : -1.72207E-04



00333

Channel Contents for ND_AMS_ARCHIVE_S:S_0211141AA-PU$04_PU

Channel														
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	[illegible]
[illegible]5:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
113:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
127:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
141:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
155:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
169:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
183:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
197:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
211:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
225:	1	0	0	0	0	0	0	0	0	0	0	0	0	0
239:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
253:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
267:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
281:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
295:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
309:	0	0	0	0	0	0	1	0	0	0	0	0	0	0
323:	0	0	0	0	0	0	0	0	0	0	0	0	1	0
337:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
351:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
365:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
379:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
393:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
407:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
421:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
435:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
449:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]3:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	[illegible]
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
505:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
519:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
533:	0	0	0	1	0	0	0	1	0	0	0	0	0	0
547:	0	0	0	0	0	0	0	0	0	0	0	0	1	0
561:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
575:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
589:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
603:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
617:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
631:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
645:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
659:	0	0	1	0	0	0	2	1	0	0	1	0	1	0
673:	0	0	0	0	1	0	0	0	1	0	0	0	0	0
687:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
701:	0	0	1	1	0	0	0	0	0	0	0	0	1	0
715:	0	2	1	0	0	1	0	0	2	3	2	2	0	4
729:	2	0	0	0	0	2	2	0	2	2	0	1	3	4
743:	3	2	5	0	2	1	2	2	3	8	2	8	3	6
757:	6	5	5	4	4	14	10	4	10	9	7	8	3	8
771:	6	3	4	9	11	9	9	11	10	4	3	0	1	0
785:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
799:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
813:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
827:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
855:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
869:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
883:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
911:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
925:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	[illegible]
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	[illegible]
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
981:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
995:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1023:	0	0												

Eberline Services
Oak Ridge Laboratory

Gross Sample Counts Within Peak Regions Generated: 5-DEC-2002 11:06:22.55

Detector ID: 42 Acquisition Start: 5-DEC-2002 07:41:14.01
Live Time: 0 02:50:00.00 Real Time: 0 02:50:00.30
Batch Id: 0211141AA-PU Sample Id: 04
Sample Type: PU

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4460.13	1	0	3.14	335.00	332	50	9.80E-05	100.0	
2	0	4838.02	0	0	0.00	461.00	425	73	0.00E+00	0.0	
3	0	5086.90	3	0	75.27	545.00	505	78	2.94E-04	57.7	
4	0	5509.66	15	0	164.55	689.60	647	75	1.47E-03	25.8	
5	0	5725.67	234	0	86.69	764.45	738	66	2.29E-02	6.5	

Background Counts Within Peak Regions Generated: 5-DEC-2002 11:06:34.58

Acquisition Start: 27-NOV-2002 19:12:22.01
Live Time: 0 16:40:00.00 Real Time: 0 16:40:00.10

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4526.94	0	0	0.00	356.50	332	50	0.00E+00	0.0	
2	0	4839.29	0	0	0.00	461.00	425	73	0.00E+00	0.0	
3	0	5083.60	1	0	3.11	543.50	505	78	1.67E-05	100.0	
4	0	5495.00	1	0	3.11	684.00	647	75	1.67E-05	100.0	
5	0	5745.38	2	0	55.99	770.50	738	66	3.33E-05	70.7	

Net Sample Counts Within Peak Regions Generated: 5-DEC-2002 11:06:36.06

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4460.13*	1	0	3.14	335.00	332	50	9.80E-05	100.0	
2	0	4838.02*	0	0	0.00	461.00	425	73	0.00E+00	0.0	
3	0	5086.90*	3	0	75.27	545.00	505	78	2.77E-04	61.5	
4	0	5509.66*	15	0	164.55	689.60	647	75	1.45E-03	26.1	
5	0	5725.67*	234	0	86.69	764.45	738	66	2.29E-02	6.5	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.0 Generated 5-DEC-2002 11:06:38

Configuration	: MCA0:[AMSCOUNT]00000125$1		
Analyses by	: ROIPEAK V1.2,PEAKEFF V2.2,ENBACK V1.6,NID V3.3		
Sample title	: VA-02-0176		
Sample date	: 25-NOV-2002 00:00:00	Acquisition date	: 5-DEC-2002 07:41:14
Sample ID	: 04	Sample quantity	: 1.0035 gram
Sample type	: PU	Sample geometry	:
Detector name	: 042	Detector geometry	:
Elapsed live time	: 0 02:50:00.00	Elapsed real time	: 0 02:50:00.30 0.0%
Energy tolerance	: 100.00 keV	Half life ratio	: 8.00
Errors propagated	: Yes	Systematic Error	: 3.00 %
Efficiency type	: Average value	Efficiencies at	: Peak Energy
Abundance limit	: 75.00		

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity pCi/gram
0	4460.13*	1	3.14	335.00	332	50	200.0		PU-244	1.339E-02
0	4838.02*	0	0.00	461.00	425	73	0.0		PU242	0.000E+00
0	5086.90*	3	75.27	545.00	505	78	123.0		PU-239	3.788E-02
0	5509.66*	15	164.55	689.60	647	75	52.3		PU-238	0.199
0	5725.67*	234	86.69	764.45	738	66	13.1		PU-236	3.15

SECTION XII

ANALYTICAL DATA (PLUTONIUM-241)

Work Order	02-11141
Analysis Code	Pu241
Run	2
Date Received	11/26/2002
Lab Deadline	12/5/2002
Client	Duratek
Project	106760.003
Report Level	4
Activity Units	pCi
Aliquot Units	g
Matrix	OS
Method	EML Pu-02 Modified
Instrument Type	Beta LSC
Radiometric Tracer	Pu242
Radiometric Sol#	Pu-15 10/01
Tracer Act (dpm/g)	8.533
Carrier	
Carrier Conc (mg/ml)	

Internal Fraction	Sample Desc	Client ID	Login CPM	Sample Date	Sample Aliquot
01	LCS	LCS		11/26/02 00:00	1.0000E+00
02	MBL	BLANK		11/26/02 00:00	1.0000E+00
03	DUP	VA-02-0176	89	11/25/02 12:00	1.0036E+00
04	DO	VA-02-0176	89	11/25/02 12:00	1.0036E+00
05	TRG	Process Blank		11/26/02 00:00	1.0000E+00

001338

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

Internal Fraction	Sample Desc	Tracer Aliquot (g)	Tracer Total ACT (dpm)	Radiometric Tracer (pCi)	Radiometric % Rec	Grav Carrier Added (ml)	Grav Filter Tare (g)	Grav Filter Final (g)	Grav Filter Net (g)	Grav % Rec	Mean % Rec	SAF 1*	SAF 2*
01	LCS	0.9803	8.4										
02	MBL	0.9793	8.4										
03	DUP	0.9753	8.3										
04	DO	0.9744	8.3										
05	TRG	0.0000	0.0										

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

Internal Fraction	Sample Desc	Rough Prep Date	Rough Prep By	Prep Date	Prep By	Sep t0 Date/Time	Sep t0 By	Sep t1 Date/Time	Sep t1 By
01	LCS			12/16/02 17:05	BMCDOWELL	12/11/02 05:25	TSMITH		
02	MBL			12/16/02 17:05	BMCDOWELL	12/11/02 05:25	TSMITH		
03	DUP			12/16/02 17:05	BMCDOWELL	12/11/02 05:25	TSMITH		
04	DO			12/16/02 17:05	BMCDOWELL	12/11/02 05:25	TSMITH		
05	TRG			12/16/02 17:05	BMCDOWELL	12/11/02 05:25	TSMITH		

* SAF1 [illegible]ed for Gross Alpha and all other radionuclides. SAF2 is used for Gross Beta only. [illegible]tual mass exceeded the calibration curve range. Results should be qualified as appro[illegible]e.

02-11141-Pu[illegible]2 (pCi/g) in OS
Tracer ID: [illegible]u-15 10/01

Internal Fraction	Sample Desc	Client ID	Sample Date	Sample Aliquot	Tracer Aliquot (g)	Tracer ACT (dpm)	Radiometric Tracer (pCi)	Radiometric % Rec	SAF 1*	SAF 2*
01	LCS	LCS	11/26/02 00:00	1.0000	0.9803	8.3649				
02	MBL	BLANK	11/26/02 00:00	1.0000	0.9793	8.3564				
03	DUP	VA-02-0176	11/25/02 12:00	1.0036	0.9753	8.3222				
04	DO	VA-02-0176	11/25/02 12:00	1.0036	0.9744	8.3146				
05	TRG	Process Blank	11/26/02 00:00	1.0000	0.0000	0.0000				

Work Order: 02-11141-Pu241-2

Run: 2
Analysis Code: Pu241
Eberline Services Work Order: 02-11141
Client: Duratek

Lab Fraction	Nuclide	Sample Desc	Client Identification	Activity Units	Results	Error Estimate	MDA	LCS Known	LCS %R	LCS Flag	RPD Flag	MDA Flag	Blank Flag
01	PU-241	LCS	LCS	pCi/g	3.33E+02	6.51E+00	4.53E+00	2.81E+02	118.46	OK		OK	
02	PU-241	MBL	BLANK	pCi/g	1.16E+01	2.76E+00	4.52E+00					OK	INV
03	PU-241	DUP	VA-02-0176	pCi/g	1.37E+01	2.94E+00	4.77E+00				INV	OK	
04	PU-241	DO	VA-02-0176	pCi/g	5.61E+00	2.96E+00	5.11E+00					INV	

Work Order: 02-11141-Pu241-2

Client: Duratek
Eberline Services Work Order: 02-11141
Analysis Code: Pu241
Run: 2

Lab Fraction	Nuclide	Sample Desc	Sample Date	Sample Aliquot	Radiometric % Rec	Grav % Rec	Mean % Rec	SAF	Sep t0 Date/Time	Sep t1 Date/Time
01	PU-241	LCS	11/26/02 00:00	1.00E+00		0.00	0.00		12/11/2002 5:25	
02	PU-241	MBL	11/26/02 00:00	1.00E+00		0.00	0.00		12/11/2002 5:25	
03	PU-241	DUP	11/25/02 12:00	1.00E+00		0.00	0.00		12/11/2002 5:25	
04	PU-241	DO	11/25/02 12:00	1.00E+00		0.00	0.00		12/11/2002 5:25	

00343

Work Order: 02-11141-Pu241-2

Client: Duratek
Eberline Services Work Order: 02-11141
Analysis Code: Pu241
Run: 2

Lab Fraction	Nuclide	Sample Desc	Counting Date/Time	Halflife (days)	Detect	Carrier	Count Time	Counts	Bkg CPM	Eff
01	PU-241	LCS	12/13/02 16:27	5215.77	2550	1	90	12966.3	12.82	0.186152719
02	PU-241	MBL	12/13/02 17:57	5215.77	2550	2	90	1567.8	12.82	0.191729263
03	PU-241	DUP	12/13/02 19:27	5215.77	2550	3	90	1614.6	12.82	0.198927668
04	PU-241	DO	12/13/02 20:57	5215.77	2550	4	90	1330.2	12.82	0.200634367

Eberline Services - Oak Ridge
Version 2.0 8/1999

Aliquot Worksheet

Work Order	Run	Analysis Code	Aliquot Units	Lab Deadline	Technician
02-11141	2	Pu241	grams	12/5/2002	MMCDOUGALL

Lab Fraction	Duratek Client ID	Sample Type	Muffle Data Ratio Post/Pre	Dilution Data Aliquot	Dilution Data Final (ml)	Dilution Data Ratio	Aliquot Data Aliquot	Aliquot Data Net Equiv	MS Aliquot Data Aliquot	MS Aliquot Data Net Equiv	H-3 Solids Only Water Added (ml)	H-3 Solids Only H3 Dist Aliq
01	LCS	LCS					1.0000E+00	1.0000E+00				
02	BLANK	MBL					1.0000E+00	1.0000E+00				
03	VA-02-0176	DUP		2.5089E+01	100.0000	2.51E-01	4.0000E+00	1.0036E+00				
04	VA-02-0176	DO		2.5089E+01	100.0000	2.51E-01	4.0000E+00	1.0036E+00				
05	Process Blank	TRG					1.0000E+00	1.0000E+00				

Corrected

Comments	

U0345

Technician: [signature] Date: 12/17/02

Eberline Services - Oak Ridge
Version 2.0 8/1999

Aliquot Worksheet

Work Order	Run	Analysis Code	Aliquot Units	Lab Deadline	Technician
02-11141	2	Pu241	grams	12/5/2002	JBARNARD

Lab Fraction	Duratek Client ID	Sample Type	Muffle Data Ratio Post/Pre	Dilution Data Aliquot	Dilution Data Final (ml)	Dilution Data Ratio	Aliquot Data Aliquot	Aliquot Data Net Equiv	MS Aliquot Data Aliquot	MS Aliquot Data Net Equiv	H-3 Solids Only Water Added (ml)	H-3 Solids Only H3 Dist Aliq
01	LCS	LCS					1.0000E+00	1.0000E+00				
02	BLANK	MBL					1.0000E+00	1.0000E+00				
03	VA-02-0176	DUP		2.5089E~~+00~~ +01	100.0000	2.51E-02	4.0000E+00	1.0036E~~+01~~ +00				
04	VA-02-0176	DO		2.5089E~~+00~~ +01	100.0000	2.51E-02	4.0000E+00	1.0036E~~+01~~ +00				
05	Process Blank	TRG					1.0000E+00	1.0000E+00				

Comments	

00346

Technician: JBarnard Date: 12/6/02

Eberline Services
Oak Ridge Laboratory

Spike and Tracer Worksheet

Printed: 12/12/2002 3:19 PM

Internal Work Order	Run	Analysis Code	Date	Technician	Technician Initials	Witness Initials
02-11141	1	Pu241	12/12/2002 15:19	ECALZADILLA		

LCS & Matrix Spikes					LCS	MS	LCSD	MSD	LCS		MS		LCSD		MSD	
Isotope	Sol #	Activity dpm/ml	Solution Date	Approx Addition	Volume Used (ml)	Volume Used (ml)	Volume Used (ml)	Volume Used (ml)	Known pCi	Error Estimate	Added pCi	Error Estimate	Known pCi	Error Estimate	Added pCi	Error Estimate
Pu-241	Pu-17a	1231.125	12/12/2002	0.510	0.5068				281.05	12.928	0.00	0.000	0.00	0.000	0.00	0.000

Tracers						
fraction	Isotope	Sol #	Activity dpm/ml	Solution Date	Volume Used (ml)	Approx Addition
01	Pu242	Pu-15 10/01	8.533	12/12/2002	1.0067	1.2900
02	Pu242	Pu-15 10/01	8.533	12/12/2002	1.0012	1.2900
03	Pu242	Pu-15 10/01	8.533	12/12/2002	0.9991	1.2900
04	Pu242	Pu-15 10/01	8.533	12/12/2002	0.9978	1.2900
05	Pu242	Pu-15 10/01	8.533	12/12/2002	0.0000	1.2900

Balance Printer Tapes

Tracer	LCS
	0.5068 g

Matrix Spike

000347

Version 2.0 08/99

Eberl[illegible]vices
Oak R[illegible]aboratory

Spike and [illegible]er Worksheet

Printed: 12/1[illegible] 5:05 PM

Internal Work Order	Run	Analysis Code	Date	Technician	Technician Initials	Witness Initials
02-11141	2	Pu241	12/16/2002 17:04	BMCDOWELL		

LCS & Matrix Spikes					LCS	MS	LCSD	MSD	LCS		MS		LCSD		MSD	
Isotope	Sol #	Activity dpm/ml	Solution Date	Approx Addition	Volume Used (ml)	Volume Used (ml)	Volume Used (ml)	Volume Used (ml)	Known pCi	Error Estimate	Added pCi	Error Estimate	Known pCi	Error Estimate	Added pCi	Error Estimate
Pu-241	Pu-17a	1230.476	12/16/2002	0.510	0.5068				280.90	12.922	0.00	0.000	0.00	0.000	0.00	0.000

Tracers

fraction	Isotope	Sol #	Activity dpm/ml	Solution Date	Volume Used (ml)	Approx Addition
01	Pu242	Pu-15 10/01	8.533	12/16/2002	0.9803	1.2900
02	Pu242	Pu-15 10/01	8.533	12/16/2002	0.9793	1.2900
03	Pu242	Pu-15 10/01	8.533	12/16/2002	0.9753	1.2900
04	Pu242	Pu-15 10/01	8.533	12/16/2002	0.9744	1.2900
05	Pu242	Pu-15 10/01	8.533	12/16/2002	0.0000	1.2900

Balance Printer Tapes

Tracer	LCS

Matrix Spike

00378

ime: 90.00
ata Mode: CPM Nuclide: 241PU
ackground Subtract: None

AC 12/4/02

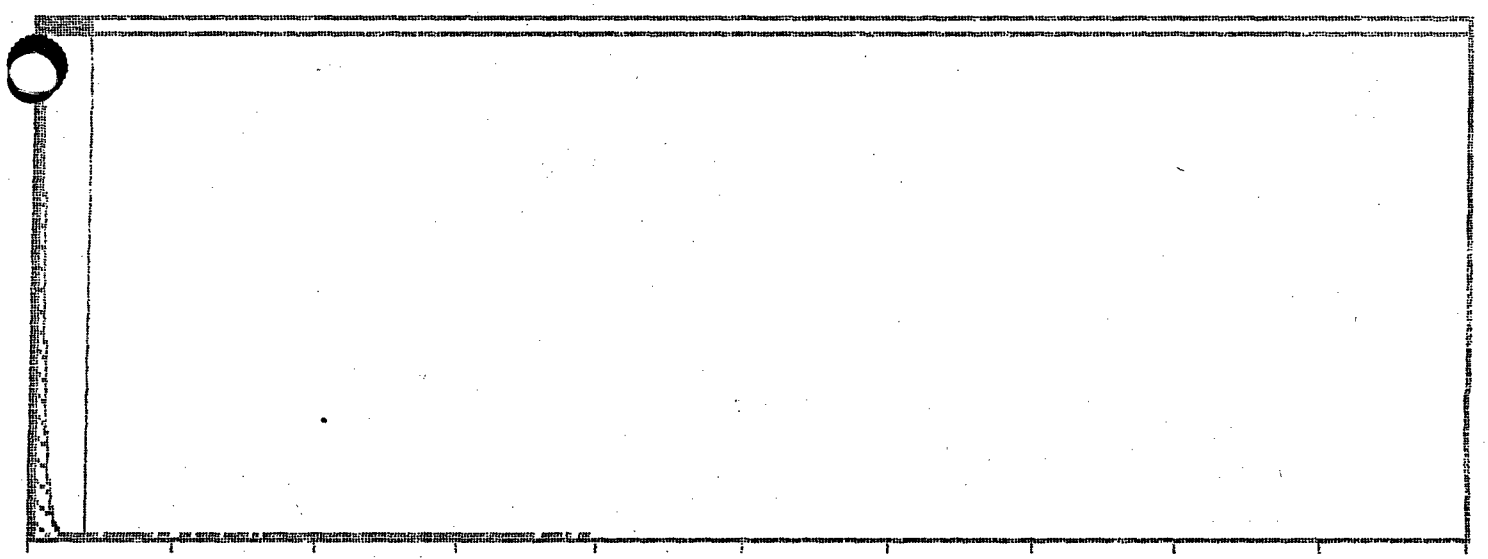
	LL	UL	LCR	2S%	BKG
egion A:	2.0 -	20.0	0	0.0	0.00
egion B:	0.0 -	20.0	0	0.0	0.00
egion C:	2.0 -	500	0	0.0	0.00

ench Indicator: tSIE
Ext Std Terminator: Count
211141B(1-5)
rotocol Data Filename: c:\spectra\PROT.DAT
ount Data Filename: c:\spectra\SDATA28.DAT
pectrum Data Drive & Path: c:\spectra

SMPL_ID	PID	S#	CPMA	CPMB	CPMC	tSIE	TIME
	38	1	94.56	144.07	140.13	308.18	90.00

SPECTRUM PLOT

4.0 CPM Y maximum Protocol No. 28 Sample No. 1 Repeat 1



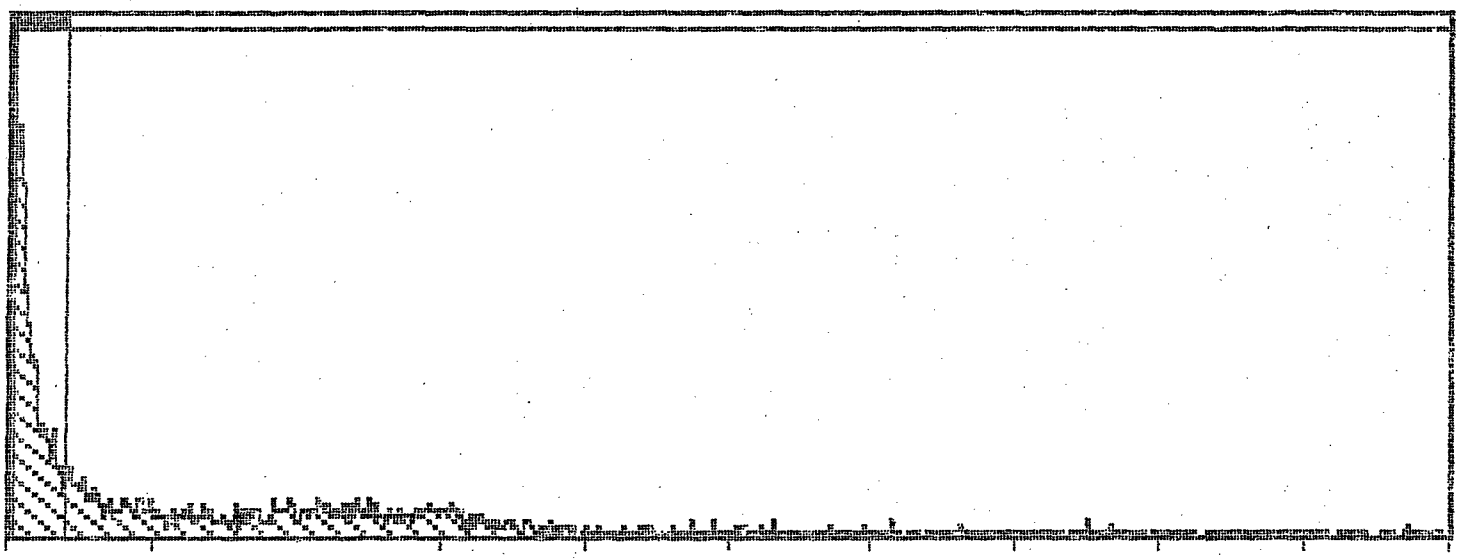
0 keV 500

Region	LL	UL	CPM
A:	2.0	20.0	94.6
B:	0.0	20.0	144.1
C:	2.0	500.	140.1

38 2 14.84 17.42 40.31 315.28 90.00

SPECTRUM PLOT

CPM Y maximum Protocol No. 28 Sample No. 2 Repeat 1



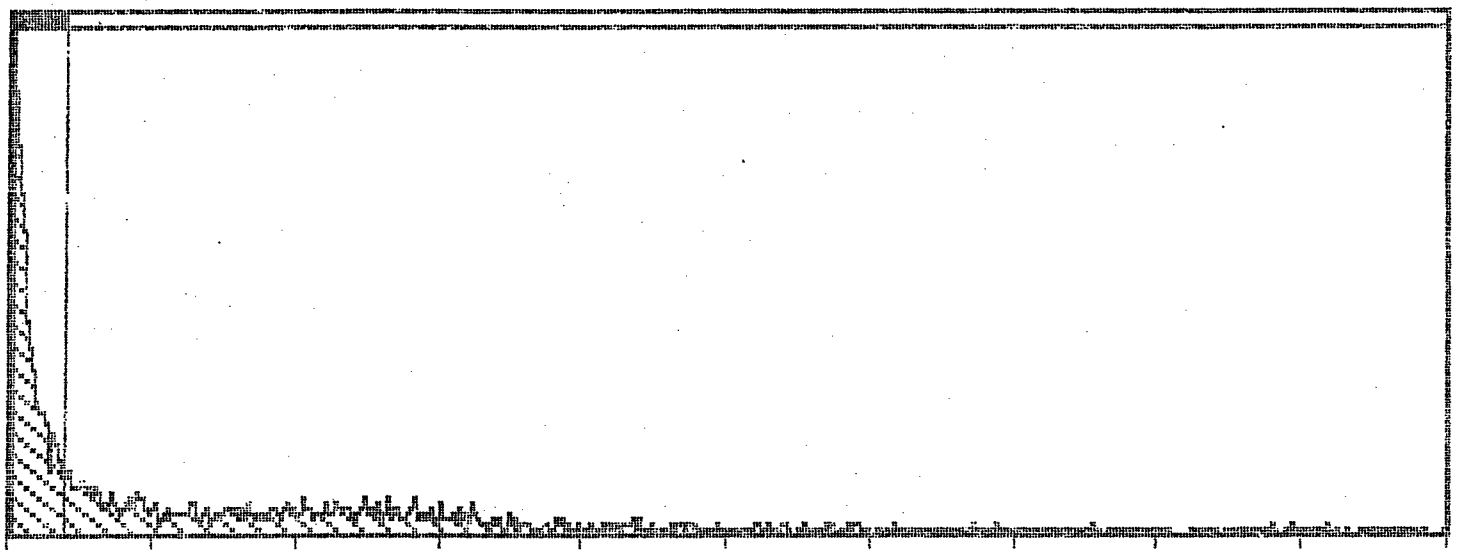
0 keV 500

Region	LL	UL	CPM
A:	2.0	20.0	14.8
B:	0.0	20.0	17.4
C:	2.0	500.	40.3

38 3 15.21 17.94 40.66 324.52 90.00

SPECTRUM PLOT

CPM Y maximum Protocol No. 28 Sample No. 3 Repeat 1



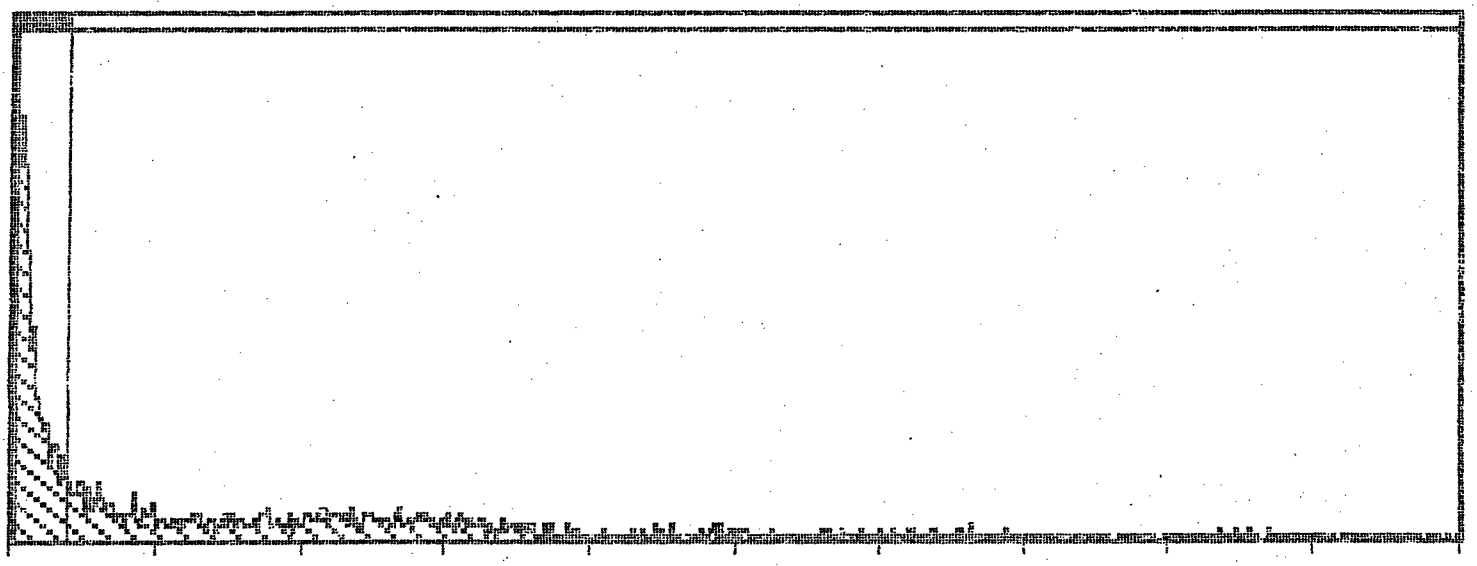
0 keV 500

Region	LL	UL	CPM
A:	2.0	20.0	15.2
B:	0.0	20.0	17.9
C:	2.0	500.	40.7

38 4 15.25 14.78 49.81 326.72 90.00

SPECTRUM PLOT

CPM Y maximum Protocol No. 28 Sample No. 4 Repeat 1



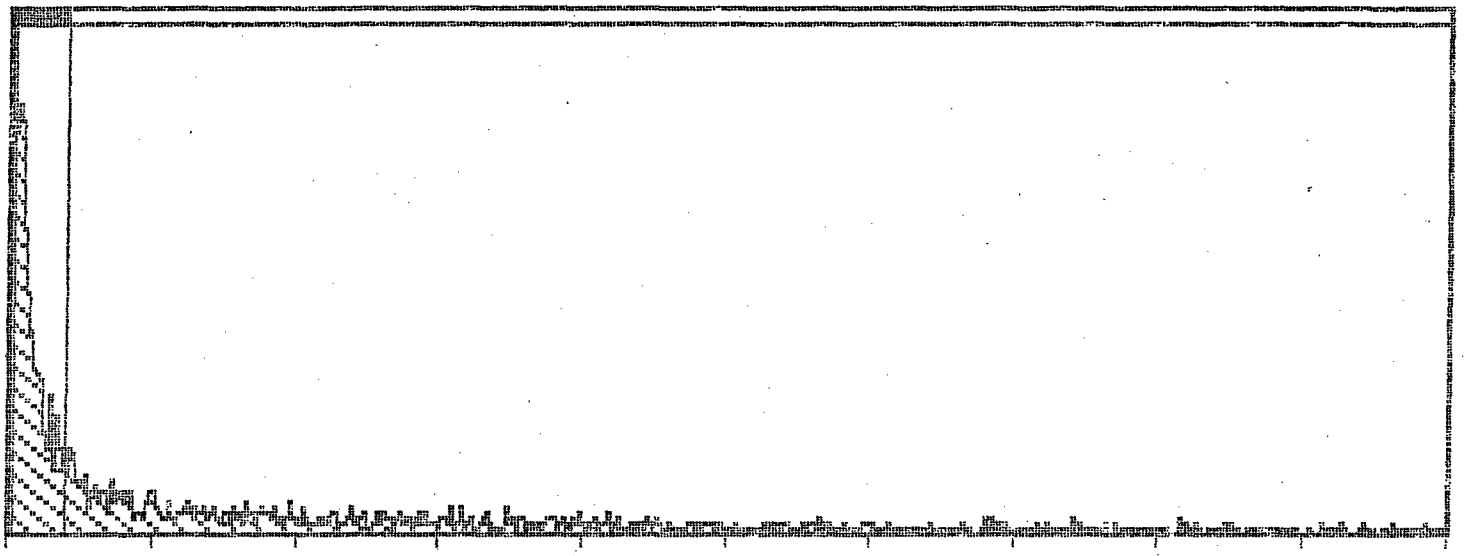
0 keV 500

Region	LL	UL	CPM
A:	2.0	20.0	15.7
B:	0.0	20.0	18.1
C:	2.0	500.	40.3

38 5 12.82 10.32 40.74 335.48 90.00

SPECTRUM PLOT

CPM Y maximum Protocol No. 28 Sample No. 5 Repeat 1



0 keV 500

Region	LL	UL	CPM
A:	2.0	20.0	13.2
B:	0.0	20.0	15.2
C:	2.0	500.	32.2

Internal Work Order: 02-11141
Run: 2

Fraction	Isotope	LSCSampleType	AnalysisCode	InstrumentID	ProtocolID	PID	SNumber	CountDuration	CPM_A	CPM_B	CPM_C	tSIE	SIS	DataSource	CountTime
1	Pu-241	S	Pu241	2550	28	38	1	90	94.56	144.07	140.13	308.181		I	12/13/2002 16:27
2	Pu-241	S	Pu241	2550	28	38	2	90	14.84	17.42	40.31	315.28		I	12/13/2002 17:57
3	Pu-241	S	Pu241	2550	28	38	3	90	15.21	17.94	40.66	324.516		I	12/13/2002 19:27
4	Pu-241	S	Pu241	2550	28	38	4	90	15.25	14.78	49.81	326.718		I	12/13/2002 20:57
0	Pu-241	B	Pu241	2550	28	38	5	90	12.82	10.32	40.74	335.481		I	12/13/2002 22:27

SECTION XIII

ANALYTICAL DATA (NEPTUNIUM-237)

Work Order	02-11141
Analysis Code	Np237El
Run	1
Date Received	11/26/2002
Lab Deadline	12/5/2002
Client	Duratek
Project	106760.003
Report Level	4
Activity Units	pCi
Aliquot Units	g
Matrix	OS
Method	ElChroM ACW08 Mod
Instrument Type	Alpha Spectroscopy
Radiometric Tracer	Np-239
Radiometric Sol#	Am-10
Tracer Act (dpm/g)	2281.895
Carrier	
Carrier Conc (mg/ml)	

Internal Fraction	Sample Desc	Client ID	Login CPM	Sample Date	Sample Aliquot
01	LCS	LCS		11/26/02 00:00	1.0000E+00
02	MBL	BLANK		11/26/02 00:00	1.0000E+00
03	DUP	VA-02-0176	89	11/25/02 12:00	1.0035E+00
04	DO	VA-02-0176	89	11/25/02 12:00	1.0035E+00

00356

* SAF1 [illegible]ed for Gross Alpha and all other radionuclides. SAF2 is used for Gross Beta only. [illegible]tual mass exceeded the calibration curve range. Results should be qualified as appro[illegible].

Internal Fraction	Sample Desc	Tracer Aliquot (g)	Tracer Total ACT (dpm)	Radiometric Tracer (pCi)	Radiometric % Rec	Grav Carrier Added (ml)	Grav Filter Tare (g)	Grav Filter Final (g)	Grav Filter Net (g)	Grav % Rec	Mean % Rec	SAF 1*	SAF 2*
01	LCS	0.4536	1035.1	357.8	76.73						76.73		
02	MBL	0.4541	1036.2	349.7	74.92						74.92		
03	DUP	0.4514	1030.0	266.8	57.51						57.51		
04	DO	0.4478	1021.8	207.2	45.02						45.02		

00357

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

Internal Fraction	Sample Desc	Rough Prep Date	Rough Prep By	Prep Date	Prep By	Sep t0 Date/Time	Sep t0 By	Sep t1 Date/Time	Sep t1 By
01	LCS			11/27/02 12:40	JBARNARD	12/05/02 08:44	TSMITH	12/06/02 04:51	TSMITH
02	MBL			11/27/02 12:40	JBARNARD	12/05/02 08:44	TSMITH	12/06/02 04:51	TSMITH
03	DUP			11/27/02 12:40	JBARNARD	12/05/02 08:44	TSMITH	12/06/02 04:51	TSMITH
04	DO			11/27/02 12:40	JBARNARD	12/05/02 08:44	TSMITH	12/06/02 04:51	TSMITH

00358

* SAF1 is [redacted]d for Gross Alpha and all other radionuclides. SAF2 is used for Gross Beta only. *[redacted]al mass exceeded the calibration curve range. Results should be qualified as approp[redacted]

Work Order: 02-11141-Np237EI-1

Client: Duratek
Eberline Services Work Order: 02-11141
Analysis Code: Np237EI
Run: 1

Lab Fraction	Nuclide	Sample Desc	Client Identification	Activity Units	Results	Error Estimate	MDA	LCS Known	LCS %R	LCS Flag	RPD Flag	MDA Flag	Blank Flag
01	NP-237	LCS	LCS	pCi/g	1.01E+01	1.16E+00	1.14E-01	9.80E+00	102.98	OK		OK	
02	NP-237	MBL	BLANK	pCi/g	0.00E+00	0.00E+00	4.69E-02					OK	OK
03	NP-237	DUP	VA-02-0176	pCi/g	0.00E+00	0.00E+00	6.25E-02				OK	OK	
04	NP-237	DO	VA-02-0176	pCi/g	2.33E-02	5.69E-02	1.30E-01					OK	

12-9-02

00359

Client: Duratek
Eberline Services Work Order: 02-11141
Analysis Code: Np237EI
Run: 1

Lab Fraction	Nuclide	Sample Desc	Sample Date	Sample Aliquot	Radiometric % Rec	Grav % Rec	Mean % Rec	SAF	Sep t0 Date/Time	Sep t1 Date/Time
01	NP-237	LCS	11/26/02 00:00	1.00E+00	76.73		76.73		12/5/2002 8:44	12/6/2002 4:51
02	NP-237	MBL	11/26/02 00:00	1.00E+00	74.92		74.92		12/5/2002 8:44	12/6/2002 4:51
03	NP-237	DUP	11/25/02 12:00	1.00E+00	57.51		57.51		12/5/2002 8:44	12/6/2002 4:51
04	NP-237	DO	11/25/02 12:00	1.00E+00	45.02		45.02		12/5/2002 8:44	12/6/2002 4:51

Work Order: 02-11141-Np237EI-1

Client: Duratek
Eberline Services Work Order: 02-11141
Analysis Code: Np237EI
Run: 1

Lab Fraction	Nuclide	Sample Desc	Counting Date/Time	Halflife (days)	Detect	Carrier	Count Time	Counts	Bkg CPM	Eff
01	NP-237	LCS	12/06/02 11:16		A_Spec	16	170	6.20 E+02	5.00 E-03	21.3
02	NP-237	MBL	12/07/02 12:52		A_Spec	35	170	0.00 E+00	0.00 E+00	20.5
03	NP-237	DUP	12/07/02 12:52		A_Spec	36	170	0.00 E+00	0.00 E+00	20
04	NP-237	DO	12/07/02 12:53		A_Spec	37	170	8.30 E-01	1.00 E-03	21

00361

16 35-37

Internal Fraction	Sample Desc	Client ID	Sample Date	Sample Aliquot	Tracer Aliquot (g)	Tracer ACT (dpm)	Radiometric Tracer (pCi)	Radiometric % Rec	SAF 1*	SAF 2*
01	LCS	LCS	11/26/02 00:00	1.0000	0.4536	1035.0676	357.7547	76.73		
02	MBL	BLANK	11/26/02 00:00	1.0000	0.4541	1036.2085	349.7188	74.92		
03	DUP	VA-02-0176	11/25/02 12:00	1.0035	0.4514	1030.0474	266.8486	57.51		
04	DO	VA-02-0176	11/25/02 12:00	1.0035	0.4478	1021.8326	207.2132	45.02		

Eberline Services
Oak R[illegible] Laboratory

Spike and [illegible]er Worksheet

Printed: 11/2[illegible] 2:40 PM

Internal Work Order	Run	Analysis Code	Date	Technician	Technician Initials	Witness Initials
02-11141	1	Np237EI	11/27/2002 12:34	JBARNARD	JBarnard	

LCS & Matrix Spikes					LCS	MS	LCSD	MSD	LCS		MS		LCSD		MSD	
Isotope	Sol #	Activity dpm/ml	Solution Date	Approx Addition	Volume Used (ml)	Volume Used (ml)	Volume Used (ml)	Volume Used (ml)	Known pCi	Error Estimate	Added pCi	Error Estimate	Known pCi	Error Estimate	Added pCi	Error Estimate
Np-237	Np-1a	23.510	11/27/2002	0.940	0.9252				9.80	0.353	0.00	0.000	0.00	0.000	0.00	0.000

Tracers						
fraction	Isotope	Sol #	Activity dpm/ml	Solution Date	Volume Used (ml)	Approx Addition
01	Np-239	Am-10	2281.895	11/27/2002	0.4536	0.4400
02	Np-239	Am-10	2281.895	11/27/2002	0.4541	0.4400
03	Np-239	Am-10	2281.895	11/27/2002	0.4514	0.4400
04	Np-239	Am-10	2281.895	11/27/2002	0.4478	0.4400

Balance Printer Tapes

Tracer	LCS
0.4536 g 0.4541 g 0.4514 g 0.4478 g	0.9252 g

Matrix Spike

003063

Version 2.0 08/99

Eberline Services - Oak Ridge
Version 2.0 8/1999

Aliquot Worksheet

Work Order	Run	Analysis Code	Aliquot Units	Lab Deadline	Technician
02-11141	1	Np237El	grams	12/5/2002	JBARNARD

Lab Fraction	Duratek	Sample	Muffle Data	Dilution Data			Aliquot Data		MS Aliquot Data		H-3 Solids Only	
	Client ID	Type	Ratio Post/Pre	Aliquot	Final (ml)	Ratio	Aliquot	Net Equiv	Aliquot	Net Equiv	Water Added (ml)	H3 Dist Aliq
01	LCS	LCS					1.0000E+00	1.0000E+00				
02	BLANK	MBL					1.0000E+00	1.0000E+00				
03	VA-02-0176	DUP		2.5089E+01	100.0000	2.51E-01	4.0000E+00	1.0035E+00				
04	VA-02-0176	DO		2.5089E+01	100.0000	2.51E-01	4.0000E+00	1.0035E+00				

Comments	

00364

Technic Jay Barnard Date: 12/3/02

Eberline Services
Oak Ridge Laboratory

ALPHA SPECTROMETRY REPORT
9-DEC-2002 01:29:25

****
Spectral File: ND_AMS_ARCHIVE_C:C_0211141A-NP$01_NP.CNF
****

BATCH ID:	0211141A-NP	SAMPLE ID:	01
SAMPLE DATE:	6-DEC-2002 00:00	ALIQUOT:	1.000E+00 gram
SAMPLE TITLE:	SPIKE	DETECTOR NUMBER:	016
ACQ DATE:	6-DEC-2002 11:16	AVERAGE EFFICIENCY:	21.30%
ELAPSED LIVE TIME:	10200.	RECOVERY:	76.73%
TRACER ID:	NONE	TRACER FWHM (kev):	0.00
LAMBDA VALUE:	0.	ROI TYPE:	STANDARD
TRACER DPM AT SAMPLE DATE:	0.000	CONFIDENCE FACTOR:	4.65
SAMPLE MATRIX:	SOIL	LLD CONSTANT:	2.71
ENERGY CAL DATE:	27-NOV-2002 07:58	EFF CAL DATE:	27-NOV-2002 07:58
BKG FILENAME:	B_016_6DEC02	BKG ELAPSED TIME:	60005.

****

NUCLIDE ACTIVITY SUMMARY

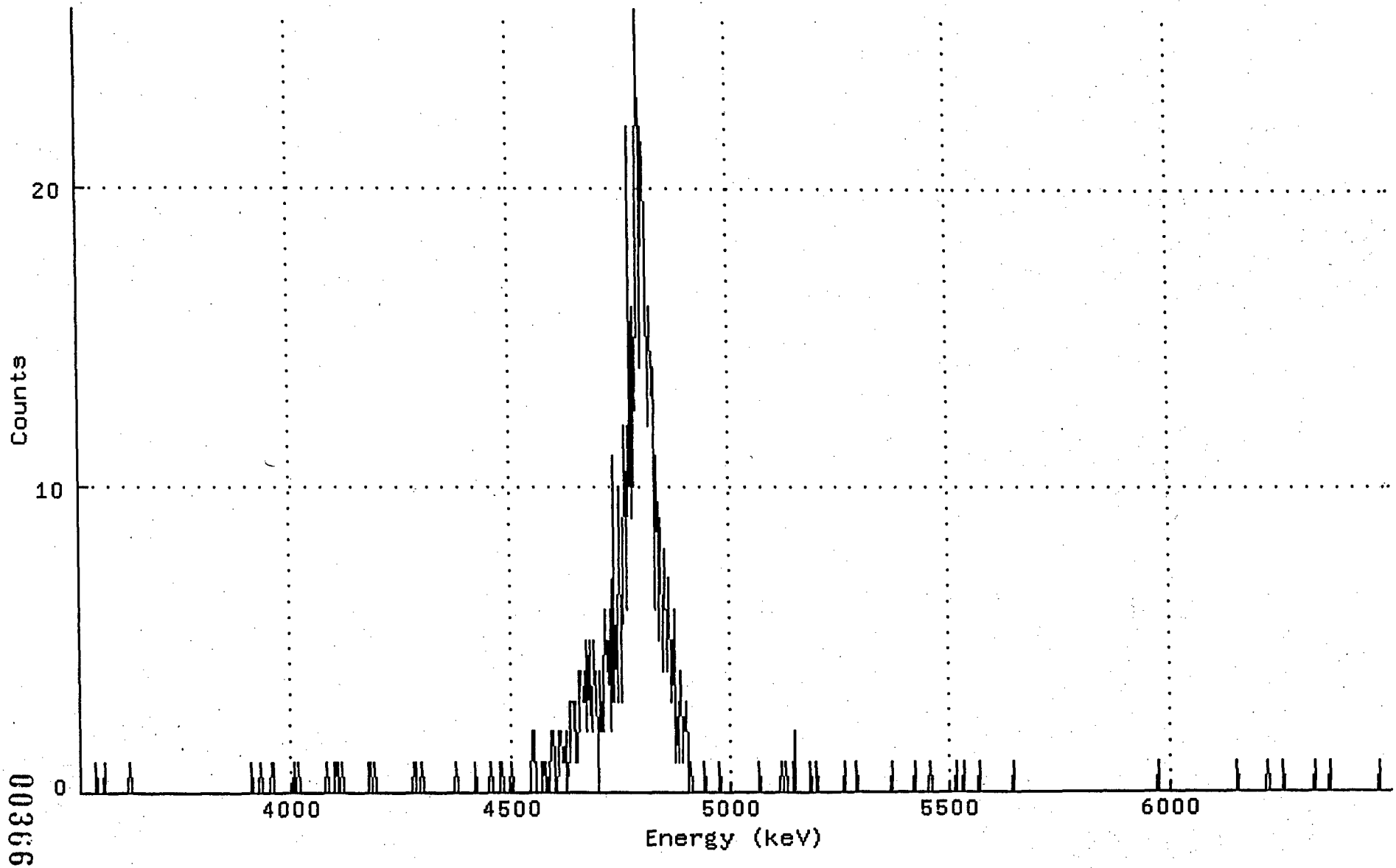
NUCLIDE	ENERGY	NET AREA	BKG	%ABN	ACTIVITY pCi/ gram	TPU/ERROR 2-SIGMA	MDC pCi/ gram
PU236	5755.0	-0.19	1.19	100.0	-3.080E-03	3.557E-02	1.262E-01
U-237	4768.8	620.15	0.85	99.6	1.009E+01	1.156E+00	1.139E-01

****

Analyst: Jay Rice Date: 12-9-02

Reviewer: Glen Gregley Date: 12/9/02

Spect[illegible] : DKA100:[ALPHA.ALUSR.ARCHIVE.C]C[illegible]11141A-NP$01_NP.CNF;1
Title : 016
Sample Title: SPIKE
Start Time: 6-DEC-2002 11:16: Sample Time: 6-DEC-2002 00:00: Energy Offset: 3.51537E+03
Real Time : 0 02:50:01.00 Sample ID : 01 Energy Slope : 3.02949E+00
Live Time : 0 02:50:00.00 Sample Type: NP Energy Quad : -1.19020E-04



00366

Channel Contents for ND_AMS_ARCHIVE_C:C_0211141A-NP$01_NP

Channel

[illegible]:	10201	10200	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	1	0	0	0	0	0	1	0	0	0	0	0	0	0
[illegible]29:	0	0	0	0	0	0	0	0	0	0	0	1	0	0
43:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
113:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
127:	0	0	0	0	0	1	0	0	0	0	0	1	1	0
141:	0	0	0	0	0	0	1	1	0	0	0	0	0	0
155:	0	0	0	0	0	0	0	0	0	1	0	0	1	0
169:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
183:	0	0	0	0	0	0	1	0	0	0	0	0	1	1
197:	0	1	0	1	0	0	0	0	0	0	0	0	0	0
211:	0	0	0	0	0	0	0	0	0	0	1	1	0	0
225:	1	0	0	0	0	0	0	0	0	0	0	0	0	0
239:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
253:	0	0	1	1	0	0	0	0	1	0	0	0	0	0
267:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
281:	0	0	0	0	0	0	1	0	0	0	0	0	0	0
295:	0	0	0	0	0	0	0	1	0	0	0	0	0	0
309:	0	0	0	0	1	0	0	0	0	0	0	0	1	1
323:	0	0	0	0	0	0	1	0	0	0	0	0	0	0
337:	0	0	0	0	0	0	0	0	2	1	2	0	0	0
351:	0	0	1	1	0	1	0	0	0	2	2	1	0	0
365:	1	2	2	1	1	1	2	0	1	1	3	3	3	1
379:	3	1	3	4	4	3	3	3	5	2	4	5	3	2
393:	5	5	3	2	0	4	2	2	3	6	4	4	5	2
407:	6	3	11	3	5	6	3	10	3	5	6	12	9	6
421:	12	10	22	9	16	10	15	15	18	26	20	14	22	21
435:	21	18	12	13	16	13	14	6	11	8	5	9	4	4
449:	8	4	5	7	3	3	4	6	1	2	3	1	4	1
[illegible]:	2	2	3	1	0	1	0	0	0	0	0	0	0	0
[illegible]	0	0	1	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	1	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
519:	0	0	0	1	0	0	0	0	0	0	0	0	0	0
533:	0	0	0	0	0	0	1	0	0	1	0	0	0	0
547:	0	0	2	0	0	0	0	0	0	0	0	0	0	0
561:	0	1	0	0	0	1	0	0	0	0	0	0	0	0
575:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
589:	1	0	0	0	0	0	0	0	0	0	1	0	0	0
603:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
617:	0	0	0	0	0	0	0	0	0	1	0	0	0	0
631:	0	0	0	0	0	0	0	0	0	0	0	0	0	1
645:	0	0	0	0	0	0	0	0	0	0	0	1	1	0
659:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
673:	0	0	0	0	1	0	0	0	0	0	1	0	0	0
687:	0	0	0	0	0	0	0	0	1	0	0	0	0	0
701:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
715:	0	0	0	0	0	0	0	1	0	0	0	0	0	0
729:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
743:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
757:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
771:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
785:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
799:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
813:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
827:	0	0	0	0	0	0	0	0	0	0	1	0	0	0
841:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
855:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
869:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
883:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
897:	0	0	0	1	0	0	0	0	0	0	0	0	0	0
911:	0	0	0	0	0	0	0	0	0	0	0	0	0	1
925:	0	0	0	0	0	0	0	0	0	0	0	0	1	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]	0	0	0	0	0	0	0	0	0	1	0	0	0	0
[illegible]	0	0	0	0	0	0	0	1	0	0	0	0	0	0
[illegible]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
995:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	1	0	0	0	0	0	0	0	0
1023:	0	0												

Eberline Services
Oak Ridge Laboratory

Gross Sample Counts Within Peak Regions Generated: 9-DEC-2002 01:29:19.35

Detector ID: 16 Acquisition Start: 6-DEC-2002 11:16:57.01
Live Time: 0 02:50:00.00 Real Time: 0 02:50:01.00
Batch Id: 0211141A-NP Sample Id: 01
Sample Type: NP

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4786.39	621	0	57.17	426.70	380	87	6.09E-02	4.0	
2	0	5640.62	1	0	3.03	722.00	718	59	9.80E-05	100.0	

Background Counts Within Peak Regions Generated: 9-DEC-2002 01:29:23.83

Acquisition Start: 6-DEC-2002 15:43:00.01
Live Time: 0 16:40:05.00 Real Time: 0 16:40:05.00

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4775.55	5	0	3.03	423.00	380	87	8.33E-05	44.7	
2	0	5711.99	7	0	142.39	747.00	718	59	1.17E-04	37.8	

Net Sample Counts Within Peak Regions Generated: 9-DEC-2002 01:29:24.13

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4786.39*	620	0	57.17	426.70	380	87	6.08E-02	4.0	
2	0	5640.62*	0	0	3.03	722.00	718	59	-1.86E-05	577.4	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.0 Generated 9-DEC-2002 01:29:25

Configuration	: MCA0:[AMSCOUNT]00000125$1		
Analyses by	: ROIPEAK V1.2,PEAKEFF V2.2,ENBACK V1.6,NID V3.3		
Sample title	: SPIKE		
Sample date	: 6-DEC-2002 00:00:00	Acquisition date	: 6-DEC-2002 11:16:57
Sample ID	: 01	Sample quantity	: 1.0000 gram
Sample type	: NP	Sample geometry	:
Detector name	: 016	Detector geometry	:
Elapsed live time	: 0 02:50:00.00	Elapsed real time	: 0 02:50:01.00 0.0%
Energy tolerance	: 100.00 keV	Half life ratio	: 8.00
Errors propagated	: Yes	Systematic Error	: 3.00 %
Efficiency type	: Average value	Efficiencies at	: Peak Energy
Abundance limit	: 75.00		

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity pCi/gram
0	4786.39*	620	57.17	426.70	380	87	8.0		NP-237	7.74
0	5640.62*	0	3.03	722.00	718	59	*****		PU236	-2.363E-03

Eberline Services
Oak Ridge Laboratory

ALPHA SPECTROMETRY REPORT
9-DEC-2002 01:29:52

****
Spectral File: ND_AMS_ARCHIVE_R:R_0211141A-NP$02_NP.CNF
****

BATCH ID:	0211141A-NP	SAMPLE ID:	02
SAMPLE DATE:	7-DEC-2002 00:00	ALIQUOT:	1.000E+00 gram
SAMPLE TITLE:	BLANK	DETECTOR NUMBER:	035
ACQ DATE:	7-DEC-2002 12:52	AVERAGE EFFICIENCY:	20.50%
ELAPSED LIVE TIME:	10200.	RECOVERY:	74.92%
TRACER ID:	NONE	TRACER FWHM (kev):	0.00
LAMBDA VALUE:	0.	ROI TYPE:	STANDARD
TRACER DPM AT SAMPLE DATE:	0.000	CONFIDENCE FACTOR:	4.65
SAMPLE MATRIX:	SOIL	LLD CONSTANT:	2.71
ENERGY CAL DATE:	6-DEC-2002 00:49	EFF CAL DATE:	6-DEC-2002 00:49
BKG FILENAME:	B_035_6DEC02	BKG ELAPSED TIME:	60000.

****

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	NET AREA	BKG	%ABN	ACTIVITY pCi/ gram	TPU/ERROR 2-SIGMA	MDC pCi/ gram
PU236	5755.0	0.49	0.51	100.0	8.458E-03	3.599E-02	1.041E-01
NP-237	4768.8	0.00	0.00	99.6	0.000E+00	0.000E+00	4.694E-02

****

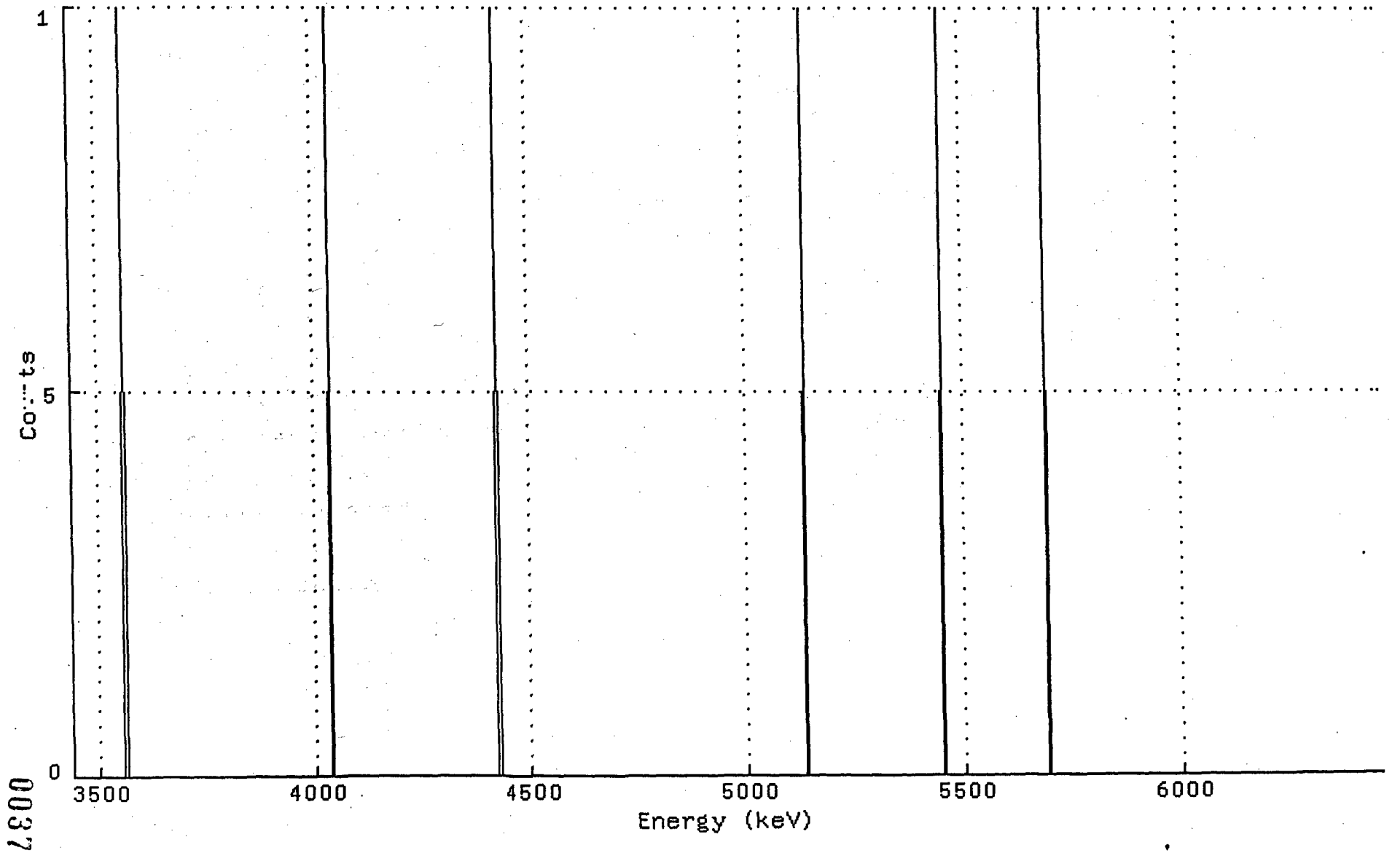
Jay Price
Analyst

12-9-02
Date

Glen Gregley
Reviewer

12/9/02
Date

Spect : DKA100:[ALPHA.ALUSR.ARCHIVE.R] 11141A-NP$02_NP.CNF;1
Title : 035
Sample Title: BLANK
Start Time: 7-DEC-2002 12:52: Sample Time: 7-DEC-2002 00:00: Energy Offset: 3.42963E+03
Real Time : 0 02:50:00.10 Sample ID : 02 Energy Slope : 3.10924E+00
Live Time : 0 02:50:00.00 Sample Type: NP Energy Quad : -1.58507E-04



Channel Contents for ND_AMS_ARCHIVE_R:R_0211141A-NP$02_NP

Channel														
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	[illegible]
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	
29:	0	0	0	0	0	0	0	0	0	0	0	0	0	1
43:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
113:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
127:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
141:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
155:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
169:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
183:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
197:	1	0	0	0	0	0	0	0	0	0	0	0	0	0
211:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
225:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
239:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
253:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
267:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
281:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
295:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
309:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
323:	0	1	0	0	0	0	0	0	0	0	0	0	0	0
337:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
351:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
365:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
379:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
393:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
407:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
421:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
435:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
449:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	[illegible]
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	
505:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
519:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
533:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
547:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
561:	0	0	0	1	0	0	0	0	0	0	0	0	0	0
575:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
589:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
603:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
617:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
631:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
645:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
659:	0	0	0	0	0	0	0	0	0	0	0	0	0	1
673:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
687:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
701:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
715:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
729:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
743:	0	0	0	0	0	0	0	0	0	0	0	0	1	0
757:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
771:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
785:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
799:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
813:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
827:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
855:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
869:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
883:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
911:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
925:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	[illegible]
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
981:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
995:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1023:	0	0												

Eberline Services
Oak Ridge Laboratory

Gross Sample Counts Within Peak Regions Generated: 9-DEC-2002 01:29:41.77

Detector ID: 35 Acquisition Start: 7-DEC-2002 12:52:26.01
Live Time: 0 02:50:00.00 Real Time: 0 02:50:00.10
Batch Id: 0211141A-NP Sample Id: 02
Sample Type: NP

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4775.92	0	0	0.00	443.00	401	85	0.00E+00	0.0	
2	0	5686.75	1	0	3.11	755.00	735	59	9.80E-05	100.0	

Background Counts Within Peak Regions Generated: 9-DEC-2002 01:29:50.17

Acquisition Start: 6-DEC-2002 15:43:49.01
Live Time: 0 16:40:00.00 Real Time: 0 16:40:00.10

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4776.65	0	0	0.00	443.00	401	85	0.00E+00	0.0	
2	0	5711.69	3	0	0.00	764.00	735	59	5.00E-05	57.7	

Net Sample Counts Within Peak Regions Generated: 9-DEC-2002 01:29:50.40

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4775.92*	0	0	0.00	443.00	401	85	0.00E+00	0.0	
2	0	5686.75*	0	0	3.11	755.00	735	59	4.80E-05	212.7	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.0 Generated 9-DEC-2002 01:29:51

Configuration	: MCA0:[AMSCOUNT]00000125$1		
Analyses by	: ROIPEAK V1.2,PEAKEFF V2.2,ENBACK V1.6,NID V3.3		
Sample title	: BLANK		
Sample date	: 7-DEC-2002 00:00:00	Acquisition date	: 7-DEC-2002 12:52:26
Sample ID	: 02	Sample quantity	: 1.0000 gram
Sample type	: NP	Sample geometry	:
Detector name	: 035	Detector geometry	:
Elapsed live time	: 0 02:50:00.00	Elapsed real time	: 0 02:50:00.10 0.0%
Energy tolerance	: 100.00 keV	Half life ratio	: 8.00
Errors propagated	: Yes	Systematic Error	: 3.00 %
Efficiency type	: Average value	Efficiencies at	: Peak Energy
Abundance limit	: 75.00		

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity pCi/gram
0	4775.92*	0	0.00	443.00	401	85	0.0		NP-237	0.000E+00
0	5686.75*	0	3.11	755.00	735	59425.5			PU236	6.337E-03

Eberline Services
Oak Ridge Laboratory

ALPHA SPECTROMETRY REPORT
9-DEC-2002 01:30:00

****
Spectral File: ND_AMS_ARCHIVE_S:S_0211141A-NP$03_NP.CNF
****

BATCH ID:	0211141A-NP	SAMPLE ID:	03
SAMPLE DATE:	25-NOV-2002 00:00	ALIQUOT:	1.003E+00 gram
SAMPLE TITLE:	VA-02-0176	DETECTOR NUMBER:	036
ACQ DATE:	7-DEC-2002 12:52	AVERAGE EFFICIENCY:	19.98%
ELAPSED LIVE TIME:	10200.	RECOVERY:	57.51%
TRACER ID:	NONE	TRACER FWHM (kev):	0.00
LAMBDA VALUE:	0.	ROI TYPE:	STANDARD
TRACER DPM AT SAMPLE DATE:	0.000	CONFIDENCE FACTOR:	4.65
SAMPLE MATRIX:	SOIL	LLD CONSTANT:	2.71
ENERGY CAL DATE:	6-DEC-2002 00:49	EFF CAL DATE:	6-DEC-2002 00:49
BKG FILENAME:	B_036_6DEC02	BKG ELAPSED TIME:	60000.

****

NUCLIDE ACTIVITY SUMMARY

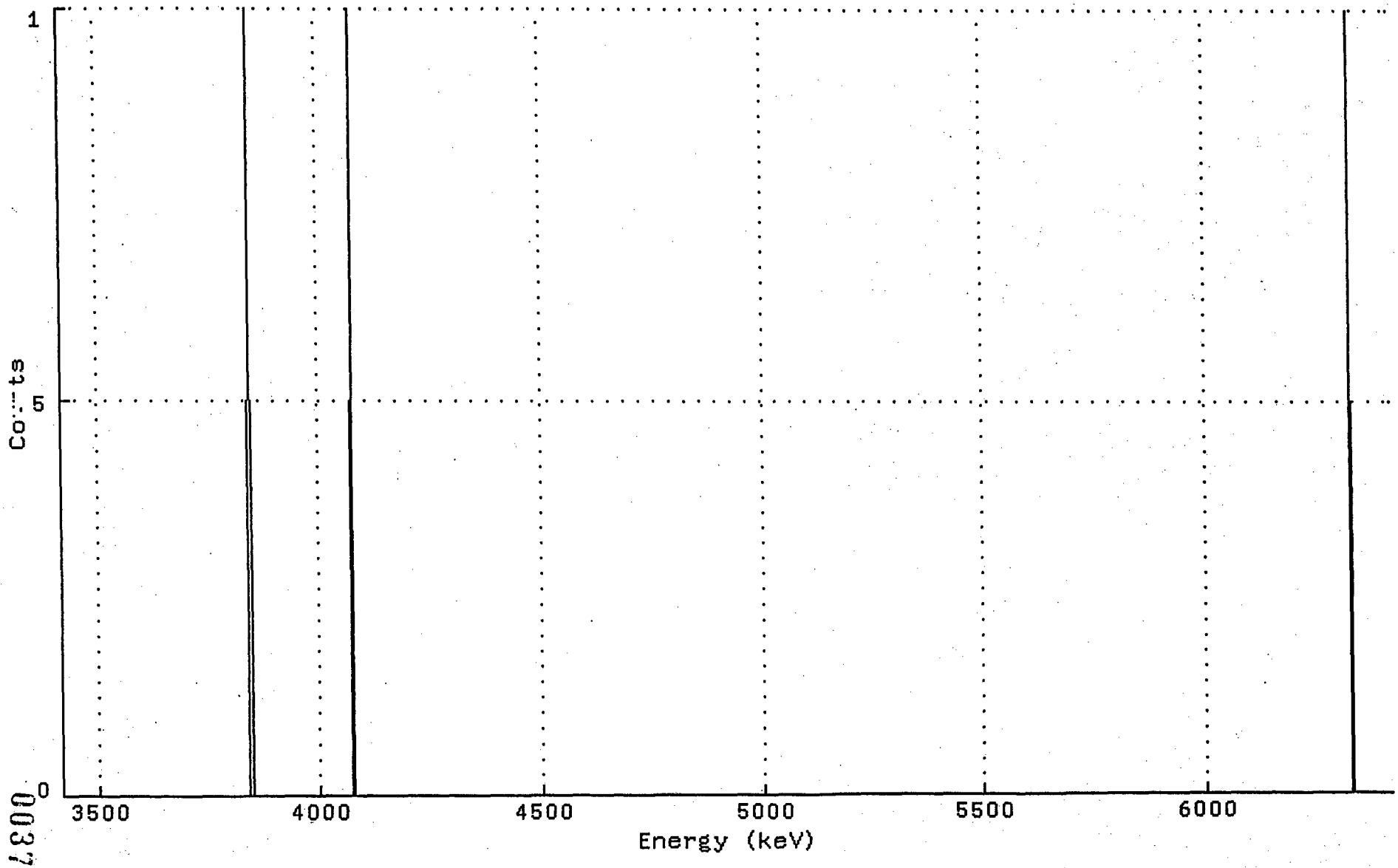
NUCLIDE	ENERGY	NET AREA	BKG	%ABN	ACTIVITY pCi/ gram	TPU/ERROR 2-SIGMA	MDC pCi/ gram
PU236	5755.0	-0.34	0.34	100.0	-7.877E-03	1.116E-02	1.246E-01
U-237	4768.8	0.00	0.00	99.6	0.000E+00	0.000E+00	6.250E-02

****

Analyst: Jay Price — Date: 12-9-02

Reviewer: Glen Gregory — Date: 12/9/02

Spectr[illegible] : DKA100:[ALPHA.ALUSR.ARCHIVE.S]S[illegible]11141A-NP$03_NP.CNF;1
Title : 036
Sample Title: VA-02-0176
Start Time: 7-DEC-2002 12:52: Sample Time: 25-NOV-2002 00:00 Energy Offset: 3.40951E+03
Real Time : 0 02:50:00.00 Sample ID : 03 Energy Slope : 3.09320E+00
Live Time : 0 02:50:00.00 Sample Type: NP Energy Quad : -1.55646E-04



00376

Channel Contents for ND_AMS_ARCHIVE_S:S_0211141A-NP$03_NP

Channel														
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]29:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
113:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
127:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
141:	1	0	0	0	0	0	0	0	0	0	0	0	0	0
155:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
169:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
183:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
197:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
211:	0	0	0	0	0	0	1	0	0	0	0	0	0	0
225:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
239:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
253:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
267:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
281:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
295:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
309:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
323:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
337:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
351:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
365:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
379:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
393:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
407:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
421:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
435:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
449:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]3:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]5:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
519:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
533:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
547:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
561:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
575:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
589:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
603:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
617:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
631:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
645:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
659:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
673:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
687:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
701:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
715:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
729:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
743:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
757:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
771:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
785:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
799:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
813:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
827:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
855:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
869:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
883:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
911:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
925:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]	0	0	0	0	0	0	0	0	0	0	0	1	0	0
995:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1023:	0	0												

Eberline Services
Oak Ridge Laboratory

Gross Sample Counts Within Peak Regions Generated: 9-DEC-2002 01:29:56.43

Detector ID: 36 Acquisition Start: 7-DEC-2002 12:52:49.01
Live Time: 0 02:50:00.00 Real Time: 0 02:50:00.00
Batch Id: 0211141A-NP Sample Id: 03
Sample Type: NP

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4774.36	0	0	0.00	451.50	409	86	0.00E+00	0.0	
2	0	5713.26	0	0	0.00	775.00	746	59	0.00E+00	0.0	

Background Counts Within Peak Regions Generated: 9-DEC-2002 01:29:58.66

Acquisition Start: 6-DEC-2002 15:43:52.01
Live Time: 0 16:40:00.00 Real Time: 0 16:40:00.10

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4773.20	0	0	0.00	451.50	409	86	0.00E+00	0.0	
2	0	5710.30	2	0178.33		775.00	746	59	3.33E-05	70.7	

Net Sample Counts Within Peak Regions Generated: 9-DEC-2002 01:29:58.91

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4774.36*	0	0	0.00	451.50	409	86	0.00E+00	0.0	
2	0	5713.26*	0	0	0.00	775.00	746	59	-3.33E-05	70.7	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.0 Generated 9-DEC-2002 01:29:59

Configuration	: MCA0:[AMSCOUNT]00000125$1		
Analyses by	: ROIPEAK V1.2,PEAKEFF V2.2,ENBACK V1.6,NID V3.3		
Sample title	: VA-02-0176		
Sample date	: 25-NOV-2002 00:00:00	Acquisition date	: 7-DEC-2002 12:52:49
Sample ID	: 03	Sample quantity	: 1.0035 gram
Sample type	: NP	Sample geometry	:
Detector name	: 036	Detector geometry	:
Elapsed live time	: 0 02:50:00.00	Elapsed real time	: 0 02:50:00.00 0.0%
Energy tolerance	: 100.00 keV	Half life ratio	: 8.00
Errors propagated	: Yes	Systematic Error	: 3.00 %
Efficiency type	: Average value	Efficiencies at	: Peak Energy
Abundance limit	: 75.00		

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity pCi/gram
0	4774.36*	0	0.00	451.50	409	86	0.0		NP-237	0.000E+00
0	5713.26*	0	0.00	775.00	746	59	141.4		PU236	-4.530E-03

Eberline Services
Oak Ridge Laboratory

ALPHA SPECTROMETRY REPORT
9-DEC-2002 01:30:07

****
Spectral File: ND_AMS_ARCHIVE_S:S_0211141A-NP$04_NP.CNF
****

BATCH ID:	0211141A-NP	SAMPLE ID:	04
SAMPLE DATE:	25-NOV-2002 00:00	ALIQUOT:	1.003E+00 gram
SAMPLE TITLE:	VA-02-0176	DETECTOR NUMBER:	037
ACQ DATE:	7-DEC-2002 12:53	AVERAGE EFFICIENCY:	21.02%
ELAPSED LIVE TIME:	10200.	RECOVERY:	45.02%
TRACER ID:	NONE	TRACER FWHM (kev):	0.00
LAMBDA VALUE:	0.	ROI TYPE:	STANDARD
TRACER DPM AT SAMPLE DATE:	0.000	CONFIDENCE FACTOR:	4.65
SAMPLE MATRIX:	SOIL	LLD CONSTANT:	2.71
ENERGY CAL DATE:	6-DEC-2002 00:49	EFF CAL DATE:	6-DEC-2002 00:49
BKG FILENAME:	B_037_6DEC02	BKG ELAPSED TIME:	60000.

****

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	NET AREA	BKG	%ABN	ACTIVITY pCi/ gram	TPU/ERROR 2-SIGMA	MDC pCi/ gram
PU236	5755.0	1.49	0.51	100.0	4.192E-02	8.136E-02	1.683E-01
NP-237	4768.8	0.83	0.17	99.6	2.325E-02	5.685E-02	1.296E-01

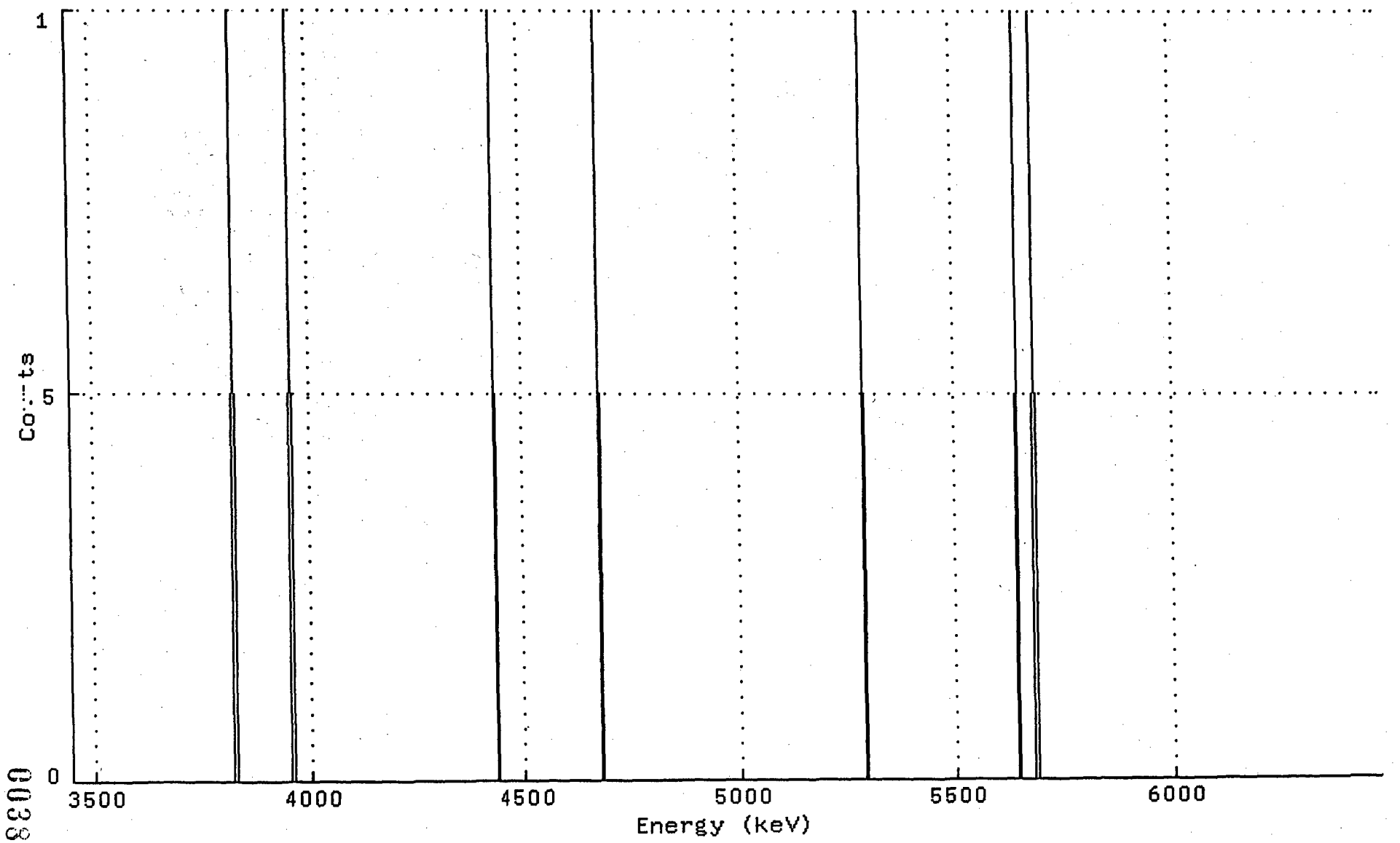
****

Analyst Jay Price Date 12-9-02

Reviewer Glen Gregory Date 12/9/02

00380

Spec : DKA100:[ALPHA.ALUSR.ARCHIVE.S] 11141A-NP$04_NP.CNF;1
Title : 037
Sample Title: VA-02-0176
Start Time: 7-DEC-2002 12:53: Sample Time: 25-NOV-2002 00:00 Energy Offset: 3.43867E+03
Real Time : 0 02:50:00.10 Sample ID : 04 Energy Slope : 3.13224E+00
Live Time : 0 02:50:00.00 Sample Type: NP Energy Quad : -1.70670E-04



Channel Contents for ND_AMS_ARCHIVE_S:S_0211141A-NP$04_NP

Channel

[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	[illegible]
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	[illegible]
29:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
113:	0	0	0	0	0	0	0	0	0	0	0	1	0	0
127:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
141:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
155:	0	0	0	0	0	0	0	0	0	0	0	0	1	0
169:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
183:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
197:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
211:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
225:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
239:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
253:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
267:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
281:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
295:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
309:	0	0	0	0	0	0	0	0	0	0	0	0	0	1
323:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
337:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
351:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
365:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
379:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
393:	0	0	0	0	0	0	0	0	0	0	0	1	0	0
407:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
421:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
435:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
449:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	[illegible]
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	[illegible]
505:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
519:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
533:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
547:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
561:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
575:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
589:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
603:	0	0	0	0	0	0	0	1	0	0	0	0	0	0
617:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
631:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
645:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
659:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
673:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
687:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
701:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
715:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
729:	0	0	0	1	0	0	0	0	0	0	0	0	0	0
743:	0	0	0	1	0	0	0	0	0	0	0	0	0	0
757:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
771:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
785:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
799:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
813:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
827:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
855:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
869:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
883:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
911:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
925:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]	0	0	0	0	0	0	0	0	0	0	0	0	0	[illegible]
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	[illegible]
981:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
995:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1023:	0	0												

Eberline Services
Oak Ridge Laboratory

Gross Sample Counts Within Peak Regions Generated: 9-DEC-2002 01:30:04.47

Detector ID: 37 Acquisition Start: 7-DEC-2002 12:53:07.01
Live Time: 0 02:50:00.00 Real Time: 0 02:50:00.10
Batch Id: 0211141A-NP Sample Id: 04
Sample Type: NP

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4676.24	1	0	3.13	404.00	395	85	9.80E-05	100.0	
2	0	5660.19	2	0	46.98	739.00	729	58	1.96E-04	70.7	

Background Counts Within Peak Regions Generated: 9-DEC-2002 01:30:05.98

Acquisition Start: 6-DEC-2002 15:43:55.01
Live Time: 0 16:40:00.00 Real Time: 0 16:40:00.20

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4774.02	1	0	3.07	437.00	395	85	1.67E-05	100.0	
2	0	5716.50	3	0	64.53	757.50	729	58	5.00E-05	57.7	

Net Sample Counts Within Peak Regions Generated: 9-DEC-2002 01:30:06.23

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4676.24*	1	0	3.13	404.00	395	85	8.14E-05	122.2	
2	0	5660.19*	1	0	46.98	739.00	729	58	1.46E-04	96.9	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.0 Generated 9-DEC-2002 01:30:07

Configuration	: MCA0:[AMSCOUNT]00000125$1		
Analyses by	: ROIPEAK V1.2,PEAKEFF V2.2,ENBACK V1.6,NID V3.3		
Sample title	: VA-02-0176		
Sample date	: 25-NOV-2002 00:00:00	Acquisition date	: 7-DEC-2002 12:53:07
Sample ID	: 04	Sample quantity	: 1.0035 gram
Sample type	: NP	Sample geometry	:
Detector name	: 037	Detector geometry	:
Elapsed live time	: 0 02:50:00.00	Elapsed real time	: 0 02:50:00.10 0.0%
Energy tolerance	: 100.00 keV	Half life ratio	: 8.00
Errors propagated	: Yes	Systematic Error	: 3.00 %
Efficiency type	: Average value	Efficiencies at	: Peak Energy
Abundance limit	: 75.00		

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity pCi/gram
0	4676.24*	1	3.13	404.00	395	85244.4			NP-237	1.047E-02
0	5660.19*	1	46.98	739.00	729	58193.9			PU236	1.887E-02

JDP
12-6-02

Detector ID	Sample ID	Alpha	Beta	Count Time	Voltage	TOD
A1	0211141-01	148	3270	10	1410	12/6/02 10:18
A2	0211141-02	174	3140	10	1410	12/6/02 10:18
A3	0211141-03	141	2313	10	1410	12/6/02 10:18
A4	0211141-04	64	1860	10	1410	12/6/02 10:18

00385

JDP
12-6-02

Detector ID	Sample ID	Alpha	Beta	Guard	Count Count Time	Event	Voltage	TOD
A1	BKGD	10	86	31963	60	0	1402.5	37596.04
A2	BKGD	3	104	31963	60	0	1402.5	37596.04
A3	BKGD	9	87	31961	60	0	1402.5	37596.04
A4	BKGD	6	92	31960	60	0	1402.5	37596.04
B1	BKGD	8	72	32517	60	0	1402.5	37596.04
B2	BKGD	18	68	32518	60	0	1402.5	37596.04
B3	BKGD	9	60	32517	60	0	1402.5	37596.04
B4	BKGD	7	79	32518	60	0	1402.5	37596.04
C1	BKGD	7	80	32677	60	0	1402.5	37596.04
C2	BKGD	8	66	32679	60	0	1402.5	37596.04
C3	BKGD	11	69	32678	60	0	1402.5	37596.04
C4	BKGD	6	88	32685	60	0	1402.5	37596.04
D1	BKGD	6	80	33138	60	0	1402.5	37596.04
D2	BKGD	5	52	33139	60	0	1402.5	37596.04
D3	BKGD	8	47	33138	60	0	1402.5	37596.04
D4	BKGD	5	57	33138	60	0	1402.5	37596.04

B2 OUT OF SERVICE JDP 12-6-02

00386

Printed 12/6/2002 1:09 AM

12-6-02

Detector ID	Sample ID	Alpha	Beta	Count Time	Voltage	TOD
A1	NP-1	2052	6447	10	1410	12/6/02 4:35
A2	NP-2	2240	6564	10	1410	12/6/02 4:35
A3	NP-3	2520	6681	10	1410	12/6/02 4:35
A4	NP-4	2247	6680	10	1410	12/6/02 4:35
B1	NP-5	2297	6776	10	1410	12/6/02 4:35
B3	NP-7	2299	6734	10	1410	12/6/02 4:35
B4	NP-8	2101	6353	10	1410	12/6/02 4:35
C1	NP-9	2053	6363	10	1410	12/6/02 4:35
C2	NP-10	2156	6493	10	1410	12/6/02 4:35
C3	NP-11	2034	6283	10	1410	12/6/02 4:35
C4	NP-12	1455	5790	10	1410	12/6/02 4:35
D1	NP-13	2113	6517	10	1410	12/6/02 4:35
D2	NP-14	2197	6509	10	1410	12/6/02 4:35
D3	NP-15	1241	5429	10	1410	12/6/02 4:35
D4	NP-16	2223	6407	10	1410	12/6/02 4:35

00387

SECTION XIV

ANALYTICAL DATA (AMERICIUM-241/CURIUM)

Work Order	02-11141
Analysis Code	Am241
Run	1
Date Received	11/26/2002
Lab Deadline	12/5/2002
Client	Duratek
Project	106760.003
Report Level	4
Activity Units	pCi
Aliquot Units	g
Matrix	OS
Method	EML Am-01 Modified
Instrument Type	Alpha Spectroscopy
Radiometric Tracer	Am-243
Radiometric Sol#	Am-6a
Tracer Act (dpm/g)	279.524
Carrier	
Carrier Conc (mg/ml)	

Internal Fraction	Sample Desc	Client ID	Login CPM	Sample Date	Sample Aliquot
01	LCS	LCS		11/26/02 00:00	1.0000E+00
02	MBL	BLANK		11/26/02 00:00	1.0000E+00
03	DUP	VA-02-0176	89	11/25/02 12:00	1.0035E+00
04	DO	VA-02-0176	89	11/25/02 12:00	1.0035E+00

00329

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

Internal Fraction	Sample Desc	Tracer Aliquot (g)	Tracer Total ACT (dpm)	Radiometric Tracer (pCi)	Radiometric % Rec	Grav Carrier Added (ml)	Grav Filter Tare (g)	Grav Filter Final (g)	Grav Filter Net (g)	Grav % Rec	Mean % Rec	SAF 1*	SAF 2*
01	LCS	0.0485	13.6										
02	MBL	0.0505	14.1										
03	DUP	0.0438	12.2										
04	DO	0.0436	12.2										

00330

* SAF1 is [illegible]d for Gross Alpha and all other radionuclides. SAF2 is used for Gross Beta only. ** [illegible]al mass exceeded the calibration curve range. Results should be qualified as approp[illegible]

Internal Fraction	Sample Desc	Rough Prep Date	Rough Prep By	Prep Date	Prep By	Sep t0 Date/Time	Sep t0 By	Sep t1 Date/Time	Sep t1 By
01	LCS			11/27/02 12:48	JBARNARD	12/06/02 04:50	TSMITH		
02	MBL			11/27/02 12:48	JBARNARD	12/06/02 04:50	TSMITH		
03	DUP			11/27/02 12:48	JBARNARD	12/06/02 04:50	TSMITH		
04	DO			11/27/02 12:48	JBARNARD	12/06/02 04:50	TSMITH		

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

Eberli[redacted]ervices
Oak Ridge Laboratory

Preliminary Data Repo[redacted] Analytical Calculations

Work Order: 02-11141-Am241-1

Printed: 12/9/200[redacted]13 AM

Client: Duratek
Eberline Services Work Order: 02-11141
Analysis Code: Am241
Run: 1

Lab Fraction	Nuclide	Sample Desc	Client Identification	Activity Units	Results	Error Estimate	MDA	LCS Known	LCS %R	LCS Flag	RPD Flag	MDA Flag	Blank Flag
01	AM-241	LCS	LCS	pCi/g	6.03E+00	1.06E+00	1.09E-01	5.64E+00	106.93	OK		OK	
02	AM-241	MBL	BLANK	pCi/g	2.41E-02	4.78E-02	1.04E-01					OK	OK
03	AM-241	DUP	VA-02-0176	pCi/g	3.41E-02	4.70E-02	8.48E-02				INV	OK	
04	AM-241	DO	VA-02-0176	pCi/g	1.36E-02	4.10E-02	1.03E-01					OK	

12-9-02

Post-it® Fax Note 7671

Date 12-9-02	# of pages ▸ 3
To Paul Jones	From Judy Pachella
Co./Dept.	Co.
Phone #	Phone #
Fax # (865) 376-6247	Fax #

003092

Work Order: 02-11141-Am241-1

Client: Duratek
Eberline Services Work Order: 02-11141
Analysis Code: Am241
Run: 1

Lab Fraction	Nuclide	Sample Desc	Sample Date	Sample Aliquot	Radiometric % Rec	Grav % Rec	Mean % Rec	SAF	Sep t0 Date/Time	Sep t1 Date/Time
01	AM-241	LCS	11/26/02 00:00	1.00E+00	98.98				12/6/2002 4:50	
02	AM-241	MBL	11/26/02 00:00	1.00E+00	100.54				12/6/2002 4:50	
03	AM-241	DUP	11/25/02 12:00	1.00E+00	115.99				12/6/2002 4:50	
04	AM-241	DO	11/25/02 12:00	1.00E+00	84.74				12/6/2002 4:50	

00393

Work Order: 02-11141-Am241-1

Run: 1
Analysis Code: Am241
Eberline Services Work Order: 02-11141
Client: Duratek

Lab Fraction	Nuclide	Sample Desc	Counting Date/Time	Halflife (days)	Detect	Carrier	Count Time	Counts	Bkg CPM	Eff
01	AM-241	LCS	12/06/02 10:39		A_Spec	30	170.1	4.68 E+02	9.00 E-03	20.8
02	AM-241	MBL	12/06/02 10:40		A_Spec	31	170.12	1.81 E+00	7.00 E-03	19.8
03	AM-241	DUP	12/06/02 10:40		A_Spec	32	170.05	2.98 E+00	6.00 E-03	19.9
04	AM-241	DO	12/06/02 11:11		A_Spec	1	170.02	9.80 E-01	6.00 E-03	22.5

Work Order: 02-11141-Am241-1

Client: Duratek
Eberline Services Work Order: 02-11141
Analysis Code: Am241
Run: 1

Lab Fraction	Nuclide	Sample Desc	Client Identification	Activity Units	Results	Error Estimate	MDA	LCS Known	LCS %R	LCS Flag	RPD Flag	MDA Flag	Blank Flag
01	CM-244	LCS	LCS	pCi/g	6.21E+00	1.09E+00	1.31E-01	6.73E+00	92.24	OK		OK	
02	CM-244	MBL	BLANK	pCi/g	-1.13E-02	1.03E-02	9.32E-02					OK	OK
03	CM-244	DUP	VA-02-0176	pCi/g	9.50E-03	2.33E-02	5.29E-02				INV	OK	
04	CM-244	DO	VA-02-0176	pCi/g	3.70E-02	4.89E-02	7.52E-02					OK	

Work Order: 02-11141-Am241-1

Run: 1
Analysis Code: Am241
Eberline Services Work Order: 02-11141
Client: Duratek

Lab Fraction	Nuclide	Sample Desc	Sample Date	Sample Aliquot	Radiometric % Rec	Grav % Rec	Mean % Rec	SAF	Sep t0 Date/Time	Sep t1 Date/Time
01	CM-244	LCS	11/26/02 00:00	1.00E+00	98.98				12/6/2002 4:50	
02	CM-244	MBL	11/26/02 00:00	1.00E+00	100.54				12/6/2002 4:50	
03	CM-244	DUP	11/25/02 12:00	1.00E+00	115.99				12/6/2002 4:50	
04	CM-244	DO	11/25/02 12:00	1.00E+00	84.74				12/6/2002 4:50	

Work Order: 02-11141-Am241-1

Client: Duratek

Eberline Services Work Order: 02-11141

Analysis Code: Am241

Run: 1

Lab Fraction	Nuclide	Sample Desc	Counting Date/Time	Halflife (days)	Detect	Carrier	Count Time	Counts	Bkg CPM	Eff
01	CM-244	LCS	12/06/02 10:39		A_Spec	30	170.1	4.81 E+02	1.50 E-02	20.8
02	CM-244	MBL	12/06/02 10:40		A_Spec	31	170.12	-8.51 E-01	5.00 E-03	19.8
03	CM-244	DUP	12/06/02 10:40		A_Spec	32	170.05	8.30 E-01	1.00 E-03	19.9
04	CM-244	DO	12/06/02 11:11		A_Spec	1	170.02	2.66 E+00	2.00 E-03	22.5

00397

20.32 1

Internal Fraction	Sample Desc	Client ID	Sample Date	Sample Aliquot	Tracer Aliquot (g)	Tracer ACT (dpm)	Radiometric Tracer (pCi)	Radiometric % Rec	SAF 1*	SAF 2*
01	LCS	LCS	11/26/02 00:00	1.0000	0.0485	13.5569				
02	MBL	BLANK	11/26/02 00:00	1.0000	0.0505	14.1160				
03	DUP	VA-02-0176	11/25/02 12:00	1.0035	0.0438	12.2432				
04	DO	VA-02-0176	11/25/02 12:00	1.0035	0.0436	12.1872				

Work Order	02-11141
Analysis Code	CmISO
Run	1
Date Received	11/26/2002
Lab Deadline	12/5/2002
Client	Duratek
Project	106760.003
Report Level	4
Activity Units	pCi
Aliquot Units	g
Matrix	OS
Method	EML Am-01 Modified for Cm
Instrument Type	Alpha Spectroscopy
Radiometric Tracer	Am-243
Radiometric Sol#	Am-6a
Tracer Act (dpm/g)	279.524
Carrier	
Carrier Conc (mg/ml)	

Internal Fraction	Sample Desc	Client ID	Login CPM	Sample Date	Sample Aliquot
01	LCS	LCS		11/26/02 00:00	1.0000E+00
02	MBL	BLANK		11/26/02 00:00	1.0000E+00
03	DUP	VA-02-0176	89	11/25/02 12:00	1.0035E+00
04	DO	VA-02-0176	89	11/25/02 12:00	1.0035E+00

0039

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

Internal Fraction	Sample Desc	Tracer Aliquot (g)	Tracer Total ACT (dpm)	Radiometric Tracer (pCi)	Radiometric % Rec	Grav Carrier Added (ml)	Grav Filter Tare (g)	Grav Filter Final (g)	Grav Filter Net (g)	Grav % Rec	Mean % Rec	SAF 1*	SAF 2*
01	LCS	0.0485	13.6										
02	MBL	0.0505	14.1										
03	DUP	0.0438	12.2										
04	DO	0.0436	12.2										

00180

* SAF1 [illegible]d for Gross Alpha and all other radionuclides. SAF2 is used for Gross Beta only. [illegible]tual mass exceeded the calibration curve range. Results should be qualified as appro[illegible]

Internal Fraction	Sample Desc	Rough Prep Date	Rough Prep By	Prep Date	Prep By	Sep t0 Date/Time	Sep t0 By	Sep t1 Date/Time	Sep t1 By
01	LCS			11/27/02 12:50	JBARNARD	12/06/02 04:50	TSMITH		
02	MBL			11/27/02 12:50	JBARNARD	12/06/02 04:50	TSMITH		
03	DUP			11/27/02 12:50	JBARNARD	12/06/02 04:50	TSMITH		
04	DO			11/27/02 12:50	JBARNARD	12/06/02 04:50	TSMITH		

00401

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

Internal Fraction	Sample Desc	Client ID	Sample Date	Sample Aliquot	Tracer Aliquot (g)	Tracer ACT (dpm)	Radiometric Tracer (pCi)	Radiometric % Rec	SAF 1*	SAF 2*
01	LCS	LCS	11/26/02 00:00	1.0000	0.0485	13.5569				
02	MBL	BLANK	11/26/02 00:00	1.0000	0.0505	14.1160				
03	DUP	VA-02-0176	11/25/02 12:00	1.0035	0.0438	12.2432				
04	DO	VA-02-0176	11/25/02 12:00	1.0035	0.0436	12.1872				

Oak Ridge Laboratory

Spike and Tracer Worksheet

Printed: 11/27/2002 12:48 PM

Internal Work Order	Run	Analysis Code	Date	Technician	Technician Initials	Witness Initials
02-11141	1	Am241	11/27/2002 12:40	JBARNARD	JBarnard	

LCS & Matrix Spikes					LCS	MS	LCSD	MSD	LCS		MS		LCSD		MSD	
Isotope	Sol #	Activity dpm/ml	Solution Date	Approx Addition	Volume Used (ml)	Volume Used (ml)	Volume Used (ml)	Volume Used (ml)	Known pCi	Error Estimate	Added pCi	Error Estimate	Known pCi	Error Estimate	Added pCi	Error Estimate
Am-241	Am-4a	46.970	11/27/2002	0.260	0.2665				5.64	0.169	0.00	0.000	0.00	0.000	0.00	0.000
Cm-244	Cm-1	27.335	11/27/2002	0.540	0.5464				6.73	0.094	0.00	0.000	0.00	0.000	0.00	0.000

Tracers						
fraction	Isotope	Sol #	Activity dpm/ml	Solution Date	Volume Used (ml)	Approx Addition
01	Am-243	Am-6a	279.524	11/27/2002	0.0485	0.0500
02	Am-243	Am-6a	279.524	11/27/2002	0.0505	0.0500
03	Am-243	Am-6a	279.524	11/27/2002	0.0438	0.0500
04	Am-243	Am-6a	279.524	11/27/2002	0.0436	0.0500

Balance Printer Tapes

Tracer	LCS
-0.0485 g 0.0505 g 0.0438 g 0.0436 g	0.2665 g 0.5464 g

Matrix Spike

00403

Version 2.0 08/99

Eberli[illegible]ervices
Oak [illegible] aboratory

Spike and [illegible]er Worksheet

Printed: 11/2[illegible] [illegible]12:50 PM

Internal Work Order	Run	Analysis Code	Date	Technician	Technician Initials	Witness Initials
02-11141	1	CmISO	11/27/2002 12:48	JBARNARD	JBarnard	

LCS & Matrix Spikes					LCS	MS	LCSD	MSD	LCS		MS		LCSD		MSD	
Isotope	Sol #	Activity dpm/ml	Solution Date	Approx Addition	Volume Used (ml)	Volume Used (ml)	Volume Used (ml)	Volume Used (ml)	Known pCi	Error Estimate	Added pCi	Error Estimate	Known pCi	Error Estimate	Added pCi	Error Estimate
Cm-244	Cm-1	27.335	11/27/2002	0.540	0.5464				6.73	0.094	0.00	0.000	0.00	0.000	0.00	0.000
Am-241	Am-4a	46.970	11/27/2002	0.260	0.2665				5.64	0.169	0.00	0.000	0.00	0.000	0.00	0.000

Tracers						
fraction	Isotope	Sol #	Activity dpm/ml	Solution Date	Volume Used (ml)	Approx Addition
01	Am-243	Am-6a	279.524	11/27/2002	0.0485	0.0500
02	Am-243	Am-6a	279.524	11/27/2002	0.0505	0.0500
03	Am-243	Am-6a	279.524	11/27/2002	0.0438	0.0500
04	Am-243	Am-6a	279.524	11/27/2002	0.0436	0.0500

Balance Printer Tapes	
Tracer	LCS
	Matrix Spike

00404

Version 2.0 08/99

Eberline Services - Oak Ridge
Version 2.0 8/1999

Aliquot Worksheet

Work Order	Run	Analysis Code	Aliquot Units	Lab Deadline	Technician
02-11141	1	Am241	grams	12/5/2002	JBARNARD

Lab Fraction	Duratek Client ID	Sample Type	Muffle Data Ratio Post/Pre	Dilution Data Aliquot	Dilution Data Final (ml)	Dilution Data Ratio	Aliquot Data Aliquot	Aliquot Data Net Equiv	MS Aliquot Data Aliquot	MS Aliquot Data Net Equiv	H-3 Solids Only Water Added (ml)	H-3 Solids Only H3 Dist Aliq
01	LCS	LCS					1.0000E+00	1.0000E+00				
02	BLANK	MBL					1.0000E+00	1.0000E+00				
03	VA-02-0176	DUP		2.5089E+01	100.0000	2.51E-01	4.0000E+00	1.0035E+00				
04	VA-02-0176	DO		2.5089E+01	100.0000	2.51E-01	4.0000E+00	1.0035E+00				

Comments	

00405

Technician: Jay Barnard Date: 12/3/02

Eberline Services - Oak Ridge
Version 2.0 8/1999

Aliquot Worksheet

Work Order	Run	Analysis Code	Aliquot Units	Lab Deadline	Technician
02-11141	1	CmISO	grams	12/5/2002	JBARNARD

Lab Fraction	Duratek	Sample	Muffle Data	Dilution Data			Aliquot Data		MS Aliquot Data		H-3 Solids Only	
	Client ID	Type	Ratio Post/Pre	Aliquot	Final (ml)	Ratio	Aliquot	Net Equiv	Aliquot	Net Equiv	Water Added (ml)	H3 Dist Aliq
01	LCS	LCS					1.0000E+00	1.0000E+00				
02	BLANK	MBL					1.0000E+00	1.0000E+00				
03	VA-02-0176	DUP		2.5089E+01	100.0000	2.51E-01	4.0000E+00	1.0035E+00				
04	VA-02-0176	DO		2.5089E+01	100.0000	2.51E-01	4.0000E+00	1.0035E+00				

Comments	

00406

Technic Jay Barnard Date: 12/3/02

Eberline Services
Oak Ridge Laboratory

ALPHA SPECTROMETRY REPORT
6-DEC-2002 14:39:42

****
Spectral File: ND_AMS_ARCHIVE_C:C_0211141A-AM$01_AM.CNF
****

BATCH ID:	0211141A-AM	SAMPLE ID:	01
SAMPLE DATE:	6-DEC-2002 00:00	ALIQUOT:	1.000E+00 gram
SAMPLE TITLE:	SPIKE	DETECTOR NUMBER:	030
ACQ DATE:	6-DEC-2002 10:39	AVERAGE EFFICIENCY:	20.76%
ELAPSED LIVE TIME:	10206.	RECOVERY:	98.98%
TRACER ID:	AM-6A	TRACER FWHM (kev):	51.97
LAMBDA VALUE:	49.	ROI TYPE:	STANDARD
TRACER DPM AT SAMPLE DATE:	13.557	CONFIDENCE FACTOR:	4.65
SAMPLE MATRIX:	SOIL	LLD CONSTANT:	2.71
ENERGY CAL DATE:	27-NOV-2002 10:13	EFF CAL DATE:	27-NOV-2002 10:13
BKG FILENAME:	B_030_27NOV02	BKG ELAPSED TIME:	60003.

****

NUCLIDE ACTIVITY SUMMARY

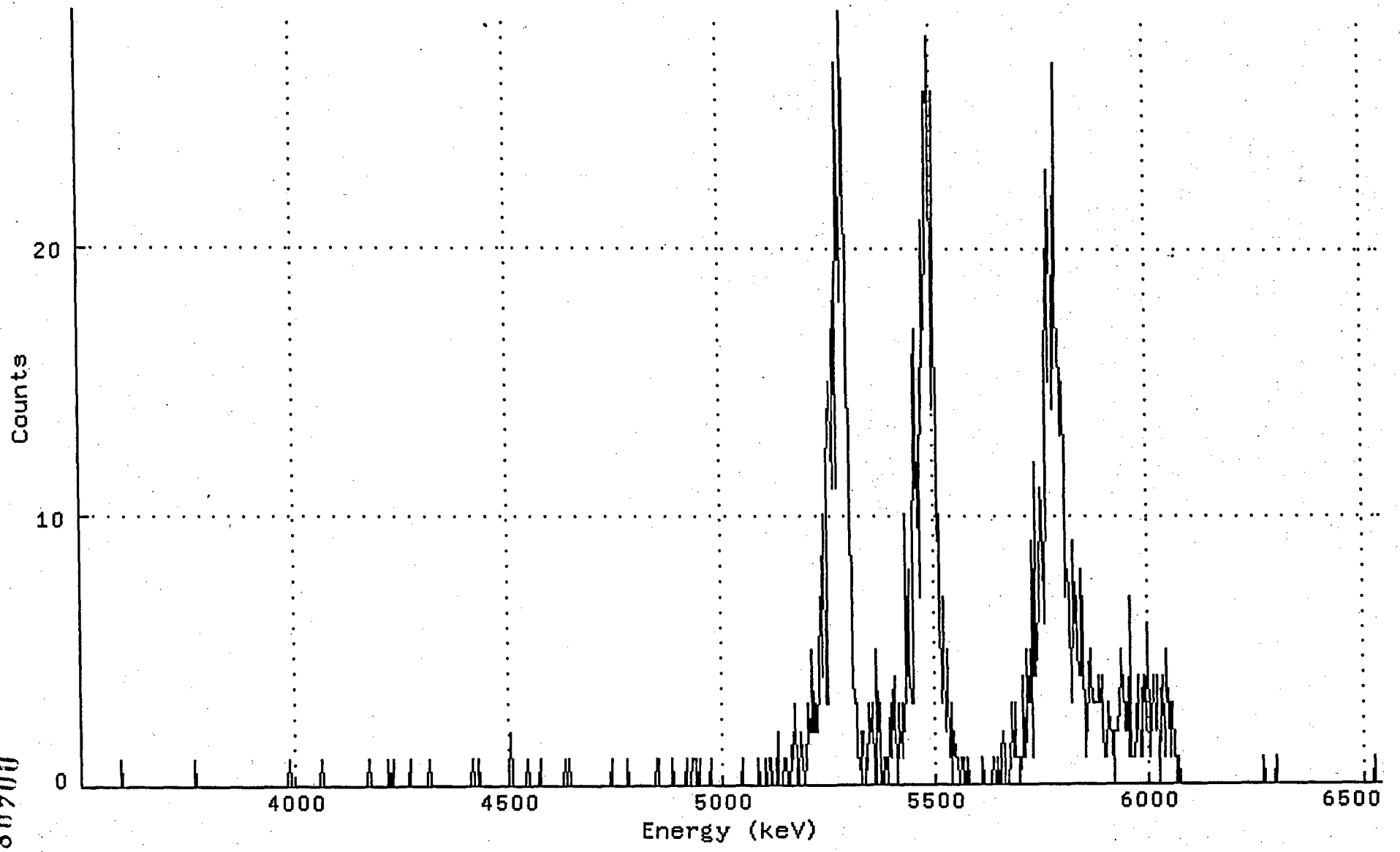
NUCLIDE	ENERGY	NET AREA	BKG	%ABN	ACTIVITY pCi/ gram	TPU/ERROR 2-SIGMA	MDC pCi/ gram
AM-241	5479.1	467.47	1.53	99.9	6.029E+00	1.060E+00	1.092E-01
[illegible]243	5270.0	471.98	1.02	99.6	6.107E+00	7.644E-01	9.584E-02
CM-244	5795.0	481.45	2.55	100.0	6.206E+00	1.087E+00	1.307E-01
CM-247	4868.0	2.66	0.34	75.7	4.529E-02	5.993E-02	9.232E-02
CM-248	5078.6	1.83	0.17	91.6	2.574E-02	4.025E-02	6.509E-02
CF-252	6111.0	78.66	0.34	97.0	1.045E+00	2.833E-01	7.203E-02

****

Alan Gregory — Analyst — Date 12/6/02

Alan Gregory — Reviewer — Date 12/9/02

Spectr : DKA100:[ALPHA.ALUSR.ARCHIVE.C]C 11141A-AM$01_AM.CNF;1
Title : 030
Sample Title: SPIKE
Start Time: 6-DEC-2002 10:39: Sample Time: 6-DEC-2002 00:00: Energy Offset: 3.49079E+03
Real Time : 0 02:50:06.00 Sample ID : 01 Energy Slope : 3.13062E+00
Live Time : 0 02:50:06.00 Sample Type: AM Energy Quad : -1.54719E-04



00408

Channel Contents for ND_AMS_ARCHIVE_C:C_0211141A-AM$01_AM

Channel

[illegible]:	10206	10206	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29:	0	0	0	0	1	0	0	0	0	0	0	0	0	0
43:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85:	0	0	0	1	0	0	0	0	0	0	0	0	0	0
99:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
113:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
127:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
141:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
155:	0	0	0	0	0	1	0	0	0	0	0	0	0	0
169:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
183:	0	1	0	0	0	0	0	0	0	0	0	0	0	0
197:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
211:	0	0	0	0	0	0	0	0	0	1	0	0	0	0
225:	0	0	0	0	0	0	0	0	0	0	1	0	0	1
239:	0	0	0	0	0	0	0	0	0	0	0	0	1	0
253:	0	0	0	0	0	0	0	0	0	0	0	0	0	1
267:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
281:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
295:	0	0	0	0	1	0	0	0	0	1	0	0	0	0
309:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
323:	0	0	0	0	0	2	0	0	0	0	0	0	0	0
337:	0	0	0	0	1	0	0	0	0	0	0	0	0	0
351:	1	0	0	0	0	0	0	0	0	0	0	0	0	0
365:	0	0	0	0	0	1	0	0	1	0	0	0	0	0
379:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
393:	0	0	0	0	0	0	0	0	0	0	0	0	0	1
407:	0	0	0	0	0	0	0	0	0	0	0	0	1	0
421:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
435:	0	0	0	0	0	0	0	1	1	0	0	0	0	0
449:	0	0	0	0	0	1	0	0	0	0	0	0	0	0
463:	0	0	1	0	0	0	0	1	1	1	0	0	1	0
[illegible]:	0	0	0	0	0	0	0	1	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]5:	0	0	0	0	1	0	0	0	0	0	0	0	0	0
519:	0	0	0	1	0	0	0	0	0	1	0	1	0	1
533:	0	0	0	0	2	0	0	0	0	1	1	1	0	0
547:	0	1	2	1	3	0	0	0	2	2	1	0	0	1
561:	2	3	2	2	5	2	2	3	2	4	4	7	4	7
575:	10	3	3	12	13	15	14	13	11	16	18	11	12	27
589:	22	21	18	26	29	24	17	16	12	5	4	3	3	1
603:	1	0	2	2	0	0	1	2	3	2	3	3	0	0
617:	5	2	3	0	0	1	0	1	1	0	2	3	1	3
631:	4	3	0	3	1	2	1	3	2	4	10	4	8	4
645:	3	3	6	15	17	11	12	7	11	15	16	21	17	21
659:	26	26	25	28	14	26	22	9	10	7	3	7	5	2
673:	5	4	1	3	0	2	1	1	1	0	0	1	0	1
687:	0	0	1	0	0	0	0	0	0	0	0	0	0	0
701:	1	0	0	0	0	0	0	0	1	1	0	0	1	0
715:	0	1	2	1	0	0	0	0	1	2	3	1	3	1
729:	1	1	0	1	1	4	1	2	5	3	4	5	1	9
743:	4	12	4	5	7	7	11	10	9	6	12	14	20	15
757:	23	20	18	14	17	27	18	16	15	13	15	11	7	8
771:	7	7	3	7	9	6	7	5	4	4	8	6	1	3
785:	2	2	4	5	4	3	3	3	3	3	4	3	4	2
799:	1	1	1	3	2	2	2	0	2	2	2	2	3	4
813:	5	3	3	2	2	3	1	7	1	1	1	1	2	4
827:	3	1	1	3	4	2	2	6	1	3	2	4	4	2
841:	3	4	0	3	3	4	4	1	5	4	3	1	3	3
855:	1	2	0	0	1	0	0	0	0	0	0	0	0	0
869:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
883:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
911:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
925:	0	0	0	1	0	0	0	0	0	0	0	0	0	1
939:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
995:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0	0	0	1	0	0	0
1023:	0	0												

Eberline Services
Oak Ridge Laboratory

Gross Sample Counts Within Peak Regions Generated: 6-DEC-2002 14:39:35.50

Detector ID: 30 Acquisition Start: 6-DEC-2002 10:39:45.01
Live Time: 0 02:50:06.00 Real Time: 0 02:50:06.00
Batch Id: 0211141A-AM Sample Id: 01
Sample Type: AM

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4822.33	3	0	78.27	434.67	407	45	2.94E-04	57.7	
2	0	5007.00	2	0	81.40	496.50	477	45	1.96E-04	70.7	
3	0	5271.05	473	0	51.97	585.61	524	94	4.63E-02	4.6	
4	0	5477.71	469	0	55.23	655.94	618	64	4.60E-02	4.6	
5	0	5776.98	484	0	42.65	758.72	722	63	4.74E-02	4.5	
6	0	6018.50	79	0	65.70	842.49	829	60	7.74E-03	11.3	

Background Counts Within Peak Regions Generated: 6-DEC-2002 14:39:40.09

Acquisition Start: 27-NOV-2002 19:11:44.01
Live Time: 0 16:40:03.00 Real Time: 0 16:40:03.00

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4806.39	2	0	87.61	429.00	407	45	3.33E-05	70.7	
2	0	5015.25	1	0	3.13	499.00	477	45	1.67E-05	100.0	
[illegible]	0	5226.99	6	0	222.16	570.50	524	94	1.00E-04	40.8	
[illegible]	0	5459.09	9	0	93.87	649.50	618	64	1.50E-04	33.3	
5	0	5760.21	15	0	120.47	753.00	722	63	2.50E-04	25.8	
6	0	6063.69	2	0	25.03	858.50	829	60	3.33E-05	70.7	

Net Sample Counts Within Peak Regions Generated: 6-DEC-2002 14:39:40.76

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4822.33*	3	0	78.27	434.67	407	45	2.61E-04	65.7	
2	0	5007.00*	2	0	81.40	496.50	477	45	1.79E-04	77.8	
3	0	5271.05*	472	0	51.97	585.61	524	94	4.62E-02	4.6	
4	0	5477.71*	467	0	55.23	655.94	618	64	4.58E-02	4.6	
5	0	5776.98*	481	0	42.65	758.72	722	63	4.72E-02	4.6	
6	0	6018.50*	79	0	65.70	842.49	829	60	7.71E-03	11.3	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.0 Generated 6-DEC-2002 14:39:41

Configuration	: MCA0:[AMSCOUNT]00000125$1		
Analyses by	: ROIPEAK V1.2,PEAKEFF V2.2,ENBACK V1.6,NID V3.3		
Sample title	: SPIKE		
Sample date	: 6-DEC-2002 00:00:00	Acquisition date	: 6-DEC-2002 10:39:45
Sample ID	: 01	Sample quantity	: 1.0000 gram
Sample type	: AM	Sample geometry	:
Detector name	: 030	Detector geometry	:
Elapsed live time	: 0 02:50:06.00	Elapsed real time	: 0 02:50:06.00 0.0%
Energy tolerance	: 100.00 keV	Half life ratio	: 8.00
Errors propagated	: Yes	Systematic Error	: 3.00 %
Efficiency type	: Average value	Efficiencies at	: Peak Energy
Abundance limit	: 75.00		

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity pCi/gram
0	4822.33*	3	78.27	434.67	407	45	131.5		CM-247	4.483E-02
0	5007.00*	2	81.40	496.50	477	45	155.7		CM-248	2.548E-02
0	5271.05*	472	51.97	585.61	524	94	9.2		AM243	6.04
0	5477.71*	467	55.23	655.94	618	64	9.3		AM-241	5.97
0	5776.98*	481	42.65	758.72	722	63	9.1		CM-244	6.14
0	6018.50*	79	65.70	842.49	829	60	22.6		CF-252	1.03

Eberline Services
Oak Ridge Laboratory

ALPHA SPECTROMETRY REPORT
6-DEC-2002 14:40:50

****
Spectral File: ND_AMS_ARCHIVE_R:R_0211141A-AM$02_AM.CNF
****

BATCH ID:	0211141A-AM	SAMPLE ID:	02
SAMPLE DATE:	6-DEC-2002 00:00	ALIQUOT:	1.000E+00 gram
SAMPLE TITLE:	BLANK	DETECTOR NUMBER:	031
ACQ DATE:	6-DEC-2002 10:40	AVERAGE EFFICIENCY:	19.78%
ELAPSED LIVE TIME:	10207.	RECOVERY:	100.54%
TRACER ID:	AM-6A	TRACER FWHM (kev):	23.44
LAMBDA VALUE:	51.	ROI TYPE:	MANUAL
TRACER DPM AT SAMPLE DATE:	14.116	CONFIDENCE FACTOR:	4.65
SAMPLE MATRIX:	SOIL	LLD CONSTANT:	2.71
ENERGY CAL DATE:	27-NOV-2002 10:13	EFF CAL DATE:	27-NOV-2002 10:13
BKG FILENAME:	B_031_27NOV02	BKG ELAPSED TIME:	60004.

****

NUCLIDE ACTIVITY SUMMARY

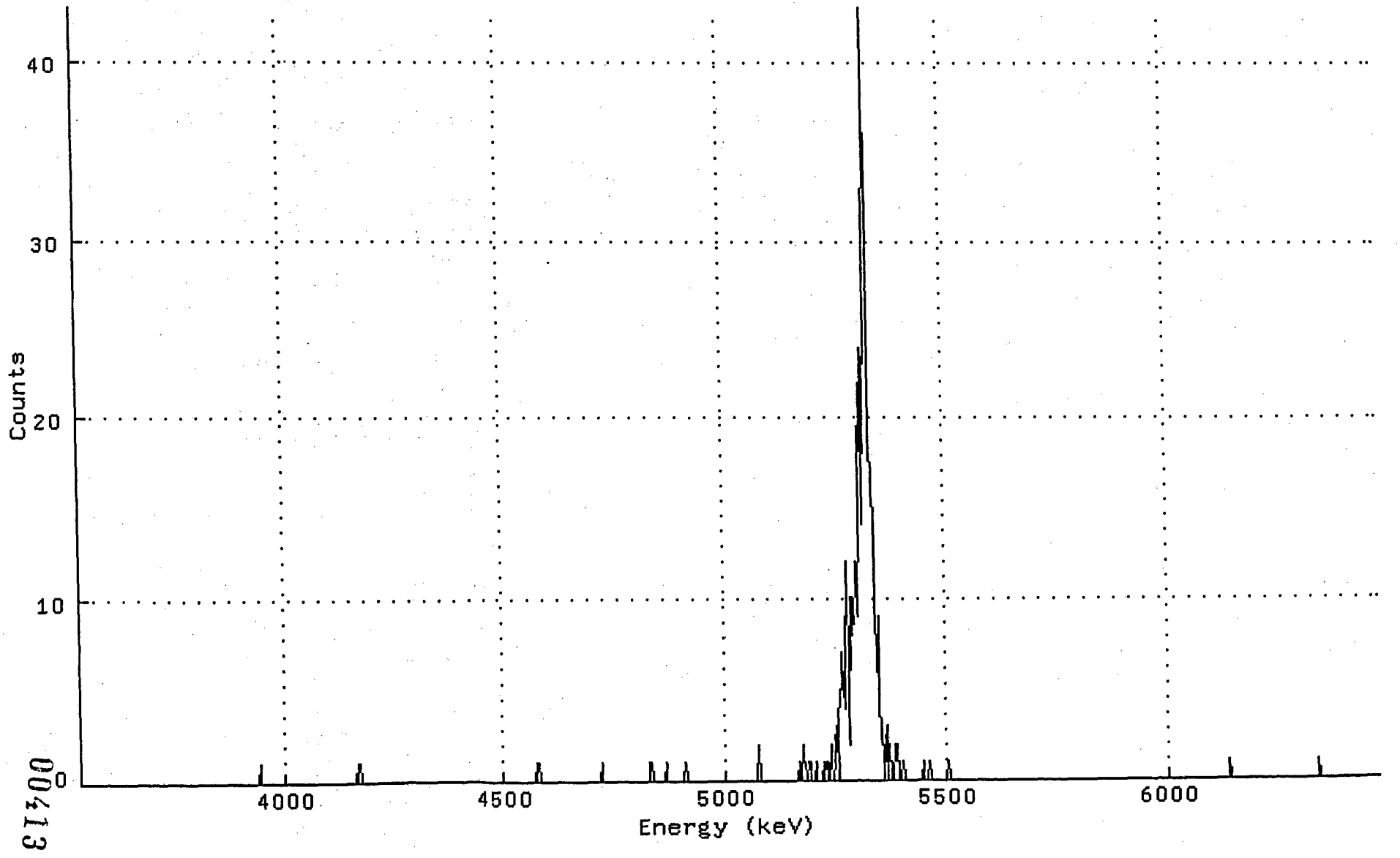
NUCLIDE	ENERGY	NET AREA	BKG	%ABN	ACTIVITY pCi/ gram	TPU/ERROR 2-SIGMA	MDC pCi/ gram
AM-241	5479.1	1.81	1.19	99.9	2.410E-02	4.781E-02	1.037E-01
AM-243	5270.0	475.83	0.17	99.6	6.359E+00	7.943E-01	6.184E-02
CM-244	5795.0	-0.85	0.85	100.0	-1.132E-02	1.027E-02	9.316E-02
CM-247	4868.0	3.00	0.00	75.7	5.276E-02	6.143E-02	4.766E-02
CM-248	5078.6	1.83	0.17	91.6	2.658E-02	4.157E-02	6.723E-02
CF-252	6111.0	0.32	0.68	97.0	4.386E-03	2.900E-02	8.980E-02

****

Alan Gregley — 12/6/02
Analyst — Date

Alan Gregley — 12/9/02
Reviewer — Date

Spec : DKA100:[ALPHA.ALUSR.ARCHIVE.R] 11141A-AM$02_AM.CNF;1
Title : 031
Sample Title: BLANK
Start Time: 6-DEC-2002 10:40: Sample Time: 6-DEC-2002 00:00: Energy Offset: 3.53019E+03
Real Time : 0 02:50:07.00 Sample ID : 02 Energy Slope : 2.99399E+00
Live Time : 0 02:50:07.00 Sample Type: AM Energy Quad : -1.22203E-04



00413

Channel Contents for ND_AMS_ARCHIVE_R:R_0211141A-AM$02_AM

Channel

[illegible]:	10207	10207	0	0	0	0	0	0	0	0	0	0	0	[illegible]
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	
29:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
113:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
127:	0	0	0	0	0	0	0	0	0	0	0	0	1	0
141:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
155:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
169:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
183:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
197:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
211:	0	0	0	1	0	1	0	0	0	0	0	0	0	0
225:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
239:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
253:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
267:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
281:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
295:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
309:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
323:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
337:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
351:	0	0	1	0	1	0	0	0	0	0	0	0	0	0
365:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
379:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
393:	0	0	0	0	0	0	0	0	0	0	0	1	0	0
407:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
421:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
435:	0	0	0	0	0	0	0	1	1	0	0	0	0	0
449:	0	0	0	0	0	1	0	0	0	0	0	0	0	0
463:	0	0	0	0	0	0	1	0	0	0	0	0	0	0
[illegible]	0	0	0	0	0	0	0	0	0	0	0	0	0	[illegible]
[illegible]	0	0	0	0	0	0	0	0	0	0	0	0	0	
505:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
519:	0	0	0	0	0	0	0	0	2	0	0	0	0	0
533:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
547:	0	0	0	0	0	0	0	0	0	0	0	0	1	0
561:	0	2	1	1	0	0	1	1	0	0	0	1	0	0
575:	0	0	0	1	0	1	0	1	0	2	1	0	1	2
589:	3	0	3	5	5	7	5	4	6	12	5	2	10	10
603:	8	9	11	12	9	15	17	22	14	24	18	29	23	43
617:	29	19	16	14	10	6	9	5	2	2	0	2	3	0
631:	2	0	1	0	2	2	2	0	1	0	1	0	0	0
645:	0	0	0	0	0	0	0	0	0	0	0	0	1	0
659:	0	0	0	1	0	0	0	0	0	0	0	0	0	0
673:	0	0	0	0	1	0	0	0	0	0	0	0	0	0
687:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
701:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
715:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
729:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
743:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
757:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
771:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
785:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
799:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
813:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
827:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
855:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
869:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
883:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	1	0	0	0	0	0	0	0
911:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
925:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
939:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]	0	0	0	0	0	0	0	0	0	0	0	0	0	[illegible]
[illegible]	0	0	0	0	0	0	0	0	1	0	0	0	0	0
981:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
995:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1023:	0	0												

Eberline Services
Oak Ridge Laboratory

Gross Sample Counts Within Peak Regions Generated: 6-DEC-2002 14:40:46.85

Detector ID: 31 Acquisition Start: 6-DEC-2002 10:40:01.01
Live Time: 0 02:50:07.00 Real Time: 0 02:50:07.00
Batch Id: 0211141A-AM Sample Id: 02
Sample Type: AM

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4842.16	3	0	38.55	446.33	411	46	2.94E-04	57.7	
2	0	5074.08	2	0	2.99	527.00	484	46	1.96E-04	70.7	
3	0	5312.01	476	0	23.44	610.34	533	111	4.66E-02	4.6	
4	0	5468.09	3	0	62.87	665.33	646	49	2.94E-04	57.7	
5	0	5760.30	0	0	0.00	769.00	737	65	0.00E+00	0.0	
6	0	6134.12	1	0	2.99	903.00	848	62	9.80E-05	100.0	

Background Counts Within Peak Regions Generated: 6-DEC-2002 14:40:48.96

Acquisition Start: 27-NOV-2002 19:11:46.01
Live Time: 0 16:40:04.00 Real Time: 0 16:40:04.00

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4792.40	0	0	0.00	433.50	411	46	0.00E+00	0.0	
2	0	5002.22	1	0	3.00	506.50	484	46	1.67E-05	100.0	
3	0	5234.72	1	0	3.00	588.00	533	111	1.67E-05	100.0	
4	0	5466.80	7	0	96.14	670.00	646	49	1.17E-04	37.8	
5	0	5744.51	5	0	72.10	769.00	737	65	8.33E-05	44.7	
6	0	6048.52	4	0	0.00	878.50	848	62	6.67E-05	50.0	

Net Sample Counts Within Peak Regions Generated: 6-DEC-2002 14:40:49.21

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4842.16*	3	0	38.55	446.33	411	46	2.94E-04	57.7	
2	0	5074.08*	2	0	2.99	527.00	484	46	1.79E-04	77.8	
3	0	5312.01*	476	0	23.44	610.34	533	111	4.66E-02	4.6	
4	0	5468.09*	2	0	62.87	665.33	646	49	1.77E-04	98.9	
5	0	5760.30*	-1	0	0.00	769.00	737	65	-8.33E-05	44.7	
6	0	6134.12*	0	0	2.99	903.00	848	62	3.13E-05	330.5	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.0 Generated 6-DEC-2002 14:40:49

Configuration : MCA0:[AMSCOUNT]00000125$1
Analyses by : ROIPEAK V1.2,PEAKEFF V2.2,ENBACK V1.6,NID V3.3
Sample title : BLANK
Sample date : 6-DEC-2002 00:00:00 Acquisition date : 6-DEC-2002 10:40:01
Sample ID : 02 Sample quantity : 1.0000 gram
Sample type : AM Sample geometry :
Detector name : 031 Detector geometry:
Elapsed live time: 0 02:50:07.00 Elapsed real time: 0 02:50:07.00 0.0%
Energy tolerance : 150.00 keV Half life ratio : 8.00
Errors propagated: Yes Systematic Error : 3.00 %
Efficiency type : Average value Efficiencies at : Peak Energy
Abundance limit : 75.00

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity pCi/gram
0	4842.16*	3	38.55	446.33	411	46	115.5		CM-247	5.304E-02
0	5074.08*	2	2.99	527.00	484	46	155.7		CM-248	2.673E-02
0	5312.01*	476	23.44	610.34	533	111	9.2		AM243	6.39
0	5468.09*	2	62.87	665.33	646	49	197.8		AM-241	2.423E-02
0	5760.30*	-1	0.00	769.00	737	65	89.4		CM-244	-1.138E-02
0	6134.12*	0	2.99	903.00	848	62	661.0		CF-252	4.410E-03

Eberline Services
Oak Ridge Laboratory

ALPHA SPECTROMETRY REPORT
6-DEC-2002 14:41:08

****
Spectral File: ND_AMS_ARCHIVE_S:S_0211141A-AM$03_AM.CNF
****

BATCH ID:	0211141A-AM	SAMPLE ID:	03
SAMPLE DATE:	25-NOV-2002 00:00	ALIQUOT:	1.003E+00 gram
SAMPLE TITLE:	VA-02-0176	DETECTOR NUMBER:	032
ACQ DATE:	6-DEC-2002 10:40	AVERAGE EFFICIENCY:	19.90%
ELAPSED LIVE TIME:	10203.	RECOVERY:	115.99%
TRACER ID:	AM-6A	TRACER FWHM (kev):	31.57
LAMBDA VALUE:	44.	ROI TYPE:	STANDARD
TRACER DPM AT SAMPLE DATE:	12.243	CONFIDENCE FACTOR:	4.65
SAMPLE MATRIX:	SOIL	LLD CONSTANT:	2.71
ENERGY CAL DATE:	27-NOV-2002 10:13	EFF CAL DATE:	27-NOV-2002 10:13
BKG FILENAME:	B_032_27NOV02	BKG ELAPSED TIME:	60001.

****

NUCLIDE ACTIVITY SUMMARY

NUCLIDE	ENERGY	NET AREA	BKG	%ABN	ACTIVITY pCi/ gram	TPU/ERROR 2-SIGMA	MDC pCi/ gram
AM-241	5479.1	2.98	1.02	99.9	3.410E-02	4.704E-02	8.477E-02
CM-243	5270.0	478.66	0.34	99.6	5.496E+00	6.855E-01	6.225E-02
CM-244	5795.0	0.83	0.17	100.0	9.504E-03	2.328E-02	5.293E-02
CM-247	4868.0	1.83	0.17	75.7	2.765E-02	4.324E-02	6.992E-02
CM-248	5078.6	1.66	0.34	91.6	2.072E-02	3.594E-02	6.767E-02
CF-252	6111.0	0.00	0.00	97.0	0.000E+00	0.000E+00	3.195E-02

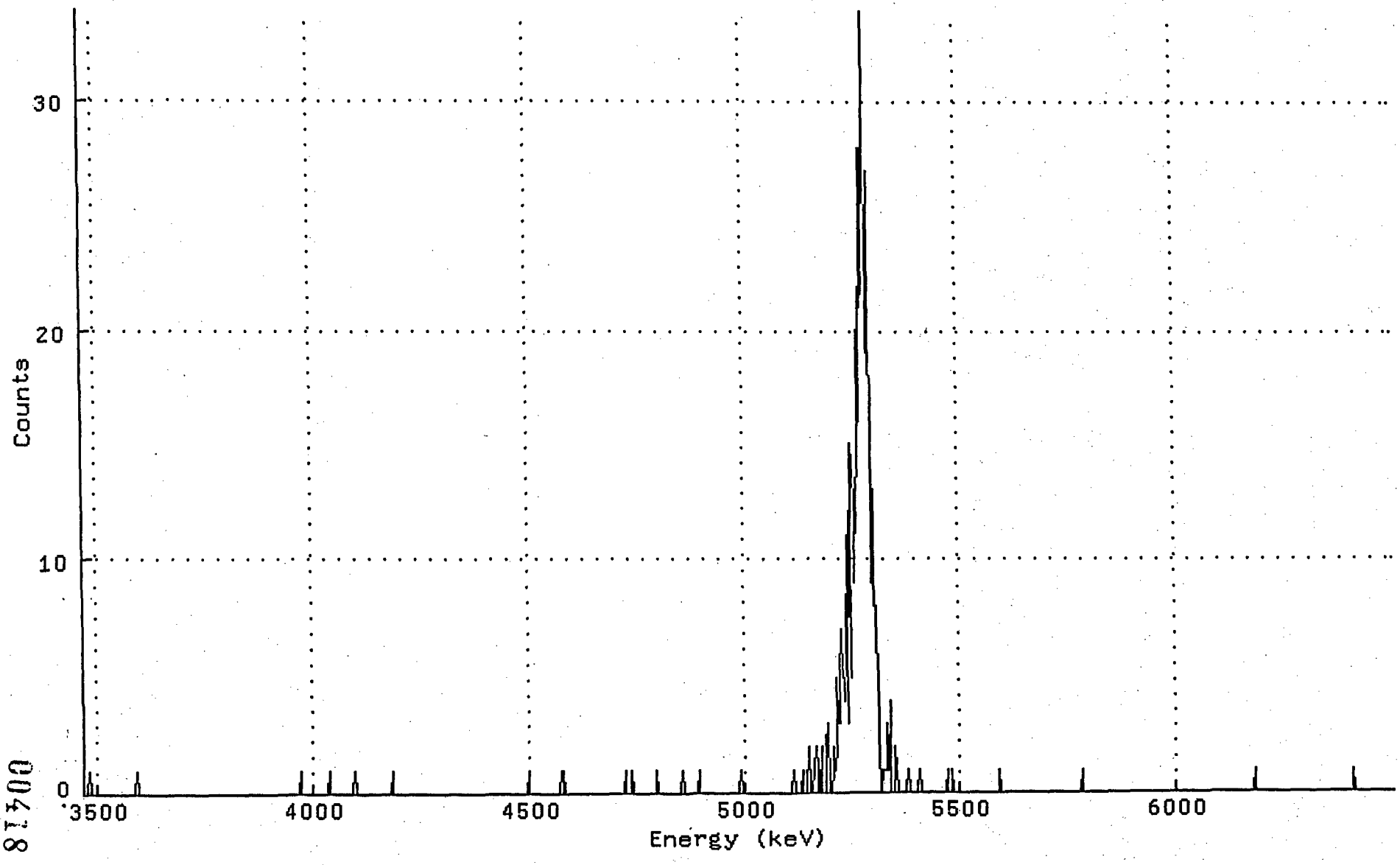
****

*** Chemical Recovery > 115.0% ***

Alan Gregory — Analyst — 12/6/02 Date

Alan Gregory — Reviewer — 12/9/02 Date

Spectr : DKA100:[ALPHA.ALUSR.ARCHIVE.S]S 11141A-AM$03_AM.CNF;1
Title : 032
Sample Title: VA-02-0176
Start Time: 6-DEC-2002 10:40: Sample Time: 25-NOV-2002 00:00 Energy Offset: 3.46137E+03
Real Time : 0 02:50:03.00 Sample ID : 03 Energy Slope : 3.17087E+00
Live Time : 0 02:50:03.00 Sample Type: AM Energy Quad : -2.04879E-04



00418

Channel Contents for ND_AMS_ARCHIVE_S:S_0211141A-AM$03_AM

Channel

[illegible]:	10203	10203	0	0	0	0	1	0	0	0	0	0	0	0
[illegible]5:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]29:	0	0	0	0	0	0	0	0	0	0	0	0	0	1
43:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
71:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
113:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
127:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
141:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
155:	0	0	0	0	0	0	0	0	1	0	0	0	0	0
169:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
183:	0	1	0	0	0	0	0	0	0	0	0	0	0	0
197:	0	0	0	0	0	0	1	0	0	0	0	0	0	0
211:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
225:	0	0	0	0	0	0	1	0	0	0	0	0	0	0
239:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
253:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
267:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
281:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
295:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
309:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
323:	0	0	0	0	0	0	0	0	0	0	0	1	0	0
337:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
351:	0	0	0	0	0	0	0	0	1	0	1	0	0	0
365:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
379:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
393:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
407:	0	1	0	0	0	0	1	0	0	0	0	0	0	0
421:	0	0	0	0	0	0	0	0	0	0	0	1	0	0
435:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
449:	0	0	0	1	0	0	0	0	0	0	0	0	0	0
[illegible]3:	0	0	1	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	1	1	0	0	0	0	0	0
[illegible]5:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
519:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
533:	0	0	0	0	0	0	1	0	0	0	0	0	0	1
547:	0	0	0	0	2	0	1	0	1	1	2	1	0	0
561:	2	0	0	0	2	3	0	0	0	1	2	1	2	5
575:	3	3	5	7	5	5	4	6	11	3	12	5	15	14
589:	12	9	13	14	20	16	28	21	22	34	32	19	27	27
603:	9	13	8	8	4	2	0	1	1	1	1	3	1	4
617:	0	0	0	2	1	0	0	0	0	0	0	0	0	1
631:	0	0	0	0	0	0	0	0	1	0	0	0	0	0
645:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
659:	0	0	1	0	0	0	1	0	0	0	0	0	0	0
673:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
687:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
701:	0	0	1	0	0	0	0	0	0	0	0	0	0	0
715:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
729:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
743:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
757:	0	0	0	0	0	0	0	0	0	0	0	0	1	0
771:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
785:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
799:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
813:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
827:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
855:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
869:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
883:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	0	0	0	0	0	0	0	1
911:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
925:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]:	0	0	0	0	0	0	0	0	0	0	1	0	0	0
995:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1023:	0	0												

Eberline Services
Oak Ridge Laboratory

Gross Sample Counts Within Peak Regions Generated: 6-DEC-2002 14:40:55.25

Detector ID: 32 Acquisition Start: 6-DEC-2002 10:40:24.01
Live Time: 0 02:50:03.00 Real Time: 0 02:50:03.00
Batch Id: 0211141A-AM Sample Id: 03
Sample Type: AM

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4822.87	2	0	66.59	442.00	414	45	1.96E-04	70.7	
2	0	4988.17	2	0	5.95	497.50	485	45	1.96E-04	70.7	
3	0	5270.36	479	0	31.57	593.24	532	94	4.69E-02	4.6	
4	0	5432.25	4	0	114.15	648.75	626	64	3.92E-04	50.0	
5	0	5778.61	1	0	3.17	769.00	731	64	9.80E-05	100.0	
6	0	6064.96	0	0	0.00	870.00	840	61	0.00E+00	0.0	

Background Counts Within Peak Regions Generated: 6-DEC-2002 14:41:06.52

Acquisition Start: 27-NOV-2002 19:11:49.01
Live Time: 0 16:40:01.00 Real Time: 0 16:40:01.00

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4805.76	1	0	3.15	436.00	414	45	1.67E-05	100.0	
2	0	5017.20	2	0	5.91	507.00	485	45	3.33E-05	70.7	
3	0	5228.26	2	0	211.09	578.50	532	94	3.33E-05	70.7	
4	0	5459.29	6	0	182.73	657.50	626	64	1.00E-04	40.8	
5	0	5762.81	1	0	3.15	762.50	731	64	1.67E-05	100.0	
6	0	6069.39	0	0	0.00	870.00	840	61	0.00E+00	0.0	

Net Sample Counts Within Peak Regions Generated: 6-DEC-2002 14:41:06.79

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4822.87*	2	0	66.59	442.00	414	45	1.79E-04	77.8	
2	0	4988.17*	2	0	5.95	497.50	485	45	1.63E-04	86.4	
3	0	5270.36*	479	0	31.57	593.24	532	94	4.69E-02	4.6	
4	0	5432.25*	3	0	114.15	648.75	626	64	2.92E-04	68.6	
5	0	5778.61*	1	0	3.17	769.00	731	64	8.13E-05	122.2	
6	0	6064.96*	0	0	0.00	870.00	840	61	0.00E+00	0.0	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.0 Generated 6-DEC-2002 14:41:07

Configuration	: MCA0:[AMSCOUNT]00000125$1		
Analyses by	: ROIPEAK V1.2,PEAKEFF V2.2,ENBACK V1.6,NID V3.3		
Sample title	: VA-02-0176		
Sample date	: 25-NOV-2002 00:00:00	Acquisition date	: 6-DEC-2002 10:40:24
Sample ID	: 03	Sample quantity	: 1.0035 gram
Sample type	: AM	Sample geometry	:
Detector name	: 032	Detector geometry	:
Elapsed live time	: 0 02:50:03.00	Elapsed real time	: 0 02:50:03.00 0.0%
Energy tolerance	: 100.00 keV	Half life ratio	: 8.00
Errors propagated	: Yes	Systematic Error	: 3.00 %
Efficiency type	: Average value	Efficiencies at	: Peak Energy
Abundance limit	: 75.00		

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity pCi/gram
0	4822.87*	2	66.59	442.00	414	45	155.7		CM-247	3.207E-02
0	4988.17*	2	5.95	497.50	485	45	172.8		CM-248	2.403E-02
0	5270.36*	479	31.57	593.24	532	94	9.1		AM243	6.37
0	5432.25*	3	114.15	648.75	626	64	137.1		AM-241	3.956E-02
0	5778.61*	1	3.17	769.00	731	64	244.4		CM-244	1.102E-02
0	6064.96*	0	0.00	870.00	840	61	0.0		CF-252	0.000E+00

Eberline Services
Oak Ridge Laboratory

ALPHA SPECTROMETRY REPORT
6-DEC-2002 14:41:17

****
Spectral File: ND_AMS_ARCHIVE_S:S_0211141A-AM$04_AM.CNF
****

BATCH ID:	0211141A-AM	SAMPLE ID:	04
SAMPLE DATE:	25-NOV-2002 00:00	ALIQUOT:	1.003E+00 gram
SAMPLE TITLE:	VA-02-0176	DETECTOR NUMBER:	001
ACQ DATE:	6-DEC-2002 11:11	AVERAGE EFFICIENCY:	22.46%
ELAPSED LIVE TIME:	10201.	RECOVERY:	84.74%
TRACER ID:	AM-6A	TRACER FWHM (kev):	37.57
LAMBDA VALUE:	44.	ROI TYPE:	STANDARD
TRACER DPM AT SAMPLE DATE:	12.187	CONFIDENCE FACTOR:	4.65
SAMPLE MATRIX:	SOIL	LLD CONSTANT:	2.71
ENERGY CAL DATE:	27-NOV-2002 07:57	EFF CAL DATE:	27-NOV-2002 07:57
BKG FILENAME:	B_001_27NOV02	BKG ELAPSED TIME:	60008.

****

NUCLIDE ACTIVITY SUMMARY

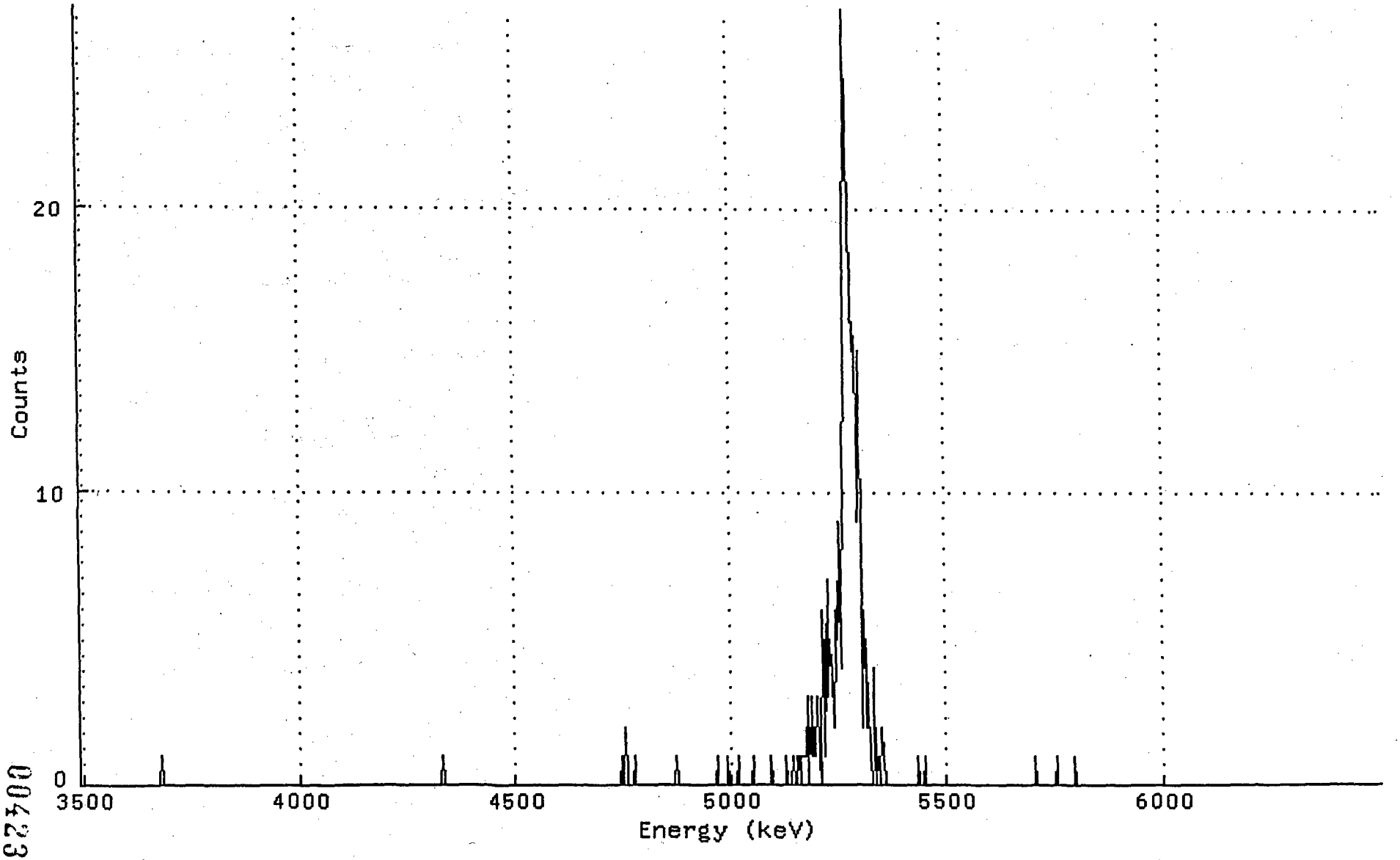
NUCLIDE	ENERGY	NET AREA	BKG	%ABN	ACTIVITY pCi/ gram	TPU/ERROR 2-SIGMA	MDC pCi/ gram
AM-241	5479.1	0.98	1.02	99.9	1.361E-02	4.099E-02	1.028E-01
AM243	5270.0	392.83	0.17	99.6	5.471E+00	7.191E-01	6.444E-02
CM-244	5795.0	2.66	0.34	100.0	3.695E-02	4.891E-02	7.521E-02
CM-247	4868.0	3.66	0.34	75.7	6.708E-02	7.456E-02	9.935E-02
CM-248	5078.6	3.83	0.17	91.6	5.798E-02	6.143E-02	7.005E-02
CF-252	6111.0	-0.17	0.17	97.0	-2.451E-03	4.916E-03	6.616E-02

****

Alan Gregley — 12/6/02
Analyst — Date

Alan Gregley — 12/9/02
Reviewer — Date

Spec : DKA100:[ALPHA.ALUSR.ARCHIVE.S]S[illegible]11141A-AM$04_AM.CNF;1
Title : 001
Sample Title: VA-02-0176
Start Time: 6-DEC-2002 11:11: Sample Time: 25-NOV-2002 00:00 Energy Offset: 3.48220E+03
Real Time : 0 02:50:01.00 Sample ID : 04 Energy Slope : 3.05805E+00
Live Time : 0 02:50:01.00 Sample Type: AM Energy Quad : -1.13434E-04



00423

Channel Contents for ND_AMS_ARCHIVE_S:S_0211141A-AM$04_AM

Channel

[illegible]:	10201	10201	0	0	0	0	0	0	0	0	0	0	0	[illegible]
[illegible]:	0	0	0	0	0	0	0	0	0	0	0	0	0	[illegible]
29:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
43:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
57:	0	0	0	0	0	0	0	1	0	0	0	0	0	0
71:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
85:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
99:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
113:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
127:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
141:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
155:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
169:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
183:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
197:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
211:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
225:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
239:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
253:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
267:	0	0	0	0	0	0	0	0	0	0	0	0	0	1
281:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
295:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
309:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
323:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
337:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
351:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
365:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
379:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
393:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
407:	0	0	0	0	0	0	0	0	0	0	0	0	0	1
421:	0	0	2	0	0	0	0	0	0	1	0	0	0	0
435:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
449:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
463:	1	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]	0	0	0	0	0	0	0	0	0	0	0	0	0	[illegible]
[illegible]	0	0	0	0	1	0	0	0	0	0	0	0	1	0
505:	0	0	0	0	0	0	1	0	0	0	0	0	0	0
519:	0	0	0	0	1	0	0	0	0	0	0	0	0	0
533:	0	0	0	0	1	0	0	0	0	0	0	0	0	0
547:	0	0	1	0	0	0	0	1	1	0	0	1	1	0
561:	1	1	1	1	1	3	0	2	1	3	1	1	1	3
575:	1	1	0	6	4	1	4	7	3	5	4	4	2	5
589:	6	5	9	7	4	12	10	15	27	26	23	19	20	17
603:	15	16	15	12	9	15	6	2	6	2	5	2	2	1
617:	0	1	4	0	1	1	0	2	2	1	0	0	0	0
631:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
645:	0	0	0	0	0	0	0	0	1	0	0	0	0	1
659:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
673:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
687:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
701:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
715:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
729:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
743:	0	0	0	1	0	0	0	0	0	0	0	0	0	0
757:	0	0	0	0	0	0	1	0	0	0	0	0	0	0
771:	0	0	0	0	0	0	0	1	0	0	0	0	0	0
785:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
799:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
813:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
827:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
841:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
855:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
869:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
883:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
897:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
911:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
925:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
939:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]	0	0	0	0	0	0	0	0	0	0	0	0	0	[illegible]
[illegible]	0	0	0	0	0	0	0	0	0	0	0	0	0	0
981:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
995:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1009:	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1023:	0	0												

Eberline Services
Oak Ridge Laboratory

Gross Sample Counts Within Peak Regions Generated: 6-DEC-2002 14:41:12.29

Detector ID: 1 Acquisition Start: 6-DEC-2002 11:11:21.01
Live Time: 0 02:50:01.00 Real Time: 0 02:50:01.00
Batch Id: 0211141A-AM Sample Id: 04
Sample Type: AM

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4758.42	4	0	3.06	424.00	418	45	3.92E-04	50.0	
2	0	5006.41	4	0	88.68	508.00	489	45	3.92E-04	50.0	
3	0	5266.49	393	0	37.57	596.68	536	95	3.85E-02	5.0	
4	0	5438.01	2	0	18.35	655.50	630	65	1.96E-04	70.7	
5	0	5747.53	3	0	100.92	762.33	735	64	2.94E-04	57.7	
6	0	6065.42	0	0	0.00	873.00	843	61	0.00E+00	0.0	

Background Counts Within Peak Regions Generated: 6-DEC-2002 14:41:16.04

Acquisition Start: 27-NOV-2002 19:10:08.01
Live Time: 0 16:40:08.00 Real Time: 0 16:40:08.00

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4805.88	2	0	43.11	440.00	418	45	3.33E-05	70.7	
2	0	5015.44	1	0	3.08	511.00	489	45	1.67E-05	100.0	
[illegible]	0	5226.57	1	0	3.08	583.00	536	95	1.67E-05	100.0	
[illegible]	0	5456.61	6	0	73.52	662.00	630	65	1.00E-04	40.8	
5	0	5758.34	2	0	15.40	766.50	735	64	3.33E-05	70.7	
6	0	6062.82	1	0	3.08	873.00	843	61	1.67E-05	100.0	

Net Sample Counts Within Peak Regions Generated: 6-DEC-2002 14:41:16.31

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	4758.42*	4	0	3.06	424.00	418	45	3.59E-04	55.0	
2	0	5006.41*	4	0	88.68	508.00	489	45	3.75E-04	52.4	
3	0	5266.49*	393	0	37.57	596.68	536	95	3.85E-02	5.0	
4	0	5438.01*	1	0	18.35	655.50	630	65	9.61E-05	150.4	
5	0	5747.53*	3	0	100.92	762.33	735	64	2.61E-04	65.7	
6	0	6065.42*	0	0	0.00	873.00	843	61	-1.67E-05	100.0	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.0 Generated 6-DEC-2002 14:41:17

Configuration	: MCA0:[AMSCOUNT]00000125$1		
Analyses by	: ROIPEAK V1.2,PEAKEFF V2.2,ENBACK V1.6,NID V3.3		
Sample title	: VA-02-0176		
Sample date	: 25-NOV-2002 00:00:00	Acquisition date	: 6-DEC-2002 11:11:21
Sample ID	: 04	Sample quantity	: 1.0035 gram
Sample type	: AM	Sample geometry	:
Detector name	: 001	Detector geometry	:
Elapsed live time	: 0 02:50:01.00	Elapsed real time	: 0 02:50:01.00 0.0%
Energy tolerance	: 100.00 keV	Half life ratio	: 8.00
Errors propagated	: Yes	Systematic Error	: 3.00 %
Efficiency type	: Average value	Efficiencies at	: Peak Energy
Abundance limit	: 75.00		

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw %Err	Fit	Nuclides	Activity pCi/gram
0	4758.42*	4	3.06	424.00	418	45110.1		CM-247	5.684E-02
0	5006.41*	4	88.68	508.00	489	45104.8		CM-248	4.913E-02
0	5266.49*	393	37.57	596.68	536	95 10.1		AM243	4.64
0	5438.01*	1	18.35	655.50	630	65300.9		AM-241	1.153E-02
0	5747.53*	3	100.92	762.33	735	64131.5		CM-244	3.131E-02
0	6065.42*	0	0.00	873.00	843	61200.0		CF-252	-2.077E-03

SECTION XV

ANALYTICAL DATA (TOTAL STRONTIUM)

Work Order	02-11141
Analysis Code	SrTOT
Run	1
Date Received	11/26/2002
Lab Deadline	12/5/2002
Client	Duratek
Project	106760.003
Report Level	4
Activity Units	pCi
Aliquot Units	g
Matrix	OS
Method	ElChroM SRW01 Modified
Instrument Type	Alpha/Beta GPC
Radiometric Tracer	
Radiometric Sol#	
Tracer Act (dpm/g)	
Carrier	Strontium
Carrier Conc (mg/ml)	115.8

Internal Fraction	Sample Desc	Client ID	Login CPM	Sample Date	Sample Aliquot
01	LCS	LCS		11/26/02 00:00	1.0000E+00
02	MBL	BLANK		11/26/02 00:00	1.0000E+00
03	DUP	VA-02-0176	89	11/25/02 12:00	1.0035E+00
04	DO	VA-02-0176	89	11/25/02 12:00	1.0035E+00

00428

* SAF1 [illegible]d for Gross Alpha and all other radionuclides. SAF2 is used for Gross Beta only. [illegible]ual mass exceeded the calibration curve range. Results should be qualified as appro[illegible].

Internal Fraction	Sample Desc	Tracer Aliquot (g)	Tracer Total ACT (dpm)	Radiometric Tracer (pCi)	Radiometric % Rec	Grav Carrier Added (ml)	Grav Filter Tare (g)	Grav Filter Final (g)	Grav Filter Net (g)	Grav % Rec	Mean % Rec	SAF 1*	SAF 2*
01	LCS					0.100	7.5441	7.5554	0.0113	97.58	97.58	1.00	1.00
02	MBL					0.100	7.5506	7.5614	0.0108	93.26	93.26	1.00	1.00
03	DUP					0.100	7.4967	7.5077	0.0110	94.99	94.99	1.00	1.00
04	DO					0.100	7.5335	7.5450	0.0115	99.31	99.31	1.00	1.00

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

Internal Fraction	Sample Desc	Rough Prep Date	Rough Prep By	Prep Date	Prep By	Sep t0 Date/Time	Sep t0 By	Sep t1 Date/Time	Sep t1 By
01	LCS			12/04/02 18:46	MROGERS	12/05/02 16:50	MROGERS		
02	MBL			12/04/02 18:46	MROGERS	12/05/02 16:50	MROGERS		
03	DUP			12/04/02 18:46	MROGERS	12/05/02 16:50	MROGERS		
04	DO			12/04/02 18:46	MROGERS	12/05/02 16:50	MROGERS		

* SAF1 is [illegible]d for Gross Alpha and all other radionuclides. SAF2 is used for Gross Beta only. *[illegible]al mass exceeded the calibration curve range. Results should be qualified as approp[illegible]

Work Order: 02-11141-SrTOT-1

Client: Duratek
Eberline Services Work Order: 02-11141
Analysis Code: SrTOT
Run: 1

Lab Fraction	Nuclide	Sample Desc	Client Identification	Activity Units	Results	Error Estimate	MDA	LCS Known	LCS %R	LCS Flag	RPD Flag	MDA Flag	Blank Flag
01	TOTAL SR	LCS	LCS	pCi/g	1.89E+01	1.17E+00	7.36E-01	2.14E+01	88.27	OK		OK	
02	TOTAL SR	MBL	BLANK	pCi/g	1.29E-01	3.35E-01	5.86E-01					OK	OK
03	TOTAL SR	DUP	VA-02-0176	pCi/g	6.30E-01	4.11E-01	6.42E-01				INV	OK	
04	TOTAL SR	DO	VA-02-0176	pCi/g	3.29E-01	4.12E-01	6.92E-01					OK	

12-6-02

Post-it® Fax Note 7671

Date 12-6-02	# of pages ▶ 1
To Paul Jones	From Judy Pachelle
Co./Dept.	Co.
Phone #	Phone #
Fax # (865) 376-6247	Fax #

Client: Duratek
Eberline Services Work Order: 02-11141
Analysis Code: SrTOT
Run: 1

Lab Fraction	Nuclide	Sample Desc	Sample Date	Sample Aliquot	Radiometric % Rec	Grav % Rec	Mean % Rec	SAF	Sep t0 Date/Time	Sep t1 Date/Time
01	TOTAL SR	LCS	11/26/02 00:00	1.00E+00		97.58	97.58	1.00	12/5/2002 16:50	
02	TOTAL SR	MBL	11/26/02 00:00	1.00E+00		93.26	93.26	1.00	12/5/2002 16:50	
03	TOTAL SR	DUP	11/25/02 12:00	1.00E+00		94.99	94.99	1.00	12/5/2002 16:50	
04	TOTAL SR	DO	11/25/02 12:00	1.00E+00		99.31	99.31	1.00	12/5/2002 16:50	

Client: Duratek
Eberline Services Work Order: 02-11141
Analysis Code: SrTOT
Run: 1

Lab Fraction	Nuclide	Sample Desc	Counting Date/Time	Halflife (days)	Detect	Carrier	Count Time	Counts	Bkg CPM	Eff
01	TOTAL SR	LCS	12/06/02 01:51		LB4110	D1	60	1217	1.333333333	0.422
02	TOTAL SR	MBL	12/06/02 01:51		LB4110	D2	60	60	0.866666667	0.454
03	TOTAL SR	DUP	12/06/02 01:51		LB4110	D3	60	81	0.783333333	0.387
04	TOTAL SR	DO	12/06/02 01:51		LB4110	D4	60	75	0.95	0.375

Internal Fraction	Sample Desc	Client ID	Sample Date	Sample Aliquot	Tracer Aliquot (g)	Tracer ACT (dpm)	Radiometric Tracer (pCi)	Radiometric % Rec	SAF 1*	SAF 2*
01	LCS	LCS	11/26/02 00:00	1.0000					1.00	1.00
02	MBL	BLANK	11/26/02 00:00	1.0000					1.00	1.00
03	DUP	VA-02-0176	11/25/02 12:00	1.0035					1.00	1.00
04	DO	VA-02-0176	11/25/02 12:00	1.0035					1.00	1.00

Eberline Services
Oak Ridge Laboratory

Spike and Tracer Worksheet

Printed: 12/4/02 6:46 PM

Internal Work Order	Run	Analysis Code	Date	Technician	Technician Initials	Witness Initials
02-11141	1	SrTOT	12/4/2002 18:46	MROGERS	MKR	

LCS & Matrix Spikes					LCS	MS	LCSD	MSD	LCS		MS		LCSD		MSD	
Isotope	Sol #	Activity dpm/ml	Solution Date	Approx Addition	Volume Used (ml)	Volume Used (ml)	Volume Used (ml)	Volume Used (ml)	Known pCi	Error Estimate	Added pCi	Error Estimate	Known pCi	Error Estimate	Added pCi	Error Estimate
TOTAL SR	Sr-4a	175.374	12/4/2002	0.270	0.2708				21.39	0.449	0.00	0.000	0.00	0.000	0.00	0.000

Tracers						
fraction	Isotope	Sol #	Activity dpm/ml	Solution Date	Volume Used (ml)	Approx Addition

Balance Printer Tapes	
Tracer	LCS
	0.2708 g
	Matrix Spike

00435

Version 2.0 08/99

Aliquot Worksheet

Work Order	Run	Analysis Code	Aliquot Units	Lab Deadline	Technician
02-11141	1	SrTOT	grams	12/5/2002	MROGERS

Lab Fraction	Duratek Client ID	Sample Type	Muffle Data Ratio Post/Pre	Dilution Data Aliquot	Dilution Data Final (ml)	Dilution Data Ratio	Aliquot Data Aliquot	Aliquot Data Net Equiv	MS Aliquot Data Aliquot	MS Aliquot Data Net Equiv	H-3 Solids Only Water Added (ml)	H-3 Solids Only H3 Dist Aliq
01	LCS	LCS					1.0000E+00	1.0000E+00				
02	BLANK	MBL					1.0000E+00	1.0000E+00				
03	VA-02-0176	DUP		2.5089E+01	100.0000	2.51E-01	4.0000E+00	1.0035E+00				
04	VA-02-0176	DO		2.5089E+01	100.0000	2.51E-01	4.0000E+00	1.0035E+00				

Comments	

00436

Technician: Meredith Rogers Date: 12/4/02

Gravimetric Worksheet

Work Order	Run	Analysis Code	Gravimetric Carrier	Carrier Conc (mg/ml)	Technician
02-11141	1	SrTOT	Strontium	115.8000	MROGERS

TRetec Fraction	Duratek Client ID	Sample Type	Carrier Data: Carrier Added (ml)	Filter Data: Filter Tare (g)	Filter Data: Filter Final (g)	Filter Data: Filter Net (g)	Gravimetric: % Recovery
01	LCS	LCS	0.1000	7.5441	7.5554	0.0113	97.58
02	BLANK	MBL	0.1000	7.5506	7.5614	0.0108	93.26
03	DUP	DUP	0.1000	7.4967	7.5077	0.0110	94.99
04	VA-02-0176	DO	0.1000	7.5335	7.5450	0.0115	99.31

00437

Technician: Meredith Rogers Date: 12/5/02

JB
12-6-02

Detector ID	Sample ID	Alpha	Beta	Count Time	Voltage	TOD
D1	0211141-01	12	1217	60	1410	12/6/02 2:51
D2	0211141-02	7	60	60	1410	12/6/02 2:51
D3	0211141-03	4	81	60	1410	12/6/02 2:51
D4	0211141-04	5	75	60	1410	12/6/02 2:51

00438

JDK
12-6-02

Detector ID	Sample ID	Alpha	Beta	Guard	Count Count Time	Event	Voltage	TOD
A1	BKGD	10	86	31963	60	0	1402.5	37596.04
A2	BKGD	3	104	31963	60	0	1402.5	37596.04
A3	BKGD	9	87	31961	60	0	1402.5	37596.04
A4	BKGD	6	92	31960	60	0	1402.5	37596.04
B1	BKGD	8	72	32517	60	0	1402.5	37596.04
B2	BKGD	18	68	32518	60	0	1402.5	37596.04
B3	BKGD	9	60	32517	60	0	1402.5	37596.04
B4	BKGD	7	79	32518	60	0	1402.5	37596.04
C1	BKGD	7	80	32677	60	0	1402.5	37596.04
C2	BKGD	8	66	32679	60	0	1402.5	37596.04
C3	BKGD	11	69	32678	60	0	1402.5	37596.04
C4	BKGD	6	88	32685	60	0	1402.5	37596.04
D1	BKGD	6	80	33138	60	0	1402.5	37596.04
D2	BKGD	5	52	33139	60	0	1402.5	37596.04
D3	BKGD	8	47	33138	60	0	1402.5	37596.04
D4	BKGD	5	57	33138	60	0	1402.5	37596.04

B2 OUT OF SERVICE JDK 12-6-02

00439

Printed 12/6/2002 1:09 AM

SECTION XVI

ANALYTICAL DATA (TECHNETIUM-99)

Work Order	02-11141
Analysis Code	Tc099
Run	1
Date Received	11/26/2002
Lab Deadline	12/5/2002
Client	Duratek
Project	17-Apr
Report Level	4
Activity Units	pCi
Aliquot Units	g
Matrix	OS
Method	ElChroM TCS01 Modified
Instrument Type	Beta LSC
Radiometric Tracer	Tc-99MS
Radiometric Sol#	Tc-2a
Tracer Act (dpm/g)	22044.467
Carrier	
Carrier Conc (mg/ml)	

Internal Fraction	Sample Desc	Client ID	Login CPM	Sample Date	Sample Aliquot
01	LCS	LCS		11/26/02 00:00	1.0000E+00
02	MBL	BLANK		11/26/02 00:00	1.0000E+00
03	DUP	VA-02-0176	89	11/25/02 12:00	1.0035E+00
04	DO	VA-02-0176	89	11/25/02 12:00	1.0035E+00

00741

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

Internal Fraction	Sample Desc	Tracer Aliquot (g)	Tracer Total ACT (dpm)	Radiometric Tracer (pCi)	Radiometric % Rec	Grav Carrier Added (ml)	Grav Filter Tare (g)	Grav Filter Final (g)	Grav Filter Net (g)	Grav % Rec	Mean % Rec	SAF 1*	SAF 2*
01	LCS	1.0000	22044.5										
02	MBL	1.0000	22044.5										
03	DUP	1.0000	22044.5										
04	DO	1.0000	22044.5										

* SAF[illegible]sed for Gross Alpha and all other radionuclides. SAF2 is used for Gross Beta only. [illegible]ctual mass exceeded the calibration curve range. Results should be qualified as appr[illegible]e.

Internal Fraction	Sample Desc	Rough Prep Date	Rough Prep By	Prep Date	Prep By	Sep t0 Date/Time	Sep t0 By	Sep t1 Date/Time	Sep t1 By
01	LCS			12/04/02 18:48	MROGERS	12/05/02 17:15	MROGERS		
02	MBL			12/04/02 18:48	MROGERS	12/05/02 17:15	MROGERS		
03	DUP			12/04/02 18:48	MROGERS	12/05/02 17:15	MROGERS		
04	DO			12/04/02 18:48	MROGERS	12/05/02 17:15	MROGERS		

00443

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

Work Order: 02-11141-Tc099-1

Client: Duratek
Eberline Services Work Order: 02-11141
Analysis Code: Tc099
Run: 1

Lab Fraction	Nuclide	Sample Desc	Client Identification	Activity Units	Results	Error Estimate	MDA	LCS Known	LCS %R	LCS Flag	RPD Flag	MDA Flag	Blank Flag
01	TC-99	LCS	LCS	pCi/g	8.90E+02	5.38E+00	1.35E+00	9.95E+02	89.45	OK		INV	
02	TC-99	MBL	BLANK	pCi/g	-1.38E-01	8.76E-01	1.50E+00					INV	OK
03	TC-99	DUP	VA-02-0176	pCi/g	3.42E-01	9.61E-01	1.63E+00				INV	INV	
04	TC-99	DO	VA-02-0176	pCi/g	1.01E+00	9.81E-01	1.64E+00					INV	

12-9-02

Post-it® Fax Note 7671

Date 12-9-02	# of pages ▶ 1
To Paul Jones	From Judy Pachitla
Co./Dept.	Co.
Phone #	Phone #
Fax # (865) 376-6247	Fax #

77300

Client: Duratek
Eberline Services Work Order: 02-11141
Analysis Code: Tc099
Run: 1

Lab Fraction	Nuclide	Sample Desc	Sample Date	Sample Aliquot	Radiometric % Rec	Grav % Rec	Mean % Rec	SAF	Sep t0 Date/Time	Sep t1 Date/Time
01	TC-99	LCS	11/26/02 00:00	1.00E+00		0.00	0.00		12/5/2002 17:15	
02	TC-99	MBL	11/26/02 00:00	1.00E+00		0.00	0.00		12/5/2002 17:15	
03	TC-99	DUP	11/25/02 12:00	1.00E+00		0.00	0.00		12/5/2002 17:15	
04	TC-99	DO	11/25/02 12:00	1.00E+00		0.00	0.00		12/5/2002 17:15	

Client: Duratek
Eberline Services Work Order: 02-11141
Analysis Code: Tc099
Run: 1

Lab Fraction	Nuclide	Sample Desc	Counting Date/Time	Halflife (days)	Detect	Carrier	Count Time	Counts	Bkg CPM	Eff
01	TC-99	LCS	12/06/02 17:10	77798250	2550	1	60	108745.2	19.8	0.907279444
02	TC-99	MBL	12/06/02 18:10	77798250	2550	2	60	1173	19.8	0.816399344
03	TC-99	DUP	12/06/02 19:10	77798250	2550	3	60	1222.2	19.8	0.749105418
04	TC-99	DO	12/06/02 20:10	77798250	2550	4	60	1288.8	19.8	0.743749639

97700

Internal Fraction	Sample Desc	Client ID	Sample Date	Sample Aliquot	Tracer Aliquot (g)	Tracer ACT (dpm)	Radiometric Tracer (pCi)	Radiometric % Rec	SAF 1*	SAF 2*
01	LCS	LCS	11/26/02 00:00	1.0000	1.0000	22044.4670				
02	MBL	BLANK	11/26/02 00:00	1.0000	1.0000	22044.4670				
03	DUP	VA-02-0176	11/25/02 12:00	1.0035	1.0000	22044.4670				
04	DO	VA-02-0176	11/25/02 12:00	1.0035	1.0000	22044.4670				

Eberline Services
Oak R[illegible] Laboratory

Spike and T[illegible]er Worksheet

Printed: 1[illegible] 6:48 PM

Internal Work Order	Run	Analysis Code	Date	Technician	Technician Initials	Witness Initials
02-11141	1	Tc099	12/4/2002 18:47	MROGERS	MRL	

LCS & Matrix Spikes					LCS	MS	LCSD	MSD	LCS		MS		LCSD		MSD	
Isotope	Sol #	Activity dpm/ml	Solution Date	Approx Addition	Volume Used (ml)	Volume Used (ml)	Volume Used (ml)	Volume Used (ml)	Known pCi	Error Estimate	Added pCi	Error Estimate	Known pCi	Error Estimate	Added pCi	Error Estimate
Tc-99	Tc-2a	22044.467	12/4/2002	0.100	0.1002				994.98	21.890	0.00	0.000	0.00	0.000	0.00	0.000

Tracers						
fraction	Isotope	Sol #	Activity dpm/ml	Solution Date	Volume Used (ml)	Approx Addition
01	Tc-99MS	Tc-2a	22044.467	12/4/2002	1.0000	0.1000
02	Tc-99MS	Tc-2a	22044.467	12/4/2002	1.0000	0.1000
03	Tc-99MS	Tc-2a	22044.467	12/4/2002	1.0000	0.1000
04	Tc-99MS	Tc-2a	22044.467	12/4/2002	1.0000	0.1000

Balance Printer Tapes	
Tracer	LCS
	0.1002 g
	Matrix Spike

00478

Version 2.0 08/99

Eberline Services - Oak Ridge
Version 2.0 8/1999

Aliquot Worksheet

Work Order	Run	Analysis Code	Aliquot Units	Lab Deadline	Technician
02-11141	1	Tc099	grams	12/5/2002	MROGERS

Lab Fraction	Duratek Client ID	Sample Type	Muffle Data Ratio Post/Pre	Dilution Data Aliquot	Dilution Data Final (ml)	Dilution Data Ratio	Aliquot Data Aliquot	Aliquot Data Net Equiv	MS Aliquot Data Aliquot	MS Aliquot Data Net Equiv	H-3 Solids Only Water Added (ml)	H-3 Solids Only H3 Dist Aliq
01	LCS	LCS					1.0000E+00	1.0000E+00				
02	BLANK	MBL					1.0000E+00	1.0000E+00				
03	VA-02-0176	DUP		2.5089E+01	100.0000	2.51E-01	4.0000E+00	1.0035E+00				
04	VA-02-0176	DO		2.5089E+01	100.0000	2.51E-01	4.0000E+00	1.0035E+00				

Comments	

00479

Technician: [signature] Date: 12/4/02

Internal Wo[illegible]rder: 02-11141
Run: 1

Fraction	Isotope	LSCSampleType	AnalysisCode	InstrumentID	ProtocolID	PID	SNumber	CountDuration	CPM_A	CPM_B	CPM_C	tSIE	SIS	DataSource	CountTime
1	TC-99	S	Tc099	2550	14	13	1	60	1681.43	1812.42	1815.15	343.339		I	12/6/2002 17:10
2	TC-99	S	Tc099	2550	14	13	2	60	12.98	19.55	22.33	345.776		I	12/6/2002 18:10
3	TC-99	S	Tc099	2550	14	13	3	60	13.03	20.37	23	137.996		I	12/6/2002 19:10
4	TC-99	S	Tc099	2550	14	13	4	60	14.88	21.48	24.38	131.185		I	12/6/2002 20:10
0	TC-99	B	Tc099	2550	14	13	5	60	12.88	19.8	22.85	341.886		I	12/6/2002 21:10

Tc-99 Quench Curve Efficiency

EBERLINE SERVICES

			WORK ORDER		02-11141
ClientID	*Type*	*Fracion*	*tsie*	*eff*	*Remarks*
LCS	LCS	01	343.339	81.637%	
BLANK	MBL	02	345.776	81.640%	
VA-02-0176	DUP	03	137.996	74.911%	
VA-02-0176	DO	04	131.185	74.375%	
		05	0.000		
		06	0.000		
		07	0.000		
		08	0.000		
		09	0.000		
		10	0.000		
		11	0.000		
		12	0.000		
		13	0.000		
		14	0.000		
		15	0.000		
		16	0.000		
		17	0.000		
		18	0.000		
		19	0.000		
		20	0.000		
ADDITIONAL REMARKS					

WEN 12/9/02

rotocol #:14 tc99 User : DURATEK

JB
12-7-02

ime: 60.00
ata Mode: CPM Nuclide: 99TC
ackground Subtract: None

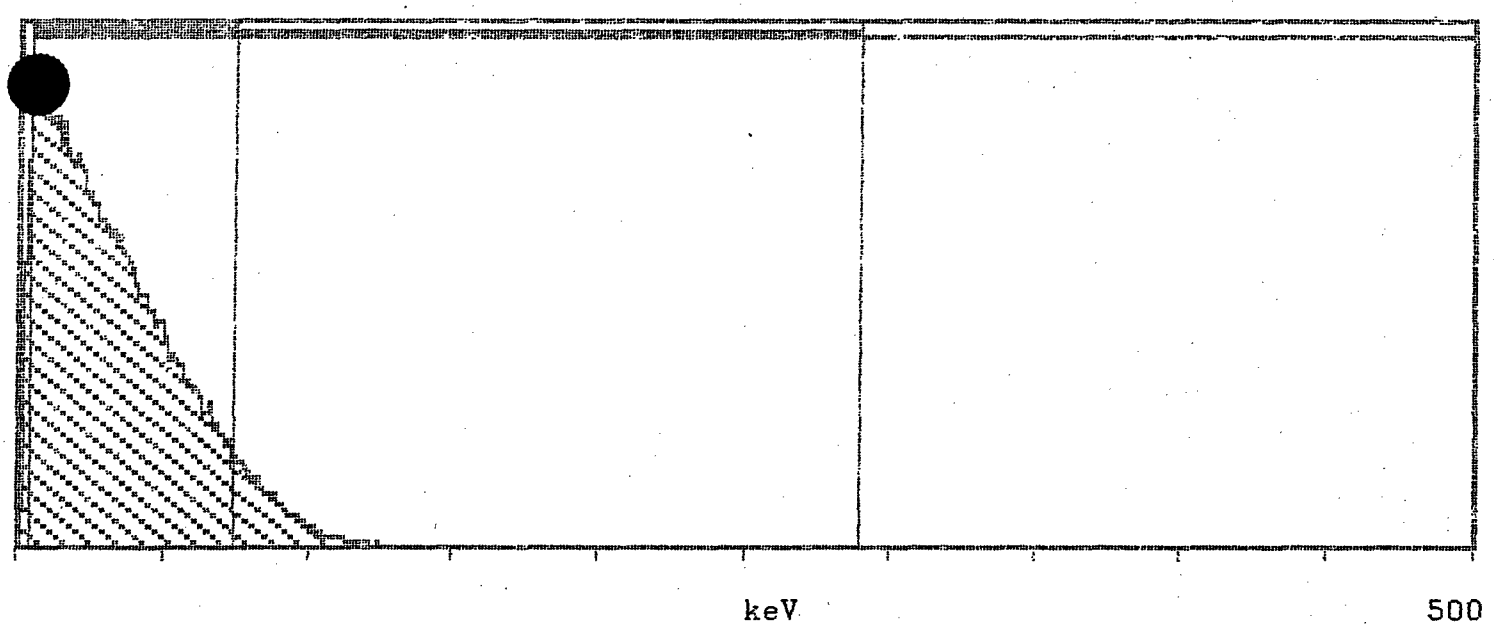
	LL	UL	LCR	2S%	BKG
egion A:	5.0 -	75.0	0	0.0	0.00
egion B:	5.0 -	290	0	0.0	0.00
egion C:	5.0 -	500	0	0.0	0.00

uench Indicator: tSIE
Ext Std Terminator: Count
211141A(1-4,B)
rotocol Data Filename: c:\spectra\PROT.DAT
ount Data Filename: c:\spectra\SDATA14.DAT
pectrum Data Drive & Path: c:\spectra

SMPL_ID	P#	PID	S#	CPMA	CPMB	CPMC	tSIE	TIME
	14	13	1	1681.43	1812.42	1815.15	343.34	60.00

SPECTRUM PLOT

2.0 CPM Y maximum Protocol No. 14 Sample No. 1 Repeat 1

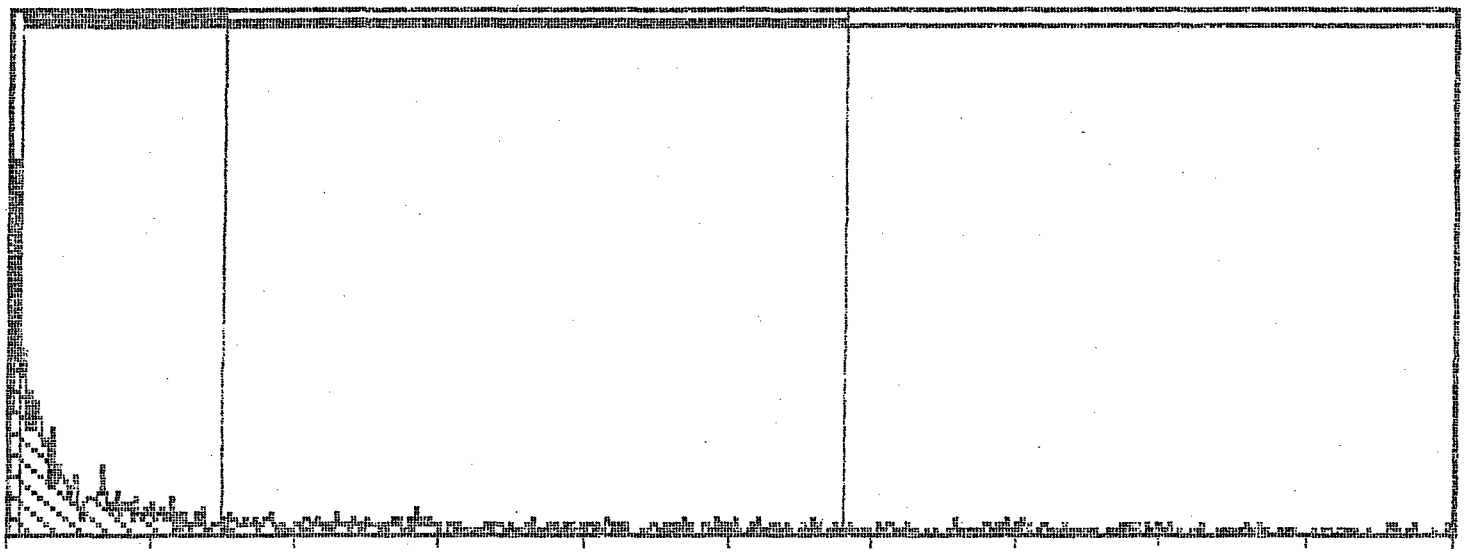


Region	LL	UL	CPM
A:	5.0	75.0	1681.4
B:	5.0	290.	1812.4
C:	5.0	500.	1815.2

14 13 2 12.98 19.55 22.33 345.78 60.00

SPECTRUM PLOT

CPM Y maximum Protocol No. 14 Sample No. 2 Repeat 1



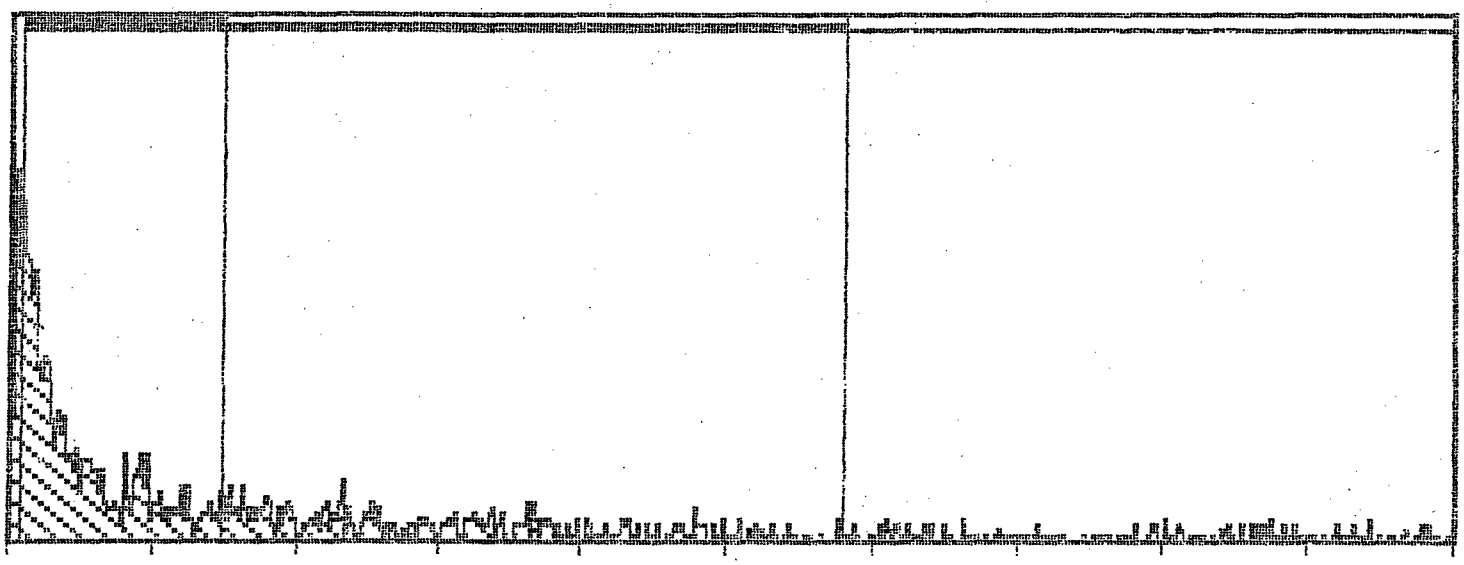
0 keV 500

Region	LL	UL	CPM
A:	5.0	75.0	13.0
B:	5.0	290.	19.5
C:	5.0	500.	22.3

14 13 3 13.03 20.37 23.00 138.00 60.00

SPECTRUM PLOT

CPM Y maximum Protocol No. 14 Sample No. 3 Repeat 1



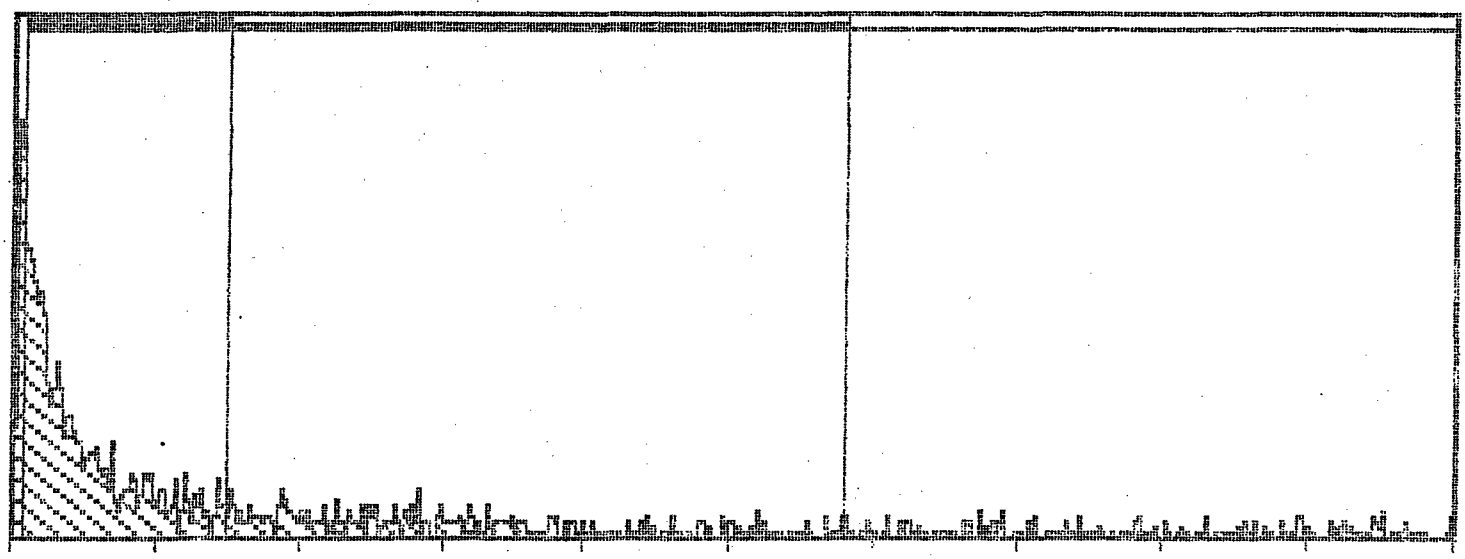
0 keV 500

Region	LL	UL	CPM
A:	5.0	75.0	13.0
B:	5.0	290.	20.4
C:	5.0	500.	23.0

14 13 4 14.88 21.48 24.38 131.19 60.00

SPECTRUM PLOT

CPM Y maximum Protocol No. 14 Sample No. 4 Repeat 1



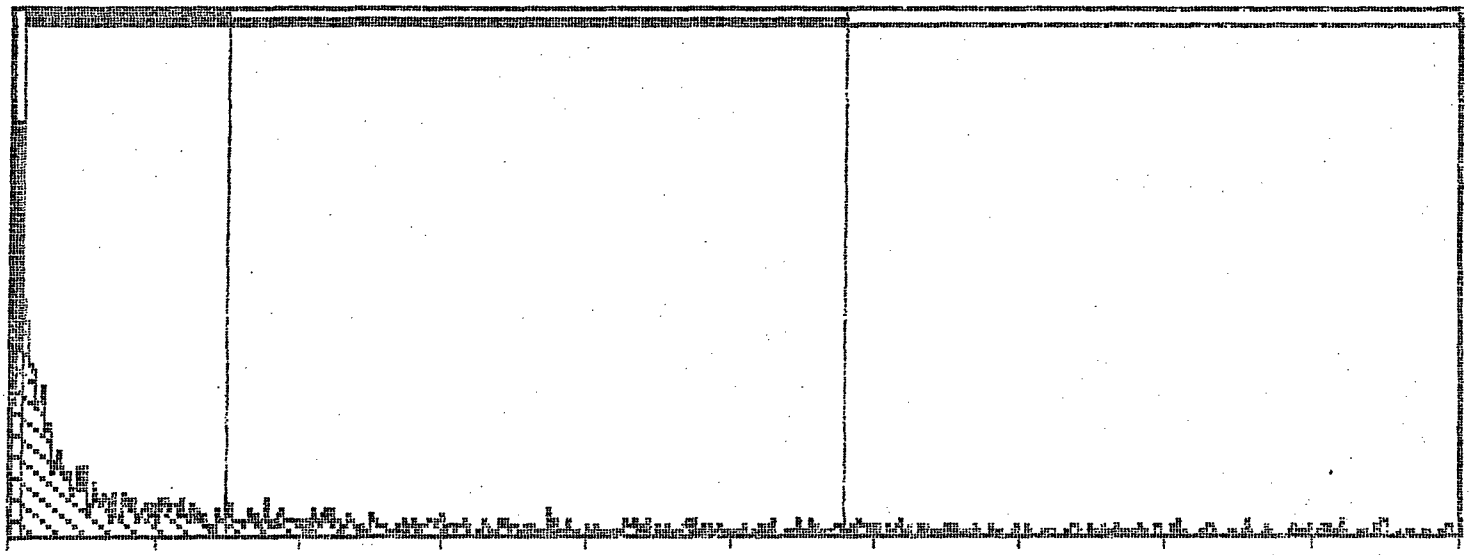
0 keV 500

Region	LL	UL	CPM
A:	5.0	75.0	14.9
B:	5.0	290.	21.5
C:	5.0	500.	24.4

14 13 5 12.88 19.80 22.85 341.89 60.00

SPECTRUM PLOT

CPM Y maximum Protocol No. 14 Sample No. 5 Repeat 1



0 keV 500

Region	LL	UL	CPM
A:	5.0	75.0	12.9
B:	5.0	290.	19.8
C:	5.0	500.	22.9

SECTION XVII

ANALYTICAL DATA (TRITIUM)

Work Order	02-11141
Analysis Code	H0003
Run	1
Date Received	11/26/2002
Lab Deadline	12/5/2002
Client	Duratek
Project	106760.003
Report Level	4
Activity Units	pCi
Aliquot Units	g
Matrix	OS
Method	LANL ER-210 Modified
Instrument Type	Beta LSC
Radiometric Tracer	H-3MS
Radiometric Sol#	H-5a
Tracer Act (dpm/g)	11717.729
Carrier	
Carrier Conc (mg/ml)	

Internal Fraction	Sample Desc	Client ID	Login CPM	Sample Date	Sample Aliquot
01	LCS	LCS		11/26/02 00:00	1.0309E+01
02	MBL	BLANK		11/26/02 00:00	1.0456E+01
03	DUP	VA-02-0176	89	11/25/02 12:00	1.0185E+01
04	DO	VA-02-0176	89	11/25/02 12:00	1.0205E+01

00438

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

Internal Fraction	Sample Desc	Tracer Aliquot (g)	Tracer Total ACT (dpm)	Radiometric Tracer (pCi)	Radiometric % Rec	Grav Carrier Added (ml)	Grav Filter Tare (g)	Grav Filter Final (g)	Grav Filter Net (g)	Grav % Rec	Mean % Rec	SAF 1*	SAF 2*
01	LCS	0.2984	3496.6										
02	MBL	0.1007	1180.0										
03	DUP	0.1003	1175.3										
04	DO	0.0979	1147.2										

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

Internal Fraction	Sample Desc	Rough Prep Date	Rough Prep By	Prep Date	Prep By	Sep t0 Date/Time	Sep t0 By	Sep t1 Date/Time	Sep t1 By
01	LCS			11/27/02 08:23	PFARRELL				
02	MBL			11/27/02 08:23	PFARRELL				
03	DUP			11/27/02 08:23	PFARRELL				
04	DO			11/27/02 08:23	PFARRELL				

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

00460

Client: Duratek
Eberline Services Work Order: 02-11141
Analysis Code: H0003
Run: 1

Lab Fraction	Nuclide	Sample Desc	Client Identification	Activity Units	Results	Error Estimate	MDA	LCS Known	LCS %R	LCS Flag	RPD Flag	MDA Flag	Blank Flag
01	H-3	LCS	LCS	pCi/g	1.21E+02	4.71E+00	4.14E+00	1.02E+02	117.77	OK		OK	
02	H-3	MBL	BLANK	pCi/g	1.87E+00	2.45E+00	4.11E+00					OK	OK
03	H-3	DUP	VA-02-0176	pCi/g	9.17E+00	2.36E+00	3.64E+00				OK	OK	
04	H-3	DO	VA-02-0176	pCi/g	7.79E+00	2.29E+00	3.58E+00					OK	

12-2-02

Post-It® Fax Note 7671

Date 12-2-02	# of pages ▶ 3
To Paul Jones	From Judy Rickelle
Co./Dept.	Co.
Phone #	Phone #
Fax # (865) 376-6247	Fax #

19700

Client: Duratek
Eberline Services Work Order: 02-11141
Analysis Code: H0003
Run: 1

Lab Fraction	Nuclide	Sample Desc	Sample Date	Sample Aliquot	Radiometric % Rec	Grav % Rec	Mean % Rec	SAF	Sep t0 Date/Time	Sep t1 Date/Time
01	H-3	LCS	11/26/02 00:00	1.03E+01		0.00	0.00			
02	H-3	MBL	11/26/02 00:00	1.05E+01		0.00	0.00			
03	H-3	DUP	11/25/02 12:00	1.02E+01		0.00	0.00			
04	H-3	DO	11/25/02 12:00	1.02E+01		0.00	0.00			

Client: Duratek
Eberline Services Work Order: 02-11141
Analysis Code: H0003
Run: 1

Lab Fraction	Nuclide	Sample Desc	Counting Date/Time	Halflife (days)	Detect	Carrier	Count Time	Counts	Bkg CPM	Eff
01	H-3	LCS	11/29/02 12:54	4485.27	2550	1	60	4030.2	10.17	0.228028801
02	H-3	MBL	11/29/02 13:54	4485.27	2550	2	60	663.6	10.17	0.226979325
03	H-3	DUP	11/29/02 14:54	4485.27	2550	3	60	906.6	10.17	0.218950548
04	H-3	DO	11/29/02 15:54	4485.27	2550	4	60	865.8	10.17	0.221938301

Internal Fraction	Sample Desc	Client ID	Sample Date	Sample Aliquot	Tracer Aliquot (g)	Tracer ACT (dpm)	Radiometric Tracer (pCi)	Radiometric % Rec	SAF 1*	SAF 2*
01	LCS	LCS	11/26/02 00:00	10.3087	0.2984	3496.5703				
02	MBL	BLANK	11/26/02 00:00	10.4560	0.1007	1179.9753				
03	DUP	VA-02-0176	11/25/02 12:00	10.1848	0.1003	1175.2882				
04	DO	VA-02-0176	11/25/02 12:00	10.2052	0.0979	1147.1657				

Oak[illegible] Laboratory

Spike and [illegible]er Worksheet

Printed: 1[illegible] [illegible]:8:23 AM

Internal Work Order	Run	Analysis Code	Date	Technician	Technician Initials	Witness Initials
02-11141	1	H0003	11/27/2002 8:20	PFARRELL		

LCS & Matrix Spikes					LCS	MS	LCSD	MSD	LCS		MS		LCSD		MSD	
Isotope	Sol #	Activity dpm/ml	Solution Date	Approx Addition	Volume Used (ml)	Volume Used (ml)	Volume Used (ml)	Volume Used (ml)	Known pCi	Error Estimate	Added pCi	Error Estimate	Known pCi	Error Estimate	Added pCi	Error Estimate
H-3	H-5a	11717.729	11/27/2002	0.240	0.1999				1055.12	37.984	0.00	0.000	0.00	0.000	0.00	0.000

Tracers						
fraction	Isotope	Sol #	Activity dpm/ml	Solution Date	Volume Used (ml)	Approx Addition
01	H-3MS	H-5a	11717.729	11/27/2002	0.2984	0.1200
02	H-3MS	H-5a	11717.729	11/27/2002	0.1007	0.1200
03	H-3MS	H-5a	11717.729	11/27/2002	0.1003	0.1200
04	H-3MS	H-5a	11717.729	11/27/2002	0.0979	0.1200

Balance Printer Tapes	
Tracer	LCS
	Matrix Spike

00465

Version 2.0 08/99

H-3 Known for solids = LCS Known / Net Equiv. Aliq.

Aliquot Worksheet

Work Order	Run	Analysis Code	Aliquot Units	Lab Deadline	Technician
02-11141	1	H0003	grams	12/5/2002	PFARRELL

Lab Fraction	Duratek Client ID	Sample Type	Muffle Data Ratio Post/Pre	Dilution Data Aliquot	Dilution Data Final (ml)	Dilution Data Ratio	Aliquot Data Aliquot	Aliquot Data Net Equiv	MS Aliquot Data Aliquot	MS Aliquot Data Net Equiv	H-3 Solids Only Water Added (ml)	H-3 Solids Only H3 Dist Aliq
01	LCS	LCS					1.0309E+01	1.0309E+01	10.1246	1.0125E+01	100.0000	10.0000
02	BLANK	MBL					1.0456E+01	1.0456E+01	10.3504	1.0350E+01	100.0000	10.0000
03	VA-02-0176	DUP					1.0185E+01	1.0185E+01	10.1790	1.0179E+01	100.0000	11.9982
04	VA-02-0176	DO					1.0205E+01	1.0205E+01	10.1904	1.0190E+01	100.0000	11.9982

Comments	

00466

Technician: P Farrell Date: 11/27/02

Internal Work Order: 02-11141
Run: 1

Fraction	Isotope	LSCSampleType	AnalysisCode	InstrumentID	ProtocolID	PID	SNumber	CountDuration	CPM_A	CPM_B	CPM_C	tSIE	SIS	DataSource	CountTime
1	H-3	S	H0003	2550	3	18	1	60	67.17	41.6	0	264.847		I	11/29/2002 12:54
2	H-3	S	H0003	2550	3	18	2	60	11.06	9.74	0	269.277		I	11/29/2002 13:54
3	H-3	S	H0003	2550	3	18	3	60	15.11	12.34	0	263.725		I	11/29/2002 14:54
4	H-3	S	H0003	2550	3	18	4	60	14.43	11.5	0	258.791		I	11/29/2002 15:54
0	H-3	B	H0003	2550	3	18	5	60	10.17	8.8	0	262.743		I	11/29/2002 16:54

Internal Work Order: 02-11141
Run: 1

Fraction	Isotope	LSCSampleType	AnalysisCode	InstrumentID	ProtocolID	PID	SNumber	CountDuration	CPM_A	CPM_B	CPM_C	tSIE	SIS	DataSource	CountTime
1	H-3	M	H0003	2550	4	26	1	15	330.36	193.03	0	261.637		I	11/29/2002 11:33
2	H-3	M	H0003	2550	4	26	2	15	278.89	167.43	0	263.964		I	11/29/2002 11:48
3	H-3	M	H0003	2550	4	26	3	15	272.44	161.44	0	266.374		I	11/29/2002 12:03
4	H-3	M	H0003	2550	4	26	4	15	269.03	157.16	0	255.728		I	11/29/2002 12:18

Nov 2002 11:24 TRI-CARB - 1.09 Pa

ɪtocol #: 3 h3 User

ɪe: 60.00
:a Mode: CPM Nuclide: 3H
Bkgnd Subtract: None

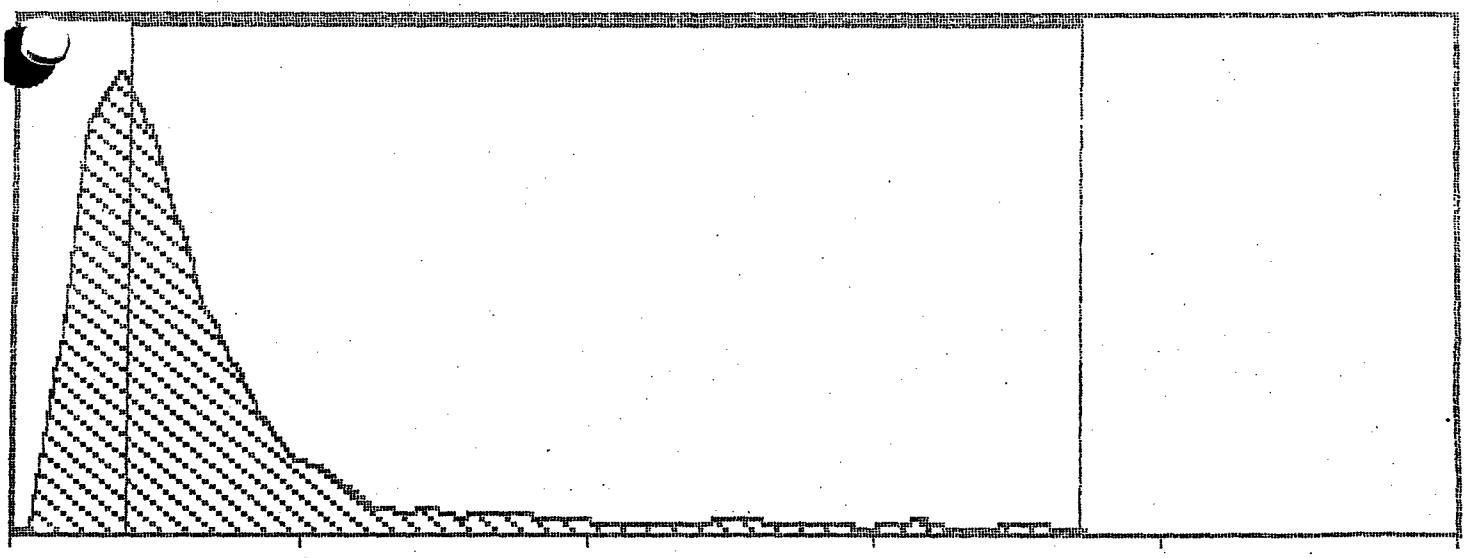
	LL	UL	LCR	2S%	BKG
gion A:	0.0 -	18.6	0	0.0	0.00
gion B:	2.0 -	18.6	0	0.0	0.00
gion C:	0.0 -	0.0	0	0.0	0.00

ɜnch Indicator: tSIE
Ext Std Terminator: Count
l1141A(1-4,B)
ɔtocol Data Filename: c:\spectra\PROT.DAT
ɪnt Data Filename: c:\spectra\SDATA3.DAT
ɜctrum Data Drive & Path: c:\spectra

SMPL_ID	P#	PID	S#	CPMA	CPMB	CPMC	tSIE	TIME
	3	18	1	67.17	41.60	0.00	264.85	60.00

SPECTRUM PLOT

.3 CPM Y maximum Protocol No. 3 Sample No. 1 Repeat 1



keV 25

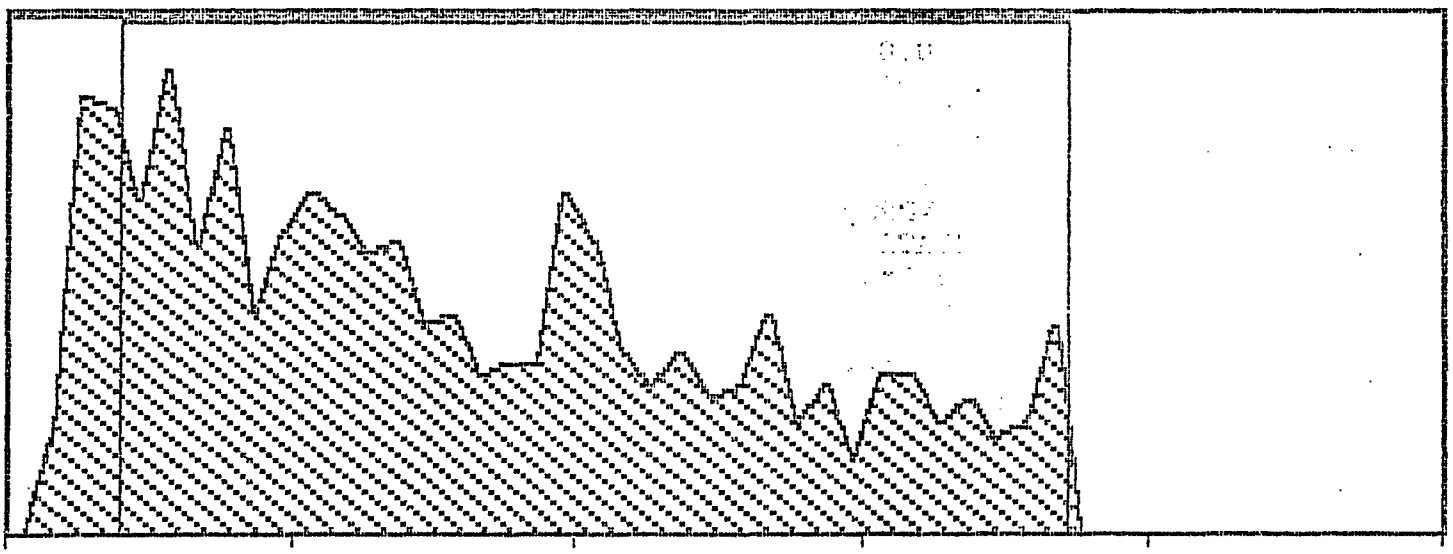
Region	LL	UL	CPM
A:	0.0	18.6	67.2
B:	2.0	18.6	41.6
C:	0.0	0.0	0.0

00469

3 18 2 11.06 9.74 0.00 269.28 60.00

SPECTRUM PLOT

CPM Y maximum Protocol No. 3 Sample No. 2 Repeat 1



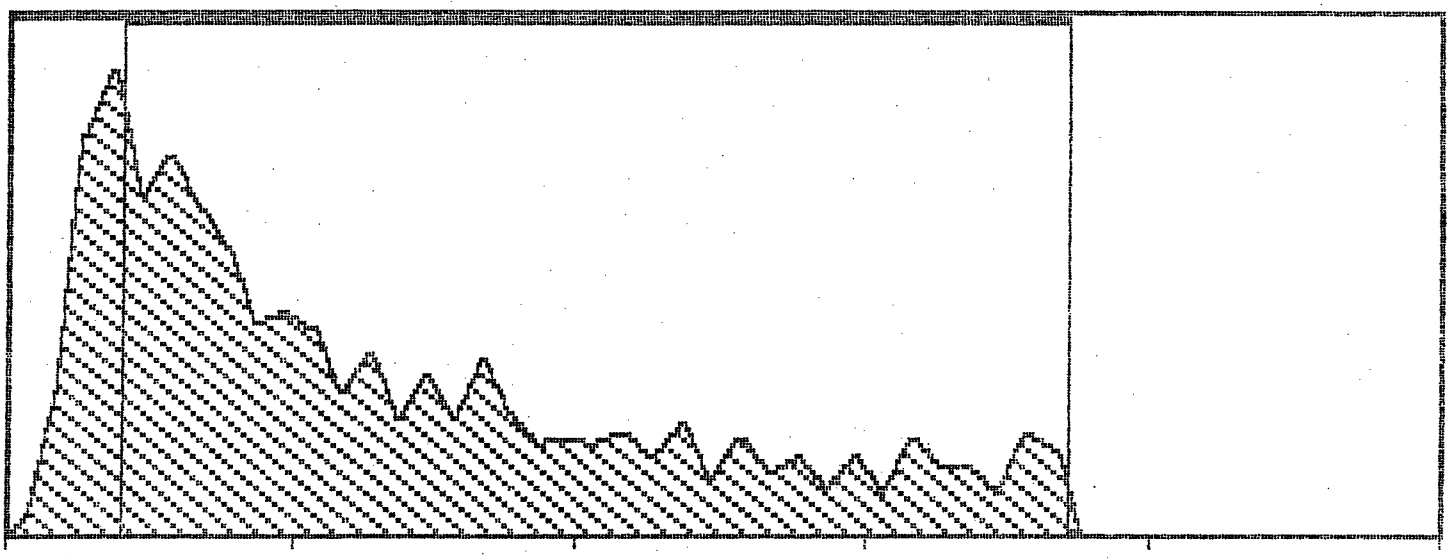
0 keV 25

Region	LL	UL	CPM
A:	0.0	18.6	11.1
B:	2.0	18.6	9.7
C:	0.0	0.0	0.0

3 18 3 15.11 12.34 0.00 263.73 60.00

SPECTRUM PLOT

CPM Y maximum Protocol No. 3 Sample No. 3 Repeat 1



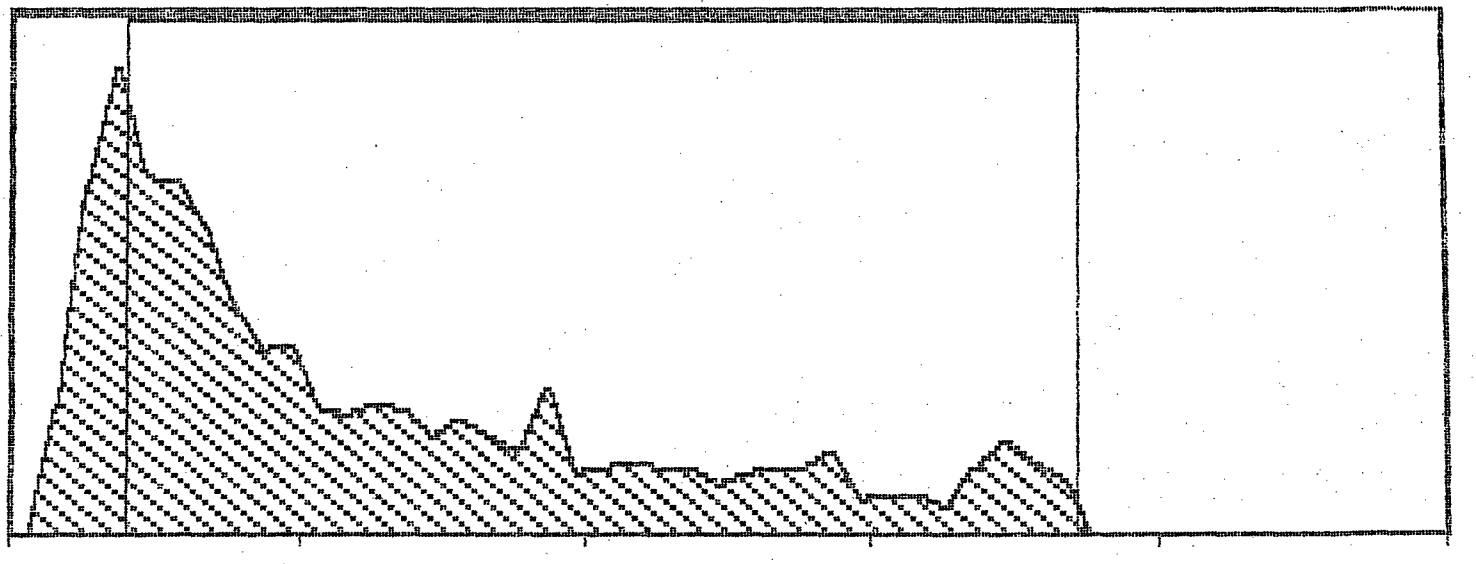
0 keV 25

Region	LL	UL	CPM
A:	0.0	18.6	15.1
B:	2.0	18.6	12.3
C:	0.0	0.0	0.0

3 18 4 14.43 11.50 0.00 258.79 60.00

SPECTRUM PLOT

CPM Y maximum Protocol No. 3 Sample No. 4 Repeat 1



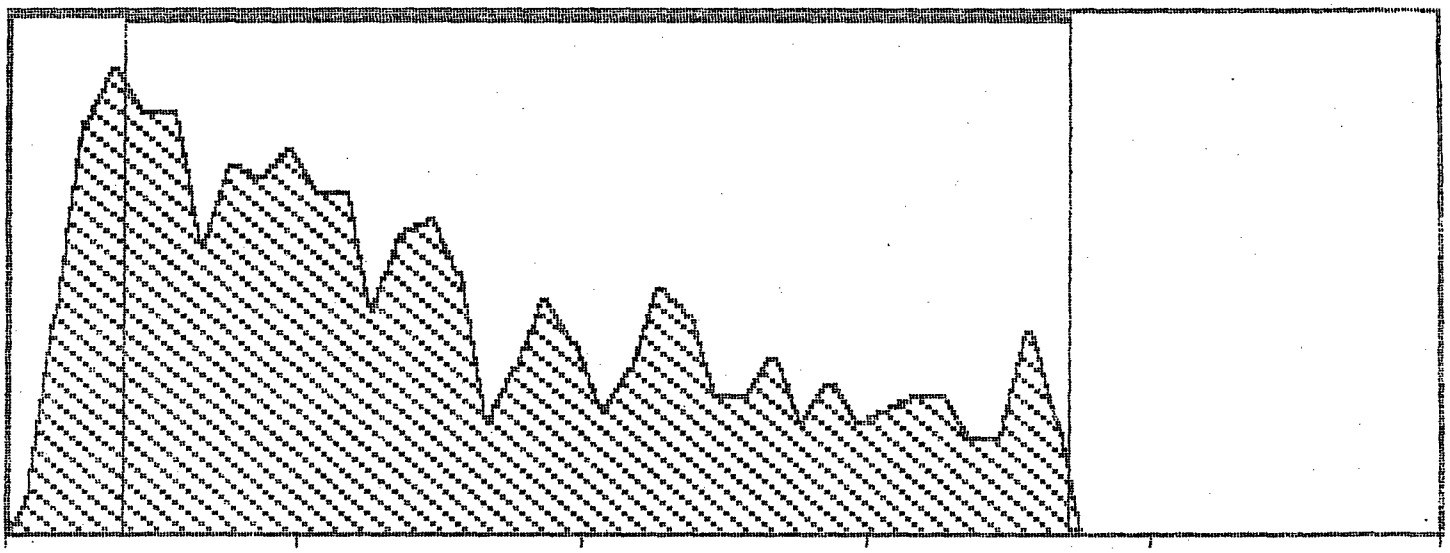
keV 25

Region	LL	UL	CPM
A:	0.0	18.6	14.4
B:	2.0	18.6	11.5
C:	0.0	0.0	0.0

3 18 5 10.17 8.80 0.00 262.74 60.00

SPECTRUM PLOT

CPM Y maximum Protocol No. 3 Sample No. 5 Repeat 1



keV 25

Region	LL	UL	CPM
A:	0.0	18.6	10.2
B:	2.0	18.6	8.8
C:	0.0	0.0	0.0

rotocol #: 4 h3 User : DURATEK

ime: 15.00
ata Mode: CPM Nuclide: 3H
ground Subtract: None

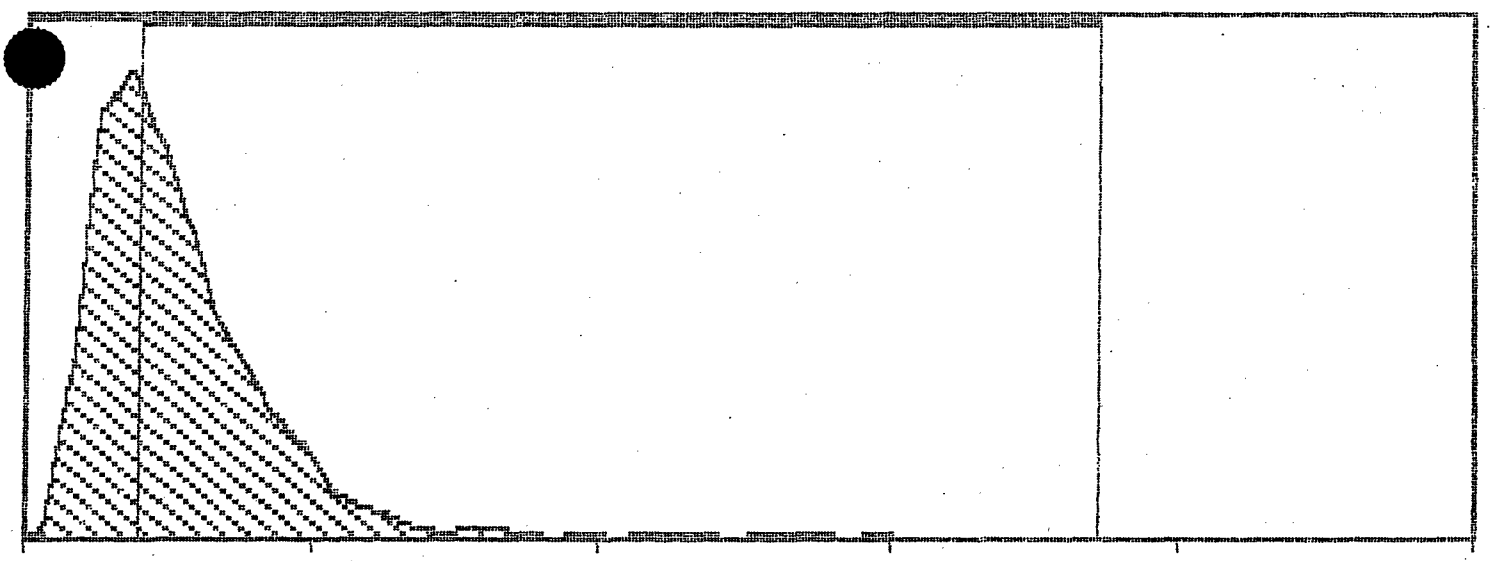
	LL	UL	LCR	2S%	BKG
egion A:	0.0 -	18.6	0	0.0	0.00
egion B:	2.0 -	18.6	0	0.0	0.00
egion C:	0.0 -	0.0	0	0.0	0.00

uench Indicator: tSIE
Ext Std Terminator: Count
211141A(1-4)MS
rotocol Data Filename: c:\spectra\PROT.DAT
ount Data Filename: c:\spectra\SDATA4.DAT
pectrum Data Drive & Path: c:\spectra

SMPL_ID	P#	PID	S#	CPMA	CPMB	CPMC	tSIE	TIME
	4	26	1	330.36	193.03	0.00	261.64	15.00

SPECTRUM PLOT

20.8 CPM Y maximum Protocol No. 4 Sample No. 1 Repeat 1



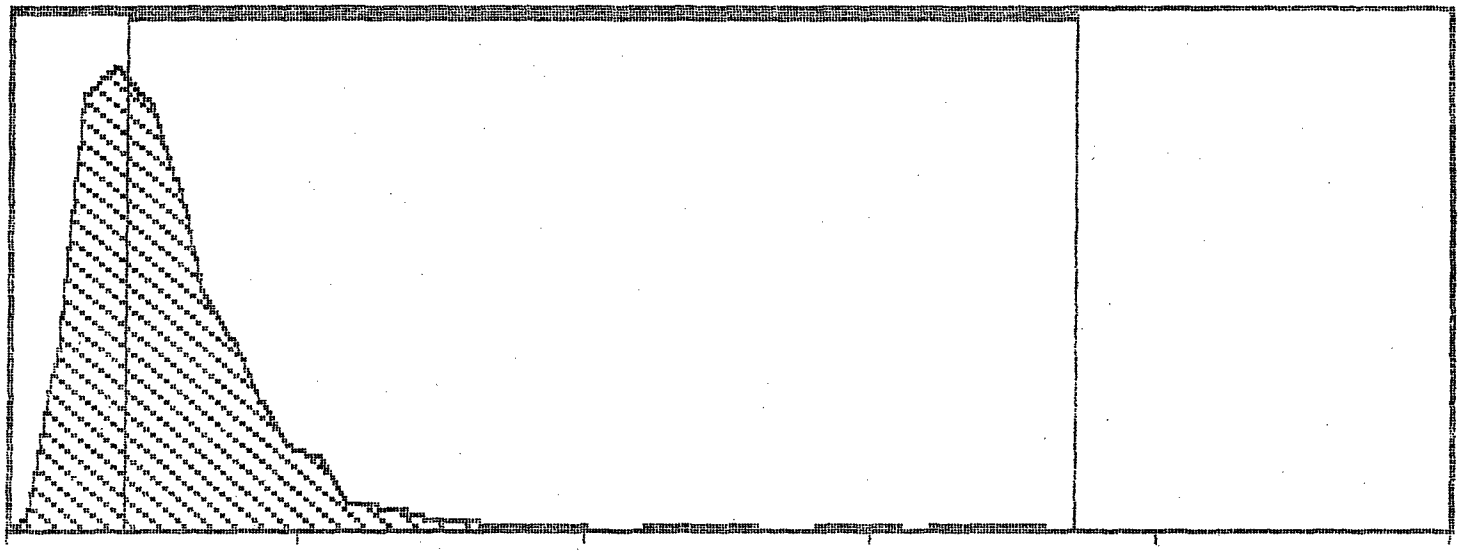
0 keV 25

Region	LL	UL	CPM
A:	0.0	18.6	330.4
B:	2.0	18.6	193.0
C:	0.0	0.0	0.0

4 26 2 278.89 167.43 0.00 263.96 15.00

SPECTRUM PLOT

CPM Y maximum Protocol No. 4 Sample No. 2 Repeat 1



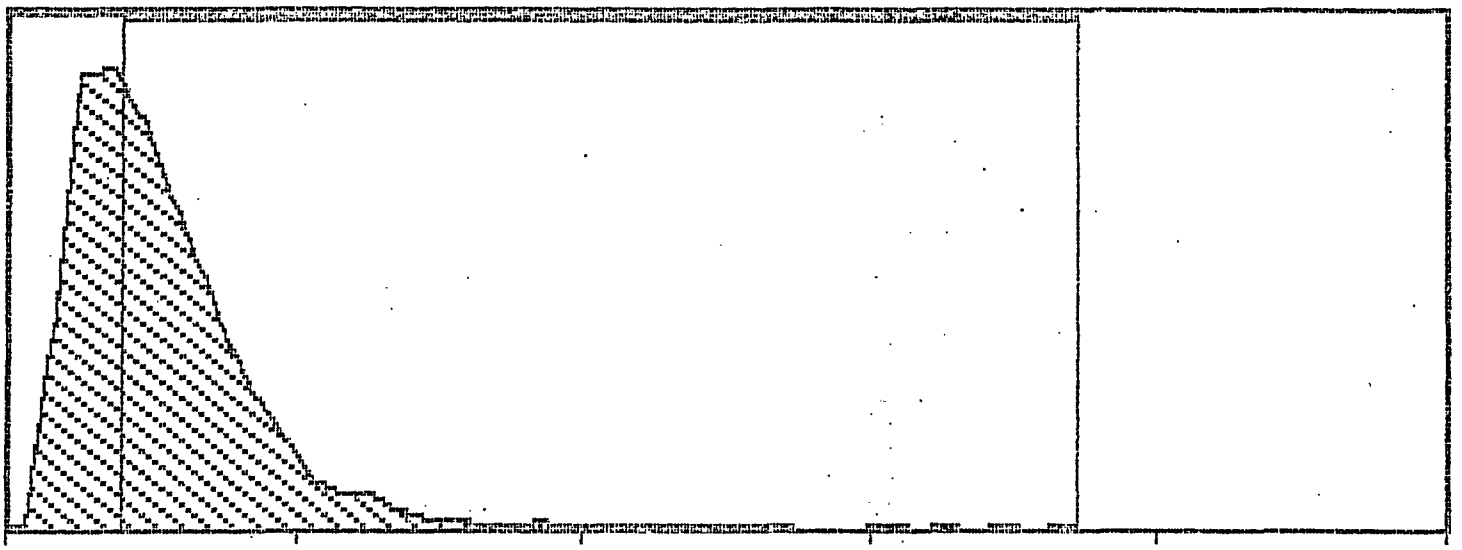
0 keV 25

Region	LL	UL	CPM
A:	0.0	18.6	278.9
B:	2.0	18.6	167.4
C:	0.0	0.0	0.0

4 26 3 272.44 161.44 0.00 266.37 15.00

SPECTRUM PLOT

CPM Y maximum Protocol No. 4 Sample No. 3 Repeat 1



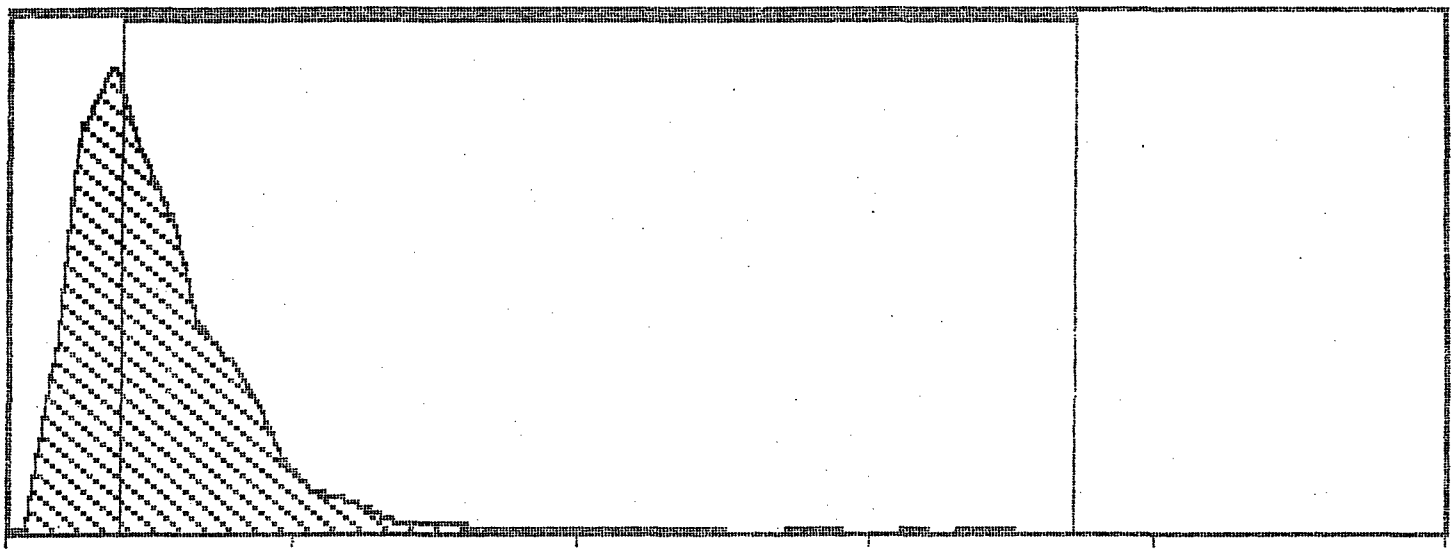
0 keV 25

Region	LL	UL	CPM
A:	0.0	18.6	272.4
B:	2.0	18.6	161.4
C:	0.0	0.0	0.0

4 26 4 269.03 157.16 0.00 255.73 15.00

SPECTRUM PLOT

CPM Y maximum Protocol No. 4 Sample No. 4 Repeat 1



0 keV 25

Region	LL	UL	CPM
A:	0.0	18.6	269.0
B:	2.0	18.6	157.2
C:	0.0	0.0	0.0

SECTION XVIII

ANALYTICAL DATA (CARBON-14)

Work Order	02-11141
Analysis Code	C0014
Run	1
Date Received	11/26/2002
Lab Deadline	12/5/2002
Client	Duratek
Project	106760.003
Report Level	4
Activity Units	pCi
Aliquot Units	g
Matrix	OS
Method	ENIC Modified
Instrument Type	Beta LSC
Radiometric Tracer	C-14 MS
Radiometric Sol#	C-6
Tracer Act (dpm/g)	4726.859
Carrier	
Carrier Conc (mg/ml)	

Internal Fraction	Sample Desc	Client ID	Login CPM	Sample Date	Sample Aliquot
01	LCS	LCS		11/26/02 00:00	1.0000E+00
02	MBL	BLANK		11/26/02 00:00	1.0000E+00
03	DUP	VA-02-0176	89	11/25/02 12:00	7.2370E-01
04	DO	VA-02-0176	89	11/25/02 12:00	7.0790E-01

00179

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

Internal Fraction	Sample Desc	Tracer Aliquot (g)	Tracer Total ACT (dpm)	Radiometric Tracer (pCi)	Radiometric % Rec	Grav Carrier Added (ml)	Grav Filter Tare (g)	Grav Filter Final (g)	Grav Filter Net (g)	Grav % Rec	Mean % Rec	SAF 1*	SAF 2*
01	LCS	0.7097	3354.7										
02	MBL	0.2574	1216.7										
03	DUP	0.2690	1271.5										
04	DO	0.2538	1199.7										

* SAF1 is used for Gross Alpha and all other radionuclides. SAF2 is used for Gross Beta only. ** [illegible]al mass exceeded the calibration curve range. Results should be qualified as appropri[illegible]

00430

Internal Fraction	Sample Desc	Rough Prep Date	Rough Prep By	Prep Date	Prep By	Sep t0 Date/Time	Sep t0 By	Sep t1 Date/Time	Sep t1 By
01	LCS			12/13/02 13:03	CMCMURRAY				
02	MBL			12/13/02 13:03	CMCMURRAY				
03	DUP			12/13/02 13:03	CMCMURRAY				
04	DO			12/13/02 13:03	CMCMURRAY				

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

Run: 1
Analysis Code: C0014
Eberline Services Work Order: 02-11141
Client: Duratek
28300

Lab Fraction	Nuclide	Sample Desc	Client Identification	Activity Units	Results	Error Estimate	MDA	LCS Known	LCS %R	LCS Flag	RPD Flag	MDA Flag	Blank Flag
01	C-14	LCS	LCS	pCi/g	8.56E+02	7.24E+00	2.39E+00	8.30E+02	103.08	OK		OK	
02	C-14	MBL	BLANK	pCi/g	0.00E+00	1.39E+00	2.37E+00					OK	OK
03	C-14	DUP	VA-02-0176	pCi/g	4.22E+02	6.26E+00	3.38E+00				OK	OK	
04	C-14	DO	VA-02-0176	pCi/g	4.00E+02	5.94E+00	3.22E+00					OK	

12-16-02

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Date 12-16-02	# of pages ▸
To Paul Jones	From Judy Pachella
Co./Dept.	Co.
Phone #	Phone #
Fax # (865) 376-6247	Fax #

Work Order: 02-11141-C0014-1

Client: Duratek
Eberline Services Work Order: 02-11141
Analysis Code: C0014
Run: 1

Lab Fraction	Nuclide	Sample Desc	Sample Date	Sample Aliquot	Radiometric % Rec	Grav % Rec	Mean % Rec	SAF	Sep t0 Date/Time	Sep t1 Date/Time
01	C-14	LCS	11/26/02 00:00	1.00E+00		0.00	0.00			
02	C-14	MBL	11/26/02 00:00	1.00E+00		0.00	0.00			
03	C-14	DUP	11/25/02 12:00	7.24E-01		0.00	0.00			
04	C-14	DO	11/25/02 12:00	7.08E-01		0.00	0.00			

Client: Duratek

Eberline Services Work Order: 02-11141

Analysis Code: C0014

Run: 1

Lab Fraction	Nuclide	Sample Desc	Counting Date/Time	Halflife (days)	Detect	Carrier	Count Time	Counts	Bkg CPM	Eff
01	C-14	LCS	12/12/02 20:37	2092882.5	3100	1	60	56880	18	0.489531466
02	C-14	MBL	12/12/02 21:38	2092882.5	3100	2	60	1080	18	0.493139806
03	C-14	DUP	12/12/02 22:39	2092882.5	3100	3	60	20520	18	0.477379498
04	C-14	DO	12/12/02 23:41	2092882.5	3100	4	60	20400	18	0.512638064

00484

Internal Fraction	Sample Desc	Client ID	Sample Date	Sample Aliquot	Tracer Aliquot (g)	Tracer ACT (dpm)	Radiometric Tracer (pCi)	Radiometric % Rec	SAF 1*	SAF 2*
01	LCS	LCS	11/26/02 00:00	1.0000	0.7097	3354.6518				
02	MBL	BLANK	11/26/02 00:00	1.0000	0.2574	1216.6935				
03	DUP	VA-02-0176	11/25/02 12:00	0.7237	0.2690	1271.5251				
04	DO	VA-02-0176	11/25/02 12:00	0.7079	0.2538	1199.6768				

Eberline Services
Oak R[illegible] Laboratory

Spike and T[illegible]er Worksheet

Printed: 12/[illegible] 1:03 PM

Internal Work Order	Run	Analysis Code	Date	Technician	Technician Initials	Witness Initials
02-11141	1	C0014	12/13/2002 13:02	CMCMURRAY		

LCS & Matrix Spikes					LCS	MS	LCSD	MSD	LCS		MS		LCSD		MSD	
Isotope	Sol #	Activity dpm/ml	Solution Date	Approx Addition	Volume Used (ml)	Volume Used (ml)	Volume Used (ml)	Volume Used (ml)	Known pCi	Error Estimate	Added pCi	Error Estimate	Known pCi	Error Estimate	Added pCi	Error Estimate
C-14	C-6	4726.859	12/13/2002	0.280	0.3899				830.18	29.056	0.00	0.000	0.00	0.000	0.00	0.000
				>>>												

Tracers

fraction	Isotope	Sol #	Activity dpm/ml	Solution Date	Volume Used (ml)	Approx Addition
01	C-14 MS	C-6	4726.859	12/13/2002	0.7097	0.2800
02	C-14 MS	C-6	4726.859	12/13/2002	0.2574	0.2800
03	C-14 MS	C-6	4726.859	12/13/2002	0.2690	0.2800
04	C-14 MS	C-6	4726.859	12/13/2002	0.2538	0.2800

Balance Printer Tapes

Tracer

0.3198
0.2574
0.2690
0.2538

LCS

0.3899 g

Matrix Spike

00486

Version 2.0 08/99

Eberline Services - Oak Ridge
Version 2.0 8/1999

Aliquot Worksheet

Work Order	Run	Analysis Code	Aliquot Units	Lab Deadline	Technician
02-11141	1	C0014	grams	12/5/2002	CMCMURRAY

Lab Fraction	Duratek Client ID	Sample Type	Muffle Data Ratio Post/Pre	Dilution Data Aliquot	Dilution Data Final (ml)	Dilution Data Ratio	Aliquot Data Aliquot	Aliquot Data Net Equiv	MS Aliquot Data Aliquot	MS Aliquot Data Net Equiv	H-3 Solids Only Water Added (ml)	H-3 Solids Only H3 Dist Aliq
01	LCS	LCS					1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00		
02	BLANK	MBL					1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00		
03	VA-02-0176	DUP					7.2370E-01	7.2370E-01	7.2370E-01	7.2370E-01		
04	VA-02-0176	DO					7.0790E-01	7.0790E-01	7.0790E-01	7.0790E-01		

Comments	

00487

Technician: Charlotte P. McMurray Date: 12/12/02

14C

Dupont (L19822)

	Sample wt (g)
84309g	1.2765g

Eberline (L19822)

	Sample wt (g)
84081	0.7079g
84082 (Dup of 84081)	0.7237g

Eberline (L19866)

	Sample wt (g)
84385	0.5794g
84386 (Dup of 84385)	0.4291g

CJF 12/10/02

14C

Eli Lilly & Co (L19856)

	Sample wt g
Prime	—
DPM-1	—
B1	—
B2	—
B3	—
84270	0.9529g
84271	0.9572g
84272	1.0906g
84273	1.2123g
DPM-2	—
B4	—
B5	—
B6	—

DPM-1 Chemical Recovery

$$\frac{40013\ \text{cts}/11.72\ \text{min} - 22.38\ \text{cpm}}{(0.0296\ \text{ml})(64{,}130\ \text{pci/ml})(2.22\ \text{dpm/pci})(0.89\ \text{cpm/dpm})} = \frac{3391.7}{3674.5} = 92.3\%$$

DPM-2 Chemical Recovery

$$\frac{39993\ \text{cts}/13.98\ \text{min} - 22.38\ \text{cpm}}{(0.0268\ \text{ml})(64{,}130\ \text{pci/ml})(2.22\ \text{dpm/pci})(0.89\ \text{cpm/dpm})} = \frac{2838.3}{3395.8} = 83.6\%$$

AVG Yield = 88.0%

CJF 12/10/02

Assay Definition-

AC 12/14/02

Assay Description:
c14-ms

Assay Type: CPM
Report Name: Report1
Output Data Path: C:\Packard\Tricarb\Results\Default\c14-cpm.ms-8
Raw Results Path: C:\Packard\Tricarb\Results\Default\c14-cpm.ms-8\20021213_2149.results
Comma-Delimited File Name: C:\Packard\Tricarb\Results\Default\c14-cpm.ms-8\0211141ams.csv
Assay File Name: C:\Packard\TriCarb\Assays\c14-cpm.ms-8.lsa

Count Conditions-

Nuclide: 14C
Quench Indicator: tSIE
External Std Terminator (sec): 0.5.2s%
Pre-Count Delay (min): 0.00
Quench Set: n/a
Count Time (min): 15.00
Count Mode: Normal
Assay Count Cycles: 1 Repeat Sample Count: 1
#Vials/Sample: 1 Calculate % Reference: Off

Background Subtract: Off
Low CPM Threshold: Off
2 Sigma % Terminator: Off

Regions	LL	UL
	0.0	156.0
B	4.0	156.0
C	0.0	0.0

Count Corrections-

Static Controller: On Luminescence Correction: Off
Colored Samples: n/a Heterogeneity Monitor: n/a
Coincidence Time (nsec): 18 Delay Before Burst (nsec): 75

Half Life-

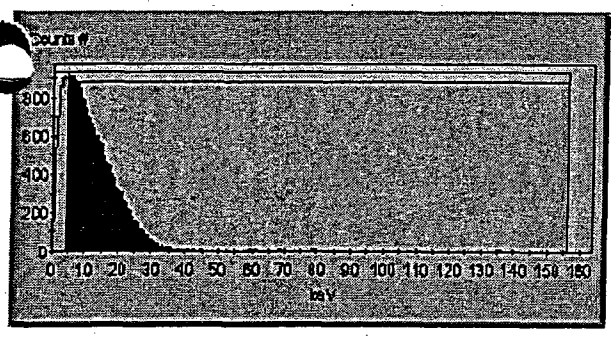
Half Life Correction: Off

Regions	Half Life	Units	Reference Date	Reference Time
A				
B				
C				

Cycle 1 Results

DATE TIME	SMPL_ID	P#	PID	S#	CPMA	CPMB	CPMC	tSIE	Count Time
12/13/02 9:50:19 PM	02-11141-1-C14-01M	8	22	1	2017	1688	0	191.37	15.00

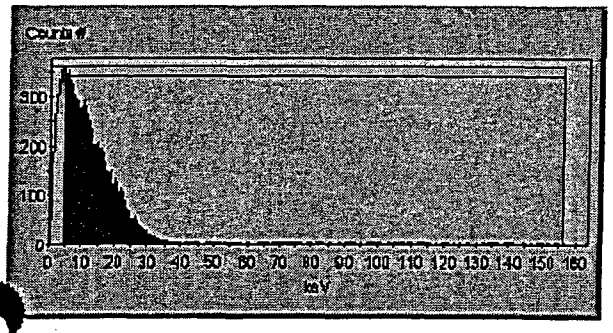
SpectraView Block Data



02-11141-1-C14-02M	8	22	2	738	618	0	189.17	15.00

12/13/02 10:06:07 PM

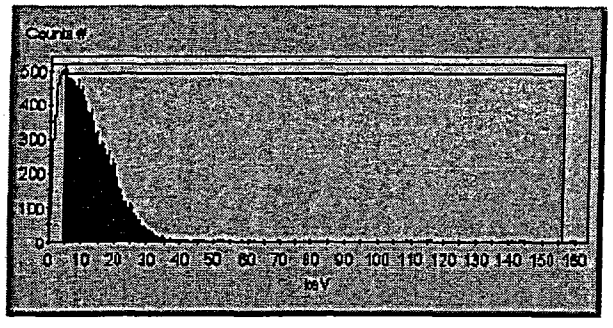
SpectraView Block Data



02-11141-1-C14-03M	8	22	3	1126	949	0	193.00	15.00

12/13/02 10:21:51 PM

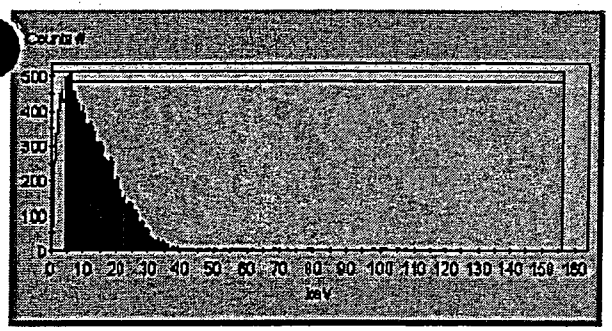
SpectraView Block Data



02-11141-1-C14-04M	8	22	4	1112	955	0	211.07	15.00

12/13/02 10:37:38 PM

SpectraView Block Data


Counts
500
400
300
200
100
0
0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160
keV

Assay Definition-

Assay Description:
c14

Assay Type: CPM
Report Name: Report1
Output Data Path: C:\Packard\Tricarb\Results\Default\c14-cpm-7
Raw Results Path: C:\Packard\Tricarb\Results\Default\c14-cpm-7\20021212_2036.results
Comma-Delimited File Name: C:\Packard\Tricarb\Results\Default\c14-cpm-7\0211141as.csv
Assay File Name: C:\Packard\TriCarb\Assays\c14-cpm-7.lsa

Count Conditions-

Nuclide: 14C
Quench Indicator: tSIE
External Std Terminator (sec): 0.5 2s%
Pre-Count Delay (min): 0.00
Quench Set: n/a
Count Time (min): 60.00
Count Mode: Normal
Assay Count Cycles: 1 Repeat Sample Count: 1
#Vials/Sample: 1 Calculate % Reference: Off

Background Subtract: Off
Low CPM Threshold: Off
2 Sigma % Terminator: Off

Regions	LL	UL
A	0.0	156.0
B	4.0	156.0
C	0.0	0.0

Count Corrections-

Static Controller: On Luminescence Correction: Off
Colored Samples: n/a Heterogeneity Monitor: n/a
Coincidence Time (nsec): 18 Delay Before Burst (nsec): 75

Half Life-

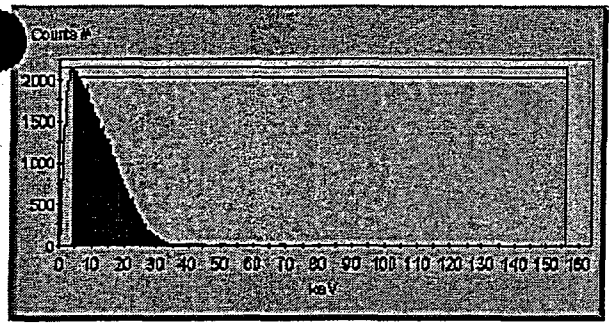
Half Life Correction: Off

Regions	Half Life	Units	Reference Date	Reference Time
A				
B				
C				

Cycle 1 Results

DATE TIME	SMPL_ID	P#	PID	S#	CPMA	CPMB	CPMC	tSIE	Count Time
12/12/02 8:37:18 PM	02-11141-1-C14-01S	7	37	1	1132	948	0	188.87	60.00

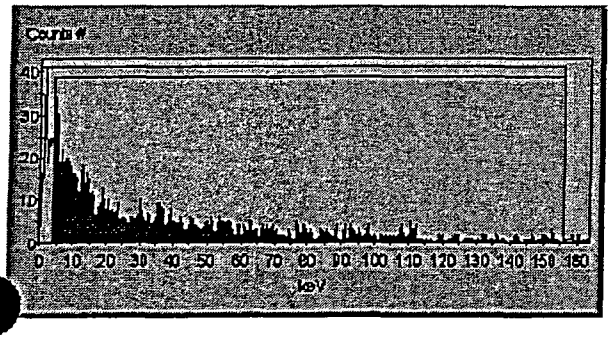
SpectraView Block Data



02-11141-1-C14-02S	7	37	2	21	18	0	186.29	60.00

12/12/02 9:38:49 PM

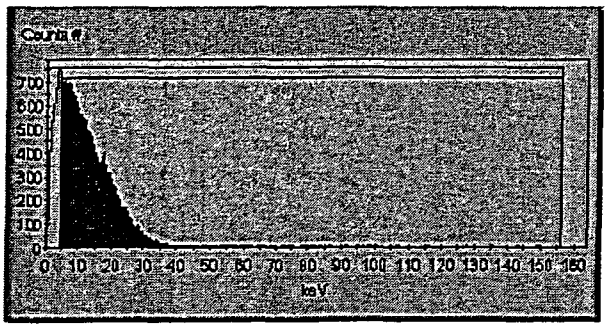
SpectraView Block Data



02-11141-1-C14-03S	7	37	3	405	342	0	196.74	60.00

12/12/02 10:39:43 PM

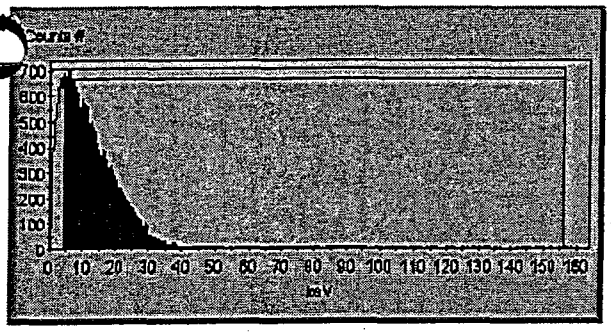
SpectraView Block Data



02-11141-1-C14-04S	7	37	4	398	340	0	204.87	60.00

12/12/02 11:41:05 PM

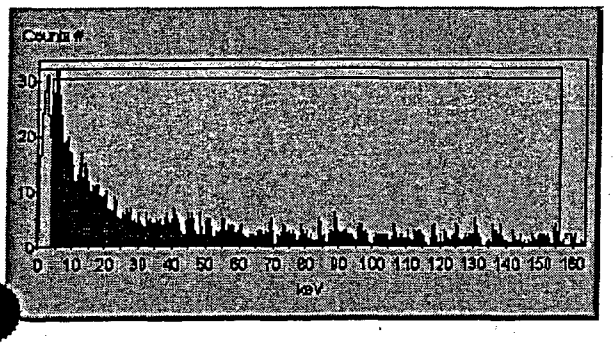
SpectraView Block Data



Sample #5	7	37	5	21	18	0	477.41	60.00

12/13/02 12:42:11 AM

SpectraView Block Data



SECTION XIX

ANALYTICAL DATA (NICKEL-63)

Work Order	02-11141
Analysis Code	Ni063
Run	1
Date Received	11/26/2002
Lab Deadline	12/5/2002
Client	Duratek
Project	106760.003
Report Level	4
Activity Units	pCi
Aliquot Units	g
Matrix	OS
Method	ASTM 3500-Ni Modified
Instrument Type	Beta LSC
Radiometric Tracer	Ni-63MS
Radiometric Sol#	Ni-1
Tracer Act (dpm/g)	21124.944
Carrier	
Carrier Conc (mg/ml)	

Internal Fraction	Sample Desc	Client ID	Login CPM	Sample Date	Sample Aliquot
01	LCS	LCS		11/26/02 00:00	1.0000E+00
02	MBL	BLANK		11/26/02 00:00	1.0000E+00
03	DUP	VA-02-0176	89	11/25/02 12:00	1.0313E+00
04	DO	VA-02-0176	89	11/25/02 12:00	1.0313E+00

00497

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

Internal Fraction	Sample Desc	Tracer Aliquot (g)	Tracer Total ACT (dpm)	Radiometric Tracer (pCi)	Radiometric % Rec	Grav Carrier Added (ml)	Grav Filter Tare (g)	Grav Filter Final (g)	Grav Filter Net (g)	Grav % Rec	Mean % Rec	SAF 1*	SAF 2*
01	LCS	1.0000	21124.9										
02	MBL	0.0000	0.0										
03	DUP	0.0000	0.0										
04	DO	0.0000	0.0										

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

00438

Internal Fraction	Sample Desc	Rough Prep Date	Rough Prep By	Prep Date	Prep By	Sep t0 Date/Time	Sep t0 By	Sep t1 Date/Time	Sep t1 By
01	LCS			11/26/02 17:27	CMCMURRAY				
02	MBL			11/26/02 17:27	CMCMURRAY				
03	DUP			11/26/02 17:27	CMCMURRAY				
04	DO			11/26/02 17:27	CMCMURRAY				

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

Eberline Services - Oak Ridge
Analysis of Nickel-63 by Beta Liquid Scintillation
Version 1.0 (10/6/00)

Nickel-66 spike dpm/milliliter: 21,124.94
Known volume: 0.1197
Work Order #: 02-11141
Associated WO#:
Client: Duratek

Instrument: Packard 3100
Counting Date: 12/4/2002 (MM/DD/YY)

Inst. Bkg (cpm): 14.00
Project:
Reporting Units: pCi/g pCi/l or pCi/g

ANALYSIS FRACTION	CLIENT ID	SAMPLE ALIQUOT*	SAMPLE CPM	COUNT TIME	COLLECT DATE	tSIE	EFF. (cpm/dpm)	DECAY FACTOR	SAMPLE ACTIVITY	ERROR	MDA
-01	L.C.S.	1.0000	382.00	60	12/4/2002	169.86	68.377%	1.0000	2.42E+02	3.32E+00	1.5E+00
-02	BLANK	1.0222	14.00	60	12/4/2002	195.92	71.298%	1.0000	0.00E+00	8.28E-01	1.4E+00
-03	VA-02-0176	1.0313	15.00	60	11/26/2002	196.00	71.305%	0.9998	6.13E-01	8.35E-01	1.4E+00
-04	VA-02-0176	1.0131	14.00	60	11/26/2002	197.83	71.466%	0.9998	0.00E+00	8.33E-01	1.4E+00
-05											
-06											
-07											
-08											
-09											
-10											
-11											
-12											
-13											
-14											
-15											
-16											
-17											
-18											
-19											
-20											

Post-it® Fax Note 7671

Date 12-10-02	# of pages ▸
To Paul Jones	From Judy Pichelle
Co./Dept.	Co.
Phone #	Phone #
Fax # (865) 376-6247	Fax #

00500

*Sample Aliquots entered in liters or grams (ie 500 ml as 0.5 liter)

L.C.S. Known Activity (pCi/L): 1,139.03 +/-2 sigma 25.06
Percent Recovery of L.C.S. 21.28%

Replicate #1 6.13E-01 +/- 8.35E-01
Replicate #2 0.00E+00 +/- 8.33E-01
R.P.D. of Replicates 200.00%
Normalized Difference 1.02E+00

Calculated by: [signature] Date: 12/10/02

Approved by: [signature] Date: 12/10/02

Internal Fraction	Sample Desc	Client ID	Sample Date	Sample Aliquot	Tracer Aliquot (g)	Tracer ACT (dpm)	Radiometric Tracer (pCi)	Radiometric % Rec	SAF 1*	SAF 2*
01	LCS	LCS	11/26/02 00:00	1.0000	1.0000	21124.9440				
02	MBL	BLANK	11/26/02 00:00	1.0000	0.0000	0.0000				
03	DUP	VA-02-0176	11/25/02 12:00	1.0313	0.0000	0.0000				
04	DO	VA-02-0176	11/25/02 12:00	1.0313	0.0000	0.0000				

Eberline Services
Oak Ridge Laboratory

Spike and Tracer Worksheet

Printed: 11/26/02 5:27 PM

Internal Work Order	Run	Analysis Code	Date	Technician	Technician Initials	Witness Initials
02-11141	1	Ni063	11/26/2002 17:26	CMCMURRAY	CMM	

LCS & Matrix Spikes					LCS	MS	LCSD	MSD	LCS		MS		LCSD		MSD	
Isotope	Sol #	Activity dpm/ml	Solution Date	Approx Addition	Volume Used (ml)	Volume Used (ml)	Volume Used (ml)	Volume Used (ml)	Known pCi	Error Estimate	Added pCi	Error Estimate	Known pCi	Error Estimate	Added pCi	Error Estimate
Ni-63	Ni-1	21124.944	11/26/2002	0.310	0.1197				1139.03	46.700	0.00	0.000	0.00	0.000	0.00	0.000

Tracers

fraction	Isotope	Sol #	Activity dpm/ml	Solution Date	Volume Used (ml)	Approx Addition
01	Ni-63MS	Ni-1	21124.944	11/26/2002	1.0000	0.1500
02	Ni-63MS	Ni-1	21124.944	11/26/2002	0.0000	0.1500
03	Ni-63MS	Ni-1	21124.944	11/26/2002	0.0000	0.1500
04	Ni-63MS	Ni-1	21124.944	11/26/2002	0.0000	0.1500

CMM 11-26-02

Balance Printer Tapes

Tracer	LCS
	- 0.1197 g
	aliquot - 5.1563 g

00502

Version 2.0 08/99

Eberline Services - Oak Ridge
Version 2.0 8/1999

Aliquot Worksheet

Printed: 11/26/2002 3:28 PM

Work Order	Run	Analysis Code	Aliquot Units	Lab Deadline	Technician
02-11141	1	Ni063	grams	12/5/2002	CMCMURRAY

Lab Fraction	Duratek Client ID	Sample Type	Muffle Data	Dilution Data			Aliquot Data		MS Aliquot Data		H-3 Solids Only	
			Ratio Post/Pre	Aliquot	Final (ml)	Ratio	Aliquot	Net Equiv	Aliquot	Net Equiv	Water Added (ml)	H3 Dist Aliq
01	LCS	LCS					1.0000E+00	1.0000E+00				
02	BLANK	MBL					1.0000E+00	1.0000E+00				
03	VA-02-0176	DUP		5.1563E+00	50.0000	1.03E-01	1.0000E+01	1.0313E+00				
04	VA-02-0176	DO		5.1563E+00	50.0000	1.03E-01	1.0000E+01	1.0313E+00				

Comments	

00503

Technician: Charlotte C. McMurray Date: 11/26/02

Nickel-63

JB 12-4-02

Assay Definition-

Assay Description:
63Ni

Assay Type: CPM
Report Name: Report1
Output Data Path: C:\Packard\Tricarb\Results\Default\ni63-cpm-26lsa
Raw Results Path: C:\Packard\Tricarb\Results\Default\ni63-cpm-26lsa\20021203_2051.results
Comma-Delimited File Name: C:\Packard\Tricarb\Results\Default\ni63-cpm-26lsa\0211141as.csv
Assay File Name: C:\Packard\TriCarb\Assays\ni63-cpm-26lsa.lsa

Count Conditions-

Nuclide: 99Tc
Quench Indicator: tSIE
External Std Terminator (sec): 0.5 2s%
Pre-Count Delay (min): 0.00
Quench Set: n/a
Count Time (min): 60.00
Count Mode: Normal
Assay Count Cycles: 1 Repeat Sample Count: 1
#Vials/Sample: 1 Calculate % Reference: Off

Background Subtract: Off
Low CPM Threshold: Off
2 Sigma % Terminator: Off

Regions	LL	UL
	5.0	75.0
B	5.0	290.0
C	5.0	500.0

Count Corrections-

Static Controller: On Luminescence Correction: Off
Colored Samples: n/a Heterogeneity Monitor: n/a
Coincidence Time (nsec): 18 Delay Before Burst (nsec): 75

Half Life-

Half Life Correction: Off

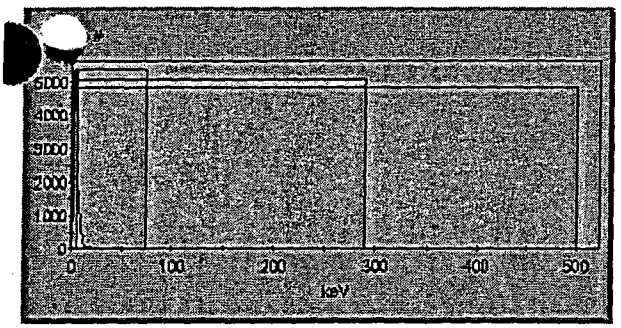
Regions	Half Life	Units	Reference Date	Reference Time
A				
B				
C				

Cycle 1 Results

DATE	TIME	SMPL_ID	P#	PID	S#	CPMA	CPMB	CPMC	tSIE	Count Time
		02-11141-1-N63-01S	26	16	1	382	388	390	169.86	60.00
12/3/02	8:52:04 PM									

SpectraView Block Data

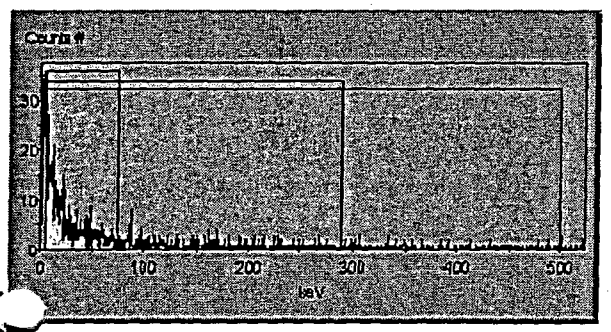
Nickel-63



02-11141-1-N63-02S	26	16	2	14	20	22	195.92	60.00

12/3/02 9:53:40 PM

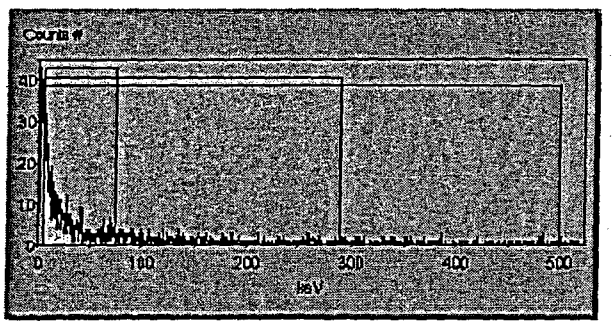
SpectraView Block Data



02-11141-1-N63-03S	26	16	3	15	21	23	196.00	60.00

12/3/02 10:54:36 PM

SpectraView Block Data

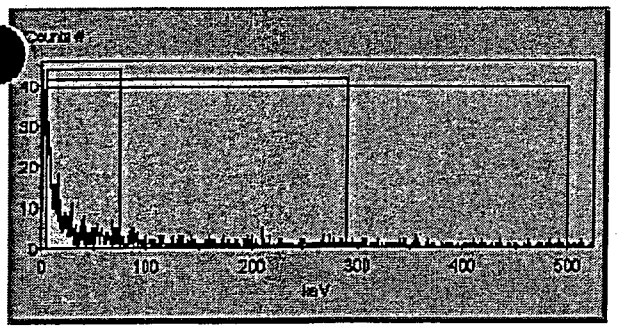


02-11141-1-N63-04S	26	16	4	14	20	23	197.83	60.00

12/3/02 11:55:27 PM

SpectraView Block Data

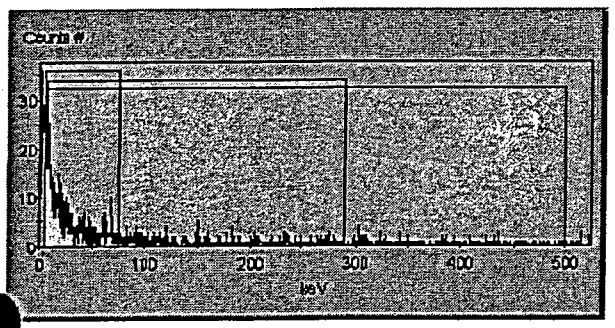
Nickel-63



Sample #5	26	16	5	14	20	23	257.87	60.00

12/4/02 12:56:22 AM

SpectraView Block Data



SECTION XX

ANALYTICAL DATA (NICKEL-59)

Run 1

Work Order	02-11141
Analysis Code	Ni59
Run	1
Date Received	11/26/2002
Lab Deadline	12/5/2002
Client	Duratek
Project	17-Apr
Report Level	4
Activity Units	pCi
Aliquot Units	g
Matrix	OS
Method	ASTM 3500-Ni Modified
Instrument Type	Gamma Spectroscopy
Radiometric Tracer	
Radiometric Sol#	
Tracer Act (dpm/g)	
Carrier	
Carrier Conc (mg/ml)	

Internal Fraction	Sample Desc	Client ID	Login CPM	Sample Date	Sample Aliquot
01	LCS	LCS		11/26/02 00:00	1.0000E+00
02	MBL	BLANK		11/26/02 00:00	1.0000E+00
03	DUP	VA-02-0176	89	11/25/02 12:00	1.0313E+00
04	DO	VA-02-0176	89	11/25/02 12:00	1.0313E+00

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

Internal Fraction	Sample Desc	Tracer Aliquot (g)	Tracer Total ACT (dpm)	Radiometric Tracer (pCi)	Radiometric % Rec	Grav Carrier Added (ml)	Grav Filter Tare (g)	Grav Filter Final (g)	Grav Filter Net (g)	Grav % Rec	Mean % Rec	SAF 1*	SAF 2*
01	LCS												
02	MBL												
03	DUP												
04	DO												

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

Internal Fraction	Sample Desc	Rough Prep Date	Rough Prep By	Prep Date	Prep By	Sep t0 Date/Time	Sep t0 By	Sep t1 Date/Time	Sep t1 By
01	LCS								
02	MBL								
03	DUP								
04	DO								

* SAF1 is used for Gross Alpha and all other radionuclides. SAF2 is used for Gross Beta only. **[redacted]ual mass exceeded the calibration curve range. Results should be qualified as approp[redacted]

Preliminary Data Report & Analytical Calculations

Work Order: [illegible]11141-Ni59-1

Lab Fraction	Nuclide	Sample Desc	Client Identification	Activity Units	Results	Error Estimate	MDA	LSC Known	LCS %R	LCS Flag	RPD Flag	Sample Date	Sample Aliquot	Counting Date/Time
01	NI-59	LCS	LCS	pCi/g	2.50E+02	3.73E+02	1.91E+01	1.23E+06	0.02	INV		11/26/02 00:00	1.00E+00	12/06/02 06:49
02	NI-59	MBL	BLANK	pCi/g	-7.53E+00	1.63E+01	1.98E+01					11/26/02 00:00	1.00E+00	12/05/02 18:02
03	NI-59	DUP	VA-02-0176	pCi/g	-4.01E+00	1.19E+01	1.77E+01				INV	11/25/02 12:00	1.03E+00	12/05/02 19:16
04	NI-59	DO	VA-02-0176	pCi/g	-6.00E+00	1.39E+01	1.80E+01					11/25/02 12:00	1.03E+00	12/06/02 07:51

No LCS available for ^{59}Ni. Recovery is an artifact of calculation necessary to process samples.
LCM 12/10/02

Post-it® Fax Note 7671	Date 12-10-02 # of pages ▶ 1
To Paul Jones	From Judy Pachella
Co./Dept.	Co.
Phone #	Phone #
Fax # (865) 376-6247	Fax #

00511

12-10-02

Internal Fraction	Sample Desc	Client ID	Sample Date	Sample Aliquot	Tracer Aliquot (g)	Tracer ACT (dpm)	Radiometric Tracer (pCi)	Radiometric % Rec	SAF 1*	SAF 2*
01	LCS	LCS	11/26/02 00:00	1.0000						
02	MBL	BLANK	11/26/02 00:00	1.0000						
03	DUP	VA-02-0176	11/25/02 12:00	1.0313						
04	DO	VA-02-0176	11/25/02 12:00	1.0313						

Eberline S[illegible]es
Oak Ridg[illegible]ratory

Spike and Tr[illegible] Worksheet

Printed: 11/2[illegible]

Internal Work Order	Run	Analysis Code	Date	Technician	Technician Initials	[illegible]tness Initials
02-11141	1	Ni063	11/26/2002 17:26	CMCMURRAY	CMM	

LCS & Matrix Spikes					LCS	MS	LCSD	MSD	LCS		MS		LCSD		MSD	
Isotope	Sol #	Activity dpm/ml	Solution Date	Approx Addition	Volume Used (ml)	Volume Used (ml)	Volume Used (ml)	Volume Used (ml)	Known pCi	Error Estimate	Added pCi	Error Estimate	Known pCi	Error Estimate	Added pCi	Error Estimate
Ni-63	Ni-1	21124.944	11/26/2002	0.310	0.1197				1139.03	46.700	0.00	0.000	0.00	0.000	0.00	0.000

Tracers						
fraction	Isotope	Sol #	Activity dpm/ml	Solution Date	Volume Used (ml)	Approx Addition
01	Ni-63MS	Ni-1	21124.944	11/26/2002	1.0000	0.1500
02	Ni-63MS	Ni-1	21124.944	11/26/2002	0.0000	0.1500
03	Ni-63MS	Ni-1	21124.944	11/26/2002	0.0000	0.1500
04	Ni-63MS	Ni-1	21124.944	11/26/2002	0.0000	0.1500

CMM 11-26-02

Balance Printer Tapes	
Tracer	LCS
	- 0.1197 g
	dryout - 5.1563 g

005113

Version 2.0 08/99

Eberline Services - Oak Ridge
Version 2.0 8/1999

Aliquot Worksheet

Work Order	Run	Analysis Code	Aliquot Units	Lab Deadline	Technician
02-11141	1	Ni59	grams	12/5/2002	CMCMURRAY

Lab Fraction	Duratek Client ID	Sample Type	Muffle Data Ratio Post/Pre	Dilution Data Aliquot	Dilution Data Final (ml)	Dilution Data Ratio	Aliquot Data Aliquot	Aliquot Data Net Equiv	MS Aliquot Data Aliquot	MS Aliquot Data Net Equiv	H-3 Solids Only Water Added (ml)	H-3 Solids Only H3 Dist Aliq
01	LCS	LCS					1.0000E+00	1.0000E+00				
02	BLANK	MBL					1.0000E+00	1.0000E+00				
03	VA-02-0176	DUP		5.1563E+00	50.0000	1.03E-01	1.0000E+01	1.0313E+00				
04	VA-02-0176	DO		5.1563E+00	50.0000	1.03E-01	1.0000E+01	1.0313E+00				

Comments	

00514

Technician: Charlotte P. McMurray Date: 11/26/02

Sample ID : 0211141-01 Acquisition date : 6-DEC-2002 06:49:45

VMS Peak Search Report Generated 6-DEC-2002 07:50:05.44

Configuration	: DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_021114101_GE5_FE55_48335.CNF;		
Analyses by	: PEAK V16.9 ENBACK V1.6 PEAKEFF V2.2		
Client ID	: SPIKE		
Deposition Date	:		
Sample Date	: 17-JUL-1997 00:00:00	Acquisition date	: 6-DEC-2002 06:49:45.
Sample ID	: 0211141-01	Sample Quantity	: 1.00000E+00 gram
Sample type	: SOIL	Sample Geometry	: 0
Detector name	: GE5	Detector Geometry	: FE55
Elapsed live time	: 0 01:00:00.00	Elapsed real time	: 0 01:00:03.87 0.1%
Start channel	: 1	End channel	: 4096
Sensitivity	: 3.00000	Gaussian	: 15.00000
Critical level	: No		

Post-NID Peak Search Report

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
1	5.98	481	50	0.61	55.75	45	23	11.6	5.51E+00	FE-55 NI-59
1	29.52*	15	3	0.69	282.57	273	18	98.6	9.74E-01	
1	109.56	42	5	0.84	1053.66	1044	20	28.7	1.82E+00	

AG
12/6/02

Sample ID : 0211141-01 Acquisition date : 6-DEC-2002 06:49:45

Total number of lines in spectrum	3	
Number of unidentified lines	1	
Number of lines tentatively identified by NID	2	66.67%

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/gram	Wtd Mean Decay Corr pCi/gram	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
FE-55	2.70Y	3.99	3.044E+02	1.214E+03	0.259E+03	21.33	
NI-59	7.50E+04Y	1.00	2.503E+02	2.503E+02	3.733E+02	149.18	
			---	---			
Total Activity :			5.547E+02	1.464E+03			
Grand Total Activity :			5.547E+02	1.464E+03			

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

Sample ID : 0211141-01
Acquisition date : 6-DEC-2002 06:49:45

Nuclide Type: FISSION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/gram	Decay Corr pCi/gram	2-Sigma %Error	Status
FE-55	5.89	24.50*	4.838E+00	3.044E+02	1.214E+03	21.33	OK
Final Mean for 1 Valid Peaks = 1.214E+03+/- 2.590E+02 (21.33%)							
NI-59	6.92	29.80*	4.838E+00	2.503E+02	2.503E+02	149.18	OK
Final Mean for 1 Valid Peaks = 2.503E+02+/- 3.733E+02 (149.18%)							

Flag: "*" = Keyline

---- Identified Nuclides ----

Nuclide	Activity (pCi/gram)	Act error	MDA (pCi/gram)	MDA error	Act/MDA
FE-55	1.214E+03	2.590E+02	1.095E+02	1.910E+01	11.092
NI-59	2.503E+02	3.733E+02	1.909E+01	2.838E+01	13.108

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

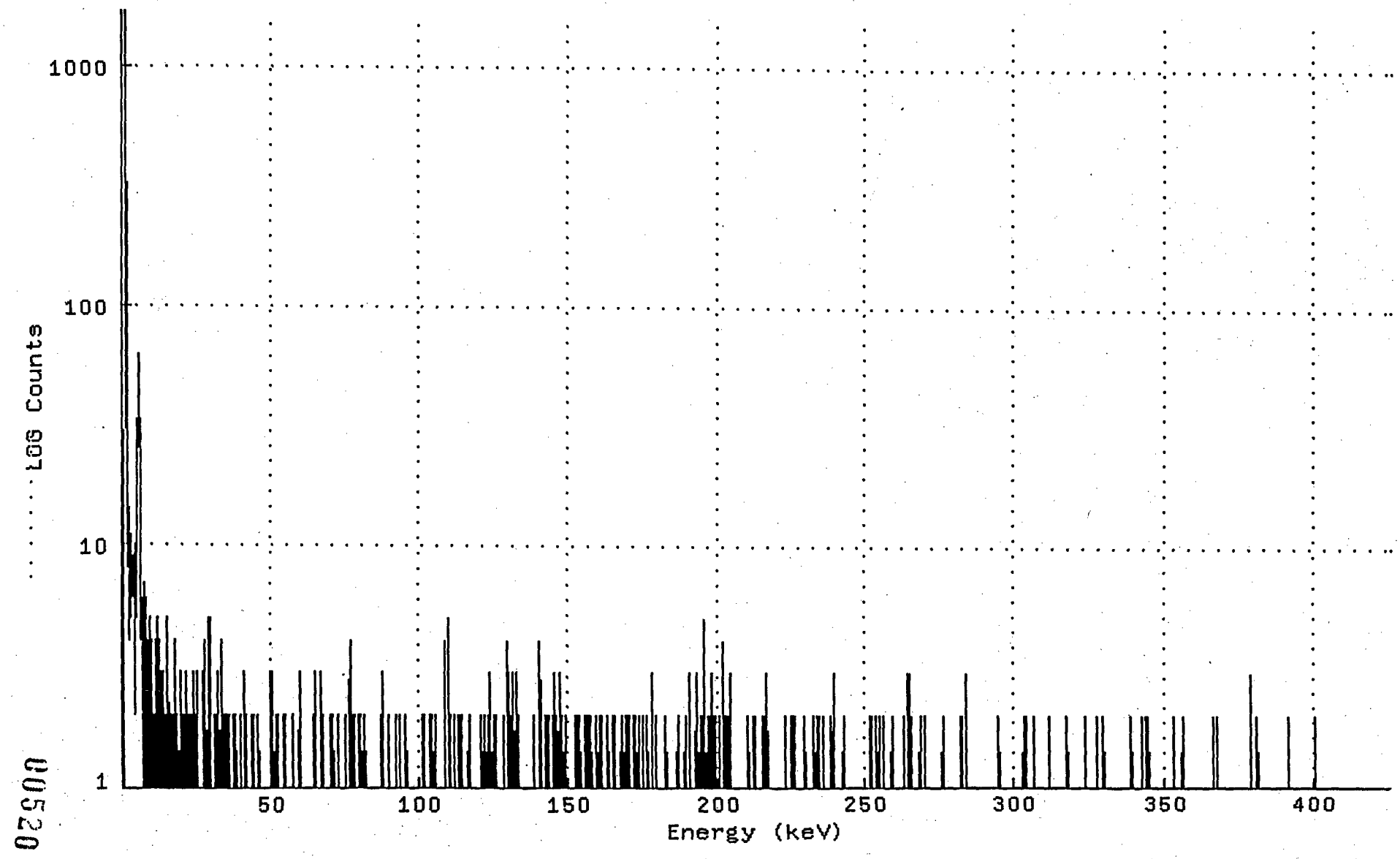
Nuclide	Key-Line Activity (pCi/gram)	K.L. Ided	Act error	MDA (pCi/gram)	MDA error	Act/MDA
CO-57	-1.272E+02		3.105E+02	5.415E+02	9.412E+01	-0.235
CD-109	4.958E+02		8.291E+02	1.724E+03	2.997E+02	0.288
I-129	4.062E+00	+	4.069E+00	8.699E+00	1.512E+00	0.467
BA-133	2.455E+00		6.132E+00	1.263E+01	2.767E+00	0.194
CE-144	-7.536E+02		1.780E+03	3.170E+03	5.510E+02	-0.238
PB-210	-7.918E+00		3.316E+01	6.366E+01	1.107E+01	-0.124
PA-231	1.445E+00		6.964E+00	1.283E+01	2.231E+00	0.113
TH-231	-7.112E+00		1.246E+01	2.122E+01	3.689E+00	-0.335
PA-234	-1.049E+00		2.711E+00	4.816E+00	8.372E-01	-0.218
TH-234	2.035E+01		2.971E+01	6.801E+01	1.182E+01	0.299
NP-237	2.352E+00		1.127E+01	2.281E+01	3.965E+00	0.103
AM-241	1.318E+00		3.148E+00	6.913E+00	1.202E+00	0.191
[illegible]243	-1.693E+00		2.527E+00	4.147E+00	8.136E-01	-0.4[illegible]

ejected Report
ample ID : 0211141-01 Acquisition date : 6-DEC-2002 0

Nuclide	Half-life	Half-Life Ratio	Energy	%Abund	Activity (pCi/gram)	2-Sigma %Error	Rejected by
	1.57E+07Y	0.00	29.78*	57.00	4.062E+00	100.18	Abun.
			33.60	13.20	--- Not Found ---		
			39.58	7.52	--- Not Found ---		
		% Abundances Found =		73.34			
A-133	10.50Y	0.51	30.80	97.60	3.386E+00	100.37	Abun.
			81.00*	33.00	--- Not Found ---		
			302.84	17.80	--- Not Found ---		
			356.01	60.00	--- Not Found ---		
			383.85	8.70	--- Not Found ---		
		% Abundances Found =		44.96			
P-237	2.14E+06Y	0.00	29.37	14.00	1.654E+01	100.18	Abun.
			86.50*	12.60	--- Not Found ---		
		% Abundances Found =		52.63			

lag: "*" = Keyline

Spect[illegible] : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP[illegible]1114101_GE5_FE55_48335.CNF;1
Title :
Sample Title: SPIKE
Start Time: 6-DEC-2002 06:49: Sample Time: 17-JUL-1997 00:00 Energy Offset: 1.88831E-01
Real Time : 0 01:00:03.87 Sample ID : 0211141-01 Energy Slope : 1.03817E-01
Live Time : 0 01:00:00.00 Sample Type: SOIL Energy Quad : -1.02782E-08



00520

Channel Contents for [GAMMA.SCUSR.ARCHIVE]SMP_021114101_GE5_FE55_48335.CNF

Channel								
1:	0	0	0	0	0	0	0	0
9:	0	5	177	1314	1708	1191	726	469
17:	220	113	50	25	16	8	14	9
25:	4	7	9	6	11	9	5	11
33:	5	9	9	7	6	6	6	6
41:	7	10	7	4	2	6	5	6
49:	9	19	16	33	32	62	48	59
57:	45	25	33	18	18	18	9	4
65:	6	4	1	2	1	2	1	1
73:	1	1	3	7	1	2	6	2
81:	2	2	3	1	4	2	2	2
89:	5	0	2	2	4	2	3	3
97:	4	1	4	1	2	1	2	2
105:	2	2	2	0	2	1	4	2
113:	1	2	2	1	5	3	3	1
121:	2	1	2	3	4	0	1	0
129:	2	3	1	1	0	3	2	3
137:	1	0	0	2	0	1	0	0
145:	0	0	2	2	5	1	1	2
153:	2	1	2	2	0	2	0	0
161:	2	1	1	0	0	2	1	4
169:	0	0	0	3	2	1	2	1
177:	0	2	2	0	0	0	0	1
185:	1	0	2	3	0	0	1	2
193:	1	2	0	0	2	1	2	1
201:	0	0	1	0	0	3	0	0
209:	1	0	0	0	0	2	1	1
217:	2	0	1	0	2	1	1	0
225:	1	1	1	2	1	1	3	0
233:	1	0	0	0	1	2	0	1
241:	1	3	1	0	2	0	0	0
249:	0	1	0	0	1	1	0	0
257:	0	0	1	3	0	0	3	1
265:	2	4	0	0	0	0	1	0
273:	0	0	0	0	3	2	4	1
281:	3	5	5	4	5	2	0	3
289:	1	0	0	0	1	0	1	1
297:	2	1	0	0	1	0	0	2
305:	0	0	0	1	1	2	1	0
313:	3	0	1	0	0	0	1	2
321:	3	0	4	0	0	1	1	0
329:	2	0	1	2	0	1	0	2
337:	1	0	2	0	1	0	1	1
345:	0	0	2	0	0	1	0	1
353:	1	0	1	1	1	0	2	1
361:	0	1	0	0	0	0	2	1
369:	1	1	0	0	0	0	0	1
377:	1	1	1	0	0	0	1	0
385:	2	0	1	1	0	0	0	0
393:	0	2	3	1	0	1	2	0
401:	2	0	0	0	0	0	0	0
409:	1	0	0	0	1	0	0	1
417:	0	0	2	2	1	0	0	1
425:	1	2	1	1	0	0	0	0

433:	0	1	0	1	0	0	0	2
441:	0	1	0	0	0	1	1	0
449:	0	0	0	0	0	0	0	0
457:	0	0	0	0	0	1	0	0
465:	0	1	0	0	1	0	0	1
473:	0	1	1	0	0	0	1	0
481:	1	3	1	0	0	3	0	0
489:	0	1	0	1	1	0	0	2
497:	2	1	0	1	0	0	2	0
505:	0	1	0	0	1	0	0	0
513:	0	0	0	0	1	0	1	0
521:	0	0	2	0	0	2	1	0
529:	0	0	0	0	0	1	1	1
537:	0	0	0	0	1	1	0	0
545:	0	0	1	1	0	0	0	2
553:	1	2	0	0	0	0	0	0
561:	0	0	0	1	0	0	1	0
569:	0	1	0	0	0	0	3	0
577:	0	0	1	0	0	1	0	0
585:	0	0	0	0	0	0	0	0
593:	0	0	0	0	0	0	1	0
601:	0	0	1	0	0	1	0	0
609:	0	1	0	0	1	0	0	1
617:	1	2	0	0	0	1	0	0
625:	0	3	0	0	0	0	1	0
633:	0	1	0	0	0	0	0	0
641:	1	1	3	1	0	0	1	0
649:	0	1	2	0	0	0	1	0
657:	1	0	0	0	1	0	0	0
665:	0	0	0	0	0	0	0	0
673:	0	0	0	2	0	0	2	1
681:	2	0	2	1	0	1	0	0
689:	0	0	0	1	0	0	0	0
697:	0	1	2	0	1	1	0	0
705:	1	0	1	0	1	1	1	0
713:	1	0	0	0	1	0	1	0
721:	0	0	2	0	0	0	0	1
729:	1	1	0	0	0	0	1	1
737:	2	4	1	1	1	0	1	0
745:	0	2	2	0	2	0	1	1
753:	0	2	0	0	1	0	0	0
761:	1	0	1	2	0	0	0	1
769:	1	2	0	0	0	2	1	1
777:	0	0	0	0	0	1	0	0
785:	0	2	1	0	0	0	0	0
793:	0	0	0	0	1	1	0	0
801:	1	1	0	1	0	0	0	0
809:	1	0	0	1	0	0	0	0
817:	0	0	0	0	0	1	1	0
825:	0	0	0	0	0	0	1	0
833:	0	1	1	1	0	1	1	2
841:	0	1	1	0	1	3	1	0
849:	1	0	1	0	0	0	1	0
857:	1	0	0	1	2	2	0	1
865:	1	0	1	0	0	0	0	1
873:	0	0	0	0	0	1	1	0
881:	1	0	0	1	2	1	1	0
889:	1	0	1	1	1	0	0	0
897:	0	0	2	1	1	0	0	1
905:	1	0	1	0	1	0	0	0

913:	0	0	0	1	0	2	2	0
921:	0	1	0	0	0	0	0	1
929:	1	0	1	1	0	0	0	0
937:	0	1	0	0	0	0	1	1
945:	0	0	0	1	0	1	1	0
953:	1	0	1	0	1	1	0	0
961:	0	0	0	1	1	1	0	1
969:	0	1	2	1	0	1	1	2
977:	0	0	0	1	1	0	0	1
985:	0	0	0	0	0	1	0	1
993:	0	0	1	2	0	0	0	2
1001:	0	1	0	2	0	1	0	1
1009:	1	0	1	0	0	2	0	1
1017:	1	0	1	0	0	0	0	0
1025:	0	0	1	1	0	1	0	0
1033:	0	1	1	0	1	0	1	0
1041:	0	1	0	0	0	4	1	0
1049:	1	0	0	0	1	0	2	5
1057:	1	2	2	1	1	2	0	0
1065:	0	1	0	0	0	0	1	1
1073:	2	0	1	0	0	0	0	0
1081:	1	1	0	0	0	1	2	0
1089:	0	0	1	1	2	0	1	1
1097:	0	0	2	0	0	1	0	1
1105:	0	0	0	1	0	0	0	0
1113:	1	1	0	0	1	1	1	2
1121:	1	1	0	0	0	1	0	0
1129:	1	0	1	0	0	0	0	0
1137:	0	1	0	0	0	0	0	0
1145:	1	0	0	1	0	0	0	1
1153:	0	0	1	1	0	0	0	2
1161:	1	0	1	0	0	0	0	0
1169:	2	2	0	0	0	0	1	0
1177:	1	1	1	0	2	0	0	0
1185:	1	1	1	3	2	0	0	0
1193:	1	1	1	1	1	0	2	1
1201:	0	0	0	0	0	2	0	0
1209:	0	0	1	0	1	0	1	0
1217:	0	0	0	1	0	0	1	0
1225:	1	1	0	1	0	0	2	1
1233:	0	0	0	0	1	0	0	1
1241:	1	1	0	2	0	0	4	1
1249:	0	0	3	0	1	1	0	0
1257:	2	1	0	0	2	1	2	3
1265:	1	0	1	0	0	1	1	3
1273:	2	2	0	0	0	0	0	0
1281:	2	0	0	0	1	0	0	0
1289:	0	0	0	1	1	0	0	1
1297:	0	0	1	0	0	1	0	0
1305:	1	1	0	0	0	0	0	0
1313:	1	0	1	0	0	0	1	0
1321:	0	1	0	0	1	1	1	0
1329:	1	2	0	1	1	0	1	0
1337:	1	0	0	0	0	1	0	0
1345:	1	0	0	0	0	4	2	1
1353:	1	1	0	0	0	1	1	1
1361:	0	1	1	0	1	2	0	2
1369:	0	2	0	1	0	0	0	2
1377:	0	0	0	1	0	0	1	0
1385:	0	1	1	1	2	0	1	0

.393:	0	3	1	0	1	1		
.401:	0	0	0	1	2	0	1	
.409:	1	0	1	3	1	0	1	
417:	2	1	0	0	1	0	2	
25:	0	0	0	1	0	1	1	
.33:	0	1	0	0	1	0	0	
441:	0	0	0	0	1	0	0	
449:	0	1	0	0	0	1	0	
457:	0	1	1	0	0	1	0	2
465:	1	1	1	1	0	1	2	0
473:	0	0	0	1	2	0	0	0
481:	0	0	1	1	0	0	0	0
489:	1	0	0	2	0	0	0	1
497:	0	1	1	0	1	2	0	0
505:	1	1	2	1	0	2	1	0
513:	0	2	1	1	0	0	1	0
521:	1	1	0	1	1	0	1	2
529:	1	0	2	1	0	0	0	1
537:	0	0	2	1	1	1	1	0
545:	1	2	2	0	0	0	0	1
553:	0	1	1	0	0	1	0	0
561:	0	0	1	1	1	1	0	2
569:	0	1	0	0	1	1	0	0
577:	0	0	0	0	0	0	1	0
585:	0	1	2	2	2	1	0	0
593:	0	0	0	0	1	0	0	1
601:	1	0	0	1	1	0	0	0
609:	0	1	0	2	1	0	0	0
617:	1	1	1	0	0	0	0	2
5:	1	1	1	1	0	0	0	1
3:	0	0	2	0	2	0	1	0
641:	0	0	0	0	0	0	1	0
649:	1	0	0	1	2	0	0	0
657:	0	0	2	0	0	0	0	0
665:	0	2	2	1	1	0	0	1
673:	0	0	0	0	0	0	0	0
681:	2	0	1	1	0	0	0	0
689:	1	1	1	1	0	0	0	2
697:	1	1	1	0	0	1	1	0
705:	0	0	0	1	0	0	3	0
713:	0	1	1	1	0	1	0	1
721:	0	0	0	2	2	0	1	1
729:	0	0	0	0	1	1	1	1
737:	1	0	0	1	0	0	0	1
745:	0	1	0	0	1	1	1	0
753:	0	1	0	2	0	0	0	0
761:	0	1	0	0	0	0	0	1
769:	0	0	1	0	0	0	1	0
777:	0	0	0	0	0	0	1	0
785:	0	0	1	0	0	1	1	0
793:	0	2	0	1	1	1	1	0
301:	1	0	0	1	1	0	0	0
309:	0	0	1	0	0	1	0	0
317:	1	2	0	1	0	0	0	1
[illegible]:	0	0	1	1	0	1	0	3
[illegible]:	0	0	1	1	0	0	0	1
[illegible]:	0	0	1	1	0	3	0	1
349:	0	0	0	1	0	0	1	0
357:	1	0	0	2	0	2	0	1
365:	1	0	0	2	0	2	0	0

00524

1873:	2	0	0	0	1	1	1	
1881:	5	0	0	1	1	0	1	
1889:	1	1	2	0	0	0	2	
[illegible]	0	2	1	2	0	1	0	
[illegible]95:	0	1	3	0	2	1	0	
[illegible]13:	0	0	0	0	0	2	0	0
1921:	0	0	0	0	0	1	0	1
1929:	1	2	0	0	0	0	0	0
1937:	0	1	0	2	0	1	0	4
1945:	0	0	1	1	0	0	0	0
1953:	2	1	0	0	0	1	0	1
1961:	1	0	2	1	3	0	0	0
1969:	1	0	0	0	0	0	0	0
1977:	1	0	0	1	0	0	0	0
1985:	0	1	0	0	0	0	0	0
1993:	1	0	0	0	1	0	0	1
2001:	0	1	0	0	1	1	0	0
2009:	1	1	0	0	0	1	0	1
2017:	0	0	0	1	0	1	2	0
2025:	1	0	0	0	1	0	0	1
2033:	0	0	0	1	1	1	0	2
2041:	0	0	1	2	0	1	0	1
2049:	0	0	0	0	0	0	0	1
2057:	0	0	0	0	1	1	1	0
2065:	0	1	0	0	1	1	2	0
2073:	0	2	1	1	0	0	1	1
2081:	0	0	0	3	0	0	1	0
2089:	0	0	1	0	0	0	1	0
[illegible]97:	0	0	0	0	0	0	0	0
[illegible]05:	0	0	0	1	0	0	0	0
[illegible]13:	0	0	1	1	1	0	0	0
2121:	0	0	1	0	0	1	0	1
2129:	0	0	0	0	0	0	1	1
2137:	1	0	0	0	0	0	2	1
2145:	0	0	0	0	0	0	0	1
2153:	0	1	1	0	0	0	0	0
2161:	1	2	0	1	0	0	0	0
2169:	2	0	0	2	0	0	1	0
2177:	0	1	1	0	0	0	1	1
2185:	0	1	0	0	0	0	1	1
2193:	0	0	1	0	0	0	0	0
2201:	0	1	1	1	2	1	0	0
2209:	0	0	0	0	0	0	0	1
2217:	0	0	1	1	0	1	0	1
2225:	1	0	0	0	0	1	1	1
2233:	1	0	2	0	0	1	0	0
2241:	1	1	2	0	0	0	0	0
2249:	1	1	0	0	0	0	0	0
2257:	1	0	0	0	2	0	2	0
2265:	0	0	1	0	1	1	0	1
2273:	0	0	0	0	0	1	0	1
2281:	1	0	0	0	0	1	0	1
2289:	0	2	0	0	0	0	0	0
2297:	3	0	0	0	0	0	0	0
[illegible]05:	1	1	0	1	1	1	0	0
[illegible]13:	0	0	0	0	0	1	0	1
[illegible]21:	1	0	0	1	1	1	0	0
2329:	0	0	0	0	0	2	0	0
2337:	0	1	0	0	0	0	0	0
2345:	1	0	0	0	0	0	0	0

2353:	0	0	0	0	0	1	1	[illegible]
2361:	1	0	0	0	0	0	0	[illegible]
2369:	0	0	1	1	0	0	0	[illegible]
[illegible]77:	0	1	0	1	0	0	0	[illegible]
[illegible]85:	1	0	0	0	0	1	1	[illegible]
[illegible]93:	0	0	0	1	0	0	1	[illegible]
2401:	0	1	0	1	0	0	0	[illegible]
2409:	0	0	1	0	0	0	0	1
2417:	1	0	0	2	1	0	1	2
2425:	0	2	1	0	0	1	1	0
2433:	0	0	0	1	0	2	0	0
2441:	0	2	1	0	0	1	0	0
2449:	0	2	0	2	0	0	1	0
2457:	0	0	0	0	0	0	1	2
2465:	2	0	1	0	0	0	1	0
2473:	0	0	0	0	0	0	1	0
2481:	0	0	0	0	0	0	0	1
2489:	0	0	2	0	0	0	0	1
2497:	0	0	0	0	0	0	1	0
2505:	0	0	0	0	0	0	1	0
2513:	0	0	1	0	0	1	0	0
2521:	1	0	0	0	0	1	0	0
2529:	2	0	0	0	1	0	1	0
2537:	0	1	0	0	1	3	2	0
2545:	0	0	2	3	0	0	1	1
2553:	0	1	1	2	1	0	0	0
2561:	0	0	0	0	0	0	0	1
2569:	0	1	0	0	0	0	0	1
[illegible]577:	0	0	0	0	1	2	0	1
[illegible]85:	0	0	0	1	0	1	1	0
[illegible]93:	0	0	0	1	0	1	2	0
2601:	1	0	1	1	0	0	0	0
2609:	1	0	0	0	0	0	0	0
2617:	0	0	0	0	0	0	0	1
2625:	0	0	1	0	0	0	1	0
2633:	0	1	0	0	0	1	0	0
2641:	1	0	1	0	0	0	0	0
2649:	1	0	0	1	0	0	2	0
2657:	0	0	0	0	0	0	0	1
2665:	1	1	1	0	0	1	0	1
2673:	1	0	0	0	1	0	1	0
2681:	0	0	0	1	0	0	0	0
2689:	1	0	0	1	0	0	0	0
2697:	0	1	1	0	0	0	0	0
2705:	0	0	0	0	0	1	0	0
2713:	2	0	0	0	0	1	2	0
2721:	0	0	0	0	0	0	0	0
2729:	3	0	0	0	0	0	0	1
2737:	0	0	0	0	1	0	0	0
2745:	0	0	1	0	0	0	0	0
2753:	0	0	0	0	0	0	1	0
2761:	0	0	0	0	0	0	1	0
2769:	0	1	0	1	0	0	0	0
2777:	0	0	1	0	0	0	0	0
[illegible]85:	0	1	1	0	0	1	1	0
[illegible]93:	0	0	0	0	0	0	1	0
[illegible]01:	0	1	0	0	0	1	1	0
2809:	0	1	0	1	0	0	1	0
2817:	0	0	0	0	0	0	0	1
2825:	1	0	1	0	1	1	0	0

2833:	0	0	0	2	0	1	0	0
2841:	0	1	0	0	1	0	1	0
2849:	0	0	0	1	0	0	1	0
2857:	0	0	0	0	0	0	1	0
2865:	0	0	0	0	1	1	0	0
2873:	0	1	0	1	0	0	0	0
2881:	0	0	0	0	0	0	0	0
2889:	0	0	0	0	0	0	0	0
2897:	0	1	0	0	0	0	0	0
2905:	0	0	0	1	0	1	1	0
2913:	0	0	0	2	0	0	0	0
2921:	1	2	0	0	0	0	1	0
2929:	0	1	0	0	0	1	0	1
2937:	0	0	0	0	0	0	0	0
2945:	1	1	0	2	0	0	0	0
2953:	0	1	0	1	0	1	0	0
2961:	0	1	0	0	0	0	0	0
2969:	0	1	0	0	0	0	1	1
2977:	0	1	1	0	1	0	1	1
2985:	0	0	0	1	0	1	0	0
2993:	0	0	0	0	0	0	2	0
3001:	0	0	1	0	0	1	0	0
3009:	0	1	0	1	0	0	0	1
3017:	0	0	0	0	0	1	0	0
3025:	1	0	0	0	0	0	0	1
3033:	1	0	0	0	0	0	0	1
3041:	0	0	1	1	1	0	0	1
3049:	1	0	1	1	0	0	2	0
3057:	0	0	1	0	0	0	1	0
3065:	0	0	0	0	0	1	0	0
3073:	0	0	0	0	1	0	0	0
3081:	0	0	0	1	1	0	0	0
3089:	0	0	1	1	1	0	0	0
3097:	0	0	0	0	0	0	0	0
3105:	1	0	0	0	0	0	0	0
3113:	2	1	0	0	0	0	0	0
3121:	0	0	0	1	0	0	1	0
3129:	0	0	0	0	0	0	0	0
3137:	0	0	1	0	0	0	0	0
3145:	0	0	0	0	2	0	0	0
3153:	0	0	1	1	1	0	0	0
3161:	0	0	1	0	0	0	0	0
3169:	0	2	0	0	0	0	1	0
3177:	1	0	0	0	1	0	0	1
3185:	1	0	0	1	0	0	0	0
3193:	0	0	0	0	1	0	0	0
3201:	0	0	0	0	1	0	0	0
3209:	1	1	0	0	0	0	0	0
3217:	0	1	0	0	0	0	0	1
3225:	0	0	0	0	1	0	0	0
3233:	0	1	0	1	0	0	0	0
3241:	0	0	0	0	0	0	0	0
3249:	0	1	0	0	0	1	0	0
3257:	1	0	0	0	2	0	0	0
3265:	0	0	0	0	0	0	0	0
3273:	0	0	1	0	0	0	0	1
3281:	0	0	0	0	0	0	0	0
3289:	0	0	1	0	0	2	0	0
3297:	0	0	0	0	0	0	0	0
3305:	0	2	0	0	0	0	0	0

3313:	1	0	1	2	0	0	0	1
3321:	0	0	0	0	0	1	1	0
3329:	0	0	0	0	0	1	1	0
3337:	0	0	0	1	0	0	0	0
3345:	0	0	0	0	1	0	1	0
3353:	0	0	0	0	1	0	0	0
3361:	1	0	0	1	1	1	0	0
3369:	0	0	0	0	0	0	0	0
3377:	1	0	0	0	0	1	0	0
3385:	0	1	0	0	1	0	1	0
3393:	1	0	0	0	1	2	0	0
3401:	0	0	0	0	0	0	0	1
3409:	0	0	0	1	0	0	0	0
3417:	1	0	1	0	1	0	0	0
3425:	1	2	0	1	0	0	0	0
3433:	0	0	0	0	1	0	1	0
3441:	0	0	0	0	0	0	0	0
3449:	1	0	0	0	0	0	0	0
3457:	0	1	0	0	0	0	0	0
3465:	0	0	0	0	0	0	0	0
3473:	1	0	0	0	0	0	0	1
3481:	0	0	0	0	0	0	0	0
3489:	0	1	1	0	0	0	0	0
3497:	0	1	1	0	0	0	0	0
3505:	0	0	1	0	1	0	1	0
3513:	0	0	0	1	0	1	1	0
3521:	0	1	0	0	0	2	0	0
3529:	0	0	0	0	0	0	0	0
3537:	0	2	2	1	0	0	0	0
3545:	0	0	0	0	0	0	0	0
3553:	0	0	0	0	0	0	0	0
3561:	0	1	0	0	1	0	1	0
3569:	0	0	1	0	0	0	0	0
3577:	1	0	0	0	0	0	0	0
3585:	0	0	0	0	0	0	0	0
3593:	1	1	0	0	0	0	0	0
3601:	0	0	0	0	0	0	0	0
3609:	0	0	0	0	0	0	0	0
3617:	0	0	0	0	0	0	0	0
3625:	0	0	1	0	0	0	0	0
3633:	0	0	0	0	0	1	0	0
3641:	0	0	0	0	0	0	0	3
3649:	0	0	0	0	0	0	0	0
3657:	1	0	0	0	0	0	0	1
3665:	0	0	0	2	0	0	0	0
3673:	1	0	0	0	1	0	0	0
3681:	0	1	0	0	0	0	0	0
3689:	0	0	0	0	0	1	0	0
3697:	0	0	0	0	0	0	0	0
3705:	1	0	0	0	0	0	0	0
3713:	0	0	0	1	0	1	0	0
3721:	0	1	0	0	1	0	0	0
3729:	0	0	1	0	0	0	0	0
3737:	0	0	0	0	0	0	1	1
3745:	0	0	0	0	0	0	1	0
3753:	0	0	0	0	0	0	0	0
3761:	1	0	0	0	1	0	1	0
3769:	0	2	0	0	0	0	1	0
3777:	0	0	0	0	0	0	0	0
3785:	1	0	0	0	0	1	0	0

793:	1	0	0	0	0	0	0	
801:	0	0	0	0	0	0	0	
809:	0	1	0	0	0	0	0	
[illegible]	0	0	0	0	0	1	0	
[illegible]25:	0	1	1	0	0	0	0	
[illegible]33:	0	0	0	0	1	1	0	
3841:	0	0	0	0	0	0	0	
3849:	1	0	0	0	0	0	2	0
3857:	0	0	0	0	0	0	1	0
3865:	1	0	0	0	0	0	0	0
3873:	1	0	0	0	0	0	0	1
3881:	0	0	0	1	0	0	1	1
3889:	0	0	0	0	1	0	1	0
3897:	0	0	1	0	0	0	0	0
3905:	0	0	0	0	0	0	0	0
3913:	0	1	0	0	0	0	0	0
3921:	0	0	0	0	0	1	0	0
3929:	0	0	0	0	0	0	0	1
3937:	0	0	0	0	0	0	0	0
3945:	0	0	0	0	0	0	0	0
3953:	0	0	0	0	0	0	0	0
3961:	0	0	1	0	0	0	0	0
3969:	0	0	0	0	1	0	0	0
3977:	0	0	0	0	1	0	0	0
3985:	0	0	0	0	0	0	0	1
3993:	1	0	0	0	0	0	0	0
4001:	0	0	0	0	1	0	0	0
4009:	1	0	0	0	0	0	0	0
[illegible]7:	0	1	0	0	0	0	0	0
[illegible]5:	0	0	0	0	1	0	0	0
[illegible]33:	0	1	0	0	0	0	1	0
4041:	0	1	0	0	1	0	0	0
4049:	0	0	0	0	0	0	0	0
4057:	0	0	0	0	0	0	0	0
4065:	0	1	0	0	1	0	0	0
4073:	0	0	0	0	0	0	0	0
4081:	0	0	0	1	0	1	0	0
4089:	0	0	0	1	0	0	1	0

Sample ID : 0211141-02 Acquisition date : 5-DEC-2002 18:02:29

/VMS Peak Search Report Generated 6-DEC-2002 05:46:01.04

Configuration	: DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_021114102_GE5_FE55_48320.CNF;		
Analyses by	: PEAK V16.9 ENBACK V1.6 PEAKEFF V2.2		
Client ID	: BLANK		
Deposition Date	:		
Sample Date	: 26-NOV-2002 00:00:00	Acquisition date	: 5-DEC-2002 18:02:29.
Sample ID	: 0211141-02	Sample Quantity	: 1.00000E+00 gram
Sample type	: SOIL	Sample Geometry	: 0
Detector name	: GE5	Detector Geometry	: FE55
Elapsed live time	: 0 01:00:00.00	Elapsed real time	: 0 01:00:03.85 0.1%
Start channel	: 1	End channel	: 4096
Sensitivity	: 3.00000	Gaussian	: 15.00000
Critical level	: No		

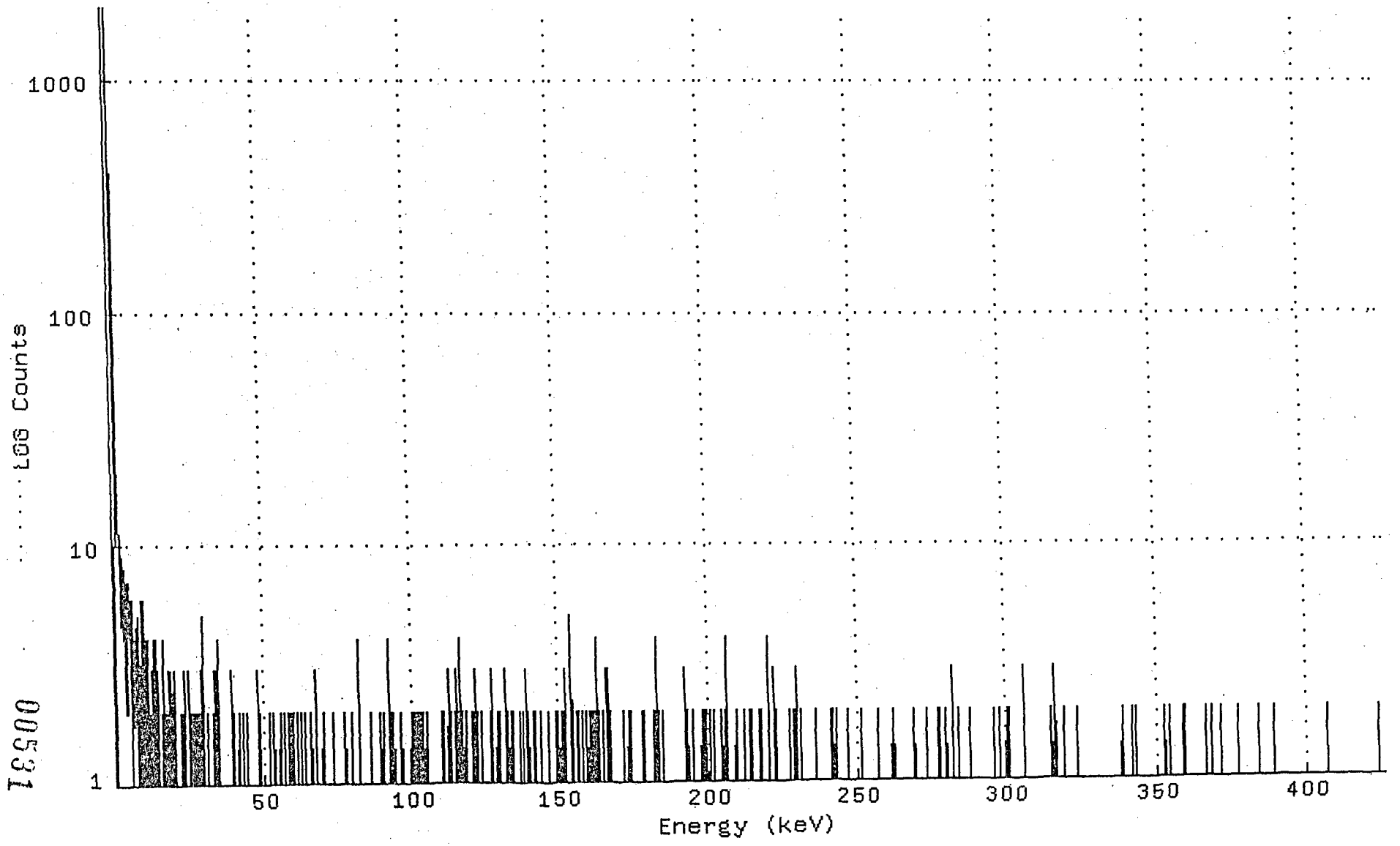
Post-NID Peak Search Report
***** No peaks found *****

AG 12/6/02

00530

Spectr[illegible] : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_[illegible]114102_GE5_FE55_48320.CNF;1
Title :
Sample Title: BLANK

Start Time:	5-DEC-2002 18:02:	Sample Time:	25-NOV-2002 00:00	Energy Offset:	1.88831E-01
Real Time :	0 01:00:03.85	Sample ID :	0211141-02	Energy Slope :	1.03817E-01
Live Time :	0 01:00:00.00	Sample Type:	SOIL	Energy Quad :	-1.02782E-08



00531

Channel Contents for [GAMMA.SCUSR.ARCHIVE]SMP_021114102_GE5_FE55_4832

annel

1:	0	0	0	0	0	0	0	
9:	0	1	103	1076	2074	1590	952	542
17:	297	146	83	36	18	18	7	9
25:	6	5	9	5	4	6	7	6
33:	6	9	6	8	7	2	2	7
41:	6	3	7	7	2	4	5	6
49:	7	5	4	5	3	4	6	5
57:	5	1	3	4	2	5	6	4
65:	3	4	4	3	3	3	1	1
73:	2	4	4	4	5	1	0	5
81:	2	5	2	2	1	3	2	2
89:	4	2	1	3	3	6	3	6
97:	6	3	5	2	1	2	1	2
105:	1	4	0	4	0	2	2	3
113:	2	0	0	1	2	2	1	0
121:	2	2	3	2	0	1	1	0
129:	0	4	1	4	0	3	0	1
137:	2	1	1	1	1	3	1	0
145:	0	1	0	0	0	0	1	1
153:	0	0	1	4	1	2	3	1
161:	3	0	0	0	0	0	2	2
169:	1	1	1	0	1	2	0	1
177:	0	0	3	1	3	1	0	1
185:	0	2	1	0	2	1	1	2
193:	3	2	3	1	1	0	1	1
201:	1	0	0	0	0	0	0	1
209:	1	0	1	2	0	1	1	0
217:	0	0	0	1	0	2	1	2
225:	1	3	1	0	0	0	1	0
233:	1	1	0	1	1	0	1	3
241:	0	0	0	0	2	1	1	2
249:	0	2	2	0	2	1	0	0
257:	0	0	1	0	1	2	0	0
265:	1	1	2	0	1	1	0	2
273:	0	0	2	0	0	0	1	1
281:	1	3	3	2	1	5	1	1
289:	1	0	0	1	0	0	0	0
297:	0	0	2	0	1	0	0	0
305:	0	0	0	0	1	0	0	1
313:	0	1	0	0	0	0	2	0
321:	3	2	1	0	0	0	1	1
329:	3	2	0	2	1	0	0	4
337:	0	0	0	0	0	0	0	1
345:	0	0	0	1	0	0	1	0
353:	1	0	1	0	1	0	0	0
361:	0	0	0	0	1	0	1	0
369:	0	0	0	1	0	0	0	3
377:	0	0	1	1	1	2	1	0
385:	0	1	0	0	1	0	0	1
393:	0	0	1	0	1	0	2	0
401:	0	0	1	0	0	1	0	1
409:	0	0	0	1	1	2	0	1
417:	0	1	0	0	1	0	0	0
425:	0	2	0	0	0	0	1	0

433:	0	0	0	0	0	0	0	0
441:	1	0	1	0	1	0	0	1
449:	1	0	0	0	0	0	0	1
457:	0	0	0	3	2	1	0	0
465:	1	2	2	1	1	0	0	0
473:	0	1	0	0	0	0	0	1
481:	0	0	0	0	0	0	1	1
489:	0	0	0	1	0	1	0	1
497:	1	2	0	0	0	0	1	0
505:	1	1	0	1	0	0	0	0
513:	2	0	0	0	1	1	1	1
521:	1	0	0	1	1	1	0	1
529:	0	1	0	2	0	1	0	1
537:	0	1	0	0	0	0	1	0
545:	0	2	0	0	0	0	0	0
553:	1	0	0	1	0	2	1	2
561:	2	0	0	0	0	0	2	1
569:	1	0	0	2	2	0	0	0
577:	2	2	1	0	0	0	1	0
585:	1	0	0	0	0	2	0	1
593:	1	1	0	0	0	0	0	0
601:	0	2	1	0	1	1	0	0
609:	0	0	0	2	0	0	1	0
617:	0	0	0	0	0	0	1	1
625:	1	0	0	1	0	0	1	0
633:	0	2	0	1	1	0	1	0
641:	0	1	0	1	1	0	0	0
649:	3	0	0	1	1	1	1	1
657:	0	0	0	0	1	0	0	0
665:	0	0	1	1	1	0	0	2
673:	0	0	0	1	1	0	0	1
681:	0	1	0	0	1	1	0	0
689:	0	1	1	0	0	0	0	1
697:	0	1	0	1	0	1	0	0
705:	2	0	1	1	0	1	0	1
713:	0	0	0	0	0	0	1	0
721:	0	0	0	0	1	1	0	0
729:	0	0	1	0	0	0	0	0
737:	0	0	0	0	0	0	2	0
745:	0	0	1	0	0	0	0	1
753:	0	0	1	0	1	0	0	0
761:	0	0	1	1	1	2	1	1
769:	0	0	0	0	1	1	0	0
777:	0	0	0	1	0	1	0	1
785:	0	0	1	0	1	4	0	0
793:	1	0	1	0	0	0	0	0
801:	0	0	0	1	1	0	0	1
809:	0	0	0	0	0	1	0	0
817:	0	0	0	0	0	0	0	2
825:	0	1	0	0	0	1	0	0
833:	0	0	0	1	0	0	0	0
841:	0	1	0	0	0	0	0	0
849:	0	0	0	0	0	0	1	0
857:	0	0	2	0	1	0	1	1
865:	1	0	0	2	0	0	1	0
873:	0	0	0	0	0	1	0	1
881:	1	0	0	1	0	0	1	0
889:	4	0	1	0	1	2	0	0
897:	0	1	1	0	2	0	1	0
905:	0	1	1	1	1	0	1	0

913:	0	0	1	0	1	1	0	1
921:	0	2	0	0	2	1	1	0
929:	0	0	1	0	0	1	1	0
937:	0	1	0	0	0	0	0	[illegible]
945:	0	0	1	1	1	0	1	[illegible]
953:	1	0	0	0	2	0	2	0
961:	0	0	0	1	1	0	2	1
969:	0	2	1	2	1	0	0	1
977:	1	0	1	2	0	0	0	0
985:	1	2	2	0	0	0	0	1
993:	0	1	0	1	2	2	0	1
1001:	0	1	0	1	2	0	0	0
1009:	1	1	1	1	1	0	0	0
1017:	1	1	1	1	0	0	0	0
1025:	1	1	0	0	1	0	0	0
1033:	0	1	0	0	0	0	0	1
1041:	1	0	0	1	0	1	0	1
1049:	1	0	0	0	1	1	0	1
1057:	0	2	0	1	0	2	0	0
1065:	0	0	1	0	0	1	0	0
1073:	0	0	0	0	0	3	2	1
1081:	0	0	1	0	0	2	0	0
1089:	1	0	0	0	0	0	0	0
1097:	1	0	0	0	2	1	1	1
1105:	3	0	0	1	1	1	1	1
1113:	0	4	0	1	1	0	0	0
1121:	1	1	0	0	0	2	0	1
1129:	1	0	1	0	0	2	0	0
1137:	1	1	0	0	0	0	1	1
1145:	1	0	0	0	0	0	1	[illegible]
1153:	0	1	2	1	0	0	0	0
1161:	2	2	0	0	0	0	0	3
1169:	1	0	2	0	0	0	1	1
1177:	0	0	0	0	0	1	2	2
1185:	1	0	0	0	1	1	1	0
1193:	0	0	0	0	0	0	1	0
1201:	1	0	0	0	0	0	0	1
1209:	1	0	0	0	0	1	1	2
1217:	0	3	1	1	0	1	1	1
1225:	0	0	0	0	0	1	0	0
1233:	0	1	0	2	0	1	1	1
1241:	2	2	1	0	1	2	0	1
1249:	0	0	1	0	1	0	0	0
1257:	0	1	0	1	0	0	2	0
1265:	3	1	0	0	0	2	0	0
1273:	1	0	1	0	0	2	1	1
1281:	0	0	1	0	0	2	1	0
1289:	1	1	1	0	1	0	0	1
1297:	1	0	1	0	0	0	0	0
1305:	1	0	1	1	1	0	0	2
1313:	1	1	1	0	1	0	1	0
1321:	1	0	2	2	1	0	0	1
1329:	0	1	0	1	1	3	0	2
1337:	1	0	0	1	1	0	1	2
1345:	0	0	1	1	1	1	0	0
1353:	0	0	1	1	1	1	2	0
1361:	0	0	0	2	1	2	0	0
1369:	1	1	1	0	0	1	1	0
1377:	0	0	1	0	0	0	0	0
1385:	2	0	1	1	1	1	1	1

1393:	0	0	1	0	1	0	1	0
1401:	0	0	1	1	0	1	0	0
1409:	0	2	0	0	1	0	0	0
1417:	0	1	0	0	1	0	0	0
1425:	0	1	0	0	0	1	0	1
1433:	1	0	2	2	0	0	1	0
1441:	2	0	0	0	1	0	1	2
1449:	0	2	1	0	0	2	0	0
1457:	0	0	0	0	0	3	0	0
1465:	0	0	0	1	0	0	1	0
1473:	1	0	1	0	0	0	0	0
1481:	0	0	5	0	0	0	0	0
1489:	0	0	0	0	1	1	1	1
1497:	0	1	0	1	2	0	0	0
1505:	2	2	0	0	0	0	0	1
1513:	1	1	0	1	2	1	0	0
1521:	1	0	0	0	0	1	0	0
1529:	2	0	2	2	1	0	0	0
1537:	0	0	0	0	1	2	0	2
1545:	0	2	1	0	0	0	1	0
1553:	0	0	2	1	0	0	2	1
1561:	0	0	1	2	0	0	1	4
1569:	1	1	1	1	0	0	1	0
1577:	0	1	0	0	0	2	0	0
1585:	2	0	1	0	0	0	0	0
1593:	0	1	0	2	0	0	3	0
1601:	1	3	1	0	0	2	0	1
1609:	1	1	0	0	1	1	0	0
1617:	0	1	0	1	1	0	0	0
1625:	0	0	1	1	1	0	0	0
1633:	1	1	0	0	1	0	1	0
1641:	0	0	0	0	0	1	0	0
1649:	2	1	0	2	0	0	0	0
1657:	1	1	0	0	0	1	0	0
1665:	0	2	0	0	0	0	0	0
1673:	2	0	0	1	0	1	1	1
1681:	0	1	0	1	0	0	0	0
1689:	1	0	0	0	0	0	0	0
1697:	0	0	1	0	0	0	1	0
1705:	0	0	0	1	1	1	1	0
1713:	1	2	0	0	2	0	0	1
1721:	0	0	1	1	0	0	1	1
1729:	0	0	0	0	0	0	0	0
1737:	0	0	0	0	0	0	0	0
1745:	0	1	2	0	0	0	0	2
1753:	1	0	0	0	0	1	0	0
1761:	4	1	0	2	1	1	0	1
1769:	0	0	0	0	1	1	0	0
1777:	2	0	0	0	1	0	1	0
1785:	0	0	0	1	1	1	0	1
1793:	0	1	0	0	1	0	0	0
1801:	0	1	0	0	0	0	0	0
1809:	0	1	0	0	0	0	0	0
1817:	0	1	1	1	1	1	0	0
1825:	0	0	0	0	0	0	1	0
1833:	1	0	1	1	0	1	0	0
1841:	1	1	0	1	0	1	0	0
1849:	0	0	0	3	0	1	0	0
1857:	2	0	0	2	1	1	0	1
1865:	1	0	0	0	0	1	0	0

1873:	0	2	1	0	0	1	0	1
1881:	0	1	0	1	0	0	1	1
1889:	0	1	0	0	1	1	1	1
1897:	0	0	1	1	0	0	2	0
1905:	0	0	0	0	2	0	1	0
1913:	0	0	2	0	0	0	1	0
1921:	0	1	1	0	0	0	0	1
1929:	2	0	1	0	0	1	0	0
1937:	0	0	0	0	0	0	2	1
1945:	0	1	1	0	0	0	0	0
1953:	0	0	0	0	0	0	1	1
1961:	1	1	0	0	1	1	0	1
1969:	2	1	1	1	0	0	0	0
1977:	0	0	1	2	0	0	0	0
1985:	4	0	0	0	0	1	0	0
1993:	0	0	0	1	0	1	1	0
2001:	0	1	0	0	0	0	0	0
2009:	0	0	0	2	0	0	1	0
2017:	0	0	1	0	0	0	0	0
2025:	0	1	0	0	1	1	0	0
2033:	0	0	1	1	0	0	2	1
2041:	0	0	0	0	0	1	1	0
2049:	1	0	1	0	0	0	1	0
2057:	2	0	0	0	1	2	0	0
2065:	2	0	0	1	1	0	0	0
2073:	0	0	0	0	0	0	1	0
2081:	0	0	0	0	1	2	1	0
2089:	0	0	2	0	0	0	2	0
2097:	0	0	1	0	0	0	0	0
2105:	0	0	1	1	1	0	0	0
2113:	0	0	0	0	0	4	0	1
2121:	0	0	1	1	0	1	1	0
2129:	0	0	0	0	0	0	0	0
2137:	3	0	0	0	0	1	0	2
2145:	0	0	0	1	1	0	0	0
2153:	1	0	0	0	0	0	1	0
2161:	1	1	0	0	1	1	0	0
2169:	1	0	0	1	0	0	1	0
2177:	0	0	0	0	0	0	0	0
2185:	1	2	0	0	0	0	0	0
2193:	0	1	2	0	1	0	0	0
2201:	0	0	2	0	0	3	0	1
2209:	0	0	0	0	0	0	0	0
2217:	0	1	1	1	0	2	1	0
2225:	1	0	0	0	0	0	1	0
2233:	0	0	0	0	0	1	1	0
2241:	1	0	0	0	0	0	0	1
2249:	0	0	0	1	0	0	0	0
2257:	0	1	1	0	0	0	1	0
2265:	0	0	0	0	1	1	2	1
2273:	0	0	1	0	1	0	0	0
2281:	0	1	1	0	0	0	0	0
2289:	0	0	1	0	1	0	0	0
2297:	1	0	0	0	0	1	0	1
2305:	0	1	0	0	1	0	0	1
2313:	0	0	0	0	0	0	0	2
2321:	0	2	0	0	0	1	0	1
2329:	0	0	0	1	0	2	2	1
2337:	0	0	0	0	0	1	0	1
2345:	0	0	0	0	0	1	0	0

2353:	0	1	0	0	0	0	1	0
2361:	1	0	0	1	0	0	0	0
2369:	0	0	0	1	2	0	0	0
2377:	0	0	1	0	0	1	0	0
2385:	1	0	1	1	0	1	0	0
2393:	0	0	0	1	0	0	1	0
2401:	1	0	1	1	1	0	0	0
2409:	1	0	1	1	0	1	0	0
2417:	2	1	0	0	1	1	1	0
2425:	1	0	0	0	0	0	0	1
2433:	0	0	0	0	1	0	0	0
2441:	0	0	1	0	1	0	0	1
2449:	0	0	1	0	0	1	0	0
2457:	0	0	0	0	0	0	0	1
2465:	0	0	0	0	0	2	0	0
2473:	0	0	0	1	1	0	0	1
2481:	0	1	1	1	0	0	0	0
2489:	0	1	1	1	0	1	0	0
2497:	1	0	0	0	0	0	1	0
2505:	0	1	1	0	0	0	0	0
2513:	1	0	0	2	0	0	1	0
2521:	2	0	0	0	1	1	0	1
2529:	0	0	0	0	0	1	1	0
2537:	0	1	0	1	0	0	0	0
2545:	0	0	0	0	1	0	0	0
2553:	0	0	0	0	1	0	0	1
2561:	0	0	0	0	0	0	0	0
2569:	1	0	0	1	1	0	0	0
2577:	1	0	0	0	0	1	0	0
2585:	1	0	2	2	0	0	1	0
2593:	0	0	0	0	0	1	0	0
2601:	1	0	1	0	0	0	0	0
2609:	0	0	0	0	0	1	0	0
2617:	1	1	0	0	0	1	0	0
2625:	0	0	0	2	1	1	0	0
2633:	0	0	0	1	1	0	0	0
2641:	1	0	0	0	0	0	0	0
2649:	0	0	0	0	0	1	0	0
2657:	0	0	0	0	0	0	0	2
2665:	0	0	1	1	0	2	1	0
2673:	0	0	1	0	0	0	0	0
2681:	0	1	0	0	1	0	0	1
2689:	1	0	2	1	0	1	0	0
2697:	1	0	0	0	0	0	0	0
2705:	1	0	1	0	0	0	0	3
2713:	0	0	1	1	1	1	0	0
2721:	1	1	1	0	0	0	1	0
2729:	0	0	0	2	0	1	0	1
2737:	0	0	1	0	1	0	0	0
2745:	0	1	0	1	0	0	0	1
2753:	1	0	0	0	0	0	0	0
2761:	1	0	0	0	0	0	2	2
2769:	0	0	0	0	1	1	0	0
2777:	0	1	1	1	1	1	0	0
2785:	0	0	1	0	0	0	0	0
2793:	0	0	0	0	0	1	0	1
2801:	0	0	0	0	0	1	1	0
2809:	1	0	0	0	0	0	0	0
2817:	0	0	0	0	0	1	0	0
2825:	1	1	0	0	0	0	0	0

2833:	0	0	0	0	0	1	1	1
2841:	0	0	0	1	2	0	0	0
2849:	0	0	0	0	0	0	1	1
2857:	1	1	0	0	1	0	0	0
2865:	2	0	0	0	0	0	0	0
2873:	0	0	0	0	1	0	0	0
2881:	0	0	0	0	0	2	0	1
2889:	0	0	0	1	0	2	0	0
2897:	0	0	0	0	0	0	0	0
2905:	0	0	0	0	1	0	0	0
2913:	0	0	0	0	0	0	0	0
2921:	0	0	0	0	0	0	1	1
2929:	0	0	0	0	0	1	0	1
2937:	1	0	0	0	0	0	1	3
2945:	0	1	0	0	1	0	1	0
2953:	0	0	0	0	1	0	0	0
2961:	0	0	0	0	0	0	0	0
2969:	0	0	0	0	1	0	0	0
2977:	0	1	0	1	1	0	1	0
2985:	0	0	0	0	0	1	1	0
2993:	0	0	1	0	0	0	0	0
3001:	1	0	0	1	0	0	0	1
3009:	0	0	0	0	0	0	0	0
3017:	0	0	1	0	0	0	0	0
3025:	0	0	0	0	0	2	0	0
3033:	0	0	0	1	0	1	0	1
3041:	0	1	3	0	0	0	0	0
3049:	1	0	0	0	1	1	0	1
3057:	1	0	0	0	0	0	0	0
3065:	0	0	0	0	0	2	1	0
3073:	0	0	1	0	0	0	0	0
3081:	0	0	1	0	0	0	0	0
3089:	0	0	0	0	0	0	0	0
3097:	0	0	0	0	0	0	0	1
3105:	1	0	0	0	1	1	0	2
3113:	0	0	0	0	0	0	0	0
3121:	0	0	0	0	0	1	0	0
3129:	1	0	1	0	0	0	0	1
3137:	0	0	0	0	0	1	0	0
3145:	0	0	1	0	0	0	0	1
3153:	0	0	0	0	0	0	0	1
3161:	0	0	0	0	0	1	0	1
3169:	0	0	0	0	0	0	0	0
3177:	0	0	0	0	0	0	0	0
3185:	0	0	0	0	0	1	0	0
3193:	0	0	0	1	1	0	1	0
3201:	1	1	0	0	0	0	0	0
3209:	0	0	0	0	0	0	0	0
3217:	0	0	0	0	0	0	1	0
3225:	0	0	0	1	0	1	0	0
3233:	0	0	0	1	0	1	0	0
3241:	0	0	1	0	1	0	1	0
3249:	0	1	0	1	0	1	0	2
3257:	2	0	0	0	0	0	0	0
3265:	0	0	0	0	0	0	0	0
3273:	0	1	0	1	0	1	0	0
3281:	1	0	1	0	0	0	0	1
3289:	0	2	0	0	0	0	0	0
3297:	0	1	0	0	0	0	2	0
3305:	0	0	0	0	0	0	0	1

3313:	0	0	0	0	0	0	0	0
3321:	1	1	0	0	0	0	0	0
3329:	0	0	0	0	0	0	1	0
3337:	0	0	0	0	1	0	0	0
3345:	1	1	1	0	0	0	0	0
3353:	0	0	1	0	0	1	0	0
3361:	0	0	1	0	0	0	0	1
3369:	0	0	0	0	0	0	0	0
3377:	1	0	0	0	1	0	0	0
3385:	1	0	0	0	1	0	0	0
3393:	1	1	2	0	0	0	0	0
3401:	0	0	0	1	0	0	0	0
3409:	0	0	0	2	0	0	0	0
3417:	0	0	1	0	0	0	0	0
3425:	0	0	0	1	1	0	0	1
3433:	0	0	1	1	0	1	1	0
3441:	0	0	0	0	0	0	0	0
3449:	0	0	0	0	0	2	0	0
3457:	0	2	0	0	0	0	0	0
3465:	0	0	0	0	0	0	1	0
3473:	0	0	0	0	0	0	0	1
3481:	0	0	0	0	0	1	0	1
3489:	0	0	0	1	0	0	0	0
3497:	0	1	0	0	0	0	0	1
3505:	0	0	0	0	0	0	1	0
3513:	0	0	0	0	0	0	0	0
3521:	0	0	0	0	0	1	2	0
3529:	0	0	0	1	0	0	0	0
3537:	0	0	0	1	0	0	1	0
3545:	2	1	1	1	0	0	0	0
3553:	0	0	0	0	0	0	0	0
3561:	0	0	0	0	0	0	0	0
3569:	0	0	0	0	1	2	0	0
3577:	0	0	0	0	0	1	0	0
3585:	0	0	1	0	0	1	0	0
3593:	0	0	1	0	0	0	0	1
3601:	0	0	0	1	0	0	0	0
3609:	0	0	0	0	0	0	1	0
3617:	0	0	0	0	0	0	0	0
3625:	0	0	0	0	2	0	0	0
3633:	0	0	0	0	1	1	0	0
3641:	0	0	0	0	0	0	1	0
3649:	1	0	0	0	0	0	0	0
3657:	0	1	0	0	1	0	1	0
3665:	0	0	0	0	0	0	0	0
3673:	1	0	1	0	0	0	1	0
3681:	0	0	0	0	0	0	1	0
3689:	0	0	1	1	0	0	0	0
3697:	2	0	0	0	0	0	1	0
3705:	0	0	1	1	0	0	0	0
3713:	0	1	0	0	0	0	1	0
3721:	0	1	0	0	0	0	0	0
3729:	0	1	0	0	0	1	0	1
3737:	0	0	0	0	0	2	0	0
3745:	0	0	0	0	0	0	0	0
3753:	0	0	0	0	0	0	0	0
3761:	0	0	0	0	1	1	0	0
3769:	0	0	0	0	0	1	0	0
3777:	0	0	0	0	0	0	1	1
3785:	0	0	0	0	0	0	0	0

3793:	1	0	0	1	0	0	1	1
3801:	0	0	0	0	0	1	0	0
3809:	0	0	0	0	0	0	0	0
3817:	0	0	0	0	0	0	0	0
3825:	0	0	1	0	0	0	1	0
3833:	0	0	0	0	0	0	0	0
3841:	0	0	0	1	1	0	0	1
3849:	0	0	0	0	0	0	0	1
3857:	0	0	0	0	0	0	0	0
3865:	0	1	0	0	0	0	0	0
3873:	0	0	0	0	0	0	0	0
3881:	0	0	0	0	0	0	0	0
3889:	0	0	0	0	1	0	0	1
3897:	0	1	0	0	0	0	0	0
3905:	0	1	0	0	1	0	0	0
3913:	0	0	2	0	0	0	0	0
3921:	0	0	0	0	0	0	0	0
3929:	0	1	0	0	0	1	0	1
3937:	0	0	0	0	0	0	1	0
3945:	0	0	0	0	0	0	1	1
3953:	0	1	1	0	0	0	0	0
3961:	0	0	0	0	0	0	0	0
3969:	0	0	0	0	0	0	0	0
3977:	0	0	0	0	0	0	0	0
3985:	0	0	0	0	0	0	1	0
3993:	0	0	1	1	0	0	0	0
4001:	0	1	0	0	0	0	0	1
4009:	0	0	1	0	0	0	0	0
4017:	1	0	0	0	0	0	1	1
4025:	0	0	0	0	0	0	0	0
4033:	0	0	0	0	0	0	0	0
4041:	0	0	0	0	0	1	0	0
4049:	0	0	0	0	0	0	0	0
4057:	0	0	0	0	0	0	0	0
4065:	1	0	0	0	0	0	0	1
4073:	0	0	0	1	0	2	0	0
4081:	0	0	0	0	1	1	0	0
4089:	0	0	0	0	0	0	0	0

Sample ID : 0211141-03 Acquisition date : 5-DEC-2002 19:16:34

/VMS Peak Search Report Generated 6-DEC-2002 05:46:22.15

Configuration	: DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_021114103_GE5_FE55_48322.CNF;		
Analyses by	: PEAK V16.9 ENBACK V1.6 PEAKEFF V2.2		
Client ID	: VA-02-0176		
Deposition Date	:		
Sample Date	: 25-NOV-2002 00:00:00	Acquisition date	: 5-DEC-2002 19:16:34.
Sample ID	: 0211141-03	Sample Quantity	: 1.03100E+00 gram
Sample type	: SOIL	Sample Geometry	: 0
Detector name	: GE5	Detector Geometry	: FE55
Elapsed live time	: 0 01:00:00.00	Elapsed real time	: 0 01:00:04.06 0.1%
Start channel	: 1	End channel	: 4096
Sensitivity	: 3.00000	Gaussian	: 15.00000
Critical level	: No		

Post-NID Peak Search Report
***** No peaks found *****

AG 12/6/02

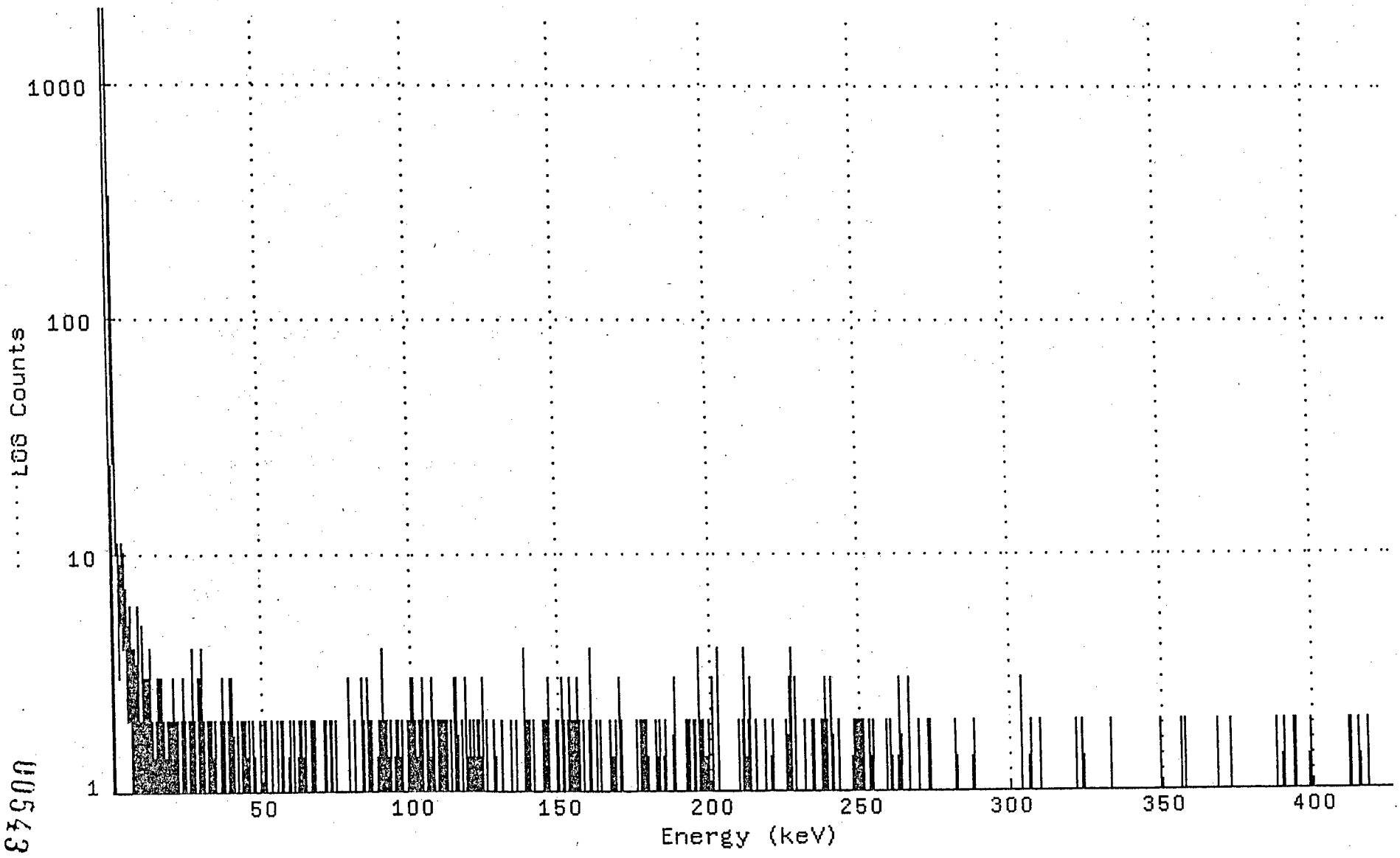
00541

Sample ID : 0211141-03
Acquisition date : 5-DEC-2002 19:16:34

- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/gram)	K.L. Ided	Act error	MDA (pCi/gram)	MDA error	Act/MDA
FE-55	-1.186E+01		1.508E+01	2.470E+01	4.311E+00	-0.480
CO-57	-1.393E+00		1.917E+00	3.114E+00	5.413E-01	-0.447
NI-59	-4.013E+00		1.190E+01	1.770E+01	2.631E+01	-0.227
CD-109	-9.636E+00		3.901E+01	7.234E+01	1.257E+01	-0.133
I-125	-3.265E+01		2.684E+01	3.703E+01	6.437E+00	-0.882
I-129	-1.317E+00		3.713E+00	7.558E+00	1.314E+00	-0.174
BA-133	-3.016E+00		4.456E+00	7.246E+00	1.587E+00	-0.416
CE-144	-1.536E+00		1.494E+01	2.819E+01	4.900E+00	-0.055
PB-210	-1.692E+01		3.181E+01	5.582E+01	9.703E+00	-0.303
PA-231	-8.238E+00		6.808E+00	1.048E+01	1.823E+00	-0.786
TH-231	1.984E+00		1.148E+01	2.225E+01	3.868E+00	0.089
PA-234	-1.146E+00		2.835E+00	4.997E+00	8.687E-01	-0.229
TH-234	3.953E+01		3.616E+01	8.204E+01	1.426E+01	0.482
NP-237	1.262E+00		1.213E+01	2.373E+01	4.124E+00	0.053
U-237	-7.050E+00		1.853E+01	3.352E+01	5.826E+00	-0.210
AM-241	3.854E+00		3.539E+00	8.210E+00	1.427E+00	0.469
AM-243	-1.314E-01		1.948E+00	3.743E+00	7.342E-01	-0.035

Spectru : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_[illegible]14103_GE5_FE55_48322.CNF;1
Title :
Sample Title: VA-02-0176
Start Time: 5-DEC-2002 19:16: Sample Time: 25-NOV-2002 00:00 Energy Offset: 1.88831E-01
Real Time : 0 01:00:04.06 Sample ID : 0211141-03 Energy Slope : 1.03817E-01
Live Time : 0 01:00:00.00 Sample Type: SOIL Energy Quad : -1.02782E-08



U0543

Channel Contents for [GAMMA.SCUSR.ARCHIVE]SMP_021114103_GE5_FE55_48322.CNF

annel

1:	0	0	0	0	0	0	0	0
9:	0	3	189	1564	2105	1456	846	449
17:	247	126	46	21	14	10	11	9
25:	3	8	10	7	5	5	9	8
33:	6	5	6	6	4	11	4	9
41:	5	6	6	10	6	4	5	7
49:	3	4	6	2	5	4	2	4
57:	2	4	5	1	1	1	6	2
65:	2	4	4	1	3	2	3	3
73:	2	1	4	4	3	2	2	0
81:	0	1	3	0	4	6	3	2
89:	2	2	2	0	1	1	3	0
97:	5	3	3	5	2	2	2	1
105:	3	3	3	1	3	0	1	1
113:	0	2	2	1	1	0	3	3
121:	4	3	2	0	1	1	1	2
129:	0	0	1	1	1	1	1	1
137:	1	2	0	0	0	2	0	0
145:	0	1	1	1	3	0	3	3
153:	0	1	0	2	0	0	3	1
161:	2	0	1	2	0	1	2	1
169:	1	1	1	1	1	1	0	2
177:	0	0	2	1	2	2	1	2
185:	0	0	1	0	1	1	1	1
193:	1	3	0	0	2	1	2	1
201:	0	1	1	1	1	1	1	2
209:	0	0	1	0	0	1	1	1
217:	1	1	1	0	2	0	3	3
225:	0	1	0	1	2	1	1	1
233:	2	1	1	1	0	0	1	0
241:	0	0	0	1	1	2	0	2
249:	2	1	0	1	0	4	1	1
257:	0	0	2	2	0	0	0	0
265:	0	0	1	1	0	1	0	2
273:	3	1	1	1	1	0	1	1
281:	1	3	0	4	4	3	3	1
289:	2	1	2	2	0	0	1	0
297:	1	0	0	0	0	0	1	0
305:	0	2	0	2	0	1	0	0
313:	1	1	0	0	0	1	2	1
321:	1	1	1	0	0	0	1	1
329:	2	0	0	0	1	1	1	1
337:	0	0	0	0	0	0	0	0
345:	0	0	2	0	0	0	2	0
353:	0	1	3	0	2	1	1	0
361:	1	0	1	0	0	1	0	1
369:	2	0	0	1	1	1	1	1
377:	1	1	1	3	0	0	1	0
385:	0	3	1	0	1	1	0	0
393:	0	0	0	0	0	0	0	2
401:	0	1	0	1	0	0	0	1
409:	0	0	1	0	0	0	1	2
417:	0	0	0	0	2	1	1	0
425:	1	2	1	0	0	0	1	1

00544

433:	1	1	2	0	0	0	1	0
441:	0	1	0	1	0	0	0	0
449:	0	0	1	2	0	0	1	0
457:	0	0	1	0	0	0	0	1
465:	0	0	0	0	0	1	0	1
473:	0	2	0	0	0	1	1	0
481:	0	1	0	0	1	0	2	0
489:	0	0	0	1	2	0	0	0
497:	0	0	0	1	0	0	1	1
505:	0	0	1	0	2	1	0	0
513:	0	0	0	1	0	1	0	0
521:	1	0	1	0	0	0	0	2
529:	0	0	0	0	1	0	0	0
537:	0	1	2	2	1	0	0	1
545:	2	0	0	0	1	0	0	0
553:	0	0	0	0	0	0	0	0
561:	0	1	0	1	1	0	0	1
569:	2	1	0	2	0	1	0	0
577:	1	1	0	0	1	0	1	0
585:	2	1	0	0	0	0	0	0
593:	1	0	0	0	0	1	2	0
601:	1	0	0	0	2	1	0	1
609:	1	0	1	1	0	1	0	1
617:	2	0	0	1	0	0	0	0
625:	0	0	0	0	1	1	0	0
633:	0	0	0	0	0	2	0	0
641:	2	0	1	0	0	0	0	0
649:	0	2	0	0	1	1	1	0
657:	0	0	0	1	0	1	1	1
665:	1	0	0	0	0	1	1	0
673:	0	0	0	1	0	1	0	0
681:	2	0	0	0	2	1	0	0
689:	0	0	0	0	1	1	0	0
697:	1	0	0	1	2	0	0	1
705:	1	2	0	0	0	0	0	0
713:	0	0	2	0	1	1	0	0
721:	0	0	1	0	1	1	0	1
729:	0	0	0	0	0	1	0	0
737:	1	0	1	0	1	1	0	1
745:	1	1	1	0	0	0	0	1
753:	1	0	0	0	0	0	2	1
761:	3	0	0	1	1	1	0	0
769:	0	1	0	0	0	1	0	0
777:	0	1	2	0	1	0	0	1
785:	0	1	0	0	0	0	0	0
793:	0	1	1	0	1	0	1	1
801:	0	1	0	3	0	1	1	2
809:	0	0	0	0	0	0	1	1
817:	1	3	0	1	1	0	0	2
825:	1	1	0	1	0	0	1	2
833:	0	1	1	0	0	0	0	1
841:	0	1	0	0	0	0	1	0
849:	0	1	0	1	0	2	0	2
857:	0	1	0	2	0	0	1	0
865:	0	0	0	1	0	0	4	0
873:	2	1	0	0	0	0	0	2
881:	0	0	1	0	0	0	0	1
889:	0	2	0	2	0	0	1	0
897:	0	1	0	0	1	0	0	1
905:	1	0	1	2	0	1	1	1

913:	0	1	0	2	1	0	2	1
921:	1	0	0	1	0	2	0	0
929:	0	0	0	0	1	1	1	0
937:	1	1	0	0	1	1	0	[illegible]
945:	0	0	0	1	0	2	0	[illegible]
953:	0	0	2	2	0	0	1	3
961:	0	1	1	0	1	1	1	3
969:	0	1	1	0	0	2	0	0
977:	0	0	1	0	1	2	1	0
985:	0	0	1	1	0	0	2	1
993:	3	1	0	2	1	1	1	1
1001:	1	1	1	0	0	0	2	0
1009:	0	0	0	2	0	0	0	0
1017:	1	0	1	0	1	1	2	2
1025:	0	0	3	0	0	2	0	0
1033:	0	0	0	1	0	1	1	1
1041:	0	1	1	0	2	0	1	0
1049:	2	1	0	0	0	2	0	0
1057:	2	0	0	1	0	0	2	1
1065:	0	1	0	0	0	2	0	2
1073:	1	0	0	1	1	0	0	0
1081:	1	0	1	1	1	2	0	0
1089:	1	0	0	0	1	1	0	0
1097:	0	0	2	2	3	0	1	1
1105:	0	0	3	0	0	1	0	0
1113:	0	1	0	0	0	1	0	0
1121:	1	0	2	1	0	0	0	0
1129:	0	0	0	0	0	0	0	3
1137:	0	2	1	0	0	0	0	0
1145:	1	1	0	0	0	2	0	[illegible]
1153:	1	0	1	1	2	0	0	0
1161:	0	1	0	0	0	0	0	0
1169:	2	1	0	1	1	0	0	0
1177:	0	0	0	2	0	0	0	1
1185:	1	0	0	0	2	1	3	0
1193:	1	0	1	0	1	0	0	0
1201:	2	0	0	1	0	1	1	1
1209:	0	0	0	1	0	0	0	0
1217:	0	0	0	1	1	0	1	0
1225:	0	1	0	1	2	1	0	0
1233:	0	1	0	0	0	1	1	0
1241:	1	1	0	0	0	0	0	0
1249:	1	2	0	0	0	1	0	0
1257:	0	0	1	1	0	0	1	1
1265:	1	1	0	1	0	0	1	1
1273:	0	1	0	0	1	0	0	2
1281:	0	2	0	1	0	1	1	1
1289:	1	1	0	0	1	0	0	0
1297:	0	0	2	0	0	1	1	0
1305:	0	0	1	0	1	1	0	0
1313:	0	0	0	1	1	0	0	0
1321:	1	1	0	0	0	0	1	0
1329:	0	0	0	4	0	0	2	0
1337:	0	0	0	0	0	2	2	0
1345:	2	2	0	0	0	0	0	[illegible]
1353:	0	1	0	1	0	1	1	0
1361:	2	0	0	0	1	0	0	1
1369:	1	0	0	1	0	1	1	0
1377:	1	1	0	1	1	0	0	0
1385:	0	0	1	2	0	0	0	0

1393:	1	0	0	0	2	0	0	2
1401:	0	0	0	0	0	0	0	1
1409:	0	3	0	0	0	0	1	0
1417:	1	1	0	0	1	1	1	0
1425:	1	1	0	0	0	0	0	1
1433:	0	1	2	0	2	0	0	0
1441:	0	0	0	0	0	1	1	1
1449:	0	0	0	3	1	0	0	0
1457:	2	0	1	1	0	1	1	0
1465:	1	0	1	0	2	0	1	2
1473:	0	3	0	1	2	0	2	2
1481:	0	1	1	0	1	1	0	2
1489:	0	2	0	0	0	1	1	0
1497:	3	1	0	0	0	2	2	2
1505:	0	0	0	0	1	1	0	1
1513:	0	0	1	2	0	1	1	0
1521:	0	0	0	1	0	0	0	0
1529:	1	0	0	0	1	2	0	0
1537:	1	0	0	0	0	1	4	1
1545:	0	0	0	0	0	0	1	0
1553:	1	0	0	0	1	2	1	0
1561:	0	1	1	1	0	1	1	1
1569:	0	0	0	2	0	1	0	0
1577:	1	0	0	1	0	0	1	0
1585:	1	0	0	1	0	0	0	0
1593:	1	0	0	0	0	1	0	0
1601:	0	2	0	0	2	0	1	1
1609:	0	0	0	0	0	0	0	0
1617:	0	2	0	2	0	1	0	0
1625:	1	1	0	1	1	0	1	2
1633:	0	3	0	2	1	1	1	0
1641:	0	1	1	0	0	0	0	1
1649:	0	1	1	0	0	0	0	0
1657:	1	0	1	0	1	0	0	0
1665:	0	0	0	0	1	0	1	0
1673:	0	1	0	0	1	1	1	0
1681:	1	0	0	0	0	0	2	0
1689:	0	1	0	0	0	0	0	0
1697:	1	1	0	2	0	1	0	0
1705:	1	2	0	0	0	2	0	1
1713:	0	0	0	2	2	0	0	2
1721:	0	0	0	0	0	1	0	0
1729:	1	0	0	0	0	0	0	0
1737:	0	1	1	0	1	1	0	0
1745:	0	1	0	1	0	2	0	0
1753:	0	0	0	0	0	2	1	0
1761:	1	0	1	0	0	0	0	0
1769:	1	1	1	0	0	0	0	2
1777:	0	0	0	2	1	0	0	0
1785:	0	1	1	0	0	1	1	0
1793:	1	1	0	0	0	0	0	1
1801:	0	1	0	1	0	3	1	0
1809:	0	1	1	1	0	0	0	1
1817:	0	0	0	0	1	1	1	0
1825:	0	1	1	0	0	0	1	1
1833:	1	0	1	1	0	1	1	0
1841:	0	0	2	0	0	1	1	2
1849:	1	0	2	1	0	0	2	0
1857:	0	0	1	0	1	0	0	0
1865:	0	0	0	2	2	2	0	1

1873:	0	0	1	0	2	0	1	1
1881:	0	0	0	0	0	0	1	0
1889:	0	4	0	0	0	1	0	0
1897:	0	0	2	1	0	2	0	0
1905:	0	1	0	1	0	1	0	1
1913:	0	1	2	0	0	0	1	0
1921:	1	0	0	0	1	0	0	0
1929:	1	3	0	0	1	0	0	1
1937:	1	0	0	1	0	1	0	0
1945:	1	0	0	4	0	0	0	1
1953:	1	1	1	1	0	0	1	0
1961:	0	1	0	0	0	0	0	0
1969:	1	0	1	0	0	0	0	0
1977:	0	0	0	1	0	0	0	1
1985:	0	0	0	0	0	1	0	0
1993:	0	0	0	1	1	0	0	1
2001:	0	0	0	0	0	0	0	0
2009:	0	1	0	0	0	1	2	1
2017:	1	1	1	0	0	1	0	0
2025:	0	0	1	1	0	4	0	0
2033:	0	0	0	0	0	0	0	1
2041:	1	0	2	0	0	0	0	0
2049:	0	3	0	0	0	0	0	0
2057:	0	0	1	0	0	0	0	0
2065:	1	0	0	2	0	0	0	0
2073:	0	1	0	0	0	0	0	0
2081:	0	1	0	1	1	0	0	1
2089:	0	0	0	0	0	0	1	1
2097:	0	0	1	2	0	1	1	0
2105:	1	0	0	1	1	0	0	1
2113:	1	1	0	0	0	1	0	1
2121:	2	0	0	0	0	0	0	0
2129:	1	0	1	0	0	0	1	0
2137:	1	1	0	0	0	0	0	0
2145:	1	0	1	0	0	1	0	1
2153:	0	0	0	0	0	0	0	0
2161:	1	0	0	1	0	2	1	0
2169:	0	0	1	0	0	0	1	3
2177:	1	2	0	1	2	4	1	0
2185:	0	0	0	0	0	1	0	1
2193:	0	0	0	1	0	3	0	0
2201:	0	0	0	0	0	1	0	0
2209:	0	1	1	0	0	0	0	0
2217:	0	1	0	0	1	0	0	0
2225:	1	0	2	0	0	0	0	0
2233:	0	1	1	0	1	0	1	0
2241:	0	0	0	0	0	0	0	1
2249:	0	1	2	0	2	1	2	0
2257:	0	0	0	0	0	0	1	0
2265:	0	0	1	0	0	0	1	0
2273:	0	0	1	0	0	0	0	1
2281:	0	1	2	0	0	2	0	0
2289:	1	0	2	1	0	0	3	0
2297:	0	1	1	2	0	1	0	1
2305:	0	0	0	0	0	0	0	0
2313:	0	0	3	0	1	0	0	0
2321:	0	1	0	1	1	1	0	1
2329:	0	1	0	0	0	0	2	0
2337:	0	1	0	0	1	0	0	0
2345:	1	0	1	0	0	1	0	1

2353:	0	1	0	0	0	0	0	0
2361:	1	0	0	0	1	0	0	0
2369:	1	0	1	0	0	0	0	0
2377:	0	0	0	0	0	2	1	0
2385:	0	1	0	2	1	0	0	0
2393:	0	0	0	0	1	2	0	0
2401:	0	0	0	0	2	0	0	2
2409:	0	0	2	0	1	0	2	1
2417:	0	1	1	0	0	1	0	0
2425:	0	0	0	0	1	0	0	1
2433:	1	0	0	2	1	0	1	0
2441:	1	0	0	0	0	0	2	1
2449:	0	1	0	0	0	0	1	0
2457:	0	0	1	0	0	0	0	0
2465:	1	1	1	0	0	1	0	0
2473:	0	0	1	0	0	0	0	1
2481:	0	0	0	1	0	2	0	0
2489:	0	0	0	0	0	1	0	0
2497:	0	0	1	0	1	0	2	0
2505:	0	0	0	1	0	0	0	0
2513:	0	0	1	1	1	0	1	0
2521:	0	1	1	0	0	0	0	2
2529:	2	0	0	0	3	0	0	0
2537:	0	0	1	1	0	0	0	0
2545:	0	0	0	0	1	0	0	0
2553:	1	0	0	0	0	0	3	0
2561:	0	0	0	0	0	0	1	0
2569:	0	1	0	0	1	0	1	1
2577:	0	0	1	0	0	0	1	1
2585:	0	0	0	0	1	2	0	0
2593:	0	0	0	0	0	0	0	0
2601:	0	0	0	1	0	1	0	0
2609:	1	0	0	0	0	0	1	0
2617:	1	1	1	0	0	0	0	2
2625:	0	0	1	0	2	0	0	0
2633:	1	0	0	1	0	0	1	0
2641:	0	0	1	0	0	0	0	1
2649:	0	0	0	0	0	1	0	0
2657:	0	0	0	0	0	0	1	1
2665:	0	0	0	0	0	1	0	0
2673:	0	0	1	0	0	0	0	0
2681:	0	1	0	0	1	0	0	1
2689:	0	1	0	0	0	0	1	0
2697:	1	0	0	1	1	0	0	0
2705:	0	0	1	0	2	0	0	0
2713:	0	0	0	0	0	0	0	0
2721:	0	1	0	0	0	0	0	0
2729:	0	0	0	1	0	0	0	0
2737:	1	1	1	1	0	0	0	0
2745:	0	0	0	1	0	0	0	1
2753:	0	0	0	0	0	1	1	0
2761:	0	0	0	0	2	1	0	1
2769:	1	1	0	0	0	0	0	0
2777:	1	0	0	0	0	0	0	0
2785:	0	1	0	0	0	0	0	0
2793:	0	0	1	0	1	0	1	0
2801:	1	0	0	0	1	0	1	0
2809:	0	1	1	0	0	1	0	1
2817:	0	0	0	0	0	0	0	1
2825:	0	0	1	0	0	1	0	0

2833:	0	0	1	1	0	1	0	0
2841:	0	1	1	0	0	0	0	0
2849:	0	0	0	1	1	0	0	0
2857:	0	0	0	0	0	0	0	0
2865:	0	0	0	0	1	0	0	0
2873:	1	0	0	0	0	0	0	0
2881:	0	0	1	1	0	1	0	0
2889:	0	0	1	0	0	1	0	0
2897:	1	0	0	0	0	0	0	0
2905:	0	0	0	1	0	0	0	0
2913:	0	1	0	1	3	0	1	0
2921:	0	0	0	0	0	0	0	0
2929:	0	0	0	0	0	0	1	0
2937:	0	0	0	1	0	0	1	0
2945:	0	0	2	0	1	1	0	0
2953:	0	0	0	0	0	0	0	0
2961:	1	0	0	0	0	0	1	1
2969:	0	0	0	0	0	0	1	1
2977:	0	0	2	1	0	0	0	0
2985:	0	0	0	0	0	0	0	0
2993:	0	0	0	0	1	0	0	0
3001:	0	1	0	0	0	0	0	0
3009:	0	1	0	0	0	0	0	0
3017:	0	0	0	0	0	1	1	0
3025:	0	0	1	0	0	0	0	0
3033:	0	0	0	0	0	1	1	0
3041:	0	0	0	0	0	0	1	0
3049:	0	0	0	1	0	0	0	0
3057:	0	0	0	1	1	0	0	0
3065:	0	1	0	0	0	0	1	1
3073:	0	1	0	0	0	0	0	0
3081:	0	0	1	0	0	0	0	0
3089:	0	0	0	0	1	1	0	2
3097:	1	0	0	0	0	0	0	0
3105:	1	0	1	0	0	0	0	0
3113:	0	0	2	0	1	0	1	1
3121:	0	1	1	1	0	0	0	0
3129:	0	0	0	0	0	0	1	1
3137:	1	1	0	0	0	0	0	1
3145:	0	0	1	0	0	0	0	0
3153:	0	1	0	0	0	1	0	0
3161:	0	0	0	0	0	0	0	0
3169:	0	0	0	0	1	0	0	1
3177:	0	0	0	0	0	0	0	0
3185:	1	0	0	0	0	0	0	0
3193:	0	0	1	0	0	0	0	1
3201:	0	2	0	0	1	0	0	0
3209:	1	0	0	0	0	1	0	1
3217:	0	0	0	1	0	1	0	0
3225:	0	0	0	0	1	0	0	0
3233:	0	0	0	0	0	0	0	0
3241:	0	0	0	0	0	1	0	0
3249:	0	0	0	1	0	0	0	0
3257:	0	0	0	1	0	0	0	0
3265:	0	0	0	0	0	0	0	0
3273:	0	0	0	0	0	0	0	0
3281:	1	0	0	0	0	0	0	0
3289:	0	0	1	1	0	0	0	0
3297:	0	0	0	1	1	0	1	0
3305:	0	0	0	0	0	1	0	0

3313:	0	1	0	1	0	1	0	0
3321:	0	0	1	0	0	1	0	0
3329:	0	0	0	0	0	0	0	0
3337:	0	0	1	0	0	0	0	0
3345:	1	0	0	0	0	1	0	0
3353:	0	0	0	0	0	0	1	0
3361:	0	2	0	1	0	0	0	1
3369:	0	0	0	1	0	0	0	0
3377:	0	0	0	0	0	0	0	0
3385:	0	0	0	0	1	1	0	0
3393:	0	0	0	1	1	0	0	0
3401:	1	0	0	0	0	0	0	1
3409:	0	0	0	0	0	0	1	0
3417:	0	0	0	0	0	0	0	0
3425:	1	1	0	0	2	0	0	0
3433:	0	0	0	0	0	0	2	1
3441:	0	1	0	0	0	1	0	0
3449:	0	0	0	0	1	0	0	0
3457:	0	0	0	0	0	0	0	1
3465:	0	0	0	0	0	0	0	0
3473:	0	1	0	0	1	0	0	0
3481:	1	0	0	0	0	0	0	0
3489:	0	0	0	0	0	0	1	0
3497:	0	0	0	0	0	0	0	0
3505:	0	0	1	0	0	0	1	0
3513:	0	0	0	0	0	1	0	1
3521:	0	0	0	1	0	0	0	0
3529:	1	0	0	0	0	0	0	0
3537:	0	0	0	0	0	2	0	0
3545:	0	0	0	0	0	0	0	1
3553:	0	0	0	0	0	0	0	0
3561:	0	0	0	0	0	0	0	0
3569:	0	0	1	0	0	0	1	0
3577:	0	1	0	1	0	0	0	0
3585:	1	2	0	0	1	0	0	0
3593:	0	0	0	0	0	0	0	0
3601:	0	0	0	1	0	0	0	0
3609:	0	0	0	0	0	1	0	0
3617:	0	1	0	0	0	0	0	1
3625:	0	0	0	1	0	0	0	1
3633:	0	1	0	0	1	0	0	0
3641:	0	0	0	0	0	0	0	0
3649:	0	1	1	0	0	0	0	0
3657:	0	0	0	0	1	1	0	0
3665:	0	0	1	0	0	0	0	0
3673:	0	1	0	0	0	0	0	0
3681:	1	0	0	0	0	0	0	0
3689:	1	0	1	0	0	0	0	0
3697:	0	1	0	1	0	0	0	1
3705:	0	0	0	0	0	0	1	0
3713:	0	0	0	1	0	0	0	0
3721:	0	0	0	0	0	0	0	0
3729:	0	0	2	0	0	0	0	0
3737:	1	1	0	0	0	0	1	0
3745:	0	0	0	0	0	0	0	0
3753:	0	2	0	1	0	0	1	0
3761:	0	0	0	1	1	0	1	0
3769:	0	0	0	0	0	0	0	0
3777:	0	0	0	1	0	0	1	0
3785:	1	0	2	0	0	0	0	0

3793:	0	2	0	0	0	0	0	0
3801:	0	0	0	0	1	0	0	0
3809:	0	0	1	1	0	0	0	0
3817:	0	1	0	0	1	0	0	0
3825:	0	0	0	0	0	0	0	0
3833:	0	0	1	0	0	0	2	0
3841:	0	0	0	0	1	0	0	0
3849:	0	0	0	0	0	0	0	0
3857:	0	1	0	0	0	0	0	0
3865:	0	0	0	0	0	0	0	0
3873:	0	0	0	0	1	0	0	0
3881:	0	0	1	0	0	0	0	1
3889:	1	0	1	0	0	0	0	0
3897:	0	0	0	0	0	0	0	0
3905:	1	0	0	0	0	0	0	0
3913:	0	0	0	0	0	0	0	0
3921:	0	0	0	0	0	0	0	0
3929:	0	0	0	0	0	0	0	0
3937:	0	0	0	0	0	0	0	1
3945:	0	0	0	0	0	0	0	0
3953:	0	0	0	0	0	0	0	0
3961:	0	0	2	0	0	0	2	1
3969:	0	1	0	0	0	0	0	0
3977:	1	0	0	0	0	0	0	1
3985:	0	0	0	0	1	0	0	0
3993:	0	0	2	0	0	0	0	0
4001:	0	0	0	0	1	0	0	0
4009:	0	0	0	1	0	0	0	0
4017:	0	0	0	0	0	0	0	2
4025:	0	0	1	1	0	0	0	0
4033:	0	0	0	0	0	1	0	0
4041:	0	0	0	0	0	1	0	0
4049:	0	1	0	0	0	1	0	0
4057:	0	0	0	1	0	0	0	0
4065:	0	0	0	1	0	0	0	1
4073:	0	0	0	0	0	1	0	0
4081:	0	0	0	0	0	0	0	0
4089:	0	0	1	0	1	0	0	0

JL 12-6-02

Sample ID : 0211141-04 Acquisition date : 6-DEC-2002 07:51:25

/VMS Peak Search Report Generated 6-DEC-2002 08:51:49.72

Configuration	: DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_021114104_GE5_FE55_48337.CNF;		
Analyses by	: PEAK V16.9 ENBACK V1.6 PEAKEFF V2.2		
Client ID	: VA-02-0176		
Deposition Date	:		
Sample Date	: 25-NOV-2002 00:00:00	Acquisition date	: 6-DEC-2002 07:51:25.
Sample ID	: 0211141-04	Sample Quantity	: 1.03100E+00 gram
Sample type	: SOIL	Sample Geometry	: 0
Detector name	: GE5	Detector Geometry	: FE55
Elapsed live time	: 0 01:00:00.00	Elapsed real time	: 0 01:00:03.92 0.1%
Start channel	: 1	End channel	: 4096
Sensitivity	: 3.00000	Gaussian	: 15.00000
Critical level	: No		

Post-NID Peak Search Report
***** No peaks found *****

AG 12/6/02

00553

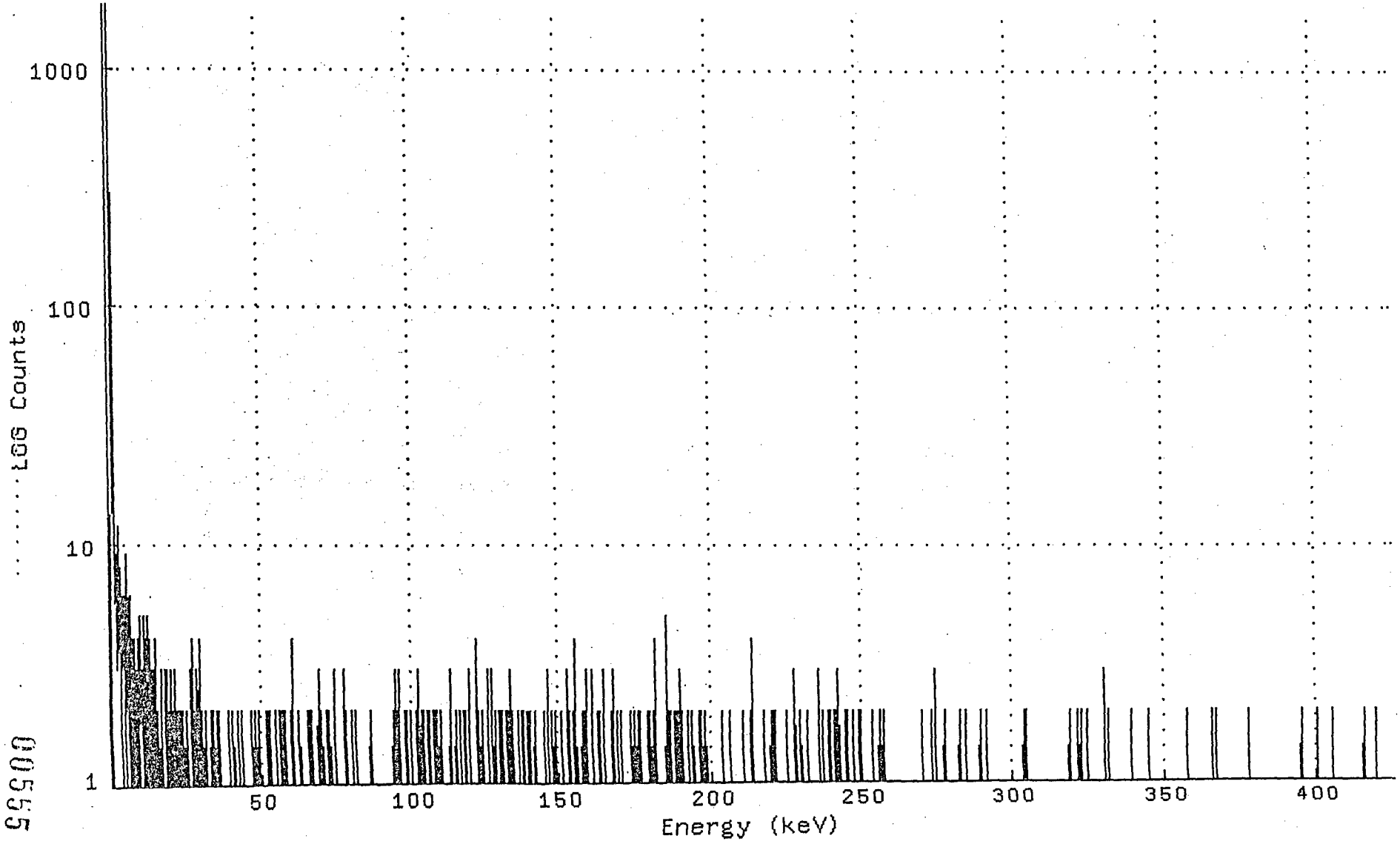
Sample ID : 0211141-04 Acquisition date : 6-DEC-2002 07:51:25

- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/gram)	K.L. Ided	Act error	MDA (pCi/gram)	MDA error	Act/MDA
FE-55	2.383E+00		1.411E+01	2.532E+01	4.419E+00	0.094
CO-57	1.046E+00		1.802E+00	3.753E+00	6.524E-01	0.279
NI-59	-5.996E+00		1.391E+01	1.803E+01	2.681E+01	-0.333
CD-109	-3.345E+00		2.684E+01	5.391E+01	9.372E+00	-0.062
I-125	-4.132E+00		2.315E+01	4.334E+01	7.535E+00	-0.095
I-129	-2.487E+00		3.562E+00	7.051E+00	1.226E+00	-0.353
BA-133	-2.043E+00		4.006E+00	6.858E+00	1.503E+00	-0.298
CE-144	9.707E+00		1.514E+01	3.163E+01	5.498E+00	0.307
PB-210	-9.622E+00		3.178E+01	5.898E+01	1.025E+01	-0.163
PA-231	-4.702E+00		6.994E+00	1.170E+01	2.034E+00	-0.402
TH-231	-1.101E+01		1.111E+01	1.705E+01	2.964E+00	-0.645
PA-234	1.721E+00		2.805E+00	5.684E+00	9.880E-01	0.303
TH-234	2.527E+01		3.043E+01	7.010E+01	1.218E+01	0.361
NP-237	4.467E+00		8.729E+00	1.949E+01	3.388E+00	0.229
U-237	-8.154E+00		1.940E+01	3.479E+01	6.047E+00	-0.234
AM-241	-9.306E-01		3.903E+00	7.214E+00	1.254E+00	-0.129
AM-243	9.432E-02		1.888E+00	3.735E+00	7.328E-01	0.025

Spectru : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_ 4104_GE5_FE55_48337.CNF;1
Title :
Sample Title: VA-02-0176

Start Time: 6-DEC-2002 07:51:	Sample Time: 25-NOV-2002 00:00	Energy Offset: 1.88831E-01
Real Time : 0 01:00:03.92	Sample ID : 0211141-04	Energy Slope : 1.03817E-01
Live Time : 0 01:00:00.00	Sample Type: SOIL	Energy Quad : -1.02782E-08



00555

Channel Contents for [GAMMA.SCUSR.ARCHIVE]SMP_021114104_GE5_FE55_48337.CNF

annel

1:	0	0	0	0	0	0	0	0
9:	0	1	181	1474	1880	1185	718	413
17:	217	107	36	21	16	10	3	9
25:	8	9	7	9	9	7	6	8
33:	7	12	1	5	8	6	5	4
41:	4	6	4	3	4	4	3	1
49:	4	3	6	1	5	6	9	4
57:	2	7	5	5	1	3	0	4
65:	4	6	1	0	1	3	2	2
73:	2	1	3	4	3	3	3	2
81:	1	4	2	3	3	1	2	1
89:	3	3	2	0	4	1	3	3
97:	4	5	3	3	2	2	1	2
105:	3	3	2	2	0	3	4	5
113:	1	3	2	0	2	4	2	0
121:	1	5	2	2	2	3	4	4
129:	3	2	0	2	3	2	0	1
137:	1	3	0	1	2	2	1	2
145:	4	1	1	1	1	0	0	2
153:	0	0	0	1	0	1	0	0
161:	0	2	3	2	1	0	1	0
169:	1	1	0	1	0	0	1	1
177:	3	0	2	1	0	3	2	1
185:	3	1	1	0	1	1	2	1
193:	2	1	0	2	0	3	1	2
201:	1	1	1	1	1	0	1	3
209:	1	0	0	0	2	0	2	2
217:	1	2	1	0	1	0	0	0
225:	0	0	1	2	0	0	0	2
233:	0	0	0	0	0	1	1	0
241:	2	0	0	0	1	0	0	1
249:	1	1	0	0	1	0	0	2
257:	2	3	1	1	0	2	4	0
265:	0	2	0	2	0	0	0	1
273:	0	0	3	0	2	1	1	0
281:	1	2	3	4	4	1	1	0
289:	0	2	1	0	0	1	2	1
297:	1	1	0	0	0	0	0	1
305:	2	1	0	0	0	1	0	0
313:	0	1	1	1	0	0	0	2
321:	1	0	0	1	0	0	0	0
329:	2	1	0	1	0	0	0	1
337:	0	2	0	0	0	0	0	0
345:	0	0	2	1	1	0	1	0
353:	1	0	0	0	0	1	0	1
361:	0	1	0	0	0	0	1	0
369:	1	1	0	0	0	0	0	0
377:	0	0	2	1	1	0	0	1
385:	0	1	0	0	1	1	0	[illegible]
393:	1	0	1	1	0	0	1	1
401:	0	1	0	0	1	0	2	0
409:	0	0	1	1	0	0	1	0
417:	0	0	0	2	1	1	0	0
425:	0	1	1	0	1	1	0	0

433:	0	0	0	0	0	0	0	0
441:	1	0	0	0	0	1	1	1
449:	0	1	2	0	0	0	1	0
457:	0	0	2	0	0	2	0	2
465:	1	0	0	0	0	1	1	1
473:	0	0	0	2	1	0	0	0
481:	0	0	0	1	0	0	0	0
489:	0	0	0	0	0	0	0	0
497:	0	0	2	0	1	1	0	0
505:	2	1	0	0	1	2	1	0
513:	0	1	0	1	0	0	0	1
521:	0	0	0	0	0	1	1	0
529:	2	0	0	0	0	0	0	0
537:	0	1	0	0	2	0	0	0
545:	0	0	0	2	1	0	0	0
553:	1	2	2	0	2	0	1	1
561:	1	0	0	0	0	1	0	0
569:	0	0	0	0	0	0	1	0
577:	1	0	0	2	0	4	0	1
585:	0	1	0	0	0	0	1	0
593:	0	0	1	0	0	1	1	1
601:	0	0	0	2	0	0	0	0
609:	0	1	1	1	0	0	0	0
617:	1	1	1	0	0	0	0	0
625:	0	0	0	1	0	0	0	2
633:	1	0	0	0	2	0	1	0
641:	1	1	2	0	0	1	1	1
649:	0	1	1	0	0	1	1	0
657:	0	1	0	0	1	0	0	1
665:	0	3	1	0	0	0	0	2
673:	0	0	1	1	2	0	1	0
681:	0	1	1	0	0	0	0	0
689:	0	1	0	2	0	0	0	0
697:	0	0	0	1	2	1	0	0
705:	0	1	0	0	0	0	0	1
713:	0	0	0	0	1	3	0	1
721:	0	1	0	0	0	0	1	0
729:	1	1	1	0	1	0	0	0
737:	0	1	0	0	0	0	0	0
745:	3	2	1	1	0	1	0	0
753:	2	0	0	0	0	0	0	0
761:	1	1	0	0	1	1	0	0
769:	0	1	0	2	0	0	0	0
777:	0	0	0	0	0	1	2	0
785:	0	0	0	0	1	0	0	1
793:	0	1	0	1	1	1	1	1
801:	0	0	1	0	0	1	0	1
809:	0	0	0	0	1	0	0	0
817:	0	1	0	0	0	1	0	0
825:	1	0	0	1	2	1	0	0
833:	0	0	0	0	0	0	0	0
841:	1	1	1	1	0	0	0	0
849:	0	0	1	0	0	0	0	0
857:	0	0	0	0	0	1	0	0
865:	0	0	0	0	0	0	0	0
873:	0	1	1	0	0	1	0	0
881:	0	0	0	1	0	1	0	1
889:	1	1	0	0	1	1	0	0
897:	1	0	0	0	0	2	1	0
905:	0	0	0	0	1	3	1	1

913:	1	1	0	2	1	1	0	1
921:	0	1	3	0	0	0	1	0
929:	0	0	1	1	1	0	0	0
937:	0	0	1	0	0	0	2	1
945:	0	0	1	0	2	0	0	1
953:	0	1	1	1	1	2	0	1
961:	1	0	1	0	1	0	0	0
969:	0	0	1	0	0	0	0	1
977:	1	0	2	0	1	0	0	1
985:	0	3	0	1	0	0	1	0
993:	1	2	0	1	1	1	1	0
1001:	1	1	2	0	0	1	1	1
1009:	1	0	0	2	0	0	1	0
1017:	1	0	0	1	2	0	1	1
1025:	1	0	0	0	0	2	0	0
1033:	0	1	0	0	0	2	0	1
1041:	1	1	0	0	0	1	2	0
1049:	1	1	1	0	0	2	0	1
1057:	1	1	0	1	0	1	0	0
1065:	0	0	0	0	0	1	0	0
1073:	1	0	0	1	0	0	1	1
1081:	1	0	0	2	0	1	0	3
1089:	0	0	0	0	1	0	0	0
1097:	1	0	1	0	0	2	0	0
1105:	0	1	0	0	0	0	0	0
1113:	0	0	1	2	0	1	1	0
1121:	1	0	0	1	0	1	0	0
1129:	0	2	0	0	0	1	1	1
1137:	2	0	0	1	1	0	0	0
1145:	0	1	3	0	0	0	0	0
1153:	1	0	0	1	0	0	0	0
1161:	1	0	1	0	1	0	0	0
1169:	0	2	0	1	0	4	1	1
1177:	0	2	0	0	0	1	0	1
1185:	0	0	2	0	0	0	2	1
1193:	0	1	0	0	0	0	1	0
1201:	0	1	0	0	1	1	1	3
1209:	1	0	0	0	1	0	0	1
1217:	0	0	0	2	3	0	0	0
1225:	0	0	1	0	0	2	0	1
1233:	1	1	1	0	0	1	0	0
1241:	0	1	2	0	0	1	1	0
1249:	1	1	2	0	1	0	0	1
1257:	2	0	1	0	0	0	0	0
1265:	0	0	0	1	1	0	2	1
1273:	2	1	0	0	0	2	1	1
1281:	0	0	3	1	0	0	1	2
1289:	1	0	0	1	0	1	0	0
1297:	0	0	0	0	0	1	1	0
1305:	0	0	2	0	1	1	1	1
1313:	0	1	0	0	0	1	0	2
1321:	2	0	0	0	1	0	0	0
1329:	0	0	0	1	0	0	0	1
1337:	2	0	0	1	0	0	1	2
1345:	1	0	0	2	0	0	0	1
1353:	0	0	0	0	0	0	0	1
1361:	0	0	2	0	1	0	0	0
1369:	0	0	0	0	0	1	0	0
1377:	0	0	1	0	1	1	0	0
1385:	1	1	0	1	0	0	1	1

1393:	1	1	1	0	2	0	0	0
1401:	0	1	0	0	0	0	0	3
1409:	0	0	0	1	1	1	1	1
1417:	0	0	0	0	0	0	2	0
1425:	0	1	1	1	0	1	1	0
1433:	1	2	1	0	0	0	0	0
1441:	0	1	0	0	1	1	1	1
1449:	2	2	1	0	1	0	0	0
1457:	0	0	1	0	0	0	1	0
1465:	0	0	3	1	1	0	1	1
1473:	0	2	0	0	0	0	1	1
1481:	1	1	0	0	2	2	0	1
1489:	0	2	0	4	0	0	0	2
1497:	0	1	1	0	0	1	0	0
1505:	1	0	1	1	1	0	0	0
1513:	0	1	2	0	0	0	1	0
1521:	1	0	1	2	1	0	3	2
1529:	0	0	1	0	0	0	0	0
1537:	0	0	0	1	1	0	0	1
1545:	0	0	0	2	3	0	1	1
1553:	1	0	0	1	1	1	0	1
1561:	0	0	0	1	1	2	1	0
1569:	1	0	0	2	1	0	0	0
1577:	0	1	1	1	0	0	0	1
1585:	0	3	1	1	0	0	1	1
1593:	0	0	0	0	0	0	0	0
1601:	0	0	1	0	0	0	1	0
1609:	2	0	0	1	1	3	1	0
1617:	0	0	0	0	1	1	1	0
1625:	0	1	1	2	1	1	0	0
1633:	0	0	0	0	1	0	2	0
1641:	0	0	0	0	0	1	0	1
1649:	0	0	0	0	1	0	0	0
1657:	1	1	0	0	0	0	0	0
1665:	1	0	1	2	1	0	1	0
1673:	0	0	0	1	1	0	2	0
1681:	0	0	1	0	0	1	1	0
1689:	0	0	2	0	1	1	1	0
1697:	0	2	1	0	0	0	0	0
1705:	0	0	1	0	0	0	1	1
1713:	0	0	1	1	0	0	1	0
1721:	0	0	0	2	1	2	0	0
1729:	0	2	0	2	0	1	0	0
1737:	0	1	2	1	0	0	0	0
1745:	0	4	2	0	0	0	1	0
1753:	0	1	1	0	1	0	1	1
1761:	0	1	0	1	0	0	0	0
1769:	0	0	0	0	0	0	1	1
1777:	0	0	1	0	1	2	0	1
1785:	5	1	0	1	1	1	1	2
1793:	0	1	0	0	2	1	0	0
1801:	1	0	0	0	0	0	2	0
1809:	1	1	1	2	1	0	0	1
1817:	0	0	0	0	0	0	2	0
1825:	0	0	3	0	1	0	1	2
1833:	0	1	0	0	1	0	0	0
1841:	0	0	0	0	0	0	0	1
1849:	2	0	1	0	0	0	0	0
1857:	0	0	0	0	0	0	0	0
1865:	0	2	1	0	1	0	1	0

1393:	1	1	1	0	2	0	0	0
1401:	0	1	0	0	0	0	0	3
1409:	0	0	0	1	1	1	1	1
1417:	0	0	0	0	0	0	2	0
1425:	0	1	1	1	0	1	1	0
1433:	1	2	1	0	0	0	0	0
1441:	0	1	0	0	1	1	1	1
1449:	2	2	1	0	1	0	0	0
1457:	0	0	1	0	0	0	1	0
1465:	0	0	3	1	1	0	1	1
1473:	0	2	0	0	0	0	1	1
1481:	1	1	0	0	2	2	0	1
1489:	0	2	0	4	0	0	0	2
1497:	0	1	1	0	0	1	0	0
1505:	1	0	1	1	1	0	0	0
1513:	0	1	2	0	0	0	1	0
1521:	1	0	1	2	1	0	3	2
1529:	0	0	1	0	0	0	0	0
1537:	0	0	0	1	1	0	0	1
1545:	0	0	0	2	3	0	1	1
1553:	1	0	0	1	1	1	0	1
1561:	0	0	0	1	1	2	1	0
1569:	1	0	0	2	1	0	0	0
1577:	0	1	1	1	0	0	0	1
1585:	0	3	1	1	0	0	1	1
1593:	0	0	0	0	0	0	0	0
1601:	0	0	1	0	0	0	1	0
1609:	2	0	0	1	1	3	1	0
1617:	0	0	0	0	1	1	1	0
1625:	0	1	1	2	1	1	0	0
1633:	0	0	0	0	1	0	2	0
1641:	0	0	0	0	0	1	0	1
1649:	0	0	0	0	1	0	0	0
1657:	1	1	0	0	0	0	0	0
1665:	1	0	1	2	1	0	1	0
1673:	0	0	0	1	1	0	2	0
1681:	0	0	1	0	0	1	1	0
1689:	0	0	2	0	1	1	1	0
1697:	0	2	1	0	0	0	0	0
1705:	0	0	1	0	0	0	1	1
1713:	0	0	1	1	0	0	1	0
1721:	0	0	0	2	1	2	0	0
1729:	0	2	0	2	0	1	0	0
1737:	0	1	2	1	0	0	0	0
1745:	0	4	2	0	0	0	1	0
1753:	0	1	1	0	1	0	1	1
1761:	0	1	0	1	0	0	0	0
1769:	0	0	0	0	0	0	1	1
1777:	0	0	1	0	1	2	0	1
1785:	5	1	0	1	1	1	1	2
1793:	0	1	0	0	2	1	0	0
1801:	1	0	0	0	0	0	2	0
1809:	1	1	1	2	1	0	0	1
1817:	0	0	0	0	0	0	2	0
1825:	0	0	3	0	1	0	1	2
1833:	0	1	0	0	1	0	0	0
1841:	0	0	0	0	0	0	0	1
1849:	2	0	1	0	0	0	0	0
1857:	0	0	0	0	0	0	0	0
1865:	0	2	1	0	1	0	1	0

1873:	1	1	0	1	0	1	0	1
1881:	0	0	0	1	0	0	2	0
1889:	0	1	1	1	0	0	1	2
1897:	0	0	0	0	0	1	0	1
1905:	0	0	2	2	0	1	0	0
1913:	1	0	0	1	0	0	0	0
1921:	1	0	0	0	0	0	0	0
1929:	0	1	0	0	0	1	1	0
1937:	0	0	0	1	1	0	0	0
1945:	1	1	0	0	1	1	0	0
1953:	0	0	0	0	1	0	1	0
1961:	2	0	1	1	0	0	1	0
1969:	1	1	1	0	1	1	0	1
1977:	0	1	0	0	0	1	0	0
1985:	2	0	0	0	0	0	0	0
1993:	0	0	0	0	1	1	1	0
2001:	0	0	1	0	1	1	0	0
2009:	0	1	0	0	0	0	1	0
2017:	1	0	0	0	1	0	0	1
2025:	0	0	1	2	0	0	0	0
2033:	0	1	0	0	0	0	1	0
2041:	0	0	1	0	1	0	1	1
2049:	1	0	2	0	1	0	0	0
2057:	0	4	0	0	0	1	0	0
2065:	0	0	0	0	0	0	0	1
2073:	0	1	0	1	0	0	0	0
2081:	1	0	0	0	0	1	1	0
2089:	0	1	0	0	2	1	0	0
2097:	1	0	0	1	0	0	0	0
2105:	1	1	0	1	1	0	1	0
2113:	1	0	2	1	0	0	0	0
2121:	1	0	1	1	0	2	0	2
2129:	0	1	1	0	0	0	1	0
2137:	1	0	1	0	0	1	0	1
2145:	0	1	0	0	1	0	1	0
2153:	0	1	0	0	1	0	0	0
2161:	0	0	0	0	2	0	1	2
2169:	0	1	0	0	1	0	1	1
2177:	0	0	0	0	0	0	0	0
2185:	0	0	0	1	0	2	1	0
2193:	3	0	0	0	0	0	0	0
2201:	0	0	0	0	0	0	0	2
2209:	0	0	2	0	1	1	1	0
2217:	0	1	1	1	0	1	0	0
2225:	1	0	0	0	0	0	0	1
2233:	0	0	2	1	0	0	1	0
2241:	0	0	1	0	0	0	0	0
2249:	0	0	0	0	0	0	0	0
2257:	1	0	1	0	0	1	1	0
2265:	1	0	0	1	1	0	3	1
2273:	0	0	0	0	0	0	0	0
2281:	0	0	2	1	0	1	0	0
2289:	1	1	0	0	0	1	0	0
2297:	0	0	2	0	0	0	0	0
2305:	0	0	2	0	0	0	1	0
2313:	0	0	0	0	0	0	2	0
2321:	2	0	1	0	2	0	0	0
2329:	1	0	0	0	3	1	0	0
2337:	1	0	1	0	0	0	0	0
2345:	1	0	0	1	0	0	1	1

2353:	2	1	0	0	0	2	0	0
2361:	1	1	0	0	1	0	0	0
2369:	0	1	0	0	1	0	0	0
2377:	0	0	1	2	0	0	1	0
2385:	0	0	0	0	0	0	0	0
2393:	0	0	2	0	1	0	1	0
2401:	0	2	0	0	2	0	0	0
2409:	0	0	0	0	0	0	0	0
2417:	1	0	0	1	0	0	0	0
2425:	0	0	0	1	1	0	1	0
2433:	0	0	0	0	0	0	0	2
2441:	0	1	1	0	1	0	0	0
2449:	0	0	0	1	0	0	0	1
2457:	0	1	1	0	2	0	0	0
2465:	0	0	0	0	0	0	0	1
2473:	2	1	0	1	0	0	0	1
2481:	0	0	0	0	0	0	0	1
2489:	1	0	1	1	0	0	1	0
2497:	0	0	0	1	0	1	0	0
2505:	0	0	0	0	0	1	0	1
2513:	0	0	0	0	0	1	1	0
2521:	0	0	1	1	0	0	0	1
2529:	0	0	1	1	1	0	0	0
2537:	0	0	1	0	0	0	0	0
2545:	0	1	0	1	0	0	0	0
2553:	0	0	0	0	0	0	0	0
2561:	1	0	1	1	0	0	0	0
2569:	1	1	0	0	0	0	1	0
2577:	0	0	0	0	0	0	0	0
2585:	0	1	0	0	0	0	1	1
2593:	1	0	0	2	2	1	0	0
2601:	0	1	0	0	0	1	0	0
2609:	0	0	0	1	0	0	0	0
2617:	1	0	0	1	1	1	0	0
2625:	0	1	0	2	0	1	0	1
2633:	0	0	0	0	1	0	0	0
2641:	3	1	0	0	0	1	0	0
2649:	1	0	1	0	0	0	0	0
2657:	1	1	1	0	0	1	1	1
2665:	0	1	2	0	0	0	0	0
2673:	1	1	0	0	0	1	0	0
2681:	1	0	0	0	1	1	0	0
2689:	1	1	1	0	0	0	0	1
2697:	0	0	1	0	0	0	0	0
2705:	0	0	1	0	0	1	1	1
2713:	0	0	0	2	0	1	0	0
2721:	0	1	1	0	0	0	0	0
2729:	0	1	0	0	0	1	2	0
2737:	0	1	0	0	0	0	0	0
2745:	0	1	1	0	0	0	1	0
2753:	1	0	0	0	0	0	0	0
2761:	0	0	0	0	0	0	0	0
2769:	0	0	0	0	0	0	0	0
2777:	0	0	0	1	0	0	2	0
2785:	1	0	0	0	0	0	0	0
2793:	0	0	0	0	1	0	0	0
2801:	1	1	0	1	2	1	0	0
2809:	1	1	0	0	1	1	0	0
2817:	0	0	0	0	0	1	0	0
2825:	0	0	0	0	1	0	0	0

2833:	0	0	0	0	1	0	1	0
2841:	0	0	0	1	0	0	0	1
2849:	0	0	0	0	1	0	0	0
[illegible]57:	0	0	0	0	0	0	0	0
[illegible]55:	0	1	0	0	1	1	0	0
2873:	1	0	0	0	0	0	0	0
2881:	0	1	0	0	0	1	0	0
2889:	0	0	0	0	1	0	0	0
2897:	0	0	0	0	0	0	0	0
2905:	0	0	0	0	0	0	0	0
2913:	0	0	0	0	0	0	0	1
2921:	0	2	0	0	0	0	0	0
2929:	2	0	0	0	0	1	0	0
2937:	0	0	0	0	0	0	0	0
2945:	0	1	0	0	0	0	0	0
2953:	0	0	0	0	0	0	0	0
2961:	1	1	0	0	1	1	0	0
2969:	0	0	0	0	0	0	0	0
2977:	0	0	0	0	0	0	0	0
2985:	0	0	0	0	0	1	0	0
2993:	0	0	0	0	0	0	0	1
3001:	0	0	1	0	0	0	0	0
3009:	0	1	1	0	0	1	0	0
3017:	1	0	1	0	0	0	0	0
3025:	1	0	1	0	0	0	0	0
3033:	1	1	1	0	0	0	0	1
3041:	0	1	1	0	1	0	0	0
3049:	0	1	0	1	0	1	0	0
[illegible]057:	0	0	0	0	0	0	0	1
[illegible]65:	1	0	0	2	0	0	0	0
[illegible]73:	0	1	0	1	0	0	0	1
3081:	0	1	0	0	0	0	0	0
3089:	1	0	0	0	0	0	0	1
3097:	2	1	0	0	0	0	0	1
3105:	1	2	0	0	0	1	0	1
3113:	0	0	0	0	0	0	0	0
3121:	0	0	0	1	0	0	2	0
3129:	1	0	1	1	0	0	0	0
3137:	0	0	1	1	0	0	0	0
3145:	1	1	0	1	0	0	0	1
3153:	0	0	1	0	0	0	0	1
3161:	1	1	0	0	0	0	0	1
3169:	0	1	0	0	0	0	0	0
3177:	0	1	0	3	1	0	0	0
3185:	0	0	0	1	1	2	0	0
3193:	0	0	1	0	0	0	0	0
3201:	0	0	0	0	0	0	0	0
3209:	1	0	1	1	0	0	1	0
3217:	0	0	1	0	0	1	0	0
3225:	0	0	0	0	0	1	1	0
3233:	0	0	0	0	0	0	0	0
3241:	0	0	0	0	0	0	0	0
3249:	0	0	0	0	0	1	1	0
3257:	0	1	0	0	0	0	0	2
[illegible]65:	0	0	0	0	0	0	0	0
[illegible]73:	0	0	1	0	0	0	0	0
3281:	0	0	0	0	1	0	0	0
3289:	0	0	0	0	0	0	0	0
3297:	0	0	0	0	1	0	1	0
3305:	0	0	0	0	0	0	0	0

3313:	0	0	0	1	0	2	0	0
3321:	0	1	0	0	0	0	0	0
3329:	0	0	0	0	0	0	0	0
3337:	0	0	0	0	0	0	1	0
3345:	0	0	0	1	0	0	1	1
3353:	0	0	0	0	0	0	0	0
3361:	1	0	1	0	0	0	0	0
3369:	0	0	0	0	0	0	0	0
3377:	0	0	1	1	1	0	0	0
3385:	0	1	1	0	1	1	1	0
3393:	0	0	0	0	0	0	0	1
3401:	0	0	1	1	1	0	0	0
3409:	0	0	1	0	0	0	0	0
3417:	0	0	0	1	0	1	0	0
3425:	0	0	0	0	0	0	0	0
3433:	1	1	0	0	0	1	0	1
3441:	2	0	0	1	0	0	0	1
3449:	0	1	0	0	0	0	0	0
3457:	0	0	0	1	0	0	1	0
3465:	0	0	0	0	0	0	0	0
3473:	0	0	0	0	0	0	1	0
3481:	0	0	0	0	0	0	0	0
3489:	0	0	0	1	0	0	0	0
3497:	0	0	0	0	0	0	1	0
3505:	0	0	0	0	0	0	0	0
3513:	0	0	0	0	0	0	2	0
3521:	0	0	0	0	0	1	0	0
3529:	1	2	0	0	0	0	0	0
3537:	0	0	1	0	0	0	0	0
3545:	0	0	0	0	1	0	0	0
3553:	0	0	1	0	0	0	0	0
3561:	0	1	0	0	0	0	1	0
3569:	0	0	0	0	0	0	1	0
3577:	0	0	1	0	0	0	0	0
3585:	0	0	0	0	0	0	0	0
3593:	0	0	0	0	1	0	0	0
3601:	0	0	0	0	0	0	1	0
3609:	0	0	0	0	0	0	0	0
3617:	0	0	0	0	0	0	0	0
3625:	0	0	0	1	0	0	0	0
3633:	1	0	2	0	0	0	0	0
3641:	1	0	0	0	0	0	0	0
3649:	0	0	0	0	0	0	0	0
3657:	0	0	0	0	0	0	0	0
3665:	1	0	0	0	1	0	0	0
3673:	0	0	1	1	0	0	0	0
3681:	0	0	0	0	0	0	0	0
3689:	0	0	0	0	0	0	0	0
3697:	0	1	0	0	0	0	0	0
3705:	0	0	0	0	0	0	0	0
3713:	0	0	0	0	1	1	0	0
3721:	0	0	0	0	0	0	0	0
3729:	0	0	0	0	1	0	0	1
3737:	0	0	0	0	0	0	0	0
3745:	0	1	0	0	0	1	0	0
3753:	0	0	0	0	0	1	0	0
3761:	0	0	1	0	0	0	0	0
3769:	0	0	0	0	0	0	0	0
3777:	0	0	0	0	0	0	1	0
3785:	0	0	1	0	0	1	0	0

3793:	0	0	0	1	0	0	0	1
3801:	0	2	0	0	0	2	0	0
3809:	0	0	1	0	0	0	0	0
3817:	0	0	0	0	0	0	0	1
3825:	1	0	0	0	1	1	0	0
3833:	0	1	0	0	0	0	0	0
3841:	0	0	0	0	1	0	0	1
3849:	0	0	0	0	2	0	0	0
3857:	0	0	0	0	0	0	1	0
3865:	0	0	0	0	0	0	0	0
3873:	0	0	0	0	0	0	0	0
3881:	0	0	0	0	0	0	0	0
3889:	0	0	0	0	0	0	0	0
3897:	0	0	1	0	0	2	0	0
3905:	0	1	0	1	0	0	1	0
3913:	0	0	1	0	1	0	0	0
3921:	0	0	0	0	0	0	0	0
3929:	0	0	0	0	0	0	0	0
3937:	0	0	0	0	0	0	1	0
3945:	1	0	1	0	1	0	0	0
3953:	0	0	1	0	0	0	0	0
3961:	0	0	1	0	0	0	0	0
3969:	0	1	1	0	0	0	1	0
3977:	0	0	0	0	0	0	0	0
3985:	0	0	0	0	0	0	0	0
3993:	0	0	0	0	0	1	0	0
4001:	0	2	0	0	0	1	0	0
4009:	0	0	0	0	0	0	0	0
4017:	1	0	0	0	0	0	0	0
4025:	0	1	0	0	1	0	0	0
4033:	1	0	0	0	0	0	1	1
4041:	0	1	2	1	0	0	0	0
4049:	1	0	0	0	0	0	0	0
4057:	0	0	0	0	1	0	0	0
4065:	0	0	0	0	0	0	0	0
4073:	0	1	0	1	0	0	1	1
4081:	1	0	1	0	0	0	0	0
4089:	0	1	0	1	0	0	1	0

SECTION XXI

ANALYTICAL DATA (LEAD-210)

Work Order	02-11141
Analysis Code	Pb210
Run	1
Date Received	11/26/2002
Lab Deadline	12/5/2002
Client	Duratek
Project	17-Apr
Report Level	4
Activity Units	pCi
Aliquot Units	g
Matrix	OS
Method	EML Pb-01 Modified
Instrument Type	Alpha/Beta GPC
Radiometric Tracer	
Radiometric Sol#	
Tracer Act (dpm/g)	
Carrier	Lead
Carrier Conc (mg/ml)	1.247

Internal Fraction	Sample Desc	Client ID	Login CPM	Sample Date	Sample Aliquot
01	LCS	LCS		11/26/02 00:00	1.0000E+00
02	MBL	BLANK		11/26/02 00:00	1.0000E+00
03	DUP	VA-02-0176	89	11/25/02 12:00	1.0035E+00
04	DO	VA-02-0176	89	11/25/02 12:00	1.0035E+00

00566

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

Internal Fraction	Sample Desc	Tracer Aliquot (g)	Tracer Total ACT (dpm)	Radiometric Tracer (pCi)	Radiometric % Rec	Grav Carrier Added (ml)	Grav Filter Tare (g)	Grav Filter Final (g)	Grav Filter Net (g)	Grav % Rec	Mean % Rec	SAF 1*	SAF 2*
01	LCS					6.000	0.0696	0.0767	0.0071	94.89	94.89	1.00	1.00
02	MBL					6.000	0.0697	0.0769	0.0072	96.23	96.23	1.00	1.00
03	DUP					6.000	0.0690	0.0757	0.0067	89.55	89.55	1.00	1.00
04	DO					6.000	0.0692	0.0756	0.0064	85.54	85.54	1.00	1.00

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

Internal Fraction	Sample Desc	Rough Prep Date	Rough Prep By	Prep Date	Prep By	Sep t0 Date/Time	Sep t0 By	Sep t1 Date/Time	Sep t1 By
01	LCS			12/04/02 10:57	DJOHNSON	12/04/02 14:45	DJOHNSON		
02	MBL			12/04/02 10:57	DJOHNSON	12/04/02 14:45	DJOHNSON		
03	DUP			12/04/02 10:57	DJOHNSON	12/04/02 14:45	DJOHNSON		
04	DO			12/04/02 10:57	DJOHNSON	12/04/02 14:45	DJOHNSON		

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

Work Order: 02-11141-Pb210-1

Client: Duratek
Eberline Services Work Order: 02-11141
Analysis Code: Pb210
Run: 1

Lab Fraction	Nuclide	Sample Desc	Client Identification	Activity Units	Results	Error Estimate	MDA	LCS Known	LCS %R	LCS Flag	RPD Flag	MDA Flag	Blank Flag
01	PB-210	LCS	LCS	pCi/g	2.44E+01	1.51E+00	1.06E+00	2.11E+01	115.28	OK		OK	
02	PB-210	MBL	BLANK	pCi/g	2.97E+00	7.85E-01	1.09E+00					OK	INV
03	PB-210	DUP	VA-02-0176	pCi/g	4.29E+00	8.17E-01	9.86E-01				OK	OK	
04	PB-210	DO	VA-02-0176	pCi/g	3.79E+00	7.97E-01	9.95E-01					OK	

12-6-02

Post-it® Fax Note 7671	Date 12-6-02	# of pages ▶ 1
To Paul Jones	From Judy Pickella	
Co./Dept.	Co.	
Phone #	Phone #	
Fax # (865) 376-6247	Fax #	

00569

Work Order: 02-11141-Pb210-1

Client: Duratek

Eberline Services Work Order: 02-11141

Analysis Code: Pb210

Run: 1

Lab Fraction	Nuclide	Sample Desc	Sample Date	Sample Aliquot	Radiometric % Rec	Grav % Rec	Mean % Rec	SAF	Sep t0 Date/Time	Sep t1 Date/Time
01	PB-210	LCS	11/26/02 00:00	1.00E+00		94.89	94.89	1.00	12/4/2002 14:45	
02	PB-210	MBL	11/26/02 00:00	1.00E+00		96.23	96.23	1.00	12/4/2002 14:45	
03	PB-210	DUP	11/25/02 12:00	1.00E+00		89.55	89.55	1.00	12/4/2002 14:45	
04	PB-210	DO	11/25/02 12:00	1.00E+00		85.54	85.54	1.00	12/4/2002 14:45	

00570

Work Order: 02-11141-Pb210-1

Client: Duratek
Eberline Services Work Order: 02-11141
Analysis Code: Pb210
Run: 1

Lab Fraction	Nuclide	Sample Desc	Counting Date/Time	Halflife (days)	Detect	Carrier	Count Time	Counts	Bkg CPM	Eff
01	PB-210	LCS	12/05/02 13:25		LB4110	A1	60	1292	1.816666667	0.439
02	PB-210	MBL	12/05/02 13:25		LB4110	A2	60	254	1.866666667	0.426
03	PB-210	DUP	12/05/02 13:25		LB4110	A3	60	277	1.366666667	0.434
04	PB-210	DO	12/05/02 13:25		LB4110	A4	60	251	1.35	0.448

Internal Fraction	Sample Desc	Client ID	Sample Date	Sample Aliquot	Tracer Aliquot (g)	Tracer ACT (dpm)	Radiometric Tracer (pCi)	Radiometric % Rec	SAF 1*	SAF 2*
01	LCS	LCS	11/26/02 00:00	1.0000					1.00	1.00
02	MBL	BLANK	11/26/02 00:00	1.0000					1.00	1.00
03	DUP	VA-02-0176	11/25/02 12:00	1.0035					1.00	1.00
04	DO	VA-02-0176	11/25/02 12:00	1.0035					1.00	1.00

Eberline Oak Ridge Laboratory

Spike and Tracer Worksheet

Internal Work Order	Run	Analysis Code	Date	Technician	Technician Initials	Witness Initials
02-11141	1	Pb210	12/4/2002 10:54	DJOHNSON		

LCS & Matrix Spikes					LCS	MS	LCSD	MSD	LCS		MS		LCSD		MSD	
Isotope	Sol #	Activity dpm/ml	Solution Date	Approx Addition	Volume Used (ml)	Volume Used (ml)	Volume Used (ml)	Volume Used (ml)	Known pCi	Error Estimate	Added pCi	Error Estimate	Known pCi	Error Estimate	Added pCi	Error Estimate
Pb-210	Pb-3a	207.970	12/4/2002	0.210	0.2256				21.13	0.782	0.00	0.000	0.00	0.000	0.00	0.000

Tracers						
fraction	Isotope	Sol #	Activity dpm/ml	Solution Date	Volume Used (ml)	Approx Addition

Balance Printer Tapes	
Tracer	LCS
	0.2256 g
	Matrix Spike

005173

Version 2.0 08/99

Eberline Services - Oak Ridge
Version 2.0 8/1999

Aliquot Worksheet

Work Order	Run	Analysis Code	Aliquot Units	Lab Deadline	Technician
02-11141	1	Pb210	grams	12/5/2002	DJOHNSON

Lab Fraction	Duratek Client ID	Sample Type	Muffle Data Ratio Post/Pre	Dilution Data Aliquot	Dilution Data Final (ml)	Dilution Data Ratio	Aliquot Data Aliquot	Aliquot Data Net Equiv	MS Aliquot Data Aliquot	MS Aliquot Data Net Equiv	H-3 Solids Only Water Added (ml)	H-3 Solids Only H3 Dist Aliq
01	LCS	LCS					1.0000E+00	1.0000E+00				
02	BLANK	MBL					1.0000E+00	1.0000E+00				
03	VA-02-0176	DUP		2.5089E+01	100.0000	2.51E-01	4.0000E+00	1.0035E+00				
04	VA-02-0176	DO		2.5089E+01	100.0000	2.51E-01	4.0000E+00	1.0035E+00				

Comments	

00574

Technician: [signature] Date: 12/5/02

Gravimetric Worksheet

Work Order	Run	Analysis Code	Gravimetric Carrier	Carrier Conc (mg/ml)	Technician
02-11141	1	Pb210	Lead	1.2470	DJOHNSON

TRetec Fraction	Duratek Client ID	Sample Type	Carrier Data: Carrier Added (ml)	Filter Data: Filter Tare (g)	Filter Data: Filter Final (g)	Filter Data: Filter Net (g)	Gravimetric: % Recovery
01	LCS	LCS	6.0000	0.0696	0.0767	0.0071	94.89
02	BLANK	MBL	6.0000	0.0697	0.0769	0.0072	96.23
03	DUP	DUP	6.0000	0.0690	0.0757	0.0067	89.55
04	VA-02-0176	DO	6.0000	0.0692	0.0756	0.0064	85.54

Technician: _____ Date: 12/5/02

00573

AC 12/5/02

Detector ID	Sample ID	Alpha	Beta	Count Time	Voltage	TOD
A1	0211141-01	158	1292	60	1410	12/5/02 14:25
A2	0211141-02	40	254	60	1410	12/5/02 14:25
A3	0211141-03	56	277	60	1410	12/5/02 14:25
A4	0211141-04	43	251	60	1410	12/5/02 14:25

00576

JOP 12-5-02

Detector ID	Sample ID	Alpha	Beta	Guard	Count Count Time	Event	Voltage	TOD
A1	BKGD	10	109	31888	60	0	1402.5	37595.05
A2	BKGD	4	112	31885	60	0	1402.5	37595.05
A3	BKGD	5	82	31885	60	0	1402.5	37595.05
A4	BKGD	3	81	31884	60	0	1402.5	37595.05
B1	BKGD	19	84	32620	60	0	1402.5	37595.05
B2	BKGD	20	72	32620	60	0	1402.5	37595.05
B3	BKGD	6	56	32620	60	0	1402.5	37595.05
B4	BKGD	16	73	32622	60	0	1402.5	37595.05
C1	BKGD	11	85	32650	60	0	1402.5	37595.05
C2	BKGD	14	64	32651	60	0	1402.5	37595.05
C3	BKGD	22	70	32654	60	0	1402.5	37595.05
C4	BKGD	4	80	32654	60	0	1402.5	37595.05
D1	BKGD	5	63	33256	60	0	1402.5	37595.05
D2	BKGD	8	74	33256	60	0	1402.5	37595.05
D3	BKGD	11	62	33257	60	0	1402.5	37595.05
D4	BKGD	16	48	33255	60	0	1402.5	37595.05

B1, B2, B4, C2, C3, D4 OUT OF SERVICE JOP 12-5-02

SECTION XXII

ANALYTICAL DATA (GROSS ALPHA/BETA)

Eberline
Oak Rid [illegible]atory
Analysis [illegible]eet

02-[illegible]
Ga[illegible]
Run 1

Printed: 11/27/[illegible]M
[illegible] 3

Work Order	02-11141
Analysis Code	GaGbT
Run	1
Date Received	11/26/2002
Lab Deadline	12/5/2002
Client	Duratek
Project	106760.003
Report Level	4
Activity Units	pCi
Aliquot Units	g
Matrix	OS
Method	LANL MLR-100 Modified
Instrument Type	Alpha/Beta GPC
Radiometric Tracer	
Radiometric Sol#	
Tracer Act (dpm/g)	
Carrier	
Carrier Conc (mg/ml)	

Internal Fraction	Sample Desc	Client ID	Login CPM	Sample Date	Sample Aliquot
01	LCS	LCS		11/26/02 00:00	1.0000E+00
02	MBL	BLANK		11/26/02 00:00	1.0000E+00
03	DUP	VA-02-0176	89	11/25/02 12:00	1.0313E+00
04	DO	VA-02-0176	89	11/25/02 12:00	1.0313E+00

00579

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

Eberline
Oak Ri[illegible]ory
Analysis [illegible]eet

02[illegible]
G[illegible]
Run 1

Printed: 11/27/[illegible]PM
[illegible] 3

Internal Fraction	Sample Desc	Tracer Aliquot (g)	Tracer Total ACT (dpm)	Radiometric Tracer (pCi)	Radiometric % Rec	Grav Carrier Added (ml)	Grav Filter Tare (g)	Grav Filter Final (g)	Grav Filter Net (g)	Grav % Rec	Mean % Rec	SAF 1*	SAF 2*
01	LCS						7.5464	7.5486	0.0022			1.07	1.00
02	MBL						7.5088	7.5109	0.0021			1.07	1.00
03	DUP						7.5242	7.5439	0.0197			1.26	1.04
04	DO						7.5264	7.5443	0.0179			1.24	1.03

* SAF1 is use[illegible] Gross Alpha and all other radionuclides. SAF2 is used for Gross Beta only. ** Actu[illegible]ass exceeded the calibration curve range. Results should be qualified as appropriate.

Internal Fraction	Sample Desc	Rough Prep Date	Rough Prep By	Prep Date	Prep By	Sep t0 Date/Time	Sep t0 By	Sep t1 Date/Time	Sep t1 By
01	LCS			11/26/02 17:24	CMCMURRAY				
02	MBL			11/26/02 17:24	CMCMURRAY				
03	DUP			11/26/02 17:24	CMCMURRAY				
04	DO			11/26/02 17:24	CMCMURRAY				

00581

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

Eberline [illegible]s
Oak Ridge Laboratory

Preliminary Data Report [illegible]tical Calculations

Work Order: 02-11141-GaGbT-1

Printed: 11/30/2002 [illegible]M
Pa[illegible]3

Lab Fraction	Nuclide	Sample Desc	Client Identification	Activity Units	Results	Error Estimate	MDA	LCS Known	LCS %R	LCS Flag	RPD Flag	MDA Flag	Blank Flag
01	GROSS ALPHA	LCS	LCS	pCi/g	3.42E+02	6.87E+00	5.46E-01	3.29E+02	104.10	OK		OK	
02	GROSS ALPHA	MBL	BLANK	pCi/g	2.87E-02	2.74E-01	5.46E-01					OK	OK
03	GROSS ALPHA	DUP	VA-02-0176	pCi/g	1.23E+00	5.36E-01	6.26E-01				INV	OK	
04	GROSS ALPHA	DO	VA-02-0176	pCi/g	9.60E-01	4.89E-01	6.14E-01					OK	

12-2-02

Client: Duratek
02-11141
GaGbT 1

00582

Preliminary Data Report Analytical Calculations

Work Order: 02-11141-GaGbT-1

Client: Duratek

Eberline Services Work Order: 02-11141

GaGbT 1

Lab Fraction	Nuclide	Sample Desc	Sample Date	Sample Aliquot	Radiometric % Rec	Grav % Rec	Mean % Rec	SAF	Sep t0 Date/Time	Sep t1 Date/Time
01	GROSS ALPHA	LCS	11/26/02 00:00	1.00E+00		0.00	0.00	1.07		
02	GROSS ALPHA	MBL	11/26/02 00:00	1.00E+00		0.00	0.00	1.07		
03	GROSS ALPHA	DUP	11/25/02 12:00	1.03E+00		0.00	0.00	1.26		
04	GROSS ALPHA	DO	11/25/02 12:00	1.03E+00		0.00	0.00	1.24		

Work Order: 02-11141-GaGbT-1

Lab Fraction	Nuclide	Sample Desc	Counting Date/Time	Halflife (days)	Detect	Carrier	Count Time	Counts	Bkg CPM	Eff
01	GROSS ALPHA	LCS	11/27/02 17:45		LB5100	3	60	9534	0.12	0.223
02	GROSS ALPHA	MBL	11/27/02 18:46		LB5100	3	60	8	0.12	0.223
03	GROSS ALPHA	DUP	11/27/02 19:46		LB5100	3	60	37	0.12	0.223
04	GROSS ALPHA	DO	11/27/02 20:46		LB5100	3	60	31	0.12	0.223

Duratek 02-11141 GaGbT 1

00584

Eberline
Oak Ridge Laboratory

Preliminary Data Report & Statistical Calculations

Work Order: 02-11141-GaGbT-1

Printed: 11/30/2002 6:01 PM
Page

Lab Fraction	Nuclide	Sample Desc	Client Identification	Activity Units	Results	Error Estimate	MDA	LCS Known	LCS %R	LCS Flag	RPD Flag	MDA Flag	Blank Flag
01	GROSS BETA	LCS	LCS	pCi/g	2.98E+02	5.63E+00	8.47E-01	2.94E+02	101.53	OK		OK	
02	GROSS BETA	MBL	BLANK	pCi/g	-3.06E-01	4.45E-01	8.47E-01					OK	OK
03	GROSS BETA	DUP	VA-02-0176	pCi/g	2.48E+01	1.48E+00	8.51E-01				OK	OK	
04	GROSS BETA	DO	VA-02-0176	pCi/g	2.42E+01	1.47E+00	8.48E-01					OK	

Client: Duratek
02-11141
GaGbT 1

00585

Preliminary Data Report Analytical Calculations

Work Order: 02-11141-GaGbT-1

Client: Duratek
Eberline Services Work Order: 02-11141
Analysis Code: GaGbT
Run: 1

Lab Fraction	Nuclide	Sample Desc	Sample Date	Sample Aliquot	Radiometric % Rec	Grav % Rec	Mean % Rec	SAF	Sep t0 Date/Time	Sep t1 Date/Time
01	GROSS BETA	LCS	11/26/02 00:00	1.00E+00		0.00	0.00	1.00		
02	GROSS BETA	MBL	11/26/02 00:00	1.00E+00		0.00	0.00	1.00		
03	GROSS BETA	DUP	11/25/02 12:00	1.03E+00		0.00	0.00	1.04		
04	GROSS BETA	DO	11/25/02 12:00	1.03E+00		0.00	0.00	1.03		

Work Order: 02-11141-GaGbT-1

Client: Duratek

Eberline Services Work Order: 02-11141

Analysis Code: GaGbT

Run: 1

Lab Fraction	Nuclide	Sample Desc	Counting Date/Time	Halflife (days)	Detect	Carrier	Count Time	Counts	Bkg CPM	Eff
01	GROSS BETA	LCS	11/27/02 17:45		LB5100	3	60	19261	1.13	0.364
02	GROSS BETA	MBL	11/27/02 18:46		LB5100	3	60	53	1.13	0.364
03	GROSS BETA	DUP	11/27/02 19:46		LB5100	3	60	1264	1.13	0.364
04	GROSS BETA	DO	11/27/02 20:46		LB5100	3	60	1241	1.13	0.364

Cour[illegible]m Report
Clien[illegible]ratek

02-11141-Ga[illegible] (pCi/g) in
Tra[illegible]D:

Printed: 11/27/[illegible]8 PM
[illegible] of 1

Internal Fraction	Sample Desc	Client ID	Sample Date	Sample Aliquot	Tracer Aliquot (g)	Tracer ACT (dpm)	Radiometric Tracer (pCi)	Radiometric % Rec	SAF 1*	SAF 2*
01	LCS	LCS	11/26/02 00:00	1.0000					1.07	1.00
02	MBL	BLANK	11/26/02 00:00	1.0000					1.07	1.00
03	DUP	VA-02-0176	11/25/02 12:00	1.0313					1.26	1.04
04	DO	VA-02-0176	11/25/02 12:00	1.0313					1.24	1.03

00528

Eberline Oak Rid[illegible]tory

Spike and Tr[illegible]orksheet

Printed: 11/26/[illegible] [illegible]f 1 [illegible]PM

Internal Work Order	Run	Analysis Code	Date	Technician	Technician Initials	Witness Initials
02-11141	1	GaGbT	11/26/2002 17:23	CMCMURRAY	[illegible]	

LCS & Matrix Spikes					LCS	MS	LCSD	MSD	LCS		MS		LCSD		MSD	
Isotope	Sol #	Activity dpm/ml	Solution Date	Approx Addition	Volume Used (ml)	Volume Used (ml)	Volume Used (ml)	Volume Used (ml)	Known pCi	Error Estimate	Added pCi	Error Estimate	Known pCi	Error Estimate	Added pCi	Error Estimate
Am-241	A/B-07	703.421	11/26/2002	0.670	1.0371				328.61	14.130	0.00	0.000	0.00	0.000	0.00	0.000
SrY-90	A/B-07	628.552	11/26/2002	0.880	1.0371				293.64	8.809	0.00	0.000	0.00	0.000	0.00	0.000

Tracers						
fraction	Isotope	Sol #	Activity dpm/ml	Solution Date	Volume Used (ml)	Approx Addition

Balance Printer Tapes

Tracer	LCS
[illegible] 7.5464 g 7.5088 g 7.5242 g 7.5264 g	1.0371 g
[illegible] 7.5486 g 7.5109 g 7.5439 g 7.5443 g	[illegible] 5.1563 g

00589

Version 2.0 08/99

Eberline Services - Oak Ridge
Version 2.0 8/1999

Aliquot Worksheet

Work Order	Run	Analysis Code	Aliquot Units	Lab Deadline	Technician
02-11141	1	GaGbT	grams	12/5/2002	CMCMURRAY

Lab Fraction	Duratek Client ID	Sample Type	Muffle Data Ratio Post/Pre	Dilution Data Aliquot	Dilution Data Final (ml)	Dilution Data Ratio	Aliquot Data Aliquot	Aliquot Data Net Equiv	MS Aliquot Data Aliquot	MS Aliquot Data Net Equiv	H-3 Solids Only Water Added (ml)	H-3 Solids Only H3 Dist Aliq
01	LCS	LCS					1.0000E+00	1.0000E+00				
02	BLANK	MBL					1.0000E+00	1.0000E+00				
03	VA-02-0176	DUP		5.1563E+00	50.0000	1.03E+01	1.0000E+01	1.0313E+00				
04	VA-02-0176	DO		5.1563E+00	50.0000	1.03E+01	1.0000E+01	1.0313E+00				

Comments	

Technician: Charlotte P. McMurray Date: 11/27/02

00590

Eberline Services - Oak Ridge
Version 1.0 9/1999

Gravimetric Worksheet

Work Order	Run	Analysis Code	Gravimetric Carrier	Carrier Conc (mg/ml)	Technician
02-11141	1	GaGbT			CMCMURRAY

TRetec	Duratek	Sample	Carrier Data	Filter Data			Gravimetric
Fraction	Client ID	Type	Carrier Added (ml)	Filter Tare (g)	Filter Final (g)	Filter Net (g)	% Recovery
01	LCS			7.5464	7.5486	0.0022	
02	BLANK			7.5088	7.5109	0.0021	
03	DUP			7.5242	7.5439	0.0197	
04	VA-02-0176			7.5264	7.5443	0.0179	

00591

Technician: Charlotte B. McMurray Date: 11/27/02

Count Rate Report

11/29/2002
11:35:07AM

Batch ID:	sample-60 - 200211271645	Acquisition Date:	11/27/2002
Group:	A	Acquisition Time:	60.0
Device:	LB5130-A		
Selected Geometry:	Daily	Operating Voltage: (volts)	1,395.0

0211(41A (1-4)

Applied Count Rate Corrections

Alpha Background Count Rate: (CPM)	0.00	±	0.00	Beta Background Count Rate: (CPM)	0.00	±	0.00
Beta/Alpha Spillover Ratio:	0.00	±	0.00	Alpha/Beta Spillover Ratio:	0.00	±	0.00

Sample ID	Alpha Count Rate (CPM)	2σ	Beta Count Rate (CPM)	2σ
20021127164526-A1	158.90	3.25	321.02	4.63
20021127184726-A2	0.13	0.09	0.88	0.24
20021129111834-A3	0.62	0.20	21.07	1.19
20021129111844-A4	0.52	0.19	20.68	1.17

Reviewed by: _____

11/27/2002
9:56:23AM

Background Report

tch ID:	Daily Bkgd - 200211270724	Acquisition Date:	11/27/2
oup:	H	Acquisition Time:	60.0
Device:	LB5130-A		
Selected Geometry:	Daily	Operating Voltage: (volts)	1,395.0

Applied Count Rate

Averaged Alpha Background: (CPM)	0.12	±	0.09	Averaged Beta Background: (CPM)	1.13	±	0.27

Sample ID	Alpha Count Rate (CPM)	2σ	Beta Count Rate (CPM)	2σ
20021127072441-H60	0.12	0.09	1.13	0.27

Reviewed by: AG 11/27/02

SECTION XXIII

ANALYTICAL DATA (GAMMA SPECTROSCOPY)

Work Order	02-11141
Analysis Code	Gamma
Run	1
Date Received	11/26/2002
Lab Deadline	12/5/2002
Client	Duratek
Project	106760.003
Report Level	4
Activity Units	pCi
Aliquot Units	g
Matrix	OS
Method	LANL ER-130 Modified
Instrument Type	Gamma Spectroscopy
Radiometric Tracer	
Radiometric Sol#	
Tracer Act (dpm/g)	
Carrier	
Carrier Conc (mg/ml)	

Internal Fraction	Sample Desc	Client ID	Login CPM	Sample Date	Sample Aliquot
01	LCS	LCS		11/26/02 00:00	1.0000E+00
02	MBL	BLANK		11/26/02 00:00	1.0000E+00
03	DUP	VA-02-0176	89	11/25/02 12:00	2.8657E+02
04	DO	VA-02-0176	89	11/25/02 12:00	2.8657E+02

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

Internal Fraction	Sample Desc	Tracer Aliquot (g)	Tracer Total ACT (dpm)	Radiometric Tracer (pCi)	Radiometric % Rec	Grav Carrier Added (ml)	Grav Filter Tare (g)	Grav Filter Final (g)	Grav Filter Net (g)	Grav % Rec	Mean % Rec	SAF 1*	SAF 2*
01	LCS												
02	MBL												
03	DUP												
04	DO												

* SAF1 is u[illegible] for Gross Alpha and all other radionuclides. SAF2 is used for Gross Beta only. ** A[illegible]l mass exceeded the calibration curve range. Results should be qualified as appropriate.

Internal Fraction	Sample Desc	Rough Prep Date	Rough Prep By	Prep Date	Prep By	Sep t0 Date/Time	Sep t0 By	Sep t1 Date/Time	Sep t1 By
01	LCS								
02	MBL								
03	DUP								
04	DO								

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

Internal Fraction	Sample Desc	Rough Prep Date	Rough Prep By	Prep Date	Prep By	Sep t0 Date/Time	Sep t0 By	Sep t1 Date/Time	Sep t1 By
01	LCS								
02	MBL								
03	DUP								
04	DO								

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

Work Order: 02-11141-Gamma-1

Lab Fraction	Nuclide	Sample Desc	Client Identification	Activity Units	Results	Error Estimate	MDA	LSC Known	LCS %R	LCS Flag	RPD Flag	Sample Date	Sample Aliquot	Counting Date/Time
01	CO-60	LCS	LCS	pCi/g	2.59E+02	1.93E+01	1.14E+00	2.57E+02	100.95	OK		11/26/02 00:00	1.00E+00	11/27/02 17:51
01	CS-137	LCS	LCS	pCi/g	1.55E+02	1.65E+01	9.95E-01	1.53E+02	101.06	OK		11/26/02 00:00	1.00E+00	11/27/02 17:51
02	AG-110M	MBL	BLANK	pCi/g	4.79E-03	1.72E-02	3.40E-02					11/26/02 00:00	1.00E+00	11/27/02 17:48
02	CO-60	MBL	BLANK	pCi/g	-1.06E-03	1.92E-02	3.70E-02					11/26/02 00:00	1.00E+00	11/27/02 17:48
02	CS-134	MBL	BLANK	pCi/g	1.31E-02	1.27E-02	2.63E-02					11/26/02 00:00	1.00E+00	11/27/02 17:48
02	CS-137	MBL	BLANK	pCi/g	-3.17E-03	1.83E-02	3.41E-02					11/26/02 00:00	1.00E+00	11/27/02 17:48
02	EU-152	MBL	BLANK	pCi/g	-3.83E-02	1.32E-01	2.41E-01					11/26/02 00:00	1.00E+00	11/27/02 17:48
02	EU-154	MBL	BLANK	pCi/g	1.98E-02	4.57E-02	1.04E-01					11/26/02 00:00	1.00E+00	11/27/02 17:48
02	EU-155	MBL	BLANK	pCi/g	1.76E-02	3.72E-02	6.02E-02					11/26/02 00:00	1.00E+00	11/27/02 17:48
02	MN-54	MBL	BLANK	pCi/g	-3.66E-03	2.20E-02	3.57E-02		12-2-02			11/26/02 00:00	1.00E+00	11/27/02 17:48
02	NB-94	MBL	BLANK	pCi/g	1.19E-02	1.73E-02	3.73E-02					11/26/02 00:00	1.00E+00	11/27/02 17:48
02	ZN-65	MBL	BLANK	pCi/g	-1.31E-03	3.76E-02	6.58E-02					11/26/02 00:00	1.00E+00	11/27/02 17:48
03	AG-110M	DUP	VA-02-0176	pCi/g	9.93E-02	2.13E-01	3.39E-01					11/25/02 12:00	2.87E+02	11/27/02 16:08
03	CO-60	DUP	VA-02-0176	pCi/g	2.56E+01	1.99E+00	3.86E-01				OK	11/25/02 12:00	2.87E+02	11/27/02 16:08
03	CS-134	DUP	VA-02-0176	pCi/g	-4.82E-02	1.84E-01	3.02E-01					11/25/02 12:00	2.87E+02	11/27/02 16:08
03	CS-137	DUP	VA-02-0176	pCi/g	1.26E+00	3.86E-01	3.56E-01					11/25/02 12:00	2.87E+02	11/27/02 16:08
03	EU-152	DUP	VA-02-0176	pCi/g	4.99E+00	1.08E+00	8.55E-01				OK	11/25/02 12:00	2.87E+02	11/27/02 16:08
03	EU-154	DUP	VA-02-0176	pCi/g	1.19E-01	3.66E-01	6.68E-01					11/25/02 12:00	2.87E+02	11/27/02 16:08
03	EU-155	DUP	VA-02-0176	pCi/g	-3.33E-03	2.21E-01	3.33E-01					11/25/02 12:00	2.87E+02	11/27/02 16:08
03	I-129	DUP	VA-02-0176	pCi/g	3.20E+01	5.36E+00	2.40E+00					11/25/02 12:00	2.87E+02	11/27/02 16:08
03	MN-54	DUP	VA-02-0176	pCi/g	1.25E-01	2.45E-01	4.27E-01					11/25/02 12:00	2.87E+02	11/27/02 16:08
03	NB-94	DUP	VA-02-0176	pCi/g	1.67E-01	2.74E-01	4.32E-01					11/25/02 12:00	2.87E+02	11/27/02 16:08
03	PB-210	DUP	VA-02-0176	pCi/g	1.18E+01	3.16E+00	3.02E+00					11/25/02 12:00	2.87E+02	11/27/02 16:08
03	ZN-65	DUP	VA-02-0176	pCi/g	2.00E+00	8.98E-01	8.98E-01				OK	11/25/02 12:00	2.87E+02	11/27/02 16:08
04	AG-110M	DO	VA-02-0176	pCi/g	2.39E-01	2.16E-01	3.51E-01					11/25/02 12:00	2.87E+02	11/27/02 17:13
04	CO-60	DO	VA-02-0176	pCi/g	2.61E+01	2.03E+00	3.36E-01					11/25/02 12:00	2.87E+02	11/27/02 17:13
04	CS-134	DO	VA-02-0176	pCi/g	8.51E-02	1.75E-01	2.96E-01					11/25/02 12:00	2.87E+02	11/27/02 17:13
04	CS-137	DO	VA-02-0176	pCi/g	5.37E-01	3.52E-01	3.74E-01					11/25/02 12:00	2.87E+02	11/27/02 17:13
04	EU-152	DO	VA-02-0176	pCi/g	5.33E+00	9.91E-01	1.08E+00					11/25/02 12:00	2.87E+02	11/27/02 17:13
04	EU-154	DO	VA-02-0176	pCi/g	2.29E-01	4.07E-01	7.49E-01					11/25/02 12:00	2.87E+02	11/27/02 17:13
04	EU-155	DO	VA-02-0176	pCi/g	2.53E-01	2.08E-01	3.48E-01					11/25/02 12:00	2.87E+02	11/27/02 17:13
04	I-129	DO	VA-02-0176	pCi/g	2.84E+01	4.93E+00	2.62E+00					11/25/02 12:00	2.87E+02	11/27/02 17:13
04	MN-54	DO	VA-02-0176	pCi/g	1.54E-01	2.42E-01	4.23E-01					11/25/02 12:00	2.87E+02	11/27/02 17:13
04	NB-94	DO	VA-02-0176	pCi/g	3.91E-02	2.65E-01	4.56E-01					11/25/02 12:00	2.87E+02	11/27/02 17:13
04	PB-210	DO	VA-02-0176	pCi/g	1.17E+01	3.19E+00	3.27E+00					11/25/02 12:00	2.87E+02	11/27/02 17:13
04	ZN-65	DO	VA-02-0176	pCi/g	1.61E+00	7.62E-01	9.39E-01					11/25/02 12:00	2.87E+02	11/27/02 17:13

Post-it® Fax Note 7671

Date 12-2-02 # of pages ▶ 1

To Paul Jones

From Judy Mellette

Co./Dept.

Co.

Phone #

Phone #

Fax # 865 376-0247

Fax #

00598

Internal Fraction	Sample Desc	Client ID	Sample Date	Sample Aliquot	Tracer Aliquot (g)	Tracer ACT (dpm)	Radiometric Tracer (pCi)	Radiometric % Rec	SAF 1*	SAF 2*
01	LCS	LCS	11/26/02 00:00	1.0000						
02	MBL	BLANK	11/26/02 00:00	1.0000						
03	DUP	VA-02-0176	11/25/02 12:00	286.5740						
04	DO	VA-02-0176	11/25/02 12:00	286.5740						

Eberline Services - Oak Ridge
Version 2.0 8/1999

Aliquot Worksheet

Work Order	Run	Analysis Code	Aliquot Units	Lab Deadline	Technician
02-11141	1	Gamma	grams	12/5/2002	KSALLINGS

Lab Fraction	Duratek	Sample	Muffle Data	Dilution Data			Aliquot Data		MS Aliquot Data		H-3 Solids Only	
	Client ID	Type	Ratio Post/Pre	Aliquot	Final (ml)	Ratio	Aliquot	Net Equiv	Aliquot	Net Equiv	Water Added (ml)	H3 Dist Aliq
01	LCS	LCS					1.0000E+00	1.0000E+00				
02	BLANK	MBL					1.0000E+00	1.0000E+00				
03	VA-02-0176	DUP					2.8657E+02	2.8657E+02				
04	VA-02-0176	DO					2.8657E+02	2.8657E+02				

Comments	

00900

Technician: Kenny Sallings Date: 11/26/02

AC 11/27/4

mple ID : 0211141-01 Acquisition date : 27-NOV-2002

/VMS Peak Search Report Generated 27-NOV-2002 18:22:32.15

nfiguration : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_021114101_GE3_GAS2_48069.
alyses by : PEAK V16.9 ENBACK V1.6 PEAKEFF V2.2
ient ID : SPIKE
position Date :
mple Date : 1-OCT-2001 00:00:00. Acquisition date : 27-NOV-2002 17:51:25
mple ID : 0211141-01 Sample Quantity : 3.84000E+02 GRAM
mple type : SOIL Sample Geometry : 0
tector name : GE3 Detector Geometry: GAS-2
apsed live time: 0 00:30:00.00 Elapsed real time: 0 00:30:46.96 2.5%
art channel : 5 End channel : 4096
nsitivity : 3.00000 Gaussian : 15.00000
itical level : No

st-NID Peak Search Report

:	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
L	59.41	119580	36617	1.37	59.89	56	7	0.8	3.66E+03	AM-241
L	67.56	2571	27634	3.73	68.05	66	7	21.7	3.70E+00	
)	85.74*	4358	26170	3.64	86.24	83	10	18.2	2.51E+01	NP-237
)	88.05	90049	9269	1.14	88.55	83	10	0.7		SN-126
										CD-109
L	111.29*	385	9630	1.80	111.79	110	5	76.9	5.58E+00	
L	122.17	36497	16261	1.58	122.68	118	10	1.6	6.92E+02	CO-57
	136.48	3881	9148	1.24	136.99	134	7	8.8	9.12E-01	CO-57
1	165.86*	13463	8846	1.38	166.38	163	8	3.0	2.22E+01	CE-139
1	199.23*	246	5612	1.51	199.76	198	5	92.1	1.68E+00	
1	255.15	372	4557	1.58	255.69	254	5	55.3	1.07E+00	SN-113
1	279.42	417	4910	1.66	279.97	277	6	54.0	3.03E+00	
1	310.92	266	4338	2.10	311.48	309	6	79.1	3.37E+00	
1	391.67	6488	5815	1.38	392.24	388	9	4.9	3.82E-01	SN-113
1	410.86	260	3678	1.99	411.43	409	6	74.7	2.71E+00	
1	511.16*	332	3780	2.94	511.75	508	8	65.2	9.36E-01	
1	583.36*	131	1974	1.61	583.95	582	5	103.4	8.48E-01	TL-208
1	608.16*	136	2677	2.48	608.75	606	7	126.8	7.19E-01	BI-214
1	661.57	32828	3937	1.53	662.16	657	10	1.3	2.40E+00	CS-137
1	697.58	134	2132	2.84	698.16	696	6	110.1	7.48E-01	
1	712.72	63	1757	1.80	713.30	711	5	199.7	1.58E+00	
1	779.56	277	1895	2.32	780.14	778	6	50.6	8.13E+00	
1	813.56	251	2058	1.56	814.14	812	6	57.8	1.17E+01	
1	897.95	6105	4403	1.69	898.52	894	10	4.8	7.97E-01	Y-88
1	1110.51	93	1984	1.68	1111.02	1108	6	152.1	2.56E-01	
1	1173.20	34681	2067	1.85	1173.69	1168	12	1.2	3.35E+00	CO-60
3	1324.81	145	491	2.74	1325.24	1321	19	54.0	1.52E+00	
3	1332.51	32018	339	1.93	1332.93	1321	19	1.1		CO-60
1	1460.34*	23	185	2.68	1460.70	1458	6	189.1	7.10E-01	K-40
1	1510.93	33	178	2.56	1511.26	1509	6	131.7	7.85E-01	
1	1764.36*	26	99	4.23	1764.52	1760	9	147.2	1.11E+00	BI-214
1	1772.17	16	47	3.39	1772.31	1770	6	141.0	3.09E+00	
	1836.33	3751	144	2.20	1836.43	1831	12	3.5	3.96E-01	Y-88
	1903.15	23	50	3.57	1903.20	1899	8	111.8	8.38E-01	
1	2041.39	166	141	42.21	2041.31	2037	31	43.5	1.21E+00	
1	2139.57	16	46	3.06	2139.39	2136	9	163.1	7.36E-01	

AG 12/2/02

00601

Sample ID : 0211141-01 Acquisition date : 27-NOV-2002 17:51:25

	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
1	2230.32	29	23	3.57	2230.05	2227	7	65.5	1.41E+00	
1	2395.01	31	14	12.08	2394.56	2389	14	60.4	1.95E+00	
1	2412.71	59	24	28.13	2412.23	2409	19	41.9	1.73E+00	
1	2448.08	13	17	5.12	2447.57	2441	13	138.0	1.39E+00	
1	2506.69	331	16	2.62	2506.10	2501	12	12.1	6.38E-01	
1	2615.56*	29	0	6.05	2614.84	2609	13	38.0	3.24E-01	TL-208
1	2735.12	66	4	2.73	2734.23	2730	8	26.5	3.73E-01	

Sample ID : 0211141-01 Acquisition date : 27-NOV-2002 17:51:25

Total number of lines in spectrum	42	
Number of unidentified lines	19	
Number of lines tentatively identified by NID	23	54.76%

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	1.646E+00	1.646E+00	3.117E+00	189.38	
TL-208	1.41E+10Y	1.00	9.403E-01	9.403E-01	3.527E-01	37.51	
BI-214	1602.00Y	1.00	1.172E+00	1.173E+00	1.139E+00	97.13	
AM-241	432.20Y	1.00	4.252E+02	4.260E+02	0.463E+02	10.87	
			---	---			
	Total Activity :		4.290E+02	4.298E+02			

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CO-57	270.90D	2.95	5.027E+01	1.483E+02	0.115E+02	7.78	
Y-88	106.60D	15.6	3.347E+01	5.229E+02	0.402E+02	7.69	
CD-109	464.00D	1.88	2.841E+03	5.343E+03	0.643E+03	12.03	
SN-113	115.10D	12.8	2.526E+01	3.222E+02	0.376E+02	11.68	
SN-126	1.00E+05Y	1.00	2.857E+02	2.857E+02	0.299E+02	10.47	
CS-137	30.17Y	1.03	1.510E+02	1.551E+02	0.165E+02	10.62	
CE-139	137.66D	8.40	2.328E+01	1.956E+02	0.199E+02	10.20	
NP-237	2.14E+06Y	1.00	4.060E+01	4.060E+01	0.852E+01	20.97	
			---	---			
	Total Activity :		3.451E+03	7.013E+03			

Nuclide Type : ACTIVATION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CO-60	5.27Y	1.16	2.225E+02	2.591E+02	0.192E+02	7.43	
			---	---			
	Total Activity :		2.225E+02	2.591E+02			

Grand Total Activity : 4.102E+03 7.702E+03

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

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.81	10.67*	5.191E-01	1.646E+00	1.646E+00	189.38	OK
Final Mean for 1 Valid Peaks = 1.646E+00+/- 3.117E+00 (189.38%)							
TL-208	583.14	30.22*	1.113E+00	1.517E+00	1.517E+00	103.98	OK
	860.37	4.48	7.974E-01	----- Line Not Found		-----	Absent
	2614.66	35.85	3.468E-01	9.100E-01	9.100E-01	39.77	OK
Final Mean for 2 Valid Peaks = 9.403E-01+/- 3.527E-01 (37.51%)							
BI-214	609.31	46.30*	1.072E+00	1.073E+00	1.073E+00	127.22	OK
	1120.29	15.10	6.402E-01	----- Line Not Found		-----	Absent
	1764.49	15.80	4.511E-01	1.401E+00	1.401E+00	147.50	OK
	2204.22	4.98	3.868E-01	----- Line Not Found		-----	Absent
Final Mean for 2 Valid Peaks = 1.173E+00+/- 1.139E+00 (97.13%)							
AM-241	59.54	35.90*	3.063E+00	4.252E+02	4.260E+02	10.87	OK
Final Mean for 1 Valid Peaks = 4.260E+02+/- 4.630E+01 (10.87%)							

Nuclide Type: FISSION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
CO-57	122.06	85.51*	3.176E+00	5.254E+01	1.550E+02	9.54	OK
	136.48	10.60	3.062E+00	4.674E+01	1.379E+02	13.37	OK
Final Mean for 2 Valid Peaks = 1.483E+02+/- 1.154E+01 (7.78%)							
Y-88	898.02	93.40	7.691E-01	3.323E+01	5.192E+02	11.58	OK
	1836.01	99.38*	4.385E-01	3.366E+01	5.259E+02	10.29	OK
Final Mean for 2 Valid Peaks = 5.229E+02+/- 4.023E+01 (7.69%)							
CD-109	88.03	3.72*	3.332E+00	2.841E+03	5.343E+03	12.03	OK
Final Mean for 1 Valid Peaks = 5.343E+03+/- 6.429E+02 (12.03%)							
SN-113	255.12	1.93	2.167E+00	3.477E+01	4.434E+02	62.80	OK
	391.69	64.90*	1.558E+00	2.508E+01	3.199E+02	11.87	OK
Final Mean for 2 Valid Peaks = 3.222E+02+/- 3.762E+01 (11.68%)							
SN-126	87.57	37.00*	3.331E+00	2.857E+02	2.857E+02	10.47	OK
Final Mean for 1 Valid Peaks = 2.857E+02+/- 2.991E+01 (10.47%)							

Sample ID : 0211141-01 Acquisition date : 27-NOV-2002 17:51:25

Nuclide Type: FISSION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
CS-137	661.65	85.12*	9.985E-01	1.510E+02	1.551E+02	10.62	OK
Final Mean for 1 Valid Peaks = 1.551E+02+/- 1.647E+01 (10.62%)							
CE-139	165.85	80.35*	2.814E+00	2.328E+01	1.956E+02	10.20	OK
Final Mean for 1 Valid Peaks = 1.956E+02+/- 1.995E+01 (10.20%)							
NP-237	86.50	12.60*	3.331E+00	4.060E+01	4.060E+01	20.97	OK
Final Mean for 1 Valid Peaks = 4.060E+01+/- 8.515E+00 (20.97%)							

Nuclide Type: ACTIVATION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
CO-60	1173.22	100.00*	6.167E-01	2.199E+02	2.561E+02	11.15	OK
	1332.49	100.00	5.573E-01	2.246E+02	2.616E+02	9.96	OK
Final Mean for 2 Valid Peaks = 2.591E+02+/- 1.925E+01 (7.43%)							

Flag: "*" = Keyline

mbined Activity-MDA Report
mple ID : 0211141-01 Acquisition date : 27-NOV-2002

---- dentified Nuclides ----

uclide	Activity (pCi/GRAM)	Act error	MDA (pCi/GRAM)	MDA error	Act/
·40	1.646E+00	3.117E+00	4.792E+00	4.490E-01	0.343
)-57	1.483E+02	1.154E+01	1.684E+00	1.433E-01	88.065
)-60	2.591E+02	1.925E+01	1.142E+00	1.181E-01	226.834
·88	5.229E+02	4.023E+01	5.907E+00	5.204E-01	88.524
)-109	5.343E+03	6.429E+02	3.202E+01	3.627E+00	166.842
N-113	3.222E+02	3.762E+01	1.310E+01	1.315E+00	24.588
N-126	2.857E+02	2.991E+01	1.712E+00	1.652E-01	166.877
S-137	1.551E+02	1.647E+01	9.948E-01	9.698E-02	155.909
E-139	1.956E+02	1.995E+01	4.877E+00	4.341E-01	40.116
L-208	9.403E-01	3.527E-01	2.532E+00	2.568E-01	0.371
I-214	1.173E+00	1.139E+00	1.739E+00	1.747E-01	0.674
P-237	4.060E+01	8.515E+00	5.025E+00	4.842E-01	8.079
M-241	4.260E+02	4.630E+01	2.402E+00	2.420E-01	177.373

--- Non-Identified Nuclides ----

uclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
	6.673E+02		1.040E+03	1.803E+03	1.830E+02	0.370
22	1.559E-01		5.128E-01	8.726E-01	8.361E-02	0.179
N-54	9.277E-01		1.566E+00	2.665E+00	2.629E-01	0.348
O-56	-7.625E+00		2.610E+01	4.389E+01	4.319E+00	-0.174
O-58	-1.494E+01		4.079E+01	6.150E+01	6.117E+00	-0.243
N-65	5.241E+00		5.313E+00	8.061E+00	8.296E-01	0.650
E-75	-4.386E+00		7.034E+00	1.089E+01	3.266E+00	-0.403
B-83	-5.271E+00		2.916E+01	4.788E+01	7.945E+00	-0.110
R-85	1.242E+02		1.191E+02	1.868E+02	1.909E+01	0.665
R-85	4.623E+01		4.433E+01	6.956E+01	7.115E+00	0.665
B-94	2.575E-01		6.615E-01	1.121E+00	1.097E-01	0.230
R-95	1.070E+00		9.370E+01	1.592E+02	1.702E+01	0.007
U-106	3.726E+00		1.050E+01	1.804E+01	2.577E+00	0.207
G-110M	3.242E+01		4.128E+00	4.249E+00	4.148E-01	7.630
E123M	8.296E-02		4.381E+00	6.511E+00	5.747E-01	0.013
B-124	-2.896E+01		6.631E+01	1.013E+02	1.022E+01	-0.286
-125	0.000E+00		0.000E+00	1.053E+01	1.610E+00	0.000
B-125	-1.151E+00		1.929E+00	3.311E+00	3.352E-01	-0.348
-129	0.000E+00		0.000E+00	6.164E-02	8.346E-03	0.000
A-133	-6.271E-01		7.387E-01	1.128E+00	2.433E-01	-0.556
S-134	-5.345E-01		7.583E-01	1.150E+00	1.160E-01	-0.465
S-135	2.698E-01		2.226E+00	3.537E+00	1.094E+00	0.076
E-144	1.119E+01		8.096E+00	1.218E+01	1.043E+00	0.919
M-144	1.239E+00	+	1.373E+00	1.975E+00	2.297E-01	0.627
M-145	0.000E+00		0.000E+00	2.415E-02	1.599E-02	0.000
M 46	-2.530E-02		1.292E+00	2.231E+00	2.247E-01	-0.011
52	1.652E+00		2.144E+00	3.747E+00	4.239E-01	0.441
-154	3.136E-01		1.160E+00	1.972E+00	1.890E-01	0.159
U-155	1.946E+01	+	4.082E+00	6.118E+00	5.895E-01	3.181
R-192	1.763E+00		5.075E+01	8.760E+01	8.868E+00	0.020

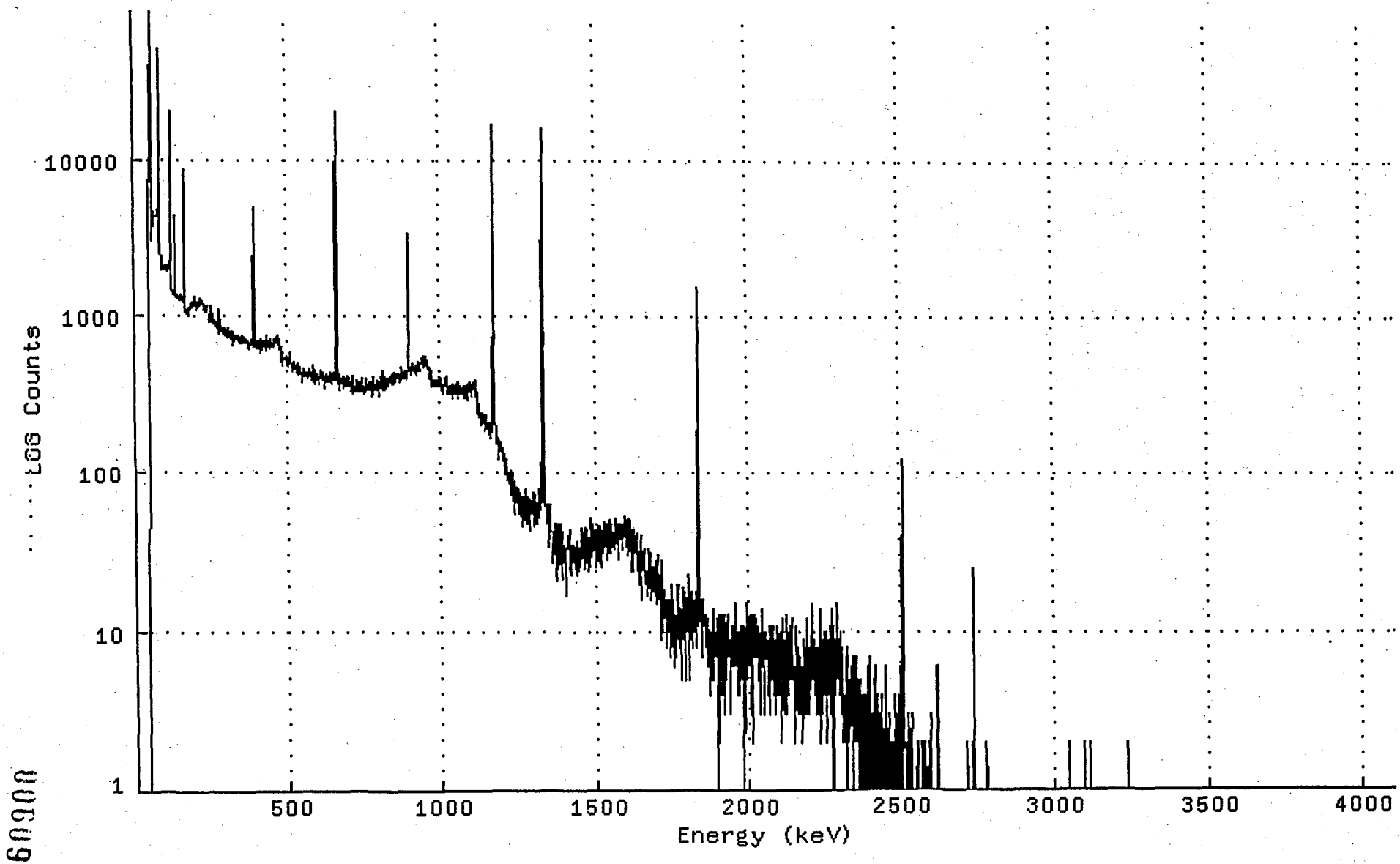
Sample ID : 0211141-01 Acquisition date : 27-NOV-2002 17:51:25

- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
BI-207	1.814E-01		4.610E-01	7.952E-01	8.095E-02	0.228
BI-210M	4.009E-01		8.636E-01	1.260E+00	3.689E-01	0.318
PB-210	-3.414E+02		4.345E+01	1.197E+01	1.402E+00	-28.520
PB-211	7.645E+00		1.522E+01	2.396E+01	2.348E+00	0.319
BI-212	2.082E+00		4.376E+00	7.492E+00	7.401E-01	0.278
PB-212	2.341E-01		8.027E-01	1.280E+00	3.002E-01	0.183
PB-214	6.920E-01		1.077E+00	1.696E+00	3.408E-01	0.408
RN-219	2.558E-01		6.742E+00	1.056E+01	1.033E+00	0.024
RA-223	1.099E+01		1.011E+01	1.552E+01	4.068E+00	0.708
RA-224	1.340E+00		8.988E+00	1.433E+01	3.442E+00	0.093
RA-226	6.393E+00		1.502E+01	1.520E+01	2.787E+01	0.421
TH-227	1.871E+00		3.128E+00	4.968E+00	1.135E+00	0.377
AC-228	2.762E+00		2.638E+00	4.473E+00	4.365E-01	0.618
TH-230	3.341E+01		5.103E+00	5.332E+00	6.161E-01	6.266
PA-231	3.523E+00		1.590E+01	2.518E+01	7.600E+00	0.140
TH-231	0.000E+00		0.000E+00	5.776E-02	1.432E-02	0.000
PA-234	-3.178E-01		1.496E+00	2.229E+00	1.905E-01	-0.143
PA-234M	2.346E+01		7.830E+01	1.318E+02	1.325E+01	0.178
TH-234	2.336E+00		1.292E+01	1.730E+01	1.710E+00	0.135
U-235	5.573E-01		2.932E+00	4.377E+00	7.671E-01	0.127

Nuclide	Half-life	Half-Life Ratio	Energy	%Abund	Activity (pCi/GRAM)	2-Sigma %Error	Rejected by
CO-56	78.76D	5.37	846.75*	99.96	--- Not Found ---		Abun.
			1037.75	14.03	--- Not Found ---		
			1238.25	67.00	--- Not Found ---		
			1771.40	15.51	3.814E+01	141.31	
			2598.48	16.90	--- Not Found ---		
		% Abundances Found =		7.27	(Abn. Limit = 99.96%)		
SE-75	119.78D	3.53	121.11	16.70	3.100E+03	11.95	Abun.
			136.00	59.20	9.652E+01	15.44	
			264.65*	59.80	--- Not Found ---		
			279.53	25.20	3.685E+01	63.94	
			400.65	11.40	--- Not Found ---		
		% Abundances Found =		58.68			
PM-144	363.00D	1.16	476.78	42.00	--- Not Found ---		Abun.
			618.01	98.60	--- Not Found ---		
			696.49*	99.49	1.239E+00	110.79	
		% Abundances Found =		41.44			
EU-152	13.60Y	0.09	121.78	20.50	2.323E+02	11.73	Abun.
			244.69	5.40	--- Not Found ---		
			344.27	19.13	--- Not Found ---		
			778.89	9.20	1.441E+01	52.01	
			964.01	10.40	--- Not Found ---		
			1085.78	7.22	--- Not Found ---		
			1112.02	9.60	--- Not Found ---		
			1407.95*	14.94	--- Not Found ---		
		% Abundances Found =		30.81			
EU-154	8.80Y	0.13	123.07	40.50	1.218E+02	9.53	Abun.
			723.30	19.70	--- Not Found ---		
			873.19	11.50	--- Not Found ---		
			996.32	10.30	--- Not Found ---		
			1004.76	17.90	--- Not Found ---		
			1274.45*	35.50	--- Not Found ---		
		% Abundances Found =		29.91			
EU-155	4.96Y	0.23	86.50*	30.90	1.946E+01	20.97	Abun.
			105.30	20.70	--- Not Found ---		
		% Abundances Found =		59.88			
HG-203	46.60D	9.07	279.19*	77.30	5.594E+02	63.96	Decay
		% Abundances Found =		100.00			
TH-227	3.28E+04Y	0.00	50.10	8.40	--- Not Found ---		Abun.
			236.00*	11.50	--- Not Found ---		
			256.20	6.30	1.068E+01	62.04	
		% Abundances Found =		24.05			
PA-233	27.00D	15.66	311.98*	38.60	7.460E+04	87.03	Decay
		% Abundances Found =		100.00			

Spectr[illegible] : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_[illegible]1114101_GE3_GAS2_48069.CNF;1
Title :
Sample Title: SPIKE
Start Time: 27-NOV-2002 17:51 Sample Time: 1-OCT-2001 00:00: Energy Offset: -4.61186E-01
Real Time : 0 00:30:46.96 Sample ID : 0211141-01 Energy Slope : 9.99592E-01
Live Time : 0 00:30:00.00 Sample Type: SOIL Energy Quad : 3.29690E-07



60900

Channel Contents for [GAMMA.SCUSR.ARCHIVE]SMP_021114101_GE3_GAS2_48069.CNF

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17:	0	0	0	0	0	0	0	0
25:	0	0	0	0	0	0	0	0
33:	0	0	0	0	0	0	0	0
41:	0	0	0	0	0	0	1	1902
49:	5880	7155	6862	6925	6939	7043	7306	7800
57:	8079	8687	17126	89964	12669	2877	2903	3042
65:	3225	3877	4326	4406	4535	4145	4318	4268
73:	4233	4119	4120	4155	4150	4302	4287	4131
81:	4226	4404	4510	4821	4925	4989	5493	42473
89:	50234	2574	2122	1991	2060	1923	1960	1903
97:	1935	1932	2017	1917	1883	1989	1973	1942
105:	1988	1982	1970	1900	1961	1979	2018	2014
113:	2032	1833	1962	1917	1926	1890	1934	2036
121:	2202	14309	20342	1724	1477	1409	1445	1357
129:	1396	1371	1321	1388	1352	1343	1344	1778
137:	4283	1697	1298	1269	1285	1315	1245	1253
145:	1318	1303	1265	1266	1231	1266	1241	1270
153:	1247	1228	1227	1293	1322	1216	1260	1190
161:	1243	1273	1180	1242	1422	8481	6173	1074
169:	1047	1038	997	1062	1059	1066	1069	1047
177:	978	972	1073	1052	1002	1068	1120	1064
185:	1167	1135	1146	1146	1092	1131	1098	1127
193:	1124	1180	1144	1148	1144	1110	1239	1278
201:	1101	1121	1118	1151	1100	1064	1084	1185
209:	1110	1096	1145	1100	1146	1133	1240	1130
217:	1249	1189	1249	1205	1235	1184	1223	1179
225:	1189	1075	1147	1153	1136	1127	1123	1130
233:	1050	1037	1105	1101	1059	1097	1120	1036
241:	1034	1035	1037	977	987	970	988	947
249:	897	937	940	932	908	924	1033	1127
257:	916	879	938	927	936	931	879	906
265:	923	885	859	858	895	905	874	822
273:	844	901	757	839	841	826	952	1049
281:	813	820	786	844	830	817	825	813
289:	810	827	751	830	780	747	835	803
297:	763	791	760	720	751	799	739	754
305:	741	740	749	765	712	790	832	744
313:	749	715	709	755	730	735	730	651
321:	754	786	724	716	713	744	724	677
329:	677	706	690	710	696	695	734	712
337:	703	699	738	706	682	709	688	691
345:	663	690	726	689	662	693	663	714
353:	734	673	681	654	679	657	710	669
361:	696	700	678	677	655	703	628	634
369:	640	643	688	664	669	630	624	638
377:	656	652	611	647	638	706	638	655
385:	658	668	652	644	658	620	1136	4747
393:	2559	693	656	655	634	617	665	673
401:	655	622	638	675	659	662	657	638
409:	614	678	666	707	645	578	630	657
417:	666	619	617	647	597	673	669	648
425:	688	632	634	650	651	678	664	730

00610

433:	592	696	682	652	644	660	632	635
441:	654	669	607	701	644	635	618	652
449:	652	623	656	640	703	648	660	651
457:	619	676	661	683	700	666	713	691
465:	692	689	653	675	732	665	648	6[illegible]
473:	655	639	606	700	616	619	573	584
481:	564	590	508	573	528	478	572	508
489:	521	523	518	512	537	517	509	525
497:	528	486	472	521	540	470	455	532
505:	491	494	499	461	494	525	577	561
513:	536	525	460	473	437	465	455	472
521:	443	503	446	446	498	461	473	478
529:	449	479	449	426	424	443	482	418
537:	471	422	417	410	453	456	424	415
545:	430	416	415	368	420	403	418	435
553:	451	425	401	429	433	407	405	403
561:	414	425	405	412	421	394	401	411
569:	423	404	398	443	413	400	416	405
577:	379	394	416	428	418	389	439	468
585:	411	372	406	377	406	428	361	420
593:	438	413	400	395	381	410	384	406
601:	401	404	371	369	355	356	399	408
609:	432	431	387	387	419	396	410	424
617:	382	399	344	391	385	377	396	396
625:	391	371	392	397	399	413	388	381
633:	389	399	375	373	381	381	419	381
641:	371	381	419	415	386	401	409	413
649:	355	386	401	423	397	376	396	382
657:	402	399	412	549	4472	20025	9190	726
665:	424	414	377	330	357	408	395	39[illegible]
673:	392	376	377	365	378	369	394	36[illegible]
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689:	373	370	372	354	355	383	350	356
697:	407	395	393	358	367	347	366	352
705:	337	366	339	347	321	370	338	348
713:	382	396	338	361	315	327	335	346
721:	345	319	331	380	347	363	367	356
729:	325	369	361	343	363	332	325	337
737:	322	371	353	337	330	340	390	349
745:	322	372	332	314	319	326	335	339
753:	314	386	333	353	344	375	324	343
761:	340	334	359	362	347	362	366	334
769:	367	342	347	338	374	355	364	332
777:	326	305	407	349	365	338	319	313
785:	346	362	351	346	335	326	377	379
793:	333	347	367	350	307	357	351	370
801:	326	357	348	356	339	401	357	347
809:	337	347	337	333	384	381	433	326
817:	335	362	378	367	406	382	391	381
825:	361	341	356	383	392	347	366	375
833:	372	389	375	402	369	385	386	374
841:	363	397	409	362	389	389	364	382
849:	404	384	376	421	387	404	411	377
857:	373	390	404	397	396	392	402	408
865:	402	376	390	372	410	402	377	455
873:	412	387	383	450	386	413	429	40[illegible]
881:	427	428	423	418	387	412	442	439
889:	411	394	411	438	429	434	442	441
897:	823	3043	3189	815	457	414	434	461
905:	415	411	455	433	474	456	484	479

913:	432	425	435	424	430	437	455	466
921:	454	412	442	445	476	467	456	499
929:	444	432	476	468	455	441	487	482
937:	478	494	496	527	485	491	506	526
945:	542	485	493	466	471	532	538	477
953:	531	506	499	470	509	486	481	489
961:	478	451	453	466	442	458	399	393
969:	412	438	361	353	389	359	386	385
977:	371	377	351	368	358	381	378	369
985:	366	349	362	369	359	361	375	383
993:	353	361	369	391	359	397	353	374
1001:	395	366	355	357	344	316	353	329
1009:	361	352	348	346	394	384	368	391
1017:	354	350	396	345	371	369	312	310
1025:	351	332	350	322	351	312	314	336
1033:	335	340	328	340	360	346	349	296
1041:	318	343	342	323	339	315	317	344
1049:	355	313	309	316	314	333	298	366
1057:	323	360	335	338	332	317	345	322
1065:	330	340	314	329	315	325	320	319
1073:	344	329	326	350	299	333	332	337
1081:	340	343	296	322	346	362	291	328
1089:	303	349	290	348	330	342	374	322
1097:	328	360	340	308	360	360	349	351
1105:	370	337	349	328	331	351	379	353
1113:	315	335	306	310	318	290	292	239
1121:	295	284	258	236	247	255	222	224
1129:	240	228	235	240	226	199	226	204
1137:	237	204	233	223	184	232	205	233
1145:	208	202	213	215	229	221	199	192
1153:	208	206	188	204	177	192	175	203
1161:	166	175	207	184	193	193	198	184
1169:	217	181	276	1924	12267	16515	4474	396
1177:	220	180	153	158	162	161	162	152
1185:	132	157	164	137	167	123	157	156
1193:	144	137	144	144	122	118	130	137
1201:	144	130	116	107	97	115	133	100
1209:	107	91	122	96	89	99	84	93
1217:	101	96	87	87	102	89	85	72
1225:	87	84	97	85	87	79	67	66
1233:	74	88	61	75	83	55	69	72
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1249:	68	57	60	67	74	53	61	56
1257:	63	47	65	56	67	70	46	51
1265:	69	51	51	59	63	58	70	48
1273:	63	78	57	64	63	69	57	70
1281:	48	52	54	51	58	43	49	68
1289:	64	57	54	54	61	56	73	72
1297:	51	59	48	46	48	71	56	55
1305:	62	48	48	55	51	49	60	65
1313:	59	56	56	55	65	78	52	65
1321:	58	58	77	83	116	88	84	65
1329:	70	107	1038	8218	15726	6694	708	88
1337:	68	51	50	54	51	62	48	45
1345:	62	60	34	42	49	48	63	58
1353:	45	46	44	40	42	39	30	27
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1377:	47	28	34	33	47	31	33	41
1385:	38	30	22	33	42	35	34	36

1393:	35	30	32	33	27	35	32	30
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1409:	37	35	37	44	30	30	37	32
1417:	24	32	32	31	35	30	23	[illegible]
1425:	28	27	35	31	28	32	25	[illegible]
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1441:	23	34	30	24	31	32	30	31
1449:	30	45	43	33	40	26	33	33
1457:	29	31	29	40	45	36	28	35
1465:	25	32	35	40	44	27	39	36
1473:	39	27	34	24	35	39	35	51
1481:	33	36	30	26	32	48	30	47
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1497:	37	43	30	36	42	26	33	46
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1513:	28	27	33	35	43	40	26	32
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1561:	40	33	36	43	47	36	40	42
1569:	40	47	35	33	45	47	46	44
1577:	29	47	48	43	43	38	42	47
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1609:	50	38	32	47	37	35	43	24
1617:	37	36	35	36	38	27	43	24
1625:	24	31	34	31	33	33	40	[illegible]
1633:	27	41	24	27	26	30	31	[illegible]
1641:	20	23	22	26	40	19	16	25
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1657:	27	23	22	30	33	33	20	24
1665:	24	17	22	21	22	26	25	19
1673:	28	21	33	21	24	19	23	16
1681:	31	19	26	18	18	21	25	24
1689:	26	25	17	24	23	17	26	20
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1705:	24	17	22	23	9	21	14	20
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1737:	13	16	14	7	14	9	8	20
1745:	14	15	14	14	8	11	6	16
1753:	9	12	13	7	13	11	13	13
1761:	13	10	20	17	19	9	14	10
1769:	9	8	12	10	20	5	8	7
1777:	10	14	8	19	15	11	9	12
1785:	16	18	8	11	9	5	14	13
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1801:	6	10	5	10	11	15	13	9
1809:	18	17	11	13	18	10	13	8
1817:	13	11	16	16	13	13	15	12
1825:	18	8	15	11	11	16	14	[illegible]
1833:	13	70	507	1470	1341	400	47	[illegible]
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1849:	15	16	11	14	14	9	8	11
1857:	11	11	13	11	11	6	12	9
1865:	11	10	4	7	8	6	7	10

1873:	9	7	8	6	5	11	11	5
1881:	14	7	10	9	10	9	10	10
1889:	7	8	9	1	6	12	9	8
1897:	2	8	5	6	7	13	11	13
1905:	9	4	8	6	9	5	13	7
1913:	10	4	8	8	3	8	8	13
1921:	5	6	5	10	5	7	11	12
1929:	13	12	7	7	9	8	5	7
1937:	9	3	9	9	7	8	8	6
1945:	11	10	8	11	6	10	8	15
1953:	9	6	8	13	9	10	10	6
1961:	6	8	4	10	7	5	6	7
1969:	4	4	11	5	6	11	9	5
1977:	7	6	11	6	10	1	5	7
1985:	8	6	4	8	14	12	7	11
1993:	5	15	10	9	8	6	9	6
2001:	13	11	3	7	5	4	11	4
2009:	5	2	7	13	8	13	10	7
2017:	11	10	13	10	8	7	7	12
2025:	7	7	11	7	11	6	5	8
2033:	7	10	8	3	5	7	8	8
2041:	14	13	6	9	5	3	10	9
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2057:	5	6	4	5	5	9	4	4
2065:	7	11	3	7	6	5	11	10
2073:	8	6	8	4	5	5	7	11
2081:	4	4	9	7	3	9	5	10
2089:	4	9	5	11	9	4	7	8
2097:	6	7	9	3	10	8	8	9
2105:	2	5	12	6	9	10	4	3
2113:	8	5	7	9	5	5	13	3
2121:	6	8	6	7	7	4	10	5
2129:	7	6	5	11	11	5	5	9
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2153:	8	6	7	5	3	8	6	6
2161:	7	5	7	3	5	7	3	6
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2177:	7	4	3	8	5	7	4	7
2185:	8	6	7	8	12	3	8	8
2193:	5	4	5	5	3	6	7	7
2201:	7	6	6	15	5	6	7	9
2209:	7	9	4	7	7	4	4	7
2217:	8	3	6	3	8	8	7	7
2225:	8	4	3	7	9	8	14	6
2233:	2	4	3	6	7	3	9	7
2241:	6	9	7	4	10	10	7	10
2249:	7	5	2	8	7	6	4	6
2257:	5	9	5	11	6	3	6	7
2265:	5	14	7	3	8	1	11	5
2273:	0	10	11	7	8	8	5	4
2281:	9	9	8	5	11	7	15	11
2289:	8	9	5	5	6	9	4	10
2297:	8	3	6	7	6	8	2	3
2305:	3	2	3	3	2	4	4	4
2313:	4	2	0	5	7	2	6	3
2321:	5	8	1	5	4	3	3	2
2329:	5	2	5	3	5	3	4	4
2337:	6	3	2	4	5	3	1	7
2345:	4	6	3	4	2	7	7	3

2353:	4	2	7	4	3	3	0	3
2361:	5	3	4	3	3	1	3	5
2369:	3	4	1	1	2	3	4	2
2377:	3	0	1	1	4	3	1	2
2385:	2	4	1	1	1	4	1	[illegible]
2393:	2	1	7	5	3	1	2	2
2401:	3	1	1	3	2	1	1	2
2409:	0	1	3	5	3	6	2	1
2417:	1	1	1	4	4	2	2	2
2425:	1	3	0	3	2	1	2	4
2433:	2	1	1	1	2	2	2	1
2441:	1	2	3	0	1	3	3	6
2449:	1	1	1	1	2	1	1	3
2457:	0	1	1	2	0	0	2	2
2465:	1	2	2	0	2	1	0	0
2473:	1	0	0	3	1	3	4	2
2481:	3	3	1	2	0	4	2	0
2489:	2	0	2	0	1	1	2	6
2497:	3	3	0	4	1	3	5	22
2505:	75	123	79	33	4	3	1	0
2513:	1	0	2	1	1	3	3	2
2521:	2	3	1	1	0	2	0	2
2529:	3	0	2	0	0	1	0	0
2537:	0	1	0	0	0	0	0	1
2545:	0	1	1	2	1	1	0	0
2553:	0	0	0	0	1	0	0	0
2561:	2	0	1	1	0	1	0	0
2569:	2	1	0	2	1	1	0	0
2577:	0	1	0	1	1	0	0	2
2585:	1	1	2	1	0	0	0	[illegible]
2593:	3	2	0	1	1	1	1	[illegible]
2601:	0	0	0	0	1	0	1	0
2609:	0	1	1	0	5	6	6	4
2617:	4	1	1	1	0	0	0	1
2625:	1	1	0	0	0	1	0	0
2633:	1	0	0	0	0	1	0	0
2641:	0	0	0	0	0	0	0	0
2649:	0	0	0	0	0	0	0	0
2657:	1	0	0	1	0	0	0	0
2665:	1	0	0	1	0	0	0	0
2673:	0	0	0	0	0	1	0	0
2681:	0	0	1	0	0	1	1	0
2689:	0	0	1	0	0	1	0	0
2697:	0	0	1	0	0	0	0	0
2705:	0	0	0	0	0	0	0	2
2713:	1	0	1	0	0	0	0	0
2721:	0	0	0	1	0	0	0	0
2729:	2	0	0	3	15	25	16	9
2737:	0	0	1	0	0	0	0	0
2745:	0	0	0	0	0	0	0	0
2753:	1	0	0	0	0	0	0	0
2761:	0	0	0	0	0	0	0	0
2769:	0	0	0	0	0	2	0	0
2777:	0	0	1	0	0	0	0	0
2785:	0	1	0	0	0	0	0	[illegible]
2793:	1	0	0	0	0	0	0	[illegible]
2801:	0	0	0	0	0	0	0	0
2809:	0	0	1	0	0	0	0	0
2817:	0	0	0	0	1	0	0	0
2825:	0	0	0	0	0	0	0	0

2833:	0	0	1	0	0	0	0	1
2841:	0	0	0	0	0	0	0	0
2849:	0	0	0	0	0	0	1	0
2857:	0	0	0	0	0	0	0	0
2865:	0	0	1	0	0	0	0	0
2873:	1	0	0	0	0	0	0	0
2881:	0	0	0	0	1	0	0	0
2889:	0	0	1	0	0	0	0	0
2897:	0	0	0	0	0	0	0	0
2905:	0	0	0	1	0	0	0	0
2913:	0	0	0	1	0	0	1	0
2921:	1	0	0	0	0	0	0	0
2929:	0	0	0	0	1	0	0	0
2937:	0	0	1	0	0	1	0	0
2945:	0	0	0	0	0	0	0	0
2953:	0	0	0	0	0	0	0	0
2961:	0	0	0	0	0	0	0	0
2969:	0	0	0	0	0	1	0	0
2977:	0	0	0	0	1	0	0	0
2985:	0	0	0	0	0	0	0	0
2993:	0	0	0	0	0	0	0	0
3001:	0	0	0	0	0	0	0	0
3009:	0	0	0	0	0	0	0	0
3017:	0	0	0	1	1	1	0	0
3025:	0	0	0	0	0	0	0	1
3033:	0	0	0	0	0	0	0	0
3041:	0	2	0	0	0	0	0	0
3049:	0	0	0	1	0	0	0	0
3057:	0	0	1	0	0	0	0	0
3065:	0	0	0	0	0	0	0	0
3073:	0	0	0	0	0	0	0	0
3081:	1	0	0	0	0	0	0	0
3089:	0	2	0	0	0	0	1	0
3097:	0	0	0	0	0	1	0	0
3105:	0	0	0	0	2	0	0	0
3113:	0	0	0	0	0	0	0	0
3121:	0	0	0	0	0	0	0	0
3129:	0	0	0	0	0	0	0	0
3137:	0	0	0	0	0	0	0	0
3145:	0	0	1	1	0	0	1	0
3153:	0	0	0	0	0	0	0	0
3161:	0	0	0	0	0	0	0	0
3169:	0	1	0	0	0	0	0	0
3177:	0	0	0	0	0	0	0	0
3185:	0	0	0	0	0	0	0	0
3193:	0	0	0	0	0	0	0	0
3201:	0	0	1	1	0	0	1	0
3209:	0	0	0	0	0	0	0	0
3217:	0	0	0	0	0	0	0	0
3225:	0	0	0	0	0	0	0	0
3233:	2	0	1	0	0	1	0	0
3241:	0	0	0	0	0	0	0	0
3249:	0	0	0	0	0	1	0	0
3257:	0	0	0	0	0	0	0	0
3265:	0	0	0	0	0	0	0	0
3273:	0	0	0	0	0	0	0	0
3281:	0	0	0	0	0	0	1	0
3289:	0	0	0	0	0	0	0	0
3297:	0	0	0	0	0	0	0	0
3305:	0	0	0	0	0	0	0	0

3313:	0	0	0	0	0	0	1	0
3321:	0	0	0	0	0	0	0	0
3329:	0	0	0	0	0	0	0	0
3337:	0	0	0	0	0	0	1	0
3345:	0	0	0	0	0	0	0	0
3353:	0	0	0	0	0	1	1	0
3361:	0	0	0	0	0	0	0	0
3369:	0	0	1	0	0	0	1	0
3377:	0	0	0	0	0	0	0	0
3385:	0	0	0	0	0	0	0	0
3393:	0	0	0	1	0	0	0	0
3401:	0	0	1	0	0	0	0	0
3409:	0	0	0	0	0	0	0	0
3417:	0	0	0	0	0	0	1	0
3425:	0	0	0	1	0	0	0	0
3433:	0	0	0	0	0	0	0	0
3441:	1	0	0	1	0	1	0	0
3449:	0	0	1	0	0	0	0	0
3457:	0	0	0	0	0	1	0	0
3465:	0	0	0	0	0	0	0	0
3473:	0	0	0	0	1	0	0	1
3481:	0	0	0	0	0	0	0	0
3489:	0	0	0	0	0	0	0	0
3497:	0	0	0	0	0	0	0	0
3505:	0	0	0	0	0	0	0	0
3513:	0	0	0	0	0	0	0	0
3521:	0	0	0	0	0	0	0	0
3529:	0	0	0	0	0	0	0	0
3537:	0	1	0	0	0	0	0	0
3545:	0	0	0	0	0	0	0	0
3553:	0	0	0	0	0	0	0	0
3561:	0	0	0	0	0	0	0	0
3569:	0	0	0	0	0	0	0	0
3577:	0	0	0	0	0	1	0	0
3585:	0	0	0	0	1	0	0	0
3593:	0	0	0	0	0	0	1	0
3601:	0	0	0	0	0	0	0	0
3609:	0	0	0	0	0	0	0	0
3617:	0	0	0	0	0	1	0	0
3625:	0	0	0	1	0	0	0	1
3633:	0	0	1	0	0	0	0	0
3641:	0	0	0	0	0	0	0	0
3649:	0	0	0	0	0	0	0	0
3657:	0	0	1	0	0	0	0	0
3665:	0	0	0	0	0	1	0	0
3673:	0	0	0	0	0	0	0	0
3681:	0	0	0	0	0	0	0	0
3689:	0	0	0	0	0	0	0	0
3697:	0	0	0	0	0	0	0	1
3705:	0	1	0	0	0	1	0	0
3713:	0	0	0	0	0	0	0	0
3721:	0	0	0	0	0	0	0	0
3729:	0	0	0	0	0	0	0	0
3737:	0	0	0	1	0	1	0	0
3745:	0	0	0	0	0	0	0	0
3753:	0	0	0	0	0	0	0	0
3761:	0	0	0	0	0	0	0	0
3769:	0	0	0	0	0	0	0	0
3777:	1	0	0	0	0	0	0	0
3785:	0	0	0	0	0	0	0	0

3793:	0	0	0	0	0	0	0	0
3801:	0	0	0	0	0	0	0	0
3809:	0	0	0	0	0	0	0	1
3817:	0	0	0	0	0	0	1	0
3825:	0	0	1	0	0	0	0	0
3833:	1	0	0	0	0	0	0	0
3841:	0	0	0	0	0	0	0	0
3849:	0	0	1	0	0	0	0	0
3857:	0	0	0	0	0	0	0	0
3865:	0	1	0	0	0	0	0	0
3873:	0	0	0	0	0	0	0	0
3881:	0	0	0	0	0	0	0	0
3889:	0	0	0	0	0	0	0	0
3897:	0	0	0	0	0	0	1	0
3905:	0	0	0	0	0	0	0	0
3913:	0	0	0	0	1	0	0	0
3921:	0	0	0	0	0	0	0	1
3929:	0	0	1	0	0	0	0	0
3937:	0	0	0	0	0	0	0	0
3945:	0	0	0	0	0	0	0	0
3953:	0	0	0	0	0	1	0	0
3961:	0	0	0	0	0	0	0	0
3969:	0	0	0	0	0	0	0	0
3977:	0	0	0	0	0	0	0	0
3985:	0	0	0	0	0	0	0	0
3993:	0	0	0	0	0	0	0	1
4001:	0	0	0	0	0	0	0	0
4009:	0	0	0	0	0	0	1	0
4017:	1	0	0	0	0	0	0	0
4025:	0	0	0	0	0	0	0	0
4033:	0	0	0	0	0	0	0	0
4041:	0	0	0	0	0	0	0	0
4049:	0	0	0	0	0	0	0	0
4057:	0	0	0	0	0	0	0	0
4065:	0	0	0	0	0	0	0	1
4073:	0	0	0	0	0	0	0	0
4081:	0	0	0	0	0	0	0	0
4089:	0	0	0	0	0	0	0	0

AC 11/27

Sample ID : 0211141-02 Acquisition date : 27-NOV-2002 17:48:19

/VMS Peak Search Report Generated 27-NOV-2002 18:48:33.18

Configuration : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_021114102_GE2_GAS2_48068.CNF;
Analyses by : PEAK V16.9 ENBACK V1.6 PEAKEFF V2.2
Client ID : BLANK
Deposition Date :
Sample Date : 27-NOV-2002 00:00:00 Acquisition date : 27-NOV-2002 17:48:19
Sample ID : 0211141-02 Sample Quantity : 3.73490E+02 GRAM
Sample type : SOIL Sample Geometry : 0
Detector name : GE2 Detector Geometry: GAS-2
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.60 0.0%
Start channel : 5 End channel : 4096
Sensitivity : 3.00000 Gaussian : 15.00000
Critical level : No

Post-NID Peak Search Report

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw %Err	Fit	Nuclides
4	63.46*	3	69	2.24	63.29	59	12*****	2.74E+00	TH-234
4	67.32	27	81	2.25	67.15	59	12119.6		
1	93.02*	2	77	1.73	92.84	89	12*****	2.35E+00	
1	96.33	19	58	1.73	96.16	89	12143.3		
1	149.40	38	82	4.06	149.22	146	8 90.4	1.18E+00	
1	186.68*	0	71	2.52	186.49	184	6*****	3.11E+00	RA-226
	236.37	21	11	1.88	236.17	235	14 47.1	4.24E+00	NB-95M
	242.03*	11	35	1.89	241.83	235	14213.2		RA-224
1	523.90	19	8	3.38	523.64	521	6 61.8	9.82E-01	
1	581.27	9	6	1.92	581.00	579	25 89.7	1.75E+00	
1	593.47	9	5	2.12	593.19	579	25115.1		
1	598.08	11	4	2.13	597.81	579	25 91.4		
1	609.10*	23	23	5.77	608.82	604	15108.6	1.34E+00	BI-214
1	704.06	13	18	4.65	703.76	700	8124.4	1.77E+00	
1	749.28	13	9	5.51	748.97	744	9 97.1	1.13E+00	
1	765.42	12	11	4.02	765.11	762	7104.4	4.49E+00	NB-95
1	775.85	15	5	3.48	775.54	773	6 72.3	5.21E-01	
1	803.40*	10	10	3.72	803.08	800	7131.1	2.26E+00	
1	841.50	26	20	9.42	841.18	838	12 76.2	1.49E+00	
1	1121.17*	9	4	4.92	1120.79	1116	9109.6	4.99E-01	BI-214
1	1764.54*	9	2	5.99	1764.03	1761	7 73.8	5.46E-01	BI-214

00619 AG 12/2/02

Sample ID : 0211141-02 Acquisition date : 27-NOV-2002 17:48:19

Total number of lines in spectrum 21
Number of unidentified lines 10
Number of lines tentatively identified by NID 11 52.38%

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
NB-95	35.06D	1.02	1.937E-02	1.966E-02	2.069E-02	105.24	
		Total Activity :	1.937E-02	1.966E-02			

Nuclide Type : ACTIVATION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
NB-95M	3.61D	1.16	5.021E-02	5.813E-02	3.357E-02	57.75	
		Total Activity :	5.021E-02	5.813E-02			

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
BI-214	1602.00Y	1.00	9.901E-02	9.901E-02	5.946E-02	60.05	
RA-224	1.41E+10Y	1.00	1.639E-01	1.639E-01	3.543E-01	216.18	
[illegible]226	1602.00Y	1.00	1.212E-03	1.212E-03	478.7E-03	39496.89	
[illegible]234	4.47E+09Y	1.00	3.496E-02	3.496E-02	38.23E-02	1093.34	
		Total Activity :	2.991E-01	2.991E-01			

Grand Total Activity : 3.686E-01 3.768E-01

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

Sample ID : 0211141-02
Acquisition date : 27-NOV-2002 17:48:19

Nuclide Type: FISSION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
NB-95	765.79	99.81*	1.201E+00	1.937E-02	1.966E-02	105.24	OK

Final Mean for 1 Valid Peaks = 1.966E-02+/- 2.069E-02 (105.24%)

Nuclide Type: ACTIVATION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
NB-95M	235.69	25.00*	3.313E+00	5.021E-02	5.813E-02	57.75	OK

Final Mean for 1 Valid Peaks = 5.813E-02+/- 3.357E-02 (57.75%)

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
BI-214	609.31	46.30*	1.487E+00	6.627E-02	6.627E-02	109.55	OK
	1120.29	15.10	8.561E-01	1.374E-01	1.374E-01	110.10	OK
	1764.49	15.80	6.124E-01	1.908E-01	1.908E-01	74.56	OK
	2204.22	4.98	5.445E-01	----- Line Not Found		-----	Absent

Final Mean for 3 Valid Peaks = 9.901E-02+/- 5.946E-02 (60.05%)

RA-224	240.98	3.95*	3.263E+00	1.639E-01	1.639E-01	216.18	OK

Final Mean for 1 Valid Peaks = 1.639E-01+/- 3.543E-01 (216.18%)

RA-226	186.21	3.28*	3.839E+00	1.212E-03	1.212E-03	*******	OK

Final Mean for 1 Valid Peaks = 1.212E-03+/- 4.787E-01 (******%)

TH-234	63.29	3.80*	4.844E+00	3.496E-02	3.496E-02	1093.34	OK

Final Mean for 1 Valid Peaks = 3.496E-02+/- 3.823E-01 (******%)

Flag: "*" = Keyline

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
NB-95	1.966E-02	2.069E-02	3.428E-02	4.342E-03	0.574
NB-95M	5.813E-02	3.357E-02	9.509E-02	3.153E-02	0.611
BI-214	9.901E-02	5.946E-02	7.335E-02	9.938E-03	1.350
RA-224	1.639E-01	3.543E-01	5.120E-01	1.808E-01	0.320
RA-226	1.212E-03	4.787E-01	6.568E-01	1.206E+00	0.002
TH-234	3.496E-02	3.823E-01	4.435E-01	4.484E-02	0.079

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

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
BE-7	8.584E-02		1.506E-01	2.974E-01	3.830E-02	0.289
NA-22	7.027E-03		1.624E-02	3.681E-02	3.400E-03	0.191
NA-24	1.035E-03		4.453E-02	8.901E-02	8.095E-03	0.012
K-40	-3.504E-02		1.919E-01	4.515E-01	4.291E-02	-0.078
CR-51	-3.182E-02		1.244E-01	2.246E-01	9.191E-02	-0.142
MN-54	-3.655E-03		2.199E-02	3.567E-02	4.165E-03	-0.102
CO-56	8.181E-04		1.780E-02	3.438E-02	3.945E-03	0.024
CO-57	-8.261E-03		1.288E-02	2.022E-02	2.197E-03	-0.409
CO-58	-1.070E-03		1.833E-02	3.119E-02	3.766E-03	-0.034
FE-59	-3.700E-02		3.719E-02	5.420E-02	5.726E-03	-0.683
CO-60	-1.058E-03		1.916E-02	3.697E-02	3.517E-03	-0.029
ZN-65	-1.308E-03		3.761E-02	6.584E-02	6.502E-03	-0.020
GA-67	3.194E-03	+	4.408E-02	7.871E-02	8.893E-02	0.041
SE-75	-6.917E-03		1.996E-02	3.538E-02	1.613E-02	-0.196
RB-83	2.856E-02		2.929E-02	5.960E-02	1.106E-02	0.479
KR-85	1.680E-01		4.906E+00	8.928E+00	1.175E+00	0.019
SR-85	7.404E-04		2.162E-02	3.935E-02	5.180E-03	0.019
Y-88	-1.481E-02		1.642E-02	2.499E-02	2.379E-03	-0.593
NB-94	1.187E-02		1.727E-02	3.725E-02	4.109E-03	0.319
ZR-95	6.246E-03		3.426E-02	5.696E-02	7.618E-03	0.110
MO-99	-1.312E-01		1.859E-01	2.605E-01	3.374E-02	-0.504
RU-103	-5.214E-03		1.570E-02	2.825E-02	4.863E-03	-0.185
RU-106	1.101E-01		1.870E-01	3.479E-01	5.903E-02	0.316
CD-109	-1.686E-02		3.311E-01	5.080E-01	6.197E-02	-0.033
AG-110M	4.794E-03		1.720E-02	3.399E-02	4.600E-03	0.141
SN-113	2.863E-03		1.775E-02	3.434E-02	4.158E-03	0.083
TE123M	9.642E-04		1.385E-02	2.327E-02	2.290E-03	0.041
SB-124	9.057E-03		1.174E-02	2.346E-02	3.177E-03	0.386
I-125	1.606E+01		2.252E+00	1.722E+00	2.174E-01	9.329
SB-125	-1.389E-02		4.402E-02	7.949E-02	9.923E-03	-0.175
SN-126	-8.087E-04		3.270E-02	5.035E-02	5.362E-03	-0.016
SB-127	-4.398E-03		4.807E-02	9.093E-02	1.218E-02	-0.048
I-129	8.804E-01		4.506E-01	7.616E-01	9.016E-02	1.156
I-131	-4.140E-03		1.801E-02	3.257E-02	7.887E-03	-0.127
TE-132	-8.566E-03		1.421E-02	2.455E-02	7.410E-03	-0.349
BA-133	-9.844E-03		2.001E-02	3.501E-02	1.032E-02	-0.281
I-133	2.759E-03		3.298E-02	5.701E-02	7.562E-03	0.048

Sample ID : 0211141-02 Acquisition date : 27-NOV-2002 17:48:19

- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
CS-134	1.306E-02		1.269E-02	2.625E-02	3.558E-03	0.498
CS-135	-2.887E-02		7.128E-02	1.251E-01	5.910E-02	-0.231
I-135	-4.501E-01		5.267E-01	7.945E-01	7.376E-02	-0.566
CS-136	-1.422E-02		2.548E-02	4.298E-02	4.462E-03	-0.331
CS-137	-3.169E-03		1.826E-02	3.412E-02	4.619E-03	-0.093
CE-139	4.786E-03		1.400E-02	2.422E-02	2.331E-03	0.198
BA-140	5.440E-03		6.489E-02	1.229E-01	4.258E-02	0.044
LA-140	3.393E-02		2.840E-02	7.302E-02	6.904E-03	0.465
CE-141	-6.017E-03		2.691E-02	4.016E-02	7.808E-03	-0.150
CE-143	1.129E-02		4.013E-02	7.626E-02	3.724E-02	0.148
CE-144	3.768E-02		1.005E-01	1.741E-01	1.837E-02	0.216
PM-144	1.773E-03		1.901E-02	3.284E-02	4.375E-03	0.054
PM-145	4.701E+00		3.101E+00	5.027E-01	3.302E-01	9.351
PM-146	4.269E-05		3.086E-02	5.868E-02	7.423E-03	0.001
ND-147	1.221E-02		1.245E-01	2.156E-01	2.861E-02	0.057
PM-149	9.880E-02		4.661E-01	8.824E-01	4.480E-01	0.112
EU-152	-3.834E-02		1.324E-01	2.413E-01	2.742E-02	-0.159
EU-154	1.977E-02		4.571E-02	1.036E-01	9.566E-03	0.191
EU-155	1.763E-02		3.715E-02	6.024E-02	6.392E-03	0.293
[illegible]156	-1.046E-01		2.019E-01	2.964E-01	7.215E-02	-0.[illegible]3
[illegible] 192	-1.596E-02		2.923E-02	5.082E-02	6.500E-03	-0.314
HG-203	-4.737E-03		1.666E-02	2.966E-02	1.557E-02	-0.160
BI-207	-2.341E-03		1.801E-02	3.277E-02	4.409E-03	-0.071
TL-208	3.008E-02		6.517E-02	1.233E-01	1.665E-02	0.244
BI-210M	2.060E-02		2.834E-02	5.275E-02	2.341E-02	0.390
PB-210	6.280E-02		3.094E-01	5.889E-01	6.450E-02	0.107
PB-211	2.865E-01		4.512E-01	9.030E-01	1.091E-01	0.317
BI-212	-3.168E-02		1.468E-01	2.682E-01	3.506E-02	-0.118
PB-212	-3.189E-03		2.899E-02	5.672E-02	1.948E-02	-0.056
PB-214	-3.014E-02		3.570E-02	5.834E-02	1.712E-02	-0.517
RN-219	1.785E-01		2.007E-01	4.108E-01	4.950E-02	0.434
RA-223	-1.813E-01		3.018E-01	5.113E-01	2.023E-01	-0.355
TH-227	1.093E-01	+	6.317E-02	1.895E-01	6.305E-02	0.577
AC-228	9.898E-03		6.382E-02	1.261E-01	1.322E-02	0.079
TH-230	9.035E-02		6.949E-02	1.285E-01	1.411E-02	0.703
PA-231	-6.491E-02		5.405E-01	9.896E-01	4.571E-01	-0.066
TH-231	0.000E+00		0.000E+00	1.235E-02	2.001E-03	0.000
PA-233	9.189E-03		3.360E-02	6.339E-02	3.048E-02	0.145
PA-234	3.176E-02		5.283E-02	9.317E-02	9.892E-03	0.341
PA-234M	-1.692E+00		2.584E+00	4.300E+00	4.446E-01	-0.393
U-235	-6.305E-02		1.284E-01	1.832E-01	3.368E-02	-0.344
NP-237	4.319E-02		9.107E-02	1.477E-01	1.567E-02	0.292
NP-239	-1.398E-02		5.721E-02	9.397E-02	1.006E-02	-0.149
AM-241	1.963E-02		2.735E-02	4.667E-02	4.724E-03	0.421

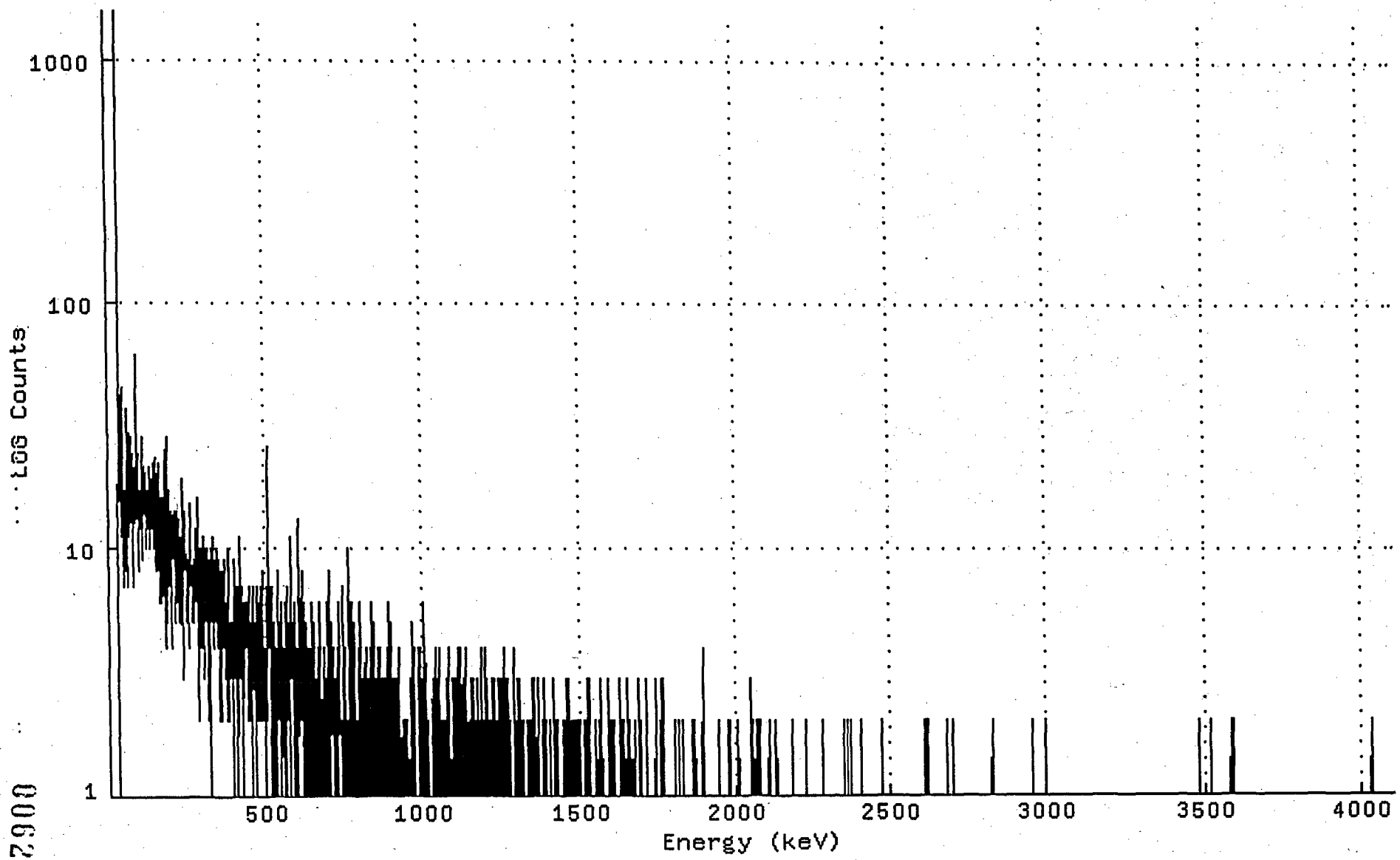
Sample ID : 0211141-02 Acquisition date : 27-NOV-2002 17:48:19

Nuclide	Half-life	Half-Life Ratio	Energy	%Abund	Activity (pCi/GRAM)	2-Sigma %Error	Rejected by
GA-67	3.26D	0.23	93.31*	35.70	3.194E-03	1379.95	Abun.
			208.95	2.24	--- Not Found ---		
			300.22	16.00	--- Not Found ---		
		% Abundances Found =		66.18			
NB-94	20300.00Y	0.00	702.63	100.00	1.939E-02	125.16	Abun.
			871.10*	100.00	--- Not Found ---		
		% Abundances Found =		50.00			
AG-110M	249.85D	0.00	657.75*	93.14	--- Not Found ---		Abun.
			677.61	10.53	--- Not Found ---		
			706.67	16.46	--- Not Found ---		
			763.93	21.98	8.793E-02	105.24	
			884.67	71.63	--- Not Found ---		
			1384.27	23.94	--- Not Found ---		
		% Abundances Found =		9.25			
CS-134	2.06Y	0.00	563.23	8.38	--- Not Found ---		Abun.
			569.32	15.43	--- Not Found ---		
			604.70*	97.60	--- Not Found ---		
			795.84	85.40	--- Not Found ---		
			801.93	8.73	1.932E-01	131.74	
		% Abundances Found =		4.05			
227	3.28E+04Y	0.00	50.10	8.40	--- Not Found ---		Abun.
			236.00*	11.50	1.093E-01	57.82	
			256.20	6.30	--- Not Found ---		
		% Abundances Found =		43.89			
TH-230	7.70E+04Y	0.00	48.44*	16.90	--- Not Found ---		Abun.
			62.85	4.60	2.892E-02	1093.34	
		% Abundances Found =		21.40			

Flag: "*" = Keyline

Spectr : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_ 114102_GE2_GAS2_48068.CNF;1
Title :
Sample Title: BLANK

Start Time: 27-NOV-2002 17:48	Sample Time: 27-NOV-2002 00:00	Energy Offset: 1.55295E-01
Real Time : 0 01:00:00.60	Sample ID : 0211141-02	Energy Slope : 1.00020E+00
Live Time : 0 01:00:00.00	Sample Type: SOIL	Energy Quad : 0.00000E+00



006 25

Channel Contents for [GAMMA.SCUSR.ARCHIVE]SMP_021114102_GE2_GAS2_48068.CNF

Channel								
1:	0	0	0	0	0	0	0	0
9:	0	0	0	0	0	0	0	0
17:	0	0	0	0	0	0	0	0
25:	0	0	0	0	0	0	0	0
33:	18	13	20	371	1601	47	19	19
41:	12	11	15	11	11	39	45	14
49:	12	7	15	17	17	11	12	10
57:	15	9	7	18	21	18	37	36
65:	14	15	29	14	16	11	14	20
73:	18	16	28	16	24	23	17	7
81:	19	11	14	20	16	15	20	21
89:	17	21	20	32	61	22	13	23
97:	12	24	14	8	11	15	15	16
105:	15	12	17	9	20	11	11	28
113:	21	17	21	15	20	14	18	10
121:	10	17	10	20	15	17	14	13
129:	12	13	14	21	16	10	12	14
137:	14	12	16	19	17	15	18	12
145:	14	10	16	22	18	23	10	14
153:	10	8	15	16	13	13	8	20
161:	12	14	15	22	7	6	13	15
169:	6	12	16	16	11	16	12	14
177:	11	7	10	4	11	14	22	11
185:	19	22	28	12	5	13	12	10
193:	13	8	12	17	16	7	13	14
201:	6	4	14	14	13	10	12	9
209:	13	11	9	5	13	6	13	14
217:	8	14	10	12	6	9	13	7
225:	8	10	5	8	6	7	9	11
233:	8	8	3	15	9	16	19	11
241:	9	14	8	8	8	10	9	6
249:	6	7	9	5	9	4	8	8
257:	8	8	10	15	8	12	8	7
265:	7	6	7	7	5	8	9	5
273:	8	8	9	8	5	7	11	6
281:	12	6	7	7	16	4	5	2
289:	6	4	4	5	10	6	9	10
297:	9	4	10	7	8	6	3	11
305:	8	9	7	6	10	5	7	9
313:	6	10	10	3	5	5	2	9
321:	8	5	1	3	5	8	5	9
329:	8	10	7	4	11	6	6	5
337:	6	8	5	7	9	5	9	5
345:	6	5	8	10	4	5	2	9
353:	6	2	4	5	8	2	6	4
361:	8	8	6	4	6	6	6	6
369:	7	9	5	5	3	6	3	4
377:	6	6	4	2	4	2	5	6
385:	10	5	5	5	3	5	3	4
393:	5	4	3	1	3	3	7	5
401:	3	9	6	5	7	2	5	6
409:	2	0	3	6	3	7	5	2
417:	5	5	4	3	11	8	6	1
425:	2	4	4	0	6	6	5	3

433:	4	4	4	4	6	4	4	4
441:	6	2	2	3	5	3	7	2
449:	6	3	3	5	3	1	3	5
457:	2	3	4	4	4	3	5	5
465:	7	1	3	1	5	5	5	[illegible]
473:	6	7	6	5	6	5	5	6
481:	2	4	3	5	7	3	2	2
489:	3	5	3	3	2	8	3	3
497:	1	4	2	4	4	4	7	4
505:	3	2	4	4	5	26	18	19
513:	9	2	1	2	4	7	3	1
521:	1	5	4	7	7	0	3	5
529:	3	4	3	1	4	4	4	3
537:	2	8	3	2	4	4	6	3
545:	5	4	5	1	3	2	5	2
553:	2	6	5	2	0	4	0	3
561:	2	1	1	4	6	1	4	5
569:	2	6	5	2	7	4	2	5
577:	4	1	2	3	6	3	11	6
585:	3	3	5	2	2	1	1	2
593:	5	2	4	1	2	6	2	1
601:	1	4	0	1	3	2	3	7
609:	7	13	3	2	3	3	5	6
617:	4	1	4	4	8	1	5	1
625:	1	2	6	4	5	1	5	3
633:	0	0	0	1	1	3	1	4
641:	3	2	1	4	4	4	2	1
649:	0	2	6	1	2	5	5	3
657:	1	3	4	1	1	3	2	3
665:	0	4	0	1	3	0	3	[illegible]
673:	3	0	4	0	6	0	2	[illegible]
681:	1	1	2	2	2	4	1	1
689:	4	2	3	3	0	3	1	6
697:	3	1	3	2	2	4	4	8
705:	2	2	1	3	3	4	3	5
713:	3	2	1	4	3	2	2	0
721:	2	2	3	2	1	4	3	1
729:	3	1	4	2	3	2	6	4
737:	3	3	0	1	0	2	1	1
745:	2	2	1	7	2	3	3	1
753:	1	3	4	2	1	2	0	2
761:	2	1	3	2	10	1	1	0
769:	3	6	1	3	2	4	4	6
777:	2	0	0	3	2	5	3	1
785:	2	4	0	0	2	0	2	1
793:	2	3	4	3	2	1	5	1
801:	2	6	4	3	1	0	1	3
809:	1	2	0	1	3	2	2	3
817:	4	2	2	3	0	1	3	2
825:	2	1	1	3	2	2	4	4
833:	2	1	1	2	3	1	0	6
841:	5	4	5	3	2	2	1	1
849:	2	1	1	3	1	1	2	3
857:	3	4	2	4	1	4	1	0
865:	1	1	2	3	3	3	1	[illegible]
873:	2	3	1	2	0	2	3	[illegible]
881:	0	3	3	0	2	4	1	1
889:	0	6	3	1	1	2	1	0
897:	2	3	5	2	1	2	1	3
905:	1	2	0	1	1	3	3	1

913:	1	2	0	1	3	0	2	1
921:	1	1	2	4	2	3	0	1
929:	1	0	1	0	1	1	1	2
937:	0	1	2	0	0	0	2	2
945:	0	2	2	1	2	2	1	1
953:	1	0	1	1	2	1	2	3
961:	0	1	3	2	2	5	1	3
969:	3	4	2	0	3	0	0	1
977:	0	0	0	0	1	4	2	2
985:	1	2	1	3	1	2	1	4
993:	1	2	3	2	1	3	1	0
1001:	3	2	2	2	6	2	2	2
1009:	1	2	0	1	2	1	1	0
1017:	1	1	1	1	1	0	1	1
1025:	1	1	2	1	2	3	0	1
1033:	0	3	0	1	0	1	4	1
1041:	1	2	3	1	0	0	3	0
1049:	2	1	2	1	4	0	2	0
1057:	2	0	1	1	0	1	2	1
1065:	0	2	2	2	2	1	0	0
1073:	0	2	0	1	3	0	2	4
1081:	2	0	2	0	1	1	0	0
1089:	0	1	1	3	3	2	2	1
1097:	0	0	0	0	3	2	1	3
1105:	2	3	1	2	0	0	4	2
1113:	1	2	0	2	0	0	1	4
1121:	2	2	1	0	0	1	2	3
1129:	2	1	3	1	1	2	2	0
1137:	0	4	0	1	1	0	1	1
1145:	1	1	0	0	2	0	3	1
1153:	1	2	0	1	0	2	1	3
1161:	1	0	0	1	1	2	2	2
1169:	0	0	0	1	3	0	2	2
1177:	1	1	1	2	1	4	0	2
1185:	1	0	1	0	2	0	1	2
1193:	2	1	3	0	1	4	3	0
1201:	3	1	3	2	1	0	1	2
1209:	1	0	0	0	2	0	2	0
1217:	1	1	0	3	1	0	0	0
1225:	3	1	0	1	1	0	1	2
1233:	1	0	1	1	2	2	3	2
1241:	0	3	0	1	2	2	0	1
1249:	1	0	1	3	3	1	4	2
1257:	0	0	0	1	0	3	1	0
1265:	2	2	2	0	3	0	0	0
1273:	2	2	1	1	0	0	0	0
1281:	0	0	1	0	0	0	0	4
1289:	2	0	1	2	2	0	2	0
1297:	3	3	1	1	1	0	3	0
1305:	3	1	0	3	0	1	0	0
1313:	0	2	2	1	1	2	1	1
1321:	0	1	0	1	1	0	1	2
1329:	2	1	1	2	2	1	1	1
1337:	0	0	1	1	0	1	0	2
1345:	1	3	1	2	1	1	0	1
1353:	0	2	0	3	0	0	0	1
1361:	0	0	3	1	1	1	1	3
1369:	0	0	0	0	1	0	1	1
1377:	2	1	0	1	0	0	1	1
1385:	3	0	0	1	1	2	0	2

1393:	1	0	1	0	1	0	0	0
1401:	2	2	1	2	0	1	0	1
1409:	1	1	0	0	0	1	1	0
1417:	3	0	0	2	1	1	1	1
1425:	0	0	2	0	0	1	0	0
1433:	0	0	0	1	1	0	1	0
1441:	1	0	0	0	2	0	1	1
1449:	2	0	0	0	0	1	0	0
1457:	0	3	1	0	3	2	0	0
1465:	1	0	0	0	2	2	0	0
1473:	0	1	2	0	1	0	0	2
1481:	1	0	1	0	2	1	1	0
1489:	0	1	1	0	0	1	0	2
1497:	0	0	2	2	0	1	0	0
1505:	0	0	0	0	0	0	1	2
1513:	0	0	1	0	0	2	1	0
1521:	1	0	3	2	0	0	2	2
1529:	0	1	3	0	1	0	0	0
1537:	0	0	0	1	0	0	0	0
1545:	0	1	0	1	2	2	2	1
1553:	0	0	0	1	1	2	1	0
1561:	1	0	0	1	0	3	0	1
1569:	2	1	0	0	1	0	1	0
1577:	1	0	1	0	0	0	1	0
1585:	1	0	0	1	2	0	0	0
1593:	3	1	1	1	0	2	1	1
1601:	0	0	0	1	2	1	0	0
1609:	0	2	0	0	1	1	0	0
1617:	0	0	1	1	0	0	1	1
1625:	0	0	3	0	0	0	1	0
1633:	2	2	2	1	1	1	0	0
1641:	0	2	0	0	1	0	0	1
1649:	1	1	3	0	0	2	0	2
1657:	0	0	0	2	1	0	1	0
1665:	0	1	0	1	0	1	1	0
1673:	2	1	1	0	1	0	1	1
1681:	0	1	0	0	0	2	1	0
1689:	3	1	0	0	2	0	2	0
1697:	0	0	0	0	1	0	0	0
1705:	1	0	0	0	0	0	0	1
1713:	3	0	0	0	0	0	0	0
1721:	1	0	0	1	0	1	1	0
1729:	0	0	0	0	1	0	0	0
1737:	0	1	1	2	0	0	0	3
1745:	0	1	1	0	0	1	0	1
1753:	0	0	0	2	0	1	1	1
1761:	0	0	3	1	3	1	0	0
1769:	1	0	0	0	0	1	1	1
1777:	1	0	0	1	1	0	0	1
1785:	0	0	1	1	0	0	0	0
1793:	0	1	0	0	0	0	0	0
1801:	0	1	2	1	0	1	0	0
1809:	0	0	0	0	0	0	1	2
1817:	0	0	0	0	0	0	1	1
1825:	0	0	2	1	2	0	1	0
1833:	0	0	0	0	1	0	0	0
1841:	1	0	1	1	0	0	1	1
1849:	1	0	1	0	0	0	0	1
1857:	0	0	0	2	1	0	1	0
1865:	2	2	0	0	0	0	0	0

1873:	1	0	1	0	0	0	0	0
1881:	0	0	0	0	0	1	0	0
1889:	0	0	4	0	0	0	2	0
1897:	0	1	0	0	0	0	0	0
1905:	1	0	0	0	0	0	0	0
1913:	0	1	0	0	0	0	1	0
1921:	0	1	0	1	0	0	0	0
1929:	0	0	0	1	0	0	0	0
1937:	1	1	0	1	0	0	2	0
1945:	1	1	1	0	0	0	0	1
1953:	0	0	1	1	1	0	0	0
1961:	0	0	0	1	0	0	0	0
1969:	0	0	0	1	2	0	1	0
1977:	0	0	2	0	0	0	0	0
1985:	0	0	0	1	1	0	0	0
1993:	0	0	0	0	1	0	1	0
2001:	0	0	0	0	0	2	0	0
2009:	1	1	0	0	1	0	0	0
2017:	0	0	0	0	0	0	0	0
2025:	0	1	0	1	1	0	0	1
2033:	0	1	0	0	0	0	0	1
2041:	0	0	1	0	1	3	0	0
2049:	1	0	0	0	0	2	0	0
2057:	0	0	0	0	0	0	1	0
2065:	1	2	2	0	2	0	0	1
2073:	0	1	0	0	2	0	0	0
2081:	0	0	0	0	0	0	1	1
2089:	0	1	1	1	0	0	1	0
2097:	0	0	0	1	0	1	0	2
2105:	0	0	1	1	0	0	1	0
2113:	1	0	1	1	0	1	0	1
2121:	0	0	1	1	0	1	2	1
2129:	0	0	1	1	0	0	1	0
2137:	0	1	0	0	0	0	0	0
2145:	0	1	1	0	0	0	0	0
2153:	0	0	0	0	0	0	0	0
2161:	0	0	0	0	0	0	0	1
2169:	0	0	0	0	0	1	1	1
2177:	0	0	2	0	1	0	0	1
2185:	0	0	0	0	0	1	0	0
2193:	0	0	1	0	0	0	0	1
2201:	0	0	0	0	0	0	0	1
2209:	0	0	0	0	0	0	0	0
2217:	0	1	0	2	2	1	0	0
2225:	0	0	0	0	0	0	0	0
2233:	0	0	0	0	1	0	0	0
2241:	0	0	0	1	0	0	1	0
2249:	0	0	0	0	1	0	1	0
2257:	0	0	0	0	0	1	0	0
2265:	0	0	0	0	0	0	1	0
2273:	0	0	2	0	1	1	0	0
2281:	0	0	0	0	0	1	0	0
2289:	0	0	0	0	0	1	1	1
2297:	0	0	1	0	0	0	1	0
2305:	0	0	0	0	0	0	0	0
2313:	1	1	1	0	0	0	0	0
2321:	0	0	0	0	0	0	0	0
2329:	0	1	1	0	1	0	0	0
2337:	0	1	0	1	2	0	1	1
2345:	0	0	0	0	0	0	1	0

2353:	0	2	1	0	0	0	0	0
2361:	0	0	0	1	1	0	0	2
2369:	0	0	0	0	0	0	1	0
2377:	0	0	1	0	1	0	0	1
2385:	0	0	0	1	0	1	0	0
2393:	0	0	0	1	0	0	0	0
2401:	0	2	0	1	0	0	0	1
2409:	0	0	0	0	0	0	0	0
2417:	0	0	1	1	1	0	0	0
2425:	1	0	0	0	1	1	0	1
2433:	0	1	0	0	0	0	1	0
2441:	0	0	0	0	0	0	0	1
2449:	0	1	0	0	0	0	0	0
2457:	0	0	1	0	0	0	0	0
2465:	0	0	1	0	1	1	0	2
2473:	0	0	0	0	0	0	0	0
2481:	0	0	0	0	0	0	1	0
2489:	0	0	0	0	0	0	0	0
2497:	0	0	0	0	1	0	0	1
2505:	0	0	0	1	1	0	0	0
2513:	0	1	0	0	1	0	0	0
2521:	0	0	0	1	0	0	0	1
2529:	0	0	0	0	1	0	1	0
2537:	0	0	0	0	0	1	1	0
2545:	0	0	0	0	0	0	0	0
2553:	1	1	0	0	0	0	0	0
2561:	0	0	0	0	0	0	0	0
2569:	0	0	0	0	0	0	0	0
2577:	0	0	0	0	0	0	0	0
2585:	0	0	0	0	0	0	0	0
2593:	0	0	0	0	0	0	0	0
2601:	0	0	1	0	0	2	0	1
2609:	0	1	2	1	0	1	2	0
2617:	1	1	0	0	0	0	0	0
2625:	1	0	1	0	0	0	0	1
2633:	0	0	0	0	0	0	0	0
2641:	0	0	1	0	0	1	0	0
2649:	0	0	0	1	0	0	0	1
2657:	0	0	0	0	0	1	0	0
2665:	0	1	0	0	0	1	0	0
2673:	0	0	2	0	0	0	0	0
2681:	1	0	0	0	1	0	0	0
2689:	0	0	0	0	0	2	0	1
2697:	0	0	0	1	0	0	0	0
2705:	0	0	0	0	1	0	1	0
2713:	0	0	1	0	1	1	0	1
2721:	1	1	0	0	0	0	0	0
2729:	0	0	0	0	0	0	0	1
2737:	0	0	0	0	0	0	0	0
2745:	0	0	0	0	0	1	0	0
2753:	0	0	0	0	0	0	0	0
2761:	0	0	0	0	0	0	1	0
2769:	0	0	0	0	0	1	0	1
2777:	0	0	1	1	0	0	0	0
2785:	0	0	0	0	0	0	0	0
2793:	0	1	0	0	0	1	1	0
2801:	0	0	1	0	0	0	1	0
2809:	0	0	0	0	0	0	0	0
2817:	0	0	2	0	0	0	1	2
2825:	1	0	0	1	0	0	0	0

2833:	1	1	0	0	0	0	0	1
2841:	0	0	1	0	0	0	1	0
2849:	1	0	0	0	0	0	0	0
2857:	1	0	0	0	0	0	0	0
2865:	0	0	0	0	0	0	0	0
2873:	0	0	0	0	1	0	0	1
2881:	0	0	0	0	0	0	0	0
2889:	0	0	0	0	0	0	0	1
2897:	0	0	0	0	0	0	1	0
2905:	0	0	0	0	0	0	0	0
2913:	0	0	0	1	0	0	0	0
2921:	1	0	1	0	0	0	1	0
2929:	0	0	0	0	1	0	1	0
2937:	0	0	0	0	0	0	0	0
2945:	1	0	0	0	0	0	2	1
2953:	0	0	0	0	0	0	1	0
2961:	0	0	0	0	1	0	0	0
2969:	1	0	0	0	0	0	0	0
2977:	0	0	1	1	0	1	0	0
2985:	0	0	1	0	0	0	0	2
2993:	0	1	0	1	0	0	0	1
3001:	0	0	1	0	1	0	1	0
3009:	0	1	1	0	1	1	0	0
3017:	0	1	0	0	0	0	0	0
3025:	0	0	0	0	0	0	0	0
3033:	0	0	0	1	0	0	0	0
3041:	0	0	1	0	0	0	0	0
3049:	0	0	0	0	0	0	0	0
3057:	0	0	0	0	0	0	0	0
3065:	1	0	0	0	0	0	0	0
3073:	0	0	0	0	1	0	0	0
3081:	0	0	0	1	0	0	1	0
3089:	0	1	0	0	0	0	0	0
3097:	0	1	0	1	0	0	0	0
3105:	0	0	0	0	0	0	0	0
3113:	0	0	0	0	0	0	0	0
3121:	0	0	0	0	0	0	0	0
3129:	0	0	0	0	1	1	0	0
3137:	0	0	0	0	1	0	0	0
3145:	0	0	0	0	0	0	0	0
3153:	0	0	0	0	0	0	1	0
3161:	0	0	0	0	0	0	0	0
3169:	1	0	1	1	0	0	0	0
3177:	0	0	0	1	0	0	0	0
3185:	0	0	0	0	0	0	0	1
3193:	0	0	0	0	0	1	1	0
3201:	0	0	0	0	0	0	0	0
3209:	0	1	0	0	0	0	0	1
3217:	0	0	0	0	1	0	1	0
3225:	0	0	0	0	0	0	0	0
3233:	1	0	0	0	0	0	0	0
3241:	0	0	0	1	0	0	0	0
3249:	0	0	0	0	0	0	0	0
3257:	0	0	0	0	0	0	0	0
3265:	0	0	0	0	1	0	1	0
3273:	0	0	0	0	0	0	0	0
3281:	0	0	0	0	0	0	0	0
3289:	0	0	0	0	0	0	0	0
3297:	1	0	1	0	0	0	0	0
3305:	0	0	0	0	1	0	0	0

3313:	0	0	1	0	0	0	0	0
3321:	0	0	0	0	0	0	0	0
3329:	1	0	0	0	0	0	0	0
3337:	0	0	0	0	0	0	0	0
3345:	0	0	0	0	0	0	0	0
3353:	0	0	0	0	0	0	0	0
3361:	0	0	0	1	0	0	0	0
3369:	0	0	1	0	0	0	0	0
3377:	0	1	0	0	0	0	1	0
3385:	0	0	0	0	1	0	0	0
3393:	1	0	0	0	0	0	0	0
3401:	0	0	0	0	0	0	0	0
3409:	1	0	0	0	0	0	0	0
3417:	0	0	0	0	0	0	0	0
3425:	0	0	0	0	0	0	0	0
3433:	0	0	0	0	1	0	0	0
3441:	1	0	0	0	0	0	0	0
3449:	0	0	0	0	0	0	0	1
3457:	0	1	1	0	0	1	0	1
3465:	0	0	0	0	0	0	0	0
3473:	0	0	0	2	0	0	0	1
3481:	0	0	0	0	0	0	0	0
3489:	0	0	0	1	1	0	0	0
3497:	0	0	0	0	0	0	0	0
3505:	0	0	0	0	0	1	0	0
3513:	0	0	2	0	0	0	0	0
3521:	0	0	0	0	0	0	0	0
3529:	0	0	1	0	0	0	0	0
3537:	0	0	0	1	0	0	0	0
3545:	0	0	0	0	0	0	0	0
3553:	0	0	0	0	0	0	0	0
3561:	0	0	0	0	0	0	0	0
3569:	0	0	0	0	0	0	0	0
3577:	0	2	0	0	0	0	0	0
3585:	0	0	2	0	0	0	0	0
3593:	0	0	0	1	0	0	0	0
3601:	0	0	0	0	0	0	0	0
3609:	1	1	0	0	0	0	0	0
3617:	0	0	0	0	1	0	0	0
3625:	0	1	0	0	1	0	0	0
3633:	0	0	0	0	1	0	0	0
3641:	0	0	0	0	0	0	0	0
3649:	0	0	0	0	0	0	0	0
3657:	0	0	0	0	1	1	0	0
3665:	0	0	0	0	0	0	0	0
3673:	0	0	0	0	0	0	0	0
3681:	0	0	0	0	0	0	0	1
3689:	0	1	0	0	0	0	0	0
3697:	0	0	1	0	1	0	0	0
3705:	0	0	0	1	0	0	0	0
3713:	0	0	0	0	0	1	0	0
3721:	0	0	0	1	0	0	0	0
3729:	0	0	0	0	0	0	0	0
3737:	0	0	0	0	0	0	0	0
3745:	0	1	0	0	0	0	0	0
3753:	0	0	0	0	1	1	0	0
3761:	0	0	0	0	0	0	0	0
3769:	0	0	0	0	0	0	0	0
3777:	0	0	0	0	1	0	0	0
3785:	0	0	0	0	0	0	0	0

3793:	0	1	0	1	0	0	0	0
3801:	0	0	0	0	0	0	0	0
3809:	0	0	1	0	0	0	1	0
3817:	0	0	0	0	0	0	0	0
3825:	0	0	0	1	0	0	0	0
3833:	0	0	0	0	0	0	0	0
3841:	0	0	0	0	0	0	0	0
3849:	0	0	1	0	0	0	0	0
3857:	0	0	0	0	0	0	0	0
3865:	0	0	0	0	0	0	0	0
3873:	0	0	0	1	0	0	0	0
3881:	0	0	0	0	0	0	0	0
3889:	0	0	0	0	0	0	0	0
3897:	0	0	0	0	0	0	1	0
3905:	0	1	0	0	0	0	0	0
3913:	0	0	0	0	0	0	0	0
3921:	0	0	0	0	0	0	0	0
3929:	0	0	0	0	0	0	0	0
3937:	0	0	0	0	0	0	0	0
3945:	0	0	0	0	0	1	0	0
3953:	1	0	0	0	0	0	0	0
3961:	0	0	0	0	0	0	0	0
3969:	0	0	0	0	0	1	0	0
3977:	0	0	0	0	0	1	0	0
3985:	0	0	0	0	1	0	0	0
3993:	0	0	0	0	0	0	0	0
4001:	0	0	0	0	0	0	0	1
4009:	0	0	0	0	0	0	0	1
4017:	0	0	1	0	0	0	0	0
4025:	0	0	2	0	0	0	0	0
4033:	0	0	0	1	0	1	0	0
4041:	0	0	0	1	1	0	0	1
4049:	0	0	0	0	0	0	0	0
4057:	1	0	0	0	0	1	0	0
4065:	0	0	0	0	0	1	0	0
4073:	0	0	0	0	0	1	0	1
4081:	0	0	0	0	1	0	0	0
4089:	0	0	0	0	0	1	0	0

AC 11/27/02

Sample ID : 0211141-03 Acquisition date : 27-NOV-2002 16:08:01

/VMS Peak Search Report Generated 27-NOV-2002 17:08:47.28

Configuration : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_021114103_GE4_GAS2_48058.CNF;
Analyses by : PEAK V16.9 ENBACK V1.6 PEAKEFF V2.2
Client ID : VA-02-0176
Deposition Date :
Sample Date : 25-NOV-2002 00:00:00 Acquisition date : 27-NOV-2002 16:08:01
Sample ID : 0211141-03 Sample Quantity : 2.86574E+02 GRAM
Sample type : SOIL Sample Geometry : 0
Detector name : GE4 Detector Geometry: GAS-2
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:29.48 0.8%
Start channel : 5 End channel : 4096
Sensitivity : 3.00000 Gaussian : 15.00000
Critical level : No

Post-NID Peak Search Report

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
1	21.90	599	1193	2.57	21.22	20	5	18.8	2.32E+01	
3	37.14	224	1361	1.89	36.47	34	10	60.3	2.39E+01	PM-145
										PM-145
3	40.20	1938	1295	1.90	39.53	34	10	7.5		I-129
1	45.86*	460	938	1.88	45.18	44	6	23.5	4.17E+00	PB-210
1	62.90*	110	1008	2.44	62.23	58	8	102.5	1.85E+00	TH-234
	79.46	245	1049	1.82	78.79	76	7	45.0	3.39E+00	
	100.50	78	660	1.90	99.83	98	5	101.1	8.70E-01	
1	122.15	1362	1244	2.00	121.48	117	9	10.7	1.04E+01	EU-152
										CO-57
1	229.66	109	919	2.72	229.00	226	7	94.0	1.27E+00	
1	244.90	200	993	2.43	244.24	241	8	56.2	2.41E+00	EU-152
1	344.67	402	772	1.47	344.02	340	9	26.8	3.36E-01	EU-152
1	377.46	29	468	3.02	376.81	375	6	237.2	1.70E+00	
1	427.46	58	412	2.22	426.82	424	6	114.3	2.63E+00	
1	434.24	992	549	1.64	433.60	430	8	10.3	1.84E+00	
1	444.09	105	651	4.89	443.45	438	10	93.4	4.01E-01	
1	530.17	78	288	2.35	529.53	527	6	72.0	3.89E+00	I-133
1	614.72	675	399	1.49	614.09	610	7	12.3	3.49E+00	
1	661.92	289	415	2.00	661.29	656	9	28.1	3.68E+00	CS-137
1	723.39	657	415	1.95	722.77	719	9	13.6	3.69E+00	
1	779.69	114	438	1.80	779.08	775	9	68.6	2.19E+00	EU-152
1	797.90	38	369	3.29	797.29	794	7	167.6	2.12E+00	
1	868.16	59	656	5.31	867.55	862	11	169.4	2.38E+00	
1	965.58	17	567	1.53	964.98	960	8	492.4	7.04E+00	
1	1008.37	55	352	2.88	1007.77	1005	7	117.1	1.15E+00	
1	1087.15	127	531	4.53	1086.56	1080	12	75.1	1.42E+00	EU-152
4	1108.98	53	286	2.92	1108.39	1105	17	107.4	2.12E+00	
4	1112.54	134	297	2.52	1111.96	1105	17	49.8		EU-152
4	1116.18	170	297	2.87	1115.59	1105	17	43.3		ZN-65
1	1173.72	4201	324	1.88	1173.13	1167	12	3.5	1.17E+00	CO-60
	1333.00	3657	55	1.95	1332.43	1327	11	3.4	1.84E+00	CO-60
	1408.68	96	16	2.45	1408.12	1402	13	27.6	7.55E-01	EU-152
1	1448.22	15	17	3.94	1447.66	1442	10	115.3	1.00E+00	
1	1461.21*	30	14	2.70	1460.65	1456	10	62.7	6.58E-01	K-40
1	1725.60	12	4	4.78	1725.06	1721	7	68.2	8.02E-01	

00635 AG 12/2/02

Sample ID : 0211141-03 Acquisition date : 27-NOV-2002 16:08:01

	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
1	1741.14	15	4	8.73	1740.60	1737	9	57.7	4.87E-01	
1	1764.49*	10	1	4.98	1763.96	1761	6	69.9	8.68E-01	
1	1770.37	13	0	3.96	1769.83	1767	6	47.8	5.37E-01	
1	1830.35	12	2	4.73	1829.82	1826	8	61.2	1.67E-01	
1	2357.34	13	0	5.31	2356.86	2353	8	47.9	7.52E-02	
1	2506.03	27	6	3.46	2505.55	2501	8	47.7	5.18E-01	

Sample ID : 0211141-03 Acquisition date : 27-NOV-2002 16:08:01

Total number of lines in spectrum 40
Number of unidentified lines 18
Number of lines tentatively identified by NID 22 55.00%

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	2.110E+00	2.110E+00	1.340E+00	63.51	
TH-234	4.47E+09Y	1.00	2.467E+00	2.467E+00	2.544E+00	103.09	
		Total Activity :	4.577E+00	4.577E+00			

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CO-57	270.90D	1.01	1.435E+00	1.445E+00	0.205E+00	14.22	
I-129	1.57E+07Y	1.00	3.195E+01	3.195E+01	0.536E+01	16.77	
CS-137	30.17Y	1.00	1.255E+00	1.255E+00	0.386E+00	30.78	
PM-145	17.70Y	1.00	1.408E+00	1.408E+00	1.265E+00	89.82	
		Total Activity :	3.604E+01	3.605E+01			

Nuclide Type : ACTIVATION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CO-60	5.27Y	1.00	2.553E+01	2.555E+01	0.199E+01	7.78	
ZN-65	244.40D	1.01	1.987E+00	2.002E+00	0.898E+00	44.86	
I-133	20.80H	8.62	2.720E-01	2.344E+00	1.718E+00	73.30	
EU-152	13.60Y	1.00	4.988E+00	4.990E+00	1.075E+00	21.55	
		Total Activity :	3.277E+01	3.489E+01			

Nuclide Type : natural

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
PB-210	4.46E+09Y	1.00	1.182E+01	1.182E+01	0.316E+01	26.74	
		Total Activity :	1.182E+01	1.182E+01			

Grand Total Activity : 8.521E+01 8.733E+01

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

Nuclide Line Activity Report
Sample ID : 0211141-03

Acquisition date : 27-NOV-2002 16:08:01

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.81	10.67*	3.528E-01	2.110E+00	2.110E+00	63.51	OK
Final Mean for 1 Valid Peaks = 2.110E+00+/- 1.340E+00 (63.51%)							
TH-234	63.29	3.80*	3.062E+00	2.467E+00	2.467E+00	103.09	OK
Final Mean for 1 Valid Peaks = 2.467E+00+/- 2.544E+00 (103.09%)							

Nuclide Type: FISSION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
CO-57	122.06	85.51*	2.908E+00	1.435E+00	1.445E+00	14.22	OK
	136.48	10.60	2.752E+00	----- Line Not Found		-----	Absent
Final Mean for 1 Valid Peaks = 1.445E+00+/- 2.054E-01 (14.22%)							
I-129	39.58	7.52*	2.113E+00	3.195E+01	3.195E+01	16.77	OK
Final Mean for 1 Valid Peaks = 3.195E+01+/- 5.358E+00 (16.77%)							
C[illegible]137	661.65	85.12*	7.085E-01	1.255E+00	1.255E+00	30.78	OK
Final Mean for 1 Valid Peaks = 1.255E+00+/- 3.864E-01 (30.78%)							
PM-145	36.85	21.70*	1.919E+00	1.408E+00	1.408E+00	89.82	OK
	37.36	39.70	1.957E+00	7.547E-01	7.549E-01	86.89	<<WM Interf
	42.30	15.10	2.287E+00	----- Line Not Found		-----	Absent
	72.40	2.31	3.172E+00	----- Line Not Found		-----	Absent
Final Mean for 1 Valid Peaks = 1.408E+00+/- 1.265E+00 (89.82%)							

Nuclide Type: ACTIVATION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
CO-60	1173.22	100.00*	4.233E-01	2.600E+01	2.602E+01	11.78	OK
	1332.49	100.00	3.804E-01	2.518E+01	2.521E+01	10.35	OK
Final Mean for 2 Valid Peaks = 2.555E+01+/- 1.987E+00 (7.78%)							
ZN-65	1115.52	50.75*	4.419E-01	1.987E+00	2.002E+00	44.86	OK
Final Mean for 1 Valid Peaks = 2.002E+00+/- 8.983E-01 (44.86%)							
[illegible]33	529.87	86.30*	8.752E-01	2.720E-01	2.344E+00	73.30	OK
Final Mean for 1 Valid Peaks = 2.344E+00+/- 1.718E+00 (73.30%)							

Sample ID : 0211141-03 Acquisition date : 27-NOV-2002 16:08:01

Nuclide Type: ACTIVATION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
EU-152	121.78	20.50	2.911E+00	5.978E+00	5.980E+00	15.77	<<WM Interf
	244.69	5.40	1.804E+00	5.378E+00	5.380E+00	83.20	OK
	344.27	19.13	1.323E+00	4.164E+00	4.166E+00	59.88	OK
	778.89	9.20	6.086E-01	5.349E+00	5.351E+00	70.05	OK
	964.01	10.40	5.020E-01	----- Line	Not Found	-----	Absent
	1085.78	7.22	4.523E-01	1.016E+01	1.016E+01	76.55	OK
	1112.02	9.60	4.431E-01	8.282E+00	8.286E+00	51.61	OK
	1407.95	14.94*	3.635E-01	4.639E+00	4.641E+00	30.13	OK

Final Mean for 6 Valid Peaks = 4.990E+00+/- 1.075E+00 (21.55%)

Nuclide Type: natural

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
PB-210	46.50	4.05*	2.519E+00	1.182E+01	1.182E+01	26.74	OK

Final Mean for 1 Valid Peaks = 1.182E+01+/- 3.159E+00 (26.74%)

Key: "*" = Keyline

Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
K-40	2.110E+00	1.340E+00	1.065E+00	1.001E-01	1.980
CO-57	1.445E+00	2.054E-01	1.318E-01	1.110E-02	10.964
CO-60	2.555E+01	1.987E+00	3.859E-01	4.051E-02	66.203
ZN-65	2.002E+00	8.983E-01	8.983E-01	9.994E-02	2.229
I-129	3.195E+01	5.358E+00	2.404E+00	3.482E-01	13.289
I-133	2.344E+00	1.718E+00	2.536E+00	3.334E-01	0.925
CS-137	1.255E+00	3.864E-01	3.557E-01	4.236E-02	3.529
PM-145	1.408E+00	1.265E+00	9.159E-01	6.087E-01	1.538
EU-152	4.990E+00	1.075E+00	8.548E-01	9.638E-02	5.838
PB-210	1.182E+01	3.159E+00	3.024E+00	3.675E-01	3.907
TH-234	2.467E+00	2.544E+00	2.573E+00	2.595E-01	0.959

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

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
BE-7	-1.225E-02		1.370E+00	2.397E+00	3.155E-01	-0.005
NA-22	4.117E-02		1.299E-01	2.372E-01	2.267E-02	0.174
[illegible]24	8.739E-01		1.623E+00	3.261E+00	2.933E-01	0.268
[illegible]51	6.275E-02		1.133E+00	2.002E+00	1.398E+00	0.031
MN-54	1.253E-01		2.448E-01	4.265E-01	5.341E-02	0.294
CO-56	-1.759E-01		2.475E-01	4.119E-01	5.161E-02	-0.427
CO-58	-8.538E-02		2.365E-01	4.008E-01	5.014E-02	-0.213
FE-59	4.350E-01		5.564E-01	9.294E-01	1.098E-01	0.468
GA-67	-1.377E-01		3.535E-01	5.143E-01	6.060E-01	-0.268
SE-75	1.072E-01		2.013E-01	2.982E-01	2.325E-01	0.359
RB-83	1.694E-01		3.291E-01	5.821E-01	1.079E-01	0.291
KR-85	-1.859E+01		3.481E+01	5.952E+01	7.847E+00	-0.312
SR-85	-8.360E-02		1.566E-01	2.677E-01	3.529E-02	-0.312
Y-88	-6.649E-02		7.951E-02	9.286E-02	8.748E-03	-0.716
NB-94	1.669E-01		2.742E-01	4.323E-01	5.416E-02	0.386
NB-95	9.695E-02		2.112E-01	3.706E-01	4.593E-02	0.262
NB-95M	4.608E-02		7.760E-01	1.143E+00	6.160E-01	0.040
ZR-95	2.544E-02		3.668E-01	6.357E-01	8.257E-02	0.040
MO-99	-1.591E+00		2.976E+00	5.029E+00	6.187E-01	-0.316
RU-103	-8.122E-04		1.642E-01	2.873E-01	4.978E-02	-0.003
RU-106	-1.510E+00		1.954E+00	2.911E+00	4.687E-01	-0.519
CD-109	7.757E-01		1.713E+00	2.829E+00	3.345E-01	0.274
AG-110M	9.927E-02		2.129E-01	3.390E-01	4.055E-02	0.293
SN-113	1.243E-03		1.848E-01	3.250E-01	4.154E-02	0.004
TE123M	-4.760E-03		9.400E-02	1.516E-01	1.542E-02	-0.031
SB-124	5.301E-02		1.758E-01	3.088E-01	3.914E-02	0.172
I-125	5.165E+00		2.433E+00	3.662E+00	6.170E-01	1.410
[illegible]-125	4.849E-01	+	5.581E-01	8.081E-01	1.053E-01	0.600
[illegible] 126	1.702E-01		1.699E-01	2.838E-01	2.902E-02	0.600
SB-127	2.029E-01		8.251E-01	1.443E+00	1.738E-01	0.141
I-131	-1.051E-01		1.866E-01	3.154E-01	1.175E-01	-0.333
TE-132	5.993E-02		2.392E-01	3.524E-01	1.699E-01	0.170

Sample ID : 0211141-03 Acquisition date : 27-NOV-2002 16:08:01

- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
BA-133	-2.251E-03		1.871E-01	3.294E-01	1.493E-01	-0.007
CS-134	-4.823E-02		1.841E-01	3.023E-01	3.830E-02	-0.160
CS-135	1.053E-01		6.915E-01	1.101E+00	8.944E-01	0.096
CS-136	1.016E-01		4.062E-01	6.980E-01	8.296E-02	0.146
CE-139	1.552E-02		1.038E-01	1.682E-01	1.773E-02	0.092
BA-140	-2.201E-02		7.643E-01	1.199E+00	4.147E-01	-0.018
LA-140	-1.178E-01		2.130E-01	3.598E-01	3.359E-02	-0.327
CE-141	3.881E-02		1.592E-01	2.596E-01	4.959E-02	0.150
CE-143	-5.682E-01		1.152E+00	1.634E+00	1.387E+00	-0.348
CE-144	1.007E-01		6.392E-01	1.042E+00	9.280E-02	0.097
PM-144	6.634E-03		1.878E-01	3.260E-01	3.946E-02	0.020
PM-146	2.471E-01		3.302E-01	5.901E-01	7.717E-02	0.419
ND-147	2.128E+00	+	1.560E+00	2.376E+00	3.124E-01	0.896
PM-149	2.449E-01		8.243E+00	1.317E+01	1.164E+01	0.019
EU-154	1.191E-01		3.655E-01	6.678E-01	6.385E-02	0.178
EU-155	-3.334E-03		2.212E-01	3.332E-01	3.396E-02	-0.010
EU-156	2.540E-01		2.462E+00	4.249E+00	1.044E+00	0.060
IR-192	-2.234E-01		2.801E-01	4.746E-01	6.234E-02	-0.471
HG-203	4.269E-03		1.460E-01	2.333E-01	2.134E-01	0.018
[illegible]207	4.044E-02		1.582E-01	2.783E-01	3.606E-02	0.1[illegible]5
[illegible]208	7.177E-02		5.077E-01	8.893E-01	1.143E-01	0.[illegible]1
BI-210M	-5.952E-02		2.455E-01	3.823E-01	2.890E-01	-0.156
PB-211	-1.193E+00		4.311E+00	7.500E+00	9.546E-01	-0.159
BI-212	1.563E+00		1.870E+00	3.004E+00	3.680E-01	0.520
PB-212	1.493E-01		2.733E-01	3.919E-01	2.201E-01	0.381
BI-214	-8.806E-02		4.169E-01	6.449E-01	8.127E-02	-0.137
PB-214	3.415E-02		3.350E-01	5.350E-01	2.537E-01	0.064
RN-219	7.069E-01		1.882E+00	3.341E+00	4.243E-01	0.212
RA-223	4.188E-01		2.782E+00	4.901E+00	3.302E+00	0.085
RA-224	-1.294E+00		3.112E+00	4.364E+00	2.531E+00	-0.297
RA-226	-4.688E-01		2.778E+00	4.252E+00	7.829E+00	-0.110
TH-227	4.608E-01		1.027E+00	1.491E+00	8.071E-01	0.309
AC-228	7.154E-01		1.005E+00	1.748E+00	2.179E-01	0.409
TH-230	1.107E+00		4.849E-01	7.661E-01	9.128E-02	1.445
PA-231	2.793E+00		5.215E+00	7.693E+00	6.151E+00	0.363
TH-231	1.573E+00		1.725E+00	2.609E+00	8.227E-01	0.603
PA-233	6.539E-02		3.141E-01	4.984E-01	3.863E-01	0.131
PA-234	-9.646E-02		3.374E-01	5.425E-01	4.775E-02	-0.178
PA-234M	-1.604E+01		3.340E+01	4.966E+01	5.979E+00	-0.323
U-235	3.603E-01		6.952E-01	1.139E+00	2.039E-01	0.316
NP-237	-7.309E-03		5.420E-01	8.164E-01	8.320E-02	-0.009
NP-239	1.159E-01		6.638E-01	1.003E+00	9.260E-02	0.116
AM-241	-3.066E-03		1.838E-01	2.792E-01	2.863E-02	-0.011

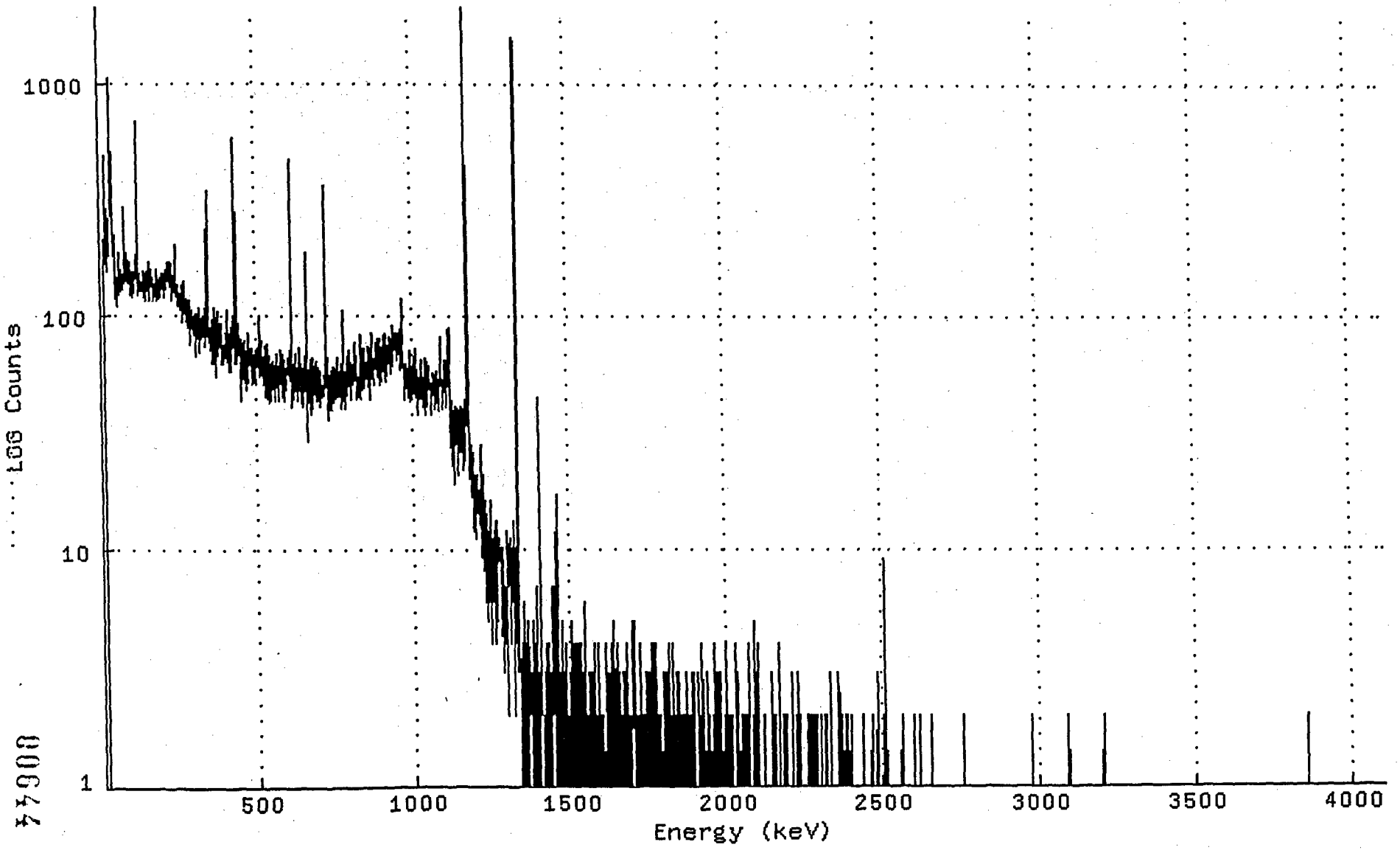
Nuclide	Half-life	Half-Life Ratio	Energy	%Abund	Activity (pCi/GRAM)	2-Sigma %Error	Rejected by
CO-56	78.76D	0.03	846.75*	99.96	--- Not Found ---		Abun.
			1037.75	14.03	--- Not Found ---		
			1238.25	67.00	--- Not Found ---		
			1771.40	15.51	7.564E-01	48.87	
			2598.48	16.90	--- Not Found ---		
		% Abundances Found =		7.27	(Abn. Limit = 99.96%)		
SE-75	119.78D	0.02	121.11	16.70	7.437E+00	15.95	Abun.
			136.00	59.20	--- Not Found ---		
			264.65*	59.80	--- Not Found ---		
			279.53	25.20	--- Not Found ---		
			400.65	11.40	--- Not Found ---		
		% Abundances Found =		9.69			
RB-83	86.20D	0.03	520.41*	46.00	--- Not Found ---		Abun.
			529.64	30.30	7.914E-01	74.36	
			552.65	16.40	--- Not Found ---		
		% Abundances Found =		32.69			
ZR-95	64.02D	0.04	724.18	43.70	6.231E+00	19.09	Abun.
			756.72*	55.30	--- Not Found ---		
		% Abundances Found =		44.14			
SB-124	60.20D	0.04	602.71*	97.87	--- Not Found ---		Abun.
			645.85	7.26	--- Not Found ---		
			722.78	11.10	2.453E+01	18.82	
			1691.02	49.00	--- Not Found ---		
		% Abundances Found =		6.72			
SB-125	2.77Y	0.00	176.33	6.89	--- Not Found ---		Abun.
			427.89*	29.33	4.849E-01	115.11	
			463.38	10.35	--- Not Found ---		
			600.56	17.80	--- Not Found ---		
			635.90	11.32	--- Not Found ---		
		% Abundances Found =		38.75			
I-131	8.04D	0.33	284.30	6.05	--- Not Found ---		Abun.
			364.48*	81.20	--- Not Found ---		
			636.97	7.26	--- Not Found ---		
			722.89	1.80	1.850E+02	18.73	
		% Abundances Found =		1.87			
ND-147	10.98D	0.25	91.11	28.90	--- Not Found ---		Abun.
			531.02*	13.10	2.128E+00	73.30	
		% Abundances Found =		31.19			
EU-154	8.80Y	0.00	123.07	40.50	3.043E+00	14.23	Abun.
			723.30	19.70	1.342E+01	18.73	
			873.19	11.50	--- Not Found ---		
			996.32	10.30	--- Not Found ---		
			1004.76	17.90	--- Not Found ---		
			1274.45*	35.50	--- Not Found ---		
		% Abundances Found =		44.46			

Sample ID : 0211141-03 Acquisition date : 27-NOV-2002 16:08:01

Nuclide	Half-life	Half-Life Ratio	Energy	%Abund	Activity (pCi/GRAM)	2-Sigma %Error	Rejected by
B. 214	1602.00Y	0.00	609.31*	46.30	--- Not Found ---		Abun.
			1120.29	15.10	--- Not Found ---		
			1764.49	15.80	5.576E-01	70.66	
			2204.22	4.98	--- Not Found ---		
		% Abundances Found =		19.23			
TH-230	7.70E+04Y	0.00	48.44*	16.90	--- Not Found ---		Abun.
			62.85	4.60	2.044E+00	103.10	
		% Abundances Found =		21.40			
NP-239	2.36D	1.14	106.10*	22.70	--- Not Found ---		Abun.
			228.18	10.70	3.088E+00	105.70	
			277.60	14.10	--- Not Found ---		
		% Abundances Found =		22.53			

Flag: "*" = Keyline

Spectr : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_ 114103_GE4_GAS2_48058.CNF;1
Title :
Sample Title: VA-02-0176
Start Time: 27-NOV-2002 16:08 Sample Time: 25-NOV-2002 00:00 Energy Offset: 6.78579E-01
Real Time : 0 01:00:29.48 Sample ID : 0211141-03 Energy Slope : 9.99920E-01
Live Time : 0 01:00:00.00 Sample Type: SOIL Energy Quad : 0.00000E+00



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Channel Contents for [GAMMA.SCUSR.ARCHIVE]SMP_021114103_GE4_GAS2_48058.CNF

Channel

1:	0	0	0	0	0	0	0	0
9:	0	0	0	0	0	0	121	211
17:	187	164	185	329	489	302	275	256
25:	201	152	208	190	178	207	215	207
33:	225	244	280	313	279	403	1052	1013
41:	252	235	178	234	434	281	172	127
49:	133	132	117	135	133	144	129	125
57:	143	109	131	138	149	157	184	139
65:	126	126	133	147	156	138	132	139
73:	130	150	147	135	138	187	288	178
81:	138	146	167	139	163	155	151	183
89:	159	138	137	172	164	142	168	135
97:	122	131	154	169	148	122	149	150
105:	120	148	153	124	143	153	145	133
113:	132	167	157	158	142	161	177	186
121:	680	682	232	146	122	134	149	137
129:	127	147	136	132	133	140	137	128
137:	130	148	119	133	154	146	119	151
145:	145	130	148	116	127	128	142	147
153:	153	133	139	140	115	148	154	125
161:	169	148	132	139	156	157	141	145
169:	130	127	115	126	117	125	120	133
177:	136	133	124	137	145	128	115	155
185:	139	131	117	132	131	122	141	141
193:	125	137	132	119	128	146	132	12[illegible]
201:	149	129	147	140	128	119	130	131
209:	151	127	136	143	130	139	156	152
217:	142	153	154	140	145	169	140	145
225:	151	133	145	167	148	164	125	127
233:	120	115	143	147	144	142	130	126
241:	121	144	129	185	199	138	124	128
249:	121	110	134	121	119	117	120	125
257:	120	116	95	102	109	117	135	95
265:	107	119	108	106	104	140	100	111
273:	105	99	96	108	94	98	108	97
281:	103	89	116	111	95	96	75	116
289:	106	94	93	106	96	87	90	100
297:	86	89	82	97	88	101	83	78
305:	82	89	68	101	80	96	85	86
313:	86	80	88	79	70	107	74	82
321:	90	92	98	81	89	99	100	81
329:	88	83	81	91	87	107	85	75
337:	74	86	91	85	86	83	159	339
345:	166	77	83	85	83	77	89	82
353:	89	78	71	86	82	79	96	77
361:	63	87	86	86	86	62	77	107
369:	89	68	77	82	68	55	80	71
377:	88	104	83	88	84	72	79	93
385:	86	85	65	75	92	71	77	62
393:	63	76	66	70	66	69	84	6[illegible]
401:	79	75	79	67	91	64	73	105
409:	65	69	84	82	71	74	68	58
417:	89	61	63	58	80	64	81	75
425:	78	82	81	100	62	62	7[illegible]	90

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433:	451	570	131	63	67	81	73	76
441:	73	83	84	93	72	71	62	54
449:	43	80	71	66	76	64	69	74
457:	54	65	77	60	74	63	66	78
465:	54	48	57	62	66	61	71	57
473:	58	70	85	52	58	66	66	67
481:	73	66	69	53	60	51	69	73
489:	56	61	69	52	61	69	63	63
497:	52	59	69	56	71	61	66	73
505:	60	66	66	60	55	99	73	67
513:	61	66	57	66	56	78	71	55
521:	56	68	61	51	59	51	45	72
529:	58	74	72	44	52	76	62	58
537:	60	42	67	57	62	67	56	49
545:	43	45	63	48	58	56	58	64
553:	48	54	58	56	51	56	43	61
561:	49	49	60	49	49	49	60	69
569:	55	53	57	43	52	55	65	61
577:	51	51	71	53	54	46	49	69
585:	50	45	52	43	54	65	53	58
593:	48	52	54	53	48	60	58	57
601:	62	66	56	57	66	55	60	67
609:	71	53	56	46	164	469	211	41
617:	62	44	52	51	57	55	47	54
625:	55	69	55	62	43	55	60	49
633:	54	58	61	72	63	58	52	51
641:	52	42	45	52	63	55	62	47
649:	47	56	41	58	60	56	52	47
657:	61	68	52	75	184	126	69	29
665:	57	46	45	59	53	44	42	65
673:	56	65	38	59	61	48	50	40
681:	52	55	66	52	48	49	54	46
689:	59	64	43	44	60	55	57	58
697:	47	52	43	52	60	57	45	54
705:	49	54	41	48	51	51	46	51
713:	49	54	52	46	53	56	46	51
721:	71	255	363	111	66	55	36	49
729:	55	66	46	46	46	54	53	39
737:	49	56	56	49	39	43	51	56
745:	60	47	52	49	52	42	44	59
753:	58	53	46	46	66	45	46	53
761:	54	51	55	55	58	45	50	54
769:	59	40	41	63	59	55	44	52
777:	43	92	105	64	52	58	40	56
785:	54	48	49	55	46	67	47	57
793:	56	50	51	71	61	62	45	44
801:	61	51	53	64	51	52	51	63
809:	51	55	65	53	64	65	77	57
817:	57	61	44	67	67	60	64	45
825:	54	49	50	49	49	61	44	67
833:	60	65	83	64	48	64	72	68
841:	66	73	49	63	51	59	51	61
849:	59	64	54	55	56	50	74	65
857:	60	72	62	57	67	56	73	44
865:	73	70	84	80	54	65	60	62
873:	54	65	51	55	66	61	59	77
881:	63	67	59	72	71	55	59	70
889:	80	57	51	66	61	57	79	63
897:	70	70	53	70	74	63	82	60
905:	67	58	74	53	67	80	85	67

913:	79	57	72	61	76	69	72	56
921:	73	63	76	81	65	74	66	76
929:	68	62	57	80	61	70	64	72
937:	90	87	77	79	85	77	71	78
945:	73	78	65	71	76	85	85	6[illegible]
953:	73	82	72	69	75	72	81	87
961:	59	61	97	118	72	65	62	60
969:	63	44	52	63	55	58	62	56
977:	54	57	49	60	60	51	46	45
985:	54	58	59	43	57	58	66	71
993:	53	61	53	58	58	44	48	57
1001:	48	54	68	58	49	61	70	61
1009:	73	48	45	51	59	50	56	38
1017:	42	55	44	44	52	51	48	49
1025:	51	48	44	65	46	54	48	55
1033:	52	41	43	66	47	45	57	38
1041:	47	41	53	56	47	54	64	50
1049:	48	61	56	54	51	49	38	48
1057:	50	49	51	54	57	46	49	55
1065:	52	51	56	51	40	55	47	47
1073:	42	58	55	50	45	47	49	48
1081:	43	44	39	74	61	81	63	64
1089:	50	54	41	40	51	49	48	51
1097:	48	49	65	54	55	54	41	46
1105:	42	44	46	65	52	50	74	87
1113:	74	63	82	89	55	52	50	32
1121:	23	33	43	34	36	31	36	34
1129:	32	39	19	33	41	36	35	28
1137:	29	32	32	30	25	21	40	31
1145:	28	26	39	34	32	27	30	3[illegible]
1153:	29	41	26	37	40	40	29	2[illegible]
1161:	36	29	29	33	37	24	38	44
1169:	34	39	83	806	2117	1168	170	21
1177:	23	26	20	21	28	18	21	17
1185:	20	22	17	16	19	21	26	12
1193:	23	15	11	21	15	17	13	21
1201:	14	17	15	17	20	16	18	14
1209:	13	16	13	12	28	11	13	14
1217:	10	8	13	8	10	12	21	12
1225:	6	11	13	14	16	10	9	11
1233:	8	14	5	12	7	12	11	10
1241:	6	16	4	11	12	10	7	8
1249:	11	7	6	11	8	7	10	8
1257:	4	7	12	8	13	9	5	7
1265:	11	10	9	9	9	11	9	8
1273:	7	9	10	7	7	6	3	5
1281:	6	10	9	5	7	4	5	5
1289:	4	5	5	10	12	6	2	7
1297:	10	10	9	8	7	10	11	7
1305:	10	4	4	6	6	10	6	6
1313:	7	10	10	4	2	13	4	9
1321:	8	4	8	9	10	8	3	4
1329:	18	35	404	1537	1422	280	22	3
1337:	5	4	3	2	3	1	2	2
1345:	2	2	1	2	4	4	1	6
1353:	0	1	3	1	3	1	0	[illegible]
1361:	4	1	0	4	4	3	4	1
1369:	5	3	2	3	3	2	2	2
1377:	1	3	0	3	2	3	1	5
1385:	4	2	1	2	4	2	0	0

1393:	1	0	2	2	0	7	3	0
1401:	2	0	3	3	2	3	26	45
1409:	27	7	2	2	2	2	1	2
1417:	2	2	2	2	3	1	2	0
1425:	4	0	2	2	1	0	0	1
1433:	2	0	4	1	1	3	3	0
1441:	2	2	2	2	3	3	7	7
1449:	2	1	0	3	2	1	2	2
1457:	4	3	5	8	17	8	2	2
1465:	1	1	0	1	3	2	2	2
1473:	3	1	1	2	5	0	2	0
1481:	3	0	2	2	4	2	3	1
1489:	1	2	2	2	2	2	1	1
1497:	1	1	2	3	0	3	0	1
1505:	5	0	2	2	2	4	1	1
1513:	0	2	4	4	4	1	4	3
1521:	0	3	2	4	2	1	2	1
1529:	2	0	4	1	4	3	1	2
1537:	4	0	1	2	3	0	1	3
1545:	0	1	2	2	0	6	1	2
1553:	2	1	1	1	0	0	2	2
1561:	3	1	3	0	0	2	1	3
1569:	3	0	1	1	3	1	2	1
1577:	4	0	3	1	2	0	1	0
1585:	2	1	2	2	1	0	3	4
1593:	1	1	2	0	0	1	2	2
1601:	0	1	2	0	2	0	1	0
1609:	0	1	0	1	2	1	4	0
1617:	0	2	2	3	2	3	0	1
1625:	3	2	3	0	2	2	1	0
1633:	2	4	1	1	1	2	3	0
1641:	3	5	2	3	1	0	1	1
1649:	1	4	2	1	1	2	3	1
1657:	1	0	2	3	0	0	2	1
1665:	1	1	2	1	3	0	0	1
1673:	1	1	0	0	3	1	2	2
1681:	0	0	4	0	0	0	1	2
1689:	0	1	2	2	2	0	1	1
1697:	3	2	2	5	3	2	2	3
1705:	5	3	2	1	0	0	1	0
1713:	2	1	2	1	0	1	0	2
1721:	0	1	1	3	2	4	0	0
1729:	2	2	1	1	1	2	0	0
1737:	0	0	0	2	3	2	1	1
1745:	0	2	3	1	3	0	1	2
1753:	0	1	0	2	3	1	2	0
1761:	1	1	4	0	4	0	0	0
1769:	4	2	4	0	0	1	1	2
1777:	0	1	2	2	2	2	1	1
1785:	2	2	1	0	1	0	1	1
1793:	1	2	1	3	0	0	3	2
1801:	1	1	0	0	3	3	2	1
1809:	1	2	0	2	1	4	1	1
1817:	0	1	2	1	1	0	0	0
1825:	1	0	0	0	4	2	2	1
1833:	0	0	1	0	0	1	1	2
1841:	3	1	2	2	3	2	0	2
1849:	0	1	1	2	1	1	1	0
1857:	1	2	0	0	0	1	1	1
1865:	0	2	0	0	2	2	3	0

1873:	1	1	1	2	0	1	1	2
1881:	1	2	2	0	0	1	3	1
1889:	1	2	1	1	0	0	3	0
1897:	0	1	1	1	0	1	1	[illegible]
1905:	3	1	0	0	2	2	1	[illegible]
1913:	1	2	2	1	1	2	2	0
1921:	4	2	0	1	1	1	2	0
1929:	1	0	1	1	1	2	1	3
1937:	1	1	1	1	1	0	2	1
1945:	1	1	1	1	1	0	0	2
1953:	1	1	1	0	1	1	1	0
1961:	2	4	0	3	0	1	2	1
1969:	2	2	1	2	3	0	0	1
1977:	3	2	0	1	2	1	1	0
1985:	0	0	0	1	0	1	1	2
1993:	0	1	2	1	1	4	0	0
2001:	1	0	0	0	0	2	2	0
2009:	1	0	0	0	0	2	0	0
2017:	0	1	0	1	0	0	1	0
2025:	1	4	0	0	1	1	1	1
2033:	1	1	3	2	1	0	0	1
2041:	0	0	1	0	1	1	2	1
2049:	0	0	2	1	0	0	0	0
2057:	2	1	1	2	0	2	1	0
2065:	2	1	1	0	0	2	4	0
2073:	1	0	1	1	1	0	1	1
2081:	1	2	0	1	1	5	2	2
2089:	1	0	2	0	1	0	3	0
2097:	1	0	4	1	0	2	0	0
2105:	1	0	0	1	1	0	1	[illegible]
2113:	1	0	0	0	2	0	1	1
2121:	0	1	0	1	1	1	1	1
2129:	0	1	0	1	0	0	0	1
2137:	0	1	1	0	3	0	1	0
2145:	0	0	1	1	0	1	2	1
2153:	0	0	2	0	1	0	0	0
2161:	1	0	1	0	1	4	2	1
2169:	1	0	0	0	1	0	1	1
2177:	2	0	1	1	1	1	1	2
2185:	0	1	1	0	0	2	2	0
2193:	2	1	1	0	1	1	1	0
2201:	1	0	0	0	0	0	1	3
2209:	0	1	0	0	0	0	0	1
2217:	1	1	1	1	0	0	2	0
2225:	0	1	0	1	1	3	1	1
2233:	1	2	0	0	1	0	0	0
2241:	0	1	1	0	0	0	0	1
2249:	1	0	0	1	1	0	1	2
2257:	1	1	0	2	2	1	0	1
2265:	0	2	0	0	1	2	1	0
2273:	0	1	1	0	2	1	1	0
2281:	2	0	1	1	1	0	0	0
2289:	2	0	0	1	1	0	0	0
2297:	1	1	0	0	2	1	1	0
2305:	1	0	1	0	1	1	0	[illegible]
2313:	0	2	0	1	0	0	0	2
2321:	0	1	1	0	0	0	1	0
2329:	0	1	0	3	0	1	0	1
2337:	1	0	0	0	0	1	1	1
2345:	0	1	0	0	0	0	0	0

2353:	0	1	0	2	3	2	1	0
2361:	0	2	0	0	2	0	0	1
2369:	1	0	0	1	0	0	1	1
2377:	2	0	1	0	2	1	0	0
2385:	0	0	0	2	1	0	0	0
2393:	0	0	0	0	2	1	0	0
2401:	0	0	0	0	0	1	0	1
2409:	0	0	0	1	0	0	0	0
2417:	1	0	0	0	1	0	0	0
2425:	1	0	0	0	0	1	0	0
2433:	0	2	0	0	0	0	0	1
2441:	1	1	0	1	0	0	0	0
2449:	1	1	0	0	0	0	0	0
2457:	0	1	0	0	0	2	1	1
2465:	0	0	0	0	0	0	0	0
2473:	0	0	1	1	0	0	0	3
2481:	0	0	0	0	0	1	0	1
2489:	0	0	0	0	0	0	0	0
2497:	0	1	0	1	0	2	0	3
2505:	8	9	8	0	2	0	0	0
2513:	0	0	0	0	1	0	1	0
2521:	0	0	0	0	0	1	0	0
2529:	0	0	0	0	1	0	0	0
2537:	0	0	0	1	0	0	0	0
2545:	0	0	0	1	0	0	0	0
2553:	0	0	0	0	0	0	2	0
2561:	0	0	0	0	1	0	0	0
2569:	0	1	0	0	1	0	0	0
2577:	0	0	0	1	0	0	0	0
2585:	0	1	0	0	0	1	0	0
2593:	0	1	0	2	0	0	0	0
2601:	0	0	0	0	0	0	0	0
2609:	0	0	0	0	1	2	1	2
2617:	0	1	0	0	0	1	0	0
2625:	0	0	0	0	0	0	0	0
2633:	0	0	0	0	0	0	0	0
2641:	0	0	0	0	1	0	0	0
2649:	0	0	0	0	0	2	1	0
2657:	0	0	0	0	0	0	0	0
2665:	1	0	0	0	0	0	0	0
2673:	0	0	1	0	0	0	1	0
2681:	0	0	0	0	0	0	0	0
2689:	0	0	1	1	0	0	0	0
2697:	0	0	1	0	0	0	0	0
2705:	0	0	0	0	0	0	0	0
2713:	0	0	0	0	1	0	0	0
2721:	0	0	0	0	0	0	1	0
2729:	0	0	0	0	1	0	0	0
2737:	0	0	0	0	1	0	0	0
2745:	0	0	0	0	1	0	0	1
2753:	0	0	0	2	0	0	0	0
2761:	0	0	0	0	0	0	0	0
2769:	0	1	0	0	0	0	0	0
2777:	0	0	0	0	1	0	1	0
2785:	0	0	0	0	0	0	0	0
2793:	1	1	0	0	0	0	0	0
2801:	0	0	0	0	0	0	0	0
2809:	0	0	0	0	0	0	0	0
2817:	0	0	0	0	0	0	0	0
2825:	0	0	0	0	1	0	1	1

2833:	0	0	0	0	0	1	0	0
2841:	0	1	0	1	0	0	1	0
2849:	0	0	0	0	0	0	0	0
2857:	0	0	0	1	0	0	0	0
2865:	0	0	0	0	0	0	1	0
2873:	0	0	0	0	1	0	0	0
2881:	1	0	0	0	1	0	0	0
2889:	0	0	0	0	0	0	0	0
2897:	0	0	0	1	0	0	0	0
2905:	0	0	1	0	0	0	0	0
2913:	0	0	0	0	0	0	1	0
2921:	0	1	0	0	0	0	0	0
2929:	0	0	1	0	0	1	0	0
2937:	0	0	0	0	0	0	0	0
2945:	0	0	0	0	0	0	0	0
2953:	0	1	0	0	0	0	0	0
2961:	0	0	0	0	0	0	0	0
2969:	1	1	0	2	0	0	0	0
2977:	0	0	0	0	0	0	0	0
2985:	0	1	0	1	1	0	0	0
2993:	0	0	0	0	0	1	0	0
3001:	0	0	0	0	0	0	0	0
3009:	1	0	0	0	0	0	0	0
3017:	0	0	1	1	0	0	0	0
3025:	0	0	1	0	1	0	0	0
3033:	0	0	0	0	0	0	0	0
3041:	0	0	0	0	0	0	0	0
3049:	0	0	0	1	0	0	0	0
3057:	0	0	0	0	0	0	0	0
3065:	0	0	0	0	0	0	0	0
3073:	0	0	0	0	0	0	1	0
3081:	0	0	0	1	0	0	0	0
3089:	0	0	2	1	0	0	0	0
3097:	0	0	0	0	0	0	0	0
3105:	0	0	0	0	1	1	0	1
3113:	0	0	0	0	0	0	0	0
3121:	0	0	0	0	0	0	0	0
3129:	0	0	0	0	0	0	1	0
3137:	0	1	0	0	0	0	0	0
3145:	0	0	0	0	0	0	0	0
3153:	0	0	0	0	0	0	0	0
3161:	0	0	1	0	1	0	0	0
3169:	0	0	0	0	0	1	0	0
3177:	0	0	1	1	0	1	1	1
3185:	0	0	0	0	0	0	0	0
3193:	0	0	0	1	0	0	0	0
3201:	0	2	0	0	0	0	0	0
3209:	0	0	0	0	0	0	0	0
3217:	0	0	1	0	0	0	0	0
3225:	0	0	0	0	0	0	0	0
3233:	0	0	0	0	0	0	0	0
3241:	0	0	0	0	0	0	0	0
3249:	0	0	0	0	1	0	0	0
3257:	1	0	0	0	0	0	1	0
3265:	0	0	0	0	0	0	0	0
3273:	0	0	0	0	0	0	0	0
3281:	0	0	0	0	0	1	0	0
3289:	0	0	0	0	0	0	0	0
3297:	0	0	0	0	0	0	0	0
3305:	0	0	0	0	0	0	0	0

3313:	0	0	0	0	0	0	0	0
3321:	0	0	0	0	1	0	0	0
3329:	0	0	0	0	0	0	0	0
3337:	0	0	0	0	0	0	0	0
3345:	0	0	0	1	0	0	0	0
3353:	0	0	0	0	1	0	0	0
3361:	0	0	0	0	0	0	0	0
3369:	0	0	0	0	0	1	0	0
3377:	0	0	0	0	0	0	0	0
3385:	1	0	0	0	0	0	0	0
3393:	0	0	0	0	0	0	0	0
3401:	0	1	0	0	0	0	0	0
3409:	0	0	1	0	0	0	0	0
3417:	0	1	0	0	0	0	0	0
3425:	1	0	0	0	0	0	1	0
3433:	0	0	1	0	0	0	0	0
3441:	0	0	0	0	0	0	0	0
3449:	0	0	0	1	0	0	0	0
3457:	1	0	0	0	0	1	0	0
3465:	0	0	0	0	0	0	0	0
3473:	0	0	0	0	1	0	0	1
3481:	0	0	0	0	0	0	0	0
3489:	1	0	0	0	0	0	0	0
3497:	0	0	0	0	0	0	0	1
3505:	0	0	0	0	0	0	0	0
3513:	0	0	0	0	0	0	0	0
3521:	0	0	0	0	0	1	0	1
3529:	0	0	0	0	0	0	1	0
3537:	0	0	0	0	1	0	0	0
3545:	0	0	0	0	0	0	0	0
3553:	0	0	0	1	1	0	0	0
3561:	0	0	0	0	0	0	0	0
3569:	0	0	0	0	1	0	0	0
3577:	0	0	0	1	0	0	0	0
3585:	0	0	0	0	0	0	0	0
3593:	0	0	0	0	0	0	0	0
3601:	0	0	0	0	1	0	0	0
3609:	0	0	0	0	0	0	0	0
3617:	1	0	0	0	0	0	0	1
3625:	0	0	0	0	1	0	0	0
3633:	0	0	1	0	1	0	0	0
3641:	0	0	0	0	0	0	0	0
3649:	0	0	0	0	1	0	0	0
3657:	1	0	0	0	0	0	0	0
3665:	0	0	0	0	0	0	0	0
3673:	0	0	1	0	0	0	0	0
3681:	0	0	0	0	0	0	0	1
3689:	0	1	0	0	0	0	0	0
3697:	0	0	1	0	0	0	0	0
3705:	0	0	1	0	0	0	0	0
3713:	0	0	0	0	0	1	0	0
3721:	0	0	0	0	0	0	0	0
3729:	0	0	0	0	0	1	0	1
3737:	0	0	0	0	0	0	0	0
3745:	0	0	0	0	0	0	0	1
3753:	0	0	0	0	0	1	1	0
3761:	0	0	0	0	0	0	0	0
3769:	0	0	0	0	0	0	0	1
3777:	0	0	0	0	0	0	1	0
3785:	0	0	0	0	1	0	0	0

3793:	0	0	0	0	0	0	0	1
3801:	0	0	0	0	0	0	0	0
3809:	0	0	0	1	0	0	0	0
3817:	0	0	0	0	1	0	0	0
3825:	0	0	0	0	0	0	0	0
3833:	0	0	0	0	0	0	0	0
3841:	0	0	0	0	1	0	0	0
3849:	0	0	0	2	0	0	0	0
3857:	0	1	1	0	0	0	0	0
3865:	0	0	0	0	0	0	0	0
3873:	0	0	0	0	0	0	0	0
3881:	0	0	1	0	0	0	0	0
3889:	0	0	0	0	0	0	1	0
3897:	0	0	0	0	0	0	0	0
3905:	0	1	0	1	0	0	0	0
3913:	0	0	0	1	0	0	0	0
3921:	0	0	0	0	0	0	0	0
3929:	0	0	0	0	0	1	0	0
3937:	0	0	0	0	0	0	0	0
3945:	0	0	0	0	0	0	0	0
3953:	0	0	0	0	0	0	0	0
3961:	0	0	1	0	0	0	0	0
3969:	0	0	0	0	1	0	0	0
3977:	0	0	0	0	0	0	0	0
3985:	0	0	0	0	0	0	0	0
3993:	0	0	1	0	0	0	0	0
4001:	0	0	0	0	0	0	0	0
4009:	0	0	0	1	0	0	0	1
4017:	0	0	0	1	0	0	0	0
4025:	0	0	0	0	0	0	1	0
4033:	0	0	1	0	1	0	0	0
4041:	0	0	0	0	0	0	0	0
4049:	0	0	0	1	0	0	0	0
4057:	0	1	0	0	0	1	0	0
4065:	0	0	0	0	0	1	0	0
4073:	0	0	0	0	0	0	0	0
4081:	0	0	0	0	0	0	0	0
4089:	0	0	0	0	0	0	0	0

AC 11/2LLC

Sample ID : 0211141-04 Acquisition date : 27-NOV-2002 17:13:26

/VMS Peak Search Report Generated 27-NOV-2002 18:14:10.71

Configuration : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_021114104_GE4_GAS2_48065.CNF;
Analyses by : PEAK V16.9 ENBACK V1.6 PEAKEFF V2.2
Client ID : VA-02-0176
Deposition Date :
Sample Date : 25-NOV-2002 00:00:00 Acquisition date : 27-NOV-2002 17:13:26
Sample ID : 0211141-04 Sample Quantity : 2.86574E+02 GRAM
Sample type : SOIL Sample Geometry : 0
Detector name : GE4 Detector Geometry: GAS-2
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:22.89 0.6%
Start channel : 5 End channel : 4096
Sensitivity : 3.00000 Gaussian : 15.00000
Critical level : No

Post-NID Peak Search Report

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
1	21.65	416	1117	2.04	20.97	20	5	26.0	4.08E+00	
1	40.16	1721	1592	1.46	39.48	36	6	8.7	7.17E+00	I-129
1	45.81*	455	971	1.68	45.14	43	6	24.1	2.25E+00	PB-210
1	63.67*	18	859	1.80	63.00	60	6	517.0	1.53E+00	TH-234
1	79.43	251	877	1.80	78.76	76	6	39.0	2.78E+00	
1	122.15	1234	1283	1.83	121.48	118	9	11.9	1.20E+01	EU-152
										CO-57
	219.46	124	1061	3.12	218.79	215	8	92.6	1.67E+00	
1	244.69	212	881	2.69	244.03	241	7	48.0	2.58E+00	EU-152
1	344.45	592	637	1.73	343.80	340	8	16.6	2.16E+01	EU-152
1	434.32	924	493	1.64	433.68	431	8	10.7	1.10E+00	
1	485.49	76	398	3.03	484.85	482	7	89.2	1.40E-01	
1	511.21*	52	486	3.52	510.57	507	8	153.4	3.94E-01	
1	564.60	48	367	1.92	563.97	562	7	134.8	1.48E+00	
1	614.69	684	464	1.67	614.06	610	9	13.8	1.49E+00	
1	662.32	124	456	2.16	661.69	658	8	64.2	9.15E+00	CS-137
1	723.32	596	416	1.81	722.70	719	8	14.3	1.47E+00	
1	779.54	97	404	2.96	778.92	775	8	75.5	3.31E+00	EU-152
1	964.86	71	382	2.21	964.26	962	6	91.1	2.90E+00	EU-152
1	986.18	50	317	3.31	985.58	983	7	122.9	2.04E+00	
1	1087.25	105	443	4.11	1086.66	1082	10	77.8	5.58E-01	EU-152
2	1112.53	127	285	2.42	1111.94	1106	15	47.9	1.45E+00	EU-152
2	1116.01	136	255	2.42	1115.42	1106	15	45.9		ZN-65
1	1173.72	4312	306	1.87	1173.14	1167	12	3.5	5.69E-01	CO-60
1	1333.00	3732	91	1.99	1332.43	1326	12	3.4	1.68E+00	CO-60
1	1404.75	9	6	2.29	1404.19	1403	14	66.7	1.23E+00	
1	1408.45	107	10	2.29	1407.88	1403	14	21.4		EU-152
1	1457.77	12	1	1.90	1457.21	1456	19	45.6	5.96E-01	
1	1461.56*	26	5	2.10	1461.00	1456	19	53.5		K-40
1	1529.75	19	0	5.33	1529.19	1526	7	43.6	1.44E+00	
1	1697.70	9	3	3.48	1697.16	1695	5	72.6	5.14E-02	
	1829.94	11	4	4.74	1829.41	1826	6	75.5	1.57E+00	
	2505.95	19	0	3.16	2505.47	2501	10	49.3	1.24E+00	

AG 12/2/02

Sample ID : 0211141-04 Acquisition date : 27-NOV-2002 17:13:26

Total number of lines in spectrum	32	
Number of unidentified lines	14	
Number of lines tentatively identified by NID	18	56.25%

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	1.835E+00	1.835E+00	0.100E+01	54.48	
TH-234	4.47E+09Y	1.00	4.066E-01	4.066E-01	21.03E-01	517.15	
		Total Activity :	2.241E+00	2.241E+00			

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CO-57	270.90D	1.01	1.300E+00	1.309E+00	0.198E+00	15.09	
I-129	1.57E+07Y	1.00	2.838E+01	2.838E+01	0.493E+01	17.38	
CS-137	30.17Y	1.00	5.373E-01	5.374E-01	3.517E-01	65.45	
		Total Activity :	3.021E+01	3.022E+01			

Nuclide Type : ACTIVATION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CO-60	5.27Y	1.00	2.612E+01	2.614E+01	0.203E+01	7.77	
ZN-65	244.40D	1.01	1.594E+00	1.607E+00	0.762E+00	47.41	
EU-152	13.60Y	1.00	5.323E+00	5.325E+00	0.991E+00	18.61	
		Total Activity :	3.303E+01	3.307E+01			

Nuclide Type : natural

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
PB-210	4.46E+09Y	1.00	1.170E+01	1.170E+01	0.319E+01	27.28	
		Total Activity :	1.170E+01	1.170E+01			

Grand Total Activity : 7.719E+01 7.723E+01

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

Sample ID : 0211141-04
Acquisition date : 27-NOV-2002 17:13:26

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.81	10.67*	3.528E-01	1.835E+00	1.835E+00	54.48	OK
Final Mean for 1 Valid Peaks = 1.835E+00+/- 9.995E-01 (54.48%)							
TH-234	63.29	3.80*	3.062E+00	4.066E-01	4.066E-01	517.15	OK
Final Mean for 1 Valid Peaks = 4.066E-01+/- 2.103E+00 (517.15%)							

Nuclide Type: FISSION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
CO-57	122.06	85.51*	2.908E+00	1.300E+00	1.309E+00	15.09	OK
	136.48	10.60	2.752E+00	-----	Line Not Found	-----	Absent
Final Mean for 1 Valid Peaks = 1.309E+00+/- 1.975E-01 (15.09%)							
I-129	39.58	7.52*	2.113E+00	2.838E+01	2.838E+01	17.38	OK
Final Mean for 1 Valid Peaks = 2.838E+01+/- 4.932E+00 (17.38%)							
C 137	661.65	85.12*	7.085E-01	5.373E-01	5.374E-01	65.45	OK
Final Mean for 1 Valid Peaks = 5.374E-01+/- 3.517E-01 (65.45%)							

Nuclide Type: ACTIVATION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
CO-60	1173.22	100.00*	4.233E-01	2.669E+01	2.671E+01	11.75	OK
	1332.49	100.00	3.804E-01	2.570E+01	2.573E+01	10.36	OK
Final Mean for 2 Valid Peaks = 2.614E+01+/- 2.032E+00 (7.77%)							
ZN-65	1115.52	50.75*	4.419E-01	1.594E+00	1.607E+00	47.41	OK
Final Mean for 1 Valid Peaks = 1.607E+00+/- 7.618E-01 (47.41%)							
EU-152	121.78	20.50	2.911E+00	5.415E+00	5.417E+00	16.56	<<WM Interf
	244.69	5.40	1.804E+00	5.706E+00	5.708E+00	77.93	OK
	344.27	19.13	1.323E+00	6.131E+00	6.134E+00	56.05	OK
	778.89	9.20	6.086E-01	4.541E+00	4.543E+00	76.79	OK
	964.01	10.40	5.020E-01	3.548E+00	3.549E+00	92.17	OK
	1085.78	7.22	4.523E-01	8.398E+00	8.401E+00	79.19	OK
	1112.02	9.60	4.431E-01	7.796E+00	7.799E+00	49.73	OK
	1407.95	14.94*	3.635E-01	5.175E+00	5.177E+00	24.56	OK
Final Mean for 7 Valid Peaks = 5.325E+00+/- 9.908E-01 (18.61%)							

Sample ID : 0211141-04 Acquisition date : 27-NOV-2002 17:13:26

Nuclide Type: natural

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
PB-210	46.50	4.05*	2.519E+00	1.170E+01	1.170E+01	27.28	OK

Final Mean for 1 Valid Peaks = 1.170E+01+/- 3.190E+00 (27.28%)

Flag: "*" = Keyline

Sample ID : 0211141-04 Acquisition date : 27-NOV-2002 17:13:26

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
K-40	1.835E+00	9.995E-01	1.595E+00	1.498E-01	1.151
CO-57	1.309E+00	1.975E-01	1.309E-01	1.103E-02	9.997
CO-60	2.614E+01	2.032E+00	3.362E-01	3.528E-02	77.765
ZN-65	1.607E+00	7.618E-01	9.390E-01	1.045E-01	1.711
I-129	2.838E+01	4.932E+00	2.624E+00	3.800E-01	10.815
CS-137	5.374E-01	3.517E-01	3.742E-01	4.457E-02	1.436
EU-152	5.325E+00	9.908E-01	1.075E+00	1.212E-01	4.954
PB-210	1.170E+01	3.190E+00	3.273E+00	3.978E-01	3.573
TH-234	4.066E-01	2.103E+00	2.685E+00	2.708E-01	0.151

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

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
BE-7	9.709E-01		1.470E+00	2.381E+00	3.134E-01	0.408
NA-22	8.809E-02		1.453E-01	2.682E-01	2.564E-02	0.328
NA-24	9.598E-01		1.817E+00	3.604E+00	3.242E-01	0.266
CR-51	-6.916E-01		1.219E+00	1.939E+00	1.354E+00	-0.357
[illegible]54	1.539E-01		2.420E-01	4.231E-01	5.299E-02	0.[illegible]4
[illegible] 56	3.014E-02		2.379E-01	4.106E-01	5.144E-02	0.073
CO-58	1.549E-01		2.251E-01	3.960E-01	4.953E-02	0.391
FE-59	-7.219E-02		5.207E-01	8.810E-01	1.041E-01	-0.082
GA-67	1.017E-01		3.367E-01	5.265E-01	6.214E-01	0.193
SE-75	-4.703E-02		1.885E-01	2.927E-01	2.282E-01	-0.161
RB-83	-8.158E-02		3.410E-01	5.637E-01	1.045E-01	-0.145
KR-85	2.897E+01		3.812E+01	6.162E+01	8.123E+00	0.470
SR-85	1.304E-01		1.715E-01	2.773E-01	3.655E-02	0.470
Y-88	1.804E-02		5.969E-02	1.220E-01	1.149E-02	0.148
NB-94	3.913E-02		2.651E-01	4.555E-01	5.707E-02	0.086
NB-95	1.637E-01		2.179E-01	3.848E-01	4.769E-02	0.425
NB-95M	8.480E-02		7.228E-01	1.158E+00	6.238E-01	0.073
ZR-95	-2.621E-05		3.743E-01	6.465E-01	8.397E-02	0.000
MO-99	-6.435E-01		3.030E+00	5.196E+00	6.392E-01	-0.124
RU-103	-8.158E-02		1.619E-01	2.773E-01	4.805E-02	-0.294
RU-106	1.070E+00		1.870E+00	2.996E+00	4.825E-01	0.357
CD-109	-4.157E-01		1.747E+00	2.833E+00	3.350E-01	-0.147
AG-110M	2.386E-01		2.155E-01	3.507E-01	4.194E-02	0.680
SN-113	-8.807E-02		1.869E-01	3.230E-01	4.128E-02	-0.273
TE123M	-2.080E-03		9.486E-02	1.531E-01	1.557E-02	-0.014
SB-124	-1.028E-03		1.750E-01	3.045E-01	3.859E-02	-0.003
I-125	1.285E+00		2.426E+00	3.727E+00	6.279E-01	0.345
SB-125	2.994E-01		5.097E-01	8.214E-01	1.071E-01	0.365
SN-126	3.839E-02		1.739E-01	2.857E-01	2.921E-02	0.134
[illegible]127	2.322E-02		8.185E-01	1.422E+00	1.712E-01	0.[illegible]6
[illegible]31	-6.484E-03		1.771E-01	3.115E-01	1.160E-01	-0.021
T[illegible] 132	1.128E-01		2.206E-01	3.476E-01	1.676E-01	0.325
BA-133	-1.228E-01		1.897E-01	3.128E-01	1.417E-01	-0.393
I-133	-8.133E-01		1.537E+00	2.628E+00	3.455E-01	-0.310

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Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
CS-134	8.514E-02		1.748E-01	2.960E-01	3.750E-02	0.288
CS-135	1.191E-01		7.003E-01	1.114E+00	9.042E-01	0.107
CS-136	-1.681E-01		4.189E-01	7.012E-01	8.334E-02	-0.240
CE-139	-6.405E-02		1.002E-01	1.582E-01	1.667E-02	-0.405
BA-140	4.202E-01		6.994E-01	1.220E+00	4.221E-01	0.344
LA-140	-4.126E-02		2.588E-01	4.739E-01	4.425E-02	-0.087
CE-141	1.057E-01		1.594E-01	2.614E-01	4.993E-02	0.404
CE-143	-5.077E-01		1.161E+00	1.688E+00	1.433E+00	-0.301
CE-144	-8.271E-02		6.401E-01	1.034E+00	9.213E-02	-0.080
PM-144	-3.680E-02		1.831E-01	3.151E-01	3.814E-02	-0.117
PM-145	1.478E+00		1.192E+00	1.081E+00	7.183E-01	1.368
PM-146	3.742E-01		3.361E-01	6.034E-01	7.891E-02	0.620
ND-147	-1.628E+00		1.354E+00	2.230E+00	2.932E-01	-0.730
PM-149	3.191E+00		8.816E+00	1.351E+01	1.195E+01	0.236
EU-154	2.291E-01		4.067E-01	7.487E-01	7.158E-02	0.306
EU-155	2.530E-01		2.082E-01	3.482E-01	3.549E-02	0.727
EU-156	2.093E+00		2.431E+00	4.221E+00	1.037E+00	0.496
IR-192	2.047E-01		2.922E-01	5.210E-01	6.843E-02	0.393
HG-203	-3.364E-02		1.517E-01	2.351E-01	2.151E-01	-0.143
[illegible]-207	-5.176E-02		1.774E-01	2.743E-01	3.554E-02	-0.189
T[illegible]-208	-5.801E-02		5.172E-01	8.969E-01	1.153E-01	-0.065
BI-210M	5.428E-02		2.446E-01	3.881E-01	2.934E-01	0.140
PB-211	-3.546E-01		4.307E+00	7.542E+00	9.600E-01	-0.047
BI-212	1.601E+00		1.847E+00	2.972E+00	3.642E-01	0.539
PB-212	-1.170E-01		2.715E-01	3.818E-01	2.144E-01	-0.306
BI-214	-2.467E-02		4.036E-01	6.297E-01	7.936E-02	-0.039
PB-214	2.214E-01		3.289E-01	5.121E-01	2.428E-01	0.432
RN-219	2.240E-01		1.870E+00	3.298E+00	4.189E-01	0.068
RA-223	6.167E-01		2.726E+00	4.785E+00	3.224E+00	0.129
RA-224	5.668E-01		2.967E+00	4.368E+00	2.533E+00	0.130
RA-226	1.006E+00		3.315E+00	4.494E+00	8.275E+00	0.224
TH-227	3.107E-01		9.373E-01	1.490E+00	8.065E-01	0.208
AC-228	1.069E-01		9.670E-01	1.658E+00	2.067E-01	0.064
TH-230	5.763E-01		4.818E-01	7.556E-01	9.004E-02	0.763
PA-231	-9.362E-01		5.078E+00	7.947E+00	6.355E+00	-0.118
TH-231	5.688E-01		1.621E+00	2.505E+00	7.900E-01	0.227
PA-233	2.684E-01		3.799E-01	5.225E-01	4.050E-01	0.514
PA-234	4.198E-02		3.607E-01	5.417E-01	4.768E-02	0.078
PA-234M	1.295E+01		2.911E+01	5.044E+01	6.074E+00	0.257
U-235	-4.151E-01		6.955E-01	1.100E+00	1.968E-01	-0.378
NP-237	6.200E-01		5.102E-01	8.531E-01	8.694E-02	0.727
NP-239	-2.897E-01		6.463E-01	1.038E+00	9.575E-02	-0.279
AM-241	-2.388E-02		1.862E-01	2.817E-01	2.888E-02	-0.085

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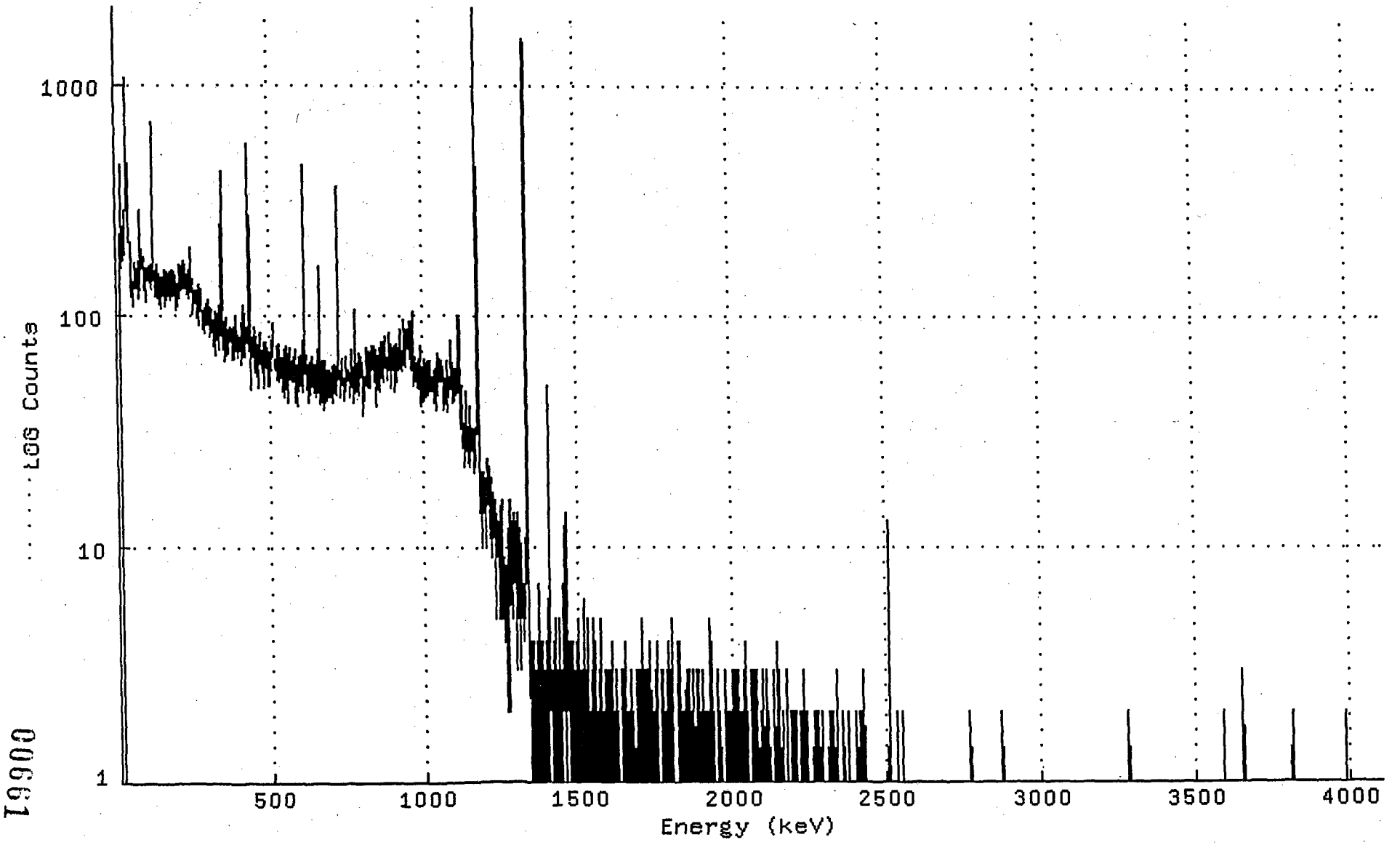
Nuclide	Half-life	Half-Life Ratio	Energy	%Abund	Activity (pCi/GRAM)	2-Sigma %Error	Rejected by
SE-75	119.78D	0.02	121.11	16.70	6.739E+00	16.73	Abun.
			136.00	59.20	--- Not Found ---		
			264.65*	59.80	--- Not Found ---		
			279.53	25.20	--- Not Found ---		
			400.65	11.40	--- Not Found ---		
		% Abundances Found =		9.69			
ZR-95	64.02D	0.04	724.18	43.70	5.656E+00	19.59	Abun.
			756.72*	55.30	--- Not Found ---		
		% Abundances Found =		44.14			
SB-124	60.20D	0.05	602.71*	97.87	--- Not Found ---		Abun.
			645.85	7.26	--- Not Found ---		
			722.78	11.10	2.227E+01	19.32	
			1691.02	49.00	--- Not Found ---		
		% Abundances Found =		6.72			
I-131	8.04D	0.34	284.30	6.05	--- Not Found ---		Abun.
			364.48*	81.20	--- Not Found ---		
			636.97	7.26	--- Not Found ---		
			722.89	1.80	1.685E+02	19.24	
		% Abundances Found =		1.87			
CS-134	2.06Y	0.00	563.23	8.38	1.813E+00	135.45	Abun.
			569.32	15.43	--- Not Found ---		
			604.70*	97.60	--- Not Found ---		
			795.84	85.40	--- Not Found ---		
			801.93	8.73	--- Not Found ---		
		% Abundances Found =		3.89			
EU-154	8.80Y	0.00	123.07	40.50	2.756E+00	15.11	Abun.
			723.30	19.70	1.217E+01	19.24	
			873.19	11.50	--- Not Found ---		
			996.32	10.30	--- Not Found ---		
			1004.76	17.90	--- Not Found ---		
			1274.45*	35.50	--- Not Found ---		
		% Abundances Found =		44.46			
TH-230	7.70E+04Y	0.00	48.44*	16.90	--- Not Found ---		Abun.
			62.85	4.60	3.368E-01	517.15	
		% Abundances Found =		21.40			

Flag: "*" = Keyline

Spectru : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_ 14104_GE4_GAS2_48065.CNF;1
Title :
Sample Title: VA-02-0176

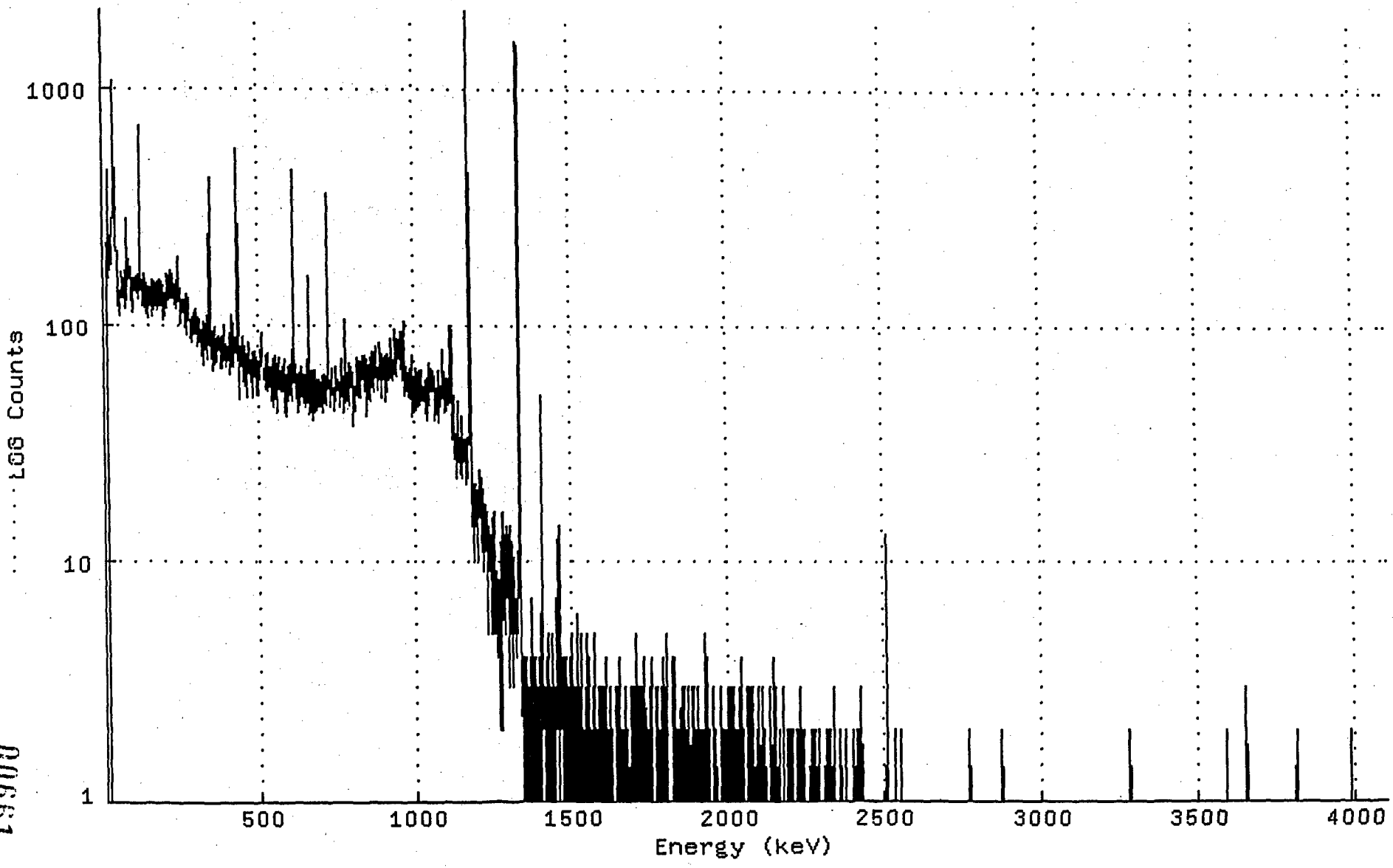
Start Time: 27-NOV-2002 17:13	Sample Time: 25-NOV-2002 00:00	Energy Offset: 6.78579E-01
Real Time : 0 01:00:22.89	Sample ID : 0211141-04	Energy Slope : 9.99920E-01
Live Time : 0 01:00:00.00	Sample Type: SOIL	Energy Quad : 0.00000E+00



19900

433:	384	552	132	60	68	48	63	77
441:	67	66	72	80	71	79	70	56
449:	72	63	61	89	68	81	67	62
457:	62	57	60	49	75	68	64	66
465:	62	61	83	67	79	64	61	61
473:	60	71	63	64	56	72	66	76
481:	49	55	63	76	76	73	68	59
489:	62	72	61	67	55	56	50	63
497:	52	60	65	50	67	71	59	68
505:	78	65	57	74	78	80	91	76
513:	67	63	58	62	64	61	62	65
521:	53	61	52	70	73	59	75	64
529:	51	54	51	54	55	57	66	64
537:	64	49	65	58	55	60	47	71
545:	53	65	63	53	44	61	74	53
553:	50	51	48	65	66	57	46	68
561:	42	46	72	61	68	55	52	54
569:	63	55	58	51	56	57	58	66
577:	61	57	65	51	59	70	42	50
585:	55	48	40	61	56	55	48	56
593:	49	47	60	65	50	50	50	57
601:	57	51	60	67	57	47	77	60
609:	48	49	62	56	168	451	195	76
617:	60	60	48	57	57	59	61	48
625:	61	50	42	60	45	51	62	57
633:	59	53	50	66	59	49	51	51
641:	55	61	47	46	51	52	54	61
649:	60	58	45	48	44	46	53	70
657:	65	63	57	64	162	147	57	59
665:	41	63	42	58	51	56	50	49
673:	39	50	55	55	63	55	57	53
681:	42	48	63	52	43	52	49	51
689:	57	47	44	58	49	49	58	56
697:	45	45	44	54	49	58	54	58
705:	46	42	60	61	46	51	59	53
713:	48	58	45	58	60	57	47	57
721:	71	241	359	108	56	47	57	46
729:	49	49	44	51	55	58	61	53
737:	64	54	44	49	43	53	43	50
745:	50	51	65	56	47	58	56	54
753:	57	56	57	58	45	46	56	51
761:	44	54	49	54	71	57	51	62
769:	48	45	58	42	59	60	46	59
777:	47	98	104	70	55	50	47	54
785:	53	47	62	68	47	50	45	50
793:	56	55	53	56	66	55	62	37
801:	56	47	51	52	43	51	51	53
809:	45	53	56	72	63	55	50	51
817:	53	49	53	62	50	69	50	55
825:	64	52	51	49	69	57	70	63
833:	58	60	73	73	52	55	66	54
841:	54	47	40	68	71	41	53	48
849:	66	57	63	57	63	72	47	69
857:	49	62	57	76	65	57	58	53
865:	67	63	76	68	75	74	51	69
873:	81	62	68	72	59	56	61	65
881:	63	52	62	70	80	63	67	57
889:	84	67	72	73	58	63	49	66
897:	61	59	61	68	70	73	63	47
905:	68	63	58	56	65	74	67	51

Spectru : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_.214104_GE4_GAS2_48065.CNF;1
Title :
Sample Title: VA-02-0176
Start Time: 27-NOV-2002 17:13 Sample Time: 25-NOV-2002 00:00 Energy Offset: 6.78579E-01
Real Time : 0 01:00:22.89 Sample ID : 0211141-04 Energy Slope : 9.99920E-01
Live Time : 0 01:00:00.00 Sample Type: SOIL Energy Quad : 0.00000E+00



00661

Channel Contents for [GAMMA.SCUSR.ARCHIVE]SMP_021114104_GE4_GAS2_48065.CNF

Channel								
1:	0	0	0	0	0	0	0	0
9:	0	0	0	0	0	0	156	219
17:	158	171	201	330	445	283	204	205
25:	200	169	223	173	184	209	239	225
33:	211	244	331	313	280	360	1060	1023
41:	206	221	206	243	449	263	162	119
49:	145	136	139	148	109	128	123	137
57:	129	130	150	129	132	163	166	165
65:	133	159	136	148	152	138	117	140
73:	136	170	160	151	147	212	283	154
81:	126	153	157	182	156	173	163	190
89:	125	156	148	178	156	153	163	138
97:	112	157	133	153	155	156	158	151
105:	156	138	143	161	159	154	145	140
113:	135	165	155	159	157	160	129	159
121:	691	630	219	156	139	143	119	155
129:	129	140	144	123	131	116	164	127
137:	146	124	138	149	130	110	136	144
145:	142	140	135	106	125	130	141	126
153:	144	143	129	109	154	145	126	148
161:	152	137	152	118	114	122	145	137
169:	120	146	129	149	127	115	124	134
177:	130	143	152	120	139	133	148	143
185:	154	153	149	152	135	148	120	12[illegible]
193:	131	139	146	105	129	113	119	13[illegible]
201:	136	108	119	115	120	138	118	163
209:	143	143	136	162	153	142	134	126
217:	159	171	152	137	154	129	128	143
225:	142	163	145	131	130	150	128	139
233:	134	121	156	116	149	134	132	121
241:	132	137	149	189	195	137	110	141
249:	128	135	114	101	119	119	123	125
257:	118	111	107	127	114	117	113	102
265:	90	130	115	99	115	134	107	128
273:	119	103	114	117	116	86	103	104
281:	86	98	105	106	104	84	105	107
289:	92	107	92	90	90	110	98	113
297:	100	114	90	106	96	90	80	106
305:	86	102	86	83	89	86	104	95
313:	102	89	96	73	87	89	77	75
321:	79	80	99	67	102	94	78	100
329:	82	101	83	71	109	81	71	93
337:	76	96	81	87	88	96	140	420
345:	140	76	82	70	73	79	63	74
353:	94	72	64	67	67	85	82	82
361:	97	77	73	87	75	76	68	76
369:	80	88	76	82	78	86	82	87
377:	77	64	71	82	84	64	89	78
385:	75	74	98	83	69	71	74	74
393:	73	65	82	67	66	79	74	[illegible]
401:	80	69	70	80	77	87	61	79
409:	75	77	108	65	68	84	70	71
417:	84	73	101	65	67	72	79	81
425:	82	75	89	87	80	76	69	100

433:	384	552	132	60	68	48	63	77
441:	67	66	72	80	71	79	70	56
449:	72	63	61	89	68	81	67	62
457:	62	57	60	49	75	68	64	66
465:	62	61	83	67	79	64	61	61
473:	60	71	63	64	56	72	66	76
481:	49	55	63	76	76	73	68	59
489:	62	72	61	67	55	56	50	63
497:	52	60	65	50	67	71	59	68
505:	78	65	57	74	78	80	91	76
513:	67	63	58	62	64	61	62	65
521:	53	61	52	70	73	59	75	64
529:	51	54	51	54	55	57	66	64
537:	64	49	65	58	55	60	47	71
545:	53	65	63	53	44	61	74	53
553:	50	51	48	65	66	57	46	68
561:	42	46	72	61	68	55	52	54
569:	63	55	58	51	56	57	58	66
577:	61	57	65	51	59	70	42	50
585:	55	48	40	61	56	55	48	56
593:	49	47	60	65	50	50	50	57
601:	57	51	60	67	57	47	77	60
609:	48	49	62	56	168	451	195	76
617:	60	60	48	57	57	59	61	48
625:	61	50	42	60	45	51	62	57
633:	59	53	50	66	59	49	51	51
641:	55	61	47	46	51	52	54	61
649:	60	58	45	48	44	46	53	70
657:	65	63	57	64	162	147	57	59
665:	41	63	42	58	51	56	50	49
673:	39	50	55	55	63	55	57	53
681:	42	48	63	52	43	52	49	51
689:	57	47	44	58	49	49	58	56
697:	45	45	44	54	49	58	54	58
705:	46	42	60	61	46	51	59	53
713:	48	58	45	58	60	57	47	57
721:	71	241	359	108	56	47	57	46
729:	49	49	44	51	55	58	61	53
737:	64	54	44	49	43	53	43	50
745:	50	51	65	56	47	58	56	54
753:	57	56	57	58	45	46	56	51
761:	44	54	49	54	71	57	51	62
769:	48	45	58	42	59	60	46	59
777:	47	98	104	70	55	50	47	54
785:	53	47	62	68	47	50	45	50
793:	56	55	53	56	66	55	62	37
801:	56	47	51	52	43	51	51	53
809:	45	53	56	72	63	55	50	51
817:	53	49	53	62	50	69	50	55
825:	64	52	51	49	69	57	70	63
833:	58	60	73	73	52	55	66	54
841:	54	47	40	68	71	41	53	48
849:	66	57	63	57	63	72	47	69
857:	49	62	57	76	65	57	58	53
865:	67	63	76	68	75	74	51	69
873:	81	62	68	72	59	56	61	65
881:	63	52	62	70	80	63	67	57
889:	84	67	72	73	58	63	49	66
897:	61	59	61	68	70	73	63	47
905:	68	63	58	56	65	74	67	51

913:	75	67	64	60	69	57	72	63
921:	71	61	87	59	66	80	63	62
929:	68	59	67	58	80	61	95	63
937:	76	76	60	63	87	76	80	63
945:	77	76	78	80	86	84	69	[illegible]
953:	74	73	68	93	74	58	92	64
961:	93	57	93	102	83	60	50	63
969:	64	62	61	59	51	65	53	58
977:	52	49	57	62	56	56	48	59
985:	54	57	73	41	40	41	60	56
993:	57	42	58	49	60	50	61	56
1001:	64	52	43	61	51	44	62	57
1009:	61	55	54	55	63	51	54	58
1017:	45	63	51	49	56	47	55	54
1025:	51	51	53	47	49	58	49	44
1033:	42	45	51	54	49	39	41	59
1041:	57	61	54	68	45	53	54	64
1049:	55	54	59	53	51	52	63	55
1057:	51	53	53	60	43	46	40	50
1065:	39	47	44	47	41	51	50	58
1073:	45	63	39	38	52	54	50	54
1081:	44	44	44	55	62	77	63	65
1089:	48	53	42	47	43	44	48	62
1097:	45	43	45	48	46	59	59	56
1105:	45	46	53	47	49	46	75	98
1113:	60	66	96	84	49	51	41	32
1121:	33	45	37	27	50	36	31	28
1129:	34	22	26	28	29	47	31	35
1137:	34	26	33	23	32	27	23	24
1145:	40	22	23	25	29	27	32	[illegible]
1153:	31	26	26	29	23	25	21	29
1161:	27	32	25	25	22	22	33	25
1169:	36	34	83	815	2154	1238	158	28
1177:	24	27	20	14	19	15	21	18
1185:	12	10	15	19	16	14	21	18
1193:	16	19	20	13	13	10	16	15
1201:	24	16	19	15	17	22	11	14
1209:	17	21	21	10	20	13	12	9
1217:	11	13	11	17	11	12	12	14
1225:	12	5	16	7	9	10	9	12
1233:	10	10	14	12	6	6	9	9
1241:	5	5	8	15	6	9	10	7
1249:	9	16	5	5	7	6	7	7
1257:	7	4	9	2	4	7	4	4
1265:	6	12	5	2	10	7	4	8
1273:	6	15	16	10	15	11	8	13
1281:	7	7	7	5	11	10	7	11
1289:	14	9	10	8	4	13	3	4
1297:	7	6	14	11	5	8	7	3
1305:	5	9	8	12	9	8	6	8
1313:	10	6	4	7	6	5	7	6
1321:	6	11	5	5	8	9	11	7
1329:	16	53	393	1564	1448	304	26	5
1337:	8	5	1	3	3	3	3	4
1345:	3	4	2	1	2	4	3	[illegible]
1353:	2	4	2	2	3	2	1	[illegible]
1361:	2	2	3	3	3	4	4	3
1369:	1	7	2	2	2	3	0	1
1377:	4	2	4	0	4	1	3	4
1385:	4	3	2	1	2	1	3	0

1393:	2	3	3	4	3	1	0	3
1401:	4	4	0	6	0	5	27	50
1409:	24	5	2	3	1	2	2	0
1417:	1	3	2	3	4	3	1	1
1425:	5	1	3	1	1	2	3	1
1433:	2	1	2	1	5	1	0	4
1441:	2	3	1	3	0	2	1	4
1449:	2	2	4	2	7	2	1	0
1457:	6	5	2	11	14	6	2	3
1465:	2	2	3	2	1	2	4	3
1473:	2	2	1	4	3	1	4	1
1481:	0	4	0	1	2	2	0	0
1489:	0	3	2	1	1	1	4	1
1497:	0	2	2	5	1	0	0	2
1505:	2	3	1	1	2	3	2	1
1513:	0	1	3	0	6	2	2	2
1521:	1	3	1	3	0	0	5	1
1529:	4	4	3	0	0	1	0	2
1537:	2	1	3	1	0	3	0	3
1545:	1	0	2	4	0	0	5	0
1553:	1	4	3	1	1	2	2	2
1561:	1	1	0	3	0	1	1	3
1569:	1	5	0	2	2	0	1	1
1577:	1	1	2	0	0	1	2	0
1585:	1	2	3	1	1	3	1	3
1593:	3	1	1	3	1	1	3	2
1601:	1	2	1	2	3	0	0	1
1609:	2	1	4	1	1	1	1	1
1617:	2	1	1	3	2	3	0	2
1625:	1	1	1	1	0	0	1	1
1633:	0	0	1	1	0	1	2	2
1641:	2	3	3	3	3	2	1	1
1649:	1	0	1	0	4	1	1	2
1657:	0	1	2	1	0	0	0	1
1665:	2	0	1	0	2	2	1	3
1673:	0	1	1	1	1	2	1	1
1681:	0	1	0	1	2	0	2	3
1689:	1	1	0	3	1	1	0	2
1697:	3	3	0	1	0	1	5	1
1705:	2	3	0	3	1	1	3	0
1713:	2	1	1	1	0	2	1	3
1721:	2	2	0	1	1	3	3	0
1729:	1	2	4	1	3	2	1	2
1737:	1	0	0	1	1	0	2	0
1745:	2	1	3	2	2	1	0	1
1753:	2	2	4	2	1	1	1	0
1761:	0	1	1	0	1	1	1	3
1769:	1	3	1	0	0	2	0	0
1777:	2	1	2	1	1	1	0	3
1785:	0	1	2	3	0	4	0	3
1793:	2	0	3	1	0	2	3	0
1801:	5	2	0	3	0	1	0	1
1809:	0	0	1	1	1	0	1	1
1817:	0	0	0	0	2	1	0	4
1825:	2	1	0	3	1	4	0	0
1833:	0	2	0	0	1	2	1	0
1841:	1	1	1	1	0	0	2	2
1849:	3	1	1	0	2	1	2	3
1857:	1	1	0	1	0	1	0	0
1865:	2	0	0	0	2	3	0	3

1873:	0	1	1	1	1	0	0	3
1881:	0	1	0	1	1	0	2	0
1889:	3	2	0	1	1	2	0	0
1897:	2	3	1	0	1	0	0	0
1905:	1	2	2	1	2	2	2	[illegible]
1913:	2	0	2	0	0	0	1	2
1921:	1	1	2	5	1	1	0	4
1929:	0	0	1	1	1	1	1	0
1937:	2	0	1	0	1	0	0	1
1945:	0	0	3	0	0	1	1	0
1953:	1	0	2	1	2	0	1	1
1961:	1	1	1	0	0	0	0	1
1969:	1	1	0	0	3	0	0	2
1977:	2	0	0	1	0	0	1	2
1985:	2	0	1	0	2	0	2	1
1993:	0	1	1	2	3	0	0	1
2001:	2	0	0	0	0	3	1	1
2009:	1	0	2	3	1	1	1	3
2017:	0	2	1	0	2	1	2	1
2025:	2	2	2	1	2	0	3	1
2033:	1	0	1	0	1	0	0	4
2041:	0	1	2	0	1	1	2	0
2049:	0	0	0	1	0	1	0	0
2057:	1	3	0	1	1	1	3	1
2065:	1	0	1	3	3	2	2	1
2073:	3	0	2	1	1	1	0	0
2081:	0	0	0	0	2	0	0	0
2089:	2	1	0	1	0	3	1	1
2097:	0	0	1	1	0	0	0	3
2105:	2	0	0	0	0	1	1	[illegible]
2113:	0	1	2	0	1	0	0	[illegible]
2121:	1	0	1	0	0	1	1	1
2129:	0	0	1	1	3	1	0	0
2137:	0	0	1	0	0	4	1	0
2145:	2	0	0	0	3	0	1	1
2153:	1	1	0	0	1	2	1	2
2161:	1	0	1	1	0	0	0	0
2169:	0	1	0	3	0	1	1	0
2177:	1	0	0	0	0	0	0	1
2185:	1	0	2	1	0	0	0	2
2193:	0	2	0	1	1	0	1	2
2201:	0	0	1	2	0	0	1	0
2209:	1	0	0	1	1	1	2	0
2217:	0	0	1	0	2	0	0	0
2225:	0	0	2	1	0	3	1	2
2233:	0	0	0	1	2	1	0	0
2241:	1	1	1	0	1	0	0	1
2249:	0	0	0	1	1	1	0	0
2257:	0	1	0	1	2	1	0	0
2265:	0	2	1	0	2	2	0	2
2273:	1	1	0	0	0	2	2	1
2281:	0	1	1	0	1	0	2	0
2289:	0	0	1	0	0	0	1	1
2297:	0	0	0	1	0	1	1	1
2305:	1	0	0	0	0	2	1	[illegible]
2313:	0	1	0	1	2	0	0	[illegible]
2321:	2	0	2	1	0	0	1	1
2329:	0	0	0	0	1	2	0	3
2337:	0	0	1	0	0	0	0	1
2345:	1	0	0	0	0	0	0	0

00666

2353:	0	1	0	0	2	1	0	0
2361:	0	0	1	0	1	0	0	0
2369:	0	0	0	0	0	2	1	1
2377:	0	0	0	0	1	0	0	0
2385:	1	0	1	0	0	1	0	0
2393:	0	0	0	2	0	0	0	0
2401:	1	1	0	0	0	0	2	1
2409:	1	1	0	0	2	2	0	0
2417:	0	0	0	0	1	0	0	3
2425:	0	1	0	1	0	1	0	0
2433:	1	1	0	0	0	0	1	1
2441:	0	0	1	0	0	0	0	1
2449:	0	1	0	0	1	0	0	1
2457:	1	0	0	0	1	0	0	0
2465:	0	0	0	0	0	0	0	1
2473:	0	0	0	0	1	0	0	0
2481:	0	0	1	0	0	0	0	1
2489:	0	0	0	0	0	0	1	1
2497:	0	0	0	0	0	0	0	2
2505:	13	3	2	2	1	0	0	1
2513:	0	0	1	1	0	1	1	0
2521:	0	0	0	0	0	0	0	0
2529:	0	0	2	0	0	0	0	0
2537:	0	0	0	1	0	0	0	0
2545:	0	0	0	2	0	0	0	0
2553:	0	0	1	0	0	1	0	0
2561:	1	1	0	0	0	0	1	1
2569:	0	0	0	0	0	0	0	0
2577:	0	0	0	0	0	0	0	0
2585:	0	0	0	0	1	0	0	1
2593:	0	0	0	0	0	1	1	0
2601:	0	0	1	0	0	0	1	0
2609:	0	0	0	0	0	1	0	0
2617:	0	0	0	1	0	1	0	0
2625:	0	0	1	0	0	0	0	0
2633:	1	0	1	0	1	0	0	0
2641:	0	0	1	0	1	0	0	0
2649:	1	0	0	0	0	0	0	0
2657:	0	0	0	0	0	0	0	0
2665:	0	0	0	0	0	1	1	1
2673:	0	0	0	0	0	0	0	0
2681:	0	0	0	1	0	1	0	0
2689:	0	0	0	0	0	0	1	1
2697:	0	0	0	0	0	0	0	0
2705:	0	0	0	0	0	0	0	0
2713:	0	0	0	1	0	0	0	0
2721:	0	0	0	0	0	0	0	1
2729:	1	0	0	0	1	0	0	0
2737:	1	1	0	0	0	0	0	0
2745:	1	0	0	0	0	0	0	0
2753:	0	0	0	0	0	0	0	0
2761:	0	1	1	0	0	0	0	0
2769:	1	2	0	0	0	0	0	0
2777:	0	0	0	0	1	0	0	0
2785:	0	0	0	0	0	0	1	1
2793:	0	0	0	1	0	0	1	0
2801:	1	0	0	0	0	0	0	0
2809:	1	1	1	0	0	0	0	1
2817:	0	0	0	0	0	0	0	1
2825:	0	0	0	0	0	0	1	0

2833:	0	1	0	0	0	0	0	0
2841:	0	0	1	0	1	1	0	0
2849:	0	0	1	0	0	0	0	0
2857:	0	0	0	0	0	0	0	0
2865:	0	0	0	1	0	2	1	0
2873:	2	0	0	1	0	0	0	0
2881:	0	0	0	0	0	0	0	0
2889:	0	0	0	0	0	0	0	0
2897:	0	1	0	0	0	0	0	0
2905:	0	0	0	0	1	0	0	0
2913:	0	0	0	0	1	0	0	0
2921:	0	1	0	0	0	0	0	0
2929:	0	0	0	0	0	0	0	0
2937:	0	0	0	0	0	0	1	0
2945:	0	0	0	0	0	0	1	0
2953:	0	1	0	0	0	0	0	0
2961:	0	0	0	0	0	0	0	1
2969:	0	0	0	0	0	0	0	0
2977:	0	0	0	0	0	0	1	0
2985:	0	0	0	0	0	0	0	1
2993:	0	0	0	0	0	0	0	0
3001:	0	0	0	0	0	0	0	0
3009:	0	1	0	0	1	0	1	0
3017:	0	0	0	0	0	0	0	0
3025:	0	0	0	0	0	0	0	0
3033:	0	0	0	0	0	0	0	0
3041:	1	0	0	1	0	0	0	0
3049:	0	1	0	0	0	0	0	1
3057:	0	0	0	0	0	1	0	0
3065:	0	0	0	0	1	0	0	1
3073:	0	0	0	0	0	0	0	0
3081:	0	0	0	0	0	0	0	0
3089:	0	1	0	0	0	0	0	0
3097:	0	1	0	1	0	0	0	0
3105:	0	0	0	0	0	0	1	0
3113:	0	0	0	0	0	0	0	0
3121:	1	0	0	0	0	0	0	0
3129:	0	0	0	0	0	0	0	0
3137:	0	0	1	0	0	1	0	1
3145:	0	0	1	1	0	0	0	0
3153:	0	0	1	0	0	1	0	0
3161:	1	0	0	0	0	1	1	1
3169:	0	0	0	0	0	0	0	0
3177:	0	0	0	0	0	0	0	0
3185:	0	0	0	0	0	0	0	0
3193:	0	0	0	0	0	0	0	0
3201:	0	0	0	0	0	0	0	0
3209:	0	0	0	0	0	0	0	0
3217:	1	0	0	0	0	0	0	0
3225:	0	0	0	0	0	1	0	1
3233:	0	0	0	0	0	1	0	0
3241:	0	0	0	0	0	0	0	0
3249:	0	0	0	0	0	0	0	0
3257:	1	1	1	0	0	0	0	0
3265:	0	0	0	1	0	0	0	0
3273:	0	0	0	0	0	0	1	0
3281:	0	1	0	0	0	0	0	0
3289:	0	0	0	0	0	0	0	0
3297:	0	0	0	0	1	0	0	0
3305:	0	0	0	0	0	0	0	0

3313:	0	0	0	0	0	0	1	0
3321:	0	0	0	0	1	0	0	0
3329:	0	0	0	0	0	0	1	1
3337:	0	0	0	0	0	0	0	0
3345:	0	0	0	0	0	0	0	0
3353:	1	0	0	0	0	0	0	1
3361:	0	0	0	0	0	0	0	0
3369:	0	0	0	0	0	0	0	0
3377:	0	0	0	0	1	0	0	0
3385:	0	0	0	0	0	0	0	0
3393:	0	0	0	0	1	0	0	0
3401:	0	0	0	0	1	1	0	0
3409:	0	0	0	0	0	0	1	0
3417:	0	0	0	1	0	1	0	0
3425:	0	0	1	0	0	0	0	0
3433:	0	0	0	0	0	0	0	0
3441:	1	0	0	1	0	0	0	0
3449:	1	0	0	0	0	0	0	0
3457:	1	0	0	0	0	0	0	0
3465:	0	0	0	0	0	0	0	0
3473:	0	0	0	0	1	0	0	0
3481:	0	0	0	0	0	0	0	0
3489:	0	0	1	0	0	0	0	1
3497:	0	0	0	0	0	0	0	0
3505:	0	0	0	0	0	0	0	0
3513:	0	0	0	0	0	0	1	0
3521:	0	0	0	0	0	0	0	0
3529:	0	0	0	0	0	0	0	0
3537:	0	0	0	0	0	0	0	1
3545:	0	0	1	0	0	0	0	0
3553:	0	0	0	0	0	0	1	0
3561:	0	0	0	0	0	0	0	0
3569:	0	0	0	0	0	1	0	0
3577:	1	0	1	1	0	0	0	0
3585:	0	0	0	2	0	0	0	0
3593:	0	1	0	0	0	0	0	0
3601:	0	0	0	0	0	0	0	1
3609:	0	0	0	0	0	0	0	0
3617:	0	0	0	0	0	0	0	1
3625:	0	1	0	0	0	0	0	1
3633:	0	0	0	1	0	1	0	0
3641:	0	0	0	0	0	1	0	0
3649:	0	3	0	0	0	0	0	0
3657:	0	0	0	0	0	0	0	0
3665:	0	0	0	0	0	0	0	0
3673:	0	0	0	1	0	0	1	1
3681:	1	0	1	0	0	0	0	0
3689:	0	1	0	0	0	0	0	0
3697:	0	0	0	0	1	1	0	0
3705:	0	0	0	0	0	1	0	0
3713:	0	1	0	0	0	0	0	0
3721:	0	0	0	0	0	0	0	0
3729:	0	0	0	0	0	0	0	1
3737:	0	0	0	0	0	0	0	0
3745:	0	0	0	0	0	0	0	0
3753:	0	0	0	0	0	0	0	1
3761:	0	1	0	0	0	0	0	0
3769:	0	0	0	0	0	1	0	0
3777:	0	0	0	0	0	0	0	0
3785:	0	0	0	0	0	0	0	0

3793:	0	0	0	0	0	1	0	0
3801:	0	0	1	0	0	0	0	2
3809:	0	0	0	1	0	0	0	0
3817:	0	0	0	0	1	0	0	0
3825:	1	0	0	0	0	1	0	1
3833:	0	0	0	1	1	1	0	0
3841:	0	0	0	0	0	0	0	0
3849:	0	0	0	0	0	0	0	1
3857:	0	0	0	0	0	0	0	0
3865:	0	0	0	0	0	0	1	0
3873:	0	0	0	0	0	0	0	0
3881:	0	0	0	0	0	1	0	0
3889:	0	0	0	0	0	0	0	0
3897:	1	0	1	0	1	0	0	0
3905:	0	1	0	0	0	0	0	0
3913:	0	0	0	0	0	0	0	0
3921:	0	0	0	0	0	0	0	0
3929:	1	0	0	1	0	0	0	0
3937:	0	0	0	0	0	0	1	0
3945:	0	0	0	0	0	0	1	0
3953:	0	1	0	1	0	0	0	0
3961:	0	0	0	0	0	0	0	0
3969:	0	0	1	0	0	0	0	0
3977:	0	1	0	0	0	2	0	0
3985:	0	0	0	0	0	0	0	0
3993:	0	0	0	0	0	0	0	0
4001:	0	1	0	0	0	0	1	0
4009:	0	0	0	0	0	0	0	1
4017:	0	0	0	0	0	0	0	0
4025:	0	1	0	0	0	0	0	0
4033:	0	0	0	0	0	0	0	0
4041:	0	0	1	0	0	1	0	0
4049:	0	0	0	0	0	0	0	0
4057:	0	0	0	0	1	0	0	1
4065:	1	0	0	0	0	0	0	0
4073:	1	0	0	0	1	0	0	0
4081:	0	1	0	0	0	0	0	0
4089:	0	0	0	0	0	0	0	0

SECTION XXIV

ANALYTICAL DATA (GAMMA LEPS)

000671

Work Order	02-11141
Analysis Code	GLEPS
Run	1
Date Received	11/26/2002
Lab Deadline	12/5/2002
Client	Duratek
Project	106760.003
Report Level	4
Activity Units	pCi
Aliquot Units	g
Matrix	OS
Method	LANL ER-130 Modified
Instrument Type	Gamma Spectroscopy
Radiometric Tracer	
Radiometric Sol#	
Tracer Act (dpm/g)	
Carrier	
Carrier Conc (mg/ml)	

Internal Fraction	Sample Desc	Client ID	Login CPM	Sample Date	Sample Aliquot
01	LCS	LCS		11/26/02 00:00	1.0000E+00
02	MBL	BLANK		11/26/02 00:00	1.0000E+00
03	DUP	VA-02-0176	89	11/25/02 12:00	2.8419E+01
04	DO	VA-02-0176	89	11/25/02 12:00	2.8419E+01

* SAF1 is [illegible] for Gross Alpha and all other radionuclides. SAF2 is used for Gross Beta only. ** [illegible]l mass exceeded the calibration curve range. Results should be qualified as appropri[illegible]

Internal Fraction	Sample Desc	Tracer Aliquot (g)	Tracer Total ACT (dpm)	Radiometric Tracer (pCi)	Radiometric % Rec	Grav Carrier Added (ml)	Grav Filter Tare (g)	Grav Filter Final (g)	Grav Filter Net (g)	Grav % Rec	Mean % Rec	SAF 1*	SAF 2*
01	LCS												
02	MBL												
03	DUP												
04	DO												

00673

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

Internal Fraction	Sample Desc	Rough Prep Date	Rough Prep By	Prep Date	Prep By	Sep t0 Date/Time	Sep t0 By	Sep t1 Date/Time	Sep t1 By
01	LCS								
02	MBL								
03	DUP								
04	DO								

* SAF1 is [illegible] for Gross Alpha and all other radionuclides. SAF2 is used for Gross Beta only. ** [illegible]al mass exceeded the calibration curve range. Results should be qualified as appropri[illegible]

Eberline Services
Oak Ridge Laboratory

Preliminary Data Report - Analytical Calculations

Work Order: 02-11141-GLEPS-1

Printed: 12/3/2002 [illegible]5 PM

Lab Fraction	Nuclide	Sample Desc	Client Identification	Activity Units	Results	Error Estimate	MDA	LSC Known	LCS %R	LCS Flag	RPD Flag	Sample Date	Sample Aliquot	Counting Date/Time
01	AM-241	LCS	LCS	pCi/g	3.86E+03	4.21E+02	5.37E+00	3.91E+03	98.82	OK		11/26/02 00:00	1.00E+00	11/27/02 10:40
01	CO-57	LCS	LCS	pCi/g	1.39E+03	1.29E+02	4.07E+00	1.33E+03	104.50	OK		11/26/02 00:00	1.00E+00	11/27/02 10:40
02	CO-57	MBL	BLANK	pCi/g	4.16E-02	7.11E-02	1.38E-01					11/26/02 00:00	1.00E+00	11/26/02 19:42
02	FE-55	MBL	BLANK	pCi/g	-3.66E+01	1.21E+03	2.07E+02					11/26/02 00:00	1.00E+00	11/26/02 19:42
02	I-129	MBL	BLANK	pCi/g	1.59E-01	2.86E-01	4.04E-01					11/26/02 00:00	1.00E+00	11/26/02 19:42
03	CO-57	DUP	VA-02-0176	pCi/g	1.23E+00	2.21E-01	1.10E-01				OK	11/25/02 12:00	2.84E+01	11/26/02 17:09
03	FE-55	DUP	VA-02-0176	pCi/g	4.81E+00	1.76E+02	1.36E+02					11/25/02 12:00	2.84E+01	11/26/02 17:09
03	I-129	DUP	VA-02-0176	pCi/g	1.35E-01	2.43E-01	2.55E-01				INV	11/25/02 12:00	2.84E+01	11/26/02 17:09
04	CO-57	DO	VA-02-0176	pCi/g	1.02E+00	1.81E-01	1.10E-01					11/25/02 12:00	2.84E+01	11/26/02 18:10
04	FE-55	DO	VA-02-0176	pCi/g	2.95E+01	9.73E+02	1.36E+02					11/25/02 12:00	2.84E+01	11/26/02 18:10
04	I-129	DO	VA-02-0176	pCi/g	-5.72E-02	1.97E-01	3.26E-01					11/25/02 12:00	2.84E+01	11/26/02 18:10

12-3-02

Post-it® Fax Note 7671	Date 12-3-02 # of pages ▶ 1
To Paul Jones	From Judy Pachulka
Co./Dept.	Co.
Phone #	Phone #
Fax # (865) 376-6247	Fax #

00675

Internal Fraction	Sample Desc	Client ID	Sample Date	Sample Aliquot	Tracer Aliquot (g)	Tracer ACT (dpm)	Radiometric Tracer (pCi)	Radiometric % Rec	SAF 1*	SAF 2*
01	LCS	LCS	11/26/02 00:00	1.0000						
02	MBL	BLANK	11/26/02 00:00	1.0000						
03	DUP	VA-02-0176	11/25/02 12:00	28.4190						
04	DO	VA-02-0176	11/25/02 12:00	28.4190						

Aliquot Worksheet

Work Order	Run	Analysis Code	Aliquot Units	Lab Deadline	Technician
02-11141	1	GLEPS	grams	12/5/2002	KSALLINGS

Lab Fraction	Duratek	Sample	Muffle Data	Dilution Data			Aliquot Data		MS Aliquot Data		H-3 Solids Only	
	Client ID	Type	Ratio Post/Pre	Aliquot	Final (ml)	Ratio	Aliquot	Net Equiv	Aliquot	Net Equiv	Water Added (ml)	H3 Dist Aliq
01	LCS	LCS					1.0000E+00	1.0000E+00				
02	BLANK	MBL					1.0000E+00	1.0000E+00				
03	VA-02-0176	DUP					2.8419E+01	2.8419E+01				
04	VA-02-0176	DO					2.8419E+01	2.8419E+01				

Comments	

00677

Technician: Kenny Sallings Date: 11/26/02

Sample ID : 0211141-01 Acquisition date : 27-NOV-2002 10:40:10

/VMS Peak Search Report Generated 27-NOV-2002 11:14:44.60

Configuration : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_021114101_GE5_LPGAS5_48030.CN
Analyses by : PEAK V16.9 ENBACK V1.6 PEAKEFF V2.2
Client ID : SPIKE
Deposition Date :
Sample Date : 1-OCT-2001 00:00:00. Acquisition date : 27-NOV-2002 10:40:10
Sample ID : 0211141-01 Sample Quantity : 3.88000E+01 GRAM
Sample type : SOIL Sample Geometry : 0
Detector name : GE5 Detector Geometry: LPGAS-5
Elapsed live time: 0 00:30:00.00 Elapsed real time: 0 00:34:18.90 13%
Start channel : 1 End channel : 4096
Sensitivity : 3.00000 Gaussian : 15.00000
Critical level : No

Post-NID Peak Search Report

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
1	4.07	1690	8918	0.60	37.43	31	14	24.2	9.36E-01	
1	7.89	3113	13694	0.62	74.16	66	16	17.2	1.92E+00	NI-59
										PA-231
1	11.04*	44883	18517	0.63	104.52	88	67	1.8	1.90E+02	PA-234
										PA-231
1	12.18	179429	20848	0.64	115.52	88	67	0.6		
1	13.96	20159	24652	0.65	132.62	88	67	3.6		
[illegible]	14.97	34983	25448	0.65	142.37	88	67	2.2		
[illegible]	16.93	5623	18452	0.66	161.30	155	23	9.6	3.00E+00	
6	17.71	21939	28059	0.66	168.74	155	23	3.4		
1	22.03	2488308	177069	0.67	210.34	194	29	0.2	3.79E+03	PA-234
1	24.93	714924	108329	0.68	238.29	223	30	0.3	1.82E+03	
1	27.39	2461	10949	0.69	262.05	257	12	15.6	5.72E+00	
1	32.02	18817	11239	0.70	306.60	289	49	2.9	4.78E+01	
1	33.29*	27380	10221	0.70	318.83	289	49	2.1		
1	36.34	4672	9410	0.71	348.24	337	42	9.3	4.36E+00	I-125
1	37.70	6657	8926	0.71	361.31	337	42	6.7		PA-234
1	38.71*	1865	6127	0.72	371.07	337	42	17.2		
4	43.24	1068	7781	0.73	414.72	407	27	32.3	1.73E+00	
4	44.08	1439	11570	0.73	422.80	407	27	32.3		
3	48.48	3966	21113	0.74	465.19	455	51	17.5	2.71E+01	
3	49.62	9360	23893	0.74	476.13	455	51	7.6		
1	59.48	519823	37562	0.76	571.18	554	35	0.3	1.16E+02	AM-241
1	78.33	624	11024	0.79	752.79	745	14	62.0	8.49E-01	
1	87.97	395632	23024	0.80	845.59	827	33	0.4	9.02E+01	CD-109
1	98.99	167	4788	0.82	951.81	945	14	152.4	1.28E+00	
1	109.58	609	3400	0.83	1053.80	1049	19	29.5	3.37E+00	
1	110.22	463	5538	0.84	1060.00	1049	19	56.6		
1	121.99	133821	10592	0.85	1173.35	1154	35	0.7	2.65E+01	CO-57
1	136.39	15851	7083	0.87	1312.11	1297	30	2.8	2.85E+00	CO-57
1	165.77	44249	6961	0.90	1595.20	1578	33	1.3	8.04E+00	
1	199.02	3029	5456	0.94	1915.57	1902	25	10.6	1.58E+00	
[illegible]	203.50	448	4508	0.94	1958.73	1948	20	56.8	9.70E-01	
[illegible]	254.93	747	4360	0.99	2454.35	2444	23	35.5	1.18E+00	
1	279.02	1080	4322	1.01	2686.55	2673	26	25.8	1.94E+00	
1	310.35	554	3458	1.04	2988.42	2977	24	43.2	8.20E-01	

AG 12/12/02

00678

Sample ID : 0211141-01 Acquisition date : 27-NOV-2002 10:40:10

	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
1	391.51	15238	5265	1.10	3770.79	3751	39	2.7	1.16E+00	

Sample ID : 0211141-01 Acquisition date : 27-NOV-2002 10:40:10

Total number of lines in spectrum	35	
Number of unidentified lines	22	
Number of lines tentatively identified by NID	13	37.14%

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CO-57	270.90D	2.95	4.720E+02	1.391E+03	0.129E+03	9.30	
NI-59	7.50E+04Y	1.00	2.873E+05	2.873E+05	3002.E+05	104491.46	
CD-109	464.00D	1.88	2.674E+04	5.027E+04	0.591E+04	11.76	
I-125	60.14D	130.	3.653E+02	4.755E+04	1.036E+04	21.79	
			---	---			
	Total Activity :		3.149E+05	3.865E+05			

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
PA-231	3.28E+04Y	1.00	1.736E+04	1.736E+04	154.4E+04	8896.85	
PA-234	4.47E+09Y	1.00	1.255E+02	1.255E+02	0.235E+02	18.72	
AM-241	432.20Y	1.00	3.856E+03	3.863E+03	0.421E+03	10.89	
			---	---			
	Total Activity :		2.134E+04	2.135E+04			

Grand Total Activity : 3.362E+05 4.079E+05

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

Nuclide Type: FISSION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
CO-57	122.06	85.51*	1.310E+01	4.623E+02	1.363E+03	13.17	OK
	136.48	10.60	1.199E+01	4.825E+02	1.422E+03	13.13	OK
Final Mean for 2 Valid Peaks = 1.391E+03+/- 1.294E+02 (9.30%)							
NI-59	6.92	29.80*	1.407E-03	2.873E+05	2.873E+05*******		OK
Final Mean for 1 Valid Peaks = 2.873E+05+/- 3.002E+08 (******%)							
CD-109	88.03	3.72*	1.539E+01	2.674E+04	5.027E+04	11.76	OK
Final Mean for 1 Valid Peaks = 5.027E+04+/- 5.910E+03 (11.76%)							
I-125	35.49	6.49*	7.628E+00	3.653E+02	4.755E+04	21.79	OK
Final Mean for 1 Valid Peaks = 4.755E+04+/- 1.036E+04 (21.79%)							

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
[illegible]231	9.28	42.00*	1.653E-02	1.736E+04	1.736E+04	8896.85	OK
	10.11	20.20	3.114E-02	2.761E+05	2.761E+05	4721.68	<<WM Interf
	283.67	1.60	5.338E+00	----- Line Not Found		-----	Absent
	302.67	2.30	4.933E+00	----- Line Not Found		-----	Absent
Final Mean for 1 Valid Peaks = 1.736E+04+/- 1.544E+06 (******%)							
PA-234	9.89	89.00	2.656E-02	7.348E+04	7.348E+04	5535.96	<<WM Interf
	21.72	64.90*	1.902E+00	7.802E+04	7.802E+04	77.42	OK
	37.93	23.75	8.649E+00	1.255E+02	1.255E+02	18.72	OK
	131.42	20.40	1.238E+01	----- Line Not Found		-----	Absent
Final Mean for 2 Valid Peaks = 1.255E+02+/- 2.348E+01 (18.72%)							
AM-241	59.54	35.90*	1.453E+01	3.856E+03	3.863E+03	10.89	OK
Final Mean for 1 Valid Peaks = 3.863E+03+/- 4.206E+02 (10.89%)							

Flag: "*" = Keyline

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
CO-57	1.391E+03	1.294E+02	4.069E+00	5.101E-01	341.928
NI-59	2.873E+05	3.002E+08	4.739E+04	4.952E+07	6.062
CD-109	5.027E+04	5.910E+03	7.350E+01	8.122E+00	683.919
I-125	4.755E+04	1.036E+04	4.675E+03	9.011E+02	10.172
PA-231	1.736E+04	1.544E+06	3.366E+03	2.994E+05	5.157
PA-234	1.255E+02	2.348E+01	4.081E+01	3.155E+01	3.074
AM-241	3.863E+03	4.206E+02	5.367E+00	5.431E-01	719.821

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

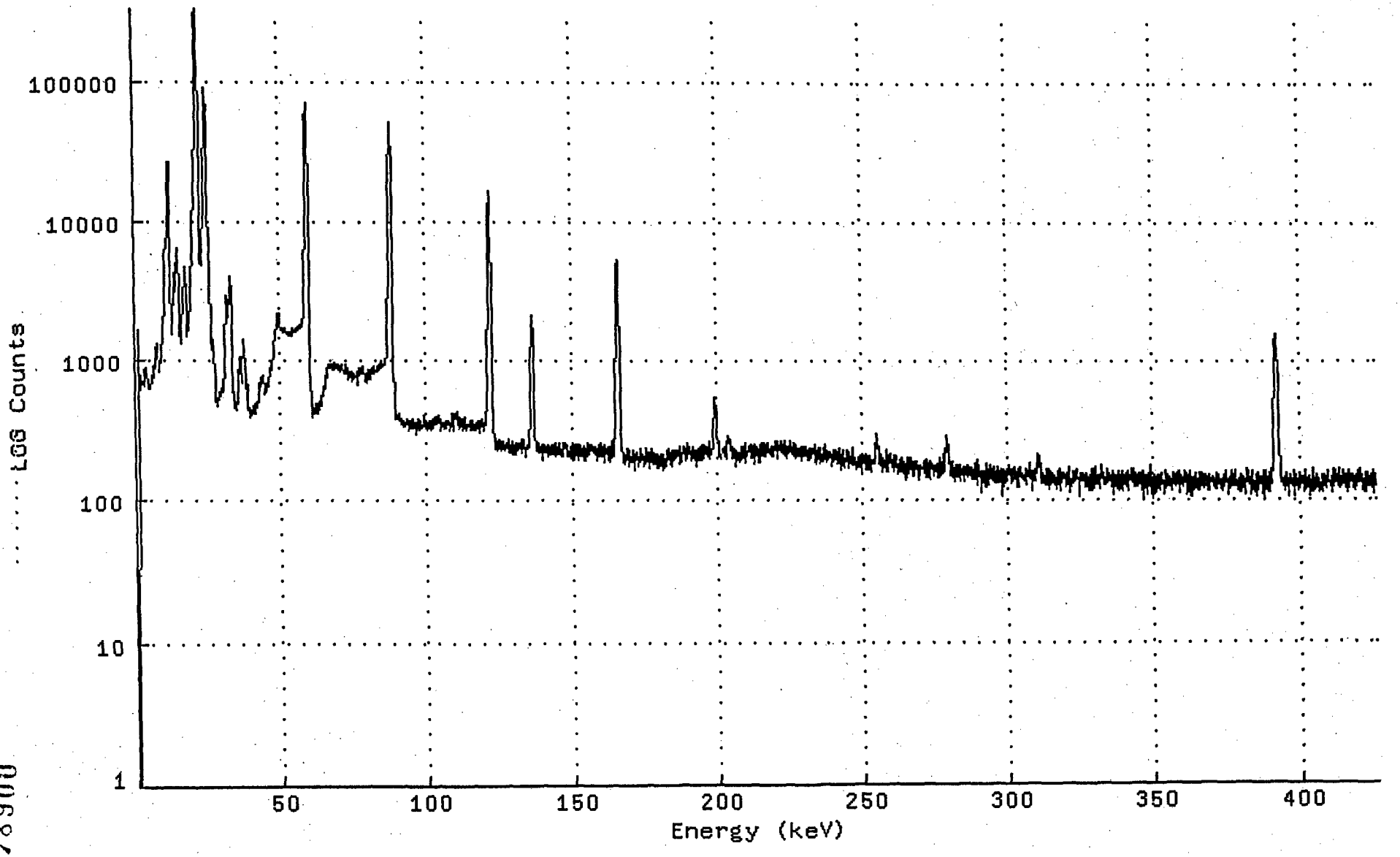
Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
FE-55	-4.416E+05		2.205E+09	3.765E+05	1.880E+09	-1.173
I-129	7.785E+00		5.933E+00	6.651E+00	1.912E+00	1.170
BA-133	2.902E+00		3.313E+00	5.173E+00	8.792E-01	0.561
CE-144	5.994E+00		2.123E+01	2.989E+01	3.667E+00	0.201
PB-210	1.186E+02		6.095E+01	5.041E+01	6.331E+00	2.353
TH-231	5.622E+04	+	2.480E+04	2.920E+02	1.282E+02	192.564
TH-234	-1.253E+02		2.529E+01	3.247E+01	3.253E+00	-3.860
[illegible]237	7.866E+03	+	9.158E+02	3.044E+01	3.326E+00	258.[illegible]
AM-243	-3.290E+00		1.506E+00	2.316E+00	3.166E-01	-1.420

Sample ID : 0211141-01 Acquisition date : 27-NOV-2002 10:40:10

Nuclide	Half-life	Half-Life Ratio	Energy	%Abund	Activity (pCi/GRAM)	2-Sigma %Error	Rejected by
I-129	1.57E+07Y	0.00	29.78*	57.00	--- Not Found ---		Abun.
			33.60	13.20	1.179E+03	22.07	
			39.58	7.52	1.031E+02	23.72	
		% Abundances Found =		26.66			
BA-133	10.50Y	0.11	30.80	97.60	1.447E+02	27.57	Abun.
			81.00*	33.00	--- Not Found ---		
			302.84	17.80	--- Not Found ---		
			356.01	60.00	--- Not Found ---		
			383.85	8.70	--- Not Found ---		
		% Abundances Found =		44.96			
PB-210	22.26Y	0.05	10.80	24.30	1.498E+05	2972.74	Wtd. Mean
			46.50*	4.05	--- Not Found ---		
		% Abundances Found =		85.71			
TH-231	7.04E+08Y	0.00	25.64*	14.70	5.622E+04	44.10	Abun.
			84.21	6.40	--- Not Found ---		
		% Abundances Found =		69.67			
NP-237	2.14E+06Y	0.00	29.37	14.00	--- Not Found ---		Abun.
			86.50*	12.60	7.866E+03	11.64	
		% Abundances Found =		47.37			

Key: "*" = Keyline

Spectrum : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_1114101_GE5_LPGAS5_48030.CNF;1
Title :
Sample Title: SPIKE
Start Time: 27-NOV-2002 10:40 Sample Time: 1-OCT-2001 00:00: Energy Offset: 1.88831E-01
Real Time : 0 00:34:18.90 Sample ID : 0211141-01 Energy Slope : 1.03817E-01
Live Time : 0 00:30:00.00 Sample Type: SOIL Energy Quad : -1.02782E-08



00684

Channel Contents for [GAMMA.$CUSR.ARCHIVE]SMP_021114101_GE5_LPGAS5_48030.CNF

Channel

1:	0	0	0	0	0	0	0	0
9:	0	9	125	998	1631	1314	1001	825
17:	744	691	751	693	630	604	698	655
25:	689	659	673	702	657	639	662	682
33:	691	760	856	827	879	882	865	777
41:	763	699	636	636	615	628	656	627
49:	635	641	660	663	636	710	692	675
57:	729	755	743	781	755	798	841	888
65:	867	870	956	903	871	1008	1043	1184
73:	1279	1272	1311	1249	1146	1040	922	940
81:	828	861	920	923	966	959	983	998
89:	1034	1070	1180	1344	1414	1480	1650	1774
97:	1879	2147	2586	3154	3904	4934	5834	6789
105:	7332	7237	6905	6621	6946	7988	10853	14676
113:	19228	23608	26502	26466	23303	18484	13131	8479
121:	5099	3160	2045	1596	1519	1618	1874	2236
129:	2743	3311	3806	4133	4200	4010	3562	3362
137:	3112	3282	3874	4562	5526	6276	6398	6099
145:	5296	4501	3764	2998	2510	2031	1831	1632
153:	1521	1333	1294	1514	1634	1850	1998	2184
161:	2221	2410	2419	2680	3090	3575	4210	4684
169:	4715	4358	3808	3190	2525	1929	1729	1520
177:	1471	1533	1628	1677	1780	1866	1994	2178
185:	2367	2653	2912	3288	3786	4311	4927	5895
193:	6961	8236	9531	11018	12611	14742	16538	19263
201:	22782	28068	36863	51235	74569	110333	161625	222792
209:	282759	322684	332352	303317	245170	176440	112343	63243
217:	33014	16348	8640	5731	4932	4741	4903	5300
225:	5963	6918	8010	9519	11216	13110	15845	20564
233:	27642	38544	54031	69806	83306	89090	86296	75059
241:	60237	45655	33948	23910	16825	11307	7167	4886
249:	3488	2998	2920	2780	2385	2055	1635	1334
257:	1237	1207	1381	1374	1347	1293	1187	1026
265:	885	766	671	639	574	558	508	525
273:	527	489	468	526	502	511	555	529
281:	584	545	531	555	592	550	577	617
289:	592	585	598	609	665	667	637	713
297:	740	857	969	1061	1244	1613	1953	2241
305:	2671	2876	2951	2950	2582	2375	2073	2005
313:	2080	2295	2656	3144	3508	3721	3973	3729
321:	3224	2722	2045	1448	994	757	584	578
329:	529	516	477	486	451	462	444	477
337:	471	454	498	485	498	540	606	701
345:	827	891	1035	1063	1032	965	854	730
353:	693	714	707	753	838	980	1109	1201
361:	1383	1307	1250	1099	951	735	636	620
369:	622	689	648	590	610	600	533	449
377:	440	389	412	402	406	396	461	443
385:	400	415	420	412	416	419	449	463
393:	438	422	464	486	417	443	447	471
401:	476	462	479	504	476	509	487	532
409:	509	534	579	585	673	655	665	659
417:	720	651	746	700	732	707	763	688
425:	689	721	668	668	565	637	602	579

433:	580	610	592	612	688	674	673	646
441:	723	654	740	701	732	765	764	787
449:	786	819	888	840	902	904	893	890
457:	968	1012	1058	1057	1174	1238	1287	1463
465:	1456	1594	1498	1584	1563	1696	1808	189[illegible]
473:	2055	2067	2179	2160	2162	2050	2036	189[illegible]
481:	1807	1743	1689	1658	1663	1618	1642	1629
489:	1656	1641	1643	1638	1642	1580	1664	1557
497:	1570	1643	1614	1564	1581	1549	1541	1568
505:	1516	1565	1515	1555	1562	1564	1504	1542
513:	1554	1539	1517	1520	1560	1543	1491	1559
521:	1478	1507	1549	1484	1672	1552	1552	1587
529:	1649	1647	1585	1643	1669	1623	1653	1594
537:	1697	1676	1749	1676	1602	1691	1732	1687
545:	1777	1678	1786	1771	1691	1801	1786	1748
553:	1778	1832	1868	1899	2011	2109	2475	2737
561:	3253	3942	5134	7385	10811	17068	25849	38452
569:	51661	63477	69413	68521	60130	46525	32222	19692
577:	10836	5412	2554	1237	676	524	420	423
585:	393	451	394	389	451	426	417	425
593:	448	452	424	443	418	430	479	419
601:	458	459	489	414	462	467	497	460
609:	470	474	447	469	468	487	502	530
617:	506	534	541	582	545	584	592	630
625:	638	626	662	720	727	760	785	755
633:	774	800	820	869	849	871	871	864
641:	936	941	887	894	883	895	923	878
649:	920	919	945	901	848	938	914	903
657:	842	918	873	935	948	940	886	873
665:	882	918	865	879	891	870	843	837
673:	920	849	826	856	892	828	865	84[illegible]
681:	853	938	865	846	882	849	879	848
689:	840	799	852	787	804	919	873	834
697:	838	807	887	863	849	820	848	736
705:	837	791	794	763	826	758	815	739
713:	785	766	780	709	820	767	786	768
721:	729	769	735	785	760	761	762	739
729:	740	760	754	828	825	661	775	804
737:	766	788	840	772	847	827	878	840
745:	838	859	806	827	848	895	900	858
753:	851	821	801	790	805	726	763	711
761:	756	723	771	692	765	760	775	810
769:	748	846	750	770	731	779	767	778
777:	740	734	852	839	886	834	885	854
785:	878	809	895	884	805	843	831	819
793:	821	825	822	854	816	853	844	873
801:	835	866	898	882	880	856	923	862
809:	908	910	894	885	986	926	956	927
817:	902	911	943	920	898	899	909	927
825:	931	948	967	961	995	1023	1043	1199
833:	1318	1451	1841	2451	3177	4629	7249	11229
841:	17312	25374	34620	43207	49211	50801	47175	38975
849:	28832	19587	11777	6664	3326	1599	906	540
857:	430	381	374	379	415	395	403	391
865:	404	382	375	404	412	391	404	370
873:	363	344	375	371	346	362	364	36[illegible]
881:	344	345	355	362	340	357	353	352
889:	358	357	359	333	363	385	356	377
897:	347	367	359	352	311	364	373	342
905:	373	352	329	365	331	337	341	328

913:	325	384	342	343	336	321	340	341
921:	347	356	345	335	353	295	362	338
929:	361	362	353	349	378	363	316	321
937:	356	332	336	319	349	364	337	349
945:	341	350	330	327	380	381	357	386
953:	398	332	367	338	341	348	342	335
961:	335	347	323	351	359	320	353	370
969:	321	333	328	337	357	348	314	357
977:	338	365	338	366	350	326	360	378
985:	352	341	377	392	378	391	382	354
993:	384	359	394	350	352	376	369	356
1001:	361	400	355	356	348	383	381	314
1009:	347	380	346	331	357	342	349	362
1017:	351	340	340	361	323	347	328	335
1025:	351	360	332	369	323	368	357	348
1033:	361	342	371	342	338	353	320	350
1041:	351	363	372	412	349	348	343	313
1049:	335	322	342	377	411	405	381	412
1057:	384	404	423	409	425	383	353	346
1065:	353	345	342	358	386	328	364	368
1073:	332	351	373	372	347	375	363	365
1081:	350	359	318	376	358	372	353	322
1089:	391	323	355	322	351	317	325	320
1097:	351	348	340	334	335	345	346	341
1105:	362	342	327	319	371	357	341	365
1113:	357	338	320	348	332	314	327	320
1121:	346	347	349	345	358	347	332	315
1129:	345	347	324	363	337	336	304	344
1137:	367	337	357	349	352	362	346	367
1145:	376	337	333	357	317	333	362	360
1153:	337	347	358	362	352	376	418	459
1161:	520	608	751	968	1317	2017	2957	4494
1169:	6822	9500	12511	14787	16174	16362	14601	12015
1177:	9245	6360	3988	2304	1283	755	444	312
1185:	276	256	243	233	246	258	242	227
1193:	246	238	240	260	228	230	245	259
1201:	239	268	258	234	264	230	243	254
1209:	227	230	262	246	228	240	249	239
1217:	238	244	233	237	222	229	242	251
1225:	238	234	245	237	267	230	222	236
1233:	231	217	229	215	236	244	234	229
1241:	225	212	237	238	247	262	237	214
1249:	236	250	240	246	253	214	252	241
1257:	220	246	231	253	243	227	235	239
1265:	249	229	236	234	228	233	255	219
1273:	250	241	269	254	251	243	236	266
1281:	267	234	249	220	228	239	232	207
1289:	229	237	250	248	233	234	235	242
1297:	240	245	240	252	265	285	351	389
1305:	410	642	895	1093	1412	1703	1936	2024
1313:	2054	1860	1552	1175	926	643	435	316
1321:	279	243	235	223	246	239	221	256
1329:	222	229	222	220	238	221	225	224
1337:	215	228	236	216	208	244	213	194
1345:	208	249	237	228	238	222	225	220
1353:	242	218	231	227	222	236	206	229
1361:	234	219	218	243	240	226	213	217
1369:	223	222	221	250	228	214	224	233
1377:	232	243	246	243	210	224	247	203
1385:	232	255	242	252	214	222	242	209

1393:	216	231	218	226	233	210	209	240
1401:	253	204	233	212	228	229	229	206
1409:	246	209	251	203	247	229	233	230
1417:	236	243	252	245	215	248	228	207
1425:	237	221	221	212	209	214	207	22[illegible]
1433:	224	211	204	219	201	237	242	193
1441:	244	226	232	223	225	194	211	244
1449:	217	215	195	237	227	244	240	206
1457:	236	240	222	228	194	195	207	243
1465:	243	219	202	206	224	241	224	204
1473:	216	227	207	225	204	234	194	236
1481:	220	208	206	195	204	235	217	204
1489:	202	218	224	216	252	223	225	226
1497:	250	223	226	237	213	240	246	221
1505:	239	221	228	228	231	237	232	220
1513:	236	211	242	224	224	213	212	222
1521:	199	193	204	235	235	212	232	244
1529:	220	206	213	206	228	205	230	215
1537:	223	255	222	242	207	227	209	240
1545:	188	248	229	226	216	247	211	215
1553:	217	219	228	228	234	205	213	241
1561:	217	230	191	223	233	202	237	221
1569:	184	206	260	200	202	234	233	207
1577:	237	221	239	208	246	239	305	342
1585:	415	474	680	854	1270	1828	2574	3353
1593:	4229	4895	5082	5281	4581	3933	3052	2107
1601:	1449	979	608	374	309	242	201	204
1609:	206	191	198	184	214	197	213	198
1617:	182	192	213	197	208	202	193	200
1625:	234	175	212	206	195	225	201	205
1633:	203	206	188	206	202	189	197	224
1641:	197	208	194	195	212	177	167	190
1649:	203	179	192	195	217	196	195	200
1657:	175	183	192	188	203	185	196	199
1665:	198	197	228	185	213	211	209	208
1673:	190	199	211	176	205	203	192	196
1681:	193	223	182	233	184	187	212	192
1689:	188	204	200	215	215	194	192	219
1697:	194	216	194	169	199	198	232	202
1705:	184	194	218	185	178	188	204	190
1713:	200	186	185	208	183	182	209	182
1721:	190	205	172	203	190	171	200	202
1729:	191	199	193	187	209	195	174	195
1737:	204	166	195	214	200	198	188	188
1745:	188	191	184	199	172	223	200	173
1753:	189	194	210	209	193	228	190	221
1761:	210	220	219	198	194	201	183	205
1769:	211	222	175	204	214	220	216	199
1777:	211	200	195	223	213	200	210	221
1785:	210	209	209	212	207	214	215	217
1793:	210	239	210	183	206	205	192	203
1801:	218	215	185	212	214	227	216	215
1809:	234	214	241	224	211	225	229	218
1817:	194	219	237	251	219	212	223	200
1825:	220	229	225	240	232	219	191	222
1833:	201	202	202	208	205	196	239	221
1841:	208	223	212	195	191	197	223	215
1849:	197	211	201	208	176	224	206	197
1857:	193	221	232	215	203	209	202	236
1865:	192	224	222	225	193	209	231	213

1873:	220	243	235	197	223	204	244	228
1881:	221	241	224	213	215	210	203	235
1889:	202	212	240	222	262	217	235	201
1897:	212	202	210	229	231	224	215	209
[illegible]05:	229	233	271	289	332	361	351	420
[illegible]3:	442	503	490	537	502	451	431	368
1921:	379	321	269	262	214	203	223	203
1929:	223	215	205	204	213	204	208	198
1937:	227	235	230	228	229	219	207	213
1945:	236	223	205	209	201	212	205	215
1953:	253	243	279	274	284	259	276	272
1961:	256	269	250	227	258	245	232	231
1969:	242	224	201	212	217	204	230	223
1977:	203	217	196	207	199	221	177	200
1985:	181	212	206	201	197	190	218	218
1993:	188	197	219	219	191	185	220	195
2001:	222	205	242	212	235	240	208	216
2009:	217	198	204	230	205	239	186	251
2017:	217	217	203	226	225	222	220	233
2025:	224	225	236	240	216	248	199	206
2033:	197	232	227	210	201	208	238	219
2041:	207	238	183	210	236	247	226	203
2049:	226	213	209	203	226	238	188	208
2057:	235	203	227	232	209	246	187	235
2065:	219	224	251	225	222	243	227	204
2073:	231	226	257	237	214	239	204	241
2081:	216	203	250	245	224	230	237	246
2089:	255	217	229	208	219	223	222	227
2097:	229	210	212	223	207	232	240	211
[illegible]105:	238	216	214	207	206	233	234	241
[illegible]13:	252	232	258	237	196	265	208	231
2121:	205	199	248	224	236	231	248	246
2129:	219	215	225	231	218	260	224	243
2137:	212	234	220	248	230	204	260	203
2145:	231	232	232	225	218	220	197	212
2153:	236	230	212	212	221	220	238	225
2161:	225	226	246	221	219	261	211	211
2169:	210	240	237	240	203	218	228	251
2177:	203	218	221	245	211	248	203	200
2185:	228	221	216	224	222	207	202	211
2193:	204	210	235	213	219	201	195	239
2201:	231	220	229	219	241	214	227	204
2209:	213	219	210	205	219	221	237	219
2217:	225	192	218	219	217	205	226	230
2225:	192	202	209	231	219	225	229	196
2233:	216	214	233	224	224	219	225	209
2241:	244	223	186	222	224	221	223	197
2249:	183	223	226	212	214	234	193	203
2257:	192	211	203	228	219	197	221	178
2265:	225	197	211	211	210	192	184	186
2273:	221	189	186	214	229	212	195	214
2281:	207	223	225	245	203	186	198	199
2289:	203	197	194	219	211	191	207	203
2297:	213	206	219	210	198	199	214	214
2305:	213	214	213	177	214	202	202	208
[illegible]13:	186	211	222	216	222	190	204	195
[illegible]21:	215	193	190	212	194	216	179	182
2329:	189	230	207	196	198	209	196	178
2337:	192	180	180	165	211	199	214	185
2345:	221	175	187	196	180	191	199	168

2353:	198	202	206	221	209	200	183	217
2361:	169	191	196	186	189	183	190	206
2369:	181	185	188	200	189	228	187	173
2377:	191	181	187	176	184	182	197	167
2385:	174	184	183	179	183	171	192	18[illegible]
2393:	180	183	191	195	203	200	168	19[illegible]
2401:	176	185	213	193	176	171	159	182
2409:	202	187	180	204	185	188	195	213
2417:	166	189	186	174	167	176	205	172
2425:	175	190	188	165	202	173	168	193
2433:	178	193	161	167	190	182	194	192
2441:	193	188	182	190	192	195	196	178
2449:	220	221	244	252	232	296	265	249
2457:	269	252	231	213	187	203	179	193
2465:	173	182	207	193	181	213	193	162
2473:	185	176	164	198	186	187	178	194
2481:	179	172	178	165	191	199	178	161
2489:	222	167	161	203	163	182	173	179
2497:	193	186	185	210	192	186	181	187
2505:	172	192	187	194	201	178	202	190
2513:	160	179	204	192	170	173	181	181
2521:	162	173	182	155	182	167	192	162
2529:	170	167	173	183	176	162	175	175
2537:	179	178	196	178	187	176	188	162
2545:	154	165	143	160	168	178	171	163
2553:	154	180	199	172	144	194	173	183
2561:	173	153	197	184	170	192	165	170
2569:	173	198	178	163	160	172	149	159
2577:	175	159	151	166	189	169	170	186
2585:	164	179	177	175	172	150	169	177
2593:	139	166	168	171	154	175	165	15[illegible]
2601:	165	169	168	172	166	166	171	175
2609:	189	157	180	174	167	177	147	161
2617:	163	176	191	146	165	178	177	167
2625:	153	168	164	173	188	141	161	174
2633:	165	173	180	174	176	177	151	158
2641:	176	153	169	157	167	158	173	161
2649:	174	174	181	146	166	175	159	150
2657:	166	171	182	198	163	145	166	151
2665:	184	170	176	173	158	160	209	172
2673:	157	153	194	188	161	175	189	204
2681:	229	218	228	249	224	287	252	276
2689:	226	230	183	178	186	210	168	182
2697:	149	161	158	162	153	164	168	158
2705:	186	146	140	158	162	147	168	169
2713:	137	174	155	147	158	167	169	169
2721:	160	168	173	171	146	170	173	171
2729:	138	149	149	149	156	157	158	160
2737:	166	147	142	156	167	137	142	170
2745:	160	153	160	168	168	152	174	155
2753:	161	170	170	146	169	154	169	151
2761:	165	159	169	153	143	164	165	167
2769:	166	161	166	153	150	148	141	170
2777:	148	182	158	143	159	150	144	154
2785:	156	128	191	162	171	147	149	172
2793:	153	153	159	159	140	151	157	11[illegible]
2801:	161	153	132	144	133	153	157	125
2809:	157	136	160	135	149	162	179	147
2817:	159	125	130	161	149	158	134	166
2825:	163	153	160	173	141	152	152	156

2833:	159	138	165	136	159	131	171	151
2841:	158	145	163	140	160	144	150	138
2849:	134	137	137	170	159	136	133	160
2857:	154	148	133	161	151	160	143	166
2865:	165	150	162	108	140	161	145	144
2873:	135	163	131	139	153	160	158	148
2881:	153	158	141	135	143	167	154	156
2889:	149	174	150	157	149	154	155	141
2897:	131	144	164	167	136	155	159	143
2905:	151	146	166	139	145	172	148	160
2913:	130	136	125	160	148	150	140	163
2921:	136	152	124	146	146	158	159	168
2929:	161	159	142	148	140	147	157	151
2937:	149	149	137	143	148	137	129	150
2945:	154	138	163	155	148	144	157	151
2953:	154	158	147	165	181	156	147	148
2961:	142	157	142	161	155	151	119	160
2969:	142	147	154	152	135	135	152	166
2977:	137	150	148	157	153	153	160	190
2985:	160	208	179	198	206	183	173	170
2993:	180	166	153	138	158	134	157	138
3001:	153	133	140	149	153	145	127	145
3009:	140	143	143	163	155	133	147	130
3017:	128	141	120	140	135	163	148	146
3025:	145	151	143	162	128	139	147	133
3033:	157	133	150	131	127	151	152	149
3041:	135	151	135	136	132	134	122	133
3049:	159	139	144	161	128	162	118	144
3057:	155	163	149	129	144	143	134	132
3065:	151	154	145	141	143	140	141	142
3073:	156	138	152	143	144	131	124	129
3081:	155	150	153	145	151	167	153	112
3089:	116	162	172	148	124	139	135	141
3097:	136	135	131	158	136	142	138	137
3105:	151	136	150	160	141	137	140	142
3113:	166	151	162	139	132	139	137	121
3121:	145	107	126	146	135	145	140	156
3129:	154	139	153	147	136	147	154	137
3137:	140	138	148	139	124	131	134	133
3145:	151	125	146	154	140	135	116	126
3153:	128	142	149	147	116	147	147	142
3161:	137	140	167	145	116	116	121	146
3169:	149	135	131	165	138	172	130	127
3177:	137	144	157	142	127	131	148	133
3185:	147	120	140	142	134	138	133	174
3193:	143	164	143	154	147	146	139	147
3201:	154	155	138	128	147	141	134	133
3209:	130	135	142	139	135	131	166	135
3217:	137	156	153	146	138	154	125	136
3225:	132	148	147	146	147	109	154	145
3233:	136	161	150	132	140	132	125	148
3241:	129	146	148	129	120	150	142	130
3249:	117	118	138	135	159	139	151	121
3257:	143	149	128	159	117	145	159	133
3265:	149	131	151	130	131	140	152	134
3273:	146	123	137	151	144	153	117	158
3281:	123	147	143	136	141	149	148	152
3289:	137	138	141	165	137	132	132	145
3297:	134	132	134	134	125	163	147	153
3305:	125	129	147	134	144	145	140	143

3313:	152	145	126	136	143	129	127	155
3321:	148	151	145	124	135	138	154	118
3329:	158	131	146	134	104	149	143	152
3337:	139	120	141	145	148	127	109	128
3345:	135	136	137	133	126	132	156	13[illegible]
3353:	130	142	129	138	173	135	110	12[illegible]
3361:	129	104	144	139	133	109	134	117
3369:	128	149	128	115	119	126	117	139
3377:	146	140	138	139	149	122	132	151
3385:	134	132	132	142	118	149	149	136
3393:	142	153	143	129	136	135	123	109
3401:	125	129	122	151	132	159	154	131
3409:	138	124	137	140	128	148	130	128
3417:	140	136	144	131	126	141	142	127
3425:	117	138	118	154	138	140	140	131
3433:	127	149	133	140	147	147	123	151
3441:	133	128	153	142	127	146	127	130
3449:	160	139	113	146	144	128	150	143
3457:	133	141	144	123	134	146	129	134
3465:	145	150	158	139	138	155	134	157
3473:	142	151	109	137	118	115	152	135
3481:	134	127	113	145	141	119	108	151
3489:	160	134	108	125	118	130	117	130
3497:	116	144	134	129	141	134	126	130
3505:	143	154	137	122	123	138	119	141
3513:	119	140	133	142	133	154	133	119
3521:	122	125	154	144	130	143	140	150
3529:	140	137	122	124	133	127	131	135
3537:	142	125	149	125	132	126	144	116
3545:	139	123	151	136	137	142	117	121
3553:	142	131	143	141	139	137	136	14[illegible]
3561:	145	146	125	142	140	130	142	127
3569:	138	122	154	131	132	129	120	153
3577:	147	136	131	134	147	134	127	138
3585:	141	121	141	125	131	129	116	121
3593:	142	135	122	133	148	129	138	123
3601:	132	141	133	131	162	145	138	143
3609:	136	139	110	140	138	115	144	145
3617:	121	132	129	127	132	158	134	123
3625:	130	145	136	136	142	124	151	144
3633:	126	162	147	129	149	146	133	119
3641:	130	135	135	129	120	121	127	130
3649:	133	141	115	134	149	129	116	141
3657:	114	126	120	141	122	140	145	141
3665:	131	128	135	135	134	110	150	145
3673:	140	164	131	148	129	158	138	141
3681:	148	144	133	127	145	109	126	130
3689:	145	139	126	119	161	132	136	129
3697:	127	137	132	112	132	138	128	122
3705:	107	133	150	117	124	150	145	135
3713:	154	140	133	131	129	140	144	146
3721:	127	135	136	128	126	116	101	130
3729:	135	158	139	120	118	133	147	158
3737:	122	126	114	145	134	128	116	147
3745:	114	134	136	127	154	138	127	150
3753:	135	153	164	145	143	170	197	24[illegible]
3761:	292	351	471	572	711	904	1061	1218
3769:	1372	1431	1543	1453	1282	1164	1054	876
3777:	664	507	386	287	230	208	186	137
3785:	139	138	152	138	126	126	133	142

3793:	141	134	135	147	119	133	131	138
3801:	138	153	146	127	125	138	126	109
3809:	140	108	117	134	129	149	144	131
3817:	130	140	128	137	137	131	134	126
3825:	129	158	143	108	125	130	132	138
3833:	124	131	137	148	136	139	128	116
3841:	124	139	137	119	121	139	123	153
3849:	156	128	131	128	147	127	129	133
3857:	139	136	139	115	121	145	134	119
3865:	135	160	142	148	119	122	139	123
3873:	131	126	139	133	147	124	133	106
3881:	122	130	131	136	115	136	127	133
3889:	149	163	131	113	137	120	136	120
3897:	131	141	118	138	122	146	130	122
3905:	148	137	137	133	141	115	117	133
3913:	133	123	118	123	132	116	121	136
3921:	130	142	150	128	115	134	140	150
3929:	125	149	137	121	130	146	131	144
3937:	139	131	141	138	161	148	140	130
3945:	126	136	137	137	137	126	127	146
3953:	114	134	147	121	136	142	136	166
3961:	133	123	152	145	158	135	132	136
3969:	135	126	144	151	143	133	123	151
3977:	121	163	146	129	137	123	144	132
3985:	141	130	144	129	150	158	132	153
3993:	129	152	133	122	124	122	145	142
4001:	112	148	135	137	147	135	124	140
4009:	162	145	122	145	143	141	131	134
4017:	133	149	135	147	134	149	144	122
4025:	142	136	133	145	116	128	133	124
4033:	132	138	151	133	135	143	158	134
4041:	157	145	132	157	166	131	145	135
4049:	145	136	138	151	144	137	117	115
4057:	126	126	142	134	128	134	141	114
4065:	129	135	135	153	136	129	147	126
4073:	135	155	136	145	140	141	126	135
4081:	134	126	120	126	150	147	145	149
4089:	160	120	145	109	133	130	148	150

Sample ID : 0211141-02 Acquisition date : 26-NOV-2002 19:42:06

X/VMS Peak Search Report Generated 26-NOV-2002 20:42:31.43

Configuration : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_021114102_GE5_LPGAS5_48017.CN
Analyses by : PEAK V16.9 ENBACK V1.6 PEAKEFF V2.2
Client ID : BLANK
Deposition Date :
Sample Date : 26-NOV-2002 00:00:00 Acquisition date : 26-NOV-2002 19:42:06
Sample ID : 0211141-02 Sample Quantity : 1.38330E+01 GRAM
Sample type : SOIL Sample Geometry : 0
Detector name : GE5 Detector Geometry: LPGAS-5
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:04.30 0.1%
Start channel : 1 End channel : 4096
Sensitivity : 3.00000 Gaussian : 15.00000
Critical level : No

Post-NID Peak Search Report

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
1	29.85*	14	26	0.69	285.71	273	22	178.9	7.97E-01	
1	41.83	28	7	0.72	401.09	391	18	47.3	8.18E-01	
1	46.38	29	5	0.73	444.98	437	16	44.1	7.50E-01	
1	63.37	33	8	0.76	608.60	595	24	50.2	7.96E-01	TH-234
1	74.81	66	28	0.78	718.80	707	21	41.3	6.27E-01	AM-243
1	77.07	104	10	0.79	740.62	731	20	23.0	6.31E-01	
	168.60	31	15	0.91	1622.44	1610	23	52.2	8.99E-01	
	238.28	32	3	0.97	2293.94	2283	23	59.6	1.08E+00	
1	238.88	39	1	0.98	2299.70	2283	23	40.2		
1	295.12	24	20	1.02	2841.71	2827	23	83.3	4.18E-01	
1	351.52	44	5	1.07	3385.32	3373	24	31.5	8.63E-01	

AG 12/2/02

00694

Sample ID : 0211141-02 Acquisition date : 26-NOV-2002 19:42:06

Total number of lines in spectrum	11	
Number of unidentified lines	7	
Number of lines tentatively identified by NID	4	36.36%

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
TH-234	4.47E+09Y	1.00	3.141E+00	3.141E+00	1.610E+00	51.27	
		Total Activity :	3.141E+00	3.141E+00			

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
AM-243	7380.00Y	1.00	3.616E-01	3.616E-01	1.575E-01	43.55	
		Total Activity :	3.616E-01	3.616E-01			

Grand Total Activity : 3.502E+00 3.502E+00

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

Sample ID : 0211141-02
Acquisition date : 26-NOV-2002 19:42:06

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-234	63.29	3.80*	1.484E+01	3.141E+00	3.141E+00	51.27	OK

Final Mean for 1 Valid Peaks = 3.141E+00+/- 1.610E+00 (51.27%)

Nuclide Type: FISSION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
AM-243	74.67	66.00*	1.509E+01	3.616E-01	3.616E-01	43.55	OK

Final Mean for 1 Valid Peaks = 3.616E-01+/- 1.575E-01 (43.55%)

Flag: "*" = Keyline

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
TH-234	3.141E+00	1.610E+00	2.180E+00	2.144E-01	1.440
AM-243	3.616E-01	1.575E-01	1.582E-01	2.087E-02	2.286

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

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
FE-55	-3.656E+01		1.209E+03	2.070E+02	6.810E+03	-0.177
CO-57	4.160E-02		7.107E-02	1.383E-01	1.723E-02	0.301
NI-59	-3.021E+01		4.473E+02	6.408E+01	9.451E+02	-0.471
CD-109	1.871E+00		1.877E+00	3.662E+00	3.522E-01	0.511
I-125	-1.678E-01		1.271E+00	2.264E+00	3.274E-01	-0.074
I-129	1.592E-01	+	2.863E-01	4.042E-01	7.334E-02	0.394
BA-133	2.302E-02		1.500E-01	2.791E-01	4.578E-02	0.082
CE-144	-4.069E-01		5.541E-01	9.235E-01	1.225E-01	-0.441
PB-210	2.978E+00	+	1.362E+00	2.988E+00	3.384E-01	0.997
PA-231	3.096E+00		1.446E+01	1.346E+01	5.458E+01	0.230
TH-231	3.175E-01		9.618E-01	1.800E+00	4.144E-01	0.176
PA-234	1.128E-01		2.765E-01	5.259E-01	1.659E-01	0.215
[illegible]-237	4.132E-01		5.101E-01	9.936E-01	9.535E-02	0.416
U-237	-3.902E-02		3.973E-01	7.341E-01	2.374E-01	-0.053
AM-241	2.280E-01		1.453E-01	3.126E-01	3.135E-02	0.730

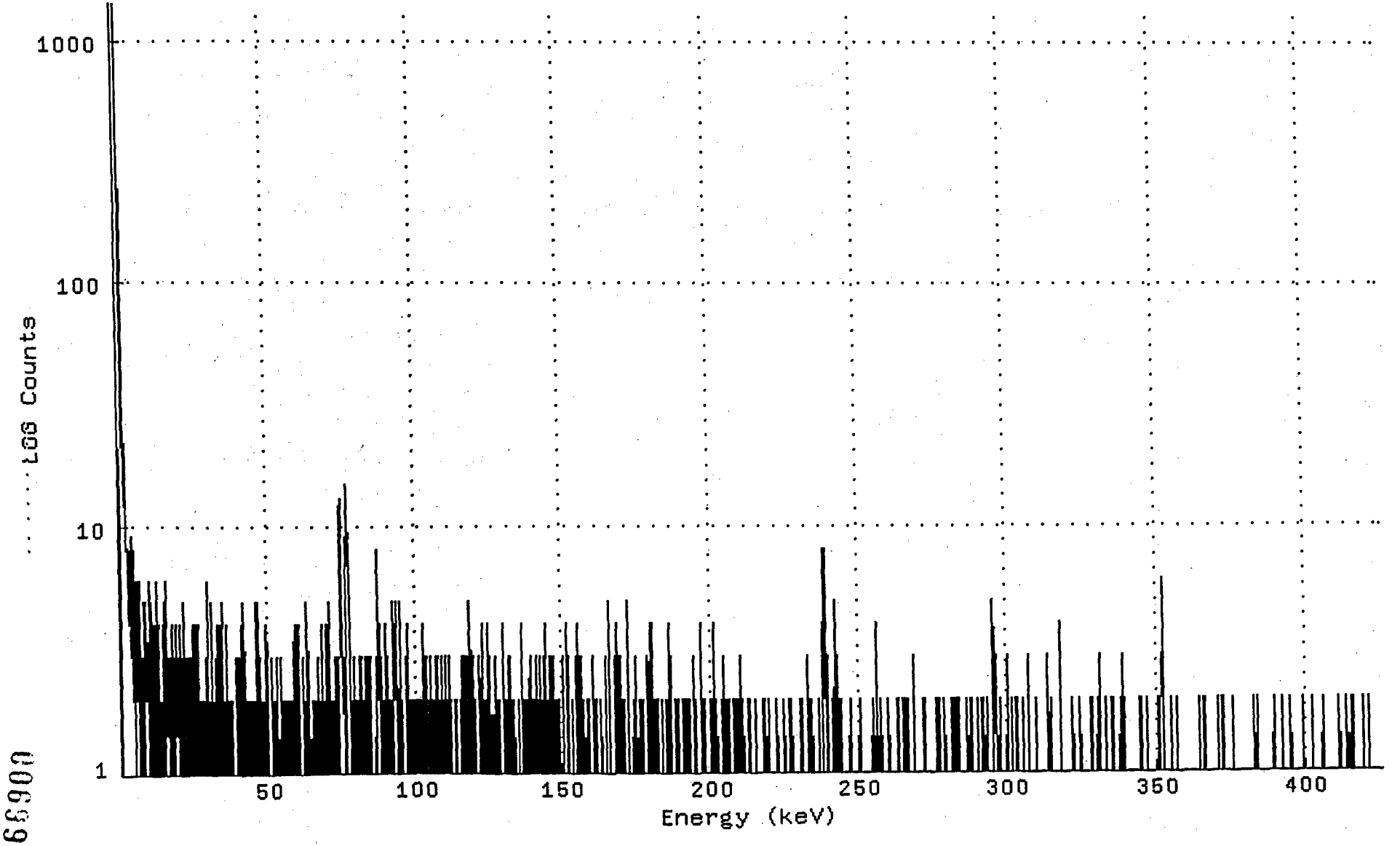
Sample ID : 0211141-02 Acquisition date : 26-NOV-2002 19:42:06

Nuclide	Half-life	Half-Life Ratio	Energy	%Abund	Activity (pCi/GRAM)	2-Sigma %Error	Rejected by
I-129	1.57E+07Y	0.00	29.78*	57.00	1.592E-01	179.84	Abun.
			33.60	13.20	--- Not Found ---		
			39.58	7.52	--- Not Found ---		
		% Abundances Found =		73.34			
BA-133	10.50Y	0.00	30.80	97.60	8.865E-02	179.86	Abun.
			81.00*	33.00	--- Not Found ---		
			302.84	17.80	--- Not Found ---		
			356.01	60.00	--- Not Found ---		
			383.85	8.70	--- Not Found ---		
		% Abundances Found =		44.96			
PB-210	22.26Y	0.00	10.80	24.30	--- Not Found ---		Abun.
			46.50*	4.05	2.978E+00	45.73	
		% Abundances Found =		14.29			
NP-237	2.14E+06Y	0.00	29.37	14.00	6.613E-01	179.87	Abun.
			86.50*	12.60	--- Not Found ---		
		% Abundances Found =		52.63			

Flag: "*" = Keyline

Spectrum : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_[illegible]1114102_GE5_LPGAS5_48017.CNF;1
Title :
Sample Title: BLANK

Start Time: 26-NOV-2002 19:42	Sample Time: 26-NOV-2002 00:00	Energy Offset: 1.88831E-01
Real Time : 0 01:00:04.30	Sample ID : 0211141-02	Energy Slope : 1.03817E-01
Live Time : 0 01:00:00.00	Sample Type: SOIL	Energy Quad : -1.02782E-08



00639

Channel Contents for [GAMMA.SCUSR.ARCHIVE]SMP_021114102_GE5_LPGAS5_48017.CNF

Channel								
1:	0	0	0	0	0	0	0	0
9:	0	3	144	1212	1412	857	552	335
17:	176	103	38	23	13	12	22	14
25:	8	13	8	11	6	7	5	6
33:	8	4	6	3	8	8	7	3
41:	6	8	2	9	3	5	6	1
49:	4	8	5	5	5	6	2	5
57:	2	2	6	3	3	4	1	0
65:	5	1	2	6	1	4	1	3
73:	2	0	1	2	1	5	1	4
81:	3	2	5	2	5	4	2	4
89:	3	3	2	1	2	3	4	6
97:	3	2	3	3	1	3	1	5
105:	0	3	1	1	1	2	4	3
113:	2	0	1	3	2	2	4	1
121:	2	3	2	6	4	3	1	2
129:	1	0	4	1	0	1	1	1
137:	1	2	0	1	3	4	3	5
145:	5	4	4	2	1	2	6	2
153:	2	3	3	2	3	1	2	0
161:	1	1	1	2	0	3	2	4
169:	1	1	2	1	1	1	2	0
177:	3	2	1	2	2	3	2	3
185:	4	0	3	1	3	0	0	1
193:	3	0	1	4	2	2	0	[illegible]
201:	0	3	1	0	0	2	1	4
209:	1	5	1	2	1	2	2	3
217:	3	0	1	1	2	1	0	1
225:	2	1	3	2	0	2	0	3
233:	3	2	0	0	1	1	4	2
241:	2	1	0	4	1	4	2	1
249:	4	1	1	1	4	2	2	3
257:	4	0	0	0	1	2	1	2
265:	1	1	1	1	0	2	1	1
273:	1	2	0	1	2	1	2	1
281:	3	2	3	6	4	5	3	4
289:	1	2	2	2	1	0	2	2
297:	5	0	0	1	2	1	0	2
305:	1	0	1	0	3	1	2	2
313:	0	1	0	1	4	0	0	0
321:	1	2	1	0	4	2	2	1
329:	4	1	2	1	5	0	1	0
337:	1	0	2	2	1	0	1	1
345:	2	1	1	2	4	0	1	2
353:	2	2	1	1	2	0	0	1
361:	1	2	1	0	2	2	0	0
369:	0	1	1	1	0	0	1	1
377:	1	2	3	2	2	2	1	0
385:	3	3	0	3	2	0	0	1
393:	0	1	1	0	4	0	0	[illegible]
401:	3	1	4	5	2	0	1	0
409:	0	0	2	1	0	1	2	0
417:	1	2	0	2	0	2	0	0
425:	0	2	0	2	2	0	1	1

433:	0	0	0	1	0	0	1	2
441:	0	2	1	2	5	3	5	4
449:	0	0	1	0	0	1	3	0
457:	3	1	2	1	1	2	1	2
465:	1	0	1	0	2	2	0	2
473:	1	1	2	0	4	3	2	1
481:	0	0	0	1	1	0	1	0
489:	1	1	3	3	1	0	1	0
497:	0	2	2	1	2	1	0	0
505:	1	1	2	2	0	1	1	3
513:	2	0	0	0	1	1	0	0
521:	3	0	0	1	0	1	0	2
529:	0	1	0	1	2	2	1	1
537:	1	0	1	2	1	2	0	2
545:	2	1	1	1	0	0	0	2
553:	0	0	1	0	1	1	0	1
561:	2	2	0	1	2	0	1	3
569:	4	0	4	1	3	1	4	0
577:	0	0	1	0	2	4	3	0
585:	2	0	1	0	1	1	1	0
593:	1	0	0	3	1	1	0	0
601:	1	1	0	2	1	3	2	2
609:	4	5	2	1	1	1	2	1
617:	1	0	0	1	1	1	2	0
625:	1	0	1	1	2	0	2	0
633:	1	0	2	0	1	0	2	0
641:	0	0	1	3	1	0	2	1
649:	0	0	2	1	2	4	0	0
657:	0	3	2	2	0	0	2	0
665:	0	0	4	0	0	1	1	0
673:	1	0	2	1	4	1	0	0
681:	3	5	2	2	0	1	2	2
689:	1	1	0	0	0	2	1	1
697:	3	3	1	1	0	1	2	3
705:	1	1	2	1	3	1	0	1
713:	3	3	7	6	6	12	8	7
721:	13	5	3	5	3	1	0	3
729:	1	0	0	0	0	2	8	3
737:	9	7	9	10	15	15	11	8
745:	6	3	1	2	1	0	0	2
753:	1	1	1	0	1	1	1	3
761:	3	1	0	2	1	1	0	0
769:	2	0	1	0	1	0	0	0
777:	1	3	1	2	1	1	2	3
785:	1	1	0	2	2	0	2	0
793:	1	3	0	0	0	0	1	0
801:	0	2	3	1	2	1	3	2
809:	0	2	2	3	2	1	0	0
817:	0	0	1	0	1	0	0	1
825:	0	1	1	0	2	0	3	1
833:	3	2	3	3	2	8	5	2
841:	3	4	2	4	1	2	2	2
849:	3	1	0	1	2	0	2	2
857:	1	0	0	3	1	2	4	0
865:	2	1	3	3	2	2	1	2
873:	2	0	2	1	2	0	2	0
881:	1	1	0	0	0	3	1	1
889:	5	2	4	2	2	3	2	3
897:	5	4	1	1	0	2	1	0
905:	1	1	1	5	3	2	0	0

913:	0	0	0	2	2	1	1	1
921:	1	1	0	1	1	1	2	0
929:	1	1	3	1	0	1	0	1
937:	0	4	1	0	1	2	2	0
945:	0	0	2	0	0	2	0	1
953:	0	2	1	1	1	1	0	0
961:	1	2	0	0	0	2	2	0
969:	0	1	0	0	0	2	0	2
977:	1	2	0	1	0	4	0	1
985:	0	3	1	3	0	0	0	1
993:	2	2	0	0	3	1	2	1
1001:	2	1	0	0	0	2	0	0
1009:	1	3	1	2	0	1	1	2
1017:	0	1	2	1	0	1	0	3
1025:	1	3	1	1	0	0	0	1
1033:	3	0	0	2	0	0	1	2
1041:	1	1	1	2	0	3	1	0
1049:	1	2	0	2	1	2	2	2
1057:	0	3	1	1	0	0	1	2
1065:	1	1	3	1	0	0	0	2
1073:	0	0	1	1	0	1	0	0
1081:	0	1	0	0	0	2	1	1
1089:	0	2	0	0	1	1	0	0
1097:	0	0	1	1	0	1	2	1
1105:	2	0	0	1	2	3	2	2
1113:	0	3	1	0	1	0	0	0
1121:	0	1	1	1	1	3	0	2
1129:	0	0	3	1	0	4	1	0
1137:	0	5	2	0	1	3	0	1
1145:	2	0	1	3	0	0	0	0
1153:	2	1	1	0	0	1	0	0
1161:	1	0	0	3	3	1	0	3
1169:	2	0	1	1	2	2	1	4
1177:	1	1	0	0	2	1	0	2
1185:	0	0	0	1	0	1	1	2
1193:	0	4	1	1	0	3	0	1
1201:	2	1	3	3	1	1	1	0
1209:	0	1	1	0	0	0	1	1
1217:	1	3	0	0	1	1	1	1
1225:	0	1	2	1	0	1	2	0
1233:	1	1	0	1	0	0	0	1
1241:	1	1	0	4	0	0	1	0
1249:	0	0	1	1	2	0	0	0
1257:	0	1	2	0	1	1	3	1
1265:	1	0	2	1	2	2	3	1
1273:	1	1	2	1	1	0	0	1
1281:	1	1	2	1	1	0	0	1
1289:	0	1	0	0	1	0	1	0
1297:	1	1	0	2	1	1	0	0
1305:	1	1	1	0	1	1	4	0
1313:	0	0	0	0	1	2	2	1
1321:	1	0	2	1	1	0	0	0
1329:	1	2	0	1	1	1	0	1
1337:	0	2	3	3	0	0	1	1
1345:	1	0	0	2	2	0	1	2
1353:	1	0	1	1	2	3	2	0
1361:	0	1	2	1	0	0	2	2
1369:	1	1	0	3	1	0	1	2
1377:	0	0	2	0	0	1	0	1
1385:	3	1	4	0	2	2	1	2

1393:	0	2	1	1	0	0	2	2
1401:	2	1	0	3	2	1	1	3
1409:	1	1	1	2	1	3	1	1
1417:	0	2	0	0	0	1	1	1
1425:	0	0	0	2	2	2	1	0
1433:	0	0	0	1	1	1	0	1
1441:	0	0	1	0	1	3	1	0
1449:	0	0	0	0	1	0	0	4
1457:	1	0	0	3	1	1	1	1
1465:	0	0	1	0	0	0	1	0
1473:	2	1	0	1	1	0	1	1
1481:	1	0	1	0	1	0	0	3
1489:	0	1	1	2	1	0	4	2
1497:	0	3	0	1	2	0	1	1
1505:	3	0	1	0	0	0	0	2
1513:	1	1	1	0	1	0	1	1
1521:	2	2	1	1	0	0	1	2
1529:	2	0	2	0	0	0	1	1
1537:	1	1	1	3	0	0	0	2
1545:	0	0	1	1	0	2	0	0
1553:	0	2	0	0	0	0	0	0
1561:	1	0	1	1	1	1	0	2
1569:	0	1	1	0	0	0	1	1
1577:	0	0	0	0	0	1	0	3
1585:	1	0	1	0	0	1	1	0
1593:	0	0	0	3	5	1	1	0
1601:	0	1	0	1	0	0	0	1
1609:	0	0	1	1	3	1	0	3
1617:	1	0	0	1	0	4	2	3
1625:	2	1	0	0	0	2	1	0
1633:	1	3	0	1	1	0	0	1
1641:	2	1	0	1	0	2	0	0
1649:	0	1	1	1	1	1	1	1
1657:	1	5	0	1	0	0	1	1
1665:	0	0	0	0	1	1	1	2
1673:	0	2	1	0	0	1	1	2
1681:	0	3	1	2	1	0	0	0
1689:	0	0	2	2	0	1	1	2
1697:	1	2	2	1	1	1	1	1
1705:	1	2	0	0	1	0	1	0
1713:	1	0	1	1	2	0	3	1
1721:	1	0	0	1	1	2	4	0
1729:	4	0	1	0	1	0	1	3
1737:	1	4	0	0	1	1	0	1
1745:	2	0	1	0	0	1	2	1
1753:	1	0	0	1	1	0	0	1
1761:	1	0	0	1	0	1	2	1
1769:	1	0	1	0	1	1	0	0
1777:	1	2	0	1	1	1	0	2
1785:	1	1	2	1	4	1	2	1
1793:	1	3	0	2	1	0	1	0
1801:	0	1	1	1	1	0	0	2
1809:	0	0	0	1	0	1	1	0
1817:	2	1	0	2	0	1	1	0
1825:	0	1	1	1	1	1	1	1
1833:	2	1	0	1	0	2	1	2
1841:	1	1	2	0	0	0	1	1
1849:	2	0	0	0	2	0	0	2
1857:	0	1	0	1	0	1	0	0
1865:	0	1	0	3	2	0	1	1

1873:	1	1	2	1	1	1	1	1
1881:	0	0	0	1	0	0	1	1
1889:	1	0	0	1	0	2	2	4
1897:	1	1	2	1	0	0	0	1
1905:	1	2	0	1	1	0	1	0
1913:	0	0	1	0	1	1	1	0
1921:	1	1	0	2	0	2	1	2
1929:	1	0	1	0	0	2	0	0
1937:	0	4	0	0	0	0	0	2
1945:	0	1	0	0	1	0	1	0
1953:	1	0	0	0	0	0	0	0
1961:	2	1	0	3	1	1	0	0
1969:	0	0	1	0	0	2	2	0
1977:	2	0	0	0	1	2	0	0
1985:	0	1	1	0	1	0	1	0
1993:	1	0	2	1	2	0	1	0
2001:	2	0	1	0	0	0	1	1
2009:	0	0	2	2	0	0	0	1
2017:	0	3	0	0	1	0	0	0
2025:	1	0	0	1	2	1	0	0
2033:	0	0	0	1	0	0	0	1
2041:	0	1	1	2	0	0	0	2
2049:	0	2	0	0	1	1	0	0
2057:	0	1	1	0	1	0	0	1
2065:	0	1	0	2	1	0	1	1
2073:	0	0	0	0	0	1	0	1
2081:	0	1	1	0	0	0	0	1
2089:	0	0	0	0	1	0	0	2
2097:	1	2	0	1	1	0	1	1
2105:	1	1	1	1	2	0	1	0
2113:	0	0	0	0	1	0	1	0
2121:	1	0	1	0	0	0	1	0
2129:	0	1	1	1	0	0	1	1
2137:	0	0	2	0	1	0	1	1
2145:	0	0	1	1	0	0	0	1
2153:	0	1	0	0	1	1	0	1
2161:	0	1	2	0	0	1	0	1
2169:	0	0	1	1	0	0	0	1
2177:	2	2	0	1	0	1	0	1
2185:	1	1	2	1	1	1	0	0
2193:	1	0	0	0	1	0	0	0
2201:	0	1	1	0	0	0	1	0
2209:	0	1	0	0	0	1	0	0
2217:	2	2	0	0	0	0	0	0
2225:	0	1	0	0	1	0	0	0
2233:	1	1	1	1	0	1	0	3
2241:	0	0	0	2	0	0	2	1
2249:	1	2	1	2	2	2	0	0
2257:	1	1	0	1	0	1	1	0
2265:	1	0	0	1	1	1	1	0
2273:	1	1	0	2	0	0	1	1
2281:	0	0	0	0	0	0	1	0
2289:	3	4	2	8	4	8	7	8
2297:	8	5	5	5	8	1	3	1
2305:	0	0	0	0	0	1	0	1
2313:	1	1	0	1	1	2	0	0
2321:	1	1	1	2	0	0	0	5
2329:	1	1	0	0	3	1	0	0
2337:	3	1	0	1	0	2	1	1
2345:	0	2	1	0	1	0	0	0

2353:	0	0	1	0	0	1	1	0
2361:	0	0	0	0	0	1	1	1
2369:	1	0	0	0	1	0	0	2
2377:	0	1	0	0	0	1	0	1
2385:	1	0	0	0	0	1	1	0
2393:	0	0	0	1	1	1	0	1
2401:	1	0	0	0	0	0	2	0
2409:	0	0	1	0	1	0	1	1
2417:	1	1	0	1	1	1	0	0
2425:	0	0	0	1	0	0	1	1
2433:	0	0	0	0	0	1	0	0
2441:	1	0	0	0	0	1	1	1
2449:	2	1	0	1	0	2	0	0
2457:	0	0	1	1	0	4	0	1
2465:	0	2	0	1	0	1	0	0
2473:	2	0	0	0	1	2	1	0
2481:	0	0	0	0	0	0	0	0
2489:	0	0	1	0	0	0	1	1
2497:	0	0	0	0	2	1	2	0
2505:	0	0	0	1	1	0	1	0
2513:	0	0	0	0	0	0	0	1
2521:	0	0	1	0	0	1	0	0
2529:	1	0	0	2	0	2	0	0
2537:	2	0	0	1	1	0	1	1
2545:	0	0	0	0	0	1	2	0
2553:	2	1	1	2	0	0	0	0
2561:	1	2	0	0	0	2	0	0
2569:	1	0	1	0	0	0	0	1
2577:	0	0	0	0	0	0	0	0
2585:	3	0	1	0	0	0	1	0
2593:	1	0	1	1	1	0	0	1
2601:	0	1	1	1	1	0	0	0
2609:	0	0	0	1	0	2	1	1
2617:	1	0	2	0	1	1	0	0
2625:	0	1	0	1	1	1	1	0
2633:	0	0	0	1	0	0	0	1
2641:	1	1	0	0	1	0	1	1
2649:	0	0	0	0	0	0	0	0
2657:	2	0	1	0	0	0	0	2
2665:	2	0	2	1	0	0	1	0
2673:	1	1	0	0	0	1	0	0
2681:	0	2	0	0	2	0	0	0
2689:	0	1	0	0	0	0	0	0
2697:	0	0	0	0	1	0	0	0
2705:	0	0	0	2	0	0	0	2
2713:	0	1	1	2	2	1	1	0
2721:	0	0	0	1	0	0	2	0
2729:	0	1	2	0	0	0	0	0
2737:	1	0	1	1	1	0	0	0
2745:	0	1	0	0	0	1	0	0
2753:	1	0	0	0	2	0	0	0
2761:	0	0	0	1	1	0	1	0
2769:	0	2	1	0	2	1	0	1
2777:	0	0	0	0	0	1	1	0
2785:	0	0	0	0	0	2	1	0
2793:	0	1	1	0	0	1	0	0
2801:	1	0	0	2	0	2	1	1
2809:	1	1	1	2	0	0	0	0
2817:	0	1	1	2	0	0	0	1
2825:	0	0	1	0	0	0	0	0

2833:	0	0	1	1	1	4	2	3
2841:	1	5	3	3	2	2	3	2
2849:	0	1	2	3	0	0	1	1
2857:	1	0	1	0	0	2	0	1
2865:	0	0	0	0	0	0	0	0
2873:	0	1	0	0	0	1	0	0
2881:	0	0	1	0	1	2	0	0
2889:	1	3	1	1	0	1	1	0
2897:	0	1	0	2	1	1	0	0
2905:	1	0	0	0	1	0	0	0
2913:	0	2	0	1	1	0	2	0
2921:	1	0	0	0	0	0	1	0
2929:	0	1	1	1	0	0	0	1
2937:	2	0	1	1	0	1	0	1
2945:	0	0	0	1	0	1	1	1
2953:	0	1	1	0	3	0	0	0
2961:	1	1	1	0	0	0	1	0
2969:	0	1	0	0	1	0	0	1
2977:	0	1	0	2	0	0	0	0
2985:	0	0	1	0	0	0	0	0
2993:	0	0	0	0	0	0	0	0
3001:	0	0	1	0	0	1	0	1
3009:	0	0	1	0	0	1	2	0
3017:	0	3	1	1	0	1	0	0
3025:	0	1	2	1	2	0	0	0
3033:	1	0	0	0	1	0	0	0
3041:	0	0	0	0	0	0	0	0
3049:	0	1	1	0	0	1	1	0
3057:	1	4	0	0	0	0	0	0
3065:	0	0	0	1	1	0	0	0
3073:	1	0	0	0	0	0	1	0
3081:	0	0	0	0	1	0	0	0
3089:	0	1	0	0	0	0	0	1
3097:	2	0	0	0	0	0	0	1
3105:	0	1	1	0	0	0	0	0
3113:	0	0	0	0	0	0	1	1
3121:	2	0	0	0	0	0	0	0
3129:	0	0	1	0	1	0	1	0
3137:	0	0	0	0	0	0	0	1
3145:	0	0	0	0	0	0	1	0
3153:	1	0	1	2	0	0	0	1
3161:	1	2	1	0	0	0	1	0
3169:	1	1	1	1	1	0	1	0
3177:	2	0	0	0	1	0	3	1
3185:	0	1	0	0	1	0	0	1
3193:	0	1	0	1	0	1	0	0
3201:	1	2	0	0	0	0	0	0
3209:	1	1	0	1	0	0	0	0
3217:	0	0	0	1	0	0	0	2
3225:	0	0	0	2	0	1	1	0
3233:	0	0	0	0	0	0	1	0
3241:	0	1	0	0	1	0	1	0
3249:	1	2	1	1	2	0	1	0
3257:	2	3	1	0	0	1	0	0
3265:	0	2	1	0	0	0	0	0
3273:	1	0	0	0	0	0	0	0
3281:	1	0	0	1	0	1	0	1
3289:	0	0	0	0	0	0	0	0
3297:	1	0	1	1	0	1	0	0
3305:	0	0	0	0	0	0	1	2

3313:	1	2	0	2	0	1	2	2
3321:	1	0	1	0	0	0	0	1
3329:	0	0	0	1	1	0	0	0
3337:	2	1	0	0	0	0	0	1
3345:	0	0	0	0	1	1	1	0
3353:	0	1	0	0	0	0	0	0
3361:	1	0	0	0	0	0	0	0
3369:	0	0	0	1	0	1	2	1
3377:	0	0	0	1	1	2	2	2
3385:	2	3	3	3	2	3	0	6
3393:	1	1	1	0	0	0	0	1
3401:	0	0	0	0	0	0	0	0
3409:	1	0	1	0	1	1	1	0
3417:	2	0	0	0	0	1	1	0
3425:	0	1	0	0	1	1	0	1
3433:	0	0	2	0	0	0	0	1
3441:	0	0	0	0	0	0	0	0
3449:	0	0	0	1	0	0	0	0
3457:	0	0	1	0	0	1	0	0
3465:	0	1	0	0	0	1	1	0
3473:	1	0	0	0	0	0	0	1
3481:	0	1	0	0	0	0	0	0
3489:	1	1	1	0	0	0	0	0
3497:	0	0	0	0	0	0	1	0
3505:	1	2	0	0	1	0	1	0
3513:	0	0	1	1	0	1	0	0
3521:	2	0	0	0	0	2	0	0
3529:	0	0	0	0	0	0	0	0
3537:	1	0	0	1	1	0	0	0
3545:	0	0	0	0	0	1	0	0
3553:	0	0	0	0	0	0	0	1
3561:	0	0	1	0	0	1	0	0
3569:	2	0	1	0	0	0	0	0
3577:	0	0	1	0	0	0	2	0
3585:	2	0	1	2	0	0	1	1
3593:	1	1	0	0	0	0	0	0
3601:	0	1	1	0	0	0	0	0
3609:	0	1	0	0	1	0	0	2
3617:	0	1	0	0	0	0	0	0
3625:	0	0	0	0	0	0	0	1
3633:	0	0	0	0	0	0	0	0
3641:	0	0	1	0	0	0	0	0
3649:	1	0	0	0	0	0	0	0
3657:	0	1	0	0	0	0	0	0
3665:	0	0	0	1	0	0	0	0
3673:	0	1	0	0	0	0	0	0
3681:	1	0	0	0	1	2	0	1
3689:	0	0	0	1	0	2	0	0
3697:	0	1	1	0	0	0	0	1
3705:	1	0	0	0	0	1	1	0
3713:	0	0	0	1	0	1	0	0
3721:	1	1	0	0	0	0	1	0
3729:	1	0	1	0	0	0	0	0
3737:	0	0	1	0	1	1	1	0
3745:	0	0	0	2	1	0	0	2
3753:	0	0	0	1	1	0	1	0
3761:	0	0	0	1	0	1	0	1
3769:	0	0	0	1	0	1	1	2
3777:	0	0	0	1	0	1	0	0
3785:	1	1	0	0	0	0	1	1

3793:	0	1	1	0	0	0	0	0
3801:	2	0	0	0	0	0	1	1
3809:	1	0	1	1	1	0	0	0
3817:	0	0	0	0	0	0	0	0
3825:	0	1	0	1	1	1	0	[illegible]
3833:	0	1	0	0	0	0	1	1
3841:	2	0	0	0	0	0	0	1
3849:	1	0	1	0	0	0	0	0
3857:	0	0	1	0	0	0	0	1
3865:	1	0	0	1	0	0	2	1
3873:	0	1	1	0	0	0	1	0
3881:	0	1	0	0	0	0	0	0
3889:	0	0	0	0	1	0	0	0
3897:	0	1	0	0	0	0	0	0
3905:	2	0	0	1	0	0	1	1
3913:	1	1	0	0	0	0	0	0
3921:	0	1	0	0	0	0	0	0
3929:	0	0	0	0	0	0	0	0
3937:	1	0	0	0	0	1	0	0
3945:	0	0	0	0	0	0	0	1
3953:	1	0	0	0	1	0	2	0
3961:	0	0	1	0	1	1	1	0
3969:	0	0	0	0	0	0	0	0
3977:	0	0	1	1	1	0	2	0
3985:	0	0	1	1	0	0	1	0
3993:	1	0	1	2	0	0	0	0
4001:	0	0	0	0	2	0	0	0
4009:	1	0	1	0	1	0	0	1
4017:	0	0	0	0	0	0	0	0
4025:	0	0	0	0	0	0	0	[illegible]
4033:	0	2	0	0	0	0	1	0
4041:	0	0	0	0	1	1	1	0
4049:	0	0	0	2	0	1	0	1
4057:	0	1	1	0	0	1	0	0
4065:	1	0	0	0	0	0	0	0
4073:	0	0	0	0	0	1	0	0
4081:	0	0	0	0	0	0	0	0
4089:	0	1	0	1	0	0	0	1

Sample ID : 0211141-03 Acquisition date : 26-NOV-2002 17:09:08

/VMS Peak Search Report Generated 27-NOV-2002 11:29:24.54

Configuration : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_021114103_GE5_LPGAS5_48009.CN
Analyses by : PEAK V16.9 ENBACK V1.6 PEAKEFF V2.2
Client ID : VA-02-0176
Deposition Date :
Sample Date : 25-NOV-2002 00:00:00 Acquisition date : 26-NOV-2002 17:09:08
Sample ID : 0211141-03 Sample Quantity : 2.84190E+01 GRAM
Sample type : GRAM Sample Geometry : 0
Detector name : GE5 Detector Geometry: LPGAS-5
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:05.24 0.1%
Start channel : 1 End channel : 4096
Sensitivity : 3.00000 Gaussian : 15.00000
Critical level : No

Post-NID Peak Search Report

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
1	21.10	318	107	0.67	201.46	190	29	18.0	2.09E+00	
1	22.03	204	94	0.67	210.41	190	29	25.7		
1	27.30	69	84	0.69	261.19	251	19	58.7	2.62E+00	
1	29.97*	23	98	0.70	286.86	276	19	179.1	1.94E+00	I-129
1	32.04	38	105	0.70	306.80	296	19	112.7	1.92E+00	
4	39.87*	708	112	0.72	382.24	367	54	10.5	3.35E+00	I-129
1	42.88	86	67	0.73	411.25	367	54	49.1		
1	45.31	131	148	0.73	434.61	425	19	41.2	8.14E-01	
1	79.20	93	98	0.79	761.14	750	21	49.0	1.41E+00	
1	121.81	515	85	0.85	1171.60	1157	35	12.3	2.35E+00	CO-57
1	226.11	40	43	0.96	2176.63	2167	19	64.6	1.57E+00	
1	244.53	66	68	0.98	2354.11	2339	26	57.0	2.44E+00	
1	344.06	160	51	1.06	3313.38	3296	30	23.5	1.33E+00	

AG 12/2/02

Sample ID : 0211141-03 Acquisition date : 26-NOV-2002 17:09:08

Total number of lines in spectrum	13	
Number of unidentified lines	8	
Number of lines tentatively identified by NID	5	38.46%

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CO-57	270.90D	1.00	1.228E+00	1.234E+00	0.221E+00	17.93	
I-129	1.57E+07Y	1.00	1.348E-01	1.348E-01	2.428E-01	180.07	
			---	---			
Total Activity :			1.363E+00	1.369E+00			
Grand Total Activity :			1.363E+00	1.369E+00			

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

Sample ID : 0211141-03
Acquisition date : 26-NOV-2002 17:09:08

Nuclide Type: FISSION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
CO-57	122.06	85.51*	1.295E+01	1.228E+00	1.234E+00	17.93	OK
	136.48	10.60	1.205E+01	----- Line Not Found		-----	Absent
Final Mean for 1 Valid Peaks = 1.234E+00+/- 2.213E-01 (17.93%)							
I-129	29.78	57.00*	8.075E+00	1.348E-01	1.348E-01	180.07	OK
	33.60	13.20	9.495E+00	----- Line Not Found		-----	Absent
	39.58	7.52	1.135E+01	2.191E+01	2.191E+01	17.09	<<WM N-Sigma
Final Mean for 1 Valid Peaks = 1.348E-01+/- 2.428E-01 (180.07%)							

Flag: "*" = Keyline

- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
CO-57	1.234E+00	2.213E-01	1.098E-01	1.368E-02	11.235
I-129	1.348E-01	2.428E-01	2.546E-01	4.619E-02	0.530

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

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
FE-55	4.806E+00		1.763E+02	1.361E+02	4.478E+03	0.035
NI-59	-3.612E+00		5.984E+01	4.695E+01	6.925E+02	-0.077
CD-109	8.471E-01		1.285E+00	2.354E+00	2.264E-01	0.360
I-125	1.240E+00		1.521E+00	2.688E+00	3.887E-01	0.461
BA-133	1.645E-01		1.683E-01	2.666E-01	4.373E-02	0.617
CE-144	-3.631E-02		5.321E-01	9.331E-01	1.238E-01	-0.039
PB-210	6.623E+00	+	2.843E+00	3.502E+00	3.966E-01	1.891
PA-231	-7.407E+00		3.054E+01	8.720E+00	3.537E+01	-0.849
TH-231	-1.582E+00		1.353E+00	1.706E+00	3.929E-01	-0.927
PA-234	1.790E+00	+	7.318E-01	1.031E+00	3.252E-01	1.737
TH-234	-2.406E-01		1.139E+00	1.964E+00	1.932E-01	-0.122
[illegible]237	-1.121E-01		3.866E-01	6.657E-01	6.389E-02	-0.168
[illegible]37	-1.062E-01		4.963E-01	8.536E-01	2.760E-01	-0.[illegible]4
AM-241	4.120E-02		1.138E-01	2.067E-01	2.073E-02	0.199
AM-243	1.945E-02		6.754E-02	1.199E-01	1.581E-02	0.162

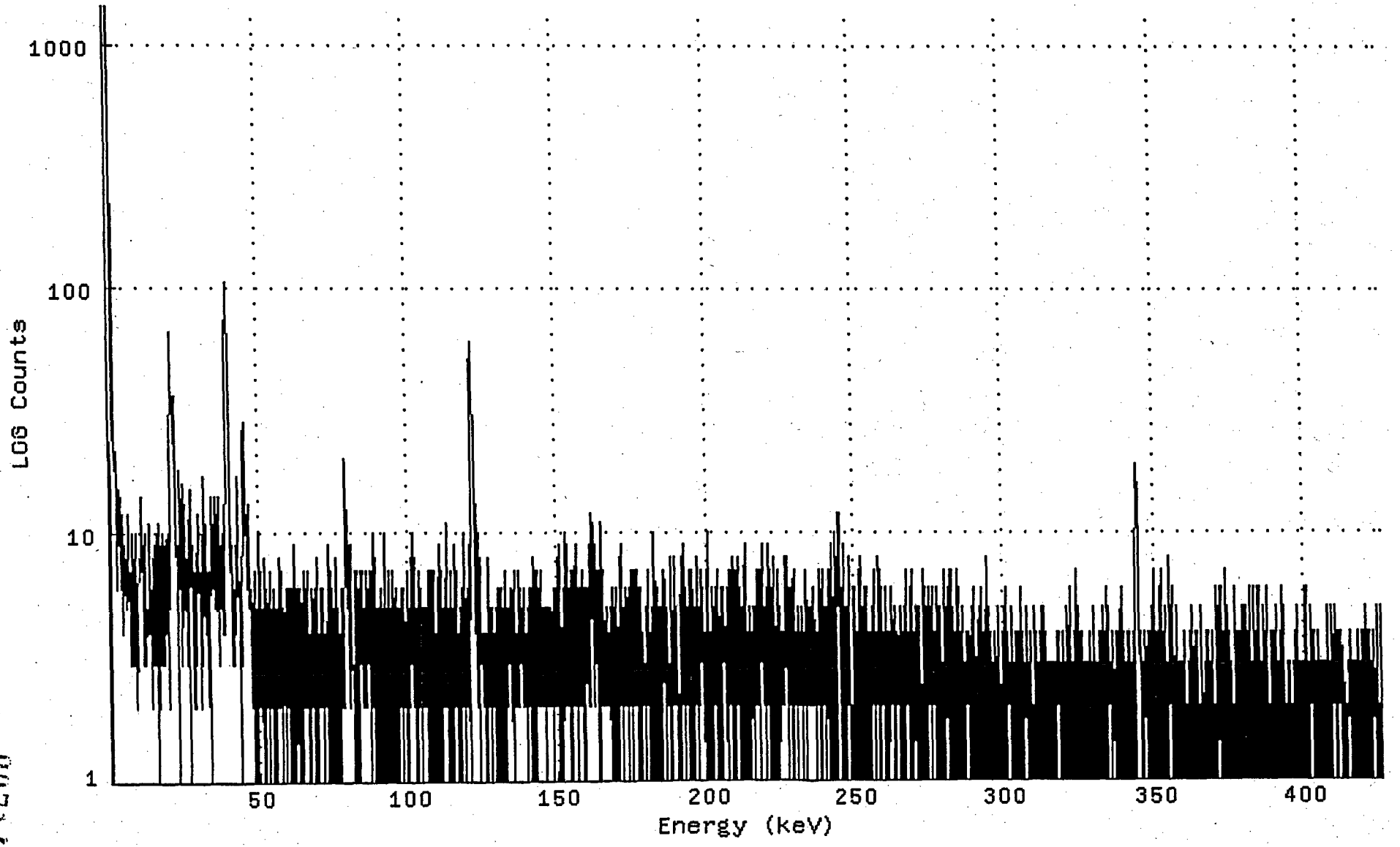
Sample ID : 0211141-03 Acquisition date : 26-NOV-2002 17:09:08

lide	Half-life	Half-Life Ratio	Energy	%Abund	Activity (pCi/GRAM)	2-Sigma %Error	Rejected by
133	10.50Y	0.00	30.80	97.60	7.508E-02	180.09	Abun.
			81.00*	33.00	--- Not Found ---		
			302.84	17.80	--- Not Found ---		
			356.01	60.00	--- Not Found ---		
			383.85	8.70	--- Not Found ---		
		% Abundances Found =		44.96			
PB-210	22.26Y	0.00	10.80	24.30	--- Not Found ---		Abun.
			46.50*	4.05	6.623E+00	42.92	
		% Abundances Found =		14.29			
PA-234	4.47E+09Y	0.00	9.89	89.00	--- Not Found ---		Abun.
			21.72*	64.90	1.790E+00	40.87	
			37.93	23.75	--- Not Found ---		
			131.42	20.40	--- Not Found ---		
		% Abundances Found =		32.77			
NP-237	2.14E+06Y	0.00	29.37	14.00	5.601E-01	180.11	Abun.
			86.50*	12.60	--- Not Found ---		
		% Abundances Found =		52.63			

Flag: "*" = Keyline

Spectr[illegible] : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_[illegible]114103_GE5_LPGAS5_48009.CNF;1
Title :
Sample Title: VA-02-0176

Start Time: 26-NOV-2002 17:09	Sample Time: 25-NOV-2002 00:00	Energy Offset: 1.88831E-01
Real Time : 0 01:00:05.24	Sample ID : 0211141-03	Energy Slope : 1.03817E-01
Live Time : 0 01:00:00.00	Sample Type: GRAM	Energy Quad : -1.02782E-08



00714

Channel Contents for [GAMMA.SCUSR.ARCHIVE]SMP_021114103_GE5_LPGAS5_48009.CNF

Channel

1:	0	0	0	0	0	0	0	0
9:	0	3	183	1390	1463	971	553	313
17:	153	92	64	29	18	22	21	13
25:	12	18	8	6	15	11	15	11
33:	9	12	14	9	8	6	11	10
41:	10	12	8	9	11	4	8	8
49:	8	8	7	9	5	7	7	6
57:	8	5	12	10	8	7	6	7
65:	4	3	7	5	4	7	6	3
73:	9	9	10	5	6	3	7	4
81:	8	5	7	6	2	10	5	2
89:	4	5	6	6	5	5	8	8
97:	7	8	7	7	7	7	8	13
105:	9	14	8	7	8	3	9	5
113:	5	4	5	4	9	10	3	5
121:	4	5	5	4	4	6	4	5
129:	5	11	9	3	6	4	6	2
137:	3	5	3	3	4	5	8	4
145:	5	9	3	5	5	4	4	10
153:	1	7	5	8	6	2	8	11
161:	9	7	9	5	6	6	3	10
169:	4	4	5	7	3	6	3	9
177:	3	7	5	6	4	4	9	7
185:	9	10	2	5	9	3	8	5
193:	5	8	14	9	13	27	34	48
201:	48	66	37	47	23	27	23	32
209:	33	36	36	26	28	21	11	9
217:	7	1	5	5	6	9	8	6
225:	10	11	18	16	12	10	10	8
233:	11	3	6	16	10	12	13	7
241:	13	7	8	9	10	8	3	5
249:	3	8	6	6	4	1	7	6
257:	9	11	12	15	13	8	7	12
265:	3	9	3	5	2	4	4	4
273:	2	5	7	4	3	6	5	7
281:	6	8	9	7	12	12	9	8
289:	11	3	2	7	6	3	7	5
297:	3	5	10	3	3	7	8	8
305:	17	12	7	11	4	5	4	4
313:	7	6	7	5	7	6	4	1
321:	7	7	6	5	4	8	6	6
329:	8	8	14	7	8	7	6	9
337:	11	9	10	9	14	7	5	12
345:	11	11	8	9	8	3	9	10
353:	10	14	7	7	8	9	8	9
361:	5	5	7	5	4	10	7	9
369:	9	4	10	11	11	16	37	39
377:	44	58	59	73	72	73	104	71
385:	91	80	53	37	26	16	9	7
393:	9	5	3	7	6	6	3	6
401:	6	4	3	6	4	9	9	7
409:	7	7	10	17	11	8	11	6
417:	5	6	2	0	4	6	7	8
425:	3	5	5	6	11	12	15	20

433:	22	26	21	28	21	20	13	12
441:	8	7	6	11	12	12	7	13
449:	5	5	5	5	6	4	3	4
457:	2	2	3	4	0	2	4	4
465:	7	5	1	3	2	5	5	[illegible]
473:	1	3	1	2	5	2	10	4
481:	3	3	3	3	4	5	7	3
489:	3	0	3	3	3	2	5	0
497:	8	0	4	2	4	4	2	5
505:	4	2	6	3	2	4	1	1
513:	4	7	2	2	5	5	5	4
521:	3	5	3	1	4	6	4	4
529:	1	6	3	2	5	1	3	4
537:	3	2	5	2	5	4	3	3
545:	8	2	5	5	3	2	7	0
553:	4	2	1	4	3	3	3	5
561:	4	2	4	3	1	1	3	4
569:	6	2	2	3	3	3	2	6
577:	4	0	2	5	3	6	0	2
585:	1	2	1	2	3	6	1	5
593:	2	1	3	9	2	3	2	5
601:	4	6	4	2	1	4	6	2
609:	4	0	4	2	2	6	1	6
617:	1	4	2	2	4	4	7	7
625:	3	2	4	2	2	4	6	3
633:	3	3	2	7	5	3	0	5
641:	3	1	1	3	2	4	4	2
649:	4	4	4	6	5	4	5	3
657:	1	5	2	2	6	3	4	1
665:	4	8	7	2	3	1	4	[illegible]
673:	2	2	2	4	3	4	2	[illegible]
681:	4	5	3	2	6	3	4	0
689:	6	2	4	4	2	2	4	4
697:	2	3	1	1	4	5	9	1
705:	4	2	9	1	2	7	3	4
713:	1	1	5	4	6	2	4	3
721:	1	2	1	5	2	5	8	5
729:	6	1	4	5	4	5	1	5
737:	3	1	4	3	4	4	2	3
745:	2	6	6	3	4	6	6	4
753:	2	2	4	4	9	15	15	20
761:	15	17	9	12	10	6	5	5
769:	9	4	2	9	4	9	3	6
777:	9	3	9	4	2	1	3	3
785:	3	1	1	7	3	2	3	4
793:	4	7	1	5	1	1	6	1
801:	3	5	6	3	5	5	6	3
809:	4	7	2	5	5	7	3	7
817:	2	3	5	3	5	2	3	7
825:	3	2	3	6	5	6	5	3
833:	3	3	5	6	4	1	7	4
841:	2	3	3	7	3	5	4	10
849:	2	8	4	2	1	3	1	6
857:	8	1	4	2	1	4	5	2
865:	3	4	2	2	1	5	4	4
873:	2	3	4	0	6	1	4	[illegible]
881:	2	5	2	10	2	2	6	1
889:	3	2	1	4	5	3	5	4
897:	7	3	3	2	0	2	1	5
905:	5	3	5	0	2	2	4	7

913:	6	5	0	4	0	4	2	6
921:	1	1	5	3	1	5	1	2
929:	2	3	4	2	3	2	2	5
937:	3	4	2	3	1	6	6	4
945:	5	2	2	5	6	5	4	1
953:	4	4	3	4	4	4	6	7
961:	7	1	4	2	5	5	3	2
969:	5	3	4	8	3	5	4	4
977:	2	10	3	5	1	3	8	5
985:	4	6	4	3	5	3	0	2
993:	2	3	7	3	4	5	4	4
1001:	3	1	6	2	5	2	4	5
1009:	5	2	4	5	3	2	3	4
1017:	3	5	2	1	3	0	7	0
1025:	0	2	3	1	5	3	2	2
1033:	1	1	7	2	3	0	0	2
1041:	7	6	4	7	1	2	4	1
1049:	4	4	1	2	4	4	3	5
1057:	5	1	5	9	0	5	5	1
1065:	2	5	5	5	7	1	5	2
1073:	4	3	3	5	5	3	4	6
1081:	3	2	4	11	3	3	10	1
1089:	6	2	4	4	2	1	5	5
1097:	7	7	0	6	1	2	1	4
1105:	5	2	3	2	4	5	2	9
1113:	3	4	4	2	7	4	1	4
1121:	4	4	4	3	2	1	4	1
1129:	4	5	3	4	3	4	6	4
1137:	2	5	3	4	1	5	10	2
1145:	5	2	2	2	3	5	6	5
1153:	3	2	2	3	1	3	9	4
1161:	4	4	5	6	13	15	36	46
1169:	58	56	56	60	50	38	24	24
1177:	17	14	4	8	8	8	13	8
1185:	12	2	8	10	5	5	1	3
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1201:	3	4	2	3	4	3	4	3
1209:	4	1	4	2	2	1	4	1
1217:	2	3	5	3	3	2	8	1
1225:	5	4	3	3	3	4	5	4
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1241:	1	0	0	4	5	3	4	3
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1257:	3	6	1	4	2	4	1	6
1265:	5	3	3	1	5	4	4	0
1273:	5	7	4	4	2	2	2	5
1281:	2	3	3	4	5	3	4	5
1289:	3	4	2	6	5	2	3	1
1297:	4	3	5	3	5	7	5	2
1305:	6	3	2	4	2	4	2	4
1313:	2	2	7	2	3	3	4	5
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1329:	4	2	5	4	3	3	4	2
1337:	6	3	4	0	0	4	3	3
1345:	4	2	5	2	2	2	3	2
1353:	6	1	3	3	1	1	6	1
1361:	5	2	7	3	8	4	6	0
1369:	1	7	1	5	6	2	5	7
1377:	2	3	3	4	4	3	2	6
1385:	5	4	7	2	3	3	5	3

1393:	4	3	5	2	3	4	2	4
1401:	5	2	1	2	4	5	3	4
1409:	4	2	3	3	3	2	3	5
1417:	4	2	2	4	3	5	4	4
1425:	4	4	1	1	4	6	3	[illegible]
1433:	3	5	2	5	2	5	5	[illegible]
1441:	6	1	4	3	6	2	8	3
1449:	3	3	1	3	9	2	3	3
1457:	0	3	1	3	6	5	4	3
1465:	4	7	10	4	4	4	2	6
1473:	2	2	3	4	9	4	3	1
1481:	2	1	5	3	3	7	4	1
1489:	4	5	2	4	7	5	3	5
1497:	4	2	6	6	5	6	9	5
1505:	5	1	7	5	3	4	6	2
1513:	4	2	4	2	2	5	6	4
1521:	1	3	2	7	3	3	4	1
1529:	4	2	0	6	4	6	4	3
1537:	5	3	2	2	4	2	6	2
1545:	2	8	7	9	5	2	10	6
1553:	11	6	9	12	10	8	7	4
1561:	4	2	9	6	5	8	3	4
1569:	6	0	7	2	3	4	1	5
1577:	3	7	0	5	5	2	10	4
1585:	11	4	3	2	7	4	4	4
1593:	5	2	4	4	3	2	4	5
1601:	2	3	3	4	3	2	2	4
1609:	3	4	3	1	4	3	1	3
1617:	5	5	5	5	6	1	0	1
1625:	4	5	4	3	3	1	3	[illegible]
1633:	4	4	6	2	4	3	3	[illegible]
1641:	3	6	3	2	4	4	7	9
1649:	1	3	8	3	1	5	4	3
1657:	2	5	4	2	5	5	6	3
1665:	2	3	3	0	5	0	5	6
1673:	3	4	2	3	4	3	4	1
1681:	5	7	4	3	4	4	4	2
1689:	3	7	3	5	5	7	2	2
1697:	3	1	1	1	7	1	6	4
1705:	6	6	0	2	2	1	2	3
1713:	6	3	4	4	3	2	3	2
1721:	3	3	3	2	1	2	3	3
1729:	5	5	2	2	4	1	3	3
1737:	7	1	1	3	3	1	4	3
1745:	3	5	1	1	4	3	1	1
1753:	5	3	1	10	4	4	0	2
1761:	3	4	3	4	1	0	6	4
1769:	4	5	2	3	3	1	0	5
1777:	2	5	0	3	2	3	4	3
1785:	6	7	7	6	3	1	6	4
1793:	3	2	5	4	5	3	2	2
1801:	3	2	1	2	1	5	3	3
1809:	3	0	8	3	3	3	2	4
1817:	3	3	4	2	2	3	8	3
1825:	4	1	3	2	5	1	1	2
1833:	1	2	2	0	1	2	2	[illegible]
1841:	4	8	7	2	5	5	3	2
1849:	1	1	9	6	4	3	3	6
1857:	2	2	2	4	5	2	2	1
1865:	2	3	1	4	1	4	3	7

1873:	2	3	2	2	1	7	5	4
1881:	1	0	3	1	4	4	2	2
1889:	4	5	1	6	2	8	5	6
1897:	4	3	2	5	4	4	3	7
1905:	4	3	4	4	4	3	6	4
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1921:	0	7	4	1	7	3	10	3
1929:	1	5	2	4	2	3	3	4
1937:	1	0	3	2	0	4	6	4
1945:	3	5	3	2	3	3	2	6
1953:	0	0	1	3	6	5	1	2
1961:	3	4	7	3	1	2	3	4
1969:	3	1	6	2	2	6	3	3
1977:	4	4	3	4	6	3	3	2
1985:	4	2	2	1	6	4	6	2
1993:	3	2	2	4	7	4	4	5
2001:	1	4	2	3	7	2	4	8
2009:	4	1	2	3	4	1	3	7
2017:	4	3	2	3	5	3	7	3
2025:	1	6	3	8	7	5	0	5
2033:	4	2	6	4	5	2	4	3
2041:	2	1	1	3	2	5	4	6
2049:	9	1	0	4	6	2	1	4
2057:	0	2	2	3	1	3	5	2
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2073:	3	5	3	0	3	2	5	2
2081:	2	3	5	2	3	4	2	3
2089:	5	7	4	7	2	1	3	4
2097:	5	5	7	3	5	5	4	4
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2113:	1	2	6	4	2	5	3	3
2121:	2	3	9	4	5	1	1	3
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2137:	6	1	4	1	8	3	5	2
2145:	6	3	1	4	2	3	3	2
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2161:	3	3	3	2	2	2	4	3
2169:	2	2	3	2	4	3	2	4
2177:	4	8	6	4	5	8	2	2
2185:	1	1	2	4	2	6	3	5
2193:	4	2	2	1	4	6	3	2
2201:	4	4	0	1	6	7	2	2
2209:	3	6	3	3	1	3	4	3
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2225:	4	3	2	3	4	3	4	5
2233:	4	2	1	1	4	3	2	3
2241:	2	2	7	1	4	6	5	7
2249:	4	3	2	3	4	2	3	3
2257:	2	2	5	3	2	4	5	5
2265:	2	4	4	4	6	2	3	5
2273:	4	4	4	1	0	4	4	3
2281:	2	2	3	4	4	3	2	4
2289:	1	7	5	3	4	5	0	3
2297:	5	7	3	3	4	2	4	1
2305:	5	2	3	3	2	2	3	3
2313:	5	2	3	1	7	3	2	5
2321:	6	2	1	7	1	3	2	2
2329:	1	7	9	4	4	2	3	4
2337:	1	2	3	10	3	2	2	2
2345:	1	1	4	1	8	7	6	5

2353:	10	6	5	10	12	4	6	12
2361:	2	1	3	2	4	4	1	3
2369:	4	9	3	5	5	4	1	4
2377:	3	2	0	2	5	2	3	3
2385:	2	2	5	2	5	8	2	[illegible]
2393:	3	0	2	1	2	2	2	2
2401:	2	2	4	6	5	0	1	6
2409:	1	2	4	0	3	4	2	3
2417:	0	3	0	7	4	4	2	5
2425:	3	1	2	3	4	8	2	2
2433:	1	2	5	3	3	4	1	3
2441:	6	2	3	6	3	1	1	3
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2457:	0	4	4	3	4	4	4	5
2465:	4	2	7	1	4	4	3	3
2473:	4	4	2	3	3	2	2	0
2481:	3	8	1	6	1	7	3	3
2489:	3	5	3	2	4	6	2	2
2497:	6	0	2	1	3	3	4	4
2505:	6	3	2	6	0	3	1	3
2513:	1	4	1	2	3	4	2	4
2521:	3	3	2	5	6	2	2	4
2529:	4	3	3	1	4	5	4	1
2537:	4	5	3	4	2	2	3	4
2545:	4	2	2	2	1	1	3	5
2553:	1	4	1	0	2	4	2	2
2561:	3	1	3	1	3	3	1	1
2569:	5	3	3	3	4	7	2	4
2577:	4	1	0	3	0	1	6	4
2585:	0	3	3	5	7	5	2	[illegible]
2593:	2	1	4	3	4	2	2	[illegible]
2601:	0	5	3	2	2	1	3	2
2609:	4	1	4	5	2	2	2	1
2617:	1	5	1	1	1	1	1	2
2625:	3	1	7	2	3	5	1	4
2633:	4	2	6	1	4	2	0	2
2641:	1	5	4	3	3	2	6	5
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2657:	3	6	2	4	3	3	3	1
2665:	4	1	5	4	1	2	2	6
2673:	1	3	3	5	2	1	5	0
2681:	4	3	5	1	2	0	3	1
2689:	3	3	3	3	1	1	1	7
2697:	2	3	5	3	2	4	3	0
2705:	0	1	5	6	1	2	1	3
2713:	2	7	3	0	7	2	1	0
2721:	3	0	3	3	2	3	5	1
2729:	4	4	4	3	1	1	5	3
2737:	2	7	6	1	2	6	3	2
2745:	4	4	4	2	1	3	2	2
2753:	5	1	5	5	3	1	2	3
2761:	1	2	1	2	4	3	4	2
2769:	2	2	4	0	2	4	3	2
2777:	2	1	1	2	1	3	5	1
2785:	2	3	1	4	6	1	3	1
2793:	5	5	2	1	1	3	2	[illegible]
2801:	2	4	2	2	0	4	5	4
2809:	0	2	2	1	6	0	4	2
2817:	3	1	3	2	2	1	4	1
2825:	3	1	3	4	0	3	8	4

2833:	1	5	0	3	1	5	3	1
2841:	1	2	3	4	3	1	4	2
2849:	2	0	3	0	2	3	3	2
2857:	0	4	1	1	0	0	3	3
2865:	1	1	2	5	1	2	3	4
2873:	1	1	0	1	1	1	2	3
2881:	2	2	1	4	0	2	2	5
2889:	1	3	2	6	2	0	2	6
2897:	3	2	3	4	4	2	2	3
2905:	1	1	3	2	3	3	3	1
2913:	5	2	4	2	0	3	2	3
2921:	1	2	0	0	2	4	2	4
2929:	3	0	4	3	3	4	3	4
2937:	4	3	0	6	3	1	4	1
2945:	2	1	3	2	4	1	2	2
2953:	3	3	2	3	3	3	1	0
2961:	2	5	2	1	2	3	1	2
2969:	2	1	2	1	4	3	2	1
2977:	1	1	2	0	0	1	0	3
2985:	4	3	4	5	3	1	1	3
2993:	4	1	1	3	1	3	0	2
3001:	3	4	2	1	2	2	2	3
3009:	0	2	5	2	1	4	3	1
3017:	5	1	1	2	4	2	2	2
3025:	1	3	2	1	2	1	3	0
3033:	1	2	3	2	1	3	2	3
3041:	0	3	1	0	2	2	0	1
3049:	3	1	0	3	1	2	3	3
3057:	3	2	3	4	3	4	3	2
3065:	1	4	3	0	0	2	3	1
3073:	1	2	4	4	2	2	0	1
3081:	2	3	1	2	0	2	2	5
3089:	0	1	1	0	3	1	1	4
3097:	3	6	3	1	4	0	0	3
3105:	1	2	3	2	0	0	2	4
3113:	2	4	1	1	7	2	1	4
3121:	2	4	3	4	1	0	3	5
3129:	3	2	2	0	4	4	1	1
3137:	4	3	1	4	2	3	2	1
3145:	1	0	3	1	1	2	2	2
3153:	3	1	3	1	3	1	0	1
3161:	4	1	4	1	0	0	1	3
3169:	3	1	0	3	1	5	1	1
3177:	1	3	0	1	2	3	3	2
3185:	0	3	0	0	4	2	0	3
3193:	2	3	4	1	1	1	2	1
3201:	4	2	1	5	1	1	4	2
3209:	0	2	2	4	2	2	0	5
3217:	0	1	6	4	4	5	2	2
3225:	2	2	0	3	3	2	0	3
3233:	3	4	3	3	2	1	1	0
3241:	1	2	2	4	1	1	1	3
3249:	2	3	4	3	3	4	1	3
3257:	0	0	1	4	4	6	6	3
3265:	1	1	0	1	4	1	1	1
3273:	1	1	1	3	1	2	2	1
3281:	1	4	2	1	1	2	0	0
3289:	2	2	4	1	1	3	2	1
3297:	2	4	0	3	4	2	4	0
3305:	6	1	4	6	8	7	15	13

3313:	19	15	19	13	16	10	6	10
3321:	4	5	2	2	0	4	1	2
3329:	2	2	3	0	2	1	3	2
3337:	3	2	4	4	3	2	2	3
3345:	2	1	4	0	2	3	3	[illegible]
3353:	2	2	2	4	0	2	1	[illegible]
3361:	2	2	3	5	0	0	7	0
3369:	4	6	2	2	0	2	2	4
3377:	4	2	0	4	2	2	1	1
3385:	2	6	1	6	2	3	1	2
3393:	7	5	2	1	3	4	2	1
3401:	4	4	5	3	3	0	2	0
3409:	1	3	2	2	1	4	2	8
3417:	4	3	2	4	5	3	3	3
3425:	1	1	2	6	4	4	2	1
3433:	0	1	2	1	2	5	1	2
3441:	2	1	1	1	0	1	3	3
3449:	1	1	1	3	1	0	0	0
3457:	1	3	1	0	3	1	1	1
3465:	4	0	0	1	1	0	1	2
3473:	1	1	1	2	1	0	3	2
3481:	1	3	2	1	3	4	1	1
3489:	5	1	2	4	3	2	0	1
3497:	2	1	4	4	1	1	3	1
3505:	2	4	2	4	4	1	1	1
3513:	1	2	2	1	4	4	4	0
3521:	4	5	1	0	1	1	0	1
3529:	2	1	0	2	3	2	2	3
3537:	4	1	2	4	4	1	4	1
3545:	3	2	3	1	1	3	2	1
3553:	3	1	3	1	4	2	1	[illegible]
3561:	2	2	1	2	2	1	0	2
3569:	6	5	0	2	2	3	3	3
3577:	5	3	3	6	3	2	1	5
3585:	2	3	3	6	1	4	1	4
3593:	2	2	3	2	3	1	7	1
3601:	0	5	3	1	4	1	1	2
3609:	1	1	2	4	1	2	0	1
3617:	3	0	2	2	1	0	1	1
3625:	2	0	6	6	1	2	0	1
3633:	1	2	1	4	3	2	1	0
3641:	3	2	4	1	0	4	2	1
3649:	3	5	1	3	1	3	1	1
3657:	2	2	5	1	1	0	4	1
3665:	3	5	4	1	1	3	2	1
3673:	3	4	1	4	0	2	1	6
3681:	0	3	2	2	2	2	1	4
3689:	2	6	2	2	4	1	3	0
3697:	4	1	6	2	5	1	1	3
3705:	2	4	0	6	4	3	2	3
3713:	2	1	1	1	2	2	0	2
3721:	5	2	1	1	4	0	2	0
3729:	6	2	1	2	1	4	1	2
3737:	1	1	2	2	2	4	1	4
3745:	3	0	2	2	4	0	0	0
3753:	1	4	2	1	4	2	4	[illegible]
3761:	4	5	4	2	0	2	2	2
3769:	3	3	1	2	4	4	3	1
3777:	3	1	2	2	6	1	1	5
3785:	0	2	2	2	0	1	2	2

3793:	2	1	2	1	1	3	2	3
3801:	0	2	2	0	1	2	3	1
3809:	2	2	2	1	2	1	1	3
3817:	2	0	1	3	3	2	1	3
3825:	4	2	0	2	2	4	5	0
3833:	0	3	1	1	1	2	0	3
3841:	2	2	0	1	2	2	1	3
3849:	1	0	3	2	0	6	0	4
3857:	1	3	6	3	4	1	2	3
3865:	1	2	1	2	2	5	3	2
3873:	3	4	3	4	2	2	4	0
3881:	2	1	3	4	0	3	3	1
3889:	1	3	0	1	1	1	4	1
3897:	0	0	0	1	2	3	2	2
3905:	0	1	1	1	3	2	2	3
3913:	1	1	1	1	3	1	0	1
3921:	1	2	2	2	3	5	2	2
3929:	1	0	3	1	2	1	1	2
3937:	2	1	1	3	5	3	3	3
3945:	2	2	2	4	2	1	5	2
3953:	2	1	3	4	1	2	2	3
3961:	2	4	3	2	2	2	1	0
3969:	1	0	4	3	1	0	3	2
3977:	3	2	1	1	1	0	1	1
3985:	2	1	2	2	2	2	3	3
3993:	2	3	3	1	4	2	1	2
4001:	0	0	2	3	3	2	1	0
4009:	2	0	1	2	1	3	2	1
4017:	2	2	3	1	4	2	4	1
4025:	0	2	3	2	0	0	1	1
4033:	2	1	0	4	2	4	0	2
4041:	4	1	3	1	2	0	2	5
4049:	3	0	3	3	1	4	0	3
4057:	4	1	2	2	4	3	1	3
4065:	1	1	2	1	3	3	2	3
4073:	2	4	2	0	2	1	0	0
4081:	2	1	2	3	5	4	0	0
4089:	2	2	1	0	0	5	0	2

AC11/26/02

Sample ID : 0211141-04 Acquisition date : 26-NOV-2002 18:10:53

/VMS Peak Search Report Generated 26-NOV-2002 19:11:16.85

Configuration : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_021114104_GE5_LPGAS5_48013.CN
Analyses by : PEAK V16.9 ENBACK V1.6 PEAKEFF V2.2
Client ID : VA-02-0176
Deposition Date :
Sample Date : 25-NOV-2002 00:00:00 Acquisition date : 26-NOV-2002 18:10:53
Sample ID : 0211141-04 Sample Quantity : 2.84190E+01 GRAM
Sample type : SOIL Sample Geometry : 0
Detector name : GE5 Detector Geometry: LPGAS-5
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:05.17 0.1%
Start channel : 1 End channel : 4096
Sensitivity : 3.00000 Gaussian : 15.00000
Critical level : No

Post-NID Peak Search Report

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides
1	11.14*	85	68	0.64	105.46	96	18	44.0	3.17E+00	PA-234
										PB-210
4	21.01	272	105	0.67	200.58	187	47	20.9	1.95E+00	
4	22.09	217	109	0.67	210.92	187	47	26.6		PA-234
4	23.79	35	71	0.68	227.38	187	47	92.1		
4	23.82	44	71	0.68	227.61	187	47	74.4		
[illegible]	27.29	64	65	0.69	261.03	254	15	52.5	1.24E+00	
[illegible]	39.49*	354	91	0.72	378.57	369	25	19.5	1.86E+00	
2	40.07*	570	81	0.72	384.19	369	25	12.2		
1	45.39	132	152	0.73	435.38	425	21	42.5	1.89E+00	PB-210
1	79.15	114	65	0.79	760.59	752	19	33.8	1.48E+00	
1	121.73	434	73	0.85	1170.82	1158	34	12.6	2.52E+00	CO-57
1	122.95	71	49	0.85	1182.57	1158	34	54.9		
1	135.76	39	53	0.87	1306.01	1294	20	75.4	3.64E+00	CO-57
1	244.76	39	80	0.98	2356.39	2345	22	91.1	2.37E+00	
1	344.02	113	56	1.06	3312.98	3297	32	34.7	1.80E+00	
1	344.62	60	36	1.06	3318.76	3297	32	53.5		

AG 12/2/02

Sample ID : 0211141-04 Acquisition date : 26-NOV-2002 18:10:53

Total number of lines in spectrum	16	
Number of unidentified lines	10	
Number of lines tentatively identified by NID	6	37.50%

Nuclide Type : FISSION

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CO-57	270.90D	1.00	1.015E+00	1.019E+00	0.181E+00	17.71	
PB-210	22.26Y	1.00	6.665E+00	6.666E+00	2.945E+00	44.18	
		Total Activity :	7.680E+00	7.686E+00			

Nuclide Type : NATURAL

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/GRAM	Wtd Mean Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
PA-234	4.47E+09Y	1.00	1.904E+00	1.904E+00	0.790E+00	41.48	
		Total Activity :	1.904E+00	1.904E+00			

Grand Total Activity : 9.584E+00 9.590E+00

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

Sample ID : 0211141-04
Acquisition date : 26-NOV-2002 18:10:53

Nuclide Type: FISSION

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
CO-57	122.06	85.51*	1.295E+01	1.035E+00	1.040E+00	18.16	OK
	136.48	10.60	1.205E+01	7.986E-01	8.022E-01	76.75	OK

Final Mean for 2 Valid Peaks = 1.019E+00+/- 1.806E-01 (17.71%)

PB-210	10.80	24.30	6.447E-01	1.429E+01	1.430E+01	231.49	<<WM Interf
	46.50	4.05*	1.294E+01	6.665E+00	6.666E+00	44.18	OK

Final Mean for 1 Valid Peaks = 6.666E+00+/- 2.945E+00 (44.18%)

Nuclide Type: NATURAL

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
PA-234	9.89	89.00	4.639E-01	5.424E+00	5.424E+00	318.91	<<WM Interf
	21.72	64.90*	4.644E+00	1.904E+00	1.904E+00	41.48	OK
	37.93	23.75	1.088E+01	-----	Line Not Found	-----	Absent
	131.42	20.40	1.237E+01	-----	Line Not Found	-----	Absent

Final Mean for 1 Valid Peaks = 1.904E+00+/- 7.898E-01 (41.48%)

Flag: "*" = Keyline

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
CO-57	1.019E+00	1.806E-01	1.098E-01	1.368E-02	9.281
PB-210	6.666E+00	2.945E+00	2.339E+00	2.648E-01	2.851
PA-234	1.904E+00	7.898E-01	5.156E-01	1.627E-01	3.693

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

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Ided	Act error	MDA (pCi/GRAM)	MDA error	Act/MDA
FE-55	2.949E+01		9.731E+02	1.363E+02	4.484E+03	0.216
NI-59	-7.084E+00		1.080E+02	4.658E+01	6.870E+02	-0.152
CD-109	8.907E-01		1.309E+00	2.397E+00	2.305E-01	0.372
I-125	1.411E+00		1.416E+00	2.533E+00	3.663E-01	0.557
I-129	-5.719E-02		1.973E-01	3.259E-01	5.912E-02	-0.175
BA-133	1.052E-01		1.707E-01	2.624E-01	4.303E-02	0.401
CE-144	-1.612E-02		6.067E-01	8.966E-01	1.190E-01	-0.018
PA-231	-4.127E+00		1.780E+01	8.407E+00	3.410E+01	-0.491
TH-231	-7.655E-01		2.330E+00	1.579E+00	3.635E-01	-0.485
TH-234	-2.279E-03		1.166E+00	2.041E+00	2.008E-01	-0.001
NP-237	1.059E-01		3.908E-01	6.980E-01	6.698E-02	0.152
[illegible]37	4.225E-01		4.899E-01	8.736E-01	2.825E-01	0.484
AM-241	-5.821E-03		1.225E-01	2.145E-01	2.151E-02	-0.027
AM-243	5.609E-02		6.948E-02	1.269E-01	1.674E-02	0.442

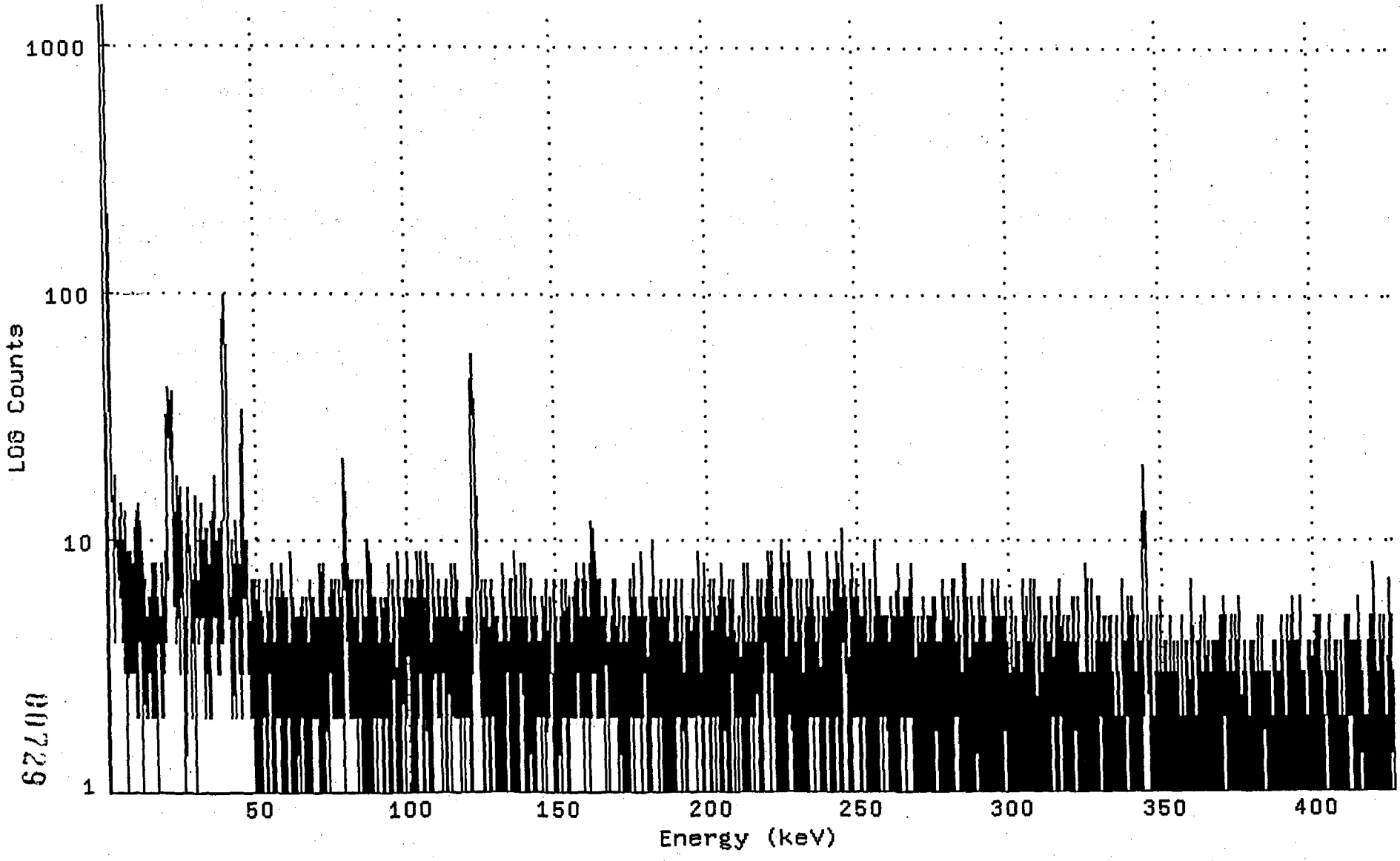
Sample ID : 0211141-04
Acquisition date : 26-NOV-2002 18:10:53

Nuclide	Half-life	Half-Life Ratio	Energy	%Abund	Activity (pCi/GRAM)	2-Sigma %Error	Rejected by
I-129	1.57E+07Y	0.00	29.78*	57.00	--- Not Found ---		Abun.
			33.60	13.20	--- Not Found ---		
			39.58	7.52	1.096E+01	23.73	
		% Abundances Found =		9.68			
PA-231	3.28E+04Y	0.00	9.28*	42.00	--- Not Found ---		Abun.
			10.11	20.20	2.197E+01	293.70	
			283.67	1.60	--- Not Found ---		
			302.67	2.30	--- Not Found ---		
		% Abundances Found =		30.56			

Flag: "*" = Keyline

Spectr : DKA100:[GAMMA.SCUSR.ARCHIVE]SMP_ 114104_GE5_LPGAS5_48013.CNF;1
Title :
Sample Title: VA-02-0176

Start Time: 26-NOV-2002 18:10	Sample Time: 25-NOV-2002 00:00	Energy Offset: 1.88831E-01
Real Time : 0 01:00:05.17	Sample ID : 0211141-04	Energy Slope : 1.03817E-01
Live Time : 0 01:00:00.00	Sample Type: SOIL	Energy Quad : -1.02782E-08



007729

Channel Contents for [GAMMA.SCUSR.ARCHIVE]SMP_021114104_GE5_LPGAS5_48013.CNF

Channel								
1:	0	0	0	0	0	0	0	0
9:	0	6	174	1387	1440	926	557	278
17:	156	84	40	19	15	24	8	15
25:	4	9	10	7	12	14	14	13
33:	18	11	9	9	8	8	7	8
41:	8	7	10	8	6	11	14	4
49:	6	7	10	5	9	3	7	9
57:	7	10	4	13	9	6	5	1
65:	8	4	4	9	7	4	3	6
73:	8	7	6	9	5	9	6	6
81:	3	7	8	3	4	8	3	7
89:	2	11	5	4	4	7	5	2
97:	9	8	5	6	13	4	8	9
105:	8	13	14	7	12	8	5	7
113:	0	5	4	7	9	8	3	3
121:	2	3	6	7	6	3	3	2
129:	5	3	4	6	6	3	4	4
137:	3	3	5	2	6	5	4	7
145:	7	8	5	4	2	7	5	8
153:	7	8	2	6	7	4	7	1
161:	8	4	5	6	6	6	5	3
169:	5	4	2	5	5	2	3	5
177:	8	5	4	6	4	5	6	4
185:	3	9	4	8	6	8	6	[illegible]
193:	7	11	13	7	26	26	38	40
201:	38	41	41	30	21	27	27	28
209:	36	30	38	40	33	25	13	6
217:	5	13	4	7	4	9	5	12
225:	14	18	10	9	13	15	11	7
233:	3	9	6	7	16	15	9	10
241:	7	5	12	6	10	1	2	2
249:	5	5	2	2	7	5	3	8
257:	5	7	16	13	12	16	9	13
265:	7	3	4	2	2	8	4	6
273:	7	5	6	5	7	4	6	8
281:	1	5	8	15	7	15	8	9
289:	5	6	4	7	5	5	4	6
297:	6	11	6	6	8	5	6	6
305:	7	14	8	3	5	10	6	2
313:	7	4	3	5	3	8	11	5
321:	5	2	11	4	2	4	7	6
329:	8	2	5	4	11	9	12	8
337:	5	13	8	5	6	6	10	5
345:	8	6	9	8	18	5	7	9
353:	10	5	3	6	3	9	9	9
361:	11	8	8	9	7	11	4	8
369:	4	11	5	10	9	16	22	32
377:	56	60	78	70	68	79	98	92
385:	87	65	57	23	21	12	10	12
393:	2	4	5	6	6	2	3	[illegible]
401:	10	6	5	5	2	6	8	6
409:	5	6	5	9	10	12	6	5
417:	9	5	5	3	5	7	2	8
425:	7	6	4	7	3	15	12	18

433:	16	18	33	27	25	19	10	6
441:	10	8	6	6	7	9	10	9
449:	6	4	3	6	4	2	3	2
457:	3	3	7	2	2	5	2	4
465:	3	7	1	5	7	4	3	4
473:	7	2	0	2	6	1	2	4
481:	5	2	5	7	1	2	4	2
489:	7	4	2	0	4	4	5	2
497:	5	4	2	2	5	2	1	4
505:	3	0	3	4	0	5	6	3
513:	7	4	5	3	3	3	3	5
521:	6	2	1	4	1	4	3	1
529:	4	4	8	2	2	3	1	3
537:	2	4	4	2	3	6	5	4
545:	4	2	7	5	2	2	6	1
553:	6	3	5	1	5	3	2	2
561:	8	5	2	1	3	4	5	4
569:	3	2	4	1	4	6	3	6
577:	2	3	3	2	2	2	4	3
585:	0	1	4	1	4	9	4	9
593:	3	1	2	6	5	3	4	4
601:	5	4	4	1	2	4	5	3
609:	3	3	5	3	1	3	4	5
617:	4	3	2	4	4	5	6	2
625:	2	1	3	2	3	1	1	5
633:	3	4	3	5	6	2	1	2
641:	2	2	4	3	4	1	5	3
649:	7	1	6	2	6	6	4	3
657:	5	4	2	5	3	6	3	2
665:	2	4	5	5	3	4	2	2
673:	3	5	5	3	1	4	4	2
681:	4	8	1	5	6	3	2	1
689:	7	8	6	3	4	3	1	3
697:	4	2	3	5	3	2	3	1
705:	2	5	3	4	6	4	3	6
713:	5	3	3	7	3	2	5	2
721:	2	4	5	5	6	7	3	3
729:	5	2	3	5	5	5	2	2
737:	3	7	2	6	3	3	5	6
745:	3	2	3	3	6	2	4	1
753:	4	8	6	4	10	19	17	11
761:	21	16	15	8	7	5	6	8
769:	2	4	4	5	8	6	6	5
777:	7	6	2	3	2	7	2	3
785:	5	2	2	2	5	2	3	5
793:	0	1	5	4	7	4	3	4
801:	2	2	2	7	1	1	4	3
809:	2	2	4	7	4	1	6	5
817:	3	4	1	5	2	4	4	4
825:	5	5	5	1	4	7	3	1
833:	10	4	3	1	5	8	7	9
841:	4	1	2	4	4	6	8	3
849:	5	2	4	6	5	3	5	2
857:	6	0	1	5	2	4	2	4
865:	4	4	2	2	2	2	2	4
873:	4	1	6	3	6	2	5	2
881:	4	1	5	6	2	4	5	5
889:	2	4	6	3	1	4	4	8
897:	1	6	6	3	6	0	4	2
905:	3	4	2	4	4	7	5	4

913:	5	4	3	6	0	1	2	2
921:	2	3	1	3	2	5	5	3
929:	6	1	9	3	6	1	2	0
937:	4	4	4	4	4	5	3	5
945:	1	6	2	5	6	3	4	[illegible]
953:	7	2	3	3	4	4	5	[illegible]
961:	4	5	3	6	3	3	2	0
969:	6	3	7	4	3	1	6	2
977:	4	2	1	1	2	6	1	5
985:	4	2	3	2	9	5	4	8
993:	6	7	3	3	5	3	4	3
1001:	1	9	3	2	5	7	4	2
1009:	3	1	3	4	6	3	3	4
1017:	9	3	4	2	1	8	0	4
1025:	4	8	5	2	1	3	1	1
1033:	0	4	2	4	5	6	8	3
1041:	3	4	3	5	6	6	3	5
1049:	3	3	2	2	4	5	3	7
1057:	2	4	5	1	6	2	1	4
1065:	2	5	5	3	3	5	5	3
1073:	4	6	5	6	0	7	4	4
1081:	0	5	6	6	3	4	5	4
1089:	6	1	5	1	3	5	1	4
1097:	3	4	8	4	4	6	2	3
1105:	3	6	4	3	2	4	8	7
1113:	2	7	2	3	2	2	2	4
1121:	2	4	1	2	5	4	2	3
1129:	4	3	2	4	5	1	5	5
1137:	5	3	5	4	5	5	2	3
1145:	6	2	3	6	3	6	1	[illegible]
1153:	6	6	3	3	3	4	1	[illegible]
1161:	6	4	3	7	6	17	28	38
1169:	53	54	57	43	52	32	37	19
1177:	13	4	8	4	15	11	7	11
1185:	10	8	5	4	3	4	2	2
1193:	5	1	4	3	2	7	2	4
1201:	3	4	1	5	3	6	2	3
1209:	3	7	5	4	6	4	1	4
1217:	3	4	3	2	1	2	3	7
1225:	4	2	6	2	6	6	1	4
1233:	2	4	2	2	5	4	0	3
1241:	2	3	3	4	5	1	3	4
1249:	1	2	4	3	3	3	2	4
1257:	2	0	2	1	6	8	2	2
1265:	6	2	2	1	6	4	3	3
1273:	5	5	5	4	3	4	1	4
1281:	3	1	0	1	3	3	1	6
1289:	7	3	4	2	1	4	7	2
1297:	2	4	5	2	0	2	4	3
1305:	8	1	8	9	6	2	4	7
1313:	1	1	4	4	5	0	5	3
1321:	5	4	3	5	3	5	3	6
1329:	8	3	3	3	2	2	5	5
1337:	2	1	1	4	4	5	8	3
1345:	0	4	2	5	4	1	2	4
1353:	2	4	4	3	0	5	6	[illegible]
1361:	6	7	2	4	4	5	1	5
1369:	3	6	1	1	3	3	4	5
1377:	2	5	3	4	4	3	3	3
1385:	3	2	4	4	4	4	1	3

1393:	2	4	3	2	2	6	5	3
1401:	4	1	1	4	1	3	3	7
1409:	5	2	5	3	4	2	4	4
1417:	4	5	6	4	3	5	3	3
1425:	3	1	2	3	3	1	7	1
1433:	5	3	4	4	5	2	3	3
1441:	1	2	4	3	3	4	2	5
1449:	2	4	0	1	0	7	2	2
1457:	5	2	5	3	2	3	2	5
1465:	4	7	4	1	6	4	3	2
1473:	3	3	2	1	5	6	4	2
1481:	4	4	4	3	2	4	3	3
1489:	4	2	5	4	6	5	3	4
1497:	3	4	5	2	2	6	8	5
1505:	4	3	4	5	3	3	2	5
1513:	2	7	3	2	3	3	3	5
1521:	0	1	2	7	0	2	2	8
1529:	6	6	3	8	6	2	3	3
1537:	3	4	5	1	4	4	5	5
1545:	2	5	8	5	6	7	3	9
1553:	4	7	6	12	8	11	7	6
1561:	3	5	6	4	9	4	4	2
1569:	7	2	3	3	3	4	4	2
1577:	3	7	2	3	4	2	4	5
1585:	5	4	3	5	4	3	1	2
1593:	2	5	5	4	4	6	4	3
1601:	3	4	1	4	4	3	4	3
1609:	4	2	3	5	3	2	3	2
1617:	5	2	7	4	5	3	3	7
1625:	2	5	6	2	7	3	2	2
1633:	4	1	1	2	2	3	4	6
1641:	2	0	2	2	4	2	1	5
1649:	3	1	3	4	3	3	4	3
1657:	1	5	3	3	0	1	4	1
1665:	3	2	4	5	4	1	1	4
1673:	5	7	3	2	2	4	2	6
1681:	0	6	3	3	5	4	4	8
1689:	2	4	4	4	6	6	2	3
1697:	4	4	5	5	2	3	3	4
1705:	2	4	1	5	2	4	3	9
1713:	2	5	5	3	3	4	3	4
1721:	5	1	5	5	4	2	3	3
1729:	3	1	1	3	4	4	1	4
1737:	2	6	5	5	5	2	6	2
1745:	3	10	2	4	4	6	3	3
1753:	5	2	6	5	6	5	4	1
1761:	2	3	5	3	4	2	3	2
1769:	4	0	4	6	7	4	2	3
1777:	1	3	3	6	0	1	1	4
1785:	5	5	1	6	5	5	0	5
1793:	4	2	7	7	2	2	1	4
1801:	3	3	4	1	0	1	3	3
1809:	4	2	2	3	2	5	2	0
1817:	6	2	4	7	5	3	4	5
1825:	5	5	3	2	5	1	0	1
1833:	2	2	4	3	4	2	7	3
1841:	3	0	2	1	3	3	2	2
1849:	2	5	4	0	3	4	5	4
1857:	4	2	3	4	5	5	4	2
1865:	5	2	2	3	2	4	4	4

1873:	5	2	7	2	3	3	5	0
1881:	3	2	2	1	4	4	3	4
1889:	3	5	2	9	2	3	2	3
1897:	3	1	2	2	0	3	1	6
1905:	6	1	6	2	5	8	3	[illegible]
1913:	3	5	2	3	3	5	3	4
1921:	1	4	2	2	3	5	2	3
1929:	7	3	1	2	2	2	2	4
1937:	2	4	5	7	4	3	3	1
1945:	5	2	2	3	5	2	3	3
1953:	4	3	0	2	5	6	5	3
1961:	1	4	1	8	3	3	2	3
1969:	1	3	4	2	2	6	5	6
1977:	4	6	2	1	6	3	1	2
1985:	3	1	1	1	4	3	3	5
1993:	7	5	5	3	4	3	5	3
2001:	1	5	7	3	5	4	2	3
2009:	4	3	4	4	4	2	3	1
2017:	0	5	2	2	2	4	2	2
2025:	1	2	2	3	2	6	5	2
2033:	6	3	1	4	3	4	1	5
2041:	2	8	1	4	4	1	3	4
2049:	3	8	1	3	2	2	4	3
2057:	2	4	4	3	2	5	4	1
2065:	2	6	2	3	4	2	5	3
2073:	3	4	3	3	3	3	2	1
2081:	7	2	6	7	1	4	2	5
2089:	6	3	4	7	6	1	6	5
2097:	4	5	4	3	3	4	4	5
2105:	4	4	6	4	4	5	2	[illegible]
2113:	7	5	8	3	1	7	7	[illegible]
2121:	7	6	5	4	3	3	6	5
2129:	5	2	9	3	4	2	3	1
2137:	4	5	2	6	5	2	4	5
2145:	0	1	5	0	3	2	3	1
2153:	4	2	3	5	5	10	4	3
2161:	2	1	1	8	3	1	2	2
2169:	4	3	3	2	1	2	1	4
2177:	4	8	4	5	6	9	5	2
2185:	5	7	3	1	4	4	7	7
2193:	3	1	3	2	0	5	3	0
2201:	4	3	2	4	1	2	2	1
2209:	2	7	6	4	3	3	3	4
2217:	1	7	1	3	1	4	3	3
2225:	1	2	2	1	2	3	2	2
2233:	1	4	2	5	2	0	7	4
2241:	2	2	2	3	5	4	4	5
2249:	6	9	4	2	6	3	7	4
2257:	2	1	2	2	2	2	2	3
2265:	5	5	3	2	3	3	4	2
2273:	2	4	1	6	1	4	1	2
2281:	2	1	3	2	5	1	5	2
2289:	3	0	1	4	6	2	4	2
2297:	2	3	5	5	2	3	5	1
2305:	9	4	4	1	2	4	3	[illegible]
2313:	3	5	7	4	1	2	4	[illegible]
2321:	3	7	1	2	3	3	4	4
2329:	3	6	2	7	2	2	9	7
2337:	1	2	2	5	3	4	2	8
2345:	1	1	5	3	6	3	5	6

2353:	4	8	7	11	11	4	6	4
2361:	3	4	3	4	1	1	6	3
2369:	4	1	1	3	2	3	3	4
2377:	2	4	7	3	1	8	7	2
2385:	4	2	3	5	6	4	4	2
2393:	6	4	5	2	7	7	2	3
2401:	2	5	6	1	1	3	5	4
2409:	1	2	2	2	3	3	5	4
2417:	2	3	3	5	2	1	2	8
2425:	3	1	2	6	2	4	3	1
2433:	2	4	4	1	2	3	5	2
2441:	7	0	1	4	3	1	2	2
2449:	4	1	2	2	1	5	2	4
2457:	2	10	1	1	1	3	5	6
2465:	3	5	4	6	5	6	2	2
2473:	4	5	5	4	3	1	4	3
2481:	4	2	4	5	4	2	3	5
2489:	4	3	1	3	2	2	2	5
2497:	2	1	3	4	1	3	1	6
2505:	0	5	3	3	3	2	5	2
2513:	1	4	4	3	2	1	5	1
2521:	3	3	1	3	1	3	5	8
2529:	5	3	3	1	6	3	2	2
2537:	4	4	5	3	3	2	3	5
2545:	3	1	3	6	5	2	1	5
2553:	3	2	5	6	3	2	6	2
2561:	2	2	3	6	3	3	2	7
2569:	3	8	1	2	2	5	4	3
2577:	5	4	2	1	1	1	3	1
2585:	3	2	1	3	4	3	2	5
2593:	1	1	1	4	1	3	3	2
2601:	1	4	4	1	5	5	4	4
2609:	4	6	0	1	1	0	3	4
2617:	3	3	3	2	5	4	3	1
2625:	2	5	2	1	1	4	5	3
2633:	3	0	2	0	6	2	4	3
2641:	4	1	3	3	6	3	3	3
2649:	2	4	1	3	3	1	1	2
2657:	1	4	2	4	2	1	4	1
2665:	2	2	3	7	4	2	0	2
2673:	3	3	6	3	3	1	3	5
2681:	0	2	0	4	3	3	1	0
2689:	3	1	6	4	1	1	2	3
2697:	1	2	7	1	5	1	4	2
2705:	3	5	7	4	5	3	4	3
2713:	4	4	2	5	4	4	1	6
2721:	6	3	3	2	2	0	3	3
2729:	2	1	2	3	3	1	4	3
2737:	8	4	0	8	2	1	6	0
2745:	0	1	3	2	5	0	6	2
2753:	1	2	0	1	1	5	5	2
2761:	3	1	6	2	2	5	4	1
2769:	5	1	2	4	2	2	2	2
2777:	3	0	4	0	3	3	3	6
2785:	0	3	6	5	5	0	2	4
2793:	2	2	6	1	7	1	0	2
2801:	3	2	1	3	5	1	4	3
2809:	2	2	0	4	2	4	3	1
2817:	1	3	2	2	0	4	2	3
2825:	4	7	0	3	1	0	2	6

2833:	3	0	4	3	3	5	2	2
2841:	1	3	4	3	6	7	2	1
2849:	4	2	5	0	3	2	3	2
2857:	2	3	0	5	2	3	5	3
2865:	3	2	3	1	2	4	3	[illegible]
2873:	1	4	4	4	1	3	0	0
2881:	0	3	3	1	1	2	0	6
2889:	3	3	4	2	1	3	3	2
2897:	2	5	1	4	2	2	2	2
2905:	4	0	3	1	1	3	4	0
2913:	2	4	4	1	0	0	3	3
2921:	2	2	2	1	7	2	3	1
2929:	2	5	5	4	2	3	2	3
2937:	6	1	0	0	3	2	1	3
2945:	1	4	3	4	2	1	7	3
2953:	2	0	3	2	4	0	2	4
2961:	2	7	3	1	1	2	2	0
2969:	0	0	6	1	4	2	2	1
2977:	3	6	2	1	2	2	1	3
2985:	2	3	2	1	2	3	5	4
2993:	1	3	3	4	1	5	5	3
3001:	1	0	3	4	2	1	2	2
3009:	4	1	3	3	2	2	4	3
3017:	3	6	2	2	2	3	1	0
3025:	1	5	2	1	2	5	2	3
3033:	5	1	6	2	2	2	5	3
3041:	3	2	7	3	1	2	0	1
3049:	4	0	0	5	2	2	2	4
3057:	2	1	2	3	3	3	5	1
3065:	1	2	2	4	4	5	2	[illegible]
3073:	1	4	1	2	2	0	1	[illegible]
3081:	1	6	1	1	0	3	2	6
3089:	3	6	5	0	3	4	2	0
3097:	2	6	4	2	4	0	1	3
3105:	0	1	3	0	0	0	3	1
3113:	1	1	1	1	2	1	3	3
3121:	1	3	2	1	1	3	3	8
3129:	1	5	2	3	7	4	2	1
3137:	0	3	3	1	1	2	7	2
3145:	1	3	2	3	2	3	3	0
3153:	3	4	0	3	1	1	3	6
3161:	2	4	0	2	3	2	3	6
3169:	3	2	4	0	1	3	4	1
3177:	5	1	3	2	1	2	3	5
3185:	0	3	5	2	0	2	2	2
3193:	4	0	0	4	5	4	3	2
3201:	3	5	0	2	1	2	3	3
3209:	2	0	2	1	2	2	0	2
3217:	2	0	2	1	4	4	1	3
3225:	5	1	3	1	3	2	2	1
3233:	0	2	2	2	2	2	0	7
3241:	2	0	3	0	2	2	4	1
3249:	2	2	4	2	2	2	2	2
3257:	0	6	1	0	2	5	2	1
3265:	1	2	2	5	6	2	0	[illegible]
3273:	5	2	3	0	4	5	3	[illegible]
3281:	3	0	3	3	2	1	5	4
3289:	2	4	4	3	2	4	2	1
3297:	1	3	3	2	4	3	1	3
3305:	2	4	5	8	13	6	14	12

3313:	20	15	16	13	8	13	13	11
3321:	4	3	2	4	2	1	1	1
3329:	5	1	0	1	1	2	1	1
3337:	2	2	2	1	1	3	1	1
3345:	1	2	3	0	2	5	3	1
3353:	2	2	0	1	3	1	3	4
3361:	0	6	0	1	3	3	1	2
3369:	2	2	1	2	4	3	4	0
3377:	2	0	4	1	3	3	3	2
3385:	1	3	3	3	0	5	1	3
3393:	1	4	1	3	0	2	2	1
3401:	3	1	1	4	3	0	1	2
3409:	1	2	3	2	1	2	4	1
3417:	3	1	1	2	1	2	1	1
3425:	1	0	1	3	5	1	1	1
3433:	2	0	2	1	1	2	4	2
3441:	2	3	1	1	1	4	4	1
3449:	4	2	2	1	2	1	1	1
3457:	2	4	1	1	7	3	1	0
3465:	2	2	2	2	0	1	1	2
3473:	0	3	2	2	2	4	1	0
3481:	3	2	4	1	2	2	2	5
3489:	2	1	3	1	3	1	0	0
3497:	0	3	2	2	1	2	3	6
3505:	2	2	2	1	2	2	1	0
3513:	3	4	2	1	0	1	2	2
3521:	2	3	0	4	3	0	4	2
3529:	3	3	0	2	4	1	1	3
3537:	2	0	0	4	2	4	1	1
3545:	3	2	2	3	2	5	1	1
3553:	3	3	5	1	2	3	3	2
3561:	2	2	3	6	2	1	2	1
3569:	0	5	1	2	1	3	2	2
3577:	1	4	3	1	0	0	4	1
3585:	3	2	5	0	1	3	2	2
3593:	0	1	2	4	5	1	3	2
3601:	2	4	3	3	1	1	3	2
3609:	3	2	2	1	6	1	1	0
3617:	0	0	1	1	0	3	3	2
3625:	0	2	3	1	1	4	0	1
3633:	0	3	0	0	1	2	1	2
3641:	1	1	0	3	1	4	2	4
3649:	0	1	1	1	3	4	1	3
3657:	4	0	2	2	2	3	2	3
3665:	2	3	2	0	3	0	2	2
3673:	2	5	0	2	3	1	2	2
3681:	1	5	0	4	2	0	3	3
3689:	2	3	3	3	1	1	1	3
3697:	0	2	1	1	1	3	1	1
3705:	2	3	3	1	3	3	0	2
3713:	0	1	2	1	0	1	1	2
3721:	3	4	4	1	1	2	1	2
3729:	3	1	1	1	1	3	0	2
3737:	0	3	1	3	1	4	4	5
3745:	0	4	0	3	0	2	4	2
3753:	2	2	0	2	2	2	1	1
3761:	2	3	0	1	5	2	4	1
3769:	3	1	2	5	1	5	2	1
3777:	2	3	2	3	2	6	0	2
3785:	0	4	3	3	3	1	2	1

3793:	4	2	2	2	4	0	0	0
3801:	1	3	2	2	4	6	1	3
3809:	0	1	1	1	1	0	2	1
3817:	3	3	2	1	1	1	1	2
3825:	0	1	4	2	1	0	1	[illegible]
3833:	0	4	1	1	3	4	1	2
3841:	2	0	2	3	4	1	2	0
3849:	1	0	2	1	0	3	5	2
3857:	5	5	1	0	0	2	0	2
3865:	4	4	2	5	1	2	1	2
3873:	2	3	0	1	0	1	1	2
3881:	2	2	4	2	2	2	2	2
3889:	1	2	3	2	4	1	0	5
3897:	2	1	3	3	2	0	0	2
3905:	3	0	0	2	1	3	1	4
3913:	3	1	0	0	1	2	1	4
3921:	4	1	1	2	1	0	2	2
3929:	1	4	1	2	3	1	1	2
3937:	0	1	0	2	1	3	5	0
3945:	3	0	4	1	3	2	4	5
3953:	2	2	3	2	5	3	4	3
3961:	4	3	2	2	3	2	4	4
3969:	3	1	2	4	4	1	0	2
3977:	0	2	4	2	2	2	0	2
3985:	5	1	2	6	2	2	4	2
3993:	4	2	2	1	2	3	0	3
4001:	0	1	2	2	1	1	1	2
4009:	1	0	1	0	0	2	2	1
4017:	0	4	2	3	1	5	2	0
4025:	3	2	0	2	3	5	2	[illegible]
4033:	8	4	1	0	2	2	2	[illegible]
4041:	4	0	2	2	2	2	0	2
4049:	2	3	2	2	2	5	4	1
4057:	2	3	3	1	1	4	0	3
4065:	5	3	4	1	2	2	2	1
4073:	0	1	3	0	3	1	2	3
4081:	4	2	3	7	1	0	2	3
4089:	3	5	3	3	2	1	3	2

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

Nuclide	Key-Line Activity (pCi/gram)	K.L. Ided	Act error	MDA (pCi/gram)	MDA error	Act/MDA
FE-55	8.222E+00		1.530E+01	2.799E+01	4.885E+00	0.294
CO-57	9.689E-01		1.904E+00	3.905E+00	6.788E-01	0.248
NI-59	-7.532E+00		1.629E+01	1.979E+01	2.942E+01	-0.381
CD-109	-3.651E+01		3.263E+01	4.553E+01	7.915E+00	-0.802
I-125	-1.340E+01		2.743E+01	4.726E+01	8.216E+00	-0.284
I-129	-3.825E+00		3.517E+00	6.675E+00	1.160E+00	-0.573
BA-133	8.524E-01		4.095E+00	8.253E+00	1.808E+00	0.103
CE-144	3.219E+00		1.575E+01	3.105E+01	5.398E+00	0.104
PB-210	-3.235E+01		3.469E+01	5.405E+01	9.395E+00	-0.599
PA-231	-3.026E-01		7.541E+00	1.348E+01	2.343E+00	-0.022
TH-231	6.506E+00		1.194E+01	2.425E+01	4.216E+00	0.268
PA-234	-3.879E+00		2.931E+00	4.162E+00	7.236E-01	-0.932
TH-234	-4.241E+00		3.376E+01	6.475E+01	1.126E+01	-0.065
NP-237	3.820E+00		7.339E+00	1.736E+01	3.017E+00	0.220
U-237	-5.272E+00		1.657E+01	3.051E+01	5.303E+00	-0.173
AM-241	7.284E-01		4.536E+00	8.856E+00	1.539E+00	0.082
AM-243	-4.862E-02		1.786E+00	3.528E+00	6.921E-01	-0.014