THIS DOCUMENT WAS TOO LARGE TO SCAN AS A SINGLE DOCUMENT. IT REQUIRED BREAKING INTO SMALLER SECTIONS.

DOCUMENT NUMBER: SD-WM-DP-149

SECTION: 3 OF 4

TITLE: 60 Day Waste Compatibility Safety Issue & Final Results for Tank 241AW102 Grab Samples 2AW-95-1 2AW-95-2 & 2AW-95-3

AUTHOR: Esch RA

RECIPIENT:

DATE: 11/15/95

KEYWORDS:

REFERENCES: EDT-612093

Sample ID : S95T002305-SAM Acquisition date : 17-OCT-1995 15:00:37

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BE-7	27541.	477.59	1.5490E+00
NA-24	79.	1368.55	2.0763E-02
K-40	871.	1460.75	6.6763E-01
SC-46	299.	1120.55	3.4262E-02
CR-51	23448.	320.08	1.0341E+00
MN-54	499.	834.83	3.4696E-02
CO-56	464.	846.76	3.4001E-02
CO-58	541.	810.78	3.5203E-02
FE-59	251.	1099.25	5.4722E-02
ZN-65	235.	1115.55	5.9659E-02
SE-75	25468.	264.66	1.6138E-01
KR-85	14289.	514.00	2.8498E+01
SR-85	14281.	514.01	1.2882E-01
Y-88	24.	1836.06	1.4325E-02
Y-90	32.	1760.70	5.6631E-02
Y-91	150.	1204.67	8.5239E+00
NB-94	1163.	871.09	5.5562E-02
NB-95	659.	765.78	3.6504E-02
RU-103	16988.	497.08	1.4391E-01
RURH-106	5629.	621.93	1.7579E+00
AG-108m	2366.	722.94	7.1479E-02
CD-109	41892.	88.03	3.1093E+00
AG-110M	17523.	657.76	1.6911E-01
SN-113	25216.	391.69	1.9670E-01
TE-123m	30917.	159.00	8.5211E-02
SB-124	7620.	602.73	1.0193E-01
TE-125m	36545.	109.27	2.9223E+01
I-129	27064.	39.60	0.0000E+00
I-131	23476.	364.48	1.4168E-01
XE-131m	31077.	163.93	3.7127E+00
BA-133	23401.	356.02	1.8167E-01
CS-136	561.	818.51	3.6177E-02
CS-138	60.	1435.86	4.0243E-02
CE-139	30629.	165.85	9.0846E-02
BA-140	9958.	537.31	4.3811E-01
LA-140	105.	1596.21	2.8106E-02
CE-141	33108.	145.44	1.5009E-01
EU-152	79.	1408.01	9.9740E-02
HF-181	22108.	482.18	1.8017E-01
TA-182	34450.	67.75	4.4546E-01
HG-203	24731.	279.20	1.1858E-01
BI-207	6768.	569.70	9.3215E-02
TL-208	24721.	277.36	1.5229E+00
PB-210	27269.	46.50	0.0000E+00
BI-212	782.	727.18	5.6476E-01
PB-212	28753.	238.63	2.1325E-01
BI-214	5830.	609.31	1.9575E-01
PB-214	23607.	351.92	5.7284E-01
RA-224	28398.	240.99	2.3535E+00
RA-226	36284.	186.10	2.4214E+00
AC-228	480.	911.21	1.4007E-01

Sample ID : S95T002305-SAM Acquisition date : 17-OCT-1995 15:00:37

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
TH-228	39346.	84.37	9.2153E+00
TH-229	39389.	88.47	4.3731E-01
U-232	32517.	57.78	1.7420E+02
PA-233	23129.	312.17	2.6309E-01
PA-234M	439.	1001.03	6.4588E-02
TH-234	32694.	63.29	5.0438E+00
U-235	35931.	185.71	1.4645E-01
U-237	37807.	59.54	9.2866E-01
NP-238	318.	984.45	1.1588E-01
NP-239	44034.	106.12	4.0624E-01
PU-239	34830.	129.30	1.1612E+03
AM-243	37405.	74.67	2.4391E-01

```
*****************************************************************************
* 222-S Laboratory Counting Room   17-OCT-1995 18:10:36.96                  *
*****************************************************************************
      >>>>>>>>>> SAMPLE INFORMATION <<<<<<<<<<
Worklist #:            2914
Sample ID:             S95T002305-DUP                    Removed by:
Sample Size:           1.00000E-03 LI
Dilution Factor:       1.00000E+00

      >>>>>>>>>> COUNT INFORMATION <<<<<<<<<<
Detector ID:           GEA4                              Verified by:
File Number:           dka300:[spec.GEA4]4g4565.cnf
Geometry:              41
Count Time:            0 00:50:00.00 sec
Real Time:             0 00:52:23.03 sec
Dead Time:             4.6%

      >>>>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<
Sample Count Time:     17-OCT-1995 17:17:36.27
Decayed to:            17-OCT-1995 17:17:36.27
Standard Deviations:   2
Analysis Library:      ENVGEA
Analyst:               EMB
Background Subtract:   DKA300:[SPEC.GEA4]4GBACK

      >>>>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<
 Date of last energy calibration:      18-APR-1994 11:17:09.37
 Date of last efficiency calibration:  18-APR-1994 11:18:36.88
*****************************************************************************
```

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/LI
10	24.31	3724	0.96	48.61	47	12	7.8	5.20E+02		
10	25.66	15849	2.11	51.33	47	12	4.0			
0	31.18	567	1.22	62.36	60	7	117.5			
0	59.49	5890	0.97	118.97	116	8	12.8		AM-241	5.80
0	86.46*	9984	1.02	172.91	169	9	8.9		~~NP-237~~	9.77
									EU-155	3.69
0	105.27	8009	1.13	210.51	207	8	9.8		EU-155	3.51
0	123.03	10178	1.04	246.03	242	9	8.3		~~CO-57~~	1.03
									EU-154	2.19
0	133.47	1756	1.02	266.90	265	6	33.1		CEPR-144	2.70
									CE-144	1.35
0	176.31	2343	1.12	352.59	350	7	25.5		SB-125	3.18
0	247.77	1289	1.42	495.48	493	7	42.7		EU-154	2.29
0	427.71	4330	1.31	855.33	851	10	16.6		SB-125	2.73
0	463.24	1665	1.38	926.39	924	7	34.3		SB-125	3.21
0	511.44*	1032	2.27	1022.78	1019	9	44.4			
0	591.84	511	1.47	1183.59	1180	8	49.7			
0	600.36	1643	1.24	1200.63	1196	11	20.8		SB-125	2.26
0	604.54	1366	1.18	1208.99	1206	7	18.0		CS-134	0.344
0	635.82	1249	1.37	1271.54	1267	10	23.9		SB-125	2.80
0	661.53*	929960	1.48	1322.97	1315	16	0.2		CS-137	285.

Sample ID : S95T002305-DUP Acquisition date : 17-OCT-1995 17:17:36

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/LI
0	723.16	1644	1.35	1446.22	1440	12	8.9		EU-154	2.36
									ZR-95	1.07
0	756.39	402	1.44	1512.69	1506	13	31.8		ZR-95	0.222
0	795.76	1298	1.51	1591.44	1585	13	10.6		CS-134	0.483
0	801.58	145	1.37	1603.07	1599	10	64.7		CS-134	0.530
0	872.96	873	1.82	1745.82	1739	13	13.1		EU-154	2.53
0	996.08	690	1.64	1992.08	1986	13	13.9		EU-154	2.60
0	1004.59	1211	1.70	2009.10	2004	13	8.7		EU-154	2.65
0	1172.95*	498	1.76	2345.85	2339	13	14.9		CO-60	0.220
0	1274.30	1952	1.83	2548.58	2541	17	5.2		EU-154	2.64
									~~NA-22~~	0.910
0	1332.27	492	1.89	2664.52	2656	19	12.8		CO-60	0.236
0	1596.43	78	2.05	3192.94	3188	11	34.4			

Sample ID : S95T002305-DUP Acquisition date : 17-OCT-1995 17:17:36

Total number of lines in spectrum 29
Number of unidentified lines 4
Number of lines tentatively identified by NID 25 86.21%

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/LI	Wtd Mean Decay Corr uCi/LI	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
~~NA-22~~	~~2.60Y~~	~~1.000~~	~~9.099E-01~~	~~9.099E-01~~	~~0.477E-01~~	~~5.24~~	154Eu
~~CO-57~~	~~271.80D~~	~~1.000~~	~~1.033E+00~~	~~1.033E+00~~	~~0.086E+00~~	~~8.33~~	
CO-60	5.27Y	1.000	2.287E-01	2.287E-01	0.222E-01	9.70	
ZR-95	64.02D	1.000	2.221E-01	2.221E-01	0.707E-01	31.85	1.03 e-1
SB-125	2.73Y	1.000	2.667E+00	2.667E+00	0.267E+00	10.03	1.24 e0
CS-134	2.06Y	1.000	4.281E-01	4.281E-01	0.391E-01	9.14	1.99e-1
CS-137	30.00Y	1.000	2.851E+02	2.851E+02	0.006E+02	0.21	
~~CE-144~~	~~284.90D~~	~~1.000~~	~~1.352E+00~~	~~1.352E+00~~	~~0.447E+00~~	~~33.08~~	
CEPR-144	284.90D	1.000	2.701E+00	2.701E+00	0.893E+00	33.08	1.25 e0
EU-154	8.59Y	1.000	2.603E+00	2.603E+00	0.165E+00	6.34	1.21 e0
EU-155	4.68Y	1.000	3.506E+00	3.506E+00	0.344E+00	9.81	1.63 e0
~~NP-237~~	~~2.14E+06Y~~	~~1.000~~	~~9.769E+00~~	~~9.769E+00~~	~~0.874E+00~~	~~8.94~~	155Eu
AM-241	432.20Y	1.000	5.802E+00	5.802E+00	0.745E+00	12.84	2.69 e0
		Total Activity :	3.163E+02	3.163E+02			

Grand Total Activity : 3.163E+02 3.163E+02

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Sample ID : S95T002305-DUP Acquisition date : 17-OCT-1995 17:17:36

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/LI)
BE-7	27204.	477.59	1.5395E+00
NA-24	70.	1368.55	1.9497E-02
K-40	872.	1460.75	6.6804E-01
SC-46	248.	1120.55	3.1231E-02
CR-51	23077.	320.08	1.0259E+00
MN-54	479.	834.83	3.4006E-02
CO-56	493.	846.76	3.5054E-02
CO-58	510.	810.78	3.4201E-02
FE-59	228.	1099.25	5.2196E-02
ZN-65	235.	1115.55	5.9647E-02
SE-75	25695.	264.66	1.6209E-01
KR-85	14077.	514.00	2.8286E+01
SR-85	14071.	514.01	1.2787E-01
Y-88	22.	1836.06	1.3787E-02
Y-90	39.	1760.70	6.1888E-02
Y-91	139.	1204.67	8.2062E+00
NB-94	1042.	871.09	5.2599E-02
NB-95	651.	765.78	3.6287E-02
RU-103	16992.	497.08	1.4392E-01
RURH-106	5578.	621.93	1.7498E+00
AG-108m	2357.	722.94	7.1345E-02
CD-109	40574.	88.03	3.0600E+00
AG-110M	17327.	657.76	1.6816E-01
SN-113	24615.	391.69	1.9434E-01
TE-123m	30361.	159.00	8.4442E-02
SB-124	7686.	602.73	1.0237E-01
TE-125m	35960.	109.27	2.8988E+01
I-129	26614.	39.60	0.0000E+00
I-131	23447.	364.48	1.4160E-01
XE-131m	30027.	163.93	3.6494E+00
BA-133	23202.	356.02	1.8090E-01
CS-136	516.	818.51	3.4678E-02
CS-138	50.	1435.86	3.6745E-02
CE-139	30062.	165.85	9.0001E-02
BA-140	9959.	537.31	4.3815E-01
LA-140	108.	1596.21	2.8531E-02
CE-141	31946.	145.44	1.4744E-01
EU-152	71.	1408.01	9.4315E-02
HF-181	21845.	482.18	1.7910E-01
TA-182	33241.	67.75	4.3757E-01
HG-203	24398.	279.20	1.1777E-01
BI-207	6621.	569.70	9.2198E-02
TL-208	24458.	277.36	1.5148E+00
PB-210	26685.	46.50	0.0000E+00
BI-212	716.	727.18	5.4052E-01
PB-212	28171.	238.63	2.1109E-01
BI-214	5690.	609.31	1.9338E-01
PB-214	22948.	351.92	5.6455E-01
RA-224	27851.	240.99	2.3307E+00
RA-226	34957.	186.10	2.3767E+00
AC-228	468.	911.21	1.3822E-01

Sample ID : S95T002305-DUP Acquisition date : 17-OCT-1995 17:17:36

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/LI)
TH-228	37995.	84.37	9.0557E+00
TH-229	38025.	88.47	4.2967E-01
U-232	31741.	57.78	1.7211E+02
PA-233	23027.	312.17	2.6251E-01
PA-234M	399.	1001.03	6.1617E-02
TH-234	31925.	63.29	4.9841E+00
U-235	34804.	185.71	1.4413E-01
U-237	36727.	59.54	9.1530E-01
NP-238	350.	984.45	1.2164E-01
NP-239	42914.	106.12	4.0104E-01
PU-239	34107.	129.30	1.1491E+03
AM-243	36095.	74.67	2.3960E-01

LABCORE Data Entry Template for Worklist# 2713

Analyst: SAC **Instrument:** GEA00 7 **Book #** 120B52

Method: LA-378-103 Rev/Mod C/0 WHC-SD-WM-SP-149, REV. 0

Worklist Comment: Use 1 mL of sample. Use 1 mL of standard. sac

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	-------TEST------	MATRIX	ACTUAL	FOUND	DL	UNIT
		1	STD				@I129-01 I129-01	LIQUID			N/A	uCi/mL
		1	STD				@I129-01 I129-01C	LIQUID			N/A	% Recovery
		1	STD				@I129-01 I129-01E	LIQUID			N/A	% Ct. Error
		2	BLNK				@I129-01 I129-01	LIQUID			N/A	uCi/mL
		2	BLNK				@I129-01 I129-01E	LIQUID			N/A	% Ct. Error
95000127	AW-102 GRAB	3	SAMPLE	S95T002308	0		@I129-01 I129-01	LIQUID	N/A			uCi/mL
95000127	AW-102 GRAB	3	SAMPLE	S95T002308	0		@I129-01 I129-01C	LIQUID	N/A			% Recovery
95000127	AW-102 GRAB	3	SAMPLE	S95T002308	0		@I129-01 I129-01E	LIQUID	N/A			% Ct. Error

Final page for worklist # 2713

Analyst Signature Date 10/4/95

Analyst Signature Date 10/4/95

Data Entry Comments: Carrier 4751-D 1mL

Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

WORKBOOK PAGE: STD1

I-129: LA-378-101 (C-0), 103 (C-0) IODINE-129

			STD
Type	GROSS WEIGHT	(wt2)	2.1311
STD	TARE WEIGHT	(wt1)	2.1064
Work List	MASS PRECIPITATE	(net wt)	0.0247
2713	I-129 µCi / SAMPLE from GEA	(I-129 GEA)	3.703E-04
Test Code	SAMPLE VOLUME in mL	(SS)	1.0000
@I129-01	DILUTION FACTOR	(DF)	1.0000
Matrix	DIGEST DILUTION FACTOR	(DDF)	1.0000
LIQUID	CARRIER FRACTIONAL RECOVERY	(Rec)	0.8098
Batch Number	COUNT TIME IN MINUTES		100
95002917	COUNTING UNCERTAINTY	(%)	3.78
Rerun	STANDARD BOOK NUMBER		120B52
0	STANDARD VALUE in µCi /mL		5.34E-04

Sample Prep	
NOT LISTED	
Sample #	
NOT LISTED	One mL of the solution is equivalent to 0.0305 grams.
Instrument Code	
WC38931	Carrier Percent Recovery = (wt2-wt1)*100/0.0305
Prepared By	I-129 µCi/mL = (I-129 GEA)(DF)(DDF) / [(Rec)(SS)]
SAC	
Chemist	
SAC	
Analyst	
SAC	
Date Complete	
10/05/95	
Analysis Date	
10/04/95	

Analysis Time	**Iodine 129 in µCi / mL**	=	**4.57E-04**
04:00 PM	**Carrier Percent Recovery**		**81.0%**
Sample Point	**Counting Uncertainty**		**3.8%**
AW-102	**Standard Recovery**	=	**85.6%**

Analyst: S A Catto	SAC	Date:	10/05/95
Signature of Chemist: S A Catto	SAC	Date:	OCT 5 1995

STANDARD.WB1 REV. 1.2 37810NML

WORKBOOK PAGE: BLANK2

I-129: LA-378-101 (C-0), 103 (C-0) IODINE-129

			BLNK
Type	GROSS WEIGHT	(wt2)	2.1209
BLNK	TARE WEIGHT	(wt1)	2.0958
Work List	MASS PRECIPITATE	(net wt)	0.0251
2713	I-129 µCi / SAMPLE from GEA	(I-129 GEA)	<3.607E-6
Test Code	SAMPLE VOLUME in mL	(SS)	1.0000
@I129-01	DILUTION FACTOR	(DF)	1.0000
Matrix	DIGEST DILUTION FACTOR	(DDF)	1.0000
LIQUID	CARRIER FRACTIONAL RECOVERY	(Rec)	0.8230
Batch Number	COUNT TIME IN MINUTES		100
95002917	COUNTING UNCERTAINTY	(%)	N/A
Rerun	DETECTION LIMIT in µCi / mL	(DL)	4.3830E-06
0			
Sample Prep			
NOT LISTED			
Sample #			
NOT LISTED	One mL of the solution is equivalent to 0.0305 grams.		
Instrument Code			
WC38931	Carrier Percent Recovery = (wt2-wt1)*100/0.0305		
Prepared By	I-129 µCi/mL = (I-129 GEA)(DF)(DDF) / [(Rec)(SS)]		
SAC	Detection Limit = I-129 µCi/mL		
Chemist			
SAC			
Analyst			
SAC			
Date Complete			
10/05/95			
Analysis Date			
10/04/95			
Analysis Time	**Iodine 129 in µCi / mL**	<	**4.38E-06**
04:00 PM	**Carrier Percent Recovery**		**82.3%**
Sample Point	**Counting Uncertainty**		**0.0%**
AW-102			

Analyst: S A Catt	SAC	Date:	10/05/95
Signature of Chemist: S A Catt	SAC	Date:	OCT 5 1995

BLANK.WB1 REV. 1.2 37810NML

WORKBOOK PAGE: SAM3

I-129: LA-378-101 (C-0), 103 (C-0) IODINE-129

			SAMPLE
Type	GROSS WEIGHT	(wt2)	2.1420
SAMPLE	TARE WEIGHT	(wt1)	2.1159
Work List	MASS PRECIPITATE	(net wt)	0.0261
2713	I-129 µCi / SAMPLE from GEA	(I-129 GEA)	2.701E-5
Test Code	SAMPLE VOLUME in mL	(SS)	1.0000
@I129-01	DILUTION FACTOR	(DF)	1.0000
Matrix	DIGEST DILUTION FACTOR	(DDF)	1.0000
LIQUID	CARRIER FRACTIONAL RECOVERY	(Rec)	0.8557
Batch Number	COUNT TIME IN MINUTES		100
95002917	COUNTING UNCERTAINTY	(%)	5.04
Rerun	DETECTION LIMIT in µCi / mL	(DL)	4.3830E-06
0			
Sample Prep			
NOT LISTED			
Sample #			
S95T002308	One mL of the solution is equivalent to 0.0305 grams.		
Instrument Code			
WC38931	Carrier Percent Recovery = (wt2-wt1)*100/0.0305		
Prepared By	I-129 µCi/mL = (I-129 GEA)(DF)(DDF) / [(Rec)(SS)]		
SAC			
Chemist			
SAC			
Analyst			
SAC			
Date Complete			
10/05/95			
Analysis Date			
10/04/95			
Analysis Time	**Iodine 129 in µCi / mL**	=	**3.16E-05**
04:00 PM	**Carrier Percent Recovery**		**85.6%**
Sample Point	**Counting Uncertainty**		**5.0%**
AW-102			

Analyst:	SAC	Date:	10/05/95
Signature of Chemist:	SAC	Date:	OCT 5 1995

SAMPLE.WB1 REV 1. 37810NML

```
*****************************************************************************
* 222-S Laboratory Counting Room    5-OCT-1995 01:16:36.38                  *
*****************************************************************************
      >>>>>>>>>> SAMPLE INFORMATION <<<<<<<<<<
Worklist #:              ML
Sample ID:               S95T2308-SAM                    Removed by:
Sample Size:             1.00000E+00
Dilution Factor:         1.00000E+00                     10/5/95

      >>>>>>>>>> COUNT INFORMATION <<<<<<<<<<
Detector ID:             GEA7                            Verified by:
File Number:             dka300:[spec.GEA7]7g7130.cnf
Geometry:                1
Count Time:              0 01:40:00.00 sec
Real Time:               0 01:41:29.31 sec
Dead Time:               1.5%

      >>>>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<
Sample Count Time:       4-OCT-1995 23:34:00.16
Decayed to:              4-OCT-1995 23:34:00.16
Standard Deviations:     2
Analysis Library:        I129
Analyst:                 MB
Background Subtract:     DKA300:[SPEC.GEA7]7GBACK

      >>>>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<
 Date of last energy calibration:       5-JUN-1995 14:54:43.68
 Date of last efficiency calibration:   5-JUN-1995 14:57:32.67
*****************************************************************************
```

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/SAMPLE
0	29.86	3006	1.16	148.29	137	20	5.0		I-129	2.701E-05
0	34.01	527	0.83	169.23	163	17	19.2			
0	39.77	437	1.06	198.27	190	17	12.7			
0	183.98	24	0.91	925.99	923	15	126.8			
0	349.25	15	0.54	1759.91	1754	10	122.7			
0	363.27	15	1.18	1830.67	1825	10	93.3			
0	507.48	60	2.89	2558.33	2549	20	57.0			
0	656.19	179	0.95	3308.71	3305	8	33.7			

Sample ID : S95T2308-SAM
Acquisition date : 4-OCT-1995 23:34:00

Total number of lines in spectrum	8	
Number of unidentified lines	6	
Number of lines tentatively identified by NID	2	25.00%

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/SAMPLE	Wtd Mean Decay Corr uCi/SAMPLE	Decay Corr 2-Sigma Error	2-Sigma Error Flags
I-129	5.73E+09D	1.000	2.701E-05	2.701E-05	0.136E-05	5.04
			---	---		
Total Activity :			**2.701E-05**	**2.701E-05**		
Grand Total Activity :			2.701E-05	2.701E-05		

Flags: "K" = Keyline not found
"E" = Manually edited
"M" = Manually accepted
"A" = Nuclide specific abn. limit

All nuclides have been identified. No MDA report generated.

```
*****************************************************************************
* 222-S Laboratory Counting Room    4-OCT-1995 23:26:05.46                  *
*****************************************************************************
      >>>>>>>>>> SAMPLE INFORMATION <<<<<<<<<<
Worklist #:              ML
Sample ID:               WL2713-BLK                    Removed by:
Sample Size:             1.00000E+00
Dilution Factor:         1.00000E+00

      >>>>>>>>>> COUNT INFORMATION <<<<<<<<<<
Detector ID:             GEA7                          Verified by:
File Number:             dka300:[spec.GEA7]7g7129.chn
Geometry:                1
Count Time:              0 01:40:00.00 sec
Real Time:               0 01:42:12.14 sec
Dead Time:               2.2%

      >>>>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<
Sample Count Time:       4-OCT-1995 21:43:17.82
Decayed to:              4-OCT-1995 21:43:17.82
Standard Deviations:     2
Analysis Library:        I129
Analyst:                 VR
Background Subtract:     DKA300:[SPEC.GEA7]7GBACK

      >>>>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<
 Date of last energy calibration:       5-JUN-1995 14:54:43.68
 Date of last efficiency calibration:   5-JUN-1995 14:57:32.67
*****************************************************************************
```

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity
0	32.40	263	1.56	161.12	152	22	21.4			
0	656.13	207	1.21	3308.44	3305	8	32.5			

Sample ID : WL2713-BLK
Acquisition date : 4-OCT-1995 21:43:17

Total number of lines in spectrum	2	
Number of unidentified lines	2	
Number of lines tentatively identified by NID	0	0.00%

**** There are no nuclides meeting summary criteria ****

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

Sample ID : WL2713-BLK Acquisition date : 4-OCT-1995 21:43:17

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/SAMPLE)
I-129	77.	39.60	3.6073E-06

```
*****************************************************************************
* 222-S Laboratory Counting Room    4-OCT-1995 21:40:46.37                  *
*****************************************************************************
      >>>>>>>>>> SAMPLE INFORMATION <<<<<<<<<<
Worklist #:              ML
Sample ID:               WL2713-STD                    Removed by:
Sample Size:             1.00000E+00
Dilution Factor:         1.00000E+00

      >>>>>>>>>> COUNT INFORMATION <<<<<<<<<<
Detector ID:             GEA7                          Verified by:
File Number:             dka300:[spec.GEA7]7gWL2713-STD.cnf
Geometry:                1
Count Time:              0 01:40:00.00 sec
Real Time:               0 01:40:24.51 sec
Dead Time:               0.4%

      >>>>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<
Sample Count Time:       4-OCT-1995 19:59:45.54
Decayed to:              4-OCT-1995 19:59:45.54
Standard Deviations:     2
Analysis Library:        I129
Analyst:                 VR
Background Subtract:     DKA300:[SPEC.GEA7]7GBACK

      >>>>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<
 Date of last energy calibration:       5-JUN-1995 14:54:43.68
 Date of last efficiency calibration:   5-JUN-1995 14:57:32.67
*****************************************************************************
```

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/SAMPLE
4	20.44	1357	1.73	100.77	85	29	11.1	4.20E+00		
4	21.49	664	0.92	106.06	85	29	15.8			
0	23.98	246	1.03	118.63	114	11	34.5			
0	29.83	28427	1.15	148.15	135	24	1.6			
0	33.87	6354	1.27	168.51	158	23	4.6			
0	39.76	4176	1.00	198.23	189	19	3.8		I-129	3.703E-04
0	75.97	185	3.21	380.95	368	24	40.4			
0	349.23	141	1.27	1759.81	1753	15	28.1			
0	468.43	22	0.32	2361.31	2359	6	63.3			
10	655.81	258	0.27	3306.82	3305	8	31.4	7.58E+01		
10	656.28	239	0.26	3309.18	3305	8	35.2			

Sample ID : WL2713-STD Acquisition date : 4-OCT-1995 19:59:45

Total number of lines in spectrum	11	
Number of unidentified lines	9	
Number of lines tentatively identified by NID	2	18.18%

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/SAMPLE	Wtd Mean Decay Corr uCi/SAMPLE	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
I-129	5.73E+09D	1.000	3.703E-04	3.703E-04	0.140E-04	3.78	
		Total Activity :	3.703E-04	3.703E-04			
		Grand Total Activity :	3.703E-04	3.703E-04			

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

All nuclides have been identified. No MDA report generated.

LABCORE Data Entry Template for Worklist# 2714

Analyst: SAC **Instrument:** LSC00 6000 **Book #** 33B52

Method: LA-348-104 Rev/Mod B/1

Worklist Comment: Use 1 mL of sample. Use 1 mL of standard. sac

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	-------TEST------		MATRIX	ACTUAL	FOUND	DL	UNIT
		1	STD				@C14-01	C14-01	LIQUID			N/A	uCi/mL
		1	STD				@C14-01	C14-01E	LIQUID			N/A	% Ct. Error
		2	BLNK				@C14-01	C14-01	LIQUID			N/A	uCi/mL
		2	BLNK				@C14-01	C14-01E	LIQUID			N/A	% Ct. Error
95000127	AW-102 GRAB	3	SAMPLE	S95T002308	0		@C14-01	C14-01	LIQUID	N/A			uCi/mL
95000127	AW-102 GRAB	3	SAMPLE	S95T002308	0		@C14-01	C14-01E	LIQUID	N/A			% Ct. Error

Final page for worklist # 2714

Analyst Signature 10/10/95 Date

Analyst Signature 10/11/95 Date

Data Entry Comments:

Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

SAM NO	POS	TIME MIN	H#	14C CPM	14C %ERROR	14C DPM	14C EFF-1	LUMEX %	ELAPSED TIME	2P
1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	50.95	[illegible]	[illegible]	[illegible]	

Blank Average DPM for 14C : 50.95 COEF. OF VAR: 0.000

1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3641.30	[illegible]	[illegible]	[illegible]	
2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2.20	[illegible]	[illegible]	[illegible]	
3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	154.74	[illegible]	[illegible]	[illegible]	

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WORKBOOK PAGE: STD1

C-14 : LA-348-104 (B-1) Carbon-14

			STD
Type	Disintegrations per Minute from Counter	(dpm)	3641.3
STD	Sample Volume in mL	(SS)	1
Work List	Dilution Factor	(DF)	1
2714	Digest Dilution Factor	(DDF)	1
Test Code	Background Count Rate in Counts per Minute	(BKG cpm)	44.36
@C14-01	Background Count Time in Minutes	(BKG time)	50
Matrix	Instrument Fractional Efficiency	(EFF)	0.8965
LIQUID	% Counting Uncertainty (from LSC)		0.49
Batch Number	Standard Book Number		33B52
95002918	Standard Value in µCi/mL		1.68E-03
Rerun	Detection Limit (dpm)	(Ld)	4.96
0	Critical Level	(Lc)	2.19

Sample Prep	
N/A	Critical Level (Lc) = 2.33 [Square Root of (BKG cpm / BKG time)]
Sample Number	Detection Limit (Ld) = [(2.72 / BKG time) + (2) (Lc)] / EFF
WRKLST#2714	C-14 µCi/L = (dpm) (1000mL/L) (DF) (DDF) / [(SS) (2220000dpm/µCi)]
Instrument Code	µCi/mL = µCi/L / 1000mL/L
WC16085	Detection Limit (µCi/mL) = (Ld)(DF)(DDF) / [(SS) (2220000 dpm/µCi)]
Prepared By	
MCB	
Chemist	% Recovery 97.63%
SAC	
Analyst	C-14 Concentration in µCi/L 1.64E+00
SAC	
Date Complete	C-14 Concentration in µCi/mL 1.64E-03
10/11/95	Detection Limit in µCi/mL 2.23E-06
Analysis Date	
10/10/95	
Analysis Time	
12:00 PM	
Sample Point	
AW-102	

Analyst:	SAC	Date:	10/11/95
Signature of Chemist: S A Cattlow	SAC	Date:	OCT 13 [illegible]

STANDARD.WB1 REV 1. 348104ML

C-14 : LA-348-104 (B-1) Carbon-14

			BLNK
Type	Disintegrations per Minute from Counter	(dpm)	2.2
BLNK	Sample Volume in mL	(SS)	1
Work List	Dilution Factor	(DF)	1
2714	Digest Dilution Factor	(DDF)	1
Test Code	Background Count Rate in Counts per Minute	(BKG cpm)	44.36
@C14-01	Background Count Time in Minutes	(BKG time)	50
Matrix	Instrument Fractional Efficiency	(EFF)	0.8971
LIQUID	% Counting Uncertainty (from LSC)		4.12
Batch Number	Detection Limit (dpm)	(Ld)	4.95
95002918	Critical Level	(Lc)	2.19

Rerun
0
Sample Prep
N/A
Sample Number
WRKLST#2714
Instrument Code
WC16085
Prepared By
MCB
Chemist
SAC
Analyst
SAC
Date Complete
10/11/95
Analysis Date
10/10/95
Analysis Time
12:00 PM
Sample Point
AW-102

Critical Level (Lc) = 2.33 [Square Root of (BKG cpm / BKG time)]

Detection Limit (Ld) = [(2.72 / BKG time) + (2) (Lc)] / EFF

C-14 µCi/L = (dpm) (1000mL/L) (DF) (DDF) / [(SS) (2220000dpm/µCi)]

µCi/mL = µCi/L / 1000mL/L

Detection Limit (µCi/mL) = (Ld)(DF)(DDF) / [(SS)(2220000 dpm/µCi)]

NOTE: Reported result is a LESS THAN value calculated from the statistical Detection Limit (Ld).

C-14 Concentration in µCi/L	<	2.23E-03
C-14 Concentration in µCi/mL	<	2.23E-06
Detection Limit in µCi/mL		2.23E-06

Analyst:	SAC	Date:	10/11/95
Signature of Chemist:	SAC	Date:	OCT 13 1995

BLANK.WB1 REV 1.1 348104ML

WORKBOOK PAGE: SAM3

C-14 : LA-348-104 (B-1) Carbon-14

			SAMPLE
Type	Disintegrations per Minute from Counter	(dpm)	154.74
SAMPLE	Sample Volume in mL	(SS)	1
Work List	Dilution Factor	(DF)	1
2714	Digest Dilution Factor	(DDF)	1
Test Code	Background Count Rate in Counts per Minute	(BKG cpm)	44.36
@C14-01	Background Count Time in Minutes	(BKG time)	50
Matrix	Instrument Fractional Efficiency	(EFF)	0.8982
LIQUID	% Counting Uncertainty (from LSC)		2.08
Batch Number	Detection Limit (dpm)	(Ld)	4.95
95002918	Critical Level	(Lc)	2.19

Rerun
0
Sample Prep
N/A
Sample Number
S95T002308
Instrument Code
WC16085
Prepared By
MCB
Chemist
SAC
Analyst
SAC
Date Complete
10/11/95
Analysis Date
10/10/95
Analysis Time
12:00 PM
Sample Point
AW-102

Critical Level (Lc) = 2.33 [Square Root of (BKG cpm / BKG time)]

Detection Limit (Ld) = [(2.72 / BKG time) + (2) (Lc)] / EFF

C-14 µCi/L = (dpm) (1000mL/L) (DF) (DDF) / [(SS) (2220000dpm/µCi)]

µCi/mL = µCi/L / 1000mL/L

Detection Limit (µCi/mL) = (Ld)(DF)(DDF) / [(SS)(2220000 dpm/µCi)]

C-14 Concentration in µCi/L	6.97E-02
C-14 Concentration in µCi/mL	6.97E-05
Detection Limit in µCi/mL	2.23E-06

Analyst:	SAC	Date:	10/11/95
Signature of Chemist:	SAC	Date:	OCT 13 1995

SAMPLE.WB1 REV 1.1 348104ML

LABCORE Data Entry Template for Worklist# 2882

Analyst: DBB **Instrument:** AB00 12 WB27811 **Book #** 51B52

Method: LA-220-101 Rev/Mod D-1

Worklist Comment: Use .100 mL sample size. Rerun #1. SLF

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	-------TEST------	MATRIX	ACTUAL	FOUND	DL	UNIT
		1	STD				@SR90-01 SR90-01	LIQUID			N/A	uCi/mL
		1	STD				@SR90-01 SR90-01C	LIQUID			N/A	% Recovery
		1	STD				@SR90-01 SR90-01E	LIQUID			N/A	% Ct. Error
		2	BLNK-PREP				@SR90-01 SR90-01	LIQUID			N/A	uCi/mL
		2	BLNK-PREP				@SR90-01 SR90-01C	LIQUID			N/A	% Recovery
		2	BLNK-PREP				@SR90-01 SR90-01E	LIQUID			N/A	% Ct. Error
		3	BLNK/BKG				@SR90-01 SR90-01	LIQUID			N/A	uCi/mL
95000127	AW-102 GRAB	4	SAMPLE	S95T002158	0		@SR90-01 SR90-01	LIQUID	N/A			uCi/mL
95000127	AW-102 GRAB	4	SAMPLE	S95T002158	0		@SR90-01 SR90-01C	LIQUID	N/A			% Recovery
95000127	AW-102 GRAB	4	SAMPLE	S95T002158	0		@SR90-01 SR90-01E	LIQUID	N/A			% Ct. Error
95000127	AW-102 GRAB	5	DUP	S95T002158	0		@SR90-01 SR90-01	LIQUID			N/A	uCi/mL
95000127	AW-102 GRAB	5	DUP	S95T002158	0		@SR90-01 SR90-01C	LIQUID			N/A	% Recovery
95000127	AW-102 GRAB	5	DUP	S95T002158	0		@SR90-01 SR90-01E	LIQUID			N/A	% Ct. Error
95000127	AW-102 GRAB	6	SAMPLE	S95T002308	0		@SR90-01 SR90-01	LIQUID	N/A			uCi/mL
95000127	AW-102 GRAB	6	SAMPLE	S95T002308	0		@SR90-01 SR90-01C	LIQUID	N/A			% Recovery
95000127	AW-102 GRAB	6	SAMPLE	S95T002308	0		@SR90-01 SR90-01E	LIQUID	N/A			% Ct. Error
95000127	AW-102 GRAB	7	DUP	S95T002308	0		@SR90-01 SR90-01	LIQUID			N/A	uCi/mL
95000127	AW-102 GRAB	7	DUP	S95T002308	0		@SR90-01 SR90-01C	LIQUID			N/A	% Recovery

Data Entry Comments:

Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

Sept 12

LABCORE Data Entry Template for Worklist# 2882

GROUP	PROJECT	S TYPE	SAMPLE#	R	A	-------TEST------	MATRIX	ACTUAL	FOUND	DL	UNIT
95000127	AW-102 GRAB	7 DUP	S95T002308	0		@SR90-01 SR90-01E	LIQUID			N/A	% Ct. Error
95000127	AW-102 GRAB	8 SAMPLE	S95T002309	0		@SR90-01 SR90-01	LIQUID	N/A			uCi/mL
95000127	AW-102 GRAB	8 SAMPLE	S95T002309	0		@SR90-01 SR90-01C	LIQUID	N/A			% Recovery
95000127	AW-102 GRAB	8 SAMPLE	S95T002309	0		@SR90-01 SR90-01E	LIQUID	N/A			% Ct. Error
95000127	AW-102 GRAB	9 DUP	S95T002309	0		@SR90-01 SR90-01	LIQUID			N/A	uCi/mL
95000127	AW-102 GRAB	9 DUP	S95T002309	0		@SR90-01 SR90-01C	LIQUID			N/A	% Recovery
95000127	AW-102 GRAB	9 DUP	S95T002309	0		@SR90-01 SR90-01E	LIQUID			N/A	% Ct. Error

Final page for worklist # 2882

K.S. Bryson 10-12-95
Analyst Signature **Date**

C.J. Quinn 10/17/95
Analyst Signature **Date**

Data Entry Comments:

Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

WORKBOOK PAGE: STD1

Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1) LIQUIDS

							STANDARD
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
STD	TOTAL COUNTS	(TC)	9478	GROSS WEIGHT	(W2)		7.9880
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.8979
2882	BACKGROUND in cpm	(BKG)	2.5	NET WEIGHT	(W3)		0.0901
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)		6.18
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST DILUTION FACTOR	DDF	1				
LIQUID	SAMPLE COUNT RATE	(Rs)	945.30	SR-90 EFFICIENCY FACTO	(C1)		0.4180
Batch Number	CRITICAL LEVEL	(Lc)	0.95	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
95003134	TIME OF SEPARATION	(ST)	08:55	Rmax			N/A
Rerun	DATE OF SEPARATION	(SD)	10/13/95	DETECTION LIMIT	(Ld)		2.00
0	TIME OF COUNT	(TOC)	15:06	Sr-89/90 CONC. in µCi/L			1.0547E+00
Sample Prep	DATE OF COUNT	(DOC)	10/13/95				
N/A	STANDARD BOOK #		51B52				
Sample #	STANDARD VALUE in µCi/mL		1.0911E-03				
WORKLIST#2882							
Instrument Code							
WB27811							
Prepared By							
CJO							
Chemist							
SLF							
Analyst							
AKL							
Date Complete							
10/17/95							
Analysis Date							
10/13/95							
Analysis Time							
08:55 AM							
Sample Point							
AW-102							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/mL REPLACE RS WITH RMAX IF RS<=LcAND RS>=0 OR REPLACE RS WITH Lc IF RS<0

RS*DF*DDF*1000/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

Sr-89/90 CONCENTRATION	1.05E-03	µCi/mL	DETECTION LEVEL
RELATIVE COUNTING ERROR	2.0%		2.23E-06 µCi/L
PERCENT CARRIER RECOVERY	90.1%		

Analyst:		AKL	Date:	17-Oct-95
Signature of Chemist:		SLF	Date:	10/19/95

STANDARD.WB1 REV 1.2 22010NML

WORKBOOK PAGE: BLANK2

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

						BLNK-PREP
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
BLNK-PREP	TOTAL COUNTS	(TC)	43	GROSS WEIGHT	(W2)	8.0337
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.9437
2882	BACKGROUND in cpm	(BKG)	2.5	NET WEIGHT	(W3)	0.0900
Test Code	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)	6.38
@SR90-01	DILUTION FACTOR	(DF)	101			
Matrix	DIGEST DILUTION FACTOR	(DDF)	1			
LIQUID	SAMPLE COUNT RATE	(Rs)	1.80	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
Batch Number	CRITICAL LEVEL	(Lc)	0.95	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
95003134	TIME OF SEPARATION	(ST)	08:55	Rmax		N/A
Rerun	DATE OF SEPARATION	(SD)	10/13/95	DETECTION LIMIT	(Ld)	2.00
0	TIME OF COUNT	(TOC)	15:18	Sr-89/90 CONC in µCi/L		2.0264E+00
Sample Prep	DATE OF COUNT	(DOC)	10/13/95			
N/A						
Sample #						
S95T2158						

Instrument Code	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)
WB27811	Sr-89/90 CONC in µCi/L Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0
Prepared By	RS*DF*DDF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)
CJO	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))
Chemist	Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)
SLF	Percent Carrier Recovery = (Net Weight / Expected weight) * 100
Analyst	NOTE: Expected weight = CVA * 0.1
AKL	Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Date Complete	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100
10/17/95	
Analysis Date	
10/13/95	
Analysis Time	
08:55 AM	
Sample Point	
AW-102	

Sr-89/90 CONCENTRATION	2.03E-03	µCi/m	DETECTION LEVEL
RELATIVE COUNTING ERROR	89.8%		2.25E-03 µCi/mL
PERCENT CARRIER RECOVERY	90.0%		

Analyst:	AKL	Date:	17-Oct-95
Signature of Chemist:	SLF	Date:	10/19/95

BLANK.WB1 REV 1.2 22010NML

WORKBOOK PAGE: SAM4

LA-220-101 / D-1 **Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)**

						SAMPLE
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
SAMPLE	TOTAL COUNTS	(TC)	33	GROSS WEIGHT	(W2)	7.9866
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.8964
2882	BACKGROUND in cpm	(BKG)	2.5	NET WEIGHT	(W3)	0.0902
Test Code	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)	6.58
@SR90-01	DILUTION FACTOR	(DF)	101			
Matrix	DIGEST DILUTION FACTOR	(DDF)	1			
LIQUID	SAMPLE COUNT RATE	(Rs)	0.80	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
Batch Number	CRITICAL LEVEL	(Lc)	0.95	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
95003134	TIME OF SEPARATION	(ST)	08:55	Rmax		1.86
Rerun	DATE OF SEPARATION	(SD)	10/13/95	DETECTION LIMIT	(Ld)	2.00
0	TIME OF COUNT	(TOC)	15:30	Sr-89/90 CONC in µCi/L	<	2.0858E+00
Sample Prep	DATE OF COUNT	(DOC)	10/13/95			
N/A						
Sample #						
S95T002158						
Instrument Code						
WB27811						
Prepared By						
CJO						
Chemist						
SLF						
Analyst						
AKL						
Date Complete						
10/17/95						
Analysis Date						
10/13/95						
Analysis Time						
08:55 AM						
Sample Point						
AW-102						

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/L Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*DF*DDF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

				DETECTION LEVEL
Sr-89/90 CONCENTRATION	< 2.09E-03	µCi/mL		
LESS THAN Value was Determined from Rmax.				
RELATIVE COUNTING ERROR	186.6%			2.24E-03 µCi/mL
PERCENT CARRIER RECOVERY	90.2%			

Analyst:	AKL	Date:	17-Oct-95
Signature of Chemist:	SLF	Date:	10/19/95

SAMPLE.WB1 REV 1.2 22010NML

WORKBOOK PAGE: DUP5

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

						DUP
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
DUP	TOTAL COUNTS	(TC)	51	GROSS WEIGHT	(W2)	7.9581
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.8698
2882	BACKGROUND in cpm	(BKG)	2.5	NET WEIGHT	(W3)	0.0883
Test Code	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)	7.08
@SR90-01	DILUTION FACTOR	(DF)	101			
Matrix	DIGEST DILUTION FACTOR	(DDF)	1			
LIQUID	SAMPLE COUNT RATE	(Rs)	2.60	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
Batch Number	CRITICAL LEVEL	(Lc)	0.95	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
95003134	TIME OF SEPARATION	(ST)	08:55	Rmax		N/A
Rerun	DATE OF SEPARATION	(SD)	10/13/95	DETECTION LIMIT	(Ld)	2.00
0	TIME OF COUNT	(TOC)	16:00	Sr-89/90 CONC in µCi/L		2.9617E+00
Sample Prep	DATE OF COUNT	(DOC)	10/13/95			
N/A						
Sample #						
S95T002158						
Instrument Code						
WB27811						
Prepared By						
CJO						
Chemist						
SLF						
Analyst						
AKL						
Date Complete						
10/17/95						
Analysis Date						
10/13/95						
Analysis Time						
08:55 AM						
Sample Point						
AW-102						

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/L Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*DF*DDF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

				DETECTION LEVEL
Sr-89/90 CONCENTRATION	2.96E-03	µCi/mL		
RELATIVE COUNTING ERROR	65.7%			2.27E-03 µCi/mL
PERCENT CARRIER RECOVERY	88.3%			

Analyst:	AKL	Date:	17-Oct-95
Signature of Chemist:	SLF	Date:	10/19/95

SAMPLE.WB1 REV 1.2 22010NML

WORKBOOK PAGE: SAM6

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

						SAMPLE
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
SAMPLE	TOTAL COUNTS	(TC)	91	GROSS WEIGHT	(W2)	8.0780
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.9904
2882	BACKGROUND in cpm	(BKG)	2.5	NET WEIGHT	(W3)	0.0876
Test Code	SAMPLE VOLUME in mL	(SS)	0.050	DELTA TIME (HOURS)	(DT)	7.27
@SR90-01	DILUTION FACTOR	(DF)	201			
Matrix	DIGEST DILUTION FACTOR	(DDF)	1			
LIQUID	SAMPLE COUNT RATE	(Rs)	6.60	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
Batch Number	CRITICAL LEVEL	(Lc)	0.95	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
95003134	TIME OF SEPARATION	(ST)	08:59	Rmax		N/A
Rerun	DATE OF SEPARATION	(SD)	10/13/95	DETECTION LIMIT	(Ld)	2.00
0	TIME OF COUNT	(TOC)	16:15	Sr-89/90 CONC in µCi/L		3.0106E+01
Sample Prep	DATE OF COUNT	(DOC)	10/13/95			
N/A						
Sample #						
S95T002308						
Instrument Code						
WB27811						
Prepared By						
CJO						
Chemist						
SLF						
Analyst						
AKL						
Date Complete						
10/17/95						
Analysis Date						
10/13/95						
Analysis Time						
08:55 AM						
Sample Point						
AW-102						

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/L Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*DF*DDF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

Sr-89/90 CONCENTRATION	3.01E-02	µCi/mL	DETECTION LEVEL
RELATIVE COUNTING ERROR	32.0%		9.10E-03 µCi/mL
PERCENT CARRIER RECOVERY	87.6%		

Analyst:	AKL	Date:	17-Oct-95
Signature of Chemist:	SLF	Date:	10/17/95

SAMPLE.WB1 REV 1.2 22010NML

WORKBOOK PAGE: DUP7

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

							DUP
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
DUP	TOTAL COUNTS	(TC)	78	GROSS WEIGHT	(W2)		8.0066
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.9147
2882	BACKGROUND in cpm	(BKG)	2.5	NET WEIGHT	(W3)		0.0919
Test Code	SAMPLE VOLUME in mL	(SS)	0.050	DELTA TIME (HOURS)	(DT)		7.52
@SR90-01	DILUTION FACTOR	(DF)	201				
Matrix	DIGEST DILUTION FACTOR	(DDF)	1				
LIQUID	SAMPLE COUNT RATE	(Rs)	5.30	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Batch Number	CRITICAL LEVEL	(Lc)	0.95	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
95003134	TIME OF SEPARATION	(ST)	08:59	Rmax			N/A
Rerun	DATE OF SEPARATION	(SD)	10/13/95	DETECTION LIMIT	(Ld)		2.00
0	TIME OF COUNT	(TOC)	16:30	Sr-89/90 CONC in µCi/L			2.2986E+01
Sample Prep	DATE OF COUNT	(DOC)	10/13/95				
N/A							
Sample #							
S95T002308							
Instrument Code	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)						
WB27811	Sr-89/90 CONC in µCi/L Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0						
Prepared By	RS*DF*DDF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)						
CJO	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))						
Chemist	Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)						
SLF	Percent Carrier Recovery = (Net Weight / Expected weight) * 100						
Analyst	NOTE: Expected weight = CVA * 0.1						
AKL	Detection Levels and Less Than Values are determined from Procedure LA-508-002.						
Date Complete	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100						
10/17/95							
Analysis Date							DETECTION LEVEL
10/13/95	Sr-89/90 CONCENTRATION			2.30E-02	µCi/mL		
Analysis Time							
08:55 AM	RELATIVE COUNTING ERROR			37.5%			8.66E-03 µCi/mL
Sample Point							
AW-102	PERCENT CARRIER RECOVERY			91.9%			

Analyst:		AKL	Date:	17-Oct-95
Signature of Chemist:		SLF	Date:	10/19/95

SAMPLE.WB1 REV 1.2 22010NML

WORKBOOK PAGE: SAM8

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

							SAMPLE
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
SAMPLE	TOTAL COUNTS	(TC)	2641	GROSS WEIGHT	(W2)		8.0051
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.9127
2882	BACKGROUND in cpm	(BKG)	2.5	NET WEIGHT	(W3)		0.0924
Test Code	SAMPLE VOLUME in mL	(SS)	0.050	DELTA TIME (HOURS)	(DT)		7.77
@SR90-01	DILUTION FACTOR	(DF)	201				
Matrix	DIGEST DILUTION FACTOR	(DDF)	1				
LIQUID	SAMPLE COUNT RATE	(Rs)	261.60	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Batch Number	CRITICAL LEVEL	(Lc)	0.95	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
95003134	TIME OF SEPARATION	(ST)	08:59	Rmax			N/A
Rerun	DATE OF SEPARATION	(SD)	10/13/95	DETECTION LIMIT	(Ld)		2.00
0	TIME OF COUNT	(TOC)	16:45	Sr-89/90 CONC in µCi/L			1.1256E+03
Sample Prep	DATE OF COUNT	(DOC)	10/13/95				
N/A							
Sample #							
S95T002309							
Instrument Code							
WB27811							
Prepared By							
CJO							
Chemist							
SLF							
Analyst							
AKL							
Date Complete							
10/17/95							
Analysis Date							
10/13/95							
Analysis Time							
08:55 AM							
Sample Point							
AW-102							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/L Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*DF*DDF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

			DETECTION LEVEL
Sr-89/90 CONCENTRATION	1.13E+00	µCi/mL	8.59E-03 µCi/mL
RELATIVE COUNTING ERROR	3.9%		
PERCENT CARRIER RECOVERY	92.4%		

Analyst:	AKL	Date:	17-Oct-95
Signature of Chemist:	SLF	Date:	10/19/95

SAMPLE.WB1 REV 1.2 22010NML

WORKBOOK PAGE: DUP9

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

							DUP
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
DUP	TOTAL COUNTS	(TC)	2730	GROSS WEIGHT	(W2)		7.9909
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.9014
2882	BACKGROUND in cpm	(BKG)	2.5	NET WEIGHT	(W3)		0.0895
Test Code	SAMPLE VOLUME in mL	(SS)	0.050	DELTA TIME (HOURS)	(DT)		7.93
@SR90-01	DILUTION FACTOR	(DF)	201				
Matrix	DIGEST DILUTION FACTOR	(DDF)	1				
LIQUID	SAMPLE COUNT RATE	(Rs)	270.50	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
Batch Number	CRITICAL LEVEL	(Lc)	0.95	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
95003134	TIME OF SEPARATION	(ST)	08:59	Rmax			N/A
Replicate	DATE OF SEPARATION	(SD)	10/13/95	DETECTION LIMIT	(Ld)		2.00
0	TIME OF COUNT	(TOC)	16:55	Sr-89/90 CONC in µCi/L			1.1995E+03
Sample Prep	DATE OF COUNT	(DOC)	10/13/95				
N/A							
Sample #							
S95T002309							
Instrument Code	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)						
WB27811	Sr-89/90 CONC in µCi/L Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0						
Prepared By	RS*DF*DDF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)						
CJO	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))						
Chemist	Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)						
SLF	Percent Carrier Recovery = (Net Weight / Expected weight) * 100						
Analyst	NOTE: Expected weight = CVA * 0.1						
AKL	Detection Levels and Less Than Values are determined from Procedure LA-508-002.						
Date Complete	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100						
10/17/95							
Analysis Date							DETECTION
10/13/95	Sr-89/90 CONCENTRATION			1.20E+00		µCi/mL	LEVEL
Analysis Time							
08:55 AM	RELATIVE COUNTING ERROR			3.8%			8.85E-03
Sample Code							µCi/mL
AW-102	PERCENT CARRIER RECOVERY			89.5%			

Analyst:		AKL	Date:	17-Oct-95
Signature of Chemist:		SLF	Date:	10/19/95

SAMPLE.WB1 REV 1.2 22010NML

LABCORE Data Entry Template for Worklist# 2942

Analyst: RK **Instrument:** AB00 10 **Book #** 51B52

Method: LA-220-101 Rev/Mod 0-1

Worklist Comment: Determine sample size using Ludlum. SLF

AW 102

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1	STD				@SR90-01 SR90-01	SOLID			N/A	uCi/g
		1	STD				@SR90-01 SR90-01C	SOLID			N/A	% Recovery
		1	STD				@SR90-01 SR90-01E	SOLID			N/A	% Ct. Error
		2	BLNK-PREP				@SR90-01 SR90-01	SOLID			N/A	uCi/g
		2	BLNK-PREP				@SR90-01 SR90-01C	SOLID			N/A	% Recovery
		2	BLNK-PREP				@SR90-01 SR90-01E	SOLID			N/A	% Ct. Error
		3	BLNK/BKG				@SR90-01 SR90-01	SOLID			N/A	uCi/g
95000127	AW-102 GRAB	4	SAMPLE	S95T002304	0	F	@SR90-01 SR90-01	SOLID	N/A			uCi/g
95000127	AW-102 GRAB	4	SAMPLE	S95T002304	0	F	@SR90-01 SR90-01C	SOLID	N/A			% Recovery
95000127	AW-102 GRAB	4	SAMPLE	S95T002304	0	F	@SR90-01 SR90-01E	SOLID	N/A			% Ct. Error
95000127	AW-102 GRAB	5	DUP	S95T002304	0	F	@SR90-01 SR90-01	SOLID			N/A	uCi/g
95000127	AW-102 GRAB	5	DUP	S95T002304	0	F	@SR90-01 SR90-01C	SOLID			N/A	% Recovery
95000127	AW-102 GRAB	5	DUP	S95T002304	0	F	@SR90-01 SR90-01E	SOLID			N/A	% Ct. Error
95000127	AW-102 GRAB	6	SAMPLE	S95T002305	0	F	@SR90-01 SR90-01	SOLID	N/A			uCi/g
95000127	AW-102 GRAB	6	SAMPLE	S95T002305	0	F	@SR90-01 SR90-01C	SOLID	N/A			% Recovery
95000127	AW-102 GRAB	6	SAMPLE	S95T002305	0	F	@SR90-01 SR90-01E	SOLID	N/A			% Ct. Error
95000127	AW-102 GRAB	7	DUP	S95T002305	0	F	@SR90-01 SR90-01	SOLID			N/A	uCi/g
95000127	AW-102 GRAB	7	DUP	S95T002305	0	F	@SR90-01 SR90-01C	SOLID			N/A	% Recovery

Data Entry Comments:

BLNK value indicates possible contamination however it is negligible compared to the sample results. No rerun requested. [signature] 10/23/95

Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

LABCORE Data Entry Template for Worklist# 2942

GROUP	PROJECT	S TYPE	SAMPLE#	R	A	-------TEST------	MATRIX	ACTUAL	FOUND	DL	UNIT
95000127	AW-102 GRAB	7 DUP	S95T002305	0	F	@SR90-01 SR90-01E	SOLID	_____	_____	N/A	% Ct. Error

Final page for worklist # 2942

Analyst Signature Date 10/17/95

Analyst Signature Date 10/19/95

Data Entry Comments:

Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

LABCORE Completed Worklist Report for Worklist# 2942

Analyst: rwk **Instrument:** AB10 **Book#** _____

Method: _____ Rev/Mod _____

Worklist Comment: Determine sample size using Ludlum. SLF

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
1	STD		0		@SR90-01 SR90-01	SOLID	1.09E-03	1.13E-3	103.670	% Recovery
1	STD		0		@SR90-01 SR90-01C	SOLID	100	8.86E+01	88.600	% Recovery
1	STD		0		@SR90-01 SR90-01E	SOLID	1.00	2.04E+00	2.040	% Ct. Error
2	BLNK-PREP		0		@SR90-01 SR90-01	SOLID	1	6.13E-1	0.610	uCi/g
2	BLNK-PREP		0		@SR90-01 SR90-01C	SOLID	100	9.14E+01	91.400	% Recovery
2	BLNK-PREP		0		@SR90-01 SR90-01E	SOLID	1.00	1.11E+01	11.100	% Ct. Error
3	BLNK/BKG		0		@SR90-01 SR90-01	SOLID	1	1.57E+01	15.700	uCi/g
4	SAMPLE	S95T002304	0	F	@SR90-01 SR90-01	SOLID	N/A	2.07E+02	3.330e-002	uCi/g
4	SAMPLE	S95T002304	0	F	@SR90-01 SR90-01C	SOLID	N/A	9.30E+01	1.000e-004	% Recovery
4	SAMPLE	S95T002304	0	F	@SR90-01 SR90-01E	SOLID	N/A	5.62E-01	0.000	% Ct. Error
5	DUP	S95T002304	0	F	@SR90-01 SR90-01	SOLID	2.07E+2	2.09E+2	0.960	RPD
5	DUP	S95T002304	0	F	@SR90-01 SR90-01C	SOLID	100	9.33E+01	93.300	% Recovery
5	DUP	S95T002304	0	F	@SR90-01 SR90-01E	SOLID	1.00	5.63E-01	0.560	% Ct. Error
6	SAMPLE	S95T002305	0	F	@SR90-01 SR90-01	SOLID	N/A	1.13E+03	0.212	uCi/g
6	SAMPLE	S95T002305	0	F	@SR90-01 SR90-01C	SOLID	N/A	9.11E+01	1.000e-004	% Recovery
6	SAMPLE	S95T002305	0	F	@SR90-01 SR90-01E	SOLID	N/A	6.05E-01	0.000	% Ct. Error
7	DUP	S95T002305	0	F	@SR90-01 SR90-01	SOLID	1.13E+3	1.11E+3	1.790	RPD
7	DUP	S95T002305	0	F	@SR90-01 SR90-01C	SOLID	100	9.16E+01	91.600	% Recovery
7	DUP	S95T002305	0	F	@SR90-01 SR90-01E	SOLID	1.00	6.15E-01	0.620	% Ct. Error

Final page for worklist# 2942

Analyst Signature **Date** **Analyst Signature** **Date**

10/23/95

Reviewer Signature **Date**

Units shown for QC (BLK/BKG) may not reflect the actual units.

WORKBOOK PAGE: STD1

Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1) LIQUIDS

						STANDARD
Type	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA)	1.000
STD	TOTAL COUNTS	(TC)	9291	GROSS WEIGHT	(W2)	7.8524
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.7638
2942	BACKGROUND in cpm	(BKG)	2.4	NET WEIGHT	(W3)	0.0886
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)	2.38
@SR90-01	DILUTION FACTOR	(DF)	1			
Matrix	DIGEST DILUTION FACTOR	DDF	1			
LIQUID	SAMPLE COUNT RATE	(Rs)	926.70	SR-90 EFFICIENCY FACTO	(C1)	0.4051
Batch Number	CRITICAL LEVEL	(Lc)	0.93	Y-90 EFFICIENCY FACTOR	(C2)	0.4503
95003219	TIME OF SEPARATION	(ST)	19:12	Rmax		N/A
Rerun	DATE OF SEPARATION	(SD)	10/17/95	DETECTION LIMIT	(Ld)	1.96
0	TIME OF COUNT	(TOC)	21:35	Sr-89/90 CONC. in µCi/L		1.1311E+00
Sample Prep	DATE OF COUNT	(DOC)	10/17/95			
N/A	STANDARD BOOK #		51B52			
Sample #	STANDARD VALUE in µCi/mL		1.0908E-03			
WORKLIST#2942						
Instrument Code						
WB26870						
Prepared By						
SZC						
Chemist						
SLF						
Analyst						
RWK						
Date Complete						
10/19/95						
Analysis Date						
10/17/95						
Analysis Time						
07:17 PM						
Sample Point						
AW-102						

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/mL REPLACE RS WITH RMAX IF RS<=LcAND RS>=0 OR REPLACE RS WITH Lc IF RS<0

RS*DF*DDF*1000/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

Sr-89/90 CONCENTRATION	1.13E-03	µCi/mL
RELATIVE COUNTING ERROR	2.0%	
PERCENT CARRIER RECOVERY	88.6%	

DETECTION LEVEL

2.39E-06 µCi/L

Analyst:	RWK	Date:	19-Oct-95
Signature of Chemist:	SLF	Date:	10/23/95

STANDARD WB1 REV 1.2 22010NML

WORKBOOK PAGE: BLANK2

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

						BLNK-PREP
Type	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA)	1.000
BLNK-PREP	TOTAL COUNTS	(TC)	377	GROSS WEIGHT	(W2)	8.0157
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.9243
2942	BACKGROUND in cpm	(BKG)	2.4	NET WEIGHT	(W3)	0.0914
Test Code	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)	2.55
@SR90-01	DILUTION FACTOR	(DF)	1			
Matrix	DIGEST FACTOR (g/L)	(D g/L)	0.6804			
SOLID	SAMPLE COUNT RATE	(Rs)	35.30	SR-90 EFFICIENCY FACTOR	(C1)	0.4051
Batch Number	CRITICAL LEVEL	(Lc)	0.93	Y-90 EFFICIENCY FACTOR	(C2)	0.4503
95003219	TIME OF SEPARATION	(ST)	19:12	Rmax		N/A
Rerun	DATE OF SEPARATION	(SD)	10/17/95	DETECTION LIMIT	(Ld)	1.96
0	TIME OF COUNT	(TOC)	21:45	Sr-89/90 CONC in µCi/g		6.1268E-01
Sample Prep	DATE OF COUNT	(DOC)	10/17/95			
N/A						
Sample #						

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

Instrument Code: WB26870				
Prepared By: SZC				
Chemist: SLF				
Analyst: RWK				
Data Complete: 10/19/95				
Analysis Date: 10/17/95	Sr-89/90 CONCENTRATION	6.13E-01	µCi/g	DETECTION LEVEL
Analysis Time: 07:17 PM	RELATIVE COUNTING ERROR	11.1%		3.40E-02 µCi/g
Sample Point: AW-102	PERCENT CARRIER RECOVERY	91.4%		

Analyst:	RWK	Date:	19-Oct-95
Signature of Chemist:	SLF	Date:	10/23/95

BLANK.WB1 REV 1.2 22010NML

WORKBOOK PAGE: SAM4

LA-220-101 / D-1 **Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)**

							SAMPLE
Type	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA)		1.000
SAMPLE	TOTAL COUNTS	(TC)	121556	GROSS WEIGHT	(W2)		8.0354
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.9424
2942	BACKGROUND in cpm	(BKG)	2.4	NET WEIGHT	(W3)		0.0930
Test Code	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)		2.80
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST FACTOR (g/L)	(D g/L	0.6804				
SOLID	SAMPLE COUNT RATE	(Rs)	12153.20	SR-90 EFFICIENCY FACTOR	(C1)		0.4051
Batch Number	CRITICAL LEVEL	(Lc)	0.93	Y-90 EFFICIENCY FACTOR	(C2)		0.4503
95003219	TIME OF SEPARATION	(ST)	19:12	Rmax			N/A
Rerun	DATE OF SEPARATION	(SD)	10/17/95	DETECTION LIMIT	(Ld)		1.96
0	TIME OF COUNT	(TOC)	22:00	Sr-89/90 CONC in µCi/g			2.0672E+02
Sample Prep	DATE OF COUNT	(DOC)	10/17/95				
FUSION01							
Sample #							
S95T002304							
Instrument Code							
WB26870							
Prepared By							
SZC							
Chemist							
SLF							
Analyst							
RWK							
Date Complete							
10/19/95							
Analysis Date							
10/17/95							
Analysis Time							
07:17 PM							
Sample Point							
AW-102							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

			DETECTION LEVEL
Sr-89/90 CONCENTRATION	2.07E+02	µCi/g	3.33E-02 µCi/g
RELATIVE COUNTING ERROR	0.6%		
PERCENT CARRIER RECOVERY	93.0%		

Analyst:	RWK	Date:	19-Oct-95
Signature of Chemist:	SLF	Date:	10/23/95

SAMPLE.WB1 REV 1.2 22010NML

WORKBOOK PAGE: DUP5

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

						DUP
Type	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA)	1.000
DUP	TOTAL COUNTS	(TC)	121328	GROSS WEIGHT	(W2)	7.8501
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.7568
2942	BACKGROUND in cpm	(BKG)	2.4	NET WEIGHT	(W3)	0.0933
Test Code	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)	2.97
@SR90-01	DILUTION FACTOR	(DF)	1			
Matrix	DIGEST FACTOR (g/L)	(D g/L	0.6684			
SOLID	SAMPLE COUNT RATE	(Rs)	12130.40	SR-90 EFFICIENCY FACTOR	(C1)	0.4051
Batch Number	CRITICAL LEVEL	(Lc)	0.93	Y-90 EFFICIENCY FACTOR	(C2)	0.4503
95003219	TIME OF SEPARATION	(ST)	19:12	Rmax		N/A
Rerun	DATE OF SEPARATION	(SD)	10/17/95	DETECTION LIMIT	(Ld)	1.96
0	TIME OF COUNT	(TOC)	22:10	Sr-89/90 CONC in µCi/g		2.0897E+02
Sample Prep	DATE OF COUNT	(DOC)	10/17/95			
FUSION01						
Sample #						
S95T002304						
Instrument Code						
WB26870						
Prepared By						
SZC						
Chemist						
SLF						
Analyst						
RWK						
Date Complete						
10/19/95						
Analysis Date						
10/17/95						
Analysis Time						
07:17 PM						
Sample Point						
AW-102						

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

			DETECTION LEVEL
Sr-89/90 CONCENTRATION	2.09E+02	µCi/g	3.37E-02 µCi/g
RELATIVE COUNTING ERROR	0.6%		
PERCENT CARRIER RECOVERY	93.3%		

Analyst:	RWK	Date:	19-Oct-95
Signature of Chemist:	SLF	Date:	10/23/95

SAMPLE.WB1 REV 1.2 22010NML

WORKBOOK PAGE: SAM6

WHC-SD-WM-DP-149, REV. 0

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

							SAMPLE
Type	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA)	1.000
SAMPLE	TOTAL COUNTS	(TC)	104886	GROSS WEIGHT	(W2)	7.8282
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.7371
2942	BACKGROUND in cpm	(BKG)	2.4	NET WEIGHT	(W3)	0.0911
Test Code	SAMPLE VOLUME in mL	(SS)	0.500	DELTA TIME (HOURS)	(DT)	3.30
@SR90-01	DILUTION FACTOR	(DF)	101			
Matrix	DIGEST FACTOR (g/L)	(D g/L	2.1948			
SOLID	SAMPLE COUNT RATE	(Rs)	10486.20	SR-90 EFFICIENCY FACTOR	(C1)	0.4051
Batch Number	CRITICAL LEVEL	(Lc)	0.93	Y-90 EFFICIENCY FACTOR	(C2)	0.4503
95003219	TIME OF SEPARATION	(ST)	19:17	Rmax		N/A
Rerun	DATE OF SEPARATION	(SD)	10/17/95	DETECTION LIMIT	(Ld)	1.96
0	TIME OF COUNT	(TOC)	22:35	Sr-89/90 CONC in µCi/g		1.1339E+03
Sample Prep	DATE OF COUNT	(DOC)	10/17/95			
FUSION01						
Sample #						
S95T002305						
Instrument Code						
WB26870						
Prepared By						
SZC						
Chemist						
SLF						
Analyst						
RWK						
Date Complete						
10/19/95						
Analysis Date						
10/17/95						
Analysis Time						
07:17 PM						
Sample Point						
AW-102						

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

			DETECTION LEVEL
Sr-89/90 CONCENTRATION	1.13E+03	µCi/g	2.12E-01 µCi/g
RELATIVE COUNTING ERROR	0.6%		
PERCENT CARRIER RECOVERY	91.1%		

Analyst:	RWK	Date:	19-Oct-95
Signature of Chemist:	SLF	Date:	10/23/95

SAMPLE.WB1 REV 1.2 22010NML

WORKBOOK PAGE: DUP7

LA-220-101 / D-1 **Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)**

							DUP
Type	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA)		1.000
DUP	TOTAL COUNTS	(TC)	101667	GROSS WEIGHT	(W2)		7.8507
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.7591
2942	BACKGROUND in cpm	(BKG)	2.4	NET WEIGHT	(W3)		0.0916
Test Code	SAMPLE VOLUME in mL	(SS)	0.500	DELTA TIME (HOURS)	(DT)		3.47
@SR90-01	DILUTION FACTOR	(DF)	101				
Matrix	DIGEST FACTOR (g/L)	(D g/L	2.1556				
SOLID	SAMPLE COUNT RATE	(Rs)	10164.30	SR-90 EFFICIENCY FACTOR	(C1)		0.4051
Batch Number	CRITICAL LEVEL	(Lc)	0.93	Y-90 EFFICIENCY FACTOR	(C2)		0.4503
95003219	TIME OF SEPARATION	(ST)	19:17	Rmax			N/A
Rerun	DATE OF SEPARATION	(SD)	10/17/95	DETECTION LIMIT	(Ld)		1.96
0	TIME OF COUNT	(TOC)	22:45	Sr-89/90 CONC in µCi/g			1.1109E+03
Sample Prep	DATE OF COUNT	(DOC)	10/17/95				
FUSION01							
Sample #							
S95T002305							
Instrument Code							
WB26870							
Prepared By							
SZC							
Chemist							
SLF							
Analyst							
RWK							
Date Complete							
10/19/95							
Analysis Date							
10/17/95							
Analysis Time							
07:17 PM							
Sample Point							
AW-102							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)
Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0
RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)
NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))
Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)
Percent Carrier Recovery = (Net Weight / Expected weight) * 100
NOTE: Expected weight = CVA * 0.1
Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

Sr-89/90 CONCENTRATION	1.11E+03	µCi/g	DETECTION LEVEL
RELATIVE COUNTING ERROR	0.6%		2.14E-01 µCi/g
PERCENT CARRIER RECOVERY	91.6%		

Analyst:	RWK	Date:	19-Oct-95
Signature of Chemist:	SLF	Date:	10/23/95

SAMPLE.WB1 REV 1.2 22010NML

THE FOLLOWING ANALYSES ARE INCLUDED IN THE DATA PACKAGE BUT THE RESULTS HAVE NOT BEEN REPORTED IN THE FINAL SUMMARY REPORTS.

LABCORE Data Entry Template for Worklist# 2720

Analyst: [illegible] **Instrument:** AB00(12)WB27811 **Book #** 51652

Method: LA-220-101 Rev/Mod D-1

Worklist Comment: Determine sample size using Ludlum. SLF

DATA NOT USED IN PACKAGE

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	-------TEST------	MATRIX	ACTUAL	FOUND	DL	UNIT
		1	STD				@SR90-01 SR90-01	LIQUID			N/A	uCi/mL
		1	STD				@SR90-01 SR90-01C	LIQUID			N/A	% Recovery
		1	STD				@SR90-01 SR90-01E	LIQUID			N/A	% Ct. Error
		2	BLNK-PREP				@SR90-01 SR90-01	LIQUID			N/A	uCi/mL
		2	BLNK-PREP				@SR90-01 SR90-01C	LIQUID			N/A	% Recovery
		2	BLNK-PREP				@SR90-01 SR90-01E	LIQUID			N/A	% Ct. Error
		3	BLNK/BKG				@SR90-01 SR90-01	LIQUID			N/A	uCi/mL
95000127	AW-102 GRAB	4	SAMPLE	S95T002308	0		@SR90-01 SR90-01	LIQUID	N/A			uCi/mL
95000127	AW-102 GRAB	4	SAMPLE	S95T002308	0		@SR90-01 SR90-01C	LIQUID	N/A			% Recovery
95000127	AW-102 GRAB	4	SAMPLE	S95T002308	0		@SR90-01 SR90-01E	LIQUID	N/A			% Ct. Error
~~95000127~~	~~AW-102 GRAB~~	~~5~~	~~DUP~~	~~S95T002308~~	~~0~~		~~@SR90-01 SR90-01E~~	~~LIQUID~~	~~N/A~~			
95000127	AW-102 GRAB	~~5~~ 6	SAMPLE	S95T002309	0		@SR90-01 SR90-01	LIQUID	N/A			uCi/mL
95000127	AW-102 GRAB	~~5~~ 6	SAMPLE	S95T002309	0		@SR90-01 SR90-01C	LIQUID	N/A			% Recovery
95000127	AW-102 GRAB	~~5~~ 6	SAMPLE	S95T002309	0		@SR90-01 SR90-01E	LIQUID	N/A			% Ct. Error
95000127	AW-102 GRAB	~~6~~ 7	DUP	S95T002309	0		@SR90-01 SR90-01	LIQUID			N/A	uCi/mL
95000127	AW-102 GRAB	~~6~~ 7	DUP	S95T002309	0		@SR90-01 SR90-01C	LIQUID			N/A	% Recovery
95000127	AW-102 GRAB	~~6~~ 7	DUP	S95T002309	0		@SR90-01 SR90-01E	LIQUID			N/A	% Ct. Error
95000127	AW-102 GRAB	~~7~~ 8	SAMPLE	S95T002158	0		@SR90-01 SR90-01	LIQUID	N/A			uCi/mL
95000127	AW-102 GRAB	~~7~~ 8	SAMPLE	S95T002158	0		@SR90-01 SR90-01C	LIQUID	N/A			% Recovery

SLF 10/12/95

Data Entry Comments: This worklist did not include S95T 2308 Dup, which I added since I believe it was mistakingly left out of the worklist. Dup Not Needed. [illegible] 10/12/95

Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

Blnk value indicates possible contamination. Batch will be rerun. [illegible] 10/12/95

LABCORE Data Entry Template for Worklist# 2720

GROUP	PROJECT	S TYPE	SAMPLE#	R	A	-------TEST------	MATRIX	ACTUAL	FOUND	DL	UNIT
95000127	AW-102 GRAB	~~7~~ 8 SAMPLE	S95T002158	0		@SR90-01 SR90-01E	LIQUID	N/A			% Ct. Error
95000127	AW-102 GRAB	~~8~~ 9 DUP	S95T002158	0		@SR90-01 SR90-01	LIQUID			N/A	uCi/mL
95000127	AW-102 GRAB	~~8~~ 9 DUP	S95T002158	0		@SR90-01 SR90-01C	LIQUID			N/A	% Recovery
95000127	AW-102 GRAB	~~8~~ 9 DUP	S95T002158	0		@SR90-01 SR90-01E	LIQUID			N/A	% Ct. Error

Final page for worklist # 2720

Rae Ann Green 10-06-95
Analyst Signature **Date** 07:00

[illegible] 10/9/95
Analyst Signature **Date**

DATA NOT USED IN PACKAGE

Data Entry Comments:

Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

WORKBOOK PAGE: STD1

Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1) LIQUIDS

							STANDARD
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
STD	TOTAL COUNTS	(TC)	9995	GROSS WEIGHT	(W2)		8.0460
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.9575
2720	BACKGROUND in cpm	(BKG)	1.4	NET WEIGHT	(W3)		0.0885
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)		5.92
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST DILUTION FACTOR	DDF	1				
LIQUID	SAMPLE COUNT RATE	(Rs)	998.10	SR-90 EFFICIENCY FACTO	(C1)		0.4180
Batch Number	CRITICAL LEVEL	(Lc)	0.71	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
95002921	TIME OF SEPARATION	(ST)	02:10	Rmax			N/A
Rerun	DATE OF SEPARATION	(SD)	10/07/95	DETECTION LIMIT	(Ld)		1.52
0	TIME OF COUNT	(TOC)	08:05	Sr-89/90 CONC. in µCi/L			1.1369E+00
Sample Prep	DATE OF COUNT	(DOC)	10/07/95				
N/A	STANDARD BOOK #		51B52				
Sample #	STANDARD VALUE in µCi/mL		1.0916E-03				
WRKLST#2720							
Instrument Code							
WB27811							
Prepared By							
MCB							
Chemist							
SLF							
Analyst							
RAG							
Date Complete							
10/09/95							
Analysis Date							
10/06/95							
Analysis Time							
07:00 AM							
Sample Point							
AW-102 GRAB							

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/mL REPLACE RS WITH RMAX IF RS<=LcAND RS>=0 OR REPLACE RS WITH Lc IF RS<0

RS*DF*DDF*1000/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

Sr-89/90 CONCENTRATION	1.14E-03	µCi/mL	DETECTION LEVEL
RELATIVE COUNTING ERROR	2.0%		1.73E-06 µCi/L
PERCENT CARRIER RECOVERY	88.5%		

Analyst:	RAG	Date:	09-Oct-95
Signature of Chemist:	SLF	Date:	10/10/95

STANDARD.WB1 REV 1.2 22010NML

DATA NOT USED IN PACKAGE

WORKBOOK PAGE: BLANK2

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

						BLNK-PREP
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
BLNK-PREP	TOTAL COUNTS	(TC)	360	GROSS WEIGHT	(W2)	7.9384
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.8480
2720	BACKGROUND in cpm	(BKG)	1.4	NET WEIGHT	(W3)	0.0904
Test Code	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)	6.17
@SR90-01	DILUTION FACTOR	(DF)	101			
Matrix	DIGEST DILUTION FACTOR	(DDF)	1			
LIQUID	SAMPLE COUNT RATE	(Rs)	34.60	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
Batch Number	CRITICAL LEVEL	(Lc)	0.71	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
95002921	TIME OF SEPARATION	(ST)	02:10	Rmax		N/A
Rerun	DATE OF SEPARATION	(SD)	10/07/95	DETECTION LIMIT	(Ld)	1.52
0	TIME OF COUNT	(TOC)	08:20	Sr-89/90 CONC in µCi/L		3.8867E+01
Sample Prep	DATE OF COUNT	(DOC)	10/07/95			
N/A						
Sample #						
WRKLST#2720						

Instrument Code	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)
WB27811	Sr-89/90 CONC in µCi/L Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0
Prepared By	RS*DF*DDF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)
MCB	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))
Chemist	Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)
SLF	Percent Carrier Recovery = (Net Weight / Expected weight) * 100
Analyst	NOTE: Expected weight = CVA * 0.1
RAG	Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Date Complete	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100
10/09/95	
Analysis Date	
10/06/95	
Analysis Time	
07:00 AM	
Sample Point	
AW-102 GRAB	

Sr-89/90 CONCENTRATION	3.89E-02	µCi/m	DETECTION LEVEL
RELATIVE COUNTING ERROR	11.0%		1.70E-03 µCi/mL
PERCENT CARRIER RECOVERY	90.4%		

Analyst:	RAG	Date:	09-Oct-95
Signature of Chemist:	SLF	Date:	10/10/95

BLANK.WB1 REV 1.2 22010NML

DATA NOT USED IN PACKAGE

WORKBOOK PAGE: SAM4

LA-220-101 / D-1 **Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)**

						SAMPLE
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
SAMPLE	TOTAL COUNTS	(TC)	247	GROSS WEIGHT	(W2)	8.0790
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	8.0205
2720	BACKGROUND in cpm	(BKG)	1.4	NET WEIGHT	(W3)	0.0585
Test Code	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)	6.17
@SR90-01	DILUTION FACTOR	(DF)	101			
Matrix	DIGEST DILUTION FACTOR	(DDF)	1			
LIQUID	SAMPLE COUNT RATE	(Rs)	23.30	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
Batch Number	CRITICAL LEVEL	(Lc)	0.71	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
95002921	TIME OF SEPARATION	(ST)	02:20	Rmax		N/A
Rerun	DATE OF SEPARATION	(SD)	10/07/95	DETECTION LIMIT	(Ld)	1.52
0	TIME OF COUNT	(TOC)	08:30	Sr-89/90 CONC in µCi/L		4.0446E+01
Sample Prep	DATE OF COUNT	(DOC)	10/07/95			
N/A						
Sample #						
S95T002308						
Instrument Code						
WB27811						
Prepared By						
MCB						
Chemist						
SLF						
Analyst						
RAG						
Date Complete						
10/09/95						
Analysis Date						
10/06/95						
Analysis Time						
07:00 AM						
Sample Point						
AW-102 GRAB						

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)

Sr-89/90 CONC in µCi/L Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0

RS*DF*DDF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)

Percent Carrier Recovery = (Net Weight / Expected weight) * 100

NOTE: Expected weight = CVA * 0.1

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

				DETECTION LEVEL
Sr-89/90 CONCENTRATION	4.04E-02	µCi/mL		
RELATIVE COUNTING ERROR	13.6%			2.63E-03 µCi/mL
PERCENT CARRIER RECOVERY	58.5%			

Analyst:	RAG	Date:	09-Oct-95	
Signature of Chemist:	SLF	Date:	10/10/95	

SAMPLE.WB1 REV 1.2 22010NML

DATA NOT USED IN PACKAGE

WORKBOOK PAGE: SAM5

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

							SAMPLE
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
SAMPLE	TOTAL COUNTS	(TC)	4026	GROSS WEIGHT	(W2)	7.9873
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.9265
2720	BACKGROUND in cpm	(BKG)	1.4	NET WEIGHT	(W3)	0.0608
Test Code	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)	6.67
@SR90-01	DILUTION FACTOR	(DF)	101			
Matrix	DIGEST DILUTION FACTOR	(DDF)	1			
LIQUID	SAMPLE COUNT RATE	(Rs)	401.20	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
Batch Number	CRITICAL LEVEL	(Lc)	0.71	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
95002921	TIME OF SEPARATION	(ST)	02:20	Rmax		N/A
Rerun	DATE OF SEPARATION	(SD)	10/07/95	DETECTION LIMIT	(Ld)	1.52
0	TIME OF COUNT	(TOC)	09:00	Sr-89/90 CONC in µCi/L		6.6660E+02
Sample Prep	DATE OF COUNT	(DOC)	10/07/95			
N/A						
Sample #						
S95T002309						
Instrument Code						
WB27811						
Prepared By						
MCB						
Chemist						
SLF						
Analyst						
RAG						
Date Complete						
10/09/95						
Analysis Date						
10/06/95						
Analysis Time						
07:00 AM						
Sample Point						
AW-102 GRAB						

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)
Sr-89/90 CONC in µCi/L Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0
RS*DF*DDF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)
NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))
Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)
Percent Carrier Recovery = (Net Weight / Expected weight) * 100
NOTE: Expected weight = CVA * 0.1
Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

			DETECTION LEVEL
Sr-89/90 CONCENTRATION	6.67E-01	µCi/mL	2.52E-03 µCi/mL
RELATIVE COUNTING ERROR	3.1%		
PERCENT CARRIER RECOVERY	60.8%		

Analyst:		RAG	Date:	09-Oct-95
Signature of Chemist:		SLF	Date:	10/10/95

SAMPLE.WB1 REV 1.2 22010NML

DATA NOT USED IN PACKAGE

WORKBOOK PAGE: DUP6

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

						DUP
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
DUP	TOTAL COUNTS	(TC)	4327	GROSS WEIGHT	(W2)	8.0489
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.9822
2720	BACKGROUND in cpm	(BKG)	1.4	NET WEIGHT	(W3)	0.0667
Test Code	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)	6.83
@SR90-01	DILUTION FACTOR	(DF)	101			
Matrix	DIGEST DILUTION FACTOR	(DDF)	1			
LIQUID	SAMPLE COUNT RATE	(Rs)	431.30	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
Batch Number	CRITICAL LEVEL	(Lc)	0.71	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
95002921	TIME OF SEPARATION	(ST)	02:20	Rmax		N/A
Rerun	DATE OF SEPARATION	(SD)	10/07/95	DETECTION LIMIT	(Ld)	1.52
0	TIME OF COUNT	(TOC)	09:10	Sr-89/90 CONC in µCi/L		6.5209E+02
Sample Prep	DATE OF COUNT	(DOC)	10/07/95			
N/A						
Sample #						
S95T002309						
Instrument Code						
WB27811						
Prepared By						
MCB						
Chemist						
SLF						
Analyst						
RAG						
Date Complete						
10/09/95						
Analysis Date						
10/06/95						
Analysis Time						
07:00 AM						
Sample Point						
AW-102 GRAB						

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)
Sr-89/90 CONC in µCi/L Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0
RS*DF*DDF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)
NOTE: 64.2 = Half Life for Y-90 and Rec: = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))
Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)
Percent Carrier Recovery = (Net Weight / Expected weight) * 100
NOTE: Expected weight = CVA * 0.1
Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

Sr-89/90 CONCENTRATION	6.52E-01	µCi/mL	DETECTION LEVEL
RELATIVE COUNTING ERROR	3.0%		2.29E-03 µCi/mL
PERCENT CARRIER RECOVERY	66.7%		

Analyst:	RAG	Date:	09-Oct-95
Signature of Chemist:	SLF	Date:	10/10/95

SAMPLE.WB1 REV 1.2 22010NML

DATA NOT USED IN PACKAGE

WORKBOOK PAGE: SAM7

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

						SAMPLE
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
SAMPLE	TOTAL COUNTS	(TC)	79	GROSS WEIGHT	(W2)	8.0043
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.9144
2720	BACKGROUND in cpm	(BKG)	1.4	NET WEIGHT	(W3)	0.0899
Test Code	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)	7.17
@SR90-01	DILUTION FACTOR	(DF)	101			
Matrix	DIGEST DILUTION FACTOR	(DDF)	1			
LIQUID	SAMPLE COUNT RATE	(Rs)	6.50	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
Batch Number	CRITICAL LEVEL	(Lc)	0.71	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
95002921	TIME OF SEPARATION	(ST)	02:10	Rmax		N/A
Rerun	DATE OF SEPARATION	(SD)	10/07/95	DETECTION LIMIT	(Ld)	1.52
0	TIME OF COUNT	(TOC)	09:20	Sr-89/90 CONC in µCi/L		7.2663E+00
Sample Prep	DATE OF COUNT	(DOC)	10/07/95			
N/A						
Sample #						
S95T002158						
Instrument Code						
WB27811						
Prepared By						
MCB						
Chemist						
SLF						
Analyst						
RAG						
Date Complete						
10/09/95						
Analysis Date						
10/06/95						
Analysis Time						
07:00 AM						
Sample Point						
AW-102 GRAB						

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)
Sr-89/90 CONC in µCi/L Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0
RS*DF*DDF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)
NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))
Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)
Percent Carrier Recovery = (Net Weight / Expected weight) * 100
NOTE: Expected weight = CVA * 0.1
Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

			DETECTION LEVEL
Sr-89/90 CONCENTRATION	7.27E-03	µCi/mL	1.70E-03 µCi/mL
RELATIVE COUNTING ERROR	29.1%		
PERCENT CARRIER RECOVERY	89.9%		

Analyst:	RAG	Date:	09-Oct-95
Signature of Chemist:	SLF	Date:	10/10/95

SAMPLE.WB1 REV 1.2 22010NML

DATA
NOT USED
IN PACKAGE

WORKBOOK PAGE: DUP8

LA-220-101 / D-1 **Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)**

						DUP
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
DUP	TOTAL COUNTS	(TC)	123	GROSS WEIGHT	(W2)	7.9997
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.9104
2720	BACKGROUND in cpm	(BKG)	1.4	NET WEIGHT	(W3)	0.0893
Test Code	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)	7.42
@SR90-01	DILUTION FACTOR	(DF)	101			
Matrix	DIGEST DILUTION FACTOR	(DDF)	1			
LIQUID	SAMPLE COUNT RATE	(Rs)	10.90	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
Batch Number	CRITICAL LEVEL	(Lc)	0.71	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
95002921	TIME OF SEPARATION	(ST)	02:10	Rmax		N/A
Rerun	DATE OF SEPARATION	(SD)	10/07/95	DETECTION LIMIT	(Ld)	1.52
0	TIME OF COUNT	(TOC)	09:35	Sr-89/90 CONC in µCi/L		1.2235E+01
Sample Prep	DATE OF COUNT	(DOC)	10/07/95			
N/A						
Sample #						
S95T002158						
Instrument Code						
WB27811						
Prepared By						
MCB						
Chemist						
SLF						
Analyst						
RAG						
Date Complete						
10/09/95						
Analysis Date						
10/06/95						
Analysis Time						
07:00 AM						
Sample Point						
AW-102 GRAB						

Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)
Sr-89/90 CONC in µCi/L Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0
RS*DF*DDF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)
NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))
Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)
Percent Carrier Recovery = (Net Weight / Expected weight) * 100
NOTE: Expected weight = CVA * 0.1
Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100

				DETECTION LEVEL
Sr-89/90 CONCENTRATION	1.22E-02	µCi/mL		
RELATIVE COUNTING ERROR	21.0%			1.70E-03 µCi/mL
PERCENT CARRIER RECOVERY	89.3%			

Analyst:	RAG	Date:	09-Oct-95
Signature of Chemist:	SLF	Date:	10/10/95

SAMPLE.WB1 REV 1.2 22010NML

DATA NOT USED IN PACKAGE

LABCORE Completed Worklist Report for Worklist# 2695

Analyst: eal **Instrument:** LSC02 **Book#** 131853

Method: LA-438-101 **Rev/Mod** D-2

Worklist Comment:

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
1	STD		0		@TC99-01 TC99-01	LIQUID	3.80E-03	3.67E-3	96.580	% Recovery
1	STD		0		@TC99-01 TC99-01E	LIQUID	1.00	8.40E-01	0.840	% Ct. Error
1	STD		0		@TC99-01 TC99-01T	LIQUID	100	5.45E+01	54.500	% Recovery
2	BLNK		0		@TC99-01 TC99-01	LIQUID	1	<9.67E-6		uCi/mL
2	BLNK		0		@TC99-01 TC99-01E	LIQUID	1.00	6.93E+00	6.930	% Ct. Error
2	BLNK		0		@TC99-01 TC99-01T	LIQUID	100	5.50E+01	55.000	% Recovery
3	SAMPLE	S95T002308	0		@TC99-01 TC99-01	LIQUID	N/A	9.64E-03	8.460e-006	uCi/mL
3	SAMPLE	S95T002308	0		@TC99-01 TC99-01T	LIQUID	N/A	6.29E+01	1.000e-004	% Recovery
3	SAMPLE	S95T002308	0		@TC99-01 TC99-01E	LIQUID	N/A	4.80E-01	0.000	% Ct. Error

Final page for worklist# 2695

Analyst Signature **Date** **Analyst Signature** **Date**

Jennifer J. Supra 10/9/95
Reviewer Signature **Date**

WHC-SD-WM-DP-149, REV. 0

Units shown for QC (BLK/BKG) may not reflect the actual units.

LABCORE Data Entry Template for Worklist# 2695

Analyst: EAL **Instrument:** LSC00 _____ **Book#** 131B52

Method: LA-438-101 Rev/Mod D2

Worklist Comment: WHC-SD-WM-DP-149, REV. 0

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				@TC99-01	LIQUID		
2	BLNK				@TC99-01	LIQUID		
3	SAMPLE	S95T002308	0		@TC99-01	LIQUID	95000127	AW-102 GRAB

Analytes Requested: TC99-01 , TC99-01E, TC99-01T

Final page for worklist # 2695

E Ann Lambel 10-6-95
Analyst Signature **Date**

SE Hogan 10/9/95
Analyst Signature **Date**

SPIKE: 80B52 → volume 0.1 ml
STD: 131B52 → volume 1.0 ml
BLK: Q H_2O → volume 1.0 ml
SAMPLE: S95T002308 → volume 1.0 ml

Data Entry Comments: corrected 2 mpk @ hood front corrected 50 mrad/hr @ over the top: HPT: Bill Bishop
samples completed @ 15:20

S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

[illegible]

SAM NO	POS	TIME MIN	H#	TC99 CPM	TC99 %ERROR	TC99 DPM	TC99 EFF-1	LUMEX %	ELAPSED TIME	2P
1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	51.99	[illegible]	[illegible]	[illegible]	
Blank Average DPM for TC99 : 51.99 COEF. OF VAR: 0.000										
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2956.03	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	6218.84	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-0.19	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3294.93	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	8982.75	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	12752.11	[illegible]	[illegible]	[illegible]	

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WORKBOOK PAGE: STD1

Tc-99 : LA-438-101 (D-2) LIQUID

			STANDARD
Type	Tracer Book Number	(Tr BN)	80B52
STD	Activity for 100µl of Spike Added in dpm		8982.2
Work List	Volume of Sample in mL	(SS)	1
2695	Dilution Factor	(DF)	1
Test Code	Digest Dilution Factor	(DDF)	1
@TC99-01	dpm of Sample from Liquid Scintillation Counter	(dm1)	2956.03
Matrix	dpm of Sample+Spike from Liquid Scintillation Counter	(dm2)	6218.84
LIQUID	Background cpm	(BKG cpm)	49.7
Batch Number	Background Time Counted in Minutes	(BKG time)	20
95002889	Instrument Fractional Efficiency	(EFF)	0.9504
Rerun	% Counting Error		0.84
0	Standard Value µCi/mL		3.800E-03
Sample Prep	Standard Book #	(Std BN)	131B52
N/A	Detection Limit	(Ld)	7.87
Sample #	Critical Level	(Lc)	3.67
WORKLIST 2695-ST	Tc-99 Concentration in µCi/L =		3.6656E+00

Instrument Code	
WC16085	Critical Level (Lc) = 2.33 * the Square Root of (BKG cpm / BKG time)
Prepared By	Detection Limit (Ld) = ((2.72 / BKG time) + (2 * Lc)) / EFF
SEH	Detection Level = Ld * dm3 * DF * DDF / ((2220000dpm/µCi) * SS * (dm2 - dm1))
Chemist	Tc-99 µCi/L = (dm1 * (1000mL/L) * dm3 * DF * DDF) / ((2220000dpm/µCi) * SS * (dm2 - dm1))
JLS	
Analyst	Spike (Tracer) Recovery = (dm2 - dm1) * 1.5 * 100 / dm3
EAL	
Date Complete	
10/09/95	
Analysis Date	
10/06/95	
Analysis Time	
08:33 PM	
Sample Point	
AW-102 GRAB	

			DETECTION LEVEL
Tc-99 Concentration in µCi/mL =	3.67E-03		
% Counting Error =	0.84		
Spike (Tracer) Recovery =	54.5%		9.76E-06 µCi/mL

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Analyst:	EAL	Date:	10/09/95
Signature of Chemist:	JLS	Date:	10/9/95

STANDARD.WB1 REV 1.1 438101ML

WHC-SD-WM-DP-149, REV. 0

WORKBOOK PAGE: BLANK2

WHC-SD-WM-DP-149, REV. 0

Tc-99 : LA-438-101 (D-2) LIQUID

			BLNK
Type	Tracer Book Number	(Tr BN)	80B52
BLNK	Activity for 100µl of Spike Added in dpm		8982.2
Work List	Volume of Sample in mL	(SS)	1
2695	Dilution Factor	(DF)	1
Test Code	Digest Dilution Factor	(DDF)	1
@TC99-01	dpm of Sample from Liquid Scintillation Counter	(dm1)	-0.19
Matrix	dpm of Sample+Spike from Liquid Scintillation Counter	(dm2)	3294.93
LIQUID	Background cpm	(BKG cpm)	49.7
Batch Number	Background Time Counted in Minutes	(BKG time)	20
95002889	Instrument Fractional Efficiency	(EFF)	0.9497
Rerun	% Counting Error		6.93
0	Detection Limit	(Ld)	7.88
Sample Prep	Critical Level	(Lc)	3.67
N/A	Tc-99 Concentration in µCi/L =	<	9.6736E-03

Sample #: WORKLIST2695-BK

Critical Level (Lc) = 2.33 * the Square Root of (BKG cpm / BKG time)

Instrument Code: WC16085

Detection Limit (Ld) = ((2.72 / BKG time) + (2 * Lc)) / EFF

Detection Level = Ld * dm3 * DF * DDF / ((2220000dpm/µCi) * SS * (dm2 - dm1))

Prepared By: SEH

Tc-99 µCi/L = (dm1 * (1000mL/L) * dm3 * DF * DDF) / ((2220000dpm/µCi) * SS * (dm2 - dm1))

Tc-99 µCi/mL = µCi/L / (1000mL/L)

Chemist: JLS

Spike (Tracer) Recovery = (dm2 - dm1) * 1.5 * 100 / dm3

Analyst: EAL

NOTE: Reported result is a LESS THAN value calculated from the statistical Detection Limit (Ld).

Date Complete: 10/09/95

Analysis Date: 10/06/95

Analysis Time: 08:33 PM

Sample Point: AW-102 GRAB

				DETECTION LEVEL
Tc-99 Concentration in µCi/mL	=	<	9.67E-06	
% Counting Error	=		6.93	
Spike (Tracer) Recovery	=		55.0%	9.67E-06 µCi/mL

349

Analyst:	EAL	Date:	10/09/95
Signature of Chemist:	JLS	Date:	10/9/95

BLANK.WB1 REV 1.1 438101ML

WORKBOOK PAGE: SAM3

Tc-99 : LA-438-101 (D-2) LIQUID

			SAMPLE
Type	Tracer Book Number	(Tr BN)	80B52
SAMPLE	Activity for 100µl of Spike Added in dpm	(dm3)	8982.2
Work List	Volume of Sample in mL	(SS)	1
2695	Dilution Factor	(DF)	1
Test Code	Digest Dilution Factor	(DDF)	1
@TC99-01	dpm of Sample from Liquid Scintillation Counter	(dm1)	8982.75
Matrix	dpm of Sample+Spike from Liquid Scintillation Counter	(dm2)	12752.11
LIQUID	Background cpm	(BKG cpm)	49.7
Batch Number	Background Time Counted in Minutes	(BKG time)	20
95002889	Instrument Fractional Efficiency	(EFF)	0.9491
Rerun	% Counting Error		0.48
0	Detection Limit	(Ld)	7.88
Sample Prep	Critical Level	(Lc)	3.67
N/A	Tc-99 Concentration in µCi/L		9.6421E+00
Sample #			
S95T002308	Critical Level (Lc) = 2.33 * the Square Root of (BKG cpm / BKG time)		
Instrument Code	Detection Limit (Ld) = ((2.72 / BKG time) + (2 * Lc)) / EFF		
WC16085	Detection Level = Ld * dm3 * DF * DDF / ((2220000dpm/µCi) * SS * (dm2 - dm1))		
Prepared By	Tc-99 µCi/L = (dm1 * (1000mL/L) * dm3 * DF * DDF) / ((2220000dpm/µCi) * SS * (dm2 - dm1))		
SEH	Tc-99 µCi/mL = µCi/L / (1000mL/L)		
Chemist	Spike (Tracer) Recovery = (dm2 - dm1) * 1.5 * 100 / dm3		
JLS			
Analyst			
EAL			
Date Complete			
10/09/95	Tc-99 Concentration in µCi/mL	9.64E-03	DETECTION LEVEL
Analysis Date			
10/06/95	% Counting Error	0.48	
Analysis Time			8.46E-06 µCi/mL
08:33 PM	Spike (Tracer) Recovery	62.9%	
Sample Point			
AW-102 GRAB			

350

Analyst:	EAL	Date:	10/09/95
Signature of Chemist:	JLS	Date:	10/9/95

SAMPLE.WB1 REV 1.1 438101ML

WHC-SD-WM-DP-149, REV. 0

LABCORE Completed Worklist Report for Worklist# 2711

Analyst: akl **Instrument:** NP01 **Book#** 108643

Method: LA-433-141 Rev/Mod H#-1 10/12/95

Worklist Comment:

Seq	Type	Sample#	R	A	Test	Matrix	Actual		Found	DL or Yield	Unit
1	STD		0	@	NP23701	NP23701 LIQUID	3.85E-02		2.77E-2	71.950	% Recovery
1	STD		0	@	NP23701	NP23701E LIQUID	1		1.60E+00	1.600	% Ct. Error
2	BLNK		0	@	NP23701	NP23701 LIQUID	1		<2.06E-5		uCi/mL
2	BLNK		0	@	NP23701	NP23701E LIQUID	1		3.72E+02	372.000	% Ct. Error
3	SAMPLE	S95T002308	0	@	NP23701	NP23701 LIQUID	N/A	<	2.06E-05	4.320e-005	uCi/mL
3	SAMPLE	S95T002308	0	@	NP23701	NP23701E LIQUID	N/A		1.36E+02	0.000	% Ct. Error

Final page for worklist# 2711

Analyst Signature **Date**

Analyst Signature **Date**

12 Oct 95

Reviewer Signature **Date**

Units shown for QC (BLK/BKG) may not reflect the actual units.

LABCORE Data Entry Template for Worklist# 2711

Analyst: AKL **Instrument:** NP01 _____ **Book#** 108 B43

Method: LA-933-141 Rev/Mod A-1

Worklist Comment: WHC-SD-WM-DP-149, REV. 0

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				@NP23701	LIQUID		
2	BLNK				@NP23701	LIQUID		
3	SAMPLE	S95T002308	0		@NP23701	LIQUID	95000127	AW-102 GRAB

Analytes Requested: NP23701 , NP23701E

Final page for worklist # 2711

A. Lewis 10-11-95
Analyst Signature **Date**

SE Hogan 10/12/95
Analyst Signature **Date**

Data Entry Comments:

S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

WORKBOOK PAGE: STD1

WHC-SD-WM-DP-149, REV. 0

Np-237 : LA-933-141 (H-1) LIQUIDS

			STD
Type	Sample Volume in mL	(SS)	0.100
STD	Dilution Factor	(DF)	1
Work List	Mount Factor (1/Mount Volume in mL)	(Mt F)	2
2711	Digest Dilution Factor	(DDF)	1
Test Code	Gross Counts	(Gc)	15514
@NP23701	Time counted in Minutes	(Tc)	30
Matrix	Background in cpm	(bkg)	5
LIQUID	Standard Value in uCi/mL		3.854E-02
Batch Number	Lc, Rmax, or Rs,(Sample Rate) as Appropriate		512.13
95002916	µCi/L in Sample		2.7683E+01
Rerun	Standard Book No.		108B43
0			
Sample Prep			
N/A			
Sample #			
WORKLIST2711-STD			
Instrument Code			
AL10539			
Prepared By			
SEH			
Chemist			
LLF			
Analyst			
AKL			
Date Complete			
10/12/95			
Analysis Date			
10/11/95			
Analysis Time			
02:00 PM			
Sample Point			
AW102-GRAB			

Sample Count Rate (Rs) = (Gc / Tc) - bkg

Np-237 µCi/L = Rs * 1000mL/L * DF * 3 * Mt F * DDF / (0.5 * SS * 2220000dpm/µCi)

WHERE: 3 is an Internal Procedure Dilution Factor and 0.5 is the Counting Effeciency Factor.

Np-237 µCi/mL = Np-237 µCi/L / 1000mL/L

Relative Counting Error = [The Square Root of (Gc + bkg * Tc) / | (Gc - bkg * Tc) |] * 1.96 *

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Np-237 µCi/L	=	2.77E+01
Np-237 µCi/mL	=	2.77E-02
Relative Counting Error	=	1.6%

DETECTION LEVEL

1.08E-04 µCi/mL

Analyst:	AKL	Date:	10/12/95
Signature of Chemist:	LLF	Date:	12 Oct 95

STANDARD.WB1 REV 1.2 933141ML

LESS THAN Value was Determined from Lc.
LESS THAN Value was Determined from Rmax.

WORKBOOK PAGE: BLANK2

Np-237 : LA-933-141 (H-1) LIQUIDS/SOLIDS

			BLNK
Type	Sample Volume in mL	(SS)	0.250
BLNK	Dilution Factor	(DF)	1
Work List	Mount Factor (1/Mount Volume in mL)	(Mt F)	2
2711	Digest Dilution Factor	(DDF)	1
Test Code	Gross Counts	(Gc)	141
@NP23701	Time counted in Minutes	(Tc)	30
Matrix	Background in cpm	(bkg)	5
LIQUID	Lc, Rmax, or Rs,(Sample Rate) as Appropriate		0.95
Batch Number	µCi/L in Sample =		< 2.0597E-02
95002916			
Rerun			
0			
Sample Prep			
N/A			
Sample #			
WORKLIST2711-BK			
Instrument Code			
AL10539			
Prepared By			
SEH			
Chemist			
LLF			
Analyst			
AKL			
Date Complete			
10/12/95			
Analysis Date			
10/11/95			
Analysis Time			
02:00 PM			
Sample Point			
AW102-GRAB			

Sample Count Rate (Rs) = (Gc / Tc) - bkg

Np-237 µCi/L = Rs * 1000mL/L * DF * 3 * Mt F * DDF / (0.5 * SS * 2220000dpm/µCi)

WHERE: 3 is an Internal Procedure Dilution Factor and 0.5 is the Counting Effeciency Factor

Np-237 µCi/mL = Np-237 µCi/L / 1000mL/L

Relative Counting Error = [The Square Root of (Gc + bkg * Tc) / | (Gc - bkg * Tc) |] * 1.96

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Np-237 µCi/L = < 2.06E-02

Np-237 µCi/mL = < 2.06E-05

LESS THAN Value was Determined from Lc.

Relative Counting Error = 371.5%

DETECTION LEVEL

4.32E-05 µCi/mL

Analyst:	AKL	Date:	10/12/95
Signature of Chemist:	LLF	Date:	12 Oct 95

BLANK.WB1 REV 1.2 933141ML

LESS THAN Value was Determined from Lc.
LESS THAN Value was Determined from Rmax.

WORKBOOK PAGE: SAM3

Np-237 : LA-933-141 (H-1) LIQUIDS/SOLIDS

			SAMPLE
Type	Sample Volume in mL	(SS)	0.250
SAMPLE	Dilution Factor	(DF)	1
Work List	Mount Factor (1/Mount Volume in mL)	(Mt F)	2
2711	Digest Dilution Factor	(DDF)	1
Test Code	Gross Counts	(Gc)	126
@NP23701	Time counted in Minutes	(Tc)	30
Matrix	Background in cpm	(bkg)	5
LIQUID	Lc, Rmax, or Rs,(Sample Rate) as Appropriate		0.95
Batch Number	µCi/mL in Sample		< 2.0597E-05
95002916			
Rerun			
0			
Sample Prep			
N/A			
Sample #			
S95T002308			
Instrument Code			
AL10539			
Prepared By			
SEH			
Chemist			
LLF			
Analyst			
AKL			
Date Complete			
10/12/95			
Analysis Date			
10/11/95			
Analysis Time			
02:00 PM			
Sample Point			
AW102-GRAB			

Sample Count Rate (Rs) = (Gc / Tc) - bkg

Np-237 µCi/mL = Rs * DF * 3 * Mt F * DDF / (0.5 * SS * 2220000dpm/µCi)

WHERE: 3 is an Internal Procedure Dilution Factor and 0.5 is the Counting Effeciency Factor

Np-237 µCi/mL = Np-237 µCi/L / 1000mL/L

Relative Counting Error = [The Square Root of (Gc + bkg * Tc) / | (Gc - bkg * Tc) |] * 1.96

Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Np-237 µCi/L = < 2.06E-02

Np-237 µCi/mL = < 2.06E-05

LESS THAN Value was Determined from Lc.

Relative Counting Error = 135.7%

DETECTION LEVEL

4.32E-05 µCi/mL

Analyst:	AKL	Date:	10/12/95
Signature of Chemist:	LLF	Date:	12 Oct 95

SAMPLE.WB1 REV 1.2 933141ML

LESS THAN Value was Determined from Lc.
LESS THAN Value was Determined from Rmax.

LABCORE Completed Worklist Report for Worklist# 2712

Analyst: akl **Instrument:** AM01 **Book#** LC4643

Method: LA-953-103 Rev/Mod A-4

Worklist Comment: Determine sample size using Ludlum. --LLF

Seq	Type	Sample#	R	A	Test	Matrix	Actual		Found	DL or Yield	Unit
1	STD		0	@	AM24102 AM24101	LIQUID	3.07E-02		2.58E-2	84.040	% Recovery
1	STD		0	@	AM24102 AM24101E	LIQUID	1.00		1.46E+00	1.460	% Ct. Error
1	STD		0	@	AM24102 AM24101T	LIQUID	100		9.33E+01	93.300	% Recovery
2	BLNK		0	@	AM24102 AM24101	LIQUID	1		<7.08E-5		uCi/mL
2	BLNK		0	@	AM24102 AM24101E	LIQUID	1.00		1.00E+02	100.000	% Ct. Error
2	BLNK		0	@	AM24102 AM24101T	LIQUID	100		1.86E+01	18.600	% Recovery
2	BLNK		0	@	AM24102 CM24301	LIQUID	1		<7.08E-5		uCi/mL
2	BLNK		0	@	AM24102 CM24301E	LIQUID	1.00		1.00E+02	100.000	% Ct. Error
3	SAMPLE	S95T002308	0	@	AM24102 AM24101	LIQUID	N/A	<	1.44E-05	1.440e-005	uCi/mL
3	SAMPLE	S95T002308	0	@	AM24102 AM24101E	LIQUID	N/A		6.42E+00	0.000	% Ct. Error
3	SAMPLE	S95T002308	0	@	AM24102 AM24101T	LIQUID	N/A		8.34E+01	1.000e-007	% Recovery
3	SAMPLE	S95T002308	0	@	AM24102 CM24301	LIQUID	N/A	<	1.44E-05	1.440e-005	uCi/mL
3	SAMPLE	S95T002308	0	@	AM24102 CM24301E	LIQUID	N/A		1.00E+02	0.000	% Ct. Error

Final page for worklist# 2712

Analyst Signature **Date** **Analyst Signature** **Date**

LLFitts 9 Oct 95

Reviewer Signature **Date**

Units shown for QC (BLK/BKG) may not reflect the actual units.

LABCORE Data Entry Template for Worklist# 2712

Analyst: AKL **Instrument:** AM01 _____ **Book#** 104B43

Method: LA-953-103 Rev/Mod A-4

Worklist Comment: Determine sample size using Ludlum. --LLF

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				@AM24102	LIQUID		
2	BLNK				@AM24102	LIQUID		
3	SAMPLE	S95T002308	0		@AM24102	LIQUID	95000127	AW-102 GRAB

Analytes Requested: AM24101 , AM24101E, AM24101T, CM24301 , CM24301E

Final page for worklist # 2712

AKLewis 10/6/95
Analyst Signature **Date**

SE Hogan 10/9/95
Analyst Signature **Date**

Data Entry Comments:

S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

WORKBOOK PAGE: STD1

Am 241 and Cm 243/244: LA-953-103 (A-4) LIQUID

						STD
Type	Date Counted		OCT-06-95	Am 241 AEA Frac.	(C241)	0.514
STD	Sample Volume in mL	(SS)	1.000	Am 243 AEA Frac.	(C243)	0.418
Work List	Sample D.F.	(DF)	101	Cm 243/244 AEA Frac.	(Cm)	0
2712	Tracer Volume in mL	(SPKV)	0.050	Total AT Counts		15568
Test Code	Digest D.F.	(DDF)	1.000	AT Count Time (min)	(TC)	30
@AM24102	Tracer Book No.		114B43	Background in cpm	(Bkg)	5
Matrix	Am-243 Tracer Value	(dpm/mL)	9214	Am 241 cpm		83.73
LIQUID	Detector Number		1	Am 243 cpm		68.09
Batch Number	Detector Efficiency	(DetEff)	0.5000	Cm 243/244 cpm		0
95002915	Standard Book No		104B43	AEA Count Time	(min)	480
Rerun	Standard Value in µCi/mL		0.03067	Am 241 µCi/L =		2.5774E+01
0				Cm 243/244 µCi/L =	<	2.6883E+00
Sample Prep						
N/A						
Sample Number	Am-241 µCi/L = (C241 * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))					
WORKLIST 2712-STD	Cm-243/244 µCi/L = (Cm * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))					
Instrument Code						
AL10539	Relative Counting Error = Square Root of [(1/(Am-243 cpm * min)) + (1 / (Am-241 or Cm-243/244 cpm * min))] * 1.96 * 100					
Prepared By	Am 243 Tracer Recovery = (Total AT Counts / TC - Bkg) * (1/DetEff) * C243 * 100 / Am-243 Tracer Value * SPKV					
SEH						
Chemist						
LLF	Am 241 µCi/mL =		2.58E-02	DETECTION LEVELS in µCi/mL		
Analyst	Relative Counting Error =		1.5%			
AKL						
Date Complete	NOTE: Cm-243/244 Result is a LESS THAN Value.			Am 241		
10/09/95	Cm 243/244 µCi/mL		< 2.69E-03	2.69E-03		
Analysis Date	Relative Counting Error =		100.0%	Cm 243/244		
10/06/95	Am 243 Tracer Recovery =		93.3%	2.69E-03		
Analysis Time						
02:30 PM						
Sample Point						
AW-102 GRAB						

Analyst:	AKL	Date:	10/09/95
Signature of Chemist:	LLF	Date:	9 Oct 95

STANDARD.WB1 REV 1.2 953103ML

WORKBOOK PAGE: BLANK2

Am 241 and Cm 243/244: LA-953-103 (A-4) LIQUID / SOLID

Type	Date Counted		OCT-06-95	Am 241 AEA Frac.	(C241)	BLNK	0
BLNK	Sample Volume in mL	(SS)	1.000	Am 243 AEA Frac.	(C243)		0.788
Work Unit	Sample D.F.	(DF)	1	Cm 243/244 AEA Frac.	(Cm)		0
2712	Tracer Volume in mL	(SPKV)	0.050	Total AT Counts			1721
Test Code	Digest D.F.	(DDF)	1.000	AT Count Time (min)	(TC)		30
@AM24102	Tracer Book No.		114B43	Background in cpm	(Bkg)		3
Matrix	Am-243 Tracer Value	(dpm/mL)	9214	Am 241 cpm			0
LIQUID	Detector Number		2	Am 243 cpm			15.65
Batch Number	Detector Efficiency	(DetEff)	0.5000	Cm 243/244 cpm			0
95002915				AEA Count Time	(min)		480
Prep				Am 241 µCi/L =		<	7.0801E-02
0				Cm 243/244 µCi/L =		<	7.0801E-02
Sample Prep							
N/A							

Sample Number

WORKLIST 2712-BLK

Instrument Code

AL10540

Prepared By

SEH

Chemist

LLF

Analyst

AKL

Date Completed

10/09/95

Analysis Date

10/08/95

Analysis Time

02:30 PM

Sample Point

AW-102 GRAB

Am-241 µCi/L = (C241 * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))

Cm-243/244 µCi/L = (Cm * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))

Relative Counting Error = Square Root of [(1/(Am-243 cpm * min)) + (1 / (Am-241 or Cm-243/244 cpm * min))] * 1.96 * 100

Am 243 Tracer Recovery = (Total AT Counts / TC - Bkg) * (1/DetEff) * C243 * 100 / Am-243 Tracer Value * SPKV

NOTE: Am-241 Result is a LESS THAN Value.

Am 241 µCi/mL	=	< 7.08E-05	
Relative Counting Error	=	100.0%	

NOTE: Cm-243/244 Result is a LESS THAN Value.

Cm 243/244 µCi/mL		< 7.08E-05	
Relative Counting Error	=	100.0%	
Am 243 Tracer Recovery	=	18.6%	

DETECTION LEVELS in µCi/mL	
Am 241	7.08E-05
Cm 243/244	7.08E-05

Analyst:	AKL	Date:	10/09/95
Signature of Chemist:	LLF	Date:	9 Oct 95

BLANK.WB1 REV 1.2 953103ML

WORKBOOK PAGE: SAM3

Am 241 and Cm 243/244: LA-953-103 (A-4) LIQUID / SOLID

						SAMPLE
Type	Date Counted		OCT-06-95	Am 241 AEA Frac.	(C241)	0.026
SAMPLE	Sample Volume in mL	(SS)	1.000	Am 243 AEA Frac.	(C243)	0.865
Work List	Sample D.F.	(DF)	1	Cm 243/244 AEA Frac.	(Cm)	0
2712	Tracer Volume in mL	(SPKV)	0.050	Total AT Counts		6750
Test Code	Digest D.F.	(DDF)	1.000	AT Count Time (min)	(TC)	30
@AM24102	Tracer Book No.		114B43	Background in cpm	(Bkg)	4
Matrix	Am-243 Tracer Value	(dpm/mL)	9214	Am 241 cpm		2
LIQUID	Detector Number		3	Am 243 cpm		67.06
Batch Number	Detector Efficiency	(DetEff)	0.5000	Cm 243/244 cpm		0
95002915				AEA Count Time	(min)	480
Rerun				Am 241 µCi/L =	<	1.4389E-02
0				Cm 243/244 µCi/L =	<	1.4389E-02
Sample Prep						
N/A						
Sample Number						
S95T002308						
Instrument Code						
AL10541						
Prepared By						
SEH						
Chemist						
LLF						
Analyst						
AKL						
Date Complete						
10/09/95						
Analysis Date						
10/06/95						
Analysis Time						
02:30 PM						
Sample Point						
AW-102 GRAB						

Am-241 µCi/L = (C241 * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))

Cm-243/244 µCi/L = (Cm * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))

Relative Counting Error = Square Root of [(1/(Am-243 cpm * min)) + (1 / (Am-241 or Cm-243/244 cpm * min))] * 1.96 * 100

Am 243 Tracer Recovery = (Total AT Counts / TC - Bkg) * (1/DetEff) * C243 * 100 / Am-243 Tracer Value * SPKV

NOTE: Am-241 Result is a LESS THAN Value.

Am 241 µCi/mL =	< 1.44E-05	DETECTION LEVELS in µCi/mL
Relative Counting Error =	6.4%	
NOTE: Cm-243/244 Result is a LESS THAN Value.		Am 241
Cm 243/244 µCi/mL	< 1.44E-05	1.44E-05
Relative Counting Error =	100.0%	Cm 243/244
Am 243 Tracer Recovery =	83.4%	1.44E-05

Analyst:	AKL	Date:	10/09/95
Signature of Chemist:	LLF	Date:	9 Oct 95

SAMPLE.WB1 REV 1.2 953103ML

Raymond 10-7-95

Westinghouse Hanford Co.

G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 2.01

DATA REDUCTION REPORT

SAMPLE
WORKLIST2712-STD
File ID: 21a2141.CNF

Counted on: 10/ 6/95 @18:28
Detector: AEA21
Geometry number: 1
Count time: 28805. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	2646.2	2646.2	300.990	300.990	12.000	5.043	6.000	2.072
2	2242.1	2242.1	255.347	255.335	10.000	4.222	5.000	1.733

PEAK RESULTS
Peak Error Limit: 30%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Pu238	0.514	5.487	5.469	0.018	0.02	83.73	1.0	6056.8	0.273E-02
	Am241		5.479	5.469	0.010				4639.3	0.209E-02
2	Am243	0.418	5.270	5.259	0.011	0.02	68.09	1.1	3582.3	0.161E-02
		---					---			
Totals:		0.932	<--valid peaks only-->				151.82			

DETECTOR CALIBRATION
Energy(MEV) = 4.084 + (0.0046)*Channel
Energy range (MeV): 4.084 TO 6.440
Efficiency = 0.0192 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	78195.0	100.000
Smoothed	78195.2	100.000
Composite fit	72887.6	93.213
Residuals	5307.4	6.787

Analyzed by: _____
ALJ

Spectrum 21a2141.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 18090.1

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Raw Data Dump for AEA Spectrum: 21a2141.CNF

1	0.	0.	1.	0.	0.	0.	0.	0.	0.	2.
11	1.	1.	1.	2.	0.	0.	0.	0.	1.	0.
21	1.	0.	1.	0.	2.	0.	1.	0.	1.	1.
31	0.	0.	1.	1.	0.	0.	1.	0.	2.	0.
41	1.	1.	0.	0.	1.	0.	3.	1.	0.	0.
51	1.	0.	3.	1.	1.	2.	0.	1.	0.	2.
61	1.	0.	0.	0.	0.	1.	1.	0.	0.	1.
71	0.	1.	0.	0.	0.	1.	0.	0.	1.	2.
81	0.	1.	1.	1.	0.	1.	2.	1.	2.	1.
91	0.	0.	0.	2.	1.	1.	1.	0.	2.	1.
101	1.	3.	2.	0.	2.	0.	1.	0.	1.	2.
111	1.	2.	2.	4.	0.	0.	2.	0.	2.	5.
121	1.	2.	5.	2.	1.	2.	3.	2.	2.	0.
131	2.	5.	6.	2.	4.	3.	1.	4.	1.	7.
141	4.	4.	8.	3.	8.	10.	4.	5.	8.	10.
151	2.	8.	10.	6.	3.	3.	15.	7.	11.	8.
161	9.	5.	8.	13.	14.	13.	8.	12.	9.	14.
171	15.	11.	14.	13.	16.	13.	15.	19.	16.	20.
181	15.	14.	19.	19.	19.	23.	25.	23.	18.	26.
191	38.	34.	38.	35.	39.	39.	32.	44.	40.	30.
201	44.	61.	47.	53.	51.	43.	52.	77.	60.	65.
211	70.	66.	66.	65.	87.	85.	83.	94.	119.	113.
221	96.	142.	141.	157.	161.	175.	186.	188.	183.	214.
231	254.	244.	259.	286.	304.	346.	344.	399.	442.	445.
241	531.	597.	622.	789.	816.	940.	1125.	1099.	1278.	1331.
251	1547.	1791.	2005.	2359.	2532.	2700.	2463.	1645.	954.	505.
261	342.	274.	242.	260.	246.	279.	261.	247.	207.	232.
271	218.	191.	212.	231.	219.	251.	259.	293.	297.	338.
281	338.	392.	455.	457.	493.	526.	642.	702.	805.	895.
291	1062.	1222.	1308.	1409.	1514.	1769.	1910.	2142.	2556.	2862.
301	3041.	3080.	2533.	1715.	1044.	644.	523.	453.	352.	312.
311	277.	173.	152.	91.	50.	26.	9.	5.	0.	1.
321	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
331	0.	1.	0.	0.	0.	2.	1.	1.	1.	0.
341	0.	0.	0.	2.	0.	1.	2.	1.	1.	2.
351	2.	0.	1.	2.	1.	1.	1.	0.	4.	2.
361	0.	1.	2.	2.	2.	1.	1.	1.	1.	0.
371	1.	1.	0.	1.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.
431	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

Raymond 10-7-95

Westinghouse Hanford Co.

G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 2.01

DATA REDUCTION REPORT

SAMPLE
WORKLIST#2712-BL
File ID: 22a2290.CNF

Counted on: 10/ 6/95 @18:29
Detector: AEA22
Geometry number: 1
Count time: 28803. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	414.8	414.8	258.292	258.292	10.000	4.176	5.000	1.196
2	26.5	26.5	212.519	211.076	56.000	101.960	28.000	37.187
3	9.0	9.0	177.465	176.334	26.000	5.966	13.000	0.249

PEAK RESULTS
Peak Error Limit: 30%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Am243	0.788	5.270	5.280	-.010	0.02	15.65	2.3	873.6	0.394E-03
2	Pu239	0.134	5.147	5.063	0.084	0.47	2.67	14.3	147.5	0.664E-04
	Pu240		5.144	5.063	0.081				147.5	0.664E-04
3	Pu242	0.076	4.891	4.903	-.012	0.03	1.51	8.4	83.5	0.376E-04
Totals:		0.998	<--valid peaks only-->				19.84			

DETECTOR CALIBRATION
Energy(MEV) = 4.092 + (0.0046)*Channel
Energy range (MeV): 4.092 TO 6.447
Efficiency = 0.0181 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	9537.0	100.000
Smoothed	9538.3	100.013
Composite fit	9522.2	99.845
Residuals	14.8	0.155

Analyzed by: _____
ALJ

Spectrum 22a2290.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 2440.1

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Raw Data Dump for AEA Spectrum: 22a2290.CNF

1	0.	0.	1.	0.	2.	1.	2.	1.	1.	0.
11	1.	2.	1.	1.	1.	1.	0.	0.	2.	0.
21	3.	1.	2.	3.	0.	0.	1.	1.	1.	2.
31	1.	1.	0.	0.	4.	1.	1.	3.	1.	2.
41	4.	2.	1.	2.	1.	1.	1.	0.	1.	5.
51	0.	1.	2.	2.	2.	6.	1.	2.	3.	6.
61	2.	2.	0.	2.	3.	1.	2.	1.	2.	1.
71	2.	3.	3.	1.	1.	2.	2.	3.	1.	2.
81	3.	4.	2.	4.	1.	2.	1.	4.	3.	5.
91	3.	4.	0.	1.	2.	6.	4.	3.	3.	3.
101	2.	2.	5.	2.	2.	4.	1.	4.	2.	5.
111	8.	3.	5.	2.	1.	6.	3.	2.	5.	3.
121	5.	3.	3.	5.	5.	5.	6.	2.	4.	6.
131	4.	5.	4.	5.	7.	5.	4.	8.	8.	6.
141	10.	1.	3.	10.	10.	12.	6.	5.	10.	15.
151	10.	5.	7.	10.	7.	8.	9.	7.	3.	9.
161	8.	9.	6.	9.	11.	14.	8.	15.	11.	10.
171	7.	13.	15.	14.	6.	15.	16.	16.	13.	10.
181	13.	11.	13.	11.	23.	13.	17.	18.	20.	12.
191	19.	16.	14.	20.	22.	22.	21.	27.	20.	20.
201	26.	24.	25.	26.	19.	32.	39.	37.	31.	38.
211	43.	32.	42.	39.	32.	37.	34.	33.	37.	41.
221	53.	45.	70.	50.	55.	59.	52.	59.	50.	68.
231	61.	87.	67.	94.	85.	112.	103.	90.	113.	102.
241	119.	126.	127.	141.	154.	153.	193.	229.	233.	246.
251	245.	279.	324.	284.	344.	366.	432.	427.	499.	436.
261	323.	178.	78.	53.	33.	35.	26.	32.	22.	35.
271	24.	17.	8.	15.	6.	6.	4.	1.	2.	0.
281	0.	1.	3.	0.	1.	1.	0.	0.	0.	0.
291	0.	0.	1.	0.	0.	3.	2.	0.	1.	2.
301	1.	1.	0.	1.	3.	2.	0.	0.	1.	0.
311	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
321	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
331	0.	1.	0.	0.	0.	0.	0.	0.	0.	2.
341	0.	0.	0.	0.	0.	1.	0.	0.	1.	1.
351	0.	0.	2.	1.	0.	0.	0.	0.	1.	1.
361	0.	3.	2.	0.	0.	1.	2.	2.	0.	0.
371	0.	2.	0.	1.	1.	4.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

Raymond 10.7.95

Westinghouse Hanford Co.

G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 2.01

DATA REDUCTION REPORT

SAMPLE
S95T2308-SAM
File ID: 23a2392.CNF

Counted on: 10/ 6/95 @18:30
Detector: AEA23
Geometry number: 1
Count time: 28802. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	48.9	48.9	300.884	300.884	10.000	5.650	5.000	1.552
2	1858.3	1858.3	255.143	255.141	12.000	4.674	6.000	1.481

PEAK RESULTS
Peak Error Limit: 30%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Pu238	0.026	5.487	5.473	0.014	0.03	2.00	6.3	330.4	0.149E-03
	Am241		5.479	5.473	0.006				253.1	0.114E-03
2	Am243	0.865	5.270	5.263	0.007	0.02	67.06	1.1	8064.4	0.363E-02
Totals:		0.891	<--valid peaks only-->				69.06			

DETECTOR CALIBRATION
Energy(MEV) = 4.089 + (0.0046)*Channel
Energy range (MeV): 4.089 TO 6.444
Efficiency = 0.0084 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	37207.0	100.000
Smoothed	37206.2	99.998
Composite fit	33151.9	89.101
Residuals	4055.1	10.899

Analyzed by: _____
ALJ

Spectrum 23a2392.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 12414.5

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Raw Data Dump for AEA Spectrum: 23a2392.CNF

1	0.	0.	1.	0.	0.	2.	0.	0.	0.	1.
11	2.	1.	0.	1.	1.	0.	1.	1.	0.	0.
21	0.	2.	1.	1.	0.	0.	1.	1.	0.	2.
31	1.	0.	0.	2.	1.	0.	2.	0.	0.	1.
41	2.	0.	0.	2.	2.	2.	1.	0.	3.	1.
51	3.	1.	1.	3.	0.	1.	4.	3.	1.	0.
61	3.	2.	3.	1.	1.	2.	3.	0.	1.	1.
71	2.	0.	4.	2.	1.	3.	1.	0.	4.	1.
81	0.	1.	2.	4.	1.	2.	1.	1.	3.	2.
91	2.	0.	0.	3.	1.	6.	1.	2.	3.	3.
101	4.	4.	1.	4.	1.	3.	4.	2.	4.	0.
111	2.	2.	2.	0.	4.	2.	9.	3.	2.	5.
121	6.	4.	4.	5.	8.	5.	2.	9.	2.	4.
131	9.	7.	7.	5.	5.	8.	2.	6.	7.	7.
141	10.	7.	7.	7.	11.	7.	6.	9.	10.	15.
151	12.	13.	13.	10.	13.	11.	12.	10.	18.	13.
161	18.	12.	18.	11.	12.	17.	16.	20.	13.	20.
171	21.	19.	29.	20.	27.	20.	29.	22.	25.	40.
181	35.	26.	33.	45.	24.	39.	55.	34.	44.	38.
191	47.	45.	43.	59.	46.	68.	62.	80.	67.	57.
201	66.	67.	89.	66.	78.	70.	97.	104.	110.	113.
211	103.	107.	116.	102.	135.	132.	130.	127.	142.	158.
221	164.	164.	173.	171.	172.	205.	234.	228.	232.	252.
231	268.	298.	329.	315.	358.	400.	405.	453.	540.	519.
241	563.	631.	718.	799.	887.	1016.	1076.	1145.	1285.	1320.
251	1402.	1587.	1771.	1931.	2107.	2085.	1883.	1488.	839.	456.
261	219.	173.	169.	140.	126.	118.	112.	100.	83.	79.
271	53.	47.	29.	14.	14.	12.	6.	7.	8.	5.
281	6.	13.	16.	16.	10.	21.	15.	17.	22.	26.
291	32.	40.	34.	28.	32.	29.	35.	49.	47.	54.
301	37.	68.	43.	29.	21.	17.	12.	6.	11.	7.
311	4.	3.	5.	3.	1.	2.	1.	0.	0.	0.
321	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
331	0.	1.	0.	0.	0.	1.	0.	0.	0.	1.
341	0.	1.	1.	0.	0.	0.	0.	0.	1.	1.
351	0.	0.	0.	3.	0.	0.	0.	2.	1.	0.
361	0.	1.	1.	1.	1.	1.	2.	2.	0.	0.
371	2.	1.	1.	1.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	1.	0.	0.	0.	0.	1.	0.
431	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

LABCORE Completed Worklist Report for Worklist# 2715

Analyst: akl **Instrument:** AM01 **Book#** 104643

Method: LA-953-103 **Rev/Mod** A-4

Worklist Comment: Determine sample size using Ludlum. --LLF

Seq	Type	Sample#	R	A	Test	Matrix	Actual		Found	DL or Yield	Unit
1	STD		0	@AM24101	AM24101	LIQUID	3.07E-02		2.68E-2	87.300	% Recovery
1	STD		0	@AM24101	AM24101E	LIQUID	1.00		2.38E+00	2.380	% Ct. Error
1	STD		0	@AM24101	AM24101T	LIQUID	100		3.24E+01	32.400	% Recovery
2	BLNK		0	@AM24101	AM24101	LIQUID	1		<1.00E-5		uCi/mL
2	BLNK		0	@AM24101	AM24101E	LIQUID	1.00		1.00E+02	100.000	% Ct. Error
2	BLNK		0	@AM24101	AM24101T	LIQUID	100		1.00E+02	100.000	% Recovery
3	SAMPLE	S95T002309	0	@AM24101	AM24101	LIQUID	N/A		3.27E-04	3.260e-005	uCi/mL
3	SAMPLE	S95T002309	0	@AM24101	AM24101E	LIQUID	N/A		1.34E+00	0.000	% Ct. Error
3	SAMPLE	S95T002309	0	@AM24101	AM24101T	LIQUID	N/A		8.81E+01	1.000e-007	% Recovery
4	DUP	S95T002309	0	@AM24101	AM24101	LIQUID	3.27E-4		3.68E-4	11.800	RPD
4	DUP	S95T002309	0	@AM24101	AM24101E	LIQUID	1.00		1.36E+00	1.360	% Ct. Error
4	DUP	S95T002309	0	@AM24101	AM24101T	LIQUID	100		8.18E+01	81.800	% Recovery
5	SAMPLE	S95T002158	0	@AM24101	AM24101	LIQUID	N/A	<	1.57E-05	1.570e-005	uCi/mL
5	SAMPLE	S95T002158	0	@AM24101	AM24101E	LIQUID	N/A		5.86E+00	0.000	% Ct. Error
5	SAMPLE	S95T002158	0	@AM24101	AM24101T	LIQUID	N/A		7.48E+01	1.000e-007	% Recovery
6	DUP	S95T002158	0	@AM24101	AM24101	LIQUID	<1.57E-5		<6.63E-5		RPD
6	DUP	S95T002158	0	@AM24101	AM24101E	LIQUID	1.00		1.25E+01	12.500	% Ct. Error
6	DUP	S95T002158	0	@AM24101	AM24101T	LIQUID	100		1.77E+01	17.700	% Recovery

Final page for worklist# 2715

Analyst Signature **Date** **Analyst Signature** **Date**

LLFritts 11 Oct 95
Reviewer Signature **Date**

Units shown for QC (BLK/BKG) may not reflect the actual units.

LABCORE Data Entry Template for Worklist# 2715

Analyst: AKL **Instrument:** AM01 _____ **Book#** 104B43

Method: LA-953-103 Rev/Mod A 4

Worklist Comment: Determine sample size using Ludlum. --LLF

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				@AM24101	LIQUID		
2	BLNK				@AM24101	LIQUID		
3	SAMPLE	S95T002309	0		@AM24101	LIQUID	95000127	AW-102 GRAB
	Analytes Requested: AM24101 , AM24101E, AM24101T							
4	DUP	S95T002309	0		@AM24101	LIQUID		
5	SAMPLE	S95T002158	0		@AM24101	LIQUID	95000127	AW-102 GRAB
	Analytes Requested: AM24101 , AM24101E, AM24101T							
6	DUP	S95T002158	0		@AM24101	LIQUID		

Final page for worklist # 2715

Analyst Signature **Date** 10/10/95

Analyst Signature **Date** 10/11/95

Data Entry Comments:

S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

WORKBOOK PAGE: STD1

Am 241 and Cm 243/244: LA-953-103 (A-4) LIQUID

						STD
Type	Date Counted		OCT-10-95	Am 241 AEA Frac.	(C241)	0.523
STD	Sample Volume in mL	(SS)	1.000	Am 243 AEA Frac.	(C243)	0.409
Work List	Sample D.F.	(DF)	101	Cm 243/244 AEA Frac.	(Cm)	0
2715	Tracer Volume in mL	(SPKV)	0.050	Total AT Counts		5598
Test Code	Digest D.F.	(DDF)	1.000	AT Count Time (min)	(TC)	30
@AM24101	Tracer Book No.		114B43	Background in cpm	(Bkg)	4
Matrix	Am-243 Tracer Value	(dpm/mL)	9214	Am 241 cpm		32.27
LIQUID	Detector Number		1	Am 243 cpm		25.23
Batch Number	Detector Efficiency	(DetEff)	0.5000	Cm 243/244 cpm		0
95002914	Standard Book No		104B43	AEA Count Time	(min)	480
Rerun	Standard Value in µCi/mL		0.03067	Am 241 µCi/L =		2.6802E+01
0				Cm 243/244 µCi/L =	<	7.9031E+00

Sample Prep
N/A
Sample Number
WRKLST#2715
Instrument Code
AL10539
Prepared By
MCB
Chemist
LLF
Analyst
AKL
Date Complete
10/11/95
Analysis Date
10/10/95
Analysis Time
03:00 PM
Sample Point
AW-102 GRAB

Am-241 µCi/L = (C241 * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))

Cm-243/244 µCi/L = (Cm * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))

Relative Counting Error = Square Root of [(1/(Am-243 cpm * min)) + (1 / (Am-241 or Cm-243/244 cpm * min))] * 1.96 * 100

Am 243 Tracer Recovery = (Total AT Counts / TC - Bkg) * (1/DetEff) * C243 * 100 / Am-243 Tracer Value * SPKV

Am 241 µCi/mL	=	2.68E-02	DETECTION LEVELS in µCi/mL
Relative Counting Error	=	2.4%	
NOTE: Cm-243/244 Result is a LESS THAN Value.			Am 241
Cm 243/244 µCi/mL		< 7.90E-03	7.90E-03
Relative Counting Error	=	100.0%	Cm 243/244
Am 243 Tracer Recovery	=	32.4%	7.90E-03

Analyst:	AKL	Date:	10/11/95
Signature of Chemist:	LLF	Date:	11 Oct 95

STANDARD.WB1 REV 1.2 953103ML

WORKBOOK PAGE: BLANK2

Am 241 and Cm 243/244: LA-953-103 (A-4) LIQUID / SOLID

						BLNK
Type	Date Counted		OCT-10-95	Am 241 AEA Frac.	(C241)	0
BLNK	Sample Volume in mL	(SS)	1.000	Am 243 AEA Frac.	(C243)	1.034
Work List	Sample D.F.	(DF)	1	Cm 243/244 AEA Frac.	(Cm)	0
2715	Tracer Volume in mL	(SPKV)	0.050	Total AT Counts		6830
Test Code	Digest D.F.	(DDF)	1.000	AT Count Time (min)	(TC)	30
@AM24101	Tracer Book No.		114B43	Background in cpm	(Bkg)	4
Matrix	Am-243 Tracer Value	(dpm/mL)	9214	Am 241 cpm		0
LIQUID	Detector Number		2	Am 243 cpm		87.57
Batch Number	Detector Efficiency	(DetEff)	0.5000	Cm 243/244 cpm		0
95002914				AEA Count Time	(min)	480
Rerun				Am 241 µCi/L =	<	1.0035E-02
0				Cm 243/244 µCi/L =	<	1.0035E-02
Sample Prep						
N/A						
Sample Number						
WRKLST#2715						
Instrument Code						
AL10540						
Prepared By						
MCB						
Chemist						
LLF						
Analyst						
AKL						
Date Complete						
10/11/95						
Analysis Date						
10/10/95						
Analysis Time						
03:00 PM						
Sample Point						
AW-102 GRAB						

Am-241 µCi/L = (C241 * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))

Cm-243/244 µCi/L = (Cm * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))

Relative Counting Error = Square Root of [(1/(Am-243 cpm * min)) + (1 / (Am-241 or Cm-243/244 cpm * min))] * 1.96 * 100

Am 243 Tracer Recovery = (Total AT Counts / TC - Bkg) * (1/DetEff) * C243 * 100 / Am-243 Tracer Value * SPKV

NOTE: Am-241 Result is a LESS THAN Value.

Am 241 µCi/mL	=	< 1.00E-05	DETECTION LEVELS in µCi/mL
Relative Counting Error	=	100.0%	
NOTE: Cm-243/244 Result is a LESS THAN Value.			Am 241
Cm 243/244 µCi/mL		< 1.00E-05	1.00E-05
Relative Counting Error	=	100.0%	Cm 243/244
Am 243 Tracer Recovery	=	100.4%	1.00E-05

Analyst:	AKL	Date:	10/11/95
Signature of Chemist: [signature]	LLF	Date:	11 Oct 95

BLANK.WB1 REV 1.2 953103ML

WORKBOOK PAGE: SAM3

Am 241 and Cm 243/244: LA-953-103 (A-4) LIQUID / SOLID

							SAMPLE
Type	Date Counted		OCT-10-95	Am 241 AEA Frac.	(C241)		0.568
SAMPLE	Sample Volume in mL	(SS)	1.000	Am 243 AEA Frac.	(C243)		0.361
Work List	Sample D.F.	(DF)	1	Cm 243/244 AEA Frac.	(Cm)		0
2715	Tracer Volume in mL	(SPKV)	0.050	Total AT Counts			17008
Test Code	Digest D.F.	(DDF)	1.000	AT Count Time (min)	(TC)		30
@AM24101	Tracer Book No.		114B43	Background in cpm	(Bkg)		5
Matrix	Am-243 Tracer Value	(dpm/mL)	9214	Am 241 cpm			114.9
LIQUID	Detector Number		3	Am 243 cpm			73.03
Batch Number	Detector Efficiency	(DetEff)	0.5000	Cm 243/244 cpm			0
95002914				AEA Count Time	(min)		480
Rerun				Am 241 µCi/L =			3.2652E-01
0				Cm 243/244 µCi/L =		<	3.2638E-02
Sample Prep							
N/A							
Sample Number							
S95T002309							
Instrument Code							
AL10541							
Prepared By							
MCB							
Chemist							
LLF							
Analyst							
AKL							
Date Complete							
10/11/95							
Analysis Date							
10/10/95							
Analysis Time							
03:00 PM							
Sample Point							
AW-102 GRAB							

Am-241 µCi/L = (C241 * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))

Cm-243/244 µCi/L = (Cm * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))

Relative Counting Error = Square Root of [(1/(Am-243 cpm * min)) + (1 / (Am-241 or Cm-243/244 cpm * min))] * 1.96 * 100

Am 243 Tracer Recovery = (Total AT Counts / TC - Bkg) * (1/DetEff) * C243 * 100 / Am-243 Tracer Value * SPKV

Am 241 µCi/mL =	3.27E-04	
Relative Counting Error =	1.3%	
NOTE: Cm-243/244 Result is a LESS THAN Value.		
Cm 243/244 µCi/mL	< 3.26E-05	
Relative Counting Error =	100.0%	
Am 243 Tracer Recovery =	88.1%	

DETECTION LEVELS in µCi/mL
Am 241
3.26E-05
Cm 243/244
3.26E-05

Analyst:	AKL	Date:	10/11/95
Signature of Chemist:	LLF	Date:	11 Oct 95

SAMPLE.WB1 REV 1.2 953103ML

WORKBOOK PAGE: DUP4

Am 241 and Cm 243/244: LA-953-103 (A-4) LIQUID / SOLID

							DUP
Type	Date Counted		OCT-10-95	Am 241 AEA Frac.	(C241)		0.625
DUP	Sample Volume in mL	(SS)	1.000	Am 243 AEA Frac.	(C243)		0.352
Work List	Sample D.F.	(DF)	1	Cm 243/244 AEA Frac.	(Cm)		0
2715	Tracer Volume in mL	(SPKV)	0.050	Total AT Counts			16176
Test Code	Digest D.F.	(DDF)	1.000	AT Count Time (min)	(TC)		30
@AM24101	Tracer Book No.		114B43	Background in cpm	(Bkg)		4
Matrix	Am-243 Tracer Value	(dpm/mL)	9214	Am 241 cpm			120.85
LIQUID	Detector Number		1	Am 243 cpm			68.07
Batch Number	Detector Efficiency	(DetEff)	0.5000	Cm 243/244 cpm			0
95002914				AEA Count Time	(min)		480
Rerun				Am 241 µCi/L =			3.6847E-01
0				Cm 243/244 µCi/L =		<	3.6043E-02
Sample Prep							
N/A							
Sample Number							
S95T002309							
Instrument Code							
AL10539							
Prepared By							
MCB							
Chemist							
LLF							
Analyst							
AKL							
Date Complete							
10/11/95							
Analysis Date							
10/10/95							
Analysis Time							
03:00 PM							
Sample Point							
AW-102 GRAB							

Am-241 µCi/L = (C241 * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))

Cm-243/244 µCi/L = (Cm * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))

Relative Counting Error = Square Root of [(1/(Am-243 cpm * min)) + (1 / (Am-241 or Cm-243/244 cpm * min))] * 1.96 * 100

Am 243 Tracer Recovery = (Total AT Counts / TC - Bkg) * (1/DetEff) * C243 * 100 / Am-243 Tracer Value * SPKV

Am 241 µCi/mL =	3.68E-04	DETECTION LEVELS in µCi/mL
Relative Counting Error =	1.4%	
NOTE: Cm-243/244 Result is a LESS THAN Value.		Am 241 3.60E-05
Cm 243/244 µCi/mL	< 3.60E-05	
Relative Counting Error =	100.0%	Cm 243/244 3.60E-05
Am 243 Tracer Recovery =	81.8%	

Analyst:	AKL	Date:	10/11/95
Signature of Chemist: [signature]	LLF	Date:	11 Oct 95

SAMPLE.WB1 REV 1.2 953103ML

WORKBOOK PAGE: SAM5

Am 241 and Cm 243/244: LA-953-103 (A-4) LIQUID / SOLID

						SAMPLE
Type	Date Counted		OCT-10-95	Am 241 AEA Frac.	(C241)	0.034
SAMPLE	Sample Volume in mL	(SS)	1.000	Am 243 AEA Frac.	(C243)	0.885
Work List	Sample D.F.	(DF)	1	Cm 243/244 AEA Frac.	(Cm)	0
2715	Tracer Volume in mL	(SPKV)	0.050	Total AT Counts		5960
Test Code	Digest D.F.	(DDF)	1.000	AT Count Time (min)	(TC)	30
@AM24101	Tracer Book No.		114B43	Background in cpm	(Bkg)	4
Matrix	Am-243 Tracer Value	(dpm/mL)	9214	Am 241 cpm		2.42
LIQUID	Detector Number		2	Am 243 cpm		62.21
Batch Number	Detector Efficiency	(DetEff)	0.5000	Cm 243/244 cpm		0
95002914				AEA Count Time	(min)	480
Rerun				Am 241 µCi/L =	<	1.5676E-02
0				Cm 243/244 µCi/L =	<	1.5676E-02
Sample Prep						
N/A						
Sample Number						
S95T002158						
Instrument Code						
AL10540						
Prepared By						
MCB						
Chemist						
LLF						
Analyst						
AKL						
Date Complete						
10/11/95						
Analysis Date						
10/10/95						
Analysis Time						
03:00 PM						
Sample Point						
AW-102 GRAB						

Am-241 µCi/L = (C241 * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))

Cm-243/244 µCi/L = (Cm * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))

Relative Counting Error = Square Root of [(1/(Am-243 cpm * min)) + (1 / (Am-241 or Cm-243/244 cpm * min))] * 1.96 * 100

Am 243 Tracer Recovery = (Total AT Counts / TC - Bkg) * (1/DetEff) * C243 * 100 / Am-243 Tracer Value * SPKV

NOTE: Am-241 Result is a LESS THAN Value.

Am 241 µCi/mL	=	< 1.57E-05
Relative Counting Error	=	5.9%

NOTE: Cm-243/244 Result is a LESS THAN Value.

Cm 243/244 µCi/mL		< 1.57E-05
Relative Counting Error	=	100.0%
Am 243 Tracer Recovery	=	74.8%

DETECTION LEVELS in µCi/mL
Am 241
1.57E-05
Cm 243/244
1.57E-05

Analyst:	AKL	Date:	10/11/95
Signature of Chemist: [signature]	LLF	Date:	11 Oct 95

SAMPLE.WB1 REV 1.2 953103ML

WORKBOOK PAGE: DUP6

Am 241 and Cm 243/244: LA-953-103 (A-4) LIQUID / SOLID

							DUP
Type	Date Counted		OCT-10-95	Am 241 AEA Frac.	(C241)		0.034
DUP	Sample Volume in mL	(SS)	1.000	Am 243 AEA Frac.	(C243)		0.885
Work List	Sample D.F.	(DF)	1	Cm 243/244 AEA Frac.	(Cm)		0
2715	Tracer Volume in mL	(SPKV)	0.050	Total AT Counts			1530
Test Code	Digest D.F.	(DDF)	1.000	AT Count Time (min)	(TC)		30
@AM24101	Tracer Book No.		114B43	Background in cpm	(Bkg)		5
Matrix	Am-243 Tracer Value	(dpm/mL)	9214	Am 241 cpm			0.53
LIQUID	Detector Number		3	Am 243 cpm			13.66
Batch Number	Detector Efficiency	(DetEff)	0.5000	Cm 243/244 cpm			0
95002914				AEA Count Time	(min)		480
Rerun				Am 241 µCi/L =		<	6.6341E-02
0				Cm 243/244 µCi/L =		<	6.6341E-02
Sample Prep							
N/A							
Sample Number							
S95T002158							
Instrument Code							
AL10541							
Prepared By							
MCB							
Chemist							
LLF							
Analyst							
AKL							
Date Complete							
10/11/95							
Analysis Date							
10/10/95							
Analysis Time							
03:00 PM							
Sample Point							
AW-102 GRAB							

Am-241 µCi/L = (C241 * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))

Cm-243/244 µCi/L = (Cm * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))

Relative Counting Error = Square Root of [(1/(Am-243 cpm * min)) + (1 / (Am-241 or Cm-243/244 cpm * min))] * 1.96 * 100

Am 243 Tracer Recovery = (Total AT Counts / TC - Bkg) * (1/DetEff) * C243 * 100 / Am-243 Tracer Value * SPKV

NOTE: Am-241 Result is a LESS THAN Value.

Am 241 µCi/mL	=	< 6.63E-05	DETECTION LEVELS in µCi/mL
Relative Counting Error	=	12.5%	
NOTE: Cm-243/244 Result is a LESS THAN Value.			Am 241
Cm 243/244 µCi/mL		< 6.63E-05	6.63E-05
Relative Counting Error	=	100.0%	Cm 243/244
Am 243 Tracer Recovery	=	17.7%	6.63E-05

Analyst:	AKL	Date:	10/11/95
Signature of Chemist:	LLF	Date:	11 Oct 95

SAMPLE.WB1 REV 1.2 953103ML

Raymond 10.11.95

Westinghouse Hanford Co.

G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 2.01

DATA REDUCTION REPORT

SAMPLE
WORKLIST2715-STD
File ID: 19a1937.CNF

Counted on: 10/10/95 @17:56
Detector: AEA19
Geometry number: 1
Count time: 28804. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	1167.2	1167.2	302.077	302.077	12.000	4.716	6.000	2.482
2	945.1	945.1	256.636	256.632	10.000	3.744	5.000	1.862
3	11.2	11.2	190.242	190.210	98.000	1.000	49.000	0.100

PEAK RESULTS
Peak Error Limit: 30%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Pu238	0.523	5.487	5.473	0.014	0.02	32.27	1.6	417.3	0.188E-03
	Am241		5.479	5.473	0.006				319.6	0.144E-03
2	Am243	0.409	5.270	5.264	0.006	0.02	25.23	1.8	237.3	0.107E-03
3		0.015		4.958		0.00	0.90	9.5	8.4	0.376E-05
Totals:		0.947	<--valid peaks only-->				58.39			

DETECTOR CALIBRATION
Energy(MEV) = 4.083 + (0.0046)*Channel
Energy range (MeV): 4.083 TO 6.438
Efficiency = 0.1074 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	29611.0	100.000
Smoothed	29612.0	100.003
Composite fit	28031.7	94.667
Residuals	1579.3	5.333

Analyzed by: _____
ALJ

Spectrum 19a1937.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 7589.4

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3
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2......
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.......................................................................... 1
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Raw Data Dump for AEA Spectrum: 19a1937.CNF

1	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
11	0.	0.	0.	1.	0.	0.	1.	0.	0.	0.
21	0.	1.	0.	0.	1.	0.	0.	1.	0.	2.
31	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
41	0.	0.	1.	0.	0.	0.	0.	0.	1.	0.
51	2.	0.	0.	1.	0.	0.	1.	0.	1.	1.
61	0.	0.	0.	1.	0.	0.	2.	0.	1.	0.
71	0.	1.	2.	0.	1.	0.	0.	1.	0.	0.
81	0.	2.	2.	0.	1.	0.	0.	1.	0.	0.
91	0.	0.	0.	1.	0.	0.	1.	0.	0.	0.
101	2.	0.	2.	2.	0.	0.	1.	1.	0.	0.
111	0.	2.	1.	0.	0.	1.	1.	1.	1.	1.
121	1.	4.	3.	1.	3.	3.	2.	6.	2.	2.
131	2.	1.	2.	1.	1.	2.	2.	2.	6.	2.
141	4.	2.	2.	3.	0.	1.	1.	6.	4.	1.
151	4.	6.	2.	4.	8.	5.	4.	6.	0.	7.
161	2.	6.	9.	4.	2.	5.	3.	7.	5.	6.
171	5.	3.	8.	6.	6.	6.	4.	6.	7.	10.
181	2.	8.	7.	14.	12.	10.	5.	10.	9.	15.
191	11.	12.	5.	12.	5.	8.	9.	10.	13.	11.
201	15.	12.	12.	14.	9.	18.	9.	20.	10.	19.
211	15.	19.	18.	11.	26.	19.	24.	16.	27.	19.
221	26.	27.	26.	37.	42.	43.	38.	36.	43.	45.
231	54.	63.	45.	74.	73.	80.	87.	81.	107.	111.
241	142.	139.	179.	190.	254.	285.	296.	405.	436.	458.
251	497.	619.	637.	769.	961.	1077.	1112.	1105.	796.	413.
261	181.	127.	95.	72.	73.	77.	73.	86.	90.	78.
271	75.	53.	55.	46.	68.	45.	53.	56.	63.	81.
281	79.	104.	113.	110.	143.	128.	143.	205.	213.	310.
291	296.	393.	425.	485.	508.	590.	613.	819.	916.	1063.
301	1281.	1396.	1380.	1086.	758.	463.	289.	234.	172.	150.
311	136.	115.	72.	60.	47.	32.	14.	2.	0.	0.
321	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
331	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
341	0.	0.	0.	0.	0.	0.	0.	1.	0.	1.
351	0.	1.	1.	0.	2.	0.	0.	0.	0.	1.
361	0.	2.	1.	0.	1.	0.	0.	0.	1.	0.
371	1.	1.	0.	1.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

Raymond
10-12-95

Westinghouse Hanford Co.

G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 2.01

DATA REDUCTION REPORT

SAMPLE
WORKLIST2715-BLK
File ID: 20a2042.CNF

Counted on: 10/10/95 @17:57
Detector: AEA20
Geometry number: 1
Count time: 28803. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	1648.3	1648.3	255.778	255.778	12.000	5.362	6.000	0.997

PEAK RESULTS
Peak Error Limit: 30%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Am243	1.034	5.270	5.257	0.013	0.02	87.57	1.0	866.3	0.390E-03
Totals:		1.034	<--valid peaks only-->				87.57			

DETECTOR CALIBRATION
Energy(MEV) = 4.080 + (0.0046)*Channel
Energy range (MeV): 4.080 TO 6.436
Efficiency = 0.1021 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	40666.0	100.000
Smoothed	40666.5	100.001
Composite fit	42037.8	103.373
Residuals	-1371.8	-3.373

Analyzed by: ALJ

Spectrum 20a2042.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 11679.7

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Raw Data Dump for AEA Spectrum: 20a2042.CNF

1	0.	0.	0.	1.	1.	2.	0.	0.	0.	0.
11	0.	0.	0.	2.	1.	0.	1.	1.	2.	1.
21	2.	1.	0.	0.	0.	0.	0.	2.	1.	1.
31	1.	1.	1.	0.	0.	0.	3.	1.	1.	1.
41	1.	1.	0.	1.	0.	1.	2.	0.	2.	1.
51	1.	3.	3.	1.	0.	1.	0.	0.	0.	1.
61	1.	2.	1.	2.	2.	2.	3.	2.	0.	1.
71	1.	1.	2.	2.	1.	4.	3.	2.	3.	2.
81	0.	1.	1.	0.	1.	2.	2.	1.	1.	2.
91	2.	1.	2.	3.	0.	0.	2.	1.	2.	4.
101	0.	3.	2.	2.	6.	1.	5.	1.	4.	4.
111	2.	5.	2.	1.	7.	5.	2.	5.	3.	1.
121	4.	2.	5.	7.	2.	3.	1.	4.	4.	5.
131	6.	2.	11.	3.	6.	9.	6.	6.	4.	5.
141	7.	7.	7.	5.	5.	10.	12.	1.	9.	11.
151	15.	6.	13.	11.	11.	8.	13.	11.	7.	8.
161	11.	15.	11.	8.	15.	14.	16.	12.	11.	16.
171	14.	18.	22.	13.	24.	12.	24.	14.	20.	27.
181	27.	30.	25.	28.	23.	32.	26.	22.	37.	37.
191	40.	32.	48.	37.	54.	33.	61.	47.	55.	59.
201	49.	55.	76.	72.	85.	89.	82.	84.	93.	84.
211	98.	128.	111.	143.	150.	177.	159.	165.	184.	213.
221	215.	233.	228.	276.	263.	327.	356.	331.	396.	413.
231	429.	528.	513.	567.	546.	631.	675.	707.	725.	795.
241	814.	906.	938.	987.	1006.	1120.	1155.	1231.	1357.	1348.
251	1437.	1495.	1588.	1631.	1637.	1738.	1795.	1704.	1222.	737.
261	413.	199.	188.	124.	121.	105.	90.	115.	98.	78.
271	68.	35.	37.	23.	8.	9.	2.	0.	2.	5.
281	2.	3.	7.	1.	5.	3.	3.	5.	3.	5.
291	3.	1.	5.	2.	4.	4.	3.	6.	2.	5.
301	5.	2.	7.	2.	1.	3.	3.	0.	0.	2.
311	1.	1.	0.	0.	1.	1.	0.	2.	0.	0.
321	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
331	0.	0.	0.	1.	1.	1.	1.	0.	0.	0.
341	0.	2.	1.	1.	1.	1.	0.	2.	1.	0.
351	0.	2.	0.	0.	1.	1.	0.	0.	0.	3.
361	0.	1.	1.	0.	0.	0.	1.	0.	0.	2.
371	1.	0.	2.	2.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

Raymond
10-11-95

Westinghouse Hanford Co.

G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 2.01

DATA REDUCTION REPORT

SAMPLE
S95T2309-SAM
File ID: 21a2149.CNF

Counted on: 10/10/95 @17:58
Detector: AEA21
Geometry number: 1
Count time: 28802. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1?	15.1	15.1	368.584	368.584	8.000	2.636	4.000	0.719
2	3403.6	3403.6	300.161	300.161	12.000	5.460	6.000	2.056
3	2212.0	2212.0	254.579	254.552	10.000	4.609	5.000	1.688

PEAK RESULTS
Peak Error Limit: 30%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1		????		5.788			0.55	12.0		
2	Pu238	0.568	5.487	5.473	0.0140.03		114.90	0.8	1631.8	0.735E-03
	Am241		5.479	5.473	0.006				1249.9	0.563E-03
3	Am243	0.361	5.270	5.264	0.0060.02		73.03	1.1	754.2	0.340E-03
Totals:		0.928	<--valid peaks only-->				187.93			

DETECTOR CALIBRATION
Energy(MEV) = 4.093 + (0.0046)*Channel
Energy range (MeV): 4.093 TO 6.448
Efficiency = 0.0978 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	97167.0	100.000
Smoothed	97168.7	100.002
Composite fit	90476.5	93.114
Residuals	6690.5	6.886

Analyzed by: _____
ALJ

Spectrum 21a2149.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 23291.5

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Raw Data Dump for AEA Spectrum: 21a2149.CNF

1	0.	0.	3.	3.	0.	0.	1.	1.	2.	1.
11	2.	4.	2.	2.	2.	3.	3.	1.	4.	0.
21	3.	1.	1.	2.	1.	1.	0.	2.	1.	0.
31	1.	2.	1.	0.	3.	2.	5.	2.	1.	4.
41	2.	1.	4.	2.	1.	4.	4.	0.	1.	2.
51	1.	5.	1.	3.	4.	3.	3.	0.	7.	1.
61	1.	3.	6.	0.	1.	5.	3.	3.	4.	2.
71	4.	1.	3.	1.	4.	3.	3.	2.	7.	4.
81	3.	3.	2.	1.	6.	3.	3.	4.	2.	3.
91	5.	2.	4.	7.	5.	2.	3.	4.	3.	6.
101	5.	2.	8.	8.	4.	4.	8.	7.	6.	5.
111	4.	9.	3.	6.	3.	1.	4.	8.	6.	3.
121	4.	8.	8.	11.	10.	6.	9.	5.	9.	6.
131	14.	9.	7.	9.	10.	12.	8.	9.	11.	12.
141	7.	12.	9.	13.	19.	16.	15.	10.	15.	23.
151	11.	10.	21.	15.	12.	15.	15.	21.	16.	16.
161	21.	22.	16.	20.	19.	25.	26.	20.	17.	27.
171	24.	24.	30.	20.	23.	42.	18.	26.	31.	28.
181	34.	26.	34.	34.	35.	39.	32.	55.	49.	47.
191	47.	54.	42.	53.	57.	60.	55.	55.	56.	68.
201	69.	70.	75.	68.	75.	72.	72.	85.	82.	82.
211	83.	113.	109.	98.	118.	112.	131.	142.	159.	154.
221	169.	176.	189.	172.	220.	182.	230.	239.	270.	264.
231	299.	353.	356.	358.	389.	428.	438.	493.	526.	613.
241	655.	746.	798.	920.	1061.	1078.	1204.	1330.	1373.	1525.
251	1768.	2022.	2143.	2497.	2656.	2443.	1893.	1238.	676.	406.
261	351.	358.	315.	343.	315.	352.	312.	290.	302.	301.
271	339.	326.	326.	343.	357.	360.	416.	484.	501.	478.
281	608.	625.	698.	723.	785.	940.	1016.	1105.	1311.	1409.
291	1551.	1784.	1878.	2080.	2291.	2458.	2811.	3189.	3600.	3965.
301	3800.	3459.	2528.	1624.	1009.	719.	651.	530.	443.	369.
311	248.	189.	150.	92.	52.	16.	1.	2.	1.	2.
321	0.	0.	0.	1.	0.	1.	1.	1.	1.	1.
331	0.	1.	0.	2.	1.	0.	2.	2.	0.	1.
341	0.	0.	1.	0.	2.	0.	2.	3.	3.	5.
351	1.	6.	6.	4.	1.	5.	7.	9.	13.	10.
361	13.	9.	14.	8.	12.	10.	12.	17.	20.	14.
371	16.	1.	2.	0.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	1.	0.	0.	0.	0.	1.
401	0.	0.	0.	0.	0.	0.	1.	1.	2.	0.
411	0.	0.	1.	0.	1.	0.	0.	0.	2.	0.
421	1.	2.	1.	3.	0.	1.	1.	2.	3.	2.
431	2.	5.	0.	2.	5.	2.	4.	1.	1.	1.
441	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

Raymond
10.11.95

Westinghouse Hanford Co.

G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 2.01

DATA REDUCTION REPORT

SAMPLE
S95T2309-DUP
File ID: 22a2297.CNF

Counted on: 10/10/95 @17:59
Detector: AEA22
Geometry number: 1
Count time: 28801. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	1544.8	1544.8	302.460	302.460	14.000	7.622	7.000	0.905
2	932.6	932.6	256.808	256.372	12.000	5.942	6.000	0.746
3?	8.8	8.8	69.192	69.011	170.000	394.699	85.000	147.332

PEAK RESULTS
Peak Error Limit: 30%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Pu238	0.625	5.487	5.479	0.008	0.04	120.85	0.8	1531.5	0.690E-03
	Am241		5.479	5.479	0.000				1173.0	0.528E-03
2	Am243	0.352	5.270	5.267	0.003	0.03	68.07	1.3	627.3	0.283E-03
3		????		4.405			1.67	15.5		
Totals:		0.976	<--valid peaks only-->				188.92			

DETECTOR CALIBRATION
Energy(MEV) = 4.088 + (0.0046)*Channel
Energy range (MeV): 4.088 TO 6.443
Efficiency = 0.1096 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	92889.0	100.000
Smoothed	92889.4	100.000
Composite fit	91486.3	98.490
Residuals	1402.7	1.510

Analyzed by: _____
ALJ

Spectrum 22a2297.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 11633.6

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Raw Data Dump for AEA Spectrum: 22a2297.CNF

1	0.	0.	4.	6.	1.	7.	3.	7.	4.	2.
11	1.	4.	2.	5.	2.	3.	4.	1.	2.	8.
21	5.	7.	6.	5.	1.	7.	5.	4.	8.	7.
31	6.	7.	4.	6.	7.	3.	4.	6.	3.	6.
41	10.	5.	9.	8.	3.	7.	7.	11.	5.	5.
51	7.	5.	7.	3.	6.	14.	9.	9.	5.	7.
61	8.	9.	7.	6.	7.	10.	8.	11.	17.	6.
71	11.	11.	6.	6.	9.	10.	5.	8.	7.	10.
81	11.	6.	15.	8.	12.	14.	11.	10.	16.	7.
91	10.	10.	8.	11.	8.	15.	16.	21.	16.	16.
101	20.	13.	14.	10.	26.	14.	21.	18.	10.	13.
111	13.	16.	16.	20.	23.	22.	20.	27.	20.	30.
121	23.	20.	17.	30.	39.	26.	25.	21.	32.	23.
131	27.	24.	28.	30.	24.	35.	41.	29.	32.	29.
141	36.	32.	41.	35.	34.	46.	52.	41.	47.	46.
151	49.	55.	33.	38.	49.	57.	39.	62.	45.	55.
161	62.	54.	67.	62.	62.	74.	62.	91.	59.	75.
171	85.	76.	83.	84.	90.	93.	82.	100.	107.	112.
181	100.	101.	96.	140.	115.	126.	113.	115.	136.	133.
191	129.	143.	148.	154.	209.	179.	189.	216.	191.	209.
201	197.	195.	204.	215.	237.	240.	229.	247.	293.	257.
211	302.	292.	315.	301.	311.	340.	368.	330.	396.	390.
221	383.	432.	424.	450.	430.	478.	513.	489.	505.	528.
231	576.	556.	593.	604.	625.	669.	643.	746.	769.	768.
241	781.	820.	758.	878.	923.	957.	979.	1068.	1034.	1075.
251	1122.	1191.	1162.	1187.	1299.	1270.	1382.	1336.	1249.	1143.
261	882.	630.	615.	496.	526.	560.	545.	537.	560.	542.
271	621.	580.	614.	636.	644.	675.	715.	707.	687.	812.
281	791.	835.	894.	831.	896.	896.	906.	997.	1108.	996.
291	1132.	1146.	1221.	1298.	1277.	1418.	1431.	1353.	1376.	1572.
301	1498.	1559.	1638.	1599.	1540.	1173.	856.	578.	414.	294.
311	243.	181.	175.	127.	86.	76.	61.	33.	10.	14.
321	3.	4.	3.	2.	3.	1.	2.	0.	1.	5.
331	0.	4.	1.	1.	2.	3.	1.	2.	5.	1.
341	2.	3.	3.	4.	4.	3.	4.	1.	5.	2.
351	5.	3.	2.	0.	2.	4.	9.	3.	6.	3.
361	6.	4.	7.	5.	7.	8.	11.	2.	9.	10.
371	8.	10.	4.	5.	2.	4.	2.	0.	0.	1.
381	0.	0.	0.	0.	0.	1.	0.	1.	0.	0.
391	0.	0.	0.	0.	0.	1.	2.	0.	0.	2.
401	1.	1.	0.	0.	0.	1.	1.	1.	0.	1.
411	0.	1.	0.	0.	2.	1.	1.	0.	0.	0.
421	0.	1.	0.	0.	3.	0.	0.	1.	2.	1.
431	1.	1.	1.	2.	2.	2.	0.	2.	1.	0.
441	2.	1.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

Raymond
10.11.95

Westinghouse Hanford Co.

G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 2.01

DATA REDUCTION REPORT

SAMPLE
S95T2158-SAM
File ID: 23a2399.CNF

Counted on: 10/10/95 @18: 1
Detector: AEA23
Geometry number: 1
Count time: 28803. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	57.8	57.8	300.144	300.144	12.000	5.402	6.000	1.410
2	1540.7	1540.7	254.347	254.345	10.000	4.973	5.000	1.345
3	20.6	20.6	163.783	163.566	104.000	1.000	52.000	0.100
4?	1.0	1.0	138.181	137.845	4.000	0.000	2.000	1.843

PEAK RESULTS
Peak Error Limit: 30%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Pu238	0.034	5.487	5.477	0.0100	0.02	2.42	5.7	195.7	0.881E-04
	Am241		5.479	5.477	0.002				149.9	0.675E-04
2	Am243	0.885	5.270	5.266	0.0040	0.02	62.21	1.1	3653.3	0.165E-02
3		0.023		4.849	0.00		1.64	7.2	95.3	0.429E-04
4		????		4.731			0.00	1000.		
Totals:		0.942	<--valid peaks only-->				66.27			

DETECTOR CALIBRATION
Energy(MEV) = 4.096 + (0.0046)*Channel
Energy range (MeV): 4.096 TO 6.452
Efficiency = 0.0172 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	33759.0	100.000
Smoothed	33761.4	100.007
Composite fit	31813.0	94.236
Residuals	1946.0	5.764

Analyzed by: ALJ

Spectrum 23a2399.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 10988.1

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Raw Data Dump for AEA Spectrum: 23a2399.CNF

1	0.	0.	2.	5.	2.	4.	2.	2.	3.	2.
11	2.	1.	2.	2.	6.	2.	4.	1.	0.	0.
21	1.	2.	5.	1.	2.	4.	5.	2.	5.	3.
31	3.	4.	1.	1.	2.	1.	3.	3.	1.	3.
41	6.	2.	3.	2.	0.	4.	1.	5.	2.	2.
51	4.	2.	4.	2.	3.	3.	3.	3.	6.	2.
61	2.	4.	2.	6.	4.	5.	4.	5.	6.	2.
71	0.	4.	4.	4.	6.	6.	2.	7.	5.	4.
81	4.	3.	4.	5.	6.	4.	5.	6.	7.	4.
91	3.	5.	6.	6.	2.	6.	3.	5.	7.	7.
101	4.	3.	1.	7.	3.	6.	5.	8.	9.	7.
111	2.	5.	6.	4.	14.	4.	6.	8.	8.	9.
121	6.	7.	8.	11.	4.	9.	3.	7.	10.	11.
131	8.	12.	9.	7.	5.	10.	10.	15.	13.	9.
141	9.	7.	6.	4.	13.	10.	14.	11.	13.	17.
151	14.	14.	15.	16.	17.	8.	15.	17.	18.	16.
161	18.	16.	26.	26.	17.	18.	18.	21.	20.	21.
171	30.	22.	23.	26.	25.	21.	27.	20.	29.	27.
181	24.	28.	32.	27.	24.	30.	34.	33.	41.	40.
191	41.	32.	27.	37.	39.	37.	45.	50.	54.	62.
201	55.	54.	64.	53.	63.	68.	74.	68.	84.	90.
211	83.	100.	72.	115.	102.	105.	109.	131.	138.	139.
221	156.	166.	163.	162.	179.	191.	224.	239.	252.	294.
231	270.	296.	333.	360.	392.	435.	470.	493.	512.	552.
241	598.	691.	707.	842.	864.	953.	1028.	1134.	1186.	1307.
251	1319.	1447.	1580.	1660.	1720.	1620.	1388.	909.	487.	232.
261	163.	129.	111.	90.	102.	105.	90.	77.	58.	43.
271	37.	26.	25.	14.	9.	9.	6.	13.	17.	13.
281	15.	21.	16.	12.	12.	21.	25.	27.	29.	30.
291	36.	35.	48.	45.	43.	41.	46.	59.	57.	70.
301	54.	65.	45.	33.	14.	9.	10.	7.	6.	6.
311	7.	1.	3.	1.	0.	0.	0.	0.	0.	0.
321	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
331	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
341	0.	0.	1.	0.	0.	0.	1.	0.	0.	0.
351	0.	0.	2.	1.	0.	0.	1.	1.	1.	1.
361	1.	3.	0.	1.	0.	1.	2.	4.	1.	0.
371	0.	1.	1.	0.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
431	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

Traymore
10-11-95

Westinghouse Hanford Co.

G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 2.01

DATA REDUCTION REPORT

SAMPLE
S95T2158-DUP
File ID: 24a2488.CNF

Counted on: 10/10/95 @18: 1
Detector: AEA24
Geometry number: 1
Count time: 28802. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	17.5	17.5	300.228	300.228	12.000	6.022	6.000	3.003
2	465.7	465.7	256.039	256.039	10.000	3.758	5.000	1.569

PEAK RESULTS
Peak Error Limit: 30%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Am241	0.034	5.479	5.457	0.022	0.03	0.53	12.3	27.3	0.123E-04
2	Am243	0.885	5.270	5.253	0.017	0.02	13.66	2.4	666.4	0.300E-03
Totals:		0.920	<--valid peaks only-->				14.19			

DETECTOR CALIBRATION
Energy(MEV) = 4.076 + (0.0046)*Channel
Energy range (MeV): 4.076 TO 6.431
Efficiency = 0.0207 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	7403.0	100.000
Smoothed	7403.2	100.002
Composite fit	6810.5	91.997
Residuals	592.5	8.003

Analyzed by: _____
ALJ

Spectrum 24a2488.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 2650.6

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Raw Data Dump for AEA Spectrum: 24a2488.CNF

1	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
21	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.
31	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
41	0.	0.	0.	0.	0.	0.	2.	0.	0.	0.
51	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
61	0.	0.	1.	0.	0.	0.	0.	0.	0.	1.
71	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
81	0.	0.	0.	0.	0.	0.	1.	0.	1.	0.
91	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
101	0.	0.	0.	0.	0.	1.	1.	1.	0.	0.
111	0.	0.	1.	0.	0.	0.	0.	1.	1.	2.
121	2.	0.	0.	1.	0.	0.	0.	0.	0.	1.
131	2.	1.	0.	2.	1.	1.	1.	2.	2.	1.
141	0.	0.	2.	1.	1.	1.	1.	2.	0.	0.
151	0.	0.	1.	3.	2.	3.	1.	1.	0.	0.
161	1.	4.	0.	2.	0.	1.	0.	1.	0.	1.
171	2.	2.	2.	1.	2.	1.	0.	1.	1.	3.
181	0.	2.	1.	2.	2.	4.	3.	1.	2.	4.
191	6.	3.	4.	2.	3.	4.	1.	9.	2.	2.
201	3.	4.	7.	7.	14.	4.	8.	3.	7.	5.
211	9.	9.	10.	11.	12.	11.	13.	11.	9.	11.
221	17.	15.	20.	25.	18.	27.	20.	30.	34.	30.
231	42.	56.	47.	53.	75.	69.	83.	57.	90.	85.
241	92.	115.	130.	134.	137.	184.	207.	219.	267.	252.
251	269.	290.	354.	441.	463.	588.	514.	444.	293.	147.
261	64.	48.	37.	37.	30.	33.	26.	31.	23.	19.
271	18.	11.	11.	10.	1.	2.	3.	4.	1.	4.
281	2.	2.	1.	3.	1.	4.	3.	7.	4.	5.
291	6.	7.	2.	9.	10.	12.	15.	16.	22.	16.
301	21.	21.	9.	7.	9.	7.	1.	5.	4.	2.
311	4.	1.	0.	0.	1.	0.	0.	0.	0.	0.
321	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
331	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
341	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
351	1.	0.	0.	0.	0.	0.	0.	1.	0.	0.
361	0.	0.	0.	0.	0.	0.	3.	1.	0.	0.
371	1.	1.	0.	0.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

LABCORE Completed Worklist Report for Worklist# 2912

Analyst: akl **Instrument:** AM01 **Book#** 104843

Method: LA-953-103 Rev/Mod A-4

Worklist Comment: Determine sample size using Ludlum. --LLF

Seq	Type	Sample#	R	A	Test		Matrix	Actual	Found	DL or Yield	Unit
1	STD		0		@AM24101	AM24101	SOLID	3.07E-02	2.65E-2	86.320	% Recovery
1	STD		0		@AM24101	AM24101E	SOLID	1.00	1.67E+00	1.670	% Ct. Error
1	STD		0		@AM24101	AM24101T	SOLID	100	4.56E+01	45.600	% Recovery
2	BLNK-PREP		0		@AM24101	AM24101	SOLID	1	<4.93E-2		uCi/g
2	BLNK-PREP		0		@AM24101	AM24101E	SOLID	1.00	1.00E+02	100.000	% Ct. Error
2	BLNK-PREP		0		@AM24101	AM24101T	SOLID	100	6.49E+01	64.900	% Recovery
3	SAMPLE	S95T002304	0	F	@AM24101	AM24101	SOLID	N/A	7.43E-01	8.250e-002	uCi/g
3	SAMPLE	S95T002304	0	F	@AM24101	AM24101E	SOLID	N/A	1.03E+00	0.000	% Ct. Error
3	SAMPLE	S95T002304	0	F	@AM24101	AM24101T	SOLID	N/A	8.68E+01	1.000e-007	% Recovery
4	DUP	S95T002304	0	F	@AM24101	AM24101	SOLID	7.43E-1	7.48E-1	0.670	RPD
4	DUP	S95T002304	0	F	@AM24101	AM24101E	SOLID	1.00	2.15E+00	2.150	% Ct. Error
4	DUP	S95T002304	0	F	@AM24101	AM24101T	SOLID	100	1.99E+01	19.900	% Recovery
5	SAMPLE	S95T002305	0	F	@AM24101	AM24101	SOLID	N/A	2.65E+00	0.345	uCi/g
5	SAMPLE	S95T002305	0	F	@AM24101	AM24101E	SOLID	N/A	1.12E+00	0.000	% Ct. Error
5	SAMPLE	S95T002305	0	F	@AM24101	AM24101T	SOLID	N/A	6.96E+01	1.000e-007	% Recovery
6	DUP	S95T002305	0	F	@AM24101	AM24101	SOLID	2.65E+0	2.68E+0	1.130	RPD
6	DUP	S95T002305	0	F	@AM24101	AM24101E	SOLID	1.00	1.37E+00	1.370	% Ct. Error
6	DUP	S95T002305	0	F	@AM24101	AM24101T	SOLID	100	4.23E+01	42.300	% Recovery

Final page for worklist# 2912

Analyst Signature **Date** **Analyst Signature** **Date**

18 Oct 95
Reviewer Signature **Date**

Cm-243/244 activity for both samples; below quantification levels.
10/18/95

Units shown for QC (BLK/BKG) may not reflect the actual units.

LABCORE Data Entry Template for Worklist# 2912

Analyst: AKL **Instrument:** AM01 _____ **Book#** 104843

Method: LA-953-103 Rev/Mod A-4

Worklist Comment: Determine sample size using Ludlum. --LLF

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				@AM24101	SOLID		
2	BLNK-PREP				@AM24101	SOLID		
3	SAMPLE	S95T002304	0	F	@AM24101	SOLID	95000127	AW-102 GRAB
	Analytes Requested: AM24101 , AM24101E, AM24101T							
4	DUP	S95T002304	0	F	@AM24101	SOLID		
5	SAMPLE	S95T002305	0	F	@AM24101	SOLID	95000127	AW-102 GRAB
	Analytes Requested: AM24101 , AM24101E, AM24101T							
6	DUP	S95T002305	0	F	@AM24101	SOLID		

Final page for worklist # 2912

C Lewis 10/16/95
Analyst Signature **Date**

SE Hogan 10/18/95
Analyst Signature **Date**

Data Entry Comments:

S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code

WORKBOOK PAGE: STD1

Am 241 and Cm 243/244: LA-953-103 (A-4) LIQUID

Type	Date Counted		OCT-17-95	Am 241 AEA Frac.	(C241)	0.337
STD	Sample Volume in mL	(SS)	1.000	Am 243 AEA Frac.	(C243)	0.533
Work List	Sample D.F.	(DF)	101	Cm 243/244 AEA Frac.	(Cm)	0
2912	Tracer Volume in mL	(SPKV)	0.100	Total AT Counts		11981
Test Code	Digest D.F.	(DDF)	1.000	AT Count Time (min)	(TC)	30
@AM24101	Tracer Book No.		114B43	Background in cpm	(Bkg)	5
Matrix	Am-243 Tracer Value	(dpm/mL)	9214	Am 241 cpm		46.67
LIQUID	Detector Number		2	Am 243 cpm		73.89
Batch Number	Detector Efficiency	(DetEff)	0.5000	Cm 243/244 cpm		0
95003174	Standard Book No		104B43	AEA Count Time	(min)	480
Rerun	Standard Value in µCi/mL		0.03067	Am 241 µCi/L =		2.6504E+01
0				Cm 243/244 µCi/L =	<	8.6189E+00
Sample Prep						
N/A						
Sample Number						
WORKLIST2912-STD						
Instrument Code						
AL10540						
Prepared By						
SEH						
Chemist						
LLF						
Analyst						
AKL						
Date Complete						
10/18/95						
Analysis Date						
10/17/95						
Analysis Time						
03:00 PM						
Sample Point						
AW-102 GRAB						

Am-241 µCi/L = (C241 * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))

Cm-243/244 µCi/L = (Cm * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))

Relative Counting Error = Square Root of [(1/(Am-243 cpm * min)) + (1 / (Am-241 or Cm-243/244 cpm * min))] * 1.96 * 100

Am 243 Tracer Recovery = (Total AT Counts / TC - Bkg) * (1/DetEff) * C243 * 100 / Am-243 Tracer Value * SPKV

Am 241 µCi/mL	=	2.65E-02	DETECTION LEVELS in µCi/mL
Relative Counting Error	=	1.7%	
NOTE: Cm-243/244 Result is a LESS THAN Value.			Am 241
Cm 243/244 µCi/mL		< 8.62E-03	8.62E-03
Relative Counting Error	=	100.0%	Cm 243/244
Am 243 Tracer Recovery	=	45.6%	8.62E-03

Analyst:	AKL	Date:	10/18/95
Signature of Chemist: LLFitts	LLF	Date:	18 Oct 95

STANDARD.WB1 REV 1.2 953103ML

WORKBOOK PAGE: BLANK2

Am 241 and Cm 243/244: LA-953-103 (A-4) LIQUID / SOLID

Type	Date Counted		OCT-17-95	Am 241 AEA Frac.	(C241)	0
BLNK-PREP	Sample Volume in mL	(SS)	1.000	Am 243 AEA Frac.	(C243)	0.953
Work List #	Sample D.F.	(DF)	1	Cm 243/244 AEA Frac.	(Cm)	0
2912	Tracer Volume in mL	(SPKV)	0.100	Total AT Counts		9564
Test Code	Digest Grams of Solids/L	(Dg/L)	0.680	AT Count Time (min)	(TC)	30
@AM24101	Tracer Book No.		114B43	Background in cpm	(Bkg)	5
Matrix	Am-243 Tracer Value	(dpm/mL)	9214	Am 241 cpm		0
SOLID	Detector Number		3	Am 243 cpm		113.98
Batch Number	Detector Efficiency	(DetEff)	0.5000	Cm 243/244 cpm		0
95003174				AEA Count Time	(min)	480
Run#				Am 241 µCi/g =	<	4.9304E-02
0				Cm 243/244 µCi/g =	<	4.9304E-02
Sample Prep						
N/A						
Sample Number						
WORKLIST2912-BLK						
Instrument Code						
AL10541						
Prepared By						
SEH						
Chemist						
LLF						
Analyst						
AKL						
Date Completed						
10/18/95						
Date Received						
10/17/95						
Sample Time						
03:00 PM						
Sample Type						
AW-102 GRAB						

Am-241 µCi/g = (C241) (Am-243 Tracer Value) (SPKV) (1000mL/L) (DF) / [(C243) (SS) (D g/L) (2220000dpm/µCi)]

Cm-243/244 µCi/g = (Cm) (Am-243 Tracer Value) (SPKV) (1000mL/L) (DF) / [(C243) (SS) (D g/L) (2220000dpm/µCi)]

Relative Counting Error = Square Root of [(1/(Am-243 cpm * min)) + (1 / (Am-241 or Cm-243/244 cpm * min))] * 1.96 * 100

Am 243 Tracer Recovery = (Total AT Counts / TC - Bkg) * (1/DetEff) * C243 * 100 / Am-243 Tracer Value * SPKV

NOTE: Am-241 Result is a LESS THAN Value.

Am241 µCi/g	=	< 4.93E-02
Relative Counting Error	=	100.0%

NOTE: Cm-243/244 Result is a LESS THAN Value.

Cm 243/244 µCi/g		< 4.93E-02
Relative Counting Error	=	100.0%
Am 243 Tracer Recovery	=	64.9%

DETECTION LEVELS in µCi/g	
Am 241	4.93E-02
Cm 243/244	4.93E-02

Analyst:	AKL	Date:	10/18/95
Signature of Chemist: [signature]	LLF	Date:	18 Oct 95

BLANK.WB1 REV 1.2 953103ML

WORKBOOK PAGE: SAM3

Am 241 and Cm 243/244: LA-953-103 (A-4) LIQUID / SOLID

							SAMPLE
Type	Date Counted		OCT-17-95	Am 241 AEA Frac.	(C241)		0.519
SAMPLE	Sample Volume in mL	(SS)	1.000	Am 243 AEA Frac.	(C243)		0.426
Work List	Sample D.F.	(DF)	1	Cm 243/244 AEA Frac.	(Cm)		0
2912	Tracer Volume in mL	(SPKV)	0.100	Total AT Counts			28304
Test Code	Digest Grams of Solids/L	(Dg/L)	0.680	AT Count Time (min)	(TC)		30
@AM24101	Tracer Book No.		114B43	Background in cpm	(Bkg)		5
Matrix	Am-243 Tracer Value	(dpm/mL)	9214	Am 241 cpm			167.1
SOLID	Detector Number		1	Am 243 cpm			137
Batch Number	Detector Efficiency	(DetEff)	0.5000	Cm 243/244 cpm			0
95003174				AEA Count Time	(min)		480
Rerun				Am 241 µCi/g =			7.4317E-01
0				Cm 243/244 µCi/g =		<	8.2505E-02
Sample Prep							
FUSION01							
Sample Number							
S95T002304							
Instrument Code							
AL10539							
Prepared By							
SEH							
Chemist							
LLF							
Analyst							
AKL							
Date Complete							
10/18/95							
Analysis Date							
10/17/95							
Analysis Time							
03:00 PM							
Sample Point							
AW-102 GRAB							

Am-241 µCi/g = (C241) (Am-243 Tracer Value) (SPKV) (1000mL/L) (DF) / [(C243) (SS) (D g/L) (2220000dpm/µCi)]

Cm-243/244 µCi/g = (Cm) (Am-243 Tracer Value) (SPKV) (1000mL/L) (DF) / [(C243) (SS) (D g/L) (2220000dpm/µCi)]

Relative Counting Error = Square Root of [(1/(Am-243 cpm * min)) + (1 / (Am-241 or Cm-243/244 cpm * min))] * 1.96 * 100

Am 243 Tracer Recovery = (Total AT Counts / TC - Bkg) * (1/DetEff) * C243 * 100 / Am-243 Tracer Value * SPKV

Am241 µCi/g =	7.43E-01	
Relative Counting Error =	1.0%	
NOTE: Cm-243/244 Result is a LESS THAN Value.		
Cm 243/244 µCi/g	< 8.25E-02	
Relative Counting Error =	100.0%	
Am 243 Tracer Recovery =	86.8%	

DETECTION LEVELS in µCi/g	
Am 241	8.25E-02
Cm 243/244	8.25E-02

Analyst:	AKL	Date:	10/18/95
Signature of Chemist: [signature]	LLF	Date:	18 Oct 95

SAMPLE.WB1 REV 1.2 953103ML

WORKBOOK PAGE: DUP4

Am 241 and Cm 243/244: LA-953-103 (A-4) LIQUID / SOLID

							DUP
Type	Date Counted		OCT-17-95	Am 241 AEA Frac.	(C241)		0.529
DUP	Sample Volume in mL	(SS)	1.000	Am 243 AEA Frac.	(C243)		0.439
Work List	Sample D.F.	(DF)	1	Cm 243/244 AEA Frac.	(Cm)		0
2912	Tracer Volume in mL	(SPKV)	0.100	Total AT Counts			6427
Test Code	Digest Grams of Solids/L	(Dg/L)	0.668	AT Count Time (min)	(TC)		30
@AM24101	Tracer Book No.		114B43	Background in cpm	(Bkg)		5
Matrix	Am-243 Tracer Value	(dpm/mL)	9214	Am 241 cpm			38.24
SOLID	Detector Number		2	Am 243 cpm			31.73
Batch Number	Detector Efficiency	(DetEff)	0.5000	Cm 243/244 cpm			0
95003174				AEA Count Time	(min)		480
Rerun				Am 241 µCi/g =			7.4826E-01
0				Cm 243/244 µCi/g =		<	3.5472E-01
Sample Prep							
FUSION01							
Sample Number							
S95T002304							
Instrument Code							
AL10540							
Prepared By							
SEH							
Chemist							
LLF							
Analyst							
AKL							
Date Complete							
10/18/95							
Analysis Date							
10/17/95							
Analysis Time							
03:00 PM							
Sample Point							
AW-102 GRAB							

Am-241 µCi/g = (C241) (Am-243 Tracer Value) (SPKV) (1000mL/L) (DF) / [(C243) (SS) (D g/L) (2220000dpm/µCi)]

Cm-243/244 µCi/g = (Cm) (Am-243 Tracer Value) (SPKV) (1000mL/L) (DF) / [(C243) (SS) (D g/L) (2220000dpm/µCi)]

Relative Counting Error = Square Root of [(1/(Am-243 cpm * min)) + (1 / (Am-241 or Cm-243/244 cpm * min))] * 1.96 * 100

Am 243 Tracer Recovery = (Total AT Counts / TC - Bkg) * (1/DetEff) * C243 * 100 / Am-243 Tracer Value * SPKV

Am241 µCi/g	=	7.48E-01	DETECTION LEVELS in µCi/g
Relative Counting Error	=	2.1%	
NOTE: Cm-243/244 Result is a LESS THAN Value.			Am 241
Cm 243/244 µCi/g		< 3.55E-01	3.55E-01
Relative Counting Error	=	100.0%	Cm 243/244
Am 243 Tracer Recovery	=	19.9%	3.55E-01

Analyst:	AKL	Date:	10/18/95
Signature of Chemist:	LLF	Date:	18 Oct 95

SAMPLE.WB1 REV 1.2 953103ML

WORKBOOK PAGE: SAM5

Am 241 and Cm 243/244: LA-953-103 (A-4) LIQUID / SOLID

						SAMPLE
Type	Date Counted		OCT-17-95	Am 241 AEA Frac.	(C241)	0.553
SAMPLE	Sample Volume in mL	(SS)	0.100	Am 243 AEA Frac.	(C243)	0.394
Work List	Sample D.F.	(DF)	1	Cm 243/244 AEA Frac.	(Cm)	0
2912	Tracer Volume in mL	(SPKV)	0.100	Total AT Counts		24570
Test Code	Digest Grams of Solids/L	(Dg/L)	2.195	AT Count Time (min)	(TC)	30
@AM24101	Tracer Book No.		114B43	Background in cpm	(Bkg)	5
Matrix	Am-243 Tracer Value	(dpm/mL)	9214	Am 241 cpm		153.39
SOLID	Detector Number		3	Am 243 cpm		109.14
Batch Number	Detector Efficiency	(DetEff)	0.5000	Cm 243/244 cpm		0
95003174				AEA Count Time	(min)	480
Rerun				Am 241 µCi/g =		2.6542E+00
0				Cm 243/244 µCi/g =	<	3.4472E-01
Sample Prep						
FUSION01						
Sample Number						
S95T002305						
Instrument Code						
AL10541						
Prepared By						
SEH						
Chemist						
LLF						
Analyst						
AKL						
Date Complete						
10/18/95						
Analysis Date						
10/17/95						
Analysis Time						
03:00 PM						
Sample Point						
AW-102 GRAB						

Am-241 µCi/g = (C241) (Am-243 Tracer Value) (SPKV) (1000mL/L) (DF) / [(C243) (SS) (D g/L) (2220000dpm/µCi)]

Cm-243/244 µCi/g = (Cm) (Am-243 Tracer Value) (SPKV) (1000mL/L) (DF) / [(C243) (SS) (D g/L) (2220000dpm/µCi)]

Relative Counting Error = Square Root of [(1/(Am-243 cpm * min)) + (1 / (Am-241 or Cm-243/244 cpm * min))] * 1.96 * 100

Am 243 Tracer Recovery = (Total AT Counts / TC - Bkg) * (1/DetEff) * C243 * 100 / Am-243 Tracer Value * SPKV

Am241 µCi/g	=	2.65E+00	DETECTION LEVELS in µCi/g
Relative Counting Error	=	1.1%	
NOTE: Cm-243/244 Result is a LESS THAN Value.			Am 241
Cm 243/244 µCi/g		< 3.45E-01	3.45E-01
Relative Counting Error	=	100.0%	Cm 243/244
Am 243 Tracer Recovery	=	69.6%	3.45E-01

Analyst:	AKL	Date:	10/18/95
Signature of Chemist:	LLF	Date:	18 Oct 95

SAMPLE.WB1 REV 1.2 953103ML

WORKBOOK PAGE: DUP6

Am 241 and Cm 243/244: LA-953-103 (A-4) LIQUID / SOLID

Type	Date Counted		OCT-17-95	Am 241 AEA Frac.	(C241)		0.559
DUP	Sample Volume in mL	(SS)	0.100	Am 243 AEA Frac.	(C243)		0.402
Work List	Sample D.F.	(DF)	1	Cm 243/244 AEA Frac.	(Cm)		0
2912	Tracer Volume in mL	(SPKV)	0.100	Total AT Counts			14710
Test Code	Digest Grams of Solids/L	(Dg/L)	2.156	AT Count Time (min)	(TC)		30
@AM24101	Tracer Book No.		114B43	Background in cpm	(Bkg)		5
Matrix	Am-243 Tracer Value	(dpm/mL)	9214	Am 241 cpm			101.42
SOLID	Detector Number		1	Am 243 cpm			72.88
Batch Number	Detector Efficiency	(DetEff)	0.5000	Cm 243/244 cpm			0
95003174				AEA Count Time	(min)		480
Rerun				Am 241 µCi/g =			2.6774E+00
0				Cm 243/244 µCi/g =		<	5.6549E-01
Sample Prep							
FUSION01							
Sample Number							
S95T002305							
Instrument Code							
AL10539							
Prepared By							
SEH							
Chemist							
LLF							
Analyst							
AKL							
Date Complete							
10/18/95							
Analysis Date							
10/17/95							
Analysis Time							
03:00 PM							
Sample Point							
AW-102 GRAB							

Am-241 µCi/g = (C241) (Am-243 Tracer Value) (SPKV) (1000mL/L) (DF) / [(C243) (SS) (D g/L) (2220000dpm/µCi)]

Cm-243/244 µCi/g = (Cm) (Am-243 Tracer Value) (SPKV) (1000mL/L) (DF) / [(C243) (SS) (D g/L) (2220000dpm/µCi)]

Relative Counting Error = Square Root of [(1/(Am-243 cpm * min)) + (1 / (Am-241 or Cm-243/244 cpm * min))] * 1.96 * 100

Am 243 Tracer Recovery = (Total AT Counts / TC - Bkg) * (1/DetEff) * C243 * 100 / Am-243 Tracer Value * SPKV

Am241 µCi/g =	2.68E+00	DETECTION LEVELS in µCi/g
Relative Counting Error =	1.4%	
NOTE: Cm-243/244 Result is a LESS THAN Value.		Am 241
Cm 243/244 µCi/g	< 5.65E-01	5.65E-01
Relative Counting Error =	100.0%	Cm 243/244
Am 243 Tracer Recovery =	42.3%	5.65E-01

Analyst:	AKL	Date:	10/18/95
Signature of Chemist: [signature]	LLF	Date:	18 Oct 95

SAMPLE.WB1 REV 1.2 953103ML

Westinghouse Hanford Co.

G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 2.01

DATA REDUCTION REPORT

SAMPLE
WORKLIST2912-STD
File ID: 19a1952.CNF

Counted on: 10/17/95 @18: 4
Detector: AEA19
Geometry number: 1
Count time: 28802. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	1519.4	1519.4	297.368	297.368	12.000	4.924	6.000	2.121
2	2591.9	2591.9	252.098	252.093	10.000	3.697	5.000	1.613
3	28.3	28.3	151.287	151.281	160.000	1.000	80.000	0.100

PEAK RESULTS
Peak Error Limit: 30%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Pu238	0.337	5.487	5.493	-.006	0.02	46.67	1.3	5787.2	0.261E-02
	Am241		5.479	5.493	-.014				4432.7	0.200E-02
2	Am243	0.533	5.270	5.281	-.011	0.02	73.89	1.0	6664.3	0.300E-02
3	Np237	0.016	4.769	4.807	-.038	0.00	2.25	6.0	230.5	0.104E-03
Totals:		0.887	<--valid peaks only-->				122.81			

DETECTOR CALIBRATION
Energy(MEV) = 4.096 + (0.0047)*Channel
Energy range (MeV): 4.096 TO 6.502
Efficiency = 0.0112 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	66491.0	100.000
Smoothed	66489.9	99.998
Composite fit	58951.5	88.661
Residuals	7539.5	11.339

Analyzed by: EMB

Spectrum 19a1952.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 16805.3

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Raw Data Dump for AEA Spectrum: 19a1952.CNF

1	0.	0.	0.	0.	0.	2.	0.	2.	0.	0.
11	0.	1.	0.	2.	0.	2.	0.	0.	0.	0.
21	1.	2.	1.	0.	0.	0.	0.	1.	0.	0.
31	0.	1.	1.	2.	0.	2.	1.	3.	2.	0.
41	0.	0.	0.	0.	0.	1.	1.	0.	0.	1.
51	1.	2.	0.	1.	1.	1.	1.	1.	2.	1.
61	0.	0.	3.	0.	2.	2.	3.	0.	0.	0.
71	1.	0.	2.	3.	1.	0.	0.	2.	1.	2.
81	2.	5.	1.	1.	5.	2.	1.	2.	3.	5.
91	2.	0.	2.	5.	3.	4.	3.	8.	4.	3.
101	2.	2.	3.	4.	2.	4.	5.	3.	9.	7.
111	8.	7.	9.	5.	4.	5.	7.	8.	8.	7.
121	7.	9.	7.	6.	12.	6.	12.	9.	10.	10.
131	8.	13.	12.	12.	18.	11.	14.	16.	8.	9.
141	21.	16.	9.	9.	16.	15.	18.	19.	21.	20.
151	23.	24.	16.	22.	15.	16.	28.	23.	23.	41.
161	23.	22.	41.	40.	31.	36.	34.	39.	37.	29.
171	39.	30.	37.	45.	31.	50.	44.	40.	65.	54.
181	51.	45.	53.	54.	62.	59.	72.	72.	65.	76.
191	71.	75.	78.	69.	76.	90.	80.	107.	94.	101.
201	92.	114.	110.	98.	107.	106.	91.	119.	106.	135.
211	124.	133.	147.	146.	142.	159.	175.	169.	183.	191.
221	202.	194.	193.	224.	237.	291.	272.	299.	281.	302.
231	362.	334.	397.	434.	434.	496.	541.	569.	613.	726.
241	808.	946.	1051.	1114.	1207.	1347.	1536.	1758.	2072.	2278.
251	2714.	3125.	3097.	2526.	1577.	728.	378.	289.	261.	249.
261	247.	219.	216.	216.	230.	204.	189.	148.	155.	151.
271	177.	155.	148.	141.	162.	210.	211.	213.	223.	227.
281	249.	311.	323.	377.	385.	457.	550.	591.	728.	756.
291	800.	915.	982.	1165.	1354.	1561.	1802.	1785.	1632.	1129.
301	673.	450.	312.	262.	233.	211.	164.	113.	83.	50.
311	37.	17.	7.	5.	0.	0.	0.	0.	0.	0.
321	0.	1.	0.	0.	0.	0.	0.	0.	0.	1.
331	0.	0.	2.	0.	0.	0.	0.	0.	0.	2.
341	0.	0.	0.	0.	0.	0.	0.	2.	0.	0.
351	0.	0.	2.	0.	1.	0.	0.	0.	2.	0.
361	0.	1.	1.	0.	1.	0.	0.	1.	0.	0.
371	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

10-18-95

Westinghouse Hanford Co.

G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 2.01

DATA REDUCTION REPORT

SAMPLE
WORKLIST2912-BLK
File ID: 20a2056.CNF

Counted on: 10/17/95 @18: 5
Detector: AEA20
Geometry number: 1
Count time: 28801. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1?	11.2	11.2	298.065	298.065	14.000	5.455	7.000	0.624
2	2330.3	2330.3	251.899	251.897	12.000	5.368	6.000	1.118
3?	13.8	13.8	147.369	146.768	120.000	1.000	60.000	0.100
4?	2.0	2.0	127.455	126.666	6.000	0.395	3.000	0.379

PEAK RESULTS
Peak Error Limit: 30%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1		????		5.473			0.88	9.6		
2	Am243	0.953	5.270	5.261	0.009	0.02	113.98	0.8	13706.7	0.617E-02
3		????		4.777			1.10	9.7		
4		????		4.685			0.02	342.		
Totals:		0.953	<--valid peaks only-->				113.98			

DETECTOR CALIBRATION
Energy(MEV) = 4.102 + (0.0046)*Channel
Energy range (MeV): 4.102 TO 6.458
Efficiency = 0.0084 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	57421.0	100.000
Smoothed	57422.2	100.002
Composite fit	55672.5	96.955
Residuals	1748.5	3.045

Analyzed by: _____
EMB

Spectrum 20a2056.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 16493.6

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Raw Data Dump for AEA Spectrum: 20a2056.CNF

1	0.	0.	3.	2.	1.	2.	2.	0.	1.	1.
11	0.	3.	2.	0.	3.	2.	0.	0.	2.	0.
21	2.	0.	1.	2.	5.	2.	0.	4.	1.	2.
31	0.	0.	1.	0.	1.	0.	2.	0.	2.	4.
41	2.	1.	0.	0.	3.	2.	2.	2.	0.	5.
51	1.	4.	2.	4.	4.	0.	0.	6.	0.	4.
61	1.	3.	4.	1.	1.	0.	2.	1.	3.	1.
71	2.	2.	3.	3.	3.	4.	2.	0.	2.	5.
81	5.	2.	3.	2.	3.	3.	4.	5.	4.	3.
91	5.	2.	2.	3.	3.	7.	3.	4.	5.	3.
101	9.	8.	10.	3.	5.	4.	2.	3.	0.	2.
111	4.	5.	7.	6.	7.	7.	10.	9.	7.	9.
121	5.	9.	17.	7.	10.	10.	14.	15.	9.	9.
131	14.	6.	9.	10.	15.	12.	13.	13.	18.	16.
141	8.	16.	19.	14.	20.	19.	22.	23.	17.	19.
151	14.	17.	16.	21.	25.	24.	21.	30.	18.	45.
161	24.	36.	34.	37.	38.	41.	40.	36.	52.	44.
171	41.	39.	35.	46.	53.	38.	55.	66.	53.	44.
181	60.	65.	65.	70.	64.	72.	92.	71.	96.	88.
191	102.	85.	98.	94.	98.	107.	118.	129.	144.	152.
201	144.	174.	167.	167.	193.	165.	197.	186.	213.	233.
211	238.	253.	241.	277.	283.	303.	328.	316.	350.	371.
221	384.	437.	441.	520.	514.	521.	586.	631.	647.	688.
231	729.	785.	814.	870.	874.	1007.	1069.	1121.	1220.	1290.
241	1403.	1559.	1490.	1725.	1807.	1849.	1871.	2101.	2187.	2240.
251	2381.	2512.	2570.	2268.	1901.	1207.	569.	346.	234.	203.
261	177.	144.	164.	156.	110.	119.	98.	55.	45.	37.
271	18.	5.	4.	2.	5.	0.	4.	1.	6.	1.
281	2.	5.	5.	7.	9.	2.	6.	4.	7.	6.
291	12.	6.	11.	6.	13.	10.	10.	13.	12.	12.
301	6.	6.	7.	2.	0.	2.	1.	0.	1.	0.
311	0.	0.	1.	1.	0.	0.	0.	0.	0.	0.
321	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
331	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
341	1.	0.	0.	0.	0.	1.	0.	1.	1.	1.
351	2.	0.	2.	2.	0.	1.	2.	1.	1.	1.
361	0.	1.	1.	1.	0.	0.	1.	0.	1.	0.
371	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	1.	1.	0.
421	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

A. Johansen 10-18-95

Westinghouse Hanford Co.

G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 2.01

DATA REDUCTION REPORT

SAMPLE
S95T2304-SAM
File ID: 21a2164.CNF

Counted on: 10/17/95 @18: 5
Detector: AEA21
Geometry number: 1
Count time: 28804. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1?	22.4	22.4	369.004	369.004	10.000	3.074	5.000	1.052
2	5397.8	5397.8	300.443	300.443	10.000	5.056	5.000	2.172
3	4638.8	4638.8	254.805	254.793	10.000	4.129	5.000	1.768

PEAK RESULTS
Peak Error Limit: 30%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Peak Centroid Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1		????		5.792			0.71	10.6		
2	Pu238	0.519	5.487	5.476	0.011	0.02	167.10	0.7	12965.5	0.584E-02
	Am241		5.479	5.476	0.003				9931.0	0.447E-02
3	Am243	0.426	5.270	5.266	0.004	0.02	137.00	0.8	7731.1	0.348E-02
		---					---			
Totals:		0.945	<--valid peaks only-->				304.10			

DETECTOR CALIBRATION
Energy(MEV) = 4.094 + (0.0046)*Channel
Energy range (MeV): 4.094 TO 6.449
Efficiency = 0.0179 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	154550.0	100.000
Smoothed	154550.9	100.001
Composite fit	146330.9	94.682
Residuals	8219.1	5.318

Analyzed by: _____
EMB

Spectrum 21a2164.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 36739.4

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Raw Data Dump for AEA Spectrum: 21a2164.CNF

1	0.	0.	2.	2.	0.	0.	3.	1.	0.	0.
11	0.	0.	1.	0.	1.	1.	1.	0.	1.	0.
21	3.	2.	1.	0.	2.	1.	0.	2.	0.	2.
31	0.	1.	1.	1.	1.	0.	2.	2.	1.	1.
41	0.	0.	0.	0.	1.	3.	1.	0.	0.	0.
51	0.	0.	0.	0.	0.	2.	1.	0.	0.	0.
61	0.	1.	0.	0.	0.	1.	0.	1.	0.	1.
71	1.	4.	0.	2.	0.	1.	1.	1.	0.	0.
81	1.	2.	2.	2.	1.	1.	0.	2.	1.	4.
91	0.	0.	1.	0.	2.	1.	2.	1.	0.	0.
101	0.	1.	4.	1.	3.	3.	1.	2.	1.	1.
111	2.	3.	1.	2.	2.	1.	3.	2.	2.	3.
121	2.	0.	2.	1.	6.	1.	4.	1.	2.	2.
131	4.	1.	1.	1.	1.	3.	4.	2.	6.	2.
141	7.	4.	3.	9.	5.	0.	5.	7.	10.	5.
151	10.	5.	10.	8.	8.	8.	8.	2.	11.	7.
161	13.	10.	12.	9.	13.	11.	15.	17.	8.	12.
171	19.	16.	20.	13.	19.	21.	18.	25.	19.	33.
181	19.	25.	33.	30.	38.	40.	44.	32.	40.	37.
191	44.	55.	54.	45.	51.	45.	54.	62.	61.	70.
201	67.	67.	64.	67.	67.	79.	80.	86.	85.	100.
211	93.	111.	129.	144.	138.	150.	127.	154.	156.	185.
221	173.	198.	209.	222.	221.	274.	306.	318.	341.	332.
231	424.	428.	455.	489.	552.	646.	699.	717.	860.	886.
241	1100.	1224.	1372.	1558.	1888.	2112.	2268.	2438.	2742.	3031.
251	3373.	3888.	4526.	5063.	5507.	5274.	4253.	2724.	1342.	729.
261	563.	495.	449.	492.	490.	424.	455.	442.	401.	387.
271	338.	341.	335.	362.	370.	425.	448.	501.	571.	600.
281	689.	762.	825.	815.	1010.	1135.	1268.	1615.	1779.	1909.
291	2262.	2633.	2752.	3021.	3362.	3685.	4304.	4836.	5534.	5999.
301	6388.	5810.	4354.	2591.	1663.	1224.	892.	820.	696.	583.
311	439.	328.	215.	157.	72.	19.	13.	3.	1.	1.
321	0.	0.	0.	0.	0.	0.	1.	0.	2.	0.
331	2.	0.	0.	1.	0.	1.	0.	0.	2.	0.
341	0.	1.	1.	5.	1.	1.	2.	6.	6.	4.
351	3.	6.	8.	11.	6.	8.	4.	8.	9.	8.
361	13.	16.	15.	13.	9.	22.	23.	20.	28.	24.
371	21.	17.	4.	1.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	1.	0.	0.	0.	1.	0.	0.	0.	0.
401	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
421	2.	0.	1.	0.	3.	3.	1.	2.	2.	7.
431	3.	3.	5.	2.	4.	4.	3.	3.	1.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

10-16-95

Westinghouse Hanford Co.

G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 2.01

DATA REDUCTION REPORT

SAMPLE
S95T2304-DUP
File ID: 22a2210.CNF

Counted on: 10/17/95 @18: 6
Detector: AEA22
Geometry number: 1
Count time: 28801. Sec

PEAK ANALYSIS

Peak	Peak height		Peak center		FWHM		Tau	
ID	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	806.6	806.6	300.809	300.809	12.000	5.865	6.000	1.301
2	703.9	703.9	255.093	255.015	12.000	4.422	6.000	0.994

PEAK RESULTS
Peak Error Limit: 30%

Peak		AEA	Peak Centroid				Count	%err		Activity
ID	Isotope	Frac	Exp.	Obs.	Diff.	FWHM	Rate c/m	@95	d/m	uCi/ea
1	Pu238	0.529	5.487	5.483	0.004	0.03	38.24	1.4	546.9	0.246E-03
	Am241		5.479	5.483	-.004				418.9	0.189E-03
2	Am243	0.439	5.270	5.273	-.003	0.02	31.73	1.7	330.1	0.149E-03
		---					---			
Totals:		0.967	<--valid peaks only-->				69.97			

DETECTOR CALIBRATION
Energy(MEV) = 4.100 + (0.0046)*Channel
Energy range (MeV): 4.100 TO 6.455
Efficiency = 0.0971 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	34723.0	100.000
Smoothed	34724.8	100.005
Composite fit	33584.9	96.722
Residuals	1138.1	3.278

Analyzed by: _____
EMB

Spectrum 22a2210.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 5784.9

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Raw Data Dump for AEA Spectrum: 22a2210.CNF

1	0.	0.	0.	0.	2.	0.	1.	0.	1.	0.
11	2.	0.	1.	1.	1.	1.	0.	0.	2.	1.
21	1.	0.	0.	1.	2.	1.	1.	2.	1.	0.
31	0.	0.	0.	0.	0.	2.	1.	1.	0.	1.
41	1.	0.	0.	0.	2.	0.	0.	0.	3.	1.
51	0.	4.	1.	0.	1.	1.	0.	1.	0.	0.
61	2.	2.	0.	1.	3.	0.	0.	1.	1.	1.
71	1.	2.	1.	1.	0.	1.	0.	0.	2.	2.
81	0.	1.	2.	1.	2.	2.	0.	1.	1.	1.
91	1.	0.	3.	0.	1.	0.	2.	1.	2.	1.
101	2.	0.	0.	2.	2.	2.	1.	1.	2.	1.
111	2.	2.	1.	4.	3.	1.	1.	2.	3.	4.
121	5.	2.	2.	3.	1.	4.	5.	2.	3.	4.
131	3.	2.	4.	4.	0.	1.	6.	1.	7.	2.
141	1.	2.	2.	8.	5.	2.	4.	6.	6.	3.
151	5.	3.	2.	3.	9.	7.	6.	7.	3.	8.
161	4.	9.	3.	5.	7.	8.	2.	3.	7.	9.
171	10.	8.	9.	5.	9.	7.	10.	15.	10.	13.
181	9.	22.	11.	16.	12.	16.	9.	20.	13.	20.
191	22.	17.	28.	23.	23.	18.	41.	34.	27.	25.
201	34.	32.	38.	36.	41.	39.	40.	45.	63.	51.
211	55.	65.	68.	61.	73.	69.	84.	95.	103.	90.
221	92.	105.	104.	133.	122.	138.	139.	168.	180.	186.
231	178.	208.	195.	202.	236.	219.	284.	274.	301.	327.
241	339.	386.	399.	416.	426.	437.	508.	545.	571.	598.
251	661.	722.	695.	737.	846.	801.	808.	568.	348.	208.
261	142.	126.	145.	146.	147.	137.	132.	140.	155.	155.
271	165.	154.	167.	170.	185.	167.	227.	226.	243.	254.
281	269.	283.	266.	306.	302.	317.	376.	423.	430.	476.
291	471.	513.	596.	619.	616.	627.	676.	733.	724.	898.
301	897.	853.	802.	574.	350.	239.	177.	132.	114.	84.
311	76.	53.	41.	40.	26.	17.	6.	1.	3.	0.
321	1.	1.	0.	1.	0.	0.	1.	0.	0.	0.
331	0.	2.	1.	0.	2.	1.	0.	3.	0.	0.
341	1.	0.	0.	1.	0.	0.	4.	1.	3.	2.
351	1.	4.	0.	1.	2.	4.	1.	0.	2.	5.
361	2.	0.	2.	7.	3.	0.	6.	7.	4.	5.
371	5.	4.	3.	4.	1.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
411	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.
421	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
431	1.	0.	0.	2.	0.	1.	0.	1.	0.	2.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

Westinghouse Hanford Co.

G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 2.01

DATA REDUCTION REPORT

SAMPLE
S95T2305-SAM
File ID: 23a2312.CNF

Counted on: 10/17/95 @18: 7
Detector: AEA23
Geometry number: 1
Count time: 28801. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1?	22.4	22.4	370.271	370.271	8.000	2.650	4.000	0.692
2	4673.7	4673.7	301.003	301.003	12.000	5.131	6.000	1.983
3	3390.4	3390.4	255.215	255.196	12.000	4.319	6.000	1.614

PEAK RESULTS
Peak Error Limit: 30%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1		????		5.799			0.84	9.7		
2	Pu238	0.553	5.487	5.481	0.006	0.02	153.39	0.7	1931.5	0.870E-03
	Am241		5.479	5.481	-.002				1479.5	0.666E-03
3	Am243	0.394	5.270	5.270	0.000	0.02	109.14	0.9	999.5	0.450E-03
Totals:		0.947	<--valid peaks only-->				262.54			

DETECTOR CALIBRATION
Energy(MEV) = 4.096 + (0.0046)*Channel
Energy range (MeV): 4.096 TO 6.451
Efficiency = 0.1103 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	133050.0	100.000
Smoothed	133049.7	100.000
Composite fit	126427.1	95.022
Residuals	6622.9	4.978

Analyzed by: _____
EMB

Spectrum 23a2312.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 32020.3

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Raw Data Dump for AEA Spectrum: 23a2312.CNF

1	0.	0.	1.	0.	0.	1.	0.	0.	0.	0.
11	0.	0.	0.	1.	0.	0.	0.	0.	1.	0.
21	1.	0.	2.	0.	0.	0.	0.	1.	0.	0.
31	2.	1.	0.	0.	1.	0.	0.	0.	0.	0.
41	1.	1.	2.	1.	1.	0.	1.	0.	0.	0.
51	0.	0.	0.	1.	1.	0.	0.	0.	0.	0.
61	2.	0.	0.	0.	1.	1.	0.	0.	0.	0.
71	1.	0.	1.	1.	1.	0.	1.	1.	1.	0.
81	1.	1.	1.	1.	0.	0.	0.	0.	0.	0.
91	3.	0.	1.	0.	0.	2.	1.	0.	3.	1.
101	1.	1.	0.	3.	2.	2.	1.	2.	1.	1.
111	1.	2.	6.	0.	2.	3.	1.	1.	3.	2.
121	4.	3.	2.	2.	1.	3.	3.	3.	7.	2.
131	4.	6.	2.	1.	2.	4.	5.	3.	5.	9.
141	5.	1.	8.	8.	4.	6.	8.	6.	8.	8.
151	9.	11.	10.	18.	9.	12.	15.	12.	7.	9.
161	11.	5.	15.	15.	16.	11.	16.	14.	16.	23.
171	21.	27.	24.	21.	26.	18.	34.	25.	44.	31.
181	32.	35.	30.	38.	34.	43.	34.	43.	46.	45.
191	60.	51.	53.	60.	63.	55.	58.	59.	58.	60.
201	80.	77.	77.	85.	92.	91.	92.	118.	112.	99.
211	110.	117.	133.	115.	134.	137.	143.	160.	169.	169.
221	201.	188.	204.	194.	229.	225.	282.	272.	343.	341.
231	357.	381.	422.	470.	519.	522.	595.	668.	736.	797.
241	887.	1022.	1183.	1240.	1418.	1712.	1732.	1934.	1977.	2267.
251	2408.	2744.	3208.	3611.	3903.	4016.	3586.	2542.	1375.	719.
261	484.	432.	410.	396.	381.	395.	399.	412.	396.	364.
271	368.	347.	362.	381.	374.	406.	438.	540.	542.	585.
281	630.	775.	835.	859.	937.	1071.	1253.	1402.	1592.	1828.
291	1981.	2284.	2438.	2634.	2777.	3041.	3485.	3754.	4423.	5036.
301	5435.	5315.	4526.	3089.	1823.	1220.	1015.	743.	664.	559.
311	425.	347.	228.	162.	106.	60.	18.	6.	2.	1.
321	0.	1.	0.	0.	2.	0.	3.	0.	0.	0.
331	1.	1.	1.	2.	0.	2.	1.	2.	5.	1.
341	3.	4.	2.	2.	3.	5.	2.	5.	2.	1.
351	3.	6.	3.	4.	4.	9.	8.	10.	12.	19.
361	12.	11.	20.	18.	19.	19.	14.	22.	14.	23.
371	31.	22.	15.	2.	1.	0.	1.	1.	0.	0.
381	1.	0.	0.	0.	0.	0.	0.	0.	1.	1.
391	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
401	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	2.	0.	0.	0.	0.	0.
421	1.	1.	1.	1.	3.	2.	1.	2.	2.	2.
431	3.	2.	3.	1.	4.	2.	2.	2.	3.	3.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

10-18-95

Westinghouse Hanford Co.

G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 2.01

DATA REDUCTION REPORT

SAMPLE
S95T2305-DUP
File ID: 24a2400.CNF

Counted on: 10/17/95 @18: 8
Detector: AEA24
Geometry number: 1
Count time: 28804. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1?	18.3	18.3	367.516	367.516	12.000	3.063	6.000	1.267
2	3248.8	3248.8	299.142	299.142	12.000	5.444	6.000	2.390
3	2442.4	2442.4	253.522	253.509	10.000	4.311	5.000	1.845

PEAK RESULTS
Peak Error Limit: 30%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1		????		5.779			0.52	12.5		
2	Pu238	0.559	5.487	5.465	0.022	0.03	101.42	0.9	11641.4	0.524E-02
	Am241		5.479	5.465	0.014				8916.8	0.402E-02
3	Am243	0.402	5.270	5.255	0.015	0.02	72.88	1.1	6083.6	0.274E-02
		---					---			
Totals:		0.961	<--valid peaks only-->				174.30			

DETECTOR CALIBRATION
Energy(MEV) = 4.089 + (0.0046)*Channel
Energy range (MeV): 4.089 TO 6.444
Efficiency = 0.0121 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	87101.0	100.000
Smoothed	87101.5	100.001
Composite fit	83921.0	96.349
Residuals	3180.0	3.651

Analyzed by: _____
EMB

Spectrum 24a2400.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 21103.2

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Raw Data Dump for AEA Spectrum: 24a2400.CNF

1	0.	0.	0.	1.	0.	0.	0.	1.	1.	1.
11	0.	0.	1.	0.	0.	1.	0.	0.	0.	0.
21	0.	2.	0.	1.	0.	2.	1.	0.	0.	0.
31	1.	0.	0.	0.	2.	0.	1.	1.	0.	0.
41	0.	0.	0.	1.	0.	1.	1.	0.	0.	0.
51	0.	0.	1.	1.	0.	0.	1.	1.	0.	0.
61	0.	1.	1.	2.	1.	0.	1.	0.	1.	0.
71	2.	1.	0.	0.	0.	2.	0.	0.	0.	0.
81	0.	1.	0.	0.	2.	0.	0.	0.	0.	1.
91	3.	0.	1.	1.	1.	2.	0.	1.	1.	4.
101	2.	0.	0.	1.	0.	0.	2.	2.	2.	3.
111	1.	2.	1.	2.	1.	1.	2.	0.	1.	0.
121	1.	0.	1.	3.	2.	2.	0.	1.	4.	5.
131	2.	0.	2.	3.	4.	1.	1.	2.	0.	4.
141	1.	1.	3.	5.	3.	6.	1.	3.	1.	4.
151	1.	4.	4.	5.	6.	1.	5.	1.	5.	5.
161	2.	6.	4.	5.	6.	4.	5.	5.	3.	4.
171	5.	5.	8.	8.	4.	7.	7.	5.	5.	6.
181	10.	6.	11.	5.	4.	9.	7.	14.	11.	7.
191	11.	21.	8.	13.	14.	17.	18.	16.	20.	16.
201	25.	23.	23.	25.	25.	32.	27.	42.	22.	39.
211	37.	49.	54.	52.	51.	50.	71.	59.	70.	70.
221	83.	98.	88.	95.	122.	137.	151.	168.	164.	203.
231	213.	256.	277.	292.	310.	357.	399.	436.	496.	631.
241	697.	774.	857.	976.	1136.	1270.	1285.	1518.	1699.	1897.
251	2262.	2494.	2702.	2882.	2664.	2114.	1272.	641.	362.	266.
261	246.	241.	258.	208.	223.	206.	217.	208.	180.	195.
271	152.	204.	208.	211.	236.	236.	281.	320.	347.	431.
281	458.	398.	508.	588.	648.	829.	953.	1053.	1216.	1512.
291	1532.	1742.	1958.	2090.	2376.	2788.	2986.	3420.	3779.	3715.
301	3224.	2337.	1463.	960.	745.	569.	528.	421.	341.	265.
311	174.	138.	94.	49.	17.	6.	0.	1.	0.	0.
321	0.	0.	0.	0.	1.	1.	0.	0.	0.	0.
331	0.	2.	0.	1.	1.	1.	0.	1.	0.	3.
341	0.	3.	1.	1.	1.	1.	3.	4.	4.	2.
351	3.	4.	1.	4.	5.	7.	8.	6.	6.	9.
361	12.	12.	9.	18.	16.	15.	27.	11.	27.	15.
371	4.	2.	2.	0.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	1.	1.	0.	1.
411	0.	1.	0.	1.	0.	2.	1.	1.	0.	2.
421	0.	1.	0.	3.	4.	1.	1.	1.	3.	5.
431	1.	3.	3.	2.	5.	2.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

LABCORE Completed Worklist Report for Worklist# 2716

Analyst: jmv **Instrument:** PU01 **Book#** 104643

Method: LA-943-127 Rev/Mod B-0

Worklist Comment: Determine sample size using Ludlum. --LLF

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
1	STD		0	@PU23901	PU23901	LIQUID	1.28E-01	1.19E-1	92.970	% Recovery
1	STD		0	@PU23901	PU23901E	LIQUID	1.00	2.25E+00	2.250	% Ct. Error
1	STD		0	@PU23901	PU23901T	LIQUID	100	7.23E+01	72.300	% Recovery
2	BLNK		0	@PU23901	PU23901	LIQUID	1	<6.15E-6		uCi/mL
2	BLNK		0	@PU23901	PU23901T	LIQUID	100	4.68E+01	46.800	% Recovery
2	BLNK		0	@PU23901	PU23901E	LIQUID	1.00	1.00E+02	100.000	% Ct. Error
3	SAMPLE	S95T002309	0	@PU23901	PU23901	LIQUID	N/A	2.36E-04	2.130e-005	uCi/mL
3	SAMPLE	S95T002309	0	@PU23901	PU23901T	LIQUID	N/A	4.99E+01	1.000e-007	% Recovery
3	SAMPLE	S95T002309	0	@PU23901	PU23901E	LIQUID	N/A	2.36E+00	0.000	% Ct. Error
4	DUP	S95T002309	0	@PU23901	PU23901	LIQUID	2.36E-4	2.43E-4	2.920	RPD
4	DUP	S95T002309	0	@PU23901	PU23901T	LIQUID	100	4.12E+01	41.200	% Recovery
4	DUP	S95T002309	0	@PU23901	PU23901E	LIQUID	1.00	2.72E+00	2.720	% Ct. Error
5	SAMPLE	S95T002158	0	@PU23901	PU23901	LIQUID	N/A	4.62E-05	5.900e-006	uCi/mL
5	SAMPLE	S95T002158	0	@PU23901	PU23901T	LIQUID	N/A	7.24E+01	1.000e-007	% Recovery
5	SAMPLE	S95T002158	0	@PU23901	PU23901E	LIQUID	N/A	2.93E+00	0.000	% Ct. Error
6	DUP	S95T002158	0	@PU23901	PU23901	LIQUID	4.62E-5	4.75E-5	2.770	RPD
6	DUP	S95T002158	0	@PU23901	PU23901T	LIQUID	100	6.51E+01	65.100	% Recovery
6	DUP	S95T002158	0	@PU23901	PU23901E	LIQUID	1.00	3.13E+00	3.130	% Ct. Error

Final page for worklist# 2716

Analyst Signature **Date** **Analyst Signature** **Date**

JJ Fitts 16 Oct 95
Reviewer Signature **Date**

Both samples show Pu-238 activity.
JJ Fitts 16 Oct 95

Units shown for QC (BLK/BKG) may not reflect the actual units.

LABCORE Data Entry Template for Worklist# 2716

Analyst: JMV **Instrument:** PU01 _____ **Book#** 104B43

Method: LA-943-127 Rev/Mod B-0

Worklist Comment: Determine sample size using Ludlum. --LLF

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				@PU23901	LIQUID		
2	BLNK				@PU23901	LIQUID		
3	SAMPLE	S95T002309	0		@PU23901	LIQUID	95000127	AW-102 GRAB
	Analytes Requested: PU23901 , PU23901E, PU23901T							
4	DUP	S95T002309	0		@PU23901	LIQUID		
5	SAMPLE	S95T002158	0		@PU23901	LIQUID	95000127	AW-102 GRAB
	Analytes Requested: PU23901 , PU23901E, PU23901T							
6	DUP	S95T002158	0		@PU23901	LIQUID		

Final page for worklist # 2716

[signature] 10-5-95
Analyst Signature **Date**

[signature] 10/13/95
Analyst Signature **Date**

Data Entry Comments:
JMV Prep

S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

WORKBOOK PAGE: STD1

Pu 238 and 239/240 : LA-943-127 (B-0) LIQUID

						STD
Type	DATE COUNTED		OCT-12-95	PU 236 AEA FRAC	(C236)	0.473
STD	SAMPLE VOLUME in mL	SS	0.100	PU 238 AEA FRAC	(C238)	0.000
Work List	SAMPLE DILUTION FACTOR	DF	101.000	PU 239 AEA FRAC	(C239)	0.558
2716	TRACER VOLUME in mL	SPKV	0.100	TOTAL AT COUNTS		5243
Test Code	DIGEST DILUTION FACTOR	DDF	1.000	AT COUNT TIME (MIN)		30
@PU23901	TRACER BOOK NO		117B43	BACKGROUND in cpm	(Bkg)	5.000
Matrix	DETECTOR NUMBER		1	PU 236 cpm		29.260
LIQUID	EFFICIENCY FACTOR	EFF	0.500	PU 238 cpm		0.000
Batch Number	TRACER PREPARATION DATE		09/12/95	PU 239 cpm		34.550
95002912	TRACER PREPARATION VALUE (dpm/mL)		2265.000	AEA COUNT TIME		480
Rerun	PU-236 DECAY CORR'D VALUE (dpm/mL)		2220.202	Pu 239/240 µCi/L		1.1916E+02
0	PU-238 TRACER VALUE (dpm/mL		0.000			
Sample Prep	STANDARD BOOK NO		104B43			
N/A	STANDARD VALUE in µCi/mL		0.128			
Sample #						
WRKLST#2716						

Instrument Code	Decay Time = Date Counted - Tracer Preparation Date
AL10539	Pu-236 Decay Corr'd Value = Pu-236 Preparation Value *[e to the power of {(-ln2 * Decay Time/1040.95}]
Prepared By	Pu 236 Tracer Recovery = (Total AT Counts / TC -Bkg)* 1/EFF *C236*100/Pu-236 Decay Corr'd Value * SPKV
MCB	Pu 239/240 µCi/L = (C239)(Pu 236 Decay Corr'd Value)(SPKV)(1000mL/L)(DF)(DDF) / [(C236)(SS)(2220000 dpm/µCi)]
Chemist	Pu 238 dpm = [(Total AT Counts / TC) - Bkg * 1/EFF * C238] - (Pu-238 Tracer Value *SPKV *Pu 236 Tracer Recovery / 100)
LLF	Pu 238 µCi/L = [(Pu 238 dpm)(DF)(DDF)(1000mL/L)] / [(Pu-236 Tracer Recovery /100)(2220000 dpm/µCi)(D g/L)(SS)]
Analyst	Relative Counting Error = Square Root of [(1/(Pu 236 cpm * min)) + (1 / (Pu 238 or 239/240 cpm * min))] * 1.96 * 100
JMV	
Date Complete	v RESULTS v

10/13/95	Pu 239/240 µCi/mL		1.19E-01	DETECTION LEVELS in µCi/mL
Analysis Date	Relative Counting Error	=	2.2%	
10/12/95				Pu 239/240
Analysis Time				8.86E-03
11:30 AM				
Sample Point				
AW-102 GRAB	Pu 236 Tracer Recovery	=	72.3%	

Analyst:		JMV	Date:	13-Oct-95
Signature of Chemist:	[signature]	LLF	Date:	16 Oct 95

STANDARD.WB1 REV 1.2 943127ML

WORKBOOK PAGE: BLANK2

Pu 238 and 239/240 : LA-943-127 (B-0) LIQUID / SOLID

						BLNK
Type	DATE COUNTED		OCT-12-95	PU 236 AEA FRAC	(C236)	1.042
BLNK	SAMPLE VOLUME in mL	SS	1.000	PU 238 AEA FRAC	(C238)	0.000
Work List	SAMPLE DILUTION FACTOR	DF	1.000	PU 239 AEA FRAC	(C239)	0.000
2716	TRACER VOLUME in mL	SPKV	0.100	TOTAL AT COUNTS		1617
Test Code	DIGEST DILUTION FACTOR	DDF	1.0000	AT COUNT TIME (MIN)		30
@PU23901	TRACER BOOK NO		117B43	BACKGROUND in cpm (Bkg)		4.000
Matrix	DETECTOR NUMBER		2	PU 236 cpm		17.800
LIQUID	EFFICIENCY FACTOR	EFF	0.5000	PU 238 cpm		0.000
Batch Number	TRACER PREPARATION DATE		09/12/95	PU 239 cpm		0.000
95002912	TRACER PREPARATION VALUE (dpm/mL)		2265.00	AEA COUNT TIME		480
Rerun	PU-236 DECAY CORR'D VALUE	(dpm/mL)	2220.20	Pu 239/240 µCi/L =	<	6.147E-03
0	PU-238 TRACER VALUE	(dpm/mL)	0.00			

Sample Prep	
N/A	
Sample #	Decay Time = Date Counted - Tracer Preparation Date
WRKLST#2716	Pu-236 Decay Corr'd Value = Pu-236 Preparation Value *[e to the power of {(-ln2 * Decay Time/1040.95)}]
Instrument Code	Pu 236 Tracer Recovery = (Total AT Counts / TC -Bkg)*C236*100/(Pu-236 Decay Corr'd Value * SPKV*EFF)
AL10540	Pu 239/240 µCi/L = (C239)(Pu 236 Decay Corr'd Value)(SPKV)(1000mL/L)(DF)(DDF) / [(C236)(SS)(D g/L)(2220000 dpm/µCi)]
Prepared By	Pu 238 dpm = [(Total AT Counts / TC) - Bkg * 1/EFF * C238] - (Pu-238 Tracer Value *SPKV *Pu 236 Tracer Recovery / 100)
MCB	Pu 238 µCi/L = [(Pu 238 dpm)(DF)(DDF)(1000mL/L)] / [(Pu-236 Tracer Recovery /100)(2220000 dpm/µCi)(D g/L)(SS)]
Chemist	Relative Counting Error = Square Root of [(1/(Pu 236 cpm * min)) + (1 / (Pu 238 or 239/240 cpm * min))] * 1.96 * 100
LLF	
Analyst	
JMV	
Date Complete	v RESULTS v

10/13/95	Pu 239/240 µCi/mL		< 6.15E-06	DETECTION LEVELS in µCi/mL
Analysis Date	Relative Counting Error	=	100.0%	
10/12/95				
Analysis Time	NOTE: Pu 238 Result is a LESS THAN Value.			Pu 239/240
11:30 AM	Pu 238 µCimL		< 6.15E-06	6.15E-06
Sample Point	Relative Counting Error	=	100.0%	Pu 238
AW-102 GRAB	Pu 236 Tracer Recovery	=	46.8%	6.15E-06

Analyst:	JMV	Date:	13-Oct-95
Signature of Chemist:	LLF	Date:	16 Oct 95

BLANK.WB1 REV 1.2 943127ML

WORKBOOK PAGE: SAM3

Pu 238 and 239/240 : LA-943-127 (B-0) LIQUID / SOLID

							SAMPLE
Type	DATE COUNTED		OCT-12-95	PU 236 AEA FRAC		(C236)	0.283
SAMPLE	SAMPLE VOLUME in mL	SS	1.000	PU 238 AEA FRAC		(C238)	0.070
Work List	SAMPLE DILUTION FACTOR	DF	1.000	PU 239 AEA FRAC		(C239)	0.669
2716	TRACER VOLUME in mL	SPKV	0.100	TOTAL AT COUNTS			5991
Test Code	DIGEST DILUTION FACTOR	DDF	1.0000	AT COUNT TIME (MIN)			30
@PU23901	TRACER BOOK NO		117B43	BACKGROUND in cpm		(Bkg)	4.000
Matrix	DETECTOR NUMBER		2	PU 236 cpm			20.380
LIQUID	EFFICIENCY FACTOR	EFF	0.500	PU 238 cpm			5.050
Batch Number	TRACER PREPARATION DATE		09/12/95	PU 239 cpm			48.150
95002912	TRACER PREPARATION VALUE (dpm/mL)		2265.000	AEA COUNT TIME			480
Rerun	PU-236 DECAY CORR'D VALUE (dpm/mL)		2220.202	Pu 239/240 µCi/L			2.3642E-01
0	PU-238 TRACER VALUE (dpm/mL)		0.000				

Sample Prep: N/A

Sample #: S95T002309

Instrument Code: AL10540

Prepared By: MCB

Chemist: LLF

Analyst: JMV

Date Complete: 10/13/95

Analysis Date: 10/12/95

Analysis Time: 11:30 AM

Sample Point: AW-102 GRAB

Decay Time = Date Counted - Tracer Preparation Date

Pu-236 Decay Corr'd Value = Pu-236 Preparation Value *[e to the power of {(-ln2 * Decay Time/1040.95)}]

Pu 236 Tracer Recovery = (Total AT Counts / TC -Bkg) *C236*100/(Pu-236 Decay Corr'd Value * SPKV * EFF)

Pu 239/240 µCi/L = (C239)(Pu 236 Decay Corr'd Value)(SPKV)(1000mL/L)(DF)(DDF) / [(C236)(SS)(D g/L)(2220000 dpm/µCi)]

Pu 238 dpm = [(Total AT Counts / TC) - Bkg * 1/EFF * C238] - (Pu-238 Tracer Value *SPKV *Pu 236 Tracer Recovery / 100)

Pu 238 µCi/L = [(Pu 238 dpm)(DF)(DDF)(1000mL/L)] / [(Pu-236 Tracer Recovery /100)(2220000 dpm/µCi)(D g/L)(SS)]

Relative Counting Error = Square Root of [(1/(Pu 236 cpm * min)) + (1 / (Pu 238 or 239/240 cpm * min))] * 1.96 * 100

v RESULTS v

Pu 239/240 µCi/mL		2.36E-04	DETECTION LEVELS in µCi/mL
Relative Counting Error	=	2.4%	
			Pu 239/240
Pu 238 µCimL		2.47E-05	2.13E-05
Relative Counting Error	=	4.4%	Pu 238
Pu 236 Tracer Recovery	=	49.9%	2.13E-05

Analyst:	JMV	Date:	13-Oct-95
Signature of Chemist:	LLF	Date:	16 Oct 95

SAMPLE.WB1 REV 1.2 943127ML

WORKBOOK PAGE: DUP4

Pu 238 and 239/240 : LA-943-127 (B-0) LIQUID / SOLID

						DUP
Type	DATE COUNTED		OCT-12-95	PU 236 AEA FRAC	(C236)	0.275
DUP	SAMPLE VOLUME in mL	SS	1.000	PU 238 AEA FRAC	(C238)	0.077
Work List	SAMPLE DILUTION FACTOR	DF	1.000	PU 239 AEA FRAC	(C239)	0.668
2716	TRACER VOLUME in mL	SPKV	0.100	TOTAL AT COUNTS		5114
Test Code	DIGEST DILUTION FACTOR	DDF	1.0000	AT COUNT TIME (MIN)		30
@PU23901	TRACER BOOK NO		117B43	BACKGROUND in cpm	(Bkg)	4.000
Matrix	DETECTOR NUMBER		2	PU 236 cpm		15.230
LIQUID	EFFICIENCY FACTOR	EFF	0.500	PU 238 cpm		4.240
Batch Number	TRACER PREPARATION DATE		09/12/95	PU 239 cpm		36.940
95002912	TRACER PREPARATION VALUE (dpm/mL)		2265.000	AEA COUNT TIME		480
Rerun	PU-236 DECAY CORR'D VALUE (dpm/mL)		2220.202	Pu 239/240 µCi/L		2.4293E-01
0	PU-238 TRACER VALUE (dpm/mL)		0.000			

Sample Prep	
N/A	
Sample #	Decay Time = Date Counted - Tracer Preparation Date
S95T002309	Pu-236 Decay Corr'd Value = Pu-236 Preparation Value *[e to the power of {(-ln2 * Decay Time/1040.95)]
Instrument Code	Pu 236 Tracer Recovery = (Total AT Counts / TC -Bkg) *C236*100/(Pu-236 Decay Corr'd Value * SPKV * EFF)
AL10540	Pu 239/240 µCi/L = (C239)(Pu 236 Decay Corr'd Value)(SPKV)(1000mL/L)(DF)(DDF) / [(C236)(SS)(D g/L)(2220000 dpm/µCi)]
Prepared By	Pu 238 dpm = [(Total AT Counts / TC) - Bkg * 1/EFF * C238] - (Pu-238 Tracer Value *SPKV *Pu 236 Tracer Recovery / 100)
MCB	Pu 238 µCi/L = [(Pu 238 dpm)(DF)(DDF)(1000mL/L)] / [(Pu-236 Tracer Recovery /100)(2220000 dpm/µCi)(D g/L)(SS)]
Chemist	Relative Counting Error = Square Root of [(1/(Pu 236 cpm * min)) + (1 / (Pu 238 or 239/240 cpm * min))] * 1.96 * 100
LLF	
Analyst	
JMV	
Date Complete	v RESULTS v
10/13/95	
Analysis Date	
10/12/95	
Analysis Time	
11:30 AM	
Sample Point	
AW-102 GRAB	

Pu 239/240 µCi/mL		2.43E-04	DETECTION LEVELS in µCi/mL	
Relative Counting Error	=	2.7%		
			Pu 239/240	
Pu 238 µCimL		2.80E-05	2.65E-05	
Relative Counting Error	=	4.9%	Pu 238	
Pu 236 Tracer Recovery	=	41.2%	2.65E-05	

Analyst:	JMV	Date:	13-Oct-95
Signature of Chemist:	LLF	Date:	16 Oct 95

SAMPLE.WB1 REV 1.2 943127ML

WORKBOOK PAGE: SAM5

Pu 238 and 239/240 : LA-943-127 (B-0) LIQUID / SOLID

							SAMPLE
Type	DATE COUNTED		OCT-12-95	PU 236 AEA FRAC		(C236)	0.703
SAMPLE	SAMPLE VOLUME in mL	SS	1.000	PU 238 AEA FRAC		(C238)	0.029
Work List	SAMPLE DILUTION FACTOR	DF	1.000	PU 239 AEA FRAC		(C239)	0.325
2716	TRACER VOLUME in mL	SPKV	0.100	TOTAL AT COUNTS			3578
Test Code	DIGEST DILUTION FACTOR	DDF	1.0000	AT COUNT TIME (MIN)			30
@PU23901	TRACER BOOK NO		117B43	BACKGROUND in cpm		(Bkg)	5.000
Matrix	DETECTOR NUMBER		3	PU 236 cpm			29.540
LIQUID	EFFICIENCY FACTOR	EFF	0.500	PU 238 cpm			1.200
Batch Number	TRACER PREPARATION DATE		09/12/95	PU 239 cpm			13.670
95002912	TRACER PREPARATION VALUE (dpm/mL)		2265.000	AEA COUNT TIME			480
Rerun	PU-236 DECAY CORR'D VALUE (dpm/mL)		2220.202	Pu 239/240 µCi/L			4.6235E-02
0	PU-238 TRACER VALUE (dpm/mL)		0.000				

Sample Prep: N/A

Sample #: S95T002158

Instrument Code: AL10541

Prepared By: MCB

Chemist: LLF

Analyst: JMV

Date Complete: 10/13/95

Analysis Date: 10/12/95

Analysis Time: 11:30 AM

Sample Point: AW-102 GRAB

Decay Time = Date Counted - Tracer Preparation Date

Pu-236 Decay Corr'd Value = Pu-236 Preparation Value *[e to the power of {(-ln2 * Decay Time/1040.95)]

Pu 236 Tracer Recovery = (Total AT Counts / TC -Bkg) *C236*100/(Pu-236 Decay Corr'd Value * SPKV * EFF)

Pu 239/240 µCi/L = (C239)(Pu 236 Decay Corr'd Value)(SPKV)(1000mL/L)(DF)(DDF) / [(C236)(SS)(D g/L)(2220000 dpm/µCi)]

Pu 238 dpm = [(Total AT Counts / TC) - Bkg * 1/EFF * C238] - (Pu-238 Tracer Value *SPKV *Pu 236 Tracer Recovery / 100)

Pu 238 µCi/L = [(Pu 238 dpm)(DF)(DDF)(1000mL/L)] / [(Pu-236 Tracer Recovery /100)(2220000 dpm/µCi)(D g/L)(SS)]

Relative Counting Error = Square Root of [(1/(Pu 236 cpm * min)) + (1 / (Pu 238 or 239/240 cpm * min))] * 1.96 * 100

v RESULTS v

Pu 239/240 µCi/mL		4.62E-05	DETECTION LEVELS in µCi/mL
Relative Counting Error	=	2.9%	
NOTE: Pu 238 Result is a LESS THAN Value.			Pu 239/240
Pu 238 µCimL		< 5.90E-06	5.90E-06
Relative Counting Error	=	8.3%	Pu 238
Pu 236 Tracer Recovery	=	72.4%	5.90E-06

Analyst:	JMV	Date:	13-Oct-95
Signature of Chemist:	LLF	Date:	16 Oct 95

SAMPLE.WB1 REV 1.2 943127ML

WORKBOOK PAGE: DUP6

Pu 238 and 239/240 : LA-943-127 (B-0) LIQUID / SOLID

							DUP
Type	DATE COUNTED		OCT-12-95	PU 236 AEA FRAC	(C236)		0.666
DUP	SAMPLE VOLUME in mL	SS	1.000	PU 238 AEA FRAC	(C238)		0.035
Work List	SAMPLE DILUTION FACTOR	DF	1.000	PU 239 AEA FRAC	(C239)		0.316
2716	TRACER VOLUME in mL	SPKV	0.100	TOTAL AT COUNTS			3403
Test Code	DIGEST DILUTION FACTOR	DDF	1.0000	AT COUNT TIME (MIN)			30
@PU23901	TRACER BOOK NO		117B43	BACKGROUND in cpm	(Bkg)		5.000
Matrix	DETECTOR NUMBER		3	PU 236 cpm			25.350
LIQUID	EFFICIENCY FACTOR	EFF	0.500	PU 238 cpm			1.330
Batch Number	TRACER PREPARATION DATE		09/12/95	PU 239 cpm			12.040
95002912	TRACER PREPARATION VALUE (dpm/mL)		2265.000	AEA COUNT TIME			480
Rerun	PU-236 DECAY CORR'D VALUE	(dpm/mL)	2220.202	Pu 239/240 µCi/L			4.7452E-02
0	PU-238 TRACER VALUE	(dpm/mL)	0.000				

Sample Prep	
N/A	
Sample #	Decay Time = Date Counted - Tracer Preparation Date
S95T002158	Pu-236 Decay Corr'd Value = Pu-236 Preparation Value *[e to the power of {(-ln2 * Decay Time/1040.95}]
Instrument Code	Pu 236 Tracer Recovery = (Total AT Counts / TC -Bkg) *C236*100/(Pu-236 Decay Corr'd Value * SPKV * EFF)
AL10541	Pu 239/240 µCi/L = (C239)(Pu 236 Decay Corr'd Value)(SPKV)(1000mL/L)(DF)(DDF) / [(C236)(SS)(D g/L)(2220000 dpm/µCi)]
Prepared By	Pu 238 dpm = [(Total AT Counts / TC) - Bkg * 1/EFF * C238] - (Pu-238 Tracer Value *SPKV *Pu 236 Tracer Recovery / 100)
MCB	Pu 238 µCi/L = [(Pu 238 dpm)(DF)(DDF)(1000mL/L)] / [(Pu-236 Tracer Recovery /100)(2220000 dpm/µCi)(D g/L)(SS)]
Chemist	Relative Counting Error = Square Root of [(1/(Pu 236 cpm * min)) + (1 / (Pu 238 or 239/240 cpm * min))] * 1.96 * 100
LLF	
Analyst	
JMV	

v RESULTS v

Date Complete				
10/13/95	Pu 239/240 µCi/mL		4.75E-05	DETECTION LEVELS in µCi/mL
Analysis Date	Relative Counting Error	=	3.1%	
10/12/95				
Analysis Time	NOTE: Pu 238 Result is a LESS THAN Value.			Pu 239/240
11:30 AM	Pu 238 µCimL		< 6.92E-06	6.92E-06
Sample Point	Relative Counting Error	=	8.0%	Pu 238
AW-102 GRAB	Pu 236 Tracer Recovery	=	65.1%	6.92E-06

Analyst:	JMV	Date:	13-Oct-95
Signature of Chemist:	LLF	Date:	16 Oct 95

SAMPLE.WB1 REV 1.2 943127ML

Raymond 10.13.95

Westinghouse Hanford Co.

G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 2.01

DATA REDUCTION REPORT

SAMPLE
WORKLIST2716-STD
File ID: 14a1436.CNF

Counted on: 10/12/95 @22:27
Detector: AEA14
Geometry number: 1
Count time: 28806. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	633.4	633.4	360.424	360.424	12.000	4.221	6.000	0.909
2?	3.0	3.0	302.154	302.154	4.000	0.000	2.000	1.632
3	870.3	870.3	227.267	227.266	12.000	4.875	6.000	1.346

PEAK RESULTS
Peak Error Limit: 30%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Pu236	0.473	5.755	5.750	0.0050	2.02	29.26	1.7	1563.4	0.704E-03
2		????		5.482			0.00	1000.		
3	Pu239	0.558	5.147	5.137	0.0100	2.02	34.55	1.5	1808.7	0.815E-03
	Pu240		5.144	5.137	0.007				1808.7	0.815E-03
Totals:		1.031	<--valid peaks only-->				63.81			

DETECTOR CALIBRATION
Energy(MEV) = 4.092 + (0.0046)*Channel
Energy range (MeV): 4.092 TO 6.447
Efficiency = 0.0191 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	29707.0	100.000
Smoothed	29707.0	100.000
Composite fit	30635.4	103.125
Residuals	-928.4	-3.125

Analyzed by: _____
EMB

Spectrum 14a1436.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 5945.3

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Raw Data Dump for AEA Spectrum: 14a1436.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
21	0.	0.	0.	0.	0.	0.	1.	0.	1.	0.
31	3.	2.	1.	0.	1.	0.	0.	2.	1.	0.
41	0.	1.	0.	0.	1.	1.	1.	3.	2.	0.
51	1.	0.	0.	2.	0.	0.	0.	1.	0.	1.
61	0.	0.	0.	2.	2.	1.	0.	0.	0.	2.
71	0.	1.	1.	0.	0.	0.	2.	0.	0.	1.
81	0.	0.	0.	2.	1.	2.	3.	2.	0.	2.
91	2.	2.	1.	3.	1.	2.	3.	0.	1.	1.
101	5.	2.	2.	2.	2.	1.	3.	2.	1.	2.
111	3.	0.	0.	1.	2.	1.	0.	2.	3.	3.
121	6.	6.	2.	4.	1.	3.	4.	1.	1.	2.
131	2.	5.	7.	3.	3.	0.	1.	4.	4.	8.
141	6.	3.	4.	3.	5.	4.	5.	3.	2.	4.
151	4.	3.	5.	13.	5.	5.	7.	7.	6.	7.
161	14.	7.	11.	16.	12.	10.	7.	13.	15.	7.
171	19.	13.	11.	7.	15.	16.	19.	22.	26.	18.
181	18.	24.	27.	23.	22.	34.	31.	35.	35.	42.
191	44.	47.	52.	68.	60.	62.	55.	77.	74.	91.
201	108.	115.	101.	131.	166.	170.	181.	203.	217.	255.
211	277.	316.	309.	341.	409.	470.	457.	507.	580.	637.
221	598.	654.	696.	762.	821.	927.	935.	993.	850.	790.
231	585.	289.	136.	63.	17.	7.	2.	1.	1.	1.
241	3.	2.	3.	6.	2.	2.	4.	4.	3.	2.
251	4.	4.	1.	3.	4.	1.	4.	2.	4.	5.
261	3.	3.	1.	0.	1.	4.	1.	2.	4.	4.
271	4.	4.	4.	6.	5.	1.	5.	4.	10.	5.
281	5.	4.	5.	7.	12.	8.	13.	11.	10.	14.
291	11.	6.	11.	17.	24.	15.	12.	19.	21.	12.
301	17.	18.	18.	19.	12.	13.	5.	12.	13.	8.
311	15.	18.	12.	9.	20.	14.	20.	17.	18.	21.
321	27.	31.	36.	29.	38.	44.	47.	44.	56.	53.
331	61.	71.	71.	94.	83.	85.	98.	115.	141.	151.
341	189.	188.	227.	235.	265.	305.	356.	355.	445.	438.
351	490.	516.	544.	510.	546.	503.	534.	566.	601.	717.
361	670.	692.	573.	401.	184.	55.	6.	0.	0.	1.
371	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
471	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

Raymond 10-13-95

Westinghouse Hanford Co.

G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 2.01

DATA REDUCTION REPORT

SAMPLE
WORKLIST2616-BLK
File ID: 15a1520.CNF

Counted on: 10/12/95 @22:27
Detector: AEA15
Geometry number: 1
Count time: 28807. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	534.2	534.2	366.463	366.463	10.000	3.541	5.000	1.174

PEAK RESULTS
Peak Error Limit: 30%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Pu236	1.042	5.755	5.768	-.013	0.02	17.80	2.1	1464.5	0.660E-03
	Cm243		5.779	5.768	0.011				1966.1	0.886E-03
Totals:		1.042	<--valid peaks only-->				17.80			

DETECTOR CALIBRATION
Energy(MEV) = 4.082 + (0.0046)*Channel
Energy range (MeV): 4.082 TO 6.438
Efficiency = 0.0124 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	8197.0	100.000
Smoothed	8197.0	100.000
Composite fit	8544.5	104.239
Residuals	-347.5	-4.239

Analyzed by: _____
EMB

Spectrum 15a1520.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 3589.3

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1
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Raw Data Dump for AEA Spectrum: 15a1520.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
21	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
31	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
41	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
51	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
61	0.	0.	0.	0.	0.	1.	0.	1.	1.	1.
71	0.	0.	1.	0.	1.	0.	0.	0.	0.	0.
81	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
91	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
101	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
111	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
121	0.	0.	0.	0.	0.	0.	1.	0.	1.	0.
131	1.	0.	0.	2.	0.	1.	2.	0.	0.	1.
141	0.	2.	1.	0.	0.	0.	0.	2.	2.	0.
151	0.	1.	0.	1.	0.	0.	0.	0.	0.	0.
161	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.
171	0.	0.	1.	0.	1.	0.	0.	0.	0.	0.
181	0.	1.	0.	0.	0.	1.	0.	0.	0.	0.
191	0.	0.	1.	0.	0.	1.	0.	0.	0.	0.
201	1.	0.	0.	1.	0.	1.	0.	1.	0.	0.
211	0.	2.	0.	0.	1.	1.	2.	2.	0.	1.
221	1.	1.	5.	4.	2.	2.	2.	3.	5.	3.
231	6.	2.	5.	4.	4.	2.	2.	1.	0.	0.
241	0.	0.	0.	0.	0.	1.	1.	1.	1.	0.
251	1.	0.	1.	1.	1.	3.	3.	3.	1.	2.
261	2.	0.	0.	0.	0.	2.	0.	0.	0.	0.
271	0.	0.	1.	1.	1.	0.	1.	0.	0.	1.
281	0.	1.	0.	1.	0.	1.	0.	0.	2.	1.
291	3.	1.	2.	4.	1.	0.	5.	0.	1.	3.
301	3.	8.	3.	4.	5.	2.	4.	7.	1.	5.
311	3.	3.	1.	2.	2.	0.	2.	0.	1.	1.
321	1.	3.	0.	2.	5.	3.	4.	3.	6.	5.
331	10.	5.	3.	7.	6.	12.	17.	13.	16.	20.
341	28.	16.	24.	37.	45.	57.	61.	77.	94.	105.
351	146.	130.	176.	211.	250.	281.	285.	365.	355.	366.
361	333.	376.	395.	448.	531.	599.	638.	559.	450.	274.
371	106.	14.	3.	1.	2.	2.	0.	1.	1.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
481	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

Raymond 10.13.95

Westinghouse Hanford Co.

G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 2.01

DATA REDUCTION REPORT

SAMPLE
S95T2309-SAM
File ID: 16a1611.CNF

Counted on: 10/12/95 @22:28
Detector: AEA16
Geometry number: 1
Count time: 28804. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	575.5	575.5	361.280	361.280	10.000	3.565	5.000	1.080
2	144.7	144.7	302.976	302.892	12.000	3.992	6.000	1.273
3	1493.2	1493.2	229.016	229.016	12.000	4.580	6.000	1.744

PEAK RESULTS
Peak Error Limit: 30%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Pu236	0.283	5.755	5.756	-.001	0.02	20.38	2.0	205.5	0.926E-04
2	Pu238	0.070	5.487	5.487	0.000	0.02	5.05	4.1	69.3	0.312E-04
	Am241		5.479	5.487	-.008				53.1	0.239E-04
3	Pu239	0.669	5.147	5.147	0.000	0.02	48.15	1.3	475.8	0.214E-03
	Pu240		5.144	5.147	-.003				475.8	0.214E-03
		---					---			
Totals:		1.022	<--valid peaks only-->				73.58			

DETECTOR CALIBRATION
Energy(MEV) = 4.094 + (0.0046)*Channel
Energy range (MeV): 4.094 TO 6.449
Efficiency = 0.1012 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	34551.0	100.000
Smoothed	34551.0	100.000
Composite fit	35321.2	102.229
Residuals	-770.2	-2.229

Analyzed by: _____
EMB

WHC-SD WM DP-149, REV. 0

Spectrum 16a1611.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 10551.7

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Raw Data Dump for AEA Spectrum: 16a1611.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
21	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
31	1.	0.	0.	1.	1.	0.	0.	0.	0.	0.
41	0.	2.	0.	0.	1.	0.	0.	0.	0.	1.
51	0.	0.	1.	0.	1.	2.	1.	2.	1.	1.
61	0.	0.	0.	1.	1.	1.	1.	1.	2.	0.
71	0.	0.	1.	0.	1.	0.	3.	0.	0.	1.
81	0.	0.	0.	1.	1.	1.	0.	2.	2.	0.
91	3.	0.	0.	0.	3.	0.	0.	0.	1.	0.
101	1.	0.	1.	1.	2.	1.	0.	0.	1.	2.
111	2.	1.	1.	0.	2.	2.	0.	0.	0.	4.
121	0.	1.	2.	2.	0.	2.	2.	1.	1.	2.
131	0.	1.	0.	0.	1.	0.	1.	2.	3.	2.
141	1.	3.	2.	7.	6.	4.	3.	8.	5.	5.
151	8.	6.	6.	5.	2.	3.	4.	8.	4.	2.
161	2.	5.	4.	5.	2.	7.	3.	7.	5.	7.
171	8.	7.	8.	6.	7.	9.	2.	11.	10.	11.
181	7.	11.	6.	9.	11.	16.	13.	18.	11.	17.
191	19.	14.	27.	20.	20.	28.	29.	40.	36.	46.
201	50.	62.	81.	60.	83.	100.	110.	166.	193.	183.
211	215.	248.	285.	317.	391.	429.	513.	593.	708.	724.
221	879.	876.	975.	1166.	1227.	1255.	1486.	1545.	1698.	1631.
231	1495.	1122.	702.	426.	204.	69.	23.	0.	2.	0.
241	0.	3.	1.	1.	1.	2.	1.	1.	1.	2.
251	3.	2.	2.	1.	3.	6.	3.	2.	5.	2.
261	0.	2.	1.	5.	2.	4.	5.	0.	4.	4.
271	5.	8.	4.	5.	6.	12.	11.	9.	12.	10.
281	13.	21.	16.	17.	23.	47.	24.	43.	43.	49.
291	58.	92.	84.	95.	96.	116.	111.	131.	130.	132.
301	141.	151.	172.	151.	149.	127.	73.	26.	10.	3.
311	5.	2.	3.	4.	5.	4.	8.	5.	2.	9.
321	4.	2.	7.	9.	13.	13.	11.	6.	11.	13.
331	24.	17.	15.	28.	33.	38.	31.	38.	49.	53.
341	70.	90.	97.	132.	120.	153.	187.	216.	246.	314.
351	333.	364.	380.	384.	378.	408.	409.	486.	549.	603.
361	577.	659.	644.	459.	244.	75.	17.	4.	0.	0.
371	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								