This document was too large to scan as a whole document, therefore it required breaking into smaller sections.

DOCUMENT NUMBER: SD-WM-DP-164

SECTION 10 **OF** 12

TITLE: Final Report for Tank 241BY104 Rotary Mode Cores 116 & 117 [Pgs 1795 Thru 1986]

DATE: 06/25/1996

ORIGINATOR: Benar CJ

CO: WHC

RECIPIENT:

CO:

REFERENCES: ECN-629043

****
* 222-S Laboratory Counting Room 12-JAN-1996 07:11:55.13 *
****

>>>>>>>>>> SAMPLE INFORMATION <<<<<<<<<< WHC-SD-WM-DP-164, REV. 1

Worklist #: 4792
Sample ID: S95T3789-SAM
Sample Size: 2.00000E-03 L
Dilution Factor: 1.00000E+00

Removed by: D H Milsian

>>>>>>>>>> COUNT INFORMATION <<<<<<<<<<

Detector ID: GEA2
File Number: dka300:[spec.GEA2]2g2527.cnf
Geometry: 42
Count Time: 0 00:50:00.00 sec
Real Time: 0 00:50:26.96 sec
Dead Time: 0.9%

Verified by: B Bachelor 1/12/96

>>>>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<

Sample Count Time: 12-JAN-1996 06:20:51.26
Decayed to: 12-JAN-1996 06:20:51.26
Standard Deviations: 2
Analysis Library: ENVGEA
Analyst: SLH
Background Subtract: DKA300:[SPEC.GEA2]2GBACK

>>>>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<

Date of last energy calibration: 21-MAR-1994 09:31:55.15
Date of last efficiency calibration: 21-MAR-1994 09:43:42.61

****

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/L
0	661.66*	199163	1.53	1323.35	1315	17	0.5		CS-137	138.
0	873.61	35	1.65	1747.21	1740	14	75.1			
0	1174.28	23	4.18	2348.62	2342	15	74.9			

Sample ID : S95T3789-SAM Acquisition date : 12-JAN-1996 06:20:51

WHC-SD-WM-DP-164, REV.

Total number of lines in spectrum	3	
Number of unidentified lines	0	
Number of lines tentatively identified by NID	3	100.00%

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/L	Wtd Mean Decay Corr uCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CS-137	30.00Y	1.000	1.382E+02	1.382E+02	0.006E+02	0.46	
		Total Activity :	1.382E+02	1.382E+02			
		Grand Total Activity :	1.382E+02	1.382E+02			

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

Sample ID : S95T3789-SAM Acquisition date : 12-JAN-1996 06:20:51

WHC-SD-WM-DP-164, REV.

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BE-7	6168.	477.59	1.5928E+00
NA-22	33.	1274.53	2.7982E-02
NA-24	4.	1368.55	1.0631E-02
K-40	87.	1460.75	4.7582E-01
SC-46	27.	1120.55	2.2646E-02
CR-51	5318.	320.08	1.1034E+00
MN-54	41.	834.83	2.1453E-02
CO-56	50.	846.76	2.3990E-02
CO-57	5985.	122.06	8.6491E-02
CO-58	48.	810.78	2.2812E-02
FE-59	25.	1099.25	3.7852E-02
CO-60	13.	1332.50	1.8494E-02
ZN-65	20.	1115.55	3.8282E-02
SE-75	5897.	264.66	1.7539E-01
KR-85	3210.	514.00	2.9186E+01
SR-85	3208.	514.01	1.3195E-01
Y-88	1.	1836.06	6.5866E-03
Y-90	4.	1760.70	4.7194E-02
Y-91	17.	1204.67	6.3546E+00
NB-94	44.	871.09	2.3027E-02
NB-95	50.	765.78	2.2142E-02
ZR-95	54.	756.73	4.1624E-02
RU-103	3932.	497.08	1.4978E-01
RURH-106	1373.	621.93	1.9519E+00
AG-108m	82.	722.94	2.9589E-02
CD-109	5088.	88.03	2.7383E+00
AG-110M	4721.	657.76	1.9871E-01
SN-113	5750.	391.69	2.0865E-01
TE-123m	5950.	159.00	8.6294E-02
SB-124	1368.	602.73	9.6323E-02
SB-125	6488.	427.89	5.2010E-01
TE-125m	5504.	109.27	2.7495E+01
I-129	4841.	39.60	0.0000E+00
I-131	5406.	364.48	1.5155E-01
XE-131m	5880.	163.93	3.7237E+00
BA-133	5293.	356.02	1.9276E-01
CS-134	1410.	604.70	9.8233E-02
CS-136	55.	818.51	2.4429E-02
CS-138	5.	1435.86	2.5794E-02
CE-139	5911.	165.85	9.1981E-02
BA-140	2363.	537.31	4.6283E-01
LA-140	4.	1596.21	1.2337E-02
CE-141	5966.	145.44	1.4775E-01
CE-144	6044.	133.51	6.5012E-01
CEPR-144	6044.	133.51	1.2991E+00
EU-152	12.	1408.01	8.7732E-02
EU-154	33.	1274.51	8.1443E-02
EU-155	5084.	86.54	3.1012E-01
HF-181	5033.	482.18	1.8657E-01
TA-182	4852.	67.75	4.1954E-01
HG-203	5603.	279.20	1.2721E-01

Sample ID : S95T3789-SAM Acquisition date : 12-JAN-1996 06:20:51

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BI-207	1563.	569.70	9.8365E-02
TL-208	5531.	277.36	1.6240E+00
PB-210	4721.	46.50	0.0000E+00
BI-212	80.	727.18	4.0110E-01
PB-212	6501.	238.63	2.3004E-01
BI-214	1432.	609.31	2.1701E-01
PB-214	5274.	351.92	5.9238E-01
RA-224	6440.	240.99	2.5413E+00
RA-226	7552.	186.10	2.5347E+00
AC-228	43.	911.21	8.8575E-02
TH-228	5153.	84.37	8.4620E+00
TH-229	5086.	88.47	3.9688E-01
U-232	4775.	57.78	1.5562E+02
PA-233	5290.	312.17	2.8219E-01
PA-234M	31.	1001.03	3.7095E-02
TH-234	4856.	63.29	4.7850E+00
U-235	7548.	185.71	1.5402E-01
NP-237	5092.	86.48	8.2199E-01
U-237	4800.	59.54	7.8962E-01
NP-238	35.	984.45	8.2872E-02
NP-239	5349.	106.12	3.4547E-01
PU-239	6007.	129.30	1.1314E+03
AM-241	4800.	59.54	7.5741E-01
AM-243	5032.	74.67	2.2727E-01

****
* 222-S Laboratory Counting Room 12-JAN-1996 08:09:07.99 *
****

>>>>>>>>>> SAMPLE INFORMATION <<<<<<<<<< WHC-SD-WM-DP-164, REV. 1

Worklist #: 4792
Sample ID: S95T3789-DUP
Sample Size: 2.00000E-03 L
Dilution Factor: 1.00000E+00

Removed by: [illegible]

>>>>>>>>>> COUNT INFORMATION <<<<<<<<<<

Detector ID: GEA2
File Number: dka300:[spec.GEA2]2g2528.cnf
Geometry: 42
Count Time: 0 00:50:00.00 sec
Real Time: 0 00:50:28.20 sec
Dead Time: 0.9%

Verified by: [illegible] 1/12/96

>>>>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<

Sample Count Time: 12-JAN-1996 07:17:58.45
Decayed to: 12-JAN-1996 07:17:58.45
Standard Deviations: 2
Analysis Library: ENVGEA
Analyst: DM
Background Subtract: DKA300:[SPEC.GEA2]2GBACK

>>>>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<

Date of last energy calibration: 21-MAR-1994 09:31:55.15
Date of last efficiency calibration: 21-MAR-1994 09:43:42.61

****

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/L
0	661.65*	208499	1.53	1323.32	1315	17	0.4		CS-137	145.
0	1460.91*	22	1.57	2922.09	2914	17	121.5		K-40	0.243
0	1764.89*	8	1.36	3530.41	3522	16	112.3			

Summary of Nuclide Activity
Sample ID : S95T3789-DUP Acquisition date : 12-JAN-1996 07:17:58

Total number of lines in spectrum	3	WHC-SD-WM-DP-164, REV.
Number of unidentified lines	0	
Number of lines tentatively identified by NID	3	100.00%

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/L	Wtd Mean Decay Corr uCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
~~K-40~~	~~1.28E+09Y~~	~~1.000~~	~~2.426E-01~~	~~2.426E-01~~	~~2.947E-01~~	~~121.50~~	~~AK~~
CS-137	30.00Y	1.000	1.447E+02	1.447E+02	0.006E+02	0.45	
			---	---			
Total Activity :			1.449E+02	1.449E+02			
Grand Total Activity :			1.449E+02	1.449E+02			

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

Sample ID : S95T3789-DUP Acquisition date : 12-JAN-1996 07:17:58

WHC-SD-WM-DP-164, REV. 1

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BE-7	6624.	477.59	1.6506E+00
NA-22	24.	1274.53	2.4042E-02
NA-24	8.	1368.55	1.4871E-02
SC-46	29.	1120.55	2.3444E-02
CR-51	5488.	320.08	1.1209E+00
MN-54	36.	834.83	2.0137E-02
CO-56	46.	846.76	2.3003E-02
CO-57	6232.	122.06	8.8262E-02
CO-58	50.	810.78	2.3166E-02
FE-59	27.	1099.25	3.9654E-02
CO-60	18.	1332.50	2.1707E-02
ZN-65	22.	1115.55	4.0031E-02
SE-75	6190.	264.66	1.7970E-01
KR-85	3464.	514.00	3.0322E+01
SR-85	3463.	514.01	1.3709E-01
Y-88	2.	1836.06	9.3149E-03
Y-90	1.	1760.70	2.2270E-02
Y-91	16.	1204.67	6.2686E+00
NB-94	43.	871.09	2.2863E-02
NB-95	58.	765.78	2.3735E-02
ZR-95	47.	756.73	3.8721E-02
RU-103	4115.	497.08	1.5323E-01
RURH-106	1427.	621.93	1.9895E+00
AG-108m	86.	722.94	3.0258E-02
CD-109	5461.	88.03	2.8368E+00
AG-110M	5103.	657.76	2.0660E-01
SN-113	6013.	391.69	2.1337E-01
TE-123m	6248.	159.00	8.8424E-02
SB-124	1436.	602.73	9.8677E-02
SB-125	6781.	427.89	5.3172E-01
TE-125m	5727.	109.27	2.8045E+01
I-129	5025.	39.60	0.0000E+00
I-131	5496.	364.48	1.5280E-01
XE-131m	6085.	163.93	3.7878E+00
BA-133	5475.	356.02	1.9606E-01
CS-134	1465.	604.70	1.0013E-01
CS-136	46.	818.51	2.2313E-02
CS-138	2.	1435.86	1.5269E-02
CE-139	6163.	165.85	9.3919E-02
BA-140	2492.	537.31	4.7526E-01
LA-140	6.	1596.21	1.5110E-02
CE-141	6201.	145.44	1.5063E-01
CE-144	6300.	133.51	6.6372E-01
CEPR-144	6299.	133.51	1.3262E+00
EU-152	7.	1408.01	6.7309E-02
EU-154	24.	1274.51	6.9848E-02
EU-155	5472.	86.54	3.2173E-01
HF-181	5266.	482.18	1.9083E-01
TA-182	5059.	67.75	4.2842E-01
HG-203	5721.	279.20	1.2854E-01
BI-207	1566.	569.70	9.8446E-02

Sample ID : S95T3789-DUP Acquisition date : 12-JAN-1996 07:17:58

WHC-SD-WM-DP-164, REV. 1

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
TL-208	5876.	277.36	1.6739E+00
PB-210	5065.	46.50	0.0000E+00
BI-212	77.	727.18	3.9179E-01
PB-212	6837.	238.63	2.3591E-01
BI-214	1443.	609.31	2.1784E-01
PB-214	5470.	351.92	6.0340E-01
RA-224	6849.	240.99	2.6207E+00
RA-226	7983.	186.10	2.6061E+00
AC-228	44.	911.21	9.0039E-02
TH-228	5526.	84.37	8.7622E+00
TH-229	5496.	88.47	4.1254E-01
U-232	4994.	57.78	1.5916E+02
PA-233	5399.	312.17	2.8509E-01
PA-234M	29.	1001.03	3.5747E-02
TH-234	5095.	63.29	4.9015E+00
U-235	7894.	185.71	1.5752E-01
NP-237	5474.	86.48	8.5229E-01
U-237	5026.	59.54	8.0798E-01
NP-238	35.	984.45	8.3139E-02
NP-239	5711.	106.12	3.5699E-01
PU-239	6279.	129.30	1.1568E+03
AM-241	5026.	59.54	7.7502E-01
AM-243	5189.	74.67	2.3077E-01

```
*****************************************************************************
* 222-S Laboratory Counting Room   12-JAN-1996 09:32:36.60                  *
*****************************************************************************
      >>>>>>>>>> SAMPLE INFORMATION <<<<<<<<<<
Worklist #:              4782
Sample ID:               S95T33790-SAM
Sample Size:             2.00000E-03 L
Dilution Factor:         1.00000E+00

      >>>>>>>>>> COUNT INFORMATION <<<<<<<<<<
Detector ID:             GEA2
File Number:             dka300:[spec.GEA2]2g2529.cnf
Geometry:                42
Count Time:              0 00:50:00.00 sec
Real Time:               0 00:50:36.19 sec
Dead Time:               1.2%

      >>>>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<
Sample Count Time:       12-JAN-1996 08:41:21.81
Decayed to:              12-JAN-1996 08:41:21.81
Standard Deviations:     2
Analysis Library:        ENVGEA
Analyst:                 SLH
Background Subtract:     DKA300:[SPEC.GEA2]2GBACK

      >>>>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<
 Date of last energy calibration:      21-MAR-1994 09:31:55.15
 Date of last efficiency calibration:  21-MAR-1994 09:43:42.61
*****************************************************************************
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WHC-SD-WM-DP-164, REV. 1

Removed by: Sharon L Udell

Verified by: B Machebo 1/12/96

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/L
0	661.65*	267004	1.52	1323.32	1315	17	0.4		CS-137	185.
0	1180.03	48	15.66	2360.11	2338	46	104.4			
0	1273.78	28	1.45	2547.68	2542	16	80.1		NA-22	2.977E-02

Sample ID : S95T33790-SAM Acquisition date : 12-JAN-1996 08:41:21

Total number of lines in spectrum	3	WHC-SD-WM-DP-164, REV. 1
Number of unidentified lines	1	
Number of lines tentatively identified by NID	2	66.67%

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/L	Wtd Mean Decay Corr uCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
~~NA-22~~	~~2.60Y~~	~~1.000~~	~~2.977E-02~~	~~2.977E-02~~	~~2.385E-02~~	~~80.11~~	BKG
CS-137	30.00Y	1.000	1.853E+02	1.853E+02	0.007E+02	0.40	
			---	---			
	Total Activity :		1.853E+02	1.853E+02			
	Grand Total Activity :		1.853E+02	1.853E+02			

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

Sample ID : S95T33790-SAM
Acquisition date : 12-JAN-1996 08:41:21

WHC-SD-WM-DP-164, REV. 1

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BE-7	8475.	477.59	1.8671E+00
NA-24	8.	1368.55	1.4902E-02
K-40	120.	1460.75	5.5790E-01
SC-46	32.	1120.55	2.4767E-02
CR-51	6884.	320.08	1.2554E+00
MN-54	58.	834.83	2.5544E-02
CO-56	56.	846.76	2.5376E-02
CO-57	7750.	122.06	9.8422E-02
CO-58	52.	810.78	2.3676E-02
FE-59	28.	1099.25	3.9916E-02
CO-60	16.	1332.50	2.0296E-02
ZN-65	24.	1115.55	4.2492E-02
SE-75	7873.	264.66	2.0267E-01
KR-85	4210.	514.00	3.3426E+01
SR-85	4209.	514.01	1.5113E-01
Y-88	3.	1836.06	1.1408E-02
Y-90	7.	1760.70	5.9908E-02
Y-91	24.	1204.67	7.5707E+00
NB-94	64.	871.09	2.7685E-02
NB-95	83.	765.78	2.8436E-02
ZR-95	83.	756.73	5.1355E-02
RU-103	5299.	497.08	1.7389E-01
RURH-106	1770.	621.93	2.2160E+00
AG-108m	93.	722.94	3.1550E-02
CD-109	6992.	88.03	3.2099E+00
AG-110M	6526.	657.76	2.3363E-01
SN-113	7707.	391.69	2.4156E-01
TE-123m	7902.	159.00	9.9446E-02
SB-124	1881.	602.73	1.1294E-01
SB-125	8775.	427.89	6.0487E-01
TE-125m	7382.	109.27	3.1842E+01
I-129	6752.	39.60	0.0000E+00
I-131	7258.	364.48	1.7559E-01
XE-131m	7885.	163.93	4.3118E+00
BA-133	7027.	356.02	2.2211E-01
CS-134	1901.	604.70	1.1408E-01
CS-136	66.	818.51	2.6772E-02
CS-138	5.	1435.86	2.5958E-02
CE-139	7804.	165.85	1.0569E-01
BA-140	3054.	537.31	5.2612E-01
LA-140	5.	1596.21	1.4283E-02
CE-141	7788.	145.44	1.6881E-01
CE-144	7921.	133.51	7.4422E-01
CEPR-144	7921.	133.51	1.4871E+00
EU-152	5.	1408.01	5.4714E-02
EU-154	44.	1274.51	9.3829E-02
EU-155	6944.	86.54	3.6243E-01
HF-181	6935.	482.18	2.1900E-01
TA-182	6583.	67.75	4.8871E-01
HG-203	7591.	279.20	1.4806E-01
BI-207	2148.	569.70	1.1532E-01

Sample ID : S95T33790-SAM Acquisition date : 12-JAN-1996 08:41:21
WHC-SD-WM-DP-164, REV.

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
TL-208	7547.	277.36	1.8970E+00
PB-210	6462.	46.50	0.0000E+00
BI-212	81.	727.18	4.0363E-01
PB-212	8726.	238.63	2.6651E-01
BI-214	1829.	609.31	2.4522E-01
PB-214	7097.	351.92	6.8822E-01
RA-224	8633.	240.99	2.9422E+00
RA-226	10154.	186.10	2.9391E+00
AC-228	52.	911.21	9.7875E-02
TH-228	6958.	84.37	9.8328E+00
TH-229	6930.	88.47	4.6325E-01
U-232	6366.	57.78	1.7969E+02
PA-233	7046.	312.17	3.2568E-01
PA-234M	38.	1001.03	4.1286E-02
TH-234	6545.	63.29	5.5551E+00
U-235	10093.	185.71	1.7811E-01
NP-237	6950.	86.48	9.6032E-01
U-237	6325.	59.54	9.0640E-01
NP-238	34.	984.45	8.1932E-02
NP-239	7219.	106.12	4.0136E-01
PU-239	8092.	129.30	1.3132E+03
AM-241	6325.	59.54	8.6943E-01
AM-243	6661.	74.67	2.6148E-01

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*****************************************************************************
* 222-S Laboratory Counting Room   12-JAN-1996 10:43:17.23                  *
*****************************************************************************
      >>>>>>>>>> SAMPLE INFORMATION <<<<<<<<<< WHC-SD-WM-DP-164, REV. 1
Worklist #:              4792
Sample ID:               S95T3790-DUP
Sample Size:             2.00000E-03 L
Dilution Factor:         1.00000E+00

      >>>>>>>>>> COUNT INFORMATION <<<<<<<<<<
Detector ID:             GEA2
File Number:             dka300:[spec.GEA2]2g2531.cnf
Geometry:                42
Count Time:              0 00:50:00.00 sec
Real Time:               0 00:50:34.66 sec
Dead Time:               1.1%

      >>>>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<
Sample Count Time:       12-JAN-1996 09:52:05.59
Decayed to:              12-JAN-1996 09:52:05.59
Standard Deviations:     2
Analysis Library:        ENVGEA
Analyst:                 SLH
Background Subtract:     DKA300:[SPEC.GEA2]2GBACK

      >>>>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<
 Date of last energy calibration:       21-MAR-1994 09:31:55.15
 Date of last efficiency calibration:   21-MAR-1994 09:43:42.61
*****************************************************************************
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Removed by: Shara Lilabel

Verified by: S Machelor 1/12/96

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/L
0	126.93	395	1.49	254.28	252	6	66.2			
0	661.65*	255970	1.52	1323.33	1315	17	0.4		CS-137	178.
0	1246.11	16	0.61	2492.31	2488	13	67.0			

Sample ID : S95T3790-DUP Acquisition date : 12-JAN-1996 09:52:05

WHC-SD-WM-DP-164, REV. 1

Total number of lines in spectrum	3	
Number of unidentified lines	2	
Number of lines tentatively identified by NID	1	33.33%

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/L	Wtd Mean Decay Corr uCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CS-137	30.00Y	1.000	1.776E+02	1.776E+02	0.007E+02	0.41	
		Total Activity :	1.776E+02	1.776E+02			
		Grand Total Activity :	1.776E+02	1.776E+02			

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

Minimum Detectable Activity Report
Sample ID : S95T3790-DUP

Acquisition date : 12-JAN-1996 09:52:05

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BE-7	7863.	477.59	1.7984E+00
NA-22	31.	1274.53	2.7178E-02
NA-24	8.	1368.55	1.4872E-02
K-40	104.	1460.75	5.1924E-01
SC-46	43.	1120.55	2.8666E-02
CR-51	6602.	320.08	1.2294E+00
MN-54	58.	834.83	2.5510E-02
CO-56	56.	846.76	2.5390E-02
CO-57	7670.	122.06	9.7912E-02
CO-58	61.	810.78	2.5728E-02
FE-59	22.	1099.25	3.5795E-02
CO-60	18.	1332.50	2.1464E-02
ZN-65	29.	1115.55	4.6605E-02
SE-75	7676.	264.66	2.0011E-01
KR-85	4115.	514.00	3.3047E+01
SR-85	4114.	514.01	1.4941E-01
Y-88	2.	1836.06	9.3149E-03
Y-90	4.	1760.70	4.3100E-02
Y-91	22.	1204.67	7.2325E+00
NB-94	63.	871.09	2.7566E-02
NB-95	75.	765.78	2.7014E-02
ZR-95	95.	756.73	5.4998E-02
RU-103	5037.	497.08	1.6953E-01
RURH-106	1768.	621.93	2.2144E+00
AG-108m	102.	722.94	3.2967E-02
CD-109	6700.	88.03	3.1423E+00
AG-110M	6122.	657.76	2.2628E-01
SN-113	7403.	391.69	2.3674E-01
TE-123m	7536.	159.00	9.7113E-02
SB-124	1800.	602.73	1.1049E-01
SB-125	8208.	427.89	5.8502E-01
TE-125m	6934.	109.27	3.0860E+01
I-129	6297.	39.60	0.0000E+00
I-131	6765.	364.48	1.6953E-01
XE-131m	7617.	163.93	4.2381E+00
BA-133	6903.	356.02	2.2015E-01
CS-134	1827.	604.70	1.1183E-01
CS-136	62.	818.51	2.6093E-02
CS-138	7.	1435.86	3.1364E-02
CE-139	7678.	165.85	1.0483E-01
BA-140	3007.	537.31	5.2212E-01
LA-140	7.	1596.21	1.6321E-02
CE-141	7805.	145.44	1.6900E-01
CE-144	7758.	133.51	7.3655E-01
CEPR-144	7759.	133.51	1.4718E+00
EU-152	7.	1408.01	6.7007E-02
EU-154	31.	1274.51	7.8960E-02
EU-155	6719.	86.54	3.5649E-01
HF-181	6555.	482.18	2.1292E-01
TA-182	6261.	67.75	4.7658E-01
HG-203	7069.	279.20	1.4288E-01

Sample ID : S95T3790-DUP Acquisition date : 12-JAN-1996 09:52:05

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BI-207	1977.	569.70	1.1061E-01
TL-208	7219.	277.36	1.8553E+00
PB-210	6242.	46.50	0.0000E+00
BI-212	86.	727.18	4.1519E-01
PB-212	8402.	238.63	2.6152E-01
BI-214	1908.	609.31	2.5050E-01
PB-214	6766.	351.92	6.7179E-01
RA-224	8391.	240.99	2.9007E+00
RA-226	9725.	186.10	2.8763E+00
AC-228	55.	911.21	1.0099E-01
TH-228	6762.	84.37	9.6932E+00
TH-229	6695.	88.47	4.5531E-01
U-232	6149.	57.78	1.7660E+02
PA-233	6771.	312.17	3.1927E-01
PA-234M	33.	1001.03	3.8327E-02
TH-234	6177.	63.29	5.3968E+00
U-235	9578.	185.71	1.7351E-01
NP-237	6723.	86.48	9.4454E-01
U-237	6216.	59.54	8.9857E-01
NP-238	38.	984.45	8.6902E-02
NP-239	6885.	106.12	3.9196E-01
PU-239	7615.	129.30	1.2739E+03
AM-241	6216.	59.54	8.6191E-01
AM-243	6676.	74.67	2.6177E-01

LABCORE Completed Worklist Report for Worklist# 5838

Analyst: wgb **Instrument:** GEA03 **Book#** 12B56

Method: LA-548-121 Rev/Mod D-1

Worklist Comment: Rerun #1 (STD); use 1 mL sample. -PPB

Seq	Type	Sample#	R	A		Test	Matrix	Actual		Found	DL or Yield	Unit
1	STD		0		@GEA-01	C060-02	SOLID	0.0262		2.59e-02	98.850	% Recovery
1	STD		0		@GEA-01	C060-02E	SOLID	1		1.21	1.210	% Ct. Error
1	STD		0		@GEA-01	CS13702	SOLID	0.0272		2.71e-02	99.630	% Recovery
1	STD		0		@GEA-01	CS13702E	SOLID	1		1.38	1.380	% Ct. Error
2	BLNK-PREP		0		@GEA-01	C060-02	SOLID	1		<1.39e-2		uCi/g
2	BLNK-PREP		0		@GEA-01	CS13702	SOLID	1		<1.78e-2		uCi/g
3	SAMPLE	S96T000374	0	Z	@GEA-01	C060-02	SOLID	N/A	<	1.683e-02	1.683e-002	uCi/g
3	SAMPLE	S96T000374	0	Z	@GEA-01	C060-02E	SOLID	N/A		n/a	0.000	% Ct. Error
3	SAMPLE	S96T000374	0	Z	@GEA-01	CS13702	SOLID	N/A		1.025e+02	0.000	uCi/g
3	SAMPLE	S96T000374	0	Z	@GEA-01	CS13702E	SOLID	N/A		0.500	0.000	% Ct. Error
4	DUP	S96T000374	0	Z	@GEA-01	C060-02	SOLID	<1.68e-2		<2.43e-2		RPD
4	DUP	S96T000374	0	Z	@GEA-01	C060-02E	SOLID	1		n/a		% Ct. Error
4	DUP	S96T000374	0	Z	@GEA-01	CS13702	SOLID	1.02e+02		1.00e+02	1.980	RPD
4	DUP	S96T000374	0	Z	@GEA-01	CS13702E	SOLID	1.00		0.490	0.490	% Ct. Error

Comments Section:

Comments for sample# S96T000374 **and test** @GEA-01 .
DL=0 => n/a. High STD recovery; rerun requested. R(0)
DL=0 => n/a. R(1)

Final page for worklist# 5838

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

RJ Michelotti 2/28/96
Reviewer Signature **Date**

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

LABCORE Data Entry Template for Worklist# 5838

Analyst: WGB **Instrument:** GEA00 3 **Book#** 12856

Method: LA-548-121 Rev/Mod D-1

Worklist Comment: Rerun #1 (STD); use 1 mL sample. -PPB

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				@GEA-01	SOLID		
2	BLNK-PREP				@GEA-01	SOLID		
3	SAMPLE	S96T000374	0	Z	@GEA-01	SOLID	95000180	BY104 ROTARY
		Analytes Requested: CO60-02 , CO60-02E, CS13702 , CS13702E						
4	DUP	S96T000374	0	Z	@GEA-01	SOLID		

Final page for worklist # 5838

Wayne A. Buchardt 2-24-96
Analyst Signature **Date**

C.J. Quinn 2/26/96
Analyst Signature **Date**

Data Entry Comments:

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

```
*****************************************************************************
* 222-S Laboratory Counting Room   24-FEB-1996 18:59:32.37                  *
*****************************************************************************
      >>>>>>>>>> SAMPLE INFORMATION <<<<<<<<<<
```

WHC-SD-WM-DP-164, REV. 1

```
Worklist #:              5838
Sample ID:               WL5838-STD
Sample Size:             1.00000E-03 L
Dilution Factor:         1.00000E+00
```

Removed by: ALJ 2-24-96

```
      >>>>>>>>>> COUNT INFORMATION <<<<<<<<<<
Detector ID:             GEA3
File Number:             dka300:[spec.GEA3]3g3678.cnf
Geometry:                42
Count Time:              0 00:50:00.00 sec
Real Time:               0 00:50:09.81 sec
Dead Time:               0.3%
```

Verified by: Bmachelor 2/26/96

```
      >>>>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<
Sample Count Time:       24-FEB-1996 18:08:46.52
Decayed to:              24-FEB-1996 18:08:46.52
Standard Deviations:     2
Analysis Library:        ENVGEA
Analyst:                 ALJ
Background Subtract:     DKA300:[SPEC.GEA3]3GBACK

      >>>>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<
 Date of last energy calibration:       11-MAR-1994 11:47:01.11
 Date of last efficiency calibration:   15-MAR-1994 10:28:40.20
*****************************************************************************
```

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/L
0	661.54*	23974	1.56	1323.26	1317	12	1.4		CS-137	27.1
0	1173.00	16299	1.89	2346.28	2338	18	1.7		CO-60	25.7
0	1332.25	14928	1.91	2664.88	2656	20	1.7		CO-60	26.1

Sample ID : WL5838-STD
Acquisition date : 24-FEB-1996 18:08:46

WHC-SD-WM-DP-164, REV. 1

Total number of lines in spectrum	3	
Number of unidentified lines	0	
Number of lines tentatively identified by NID	3	100.00%

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/L	Wtd Mean Decay Corr uCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CO-60	5.27Y	1.000	2.592E+01	2.592E+01	0.031E+01	1.21	
CS-137	30.00Y	1.000	2.710E+01	2.710E+01	0.037E+01	1.38	
		Total Activity :	5.302E+01	5.302E+01			
		Grand Total Activity :	5.302E+01	5.302E+01			

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

Sample ID : WL5838-STD
Acquisition date : 24-FEB-1996 18:08:46
WHC-SD-WM-DP-164, REV. 1

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BE-7	1310.	477.59	1.1923E+00
NA-22	91.	1274.53	7.4885E-02
NA-24	40.	1368.55	5.3517E-02
K-40	139.	1460.75	9.6599E-01
CR-51	1285.	320.08	8.8858E-01
MN-54	731.	834.83	1.4784E-01
CO-56	739.	846.76	1.5055E-01
CO-57	1311.	122.06	6.2656E-02
CO-58	755.	810.78	1.4730E-01
FE-59	796.	1099.25	3.4596E-01
SE-75	1469.	264.66	1.4236E-01
SR-85	948.	514.01	1.1599E-01
Y-88	23.	1836.06	5.0028E-02
NB-94	863.	871.09	1.6666E-01
ZRNB-95	602.	724.18	2.7182E-01
RU-103	927.	497.08	1.1779E-01
RURH-106	696.	621.93	2.2612E+00
AG-108m	632.	722.94	1.3376E-01
CD-109	1168.	88.03	1.9585E+00
AG-110M	1070.	657.76	1.5411E-01
SN-113	1141.	391.69	1.5354E-01
TE-123m	1343.	159.00	6.5235E-02
SB-124	679.	602.73	1.1032E-01
SB-125	1292.	427.89	3.8144E-01
TE-125m	1247.	109.27	1.9894E+01
I-131	1151.	364.48	1.1535E-01
CS-134	690.	604.70	1.1170E-01
BA-140	753.	537.31	4.2244E-01
LA-140	28.	1596.21	5.2333E-02
CEPR-144	1401.	133.51	9.7989E-01
EU-152	33.	1408.01	2.3421E-01
EU-154	91.	1274.51	2.1708E-01
EU-155	1212.	105.31	2.6195E-01
HG-203	1352.	279.20	1.0185E-01
TL-208	1387.	277.36	1.3249E+00
BI-212	613.	727.18	1.8084E+00
PB-212	1665.	238.63	1.8851E-01
BI-214	681.	609.31	2.4337E-01
PB-214	1180.	351.92	4.5985E-01
RA-224	1608.	240.99	2.0568E+00
RA-226	1512.	186.10	1.8210E+00
AC-228	1006.	911.21	7.0256E-01
TH-228	1137.	84.37	5.9507E+00
TH-229	1179.	88.47	2.8514E-01
PA-233	1353.	312.17	2.3357E-01
UTH-233	1633.	245.34	7.7687E+01
PA-234M	791.	1001.03	3.0465E-01
TH-234	1168.	63.29	4.0634E+00
U-235	1527.	185.71	1.1120E-01
NP-237	1144.	86.48	5.8219E-01
NP-239	1238.	106.12	2.5157E-01

Sample ID : WL5838-STD Acquisition date : 24-FEB-1996 18:08:46

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
PU-239	1316.	129.30	8.2625E+02
AM-241	1060.	59.54	6.8297E-01
AM-243	1096.	74.67	1.6324E-01

```
*****************************************************************************
* 22?-S Laboratory Counting Room   24-FEB-1996 19:53:38.09                  *
*****************************************************************************
      >>>>>>>>>> SAMPLE INFORMATION <<<<<<<<<<
Worklist #:              5838
Sample ID:               WL5838-BLK
Sample Size:             1.00000E-03 L
Dilution Factor:         1.00000E+00

      >>>>>>>>>> COUNT INFORMATION <<<<<<<<<<
Detector ID:             GEA3
File Number:             dka300:[spec.GEA3]3g3679.cnf
Geometry:                42
Count Time:              0 00:50:00.00 sec
Real Time:               0 00:50:00.42 sec
Dead Time:               0.0%

      >>>>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<
Sample Count Time:       24-FEB-1996 19:03:00.08
Decayed to:              24-FEB-1996 19:03:00.08
Standard Deviations:     2
Analysis Library:        ENVGEA
Analyst:                 ALJ
Background Subtract:     DKA300:[SPEC.GEA3]3GBACK

      >>>>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<
 Date of last energy calibration:       11-MAR-1994 11:47:01.11
 Date of last efficiency calibration:   15-MAR-1994 10:28:40.20
*****************************************************************************
```

WHC-SD-WM-DP-164, REV. 1

Removed by: [signature] 2-24-96

Verified by: [signature] 2/26/96

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/L
0	661.70*	29	1.67	1323.57	1318	15100.5			CS-137	3.229E-02

Summary of Nuclide Activity
Sample ID : WL5838-BLK

Acquisition date : 24-FEB-1996 19:03:00

WHC-SD-WM-DP-164, REV. 1

Total number of lines in spectrum	1	
Number of unidentified lines	0	
Number of lines tentatively identified by NID	1	100.00%

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/L	Wtd Mean Decay Corr uCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
~~CS-137~~	~~30.00Y~~	~~1.000~~	~~3.229E-02~~	~~3.229E-02~~	~~3.245E-02~~	~~100.50~~	BKG
			---	---			
Total Activity :			3.229E-02	3.229E-02			
Grand Total Activity :			3.229E-02	3.229E-02			

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

Sample ID : WL5838-BLK
Acquisition date : 24-FEB-1996 19:03:00

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BE-7	28.	477.59	1.7446E-01
NA-22	9.	1274.53	2.3793E-02
NA-24	12.	1368.55	2.8894E-02
K-40	130.	1460.75	9.3273E-01
CR-51	51.	320.08	1.7688E-01
MN-54	18.	834.83	2.3052E-02
CO-56	13.	846.76	2.0144E-02
CO-57	78.	122.06	1.5328E-02
CO-58	23.	810.78	2.5661E-02
FE-59	12.	1099.25	4.1899E-02
CO-60	10.	1332.50	2.5282E-02
SE-75	42.	264.66	2.3958E-02
SR-85	52.	514.01	2.7282E-02
Y-88	7.	1836.06	2.7368E-02
NB-94	13.	871.09	2.0406E-02
ZRNB-95	21.	724.18	5.1102E-02
RU-103	25.	497.08	1.9447E-02
RURH-106	18.	621.93	3.6030E-01
AG-108m	19.	722.94	2.3366E-02
CD-109	60.	88.03	4.4462E-01
AG-110M	19.	657.76	2.0472E-02
SN-113	32.	391.69	2.5707E-02
TE-123m	67.	159.00	1.4533E-02
SB-124	30.	602.73	2.3232E-02
SB-125	37.	427.89	6.4895E-02
TE-125m	81.	109.27	5.0647E+00
I-131	54.	364.48	2.4908E-02
CS-134	25.	604.70	2.1129E-02
BA-140	33.	537.31	8.8172E-02
LA-140	1.	1596.21	9.8677E-03
CEPR-144	86.	133.51	2.4244E-01
EU-152	7.	1408.01	1.0761E-01
EU-154	9.	1274.51	6.9275E-02
EU-155	67.	105.31	6.1371E-02
HG-203	74.	279.20	2.3790E-02
TL-208	54.	277.36	2.6070E-01
BI-212	20.	727.18	3.2750E-01
PB-212	85.	238.63	4.2674E-02
BI-214	45.	609.31	6.2685E-02
PB-214	62.	351.92	1.0520E-01
RA-224	83.	240.99	4.6863E-01
RA-226	79.	186.10	4.1612E-01
AC-228	31.	911.21	1.2264E-01
TH-228	66.	84.37	1.4373E+00
TH-229	59.	88.47	6.3943E-02
PA-233	52.	312.17	4.5987E-02
UTH-233	79.	245.34	1.7061E+01
PA-234M	19.	1001.03	4.6685E-02
TH-234	63.	63.29	9.4403E-01
U-235	82.	185.71	2.5728E-02
NP-237	59.	86.48	1.3250E-01

Sample ID : WL5838-BLK Acquisition date : 24-FEB-1996 19:03:00

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
NP-239	63.	106.12	5.6950E-02
PU-239	75.	129.30	1.9758E+02
AM-241	45.	59.54	1.4081E-01
AM-243	77.	74.67	4.3209E-02

```
*****************************************************************************
* 222-S Laboratory Counting Room   24-FEB-1996 21:01:43.50                  *
*****************************************************************************
```

WHC-SD-WM-DP-164, REV.

>>>>>>>>>> SAMPLE INFORMATION <<<<<<<<<<

Worklist #:	5838
Sample ID:	S96T000374-SAM
Sample Size:	1.00000E-03 L
Dilution Factor:	1.00000E+00

Removed by: 2-24-96

>>>>>>>>>> COUNT INFORMATION <<<<<<<<<<

Detector ID:	GEA3
File Number:	dka300:[spec.GEA3]3g3680.cnf
Geometry:	42
Count Time:	0 00:50:00.00 sec
Real Time:	0 00:50:20.49 sec
Dead Time:	0.7%

Verified by: 2/26/96

>>>>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<

Sample Count Time:	24-FEB-1996 20:10:30.18
Decayed to:	24-FEB-1996 20:10:30.18
Standard Deviations:	2
Analysis Library:	ENVGEA
Analyst:	ALJ
Background Subtract:	DKA300:[SPEC.GEA3]3GBACK

>>>>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<

Date of last energy calibration: 11-MAR-1994 11:47:01.11
Date of last efficiency calibration: 15-MAR-1994 10:28:40.20

*****

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/L
0	661.51*	164787	1.56	1323.20	1315	17	0.5		CS-137	186.

Sample ID : S96T000374-SAM Acquisition date : 24-FEB-1996 20:10:30

WHC-SD-WM-DP-164, REV. 1

Total number of lines in spectrum	1	
Number of unidentified lines	0	
Number of lines tentatively identified by NID	1	100.00%

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/L	Wtd Mean Decay Corr uCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CS-137	30.00Y	1.000	1.863E+02	1.863E+02	0.009E+02	0.50	
		Total Activity :	1.863E+02	1.863E+02			
		Grand Total Activity :	1.863E+02	1.863E+02			

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

Sample ID : S96T000374-SAM
Acquisition date : 24-FEB-1996 20:10:30

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BE-7	5104.	477.59	2.3537E+00
NA-22	19.	1274.53	3.4214E-02
NA-24	13.	1368.55	3.0320E-02
K-40	114.	1460.75	8.7374E-01
CR-51	4015.	320.08	1.5709E+00
MN-54	38.	834.83	3.3885E-02
CO-56	30.	846.76	3.0219E-02
CO-57	4330.	122.06	1.1389E-01
CO-58	30.	810.78	2.9299E-02
FE-59	20.	1099.25	5.5120E-02
CO-60	14.	1332.50	3.0552E-02
SE-75	4371.	264.66	2.4557E-01
SR-85	2501.	514.01	1.8837E-01
Y-88	1.	1836.06	1.0492E-02
NB-94	40.	871.09	3.5839E-02
ZRNB-95	66.	724.18	8.9848E-02
RU-103	3063.	497.08	2.1411E-01
RURH-106	864.	621.93	2.5189E+00
AG-108m	59.	722.94	4.0750E-02
CD-109	3640.	88.03	3.4576E+00
AG-110M	4008.	657.76	2.9822E-01
SN-113	4285.	391.69	2.9759E-01
TE-123m	4302.	159.00	1.1678E-01
SB-124	928.	602.73	1.2891E-01
SB-125	4893.	427.89	7.4241E-01
TE-125m	3886.	109.27	3.5126E+01
I-131	4099.	364.48	2.1762E-01
CS-134	886.	604.70	1.2656E-01
BA-140	1748.	537.31	6.4359E-01
LA-140	2.	1596.21	1.3956E-02
CEPR-144	4292.	133.51	1.7149E+00
EU-152	5.	1408.01	8.9377E-02
EU-154	19.	1274.51	9.9400E-02
EU-155	3990.	105.31	4.7536E-01
HG-203	4125.	279.20	1.7788E-01
TL-208	4105.	277.36	2.2795E+00
BI-212	56.	727.18	5.4534E-01
PB-212	4945.	238.63	3.2484E-01
BI-214	933.	609.31	2.8482E-01
PB-214	4048.	351.92	8.5339E-01
RA-224	4826.	240.99	3.5631E+00
RA-226	5730.	186.10	3.5443E+00
AC-228	39.	911.21	1.3749E-01
TH-228	3690.	84.37	1.0720E+01
TH-229	3662.	88.47	5.0260E-01
PA-233	3865.	312.17	3.9486E-01
UTH-233	4730.	245.34	1.3222E+02
PA-234M	30.	1001.03	5.9302E-02
TH-234	3476.	63.29	7.0090E+00
U-235	5681.	185.71	2.1449E-01
NP-237	3681.	86.48	1.0442E+00

Sample ID : S96T000374-SAM Acquisition date : 24-FEB-1996 20:10:30

WHC-SD-WM-DP-164, REV. 7

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
NP-239	4010.	106.12	4.5278E-01
PU-239	4401.	129.30	1.5111E+03
AM-241	3411.	59.54	1.2252E+00
AM-243	3554.	74.67	2.9394E-01

```
*****************************************************************************
* 222-S Laboratory Counting Room   24-FEB-1996 21:56:45.08                  *
*****************************************************************************
      >>>>>>>>>> SAMPLE INFORMATION <<<<<<<<<<
```

WHC-SD-WM-DP-164, REV. 1

```
Worklist #:              5838
Sample ID:               S96T000374-DUP
Sample Size:             1.00000E-03 L
Dilution Factor:         1.00000E+00
```

Removed by: 2-28-96

```
      >>>>>>>>>> COUNT INFORMATION <<<<<<<<<<
Detector ID:             GEA3
File Number:             dka300:[spec.GEA3]3g3681.cnf
Geometry:                42
Count Time:              0 00:50:00.00 sec
Real Time:               0 00:50:21.31 sec
Dead Time:               0.7%
```

Verified by: Bachelor 2/26/96

```
      >>>>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<
Sample Count Time:       24-FEB-1996 21:05:47.89
Decayed to:              24-FEB-1996 21:05:47.89
Standard Deviations:     2
Analysis Library:        ENVGEA
Analyst:                 ALJ
Background Subtract:     DKA300:[SPEC.GEA3]3GBACK

      >>>>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<
 Date of last energy calibration:       11-MAR-1994 11:47:01.11
 Date of last efficiency calibration:   15-MAR-1994 10:28:40.20
*****************************************************************************
```

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/L
0	661.51*	172220	1.55	1323.20	1315	17	0.5		CS-137	195.
0	1332.40	28	1.15	2665.18	2659	12	51.5			
0	1460.49*	14	1.54	2921.47	2913	17	191.7		K-40	0.238

Summary of Nuclide Activity
Sample ID : S96T000374-DUP

Acquisition date : 24-FEB-1996 21:05:47
WHC-SD-WM-DP-164, REV. 1

Total number of lines in spectrum	3	
Number of unidentified lines	0	
Number of lines tentatively identified by NID	3	100.00%

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/L	Wtd Mean Decay Corr uCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
~~K-40~~	~~1.28E+09Y~~	~~1.000~~	~~2.382E-01~~	~~2.382E-01~~	~~4.567E-01~~	~~191.75~~	BKG
CS-137	30.00Y	1.000	1.947E+02	1.947E+02	0.001E+03	0.49	
		Total Activity :	1.949E+02	1.949E+02			
		Grand Total Activity :	1.949E+02	1.949E+02			

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

Sample ID : S96T000374-DUP Acquisition date : 24-FEB-1996 21:05:47

WHC-SD-WM-DP-164, REV. 1

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BE-7	5223.	477.59	2.3809E+00
NA-22	32.	1274.53	4.4401E-02
NA-24	6.	1368.55	2.0441E-02
CR-51	4136.	320.08	1.5945E+00
MN-54	25.	834.83	2.7430E-02
CO-56	39.	846.76	3.4514E-02
CO-57	4420.	122.06	1.1506E-01
CO-58	39.	810.78	3.3629E-02
FE-59	24.	1099.25	6.0037E-02
CO-60	34.	1332.50	4.7310E-02
SE-75	4573.	264.66	2.5117E-01
SR-85	2535.	514.01	1.8965E-01
Y-88	3.	1836.06	1.8173E-02
NB-94	25.	871.09	2.8594E-02
ZRNB-95	57.	724.18	8.3637E-02
RU-103	3139.	497.08	2.1674E-01
RURH-106	910.	621.93	2.5849E+00
AG-108m	58.	722.94	4.0599E-02
CD-109	3946.	88.03	3.6000E+00
AG-110M	4218.	657.76	3.0595E-01
SN-113	4526.	391.69	3.0586E-01
TE-123m	4407.	159.00	1.1819E-01
SB-124	948.	602.73	1.3030E-01
SB-125	5174.	427.89	7.6341E-01
TE-125m	4010.	109.27	3.5679E+01
I-131	4201.	364.48	2.2033E-01
CS-134	947.	604.70	1.3082E-01
BA-140	1834.	537.31	6.5927E-01
LA-140	5.	1596.21	2.2066E-02
CEPR-144	4442.	133.51	1.7446E+00
EU-152	9.	1408.01	1.2201E-01
EU-154	32.	1274.51	1.2900E-01
EU-155	4077.	105.31	4.8047E-01
HG-203	4414.	279.20	1.8401E-01
TL-208	4371.	277.36	2.3523E+00
BI-212	50.	727.18	5.1706E-01
PB-212	5102.	238.63	3.2995E-01
BI-214	962.	609.31	2.8920E-01
PB-214	4212.	351.92	8.7060E-01
RA-224	4987.	240.99	3.6217E+00
RA-226	5876.	186.10	3.5893E+00
AC-228	41.	911.21	1.4262E-01
TH-228	3816.	84.37	1.0903E+01
TH-229	3918.	88.47	5.1989E-01
PA-233	4182.	312.17	4.1073E-01
UTH-233	4870.	245.34	1.3417E+02
PA-234M	17.	1001.03	4.4992E-02
TH-234	3515.	63.29	7.0474E+00
U-235	5855.	185.71	2.1776E-01
NP-237	3963.	86.48	1.0836E+00
NP-239	4074.	106.12	4.5636E-01

Sample ID : S96T000374-DUP Acquisition date : 24-FEB-1996 21:05:47

WHC-SD-WM-DP-164, REV. 1

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
PU-239	4439.	129.30	1.5176E+03
AM-241	3429.	59.54	1.2283E+00
AM-243	3580.	74.67	2.9502E-01

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

LABCORE Completed Worklist Report for Worklist# 5742

Analyst: wgb **Instrument:** GEA01 **Book#** 12856

Method: LA-548-121 Rev/Mod D-1

Worklist Comment: BY-104 Rotary. Sample Size = 1.0 ml. new

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
1	STD		0		@GEA-01	CO60-02	SOLID	0.0262	3.19e-02	121.760	% Recovery
1	STD		0		@GEA-01	CO60-02E	SOLID	1	1.30	1.300	% Ct. Error
1	STD		0		@GEA-01	CS13702	SOLID	0.0272	3.33e-02	122.430	% Recovery
1	STD		0		@GEA-01	CS13702E	SOLID	1	1.49	1.490	% Ct. Error
2	BLNK-PREP		0		@GEA-01	CO60-02	SOLID	1	<3.06e-2		uCi/g
2	BLNK-PREP		0		@GEA-01	CS13702	SOLID	1	<3.44e-2		uCi/g
3	SAMPLE	S96T000374	0	Z	@GEA-01	CO60-02	SOLID	N/A	< 3.527e-02	3.527e-002	uCi/g
3	SAMPLE	S96T000374	0	Z	@GEA-01	CO60-02E	SOLID	N/A	n/a	0.000	% Ct. Error
3	SAMPLE	S96T000374	0	Z	@GEA-01	CS13702	SOLID	N/A	1.278e+02	0.000	uCi/g
3	SAMPLE	S96T000374	0	Z	@GEA-01	CS13702E	SOLID	N/A	0.520	0.000	% Ct. Error
4	DUP	S96T000374	0	Z	@GEA-01	CO60-02	SOLID	<3.53e-2	<3.30e-2		RPD
4	DUP	S96T000374	0	Z	@GEA-01	CO60-02E	SOLID	1	n/a		% Ct. Error
4	DUP	S96T000374	0	Z	@GEA-01	CS13702	SOLID	1.28e+02	1.20e+02	6.450	RPD
4	DUP	S96T000374	0	Z	@GEA-01	CS13702E	SOLID	1.00	0.510	0.510	% Ct. Error

Comments Section:

Comments for sample# S96T000374 and test @GEA-01 .
DL=0 => n/a. High STD recovery; rerun requested.

Final page for worklist# 5742

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

B Bachelor 2/23/96
Reviewer Signature **Date**

DATA NOT USED IN PACKAGE

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

LABCORE Data Entry Template for Worklist# 5742

Analyst: WGB **Instrument:** GEA00 1 **Book#** 12856

Method: LA-548-121 Rev/Mod D-1

Worklist Comment: BY-104 Rotary. Sample Size = 1.0 ml. new

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				@GEA-01	SOLID		
2	BLNK-PREP				@GEA-01	SOLID		
3	SAMPLE	S96T000374	0	F	@GEA-01	SOLID	95000180	BY104 ROTARY
	Analytes Requested: CO60-02 , CO60-02E, CS13702 , CS13702E							
4	DUP	S96T000374	0	F	@GEA-01	SOLID		

Final page for worklist # 5742

Warren J. Burkhart 2-17-96
Analyst Signature **Date**

Sharon L Hale 2-22-96
Analyst Signature **Date**

Data Entry Comments:

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

DATA NOT USED IN PACKAGE

```
*****************************************************************************
* 222-S Laboratory Counting Room   18-FEB-1996 10:11:01.30                  *
*****************************************************************************
```

WHC-SD-WM-DP-164, REV. 1

>>>>>>>>>> SAMPLE INFORMATION <<<<<<<<<<

Worklist #:	5742
Sample ID:	WL5742-STD
Sample Size:	1.00000E-03 L
Dilution Factor:	1.00000E+00

Removed by: Em Buela

>>>>>>>>>> COUNT INFORMATION <<<<<<<<<<

Detector ID:	GEA1
File Number:	dka300:[spec.GEA1]lg1329.cnf
Geometry:	41
Count Time:	0 00:50:00.00 sec
Real Time:	0 00:50:20.58 sec
Dead Time:	0.7%

Verified by: Bmacheler 2/19/96

>>>>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<

Sample Count Time:	18-FEB-1996 09:20:01.48
Decayed to:	18-FEB-1996 09:20:01.48
Standard Deviations:	2
Analysis Library:	ENVGEA
Analyst:	EMB
Background Subtract:	DKA300:[SPEC.GEA1]lGBACK

>>>>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<

Date of last energy calibration: 13-DEC-1995 10:25:45.49
Date of last efficiency calibration: 13-DEC-1995 10:49:51.10

*****

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/L
0	31.82	3989	1.07	64.00	60	9	5.8			
0	36.31	1068	1.09	72.97	69	9	16.6			
0	661.56*	23050	1.47	1323.07	1315	15	1.5		CS-137	33.3
0	1172.92	15422	1.76	2345.77	2336	20	1.9		CO-60	31.8
0	1332.09	13994	1.97	2664.17	2654	21	1.8		CO-60	32.0

DATA NOT USED IN PACKAGE

Sample ID : WL5742-STD Acquisition date : 18-FEB-1996 09:20:01

WHC-SD-WM-DP-164, REV. 1

Total number of lines in spectrum	5	
Number of unidentified lines	2	
Number of lines tentatively identified by NID	3	60.00%

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/L	Wtd Mean Decay Corr uCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CO-60	5.27Y	1.000	3.192E+01	3.192E+01	0.042E+01	1.30	
CS-137	30.00Y	1.000	3.326E+01	3.326E+01	0.050E+01	1.49	
		Total Activity :	6.518E+01	6.518E+01			
		Grand Total Activity :	6.518E+01	6.518E+01			

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

DATA NOT USED IN PACKAGE

Sample ID : WL5742-STD
Acquisition date : 18-FEB-1996 09:20:01

WHC-SD-WM-DP-164, REV. /

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BE-7	1299.	477.59	1.4741E+00
NA-22	91.	1274.53	9.8056E-02
NA-24	31.	1368.55	6.1749E-02
K-40	594.	1460.75	2.6166E+00
CR-51	1277.	320.08	1.0597E+00
MN-54	820.	834.83	2.0297E-01
CO-56	786.	846.76	2.0144E-01
CO-57	1498.	122.06	7.5252E-02
CO-58	771.	810.78	1.9268E-01
FE-59	765.	1099.25	4.4345E-01
SE-75	1411.	264.66	1.6512E-01
SR-85	1016.	514.01	1.5033E-01
Y-88	20.	1836.06	6.0363E-02
NB-94	851.	871.09	2.1509E-01
ZRNB-95	692.	724.18	3.7427E-01
RU-103	1066.	497.08	1.5754E-01
RURH-106	725.	621.93	2.9306E+00
AG-108m	664.	722.94	1.7611E-01
CD-109	1258.	88.03	1.5427E+00
AG-110M	1334.	657.76	2.1955E-01
SN-113	1263.	391.69	1.9693E-01
TE-123m	1461.	159.00	8.4688E-02
SB-124	679.	602.73	1.3976E-01
SB-125	1354.	427.89	4.7978E-01
TE-125m	1466.	109.27	2.1995E+01
I-131	1226.	364.48	1.4390E-01
CS-134	693.	604.70	1.4183E-01
BA-140	889.	537.31	5.7693E-01
LA-140	32.	1596.21	7.3376E-02
CEPR-144	1496.	133.51	1.2009E+00
EU-152	35.	1408.01	3.1655E-01
EU-154	91.	1274.51	2.8457E-01
EU-155	1366.	105.31	2.7247E-01
HG-203	1358.	279.20	1.2121E-01
TL-208	1390.	277.36	1.5745E+00
BI-212	725.	727.18	2.5275E+00
PB-212	1596.	238.63	2.1842E-01
BI-214	857.	609.31	3.4607E-01
PB-214	1379.	351.92	5.9974E-01
RA-224	1514.	240.99	2.3606E+00
RA-226	1726.	186.10	2.4059E+00
AC-228	1077.	911.21	9.4654E-01
TH-228	1376.	84.37	4.5940E+00
TH-229	1246.	88.47	2.2441E-01
PA-233	1427.	312.17	2.8657E-01
UTH-233	1506.	245.34	8.8171E+01
PA-234M	847.	1001.03	4.1155E-01
TH-234	1136.	63.29	1.2157E+00
U-235	1727.	185.71	1.4631E-01
NP-237	1340.	86.48	4.6310E-01
NP-239	1374.	106.12	2.6191E-01

DATA NOT USED IN PACKAGE

Sample ID : WL5742-STD Acquisition date : 18-FEB-1996 09:20:01

WHC-SD-WM-DP-164, REV. /

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
PU-239	1485.	129.30	1.0238E+03
AM-241	1080.	59.54	1.5127E-01
AM-243	1370.	74.67	9.7197E-02

DATA NOT USED IN PACKAGE

```
*****************************************************************************
* 222-S Laboratory Counting Room   18-FEB-1996 11:09:55.47                  *
*****************************************************************************
```

WHC-SD-WM-DP-164, REV. 1

```
      >>>>>>>>>> SAMPLE INFORMATION <<<<<<<<<<
Worklist #:              5742
Sample ID:               5742-BLK
Sample Size:             1.00000E-03 L
Dilution Factor:         1.00000E+00

      >>>>>>>>>> COUNT INFORMATION <<<<<<<<<<
Detector ID:             GEA1
File Number:             dka300:[spec.GEA1]lg1330.cnf
Geometry:                41
Count Time:              0 00:50:00.00 sec
Real Time:               0 00:50:03.65 sec
Dead Time:               0.1%

      >>>>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<
Sample Count Time:       18-FEB-1996 10:19:11.55
Decayed to:              18-FEB-1996 10:19:11.55
Standard Deviations:     2
Analysis Library:        ENVGEA
Analyst:                 EMB
Background Subtract:     DKA300:[SPEC.GEA1]1GBACK

      >>>>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<
 Date of last energy calibration:       13-DEC-1995 10:25:45.49
 Date of last efficiency calibration:   13-DEC-1995 10:49:51.10
*****************************************************************************

Post-NID Peak Search Report
***** No peaks found *****
```

Removed by: EM Barela

Verified by: D Bachelor 2/19/96

DATA NOT USED IN PACKAGE

Sample ID : 5742-BLK
Acquisition date : 18-FEB-1996 10:19:11
WHC-SD-WM-DP-164, REV. 1

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

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

DATA NOT USED IN PACKAGE

Sample ID : 5742-BLK Acquisition date : 18-FEB-1996 10:19:11

WHC-SD-WM-DP-164, REV. 1

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BE-7	107.	477.59	4.2269E-01
NA-22	31.	1274.53	5.6879E-02
NA-24	19.	1368.55	4.7738E-02
K-40	580.	1460.75	2.5840E+00
CR-51	207.	320.08	4.2688E-01
MN-54	64.	834.83	5.6690E-02
CO-56	60.	846.76	5.5623E-02
CO-57	499.	122.06	4.3429E-02
CO-58	58.	810.78	5.2800E-02
FE-59	42.	1099.25	1.0332E-01
CO-60	27.	1332.50	5.5502E-02
SE-75	272.	264.66	7.2525E-02
SR-85	141.	514.01	5.6072E-02
Y-88	9.	1836.06	4.0966E-02
NB-94	43.	871.09	4.8505E-02
ZRNB-95	71.	724.18	1.1956E-01
RU-103	112.	497.08	5.0967E-02
RURH-106	87.	621.93	1.0128E+00
AG-108m	63.	722.94	5.4180E-02
CD-109	405.	88.03	8.7573E-01
AG-110M	72.	657.76	5.1174E-02
SN-113	156.	391.69	6.9175E-02
TE-123m	469.	159.00	4.7995E-02
SB-124	99.	602.73	5.3436E-02
SB-125	142.	427.89	1.5559E-01
TE-125m	473.	109.27	1.2490E+01
I-131	182.	364.48	5.5497E-02
CS-134	99.	604.70	5.3706E-02
CS-137	87.	661.66	6.2514E-02
BA-140	92.	537.31	1.8518E-01
LA-140	15.	1596.21	5.0261E-02
CEPR-144	491.	133.51	6.8804E-01
EU-152	27.	1408.01	2.7922E-01
EU-154	31.	1274.51	1.6557E-01
EU-155	415.	105.31	1.5020E-01
HG-203	263.	279.20	5.3390E-02
TL-208	254.	277.36	6.7366E-01
BI-212	83.	727.18	8.5489E-01
PB-212	410.	238.63	1.1068E-01
BI-214	186.	609.31	1.6104E-01
PB-214	273.	351.92	2.6589E-01
RA-224	345.	240.99	1.1265E+00
RA-226	426.	186.10	1.1958E+00
AC-228	114.	911.21	3.0782E-01
TH-228	507.	84.37	2.7883E+00
TH-229	401.	88.47	1.2735E-01
PA-233	194.	312.17	1.0569E-01
UTH-233	313.	245.34	4.0210E+01
PA-234M	49.	1001.03	9.8713E-02
TH-234	309.	63.29	6.3349E-01
U-235	430.	185.71	7.3001E-02

DATA NOT USED IN PACKAGE

Sample ID : 5742-BLK Acquisition date : 18-FEB-1996 10:19:11

WHC-SD-WM-DP-164, REV. 1

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
NP-237	445.	86.48	2.6701E-01
NP-239	425.	106.12	1.4558E-01
PU-239	468.	129.30	5.7490E+02
AM-241	301.	59.54	7.9876E-02
AM-243	530.	74.67	6.0433E-02

DATA NOT USED IN PACKAGE

```
*****************************************************************************
* 222-S Laboratory Counting Room   18-FEB-1996 12:12:40.32                  *
*****************************************************************************
      >>>>>>>>>> SAMPLE INFORMATION <<<<<<<<<<
Worklist #:              5742
Sample ID:               S96T374-SAM
Sample Size:             1.00000E-03 L
Dilution Factor:         1.00000E+00

      >>>>>>>>>> COUNT INFORMATION <<<<<<<<<<
Detector ID:             GEA1
File Number:             dka300:[spec.GEA1]1g1331.cnf
Geometry:                41
Count Time:              0 00:50:00.00 sec
Real Time:               0 00:50:44.57 sec
Dead Time:               1.5%

      >>>>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<
Sample Count Time:       18-FEB-1996 11:21:04.55
Decayed to:              18-FEB-1996 11:21:04.55
Standard Deviations:     2
Analysis Library:        ENVGEA
Analyst:                 EMB
Background Subtract:     DKA300:[SPEC.GEA1]1GBACK

      >>>>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<
 Date of last energy calibration:       13-DEC-1995 10:25:45.49
 Date of last efficiency calibration:   13-DEC-1995 10:49:51.10
*****************************************************************************
```

WHC-SD-WM-DP-164 REV. 1

Removed by: Em Barela

Verified by: [illegible] 2/19/96

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/L
0	31.80	27339	1.05	63.96	60	9	1.9			
0	36.31	7569	1.11	72.96	69	9	4.7			
0	661.53*	160638	1.48	1323.02	1315	16	0.5		CS-137	232.

DATA NOT USED IN PACKAGE

Sample ID : S96T374-SAM Acquisition date : 18-FEB-1996 11:21:04

WHC-SD-WM-DP-164, REV. 1

Total number of lines in spectrum	3	
Number of unidentified lines	2	
Number of lines tentatively identified by NID	1	33.33%

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/L	Wtd Mean Decay Corr uCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CS-137	30.00Y	1.000	2.318E+02	2.318E+02	0.012E+02	0.52	
		Total Activity :	2.318E+02	2.318E+02			
		Grand Total Activity :	2.318E+02	2.318E+02			

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

DATA NOT USED IN PACKAGE

Sample ID : S96T374-SAM
Acquisition date : 18-FEB-1996 11:21:04

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BE-7	4970.	477.59	2.8837E+00
NA-22	35.	1274.53	6.0603E-02
NA-24	12.	1368.55	3.8378E-02
K-40	539.	1460.75	2.4907E+00
CR-51	4122.	320.08	1.9037E+00
MN-54	47.	834.83	4.8495E-02
CO-56	57.	846.76	5.4269E-02
CO-57	4049.	122.06	1.2373E-01
CO-58	52.	810.78	5.0021E-02
FE-59	53.	1099.25	1.1688E-01
CO-60	36.	1332.50	6.4003E-02
SE-75	4057.	264.66	2.7998E-01
SR-85	2591.	514.01	2.4005E-01
Y-88	8.	1836.06	3.8623E-02
NB-94	48.	871.09	5.1044E-02
ZRNB-95	68.	724.18	1.1726E-01
RU-103	3017.	497.08	2.6506E-01
RURH-106	834.	621.93	3.1434E+00
AG-108m	59.	722.94	5.2710E-02
CD-109	3685.	88.03	2.6402E+00
AG-110M	5174.	657.76	4.3237E-01
SN-113	4402.	391.69	3.6763E-01
TE-123m	3873.	159.00	1.3789E-01
SB-124	863.	602.73	1.5754E-01
SB-125	5225.	427.89	9.4256E-01
TE-125m	3766.	109.27	3.5254E+01
I-131	4182.	364.48	2.6571E-01
CS-134	878.	604.70	1.5966E-01
BA-140	1881.	537.31	8.3906E-01
LA-140	8.	1596.21	3.5603E-02
CEPR-144	3894.	133.51	1.9376E+00
EU-152	24.	1408.01	2.6355E-01
EU-154	35.	1274.51	1.7617E-01
EU-155	3751.	105.31	4.5150E-01
HG-203	4046.	279.20	2.0921E-01
TL-208	4139.	277.36	2.7171E+00
BI-212	89.	727.18	8.8702E-01
PB-212	4295.	238.63	3.5827E-01
BI-214	982.	609.31	3.7039E-01
PB-214	4165.	351.92	1.0468E+00
RA-224	4295.	240.99	3.9757E+00
RA-226	5861.	186.10	4.4339E+00
AC-228	142.	911.21	3.4314E-01
TH-228	3755.	84.37	7.5886E+00
TH-229	3648.	88.47	3.8407E-01
PA-233	3934.	312.17	4.7579E-01
UTH-233	4431.	245.34	1.5126E+02
PA-234M	51.	1001.03	1.0056E-01
TH-234	3424.	63.29	2.1104E+00
U-235	5735.	185.71	2.6664E-01
NP-237	3716.	86.48	7.7131E-01

DATA NOT USED IN PACKAGE

Sample ID : S96T374-SAM Acquisition date : 18-FEB-1996 11:21:04

WHC-SD-WM-DP-164, REV. 1

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
NP-239	3780.	106.12	4.3440E-01
PU-239	3984.	129.30	1.6768E+03
AM-241	3556.	59.54	2.7445E-01
AM-243	3926.	74.67	1.6455E-01

DATA NOT USED IN PACKAGE

```
*****************************************************************************
* 222-S Laboratory Counting Room   18-FEB-1996 13:13:23.45                  *
*****************************************************************************
      >>>>>>>>>> SAMPLE INFORMATION <<<<<<<<<<
Worklist #:              5742
Sample ID:               S96T374-DUP
Sample Size:             1.00000E-03 L
Dilution Factor:         1.00000E+00

      >>>>>>>>>> COUNT INFORMATION <<<<<<<<<<
Detector ID:             GEA1
File Number:             dka300:[spec.GEA1]1g1332.cnf
Geometry:                41
Count Time:              0 00:50:00.00 sec
Real Time:               0 00:50:45.23 sec
Dead Time:               1.5%

      >>>>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<
Sample Count Time:       18-FEB-1996 12:21:55.61
Decayed to:              18-FEB-1996 12:21:55.61
Standard Deviations:     2
Analysis Library:        ENVGEA
Analyst:                 EMB
Background Subtract:     DKA300:[SPEC.GEA1]1GBACK

      >>>>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<
 Date of last energy calibration:       13-DEC-1995 10:25:45.49
 Date of last efficiency calibration:   13-DEC-1995 10:49:51.10
*****************************************************************************
```

WHC-SD-WM-DP-164, REV. 1

Removed by: EMBaela

Verified by: RJMachelor 2/19/96

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/L
0	31.80	27817	1.06	63.95	60	8	1.8			
0	36.31	7621	1.10	72.97	69	10	5.1			
0	661.54*	162176	1.48	1323.02	1315	16	0.5		CS-137	234.
0	1377.28*	31	1.71	2754.56	2746	17	61.4			
0	1764.22*	17	2.06	3528.69	3520	18	97.4			

DATA NOT USED IN PACKAGE

Sample ID : S96T374-DUP
Acquisition date : 18-FEB-1996 12:21:55

Total number of lines in spectrum	5	WHC-SD-WM-DP-164, REV. 1
Number of unidentified lines	3	
Number of lines tentatively identified by NID	2	40.00%

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/L	Wtd Mean Decay Corr uCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CS-137	30.00Y	1.000	2.340E+02	2.340E+02	0.012E+02	0.51	
		Total Activity :	2.340E+02	2.340E+02			
		Grand Total Activity :	2.340E+02	2.340E+02			

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

DATA NOT USED IN PACKAGE

Sample ID : S96T374-DUP
Acquisition date : 18-FEB-1996 12:21:55

WHC-SD-WM-DP-164, REV. 1

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BE-7	4952.	477.59	2.8785E+00
NA-22	46.	1274.53	6.9842E-02
NA-24	24.	1368.55	5.4658E-02
K-40	570.	1460.75	2.5612E+00
CR-51	4074.	320.08	1.8924E+00
MN-54	59.	834.83	5.4249E-02
CO-56	61.	846.76	5.6256E-02
CO-57	4198.	122.06	1.2598E-01
CO-58	60.	810.78	5.3653E-02
FE-59	37.	1099.25	9.7236E-02
CO-60	36.	1332.50	6.4146E-02
SE-75	4142.	264.66	2.8291E-01
SR-85	2473.	514.01	2.3450E-01
Y-88	10.	1836.06	4.3884E-02
NB-94	50.	871.09	5.2253E-02
ZRNB-95	74.	724.18	1.2242E-01
RU-103	3088.	497.08	2.6813E-01
RURH-106	772.	621.93	3.0232E+00
AG-108m	69.	722.94	5.6772E-02
CD-109	3665.	88.03	2.6332E+00
AG-110M	5060.	657.76	4.2758E-01
SN-113	4524.	391.69	3.7270E-01
TE-123m	4037.	159.00	1.4078E-01
SB-124	845.	602.73	1.5584E-01
SB-125	5311.	427.89	9.5031E-01
TE-125m	3754.	109.27	3.5197E+01
I-131	4285.	364.48	2.6899E-01
CS-134	854.	604.70	1.5747E-01
BA-140	1835.	537.31	8.2885E-01
LA-140	16.	1596.21	5.1465E-02
CEPR-144	4023.	133.51	1.9695E+00
EU-152	26.	1408.01	2.6980E-01
EU-154	46.	1274.51	2.0344E-01
EU-155	3750.	105.31	4.5139E-01
HG-203	4001.	279.20	2.0806E-01
TL-208	4106.	277.36	2.7063E+00
BI-212	84.	727.18	8.6054E-01
PB-212	4439.	238.63	3.6424E-01
BI-214	975.	609.31	3.6909E-01
PB-214	4334.	351.92	1.0679E+00
RA-224	4385.	240.99	4.0174E+00
RA-226	5837.	186.10	4.4245E+00
AC-228	143.	911.21	3.4521E-01
TH-228	3781.	84.37	7.6151E+00
TH-229	3614.	88.47	3.8224E-01
PA-233	3909.	312.17	4.7429E-01
UTH-233	4155.	245.34	1.4647E+02
PA-234M	46.	1001.03	9.5718E-02
TH-234	3422.	63.29	2.1097E+00
U-235	5790.	185.71	2.6791E-01
NP-237	3723.	86.48	7.7194E-01

DATA NOT USED IN PACKAGE

Sample ID : S96T374-DUP Acquisition date : 18-FEB-1996 12:21:55

WHC-SD-WM-DP-164, REV.

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
NP-239	3691.	106.12	4.2923E-01
PU-239	4002.	129.30	1.6807E+03
AM-241	3546.	59.54	2.7408E-01
AM-243	3824.	74.67	1.6239E-01

DATA
NOT USED
IN PACKAGE

LABCORE Completed Worklist Report for Worklist# 4580

Analyst: dgg **Instrument:** GEA01 **Book#** 144852

Method: LA-548-121 Rev/Mod D-1

Worklist Comment: BY-104 GEA S95T003786,87,88,89,90 SS=2,1,1,2,2ML RESP RTS

Seq	Type	Sample#	R	A		Test	Matrix	Actual		Found	DL or Yield	Unit
1	STD		0		@GEA-01	CO60-02	SOLID	0.0209		2.50e-02	119.620	% Recovery
1	STD		0		@GEA-01	CO60-02E	SOLID	1		1.43	1.430	% Ct. Error
1	STD		0		@GEA-01	CS13702	SOLID	0.0253		3.06e-02	120.950	% Recovery
1	STD		0		@GEA-01	CS13702E	SOLID	1		1.51	1.510	% Ct. Error
2	BLNK-PREP		0		@GEA-01	CO60-02	SOLID	1		<1.24e-2		uCi/g
2	BLNK-PREP		0		@GEA-01	CS13702	SOLID	1		<1.61e-2		uCi/g
3	SAMPLE	S95T003786	0	Z	@GEA-01	CO60-02	SOLID	N/A	<	1.569e-02	1.200e-002	uCi/g
3	SAMPLE	S95T003786	0	Z	@GEA-01	CO60-02E	SOLID	N/A		n/a	0.000	% Ct. Error
3	SAMPLE	S95T003786	0	Z	@GEA-01	CS13702	SOLID	N/A		1.113e+02	1.600e-002	uCi/g
3	SAMPLE	S95T003786	0	Z	@GEA-01	CS13702E	SOLID	N/A		.37	0.000	% Ct. Error
4	DUP	S95T003786	0	Z	@GEA-01	CO60-02	SOLID	<1.57e-2		<1.53e-2		RPD
4	DUP	S95T003786	0	Z	@GEA-01	CO60-02E	SOLID	1		n/a		% Ct. Error
4	DUP	S95T003786	0	Z	@GEA-01	CS13702	SOLID	1.11e+02		1.13e+02	1.790	RPD
4	DUP	S95T003786	0	Z	@GEA-01	CS13702E	SOLID	1.00		.37	0.370	% Ct. Error
5	SAMPLE	S95T003787	0	Z	@GEA-01	CO60-02	SOLID	N/A	<	3.636e-02	1.200e-002	uCi/g
5	SAMPLE	S95T003787	0	Z	@GEA-01	CO60-02E	SOLID	N/A		n/a	0.000	% Ct. Error
5	SAMPLE	S95T003787	0	Z	@GEA-01	CS13702	SOLID	N/A		1.615e+02	1.600e-002	uCi/g
5	SAMPLE	S95T003787	0	Z	@GEA-01	CS13702E	SOLID	N/A		n/a	0.000	% Ct. Error
6	DUP	S95T003787	0	Z	@GEA-01	CO60-02	SOLID	<3.64e-2		<3.72e-2		RPD
6	DUP	S95T003787	0	Z	@GEA-01	CO60-02E	SOLID	1		n/a		% Ct. Error
6	DUP	S95T003787	0	Z	@GEA-01	CS13702	SOLID	1.62e+02		1.55e+02	4.420	RPD
6	DUP	S95T003787	0	Z	@GEA-01	CS13702E	SOLID	1.00		.43	0.430	% Ct. Error
7	SAMPLE	S95T003788	0	Z	@GEA-01	CO60-02	SOLID	N/A	<	3.266e-02	1.200e-002	uCi/g
7	SAMPLE	S95T003788	0	Z	@GEA-01	CO60-02E	SOLID	N/A		n/a	0.000	% Ct. Error
7	SAMPLE	S95T003788	0	Z	@GEA-01	CS13702	SOLID	N/A		2.859e+02	1.600e-002	uCi/g
7	SAMPLE	S95T003788	0	Z	@GEA-01	CS13702E	SOLID	N/A		.32	0.000	% Ct. Error
8	DUP	S95T003788	0	Z	@GEA-01	CO60-02	SOLID	<3.27e-2		<4.44e-2		RPD
8	DUP	S95T003788	0	Z	@GEA-01	CO60-02E	SOLID	1		n/a		% Ct. Error
8	DUP	S95T003788	0	Z	@GEA-01	CS13702	SOLID	2.86e+02		2.91e+02	1.730	RPD
8	DUP	S95T003788	0	Z	@GEA-01	CS13702E	SOLID	1.00		.32	0.320	% Ct. Error
9	SAMPLE	S95T003789	0	Z	@GEA-01	CO60-02	SOLID	N/A	<	1.543e-02	1.200e-002	uCi/g
9	SAMPLE	S95T003789	0	Z	@GEA-01	CO60-02E	SOLID	N/A		n/a	0.000	% Ct. Error
9	SAMPLE	S95T003789	0	Z	@GEA-01	CS13702	SOLID	N/A		8.386e+01	1.600e-002	uCi/g
9	SAMPLE	S95T003789	0	Z	@GEA-01	CS13702E	SOLID	N/A		.43	0.000	% Ct. Error
10	DUP	S95T003789	0	Z	@GEA-01	CO60-02	SOLID	<1.54e-2		<1.48e-2		RPD
10	DUP	S95T003789	0	Z	@GEA-01	CO60-02E	SOLID	1		n/a		% Ct. Error
10	DUP	S95T003789	0	Z	@GEA-01	CS13702	SOLID	8.39e+01		8.70e+01	3.630	RPD
10	DUP	S95T003789	0	Z	@GEA-01	CS13702E	SOLID	1.00		.42	0.420	% Ct. Error
11	SAMPLE	S95T003790	0	Z	@GEA-01	CO60-02	SOLID	N/A	<	1.510e-02	1.200e-002	uCi/g
11	SAMPLE	S95T003790	0	Z	@GEA-01	CO60-02E	SOLID	N/A		n/a	0.000	% Ct. Error
11	SAMPLE	S95T003790	0	Z	@GEA-01	CS13702	SOLID	N/A		1.021e+02	1.600e-002	uCi/g

DATA NOT USED IN PACKAGE

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

LABCORE Completed Worklist Report for Worklist# 4580

Seq	Type	Sample#	R	A		Test	Matrix	Actual	Found	DL or Yield	Unit
11	SAMPLE	S95T003790	0	Z	@GEA-01	CS13702E	SOLID	N/A	.38	0.000	% Ct. Error
12	DUP	S95T003790	0	Z	@GEA-01	CO60-02	SOLID	<1.51e-2	<1.59e-2		RPD
12	DUP	S95T003790	0	Z	@GEA-01	CO60-02E	SOLID	1	n/a		% Ct. Error
12	DUP	S95T003790	0	Z	@GEA-01	CS13702	SOLID	1.02e+02	1.05e+02	2.900	RPD
12	DUP	S95T003790	0	Z	@GEA-01	CS13702E	SOLID	1.00	.37	0.370	% Ct. Error

Comments Section:

Comments for sample# S95T003786 **and test** @GEA-01 .
High STD recovery; re-run requested. -PPB

Comments for sample# S95T003787 **and test** @GEA-01 .
High STD recovery; re-run requested. -PPB

Comments for sample# S95T003788 **and test** @GEA-01 .
High STD recovery; re-run requested. -PPB

Comments for sample# S95T003789 **and test** @GEA-01 .
High STD recovery; re-run requested. -PPB

Comments for sample# S95T003790 **and test** @GEA-01 .
High STD recovery; re-run requested. -PPB

Final page for worklist# 4580

Analyst Signature **Date**

Analyst Signature **Date**

D Bachelor 1/9/96
Reviewer Signature **Date**

DATA NOT USED IN PACKAGE

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

LABCORE Data Entry Template for Worklist# 4580

Analyst: DBS **Instrument:** GEA00 #1 **Book#** 144B52

Method: LA-548-121 Rev/Mod D-1 WHC-SD-WM-DP-164, REV. 1

Worklist Comment: BY-104 GEA S95T003786,87,88,89,90 SS=2,1,1,2,2ML RESP RTS

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				@GEA-01	SOLID		
2	BLNK-PREP				@GEA-01	SOLID		
3	SAMPLE	S95T003786	0	F	@GEA-01	SOLID	95000200	BY104 ROTARY
	Analytes Requested: CO60-02 , CO60-02E, CS13702 , CS13702E							
4	DUP	S95T003786	0	F	@GEA-01	SOLID		
5	SAMPLE	S95T003787	0	F	@GEA-01	SOLID	95000200	BY104 ROTARY
	Analytes Requested: CO60-02 , CO60-02E, CS13702 , CS13702E							
6	DUP	S95T003787	0	F	@GEA-01	SOLID		
7	SAMPLE	S95T003788	0	F	@GEA-01	SOLID	95000200	BY104 ROTARY
	Analytes Requested: CO60-02 , CO60-02E, CS13702 , CS13702E							
8	DUP	S95T003788	0	F	@GEA-01	SOLID		
9	SAMPLE	S95T003789	0	F	@GEA-01	SOLID	95000200	BY104 ROTARY
	Analytes Requested: CO60-02 , CO60-02E, CS13702 , CS13702E							
10	DUP	S95T003789	0	F	@GEA-01	SOLID		
11	SAMPLE	S95T003790	0	F	@GEA-01	SOLID	95000200	BY104 ROTARY
	Analytes Requested: CO60-02 , CO60-02E, CS13702 , CS13702E							
12	DUP	S95T003790	0	F	@GEA-01	SOLID		

Final page for worklist # 4580

DB Suffer 1-3-96
Analyst Signature **Date**

1/8/96
Analyst Signature **Date**
SE Hogan 1/8/96

Data Entry Comments:

DATA NOT USED IN PACKAGE

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

```
*****************************************************************************
* 222-S Laboratory Counting Room    3-JAN-1996 11:33:55.55                  *
*****************************************************************************
```

>>>>>>>>>> SAMPLE INFORMATION <<<<<<<<<< WHC-SD-WM-DP-164, REV. 1

Worklist #: 4580
Sample ID: WL4580-STD
Sample Size: 1.00000E-03 L
Dilution Factor: 1.00000E+00

Removed by: Em Baeler

>>>>>>>>>> COUNT INFORMATION <<<<<<<<<<

Detector ID: GEA1
File Number: dka300:[spec.GEA1]1g1144.cnf
Geometry: 41
Count Time: 0 00:50:00.00 sec
Real Time: 0 00:50:18.28 sec
Dead Time: 0.6%

Verified by: B Trachela 1/4/96

>>>>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<

Sample Count Time: 3-JAN-1996 10:42:56.09
Decayed to: 3-JAN-1996 10:42:56.09
Standard Deviations: 2
Analysis Library: ENVGEA
Analyst: EMB
Background Subtract: DKA300:[SPEC.GEA1]1GBACK

>>>>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<

Date of last energy calibration: 13-DEC-1995 10:25:45.49
Date of last efficiency calibration: 13-DEC-1995 10:49:51.10

*****

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/L
0	31.70	3746	1.06	63.76	58	12	6.7			
0	36.37	979	1.03	73.08	69	10	17.8			
0	334.45	105	1.04	669.01	667	6	87.9			
0	661.86*	21194	1.47	1323.68	1316	14	1.5		CS-137	30.6
0	1173.45	12086	1.78	2346.84	2337	17	2.0		CO-60	24.9
0	1332.73	10960	1.90	2665.45	2655	19	2.0		CO-60	25.1
0	1764.95*	21	2.00	3530.17	3522	15	114.5			
0	1782.29	18	3.33	3564.86	3557	15	83.3			

DATA NOT USED IN PACKAGE

Summary of Nuclide Activity
Sample ID : WL4580-STD

Acquisition date : 3-JAN-1996 10:42:56

WHC-SD-WM-DP-164, REV. 1

Total number of lines in spectrum	8	
Number of unidentified lines	3	
Number of lines tentatively identified by NID	5	62.50%

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/L	Wtd Mean Decay Corr uCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CO-60	5.27Y	1.000	2.500E+01	2.500E+01	0.036E+01	1.43	
CS-137	30.00Y	1.000	3.058E+01	3.058E+01	0.046E+01	1.51	
		Total Activity :	5.559E+01	5.559E+01			
		Grand Total Activity :	5.559E+01	5.559E+01			

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

DATA NOT USED IN PACKAGE

Minimum Detectable Activity Report
Sample ID : WL4580-STD Acquisition date : 3-JAN-1996 10:42:56

WHC-SD-WM-DP-164, REV. /

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BE-7	1199.	477.59	1.4163E+00
NA-22	76.	1274.53	8.9261E-02
NA-24	36.	1368.55	6.6184E-02
K-40	588.	1460.75	2.6027E+00
SC-46	505.	1120.55	2.0700E-01
CR-51	1083.	320.08	9.7588E-01
MN-54	617.	834.83	1.7600E-01
CO-56	612.	846.76	1.7768E-01
CO-57	1349.	122.06	7.1404E-02
CO-58	598.	810.78	1.6963E-01
FE-59	635.	1099.25	4.0408E-01
ZN-65	555.	1115.55	4.2604E-01
SE-75	1217.	264.66	1.5336E-01
KR-85	921.	514.00	3.1659E+01
SR-85	921.	514.01	1.4313E-01
Y-88	17.	1836.06	5.6303E-02
Y-90	23.	1760.70	2.2316E-01
Y-91	218.	1204.67	4.8153E+01
NB-94	703.	871.09	1.9548E-01
NB-95	558.	765.78	1.5499E-01
ZR-95	532.	756.73	2.7400E-01
RU-103	828.	497.08	1.3883E-01
RURH-106	573.	621.93	2.6054E+00
AG-108m	532.	722.94	1.5765E-01
CD-109	1151.	88.03	1.4754E+00
AG-110M	899.	657.76	1.8028E-01
SN-113	1097.	391.69	1.8354E-01
TE-123m	1349.	159.00	8.1378E-02
SB-124	582.	602.73	1.2932E-01
SB-125	1175.	427.89	4.4705E-01
TE-125m	1246.	109.27	2.0279E+01
I-129	860.	39.60	8.0916E-01
I-131	1080.	364.48	1.3506E-01
XE-131m	1301.	163.93	3.4809E+00
BA-133	1090.	356.02	1.7377E-01
CS-134	588.	604.70	1.3065E-01
CS-136	613.	818.51	1.7299E-01
CS-138	33.	1435.86	1.3859E-01
CE-139	1246.	165.85	8.4019E-02
BA-140	703.	537.31	5.1285E-01
LA-140	23.	1596.21	6.1799E-02
CE-141	1331.	145.44	1.3518E-01
CE-144	1335.	133.51	5.6770E-01
CEPR-144	1335.	133.51	1.1344E+00
EU-152	46.	1408.01	3.6001E-01
EU-154	75.	1274.51	2.5919E-01
EU-155	1118.	86.54	1.5996E-01
HF-181	1064.	482.18	1.7303E-01
TA-182	1050.	67.75	1.2569E-01
HG-203	1228.	279.20	1.1527E-01
BI-207	588.	569.70	1.2336E-01

DATA NOT USED IN PACKAGE

Sample ID : WL4580-STD Acquisition date : 3-JAN-1996 10:42:56

WHC-SD-WM-DP-164, REV. 1

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
TL-208	1221.	277.36	1.4756E+00
PB-210	887.	46.50	1.3632E+00
BI-212	560.	727.18	2.2208E+00
PB-212	1394.	238.63	2.0409E-01
BI-214	702.	609.31	3.1324E-01
PB-214	1180.	351.92	5.5466E-01
RA-224	1332.	240.99	2.2139E+00
RA-226	1448.	186.10	2.2041E+00
AC-228	837.	911.21	8.3415E-01
TH-228	1186.	84.37	4.2649E+00
TH-229	1164.	88.47	2.1694E-01
U-232	953.	57.78	2.5764E+01
PA-233	1115.	312.17	2.5332E-01
PA-234M	596.	1001.03	3.4520E-01
TH-234	988.	63.29	1.1335E+00
U-235	1438.	185.71	1.3350E-01
NP-237	1121.	86.48	4.2362E-01
U-237	989.	59.54	1.5091E-01
NP-238	689.	984.45	7.8077E-01
NP-239	1254.	106.12	2.5020E-01
PU-239	1351.	129.30	9.7651E+02
AM-241	989.	59.54	1.4477E-01
AM-243	1252.	74.67	9.2930E-02

DATA NOT USED IN PACKAGE

```
*****************************************************************************
* 222-S Laboratory Counting Room    3-JAN-1996 12:39:35.31                  *
*****************************************************************************
     >>>>>>>>>> SAMPLE INFORMATION <<<<<<<<<<
Worklist #:            4580
Sample ID:             WL4580-BLK
Sample Size:           2.00000E-03 L
Dilution Factor:       1.00000E+00

     >>>>>>>>>> COUNT INFORMATION <<<<<<<<<<
Detector ID:           GEA1
File Number:           dka300:[spec.GEA1]1g1145.cnf
Geometry:              41
Count Time:            0 00:50:00.00 sec
Real Time:             0 00:50:03.69 sec
Dead Time:             0.1%

     >>>>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<
Sample Count Time:     3-JAN-1996 11:48:54.29
Decayed to:            3-JAN-1996 11:48:54.29
Standard Deviations:   2
Analysis Library:      ENVGEA
Analyst:               EMB
Background Subtract:   DKA300:[SPEC.GEA1]1GBACK

     >>>>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<
 Date of last energy calibration:      13-DEC-1995 10:25:45.49
 Date of last efficiency calibration:  13-DEC-1995 10:49:51.10
*****************************************************************************
```

WHC-SD-WM-DP-164, REV. 1

Removed by: Em Barela

Verified by: B Bachelor 1/4/96

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/L
0	1593.49*	10	1.07	3187.12	3183	10134.0				

DATA NOT USED IN PACKAGE

Sample ID : WL4580-BLK Acquisition date : 3-JAN-1996 11:48:54

WHC-SD-WM-DP-164, REV. (

Total number of lines in spectrum	1	
Number of unidentified lines	1	
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

DATA NOT USED IN PACKAGE

Sample ID : WL4580-BLK Acquisition date : 3-JAN-1996 11:48:54

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BE-7	108.	477.59	2.1295E-01
NA-22	27.	1274.53	2.6521E-02
NA-24	17.	1368.55	2.3052E-02
K-40	537.	1460.75	1.2431E+00
SC-46	78.	1120.55	4.0640E-02
CR-51	200.	320.08	2.0961E-01
MN-54	59.	834.83	2.7286E-02
CO-56	53.	846.76	2.6043E-02
CO-57	487.	122.06	2.1458E-02
CO-58	46.	810.78	2.3451E-02
FE-59	38.	1099.25	4.9633E-02
CO-60	22.	1332.50	2.4991E-02
ZN-65	40.	1115.55	5.7231E-02
SE-75	262.	264.66	3.5559E-02
KR-85	148.	514.00	6.3377E+00
SR-85	147.	514.01	2.8620E-02
Y-88	7.	1836.06	1.8212E-02
Y-90	15.	1760.70	8.9087E-02
Y-91	61.	1204.67	1.2699E+01
NB-94	58.	871.09	2.8038E-02
NB-95	65.	765.78	2.6456E-02
ZR-95	44.	756.73	3.9323E-02
RU-103	96.	497.08	2.3653E-02
RURH-106	76.	621.93	4.7378E-01
AG-108m	61.	722.94	2.6628E-02
CD-109	384.	88.03	4.2642E-01
AG-110M	66.	657.76	2.4413E-02
SN-113	139.	391.69	3.2674E-02
TE-123m	399.	159.00	2.2122E-02
SB-124	80.	602.73	2.3978E-02
SB-125	119.	427.89	7.1053E-02
TE-125m	428.	109.27	5.9432E+00
I-129	219.	39.60	2.0439E-01
I-131	167.	364.48	2.6579E-02
XE-131m	389.	163.93	9.5188E-01
BA-133	151.	356.02	3.2302E-02
CS-134	82.	604.70	2.4441E-02
CS-136	49.	818.51	2.4419E-02
CS-137	96.	661.66	3.2790E-02
CS-138	17.	1435.86	4.9646E-02
CE-139	415.	165.85	2.4252E-02
BA-140	95.	537.31	9.4190E-02
LA-140	20.	1596.21	2.9246E-02
CE-141	500.	145.44	4.1424E-02
CE-144	469.	133.51	1.6831E-01
CEPR-144	469.	133.51	3.3634E-01
EU-152	25.	1408.01	1.3293E-01
EU-154	27.	1274.51	7.7223E-02
EU-155	418.	86.54	4.8919E-02
HF-181	98.	482.18	2.6247E-02
TA-182	320.	67.75	3.4701E-02

DATA NOT USED IN PACKAGE

Sample ID : WL4580-BLK Acquisition date : 3-JAN-1996 11:48:54
WHC-SD-WM-DP-164, REV. /

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
HG-203	245.	279.20	2.5737E-02
BI-207	93.	569.70	2.4601E-02
TL-208	240.	277.36	3.2710E-01
PB-210	252.	46.50	3.6362E-01
BI-212	79.	727.18	4.1714E-01
PB-212	413.	238.63	5.5576E-02
BI-214	216.	609.31	8.6831E-02
PB-214	298.	351.92	1.3907E-01
RA-224	343.	240.99	5.6191E-01
RA-226	435.	186.10	6.0395E-01
AC-228	118.	911.21	1.5691E-01
TH-228	493.	84.37	1.3749E+00
TH-229	374.	88.47	6.1483E-02
U-232	278.	57.78	6.9526E+00
PA-233	175.	312.17	5.0243E-02
PA-234M	51.	1001.03	5.0581E-02
TH-234	305.	63.29	3.1484E-01
U-235	426.	185.71	3.6351E-02
NP-237	424.	86.48	1.3029E-01
U-237	280.	59.54	4.0120E-02
NP-238	45.	984.45	9.9635E-02
NP-239	445.	106.12	7.4502E-02
PU-239	489.	129.30	2.9370E+02
AM-241	280.	59.54	3.8485E-02
AM-243	492.	74.67	2.9117E-02

DATA NOT USED IN PACKAGE

```
*****************************************************************************
* 222-S Laboratory Counting Room    3-JAN-1996 13:55:55.76                  *
*****************************************************************************
      >>>>>>>>>> SAMPLE INFORMATION <<<<<<<<<<
Worklist #:              4580
Sample ID:               S95T003786-SAM
Sample Size:             2.00000E-03 L
Dilution Factor:         1.00000E+00

      >>>>>>>>>> COUNT INFORMATION <<<<<<<<<<
Detector ID:             GEA1
File Number:             dka300:[spec.GEA1]1g1147.cnf
Geometry:                41
Count Time:              0 00:50:00.00 sec
Real Time:               0 00:51:24.13 sec
Dead Time:               2.7%

      >>>>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<
Sample Count Time:       3-JAN-1996 13:03:53.93
Decayed to:              3-JAN-1996 13:03:53.93
Standard Deviations:     2
Analysis Library:        ENVGEA
Analyst:                 EMB
Background Subtract:     DKA300:[SPEC.GEA1]1GBACK

      >>>>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<
 Date of last energy calibration:       13-DEC-1995 10:25:45.49
 Date of last efficiency calibration:   13-DEC-1995 10:49:51.10
*****************************************************************************
```

WHC-SD-WM-DP-164, REV. 1

Removed by: EMBaeler

Verified by: DJ Bachelor 1/4/96

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/L
0	31.80	53077	1.07	63.95	60	8	1.3			
0	36.30	14578	1.11	72.95	69	9	3.3			
0	74.82*	249	1.25	149.95	148	6	106.8		AM-243	7.031E-02
0	661.84*	314904	1.49	1323.63	1316	16	0.4		CS-137	227.

DATA NOT USED IN PACKAGE

Sample ID : S95T003786-SAM Acquisition date : 3-JAN-1996 13:03:53

WHC-SD-WM-DP-164, REV.)

Total number of lines in spectrum 4
Number of unidentified lines 2
Number of lines tentatively identified by NID 2 50.00%

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/L	Wtd Mean Decay Corr uCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CS-137	30.00Y	1.000	2.272E+02	2.272E+02	0.008E+02	0.37	
~~AM-243~~	~~7380.00Y~~	~~1.000~~	~~7.031E-02~~	~~7.031E-02~~	~~7.508E-02~~	~~106.80~~	BKG
Total Activity :			2.273E+02	2.273E+02			
Grand Total Activity :			2.273E+02	2.273E+02			

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

DATA NOT USED IN PACKAGE

Minimum Detectable Activity Report
Sample ID : S95T003786-SAM Acquisition date : 3-JAN-1996 13:03:53

WHC-SD-WM-DP-164, REV. /

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BE-7	9758.	477.59	2.0202E+00
NA-22	56.	1274.53	3.8347E-02
NA-24	23.	1368.55	2.6689E-02
K-40	609.	1460.75	1.3243E+00
SC-46	88.	1120.55	4.3238E-02
CR-51	7650.	320.08	1.2967E+00
MN-54	59.	834.83	2.7313E-02
CO-56	48.	846.76	2.4930E-02
CO-57	7408.	122.06	8.3675E-02
CO-58	54.	810.78	2.5445E-02
FE-59	39.	1099.25	5.0177E-02
CO-60	36.	1332.50	3.1970E-02
ZN-65	52.	1115.55	6.5487E-02
SE-75	7778.	264.66	1.9385E-01
KR-85	4997.	514.00	3.6863E+01
SR-85	4997.	514.01	1.6668E-01
Y-88	5.	1836.06	1.5614E-02
Y-90	13.	1760.70	8.4825E-02
Y-91	40.	1204.67	1.0317E+01
NB-94	51.	871.09	2.6332E-02
NB-95	68.	765.78	2.7084E-02
ZR-95	68.	756.73	4.9008E-02
RU-103	5925.	497.08	1.8571E-01
RURH-106	1574.	621.93	2.1587E+00
AG-108m	89.	722.94	3.2177E-02
CD-109	6534.	88.03	1.7579E+00
AG-110M	7347.	657.76	2.5761E-01
SN-113	8693.	391.69	2.5830E-01
TE-123m	7260.	159.00	9.4395E-02
SB-124	1595.	602.73	1.0706E-01
SB-125	9998.	427.89	6.5192E-01
TE-125m	6946.	109.27	2.3939E+01
I-129	6074.	39.60	1.0753E+00
I-131	8100.	364.48	1.8491E-01
XE-131m	7328.	163.93	4.1314E+00
BA-133	7930.	356.02	2.3431E-01
CS-134	1603.	604.70	1.0788E-01
CS-136	41.	818.51	2.2481E-02
CS-138	17.	1435.86	5.0967E-02
CE-139	7330.	165.85	1.0190E-01
BA-140	3401.	537.31	5.6418E-01
LA-140	17.	1596.21	2.6651E-02
CE-141	7318.	145.44	1.5845E-01
CE-144	7325.	133.51	6.6500E-01
CEPR-144	7324.	133.51	1.3288E+00
EU-152	33.	1408.01	1.5301E-01
EU-154	56.	1274.51	1.1137E-01
EU-155	6597.	86.54	1.9425E-01
HF-181	7867.	482.18	2.3528E-01
TA-182	6227.	67.75	1.5305E-01
HG-203	7749.	279.20	1.4477E-01

DATA NOT USED IN PACKAGE

Sample ID : S95T003786-SAM Acquisition date : 3-JAN-1996 13:03:53
WHC-SD-WM-DP-164, REV. /

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BI-207	1992.	569.70	1.1355E-01
TL-208	7871.	277.36	1.8735E+00
PB-210	6123.	46.50	1.7910E+00
BI-212	75.	727.18	4.0569E-01
PB-212	8375.	238.63	2.5015E-01
BI-214	1718.	609.31	2.4498E-01
PB-214	8014.	351.92	7.3087E-01
RA-224	8132.	240.99	2.7354E+00
RA-226	10732.	186.10	2.9998E+00
AC-228	118.	911.21	1.5661E-01
TH-228	6656.	84.37	5.0520E+00
TH-229	6545.	88.47	2.5720E-01
U-232	6095.	57.78	3.2581E+01
PA-233	7787.	312.17	3.3471E-01
PA-234M	64.	1001.03	5.6414E-02
TH-234	6159.	63.29	1.4152E+00
U-235	10566.	185.71	1.8096E-01
NP-237	6612.	86.48	5.1439E-01
U-237	6193.	59.54	1.8879E-01
NP-238	48.	984.45	1.0318E-01
NP-239	6822.	106.12	2.9179E-01
PU-239	7464.	129.30	1.1476E+03
AM-241	6193.	59.54	1.8110E-01

DATA NOT USED IN PACKAGE

```
*****************************************************************************
* 222-S Laboratory Counting Room    3-JAN-1996 14:52:18.74                  *
*****************************************************************************
      >>>>>>>>>> SAMPLE INFORMATION <<<<<<<<<<
```

WHC-SD-WM-DP-164, REV. 1

```
Worklist #:              4580
Sample ID:               S95T003786-DUP
Sample Size:             2.00000E-03 L
Dilution Factor:         1.00000E+00
```

Removed by: [illegible]

```
      >>>>>>>>>> COUNT INFORMATION <<<<<<<<<<
Detector ID:             GEA1
File Number:             dka300:[spec.GEA1]1g1148.cnf
Geometry:                41
Count Time:              0 00:50:00.00 sec
Real Time:               0 00:51:25.07 sec
Dead Time:               2.8%
```

Verified by: [illegible] 1/4/96

```
      >>>>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<
Sample Count Time:       3-JAN-1996 14:00:15.31
Decayed to:              3-JAN-1996 14:00:15.31
Standard Deviations:     2
Analysis Library:        ENVGEA
Analyst:                 EMB
Background Subtract:     DKA300:[SPEC.GEA1]1GBACK

      >>>>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<
 Date of last energy calibration:      13-DEC-1995 10:25:45.49
 Date of last efficiency calibration:  13-DEC-1995 10:49:51.10
*****************************************************************************
```

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/L
0	31.78	54128	1.07	63.92	60	9	1.3			
0	36.30	15228	1.13	72.95	69	9	3.2			
0	75.12*	343	0.96	150.56	148	7	87.7		AM-243	9.681E-02
0	661.85*	318717	1.50	1323.65	1315	17	0.4		CS-137	230.
0	1765.02*	18	1.76	3530.30	3522	17	92.7			

DATA NOT USED IN PACKAGE

Sample ID : S95T003786-DUP Acquisition date : 3-JAN-1996 14:00:15

WHC-SD-WM-DP-164, REV. 1

Total number of lines in spectrum	5	
Number of unidentified lines	2	
Number of lines tentatively identified by NID	3	60.00%

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/L	Wtd Mean Decay Corr uCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CS-137	30.00Y	1.000	2.299E+02	2.299E+02	0.008E+02	0.37	
~~AM-243~~	~~7380.00Y~~	~~1.000~~	~~9.681E-02~~	~~9.681E-02~~	~~8.489E-02~~	~~87.70~~	~~BKG~~
			---	---			
Total Activity :			2.300E+02	2.300E+02			
Grand Total Activity :			2.300E+02	2.300E+02			

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

DATA NOT USED IN PACKAGE

Sample ID : S95T003786-DUP Acquisition date : 3-JAN-1996 14:00:15

WHC-SD-WM-DP-164, REV.1

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BE-7	9885.	477.59	2.0334E+00
NA-22	44.	1274.53	3.3991E-02
NA-24	13.	1368.55	1.9641E-02
K-40	578.	1460.75	1.2904E+00
SC-46	82.	1120.55	4.1698E-02
CR-51	7690.	320.08	1.3000E+00
MN-54	63.	834.83	2.8115E-02
CO-56	41.	846.76	2.3048E-02
CO-57	7585.	122.06	8.4670E-02
CO-58	66.	810.78	2.8159E-02
FE-59	45.	1099.25	5.3541E-02
CO-60	34.	1332.50	3.1063E-02
ZN-65	38.	1115.55	5.6018E-02
SE-75	7727.	264.66	1.9321E-01
KR-85	5057.	514.00	3.7081E+01
SR-85	5056.	514.01	1.6765E-01
Y-88	3.	1836.06	1.1826E-02
Y-90	14.	1760.70	8.6284E-02
Y-91	44.	1204.67	1.0866E+01
NB-94	66.	871.09	3.0058E-02
NB-95	69.	765.78	2.7260E-02
ZR-95	75.	756.73	5.1402E-02
RU-103	5921.	497.08	1.8565E-01
RURH-106	1536.	621.93	2.1328E+00
AG-108m	61.	722.94	2.6674E-02
CD-109	6510.	88.03	1.7546E+00
AG-110M	7412.	657.76	2.5875E-01
SN-113	8661.	391.69	2.5783E-01
TE-123m	7477.	159.00	9.5796E-02
SB-124	1560.	602.73	1.0591E-01
SB-125	10188.	427.89	6.5808E-01
TE-125m	7013.	109.27	2.4055E+01
I-129	6100.	39.60	1.0776E+00
I-131	8069.	364.48	1.8456E-01
XE-131m	7280.	163.93	4.1178E+00
BA-133	7943.	356.02	2.3451E-01
CS-134	1589.	604.70	1.0741E-01
CS-136	57.	818.51	2.6263E-02
CS-138	11.	1435.86	4.0143E-02
CE-139	7300.	165.85	1.0169E-01
BA-140	3486.	537.31	5.7121E-01
LA-140	11.	1596.21	2.1841E-02
CE-141	7453.	145.44	1.5991E-01
CE-144	7388.	133.51	6.6788E-01
CEPR-144	7388.	133.51	1.3345E+00
EU-152	28.	1408.01	1.4074E-01
EU-154	44.	1274.51	9.8619E-02
EU-155	6695.	86.54	1.9569E-01
HF-181	7829.	482.18	2.3471E-01
TA-182	6160.	67.75	1.5223E-01
HG-203	7638.	279.20	1.4373E-01

DATA NOT USED IN PACKAGE

Sample ID : S95T003786-DUP Acquisition date : 3-JAN-1996 14:00:15

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BI-207	1955.	569.70	1.1248E-01
TL-208	7777.	277.36	1.8622E+00
PB-210	6157.	46.50	1.7960E+00
BI-212	77.	727.18	4.1056E-01
PB-212	8121.	238.63	2.4633E-01
BI-214	1652.	609.31	2.4028E-01
PB-214	8034.	351.92	7.3187E-01
RA-224	8075.	240.99	2.7259E+00
RA-226	10721.	186.10	2.9983E+00
AC-228	146.	911.21	1.7424E-01
TH-228	6616.	84.37	5.0368E+00
TH-229	6478.	88.47	2.5588E-01
U-232	6165.	57.78	3.2765E+01
PA-233	7737.	312.17	3.3363E-01
PA-234M	48.	1001.03	4.9112E-02
TH-234	6236.	63.29	1.4241E+00
U-235	10643.	185.71	1.8162E-01
NP-237	6700.	86.48	5.1781E-01
U-237	6236.	59.54	1.8944E-01
NP-238	53.	984.45	1.0861E-01
NP-239	6750.	106.12	2.9025E-01
PU-239	7377.	129.30	1.1409E+03
AM-241	6235.	59.54	1.8172E-01

DATA NOT USED IN PACKAGE

```
*****************************************************************************
* 222-S Laboratory Counting Room    3-JAN-1996 16:00:43.11                  *
*****************************************************************************
      >>>>>>>>>> SAMPLE INFORMATION <<<<<<<<<<
```

WHC-SD-WM-DP-164, REV. 1

```
Worklist #:              4580
Sample ID:               S95T003787-SAM
Sample Size:             1.00000E-03 L
Dilution Factor:         1.00000E+00
```

Removed by: Em Boeler

```
      >>>>>>>>>> COUNT INFORMATION <<<<<<<<<<
Detector ID:             GEA1
File Number:             dka300:[spec.GEA1]1g1149.cnf
Geometry:                41
Count Time:              0 00:50:00.00 sec
Real Time:               0 00:51:04.10 sec
Dead Time:               2.1%
```

Verified by: B Machelor 1/4/96

```
      >>>>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<
Sample Count Time:       3-JAN-1996 15:09:00.49
Decayed to:              3-JAN-1996 15:09:00.49
Standard Deviations:     2
Analysis Library:        ENVGEA
Analyst:                 EMB
Background Subtract:     DKA300:[SPEC.GEA1]1GBACK

      >>>>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<
 Date of last energy calibration:       13-DEC-1995 10:25:45.49
 Date of last efficiency calibration:   13-DEC-1995 10:49:51.10
*****************************************************************************
```

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/L
0	31.79	39519	1.05	63.93	60	8	1.5			
0	36.31	10705	1.13	72.97	69	9	4.1			
0	661.86*	233894	1.49	1323.68	1316	16	0.4		CS-137	338.
0	1275.07	59	1.94	2550.11	2544	16	40.3		NA-22	0.130
0	1332.51	40	1.62	2665.00	2659	11	45.1			
0	1588.46*	8	1.08	3177.05	3173	7	128.9			

DATA NOT USED IN PACKAGE

Sample ID : S95T003787-SAM Acquisition date : 3-JAN-1996 15:09:00

Total number of lines in spectrum	6	WHC-SD-WM-DP-164, REV. J
Number of unidentified lines	3	
Number of lines tentatively identified by NID	3	50.00%

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/L	Wtd Mean Decay Corr uCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
~~NA-22~~	~~2.60Y~~	~~1.000~~	~~1.297E-01~~	~~1.297E-01~~	~~0.523E-01~~	~~40.29~~	BKG
CS-137	30.00Y	1.000	3.375E+02	3.375E+02	0.014E+02	0.43	
		Total Activity :	3.376E+02	3.376E+02			
		Grand Total Activity :	3.376E+02	3.376E+02			

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

DATA NOT USED IN PACKAGE

Sample ID : S95T003787-SAM Acquisition date : 3-JAN-1996 15:09:00

WHC-SD-WM-DP-164, REV. 1

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BE-7	7453.	477.59	3.5311E+00
NA-24	18.	1368.55	4.6965E-02
K-40	617.	1460.75	2.6668E+00
SC-46	91.	1120.55	8.7840E-02
CR-51	5830.	320.08	2.2639E+00
MN-54	66.	834.83	5.7589E-02
CO-56	49.	846.76	5.0369E-02
CO-57	5882.	122.06	1.4912E-01
CO-58	60.	810.78	5.3624E-02
FE-59	53.	1099.25	1.1718E-01
CO-60	51.	1332.50	7.6103E-02
ZN-65	62.	1115.55	1.4255E-01
SE-75	5941.	264.66	3.3882E-01
KR-85	3765.	514.00	6.3992E+01
SR-85	3764.	514.01	2.8933E-01
Y-88	6.	1836.06	3.4661E-02
Y-90	12.	1760.70	1.5961E-01
Y-91	46.	1204.67	2.2233E+01
NB-94	49.	871.09	5.1503E-02
NB-95	62.	765.78	5.1823E-02
ZR-95	69.	756.73	9.8939E-02
RU-103	4526.	497.08	3.2462E-01
RURH-106	1210.	621.93	3.7856E+00
AG-108m	109.	722.94	7.1377E-02
CD-109	5307.	88.03	3.1686E+00
AG-110M	5222.	657.76	4.3437E-01
SN-113	6509.	391.69	4.4704E-01
TE-123m	5593.	159.00	1.6570E-01
SB-124	1249.	602.73	1.8950E-01
SB-125	7710.	427.89	1.1450E+00
TE-125m	5517.	109.27	4.2671E+01
I-129	5334.	39.60	2.0153E+00
I-131	6208.	364.48	3.2377E-01
XE-131m	5659.	163.93	7.2611E+00
BA-133	5969.	356.02	4.0656E-01
CS-134	1250.	604.70	1.9054E-01
CS-136	73.	818.51	5.9816E-02
CS-138	13.	1435.86	8.9401E-02
CE-139	5744.	165.85	1.8041E-01
BA-140	2762.	537.31	1.0170E+00
LA-140	11.	1596.21	4.2806E-02
CE-141	5595.	145.44	2.7709E-01
CE-144	5835.	133.51	1.1870E+00
CEPR-144	5835.	133.51	2.3719E+00
EU-152	21.	1408.01	2.4204E-01
EU-154	60.	1274.51	2.3091E-01
EU-155	5361.	86.54	3.5024E-01
HF-181	5799.	482.18	4.0399E-01
TA-182	5085.	67.75	2.7663E-01
HG-203	5868.	279.20	2.5196E-01
BI-207	1502.	569.70	1.9718E-01

DATA NOT USED IN PACKAGE

Sample ID : S95T003787-SAM Acquisition date : 3-JAN-1996 15:09:00

WHC-SD-WM-DP-164, REV. 1

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
TL-208	5857.	277.36	3.2322E+00
PB-210	5174.	46.50	3.2926E+00
BI-212	106.	727.18	9.6460E-01
PB-212	6209.	238.63	4.3079E-01
BI-214	1324.	609.31	4.3013E-01
PB-214	6061.	351.92	1.2669E+00
RA-224	6175.	240.99	4.7672E+00
RA-226	8207.	186.10	5.2466E+00
AC-228	120.	911.21	3.1624E-01
TH-228	5250.	84.37	8.9736E+00
TH-229	5242.	88.47	4.6038E-01
U-232	5165.	57.78	5.9980E+01
PA-233	5718.	312.17	5.7365E-01
PA-234M	56.	1001.03	1.0625E-01
TH-234	5086.	63.29	2.5719E+00
U-235	8050.	185.71	3.1590E-01
NP-237	5371.	86.48	9.2722E-01
U-237	5207.	59.54	3.4621E-01
NP-238	46.	984.45	2.0206E-01
NP-239	5304.	106.12	5.1454E-01
PU-239	5824.	129.30	2.0275E+03
AM-241	5206.	59.54	3.3210E-01
AM-243	5499.	74.67	1.9473E-01

DATA NOT USED IN PACKAGE

****
* 222-S Laboratory Counting Room 3-JAN-1996 16:55:12.93 *
****

WHC-SD-WM-DP-164, REV. 1

>>>>>>>>>> SAMPLE INFORMATION <<<<<<<<<<

Worklist #: 4580
Sample ID: S95T003787-DUP
Sample Size: 1.00000E-03 L
Dilution Factor: 1.00000E+00

Removed by: Em Barela

>>>>>>>>>> COUNT INFORMATION <<<<<<<<<<

Detector ID: GEA1
File Number: dka300:[spec.GEA1]1g1150.cnf
Geometry: 41
Count Time: 0 00:50:00.00 sec
Real Time: 0 00:51:02.64 sec
Dead Time: 2.0%

Verified by: B Bachelor 1/4/96

>>>>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<

Sample Count Time: 3-JAN-1996 16:03:31.90
Decayed to: 3-JAN-1996 16:03:31.90
Standard Deviations: 2
Analysis Library: ENVGEA
Analyst: EMB
Background Subtract: DKA300:[SPEC.GEA1]1GBACK

>>>>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<

Date of last energy calibration: 13-DEC-1995 10:25:45.49
Date of last efficiency calibration: 13-DEC-1995 10:49:51.10

****

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/L
0	31.78	38438	1.06	63.91	60	10	1.7			
0	36.32	10736	1.12	72.98	69	9	4.0			
0	122.87	274	1.35	246.00	244	6	87.5		CO-57	0.115
0	661.87*	227752	1.48	1323.68	1316	16	0.4		CS-137	329.
0	934.61	22	1.43	1869.13	1867	5	64.5			
0	1332.29	34	1.01	2664.56	2660	15	74.9			
0	1408.19	20	1.30	2816.40	2813	9	70.2			
0	1461.06*	52	2.12	2922.16	2912	21	103.9		K-40	1.20
0	1765.12*	20	1.51	3530.50	3523	17	95.2			

DATA NOT USED IN PACKAGE

Summary of Nuclide Activity
Sample ID : S95T003787-DUP Acquisition date : 3-JAN-1996 16:03:31

WHC-SD-WM-DP-164, REV. 1

Total number of lines in spectrum	9	
Number of unidentified lines	3	
Number of lines tentatively identified by NID	6	66.67%

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/L	Wtd Mean Decay Corr uCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
~~K-40~~	~~1.28E+09Y~~	~~1.000~~	~~1.201E+00~~	~~1.201E+00~~	~~1.240E+00~~	~~103.95~~	BKG
~~CO-57~~	~~271.80D~~	~~1.000~~	~~1.147E-01~~	~~1.147E-01~~	~~1.004E-01~~	~~87.52~~	BKG
CS-137	30.00Y	1.000	3.286E+02	3.286E+02	0.014E+02	0.43	
			---	---			
Total Activity :			3.300E+02	3.300E+02			
Grand Total Activity :			3.300E+02	3.300E+02			

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

DATA NOT USED IN PACKAGE

Sample ID : S95T003787-DUP Acquisition date : 3-JAN-1996 16:03:31

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BE-7	7270.	477.59	3.4877E+00
NA-22	57.	1274.53	7.7277E-02
NA-24	19.	1368.55	4.8800E-02
SC-46	66.	1120.55	7.4722E-02
CR-51	5503.	320.08	2.1995E+00
MN-54	75.	834.83	6.1323E-02
CO-56	52.	846.76	5.1681E-02
CO-58	52.	810.78	5.0123E-02
FE-59	47.	1099.25	1.1047E-01
CO-60	55.	1332.50	7.8995E-02
ZN-65	46.	1115.55	1.2239E-01
SE-75	5747.	264.66	3.3325E-01
KR-85	3509.	514.00	6.1782E+01
SR-85	3509.	514.01	2.7933E-01
Y-88	6.	1836.06	3.2142E-02
Y-90	10.	1760.70	1.4612E-01
Y-91	46.	1204.67	2.2057E+01
NB-94	52.	871.09	5.3402E-02
NB-95	77.	765.78	5.7430E-02
ZR-95	73.	756.73	1.0159E-01
RU-103	4208.	497.08	3.1302E-01
RURH-106	1105.	621.93	3.6174E+00
AG-108m	90.	722.94	6.4757E-02
CD-109	5275.	88.03	3.1590E+00
AG-110M	5194.	657.76	4.3322E-01
SN-113	6408.	391.69	4.4356E-01
TE-123m	5451.	159.00	1.6359E-01
SB-124	1181.	602.73	1.8424E-01
SB-125	7315.	427.89	1.1152E+00
TE-125m	5214.	109.27	4.1481E+01
I-129	5013.	39.60	1.9537E+00
I-131	5960.	364.48	3.1724E-01
XE-131m	5512.	163.93	7.1665E+00
BA-133	5832.	356.02	4.0190E-01
CS-134	1199.	604.70	1.8658E-01
CS-136	64.	818.51	5.5785E-02
CS-138	18.	1435.86	1.0424E-01
CE-139	5492.	165.85	1.7640E-01
BA-140	2422.	537.31	9.5219E-01
LA-140	14.	1596.21	4.8105E-02
CE-141	5455.	145.44	2.7363E-01
CE-144	5553.	133.51	1.1580E+00
CEPR-144	5553.	133.51	2.3139E+00
EU-152	31.	1408.01	2.9583E-01
EU-154	57.	1274.51	2.2459E-01
EU-155	5294.	86.54	3.4803E-01
HF-181	5636.	482.18	3.9829E-01
TA-182	4940.	67.75	2.7264E-01
HG-203	5725.	279.20	2.4888E-01
BI-207	1444.	569.70	1.9335E-01
TL-208	5682.	277.36	3.1836E+00

DATA NOT USED IN PACKAGE

Sample ID : S95T003787-DUP Acquisition date : 3-JAN-1996 16:03:31

WHC-SD-WM-DP-164, REV. 1

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
PB-210	5095.	46.50	3.2676E+00
BI-212	95.	727.18	9.1600E-01
PB-212	5800.	238.63	4.1633E-01
BI-214	1296.	609.31	4.2553E-01
PB-214	5782.	351.92	1.2371E+00
RA-224	5818.	240.99	4.6274E+00
RA-226	7937.	186.10	5.1595E+00
AC-228	131.	911.21	3.2978E-01
TH-228	5227.	84.37	8.9540E+00
TH-229	5231.	88.47	4.5986E-01
U-232	4992.	57.78	5.8972E+01
PA-233	5530.	312.17	5.6413E-01
PA-234M	57.	1001.03	1.0718E-01
TH-234	5091.	63.29	2.5733E+00
U-235	7820.	185.71	3.1135E-01
NP-237	5298.	86.48	9.2091E-01
U-237	5084.	59.54	3.4212E-01
NP-238	36.	984.45	1.7955E-01
NP-239	5271.	106.12	5.1295E-01
PU-239	5549.	129.30	1.9790E+03
AM-241	5084.	59.54	3.2818E-01
AM-243	5319.	74.67	1.9152E-01

DATA NOT USED IN PACKAGE

```
*****************************************************************************
* 222-S Laboratory Counting Room    3-JAN-1996 17:52:12.09                  *
*****************************************************************************
      >>>>>>>>>> SAMPLE INFORMATION <<<<<<<<<<
Worklist #:              4580
Sample ID:               S95T003788-SAM
Sample Size:             1.00000E-03 L
Dilution Factor:         1.00000E+00

      >>>>>>>>>> COUNT INFORMATION <<<<<<<<<<
Detector ID:             GEA1
File Number:             dka300:[spec.GEA1]1g1151.cnf
Geometry:                41
Count Time:              0 00:50:00.00 sec
Real Time:               0 00:51:55.58 sec
Dead Time:               3.7%

      >>>>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<
Sample Count Time:       3-JAN-1996 16:59:36.67
Decayed to:              3-JAN-1996 16:59:36.67
Standard Deviations:     2
Analysis Library:        ENVGEA
Analyst:                 EMB
Background Subtract:     DKA300:[SPEC.GEA1]1GBACK

      >>>>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<
 Date of last energy calibration:       13-DEC-1995 10:25:45.49
 Date of last efficiency calibration:   13-DEC-1995 10:49:51.10
*****************************************************************************
```

WHC-SD-WM-DP-164, REV. 1

Removed by: Raymond

Verified by: D Bachelor 1/4/96

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/L
0	31.77	69309	1.09	63.89	60	8	1.2			
0	36.30	18922	1.16	72.95	69	9	3.4			
0	75.02*	332	0.67	150.34	148	6	104.4		AM-243	0.188
0	123.11	433	0.97	246.49	245	6	75.7		CO-57	0.181
0	661.85*	409747	1.50	1323.66	1315	17	0.3		CS-137	591.
0	1275.11	73	1.42	2550.19	2542	16	45.1		NA-22	0.162
0	1461.08*	29	1.62	2922.20	2913	18	194.1		K-40	0.659

DATA NOT USED IN PACKAGE

Sample ID : S95T003788-SAM Acquisition date : 3-JAN-1996 16:59:36

Total number of lines in spectrum 7
Number of unidentified lines 2
Number of lines tentatively identified by NID 5 71.43%

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/L	Wtd Mean Decay Corr uCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
~~NA-22~~	~~2.60Y~~	~~1.000~~	~~1.618E-01~~	~~1.618E-01~~	~~0.730E-01~~	~~45.10~~	BKG
~~K-40~~	~~1.28E+09Y~~	~~1.000~~	~~6.585E-01~~	~~6.585E-01~~	~~12.78E-01~~	~~194.05~~	BKG
~~CO-57~~	~~271.80D~~	~~1.000~~	~~1.812E-01~~	~~1.812E-01~~	~~1.372E-01~~	~~75.70~~	BKG
CS-137	30.00Y	1.000	5.913E+02	5.913E+02	0.019E+02	0.32	
~~AM-243~~	~~7380.00Y~~	~~1.000~~	~~1.875E-01~~	~~1.875E-01~~	~~1.959E-01~~	~~104.44~~	BKG
			---	---			
	Total Activity :		5.924E+02	5.924E+02			
	Grand Total Activity :		5.924E+02	5.924E+02			

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

DATA NOT USED IN PACKAGE

Sample ID : S95T003788-SAM Acquisition date : 3-JAN-1996 16:59:36

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BE-7	12737.	477.59	4.6163E+00
NA-24	22.	1368.55	5.2223E-02
SC-46	91.	1120.55	8.7786E-02
CR-51	9955.	320.08	2.9583E+00
MN-54	78.	834.83	6.2581E-02
CO-56	59.	846.76	5.5070E-02
CO-58	72.	810.78	5.8978E-02
FE-59	64.	1099.25	1.2836E-01
CO-60	40.	1332.50	6.7462E-02
ZN-65	55.	1115.55	1.3385E-01
SE-75	10283.	264.66	4.4578E-01
KR-85	6396.	514.00	8.3404E+01
SR-85	6395.	514.01	3.7711E-01
Y-88	11.	1836.06	4.5526E-02
Y-90	8.	1760.70	1.2991E-01
Y-91	54.	1204.67	2.4075E+01
NB-94	84.	871.09	6.7558E-02
NB-95	82.	765.78	5.9453E-02
ZR-95	89.	756.73	1.1213E-01
RU-103	7754.	497.08	4.2490E-01
RURH-106	1981.	621.93	4.8435E+00
AG-108m	137.	722.94	7.9873E-02
CD-109	10457.	88.03	4.4478E+00
AG-110M	9673.	657.76	5.9120E-01
SN-113	11276.	391.69	5.8838E-01
TE-123m	10232.	159.00	2.2413E-01
SB-124	2136.	602.73	2.4784E-01
SB-125	13089.	427.89	1.4918E+00
TE-125m	10446.	109.27	5.8713E+01
I-129	12439.	39.60	3.0775E+00
I-131	10591.	364.48	4.2290E-01
XE-131m	10235.	163.93	9.7652E+00
BA-133	10394.	356.02	5.3652E-01
CS-134	2107.	604.70	2.4732E-01
CS-136	80.	818.51	6.2320E-02
CS-138	21.	1435.86	1.1319E-01
CE-139	10153.	165.85	2.3985E-01
BA-140	4500.	537.31	1.2979E+00
LA-140	15.	1596.21	4.9397E-02
CE-141	10230.	145.44	3.7470E-01
CE-144	10395.	133.51	1.5844E+00
CEPR-144	10395.	133.51	3.1660E+00
EU-152	26.	1408.01	2.7412E-01
EU-154	90.	1274.51	2.8378E-01
EU-155	10676.	86.54	4.9424E-01
HF-181	10093.	482.18	5.3298E-01
TA-182	11206.	67.75	4.1063E-01
HG-203	10185.	279.20	3.3195E-01
BI-207	2742.	569.70	2.6643E-01
TL-208	10246.	277.36	4.2752E+00
PB-210	12107.	46.50	5.0370E+00

DATA NOT USED IN PACKAGE

Sample ID : S95T003788-SAM Acquisition date : 3-JAN-1996 16:59:36

WHC-SD-WM-DP-164, REV. 1

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BI-212	124.	727.18	1.0464E+00
PB-212	10696.	238.63	5.6541E-01
BI-214	2198.	609.31	5.5427E-01
PB-214	10431.	351.92	1.6765E+00
RA-224	10671.	240.99	6.2673E+00
RA-226	14404.	186.10	6.9506E+00
AC-228	138.	911.21	3.3899E-01
TH-228	10873.	84.37	1.2914E+01
TH-229	10386.	88.47	6.4799E-01
U-232	11476.	57.78	8.9411E+01
PA-233	10287.	312.17	7.6942E-01
PA-234M	64.	1001.03	1.1326E-01
TH-234	11336.	63.29	3.8400E+00
U-235	14208.	185.71	4.1969E-01
NP-237	10694.	86.48	1.3084E+00
U-237	11533.	59.54	5.1527E-01
NP-238	57.	984.45	2.2534E-01
NP-239	10189.	106.12	7.1326E-01
PU-239	10571.	129.30	2.7316E+03
AM-241	11532.	59.54	4.9426E-01

DATA NOT USED IN PACKAGE

```
*****************************************************************************
* 222-S Laboratory Counting Room    3-JAN-1996 19:35:31.99                  *
*****************************************************************************
      >>>>>>>>>> SAMPLE INFORMATION <<<<<<<<<<
```

WHC-SD-WM-DP-164, REV. 1

```
Worklist #:              4580
Sample ID:               S95T788-DUP
Sample Size:             1.00000E-03 L
Dilution Factor:         1.00000E+00
```

Removed by: Raymond

```
      >>>>>>>>>> COUNT INFORMATION <<<<<<<<<<
Detector ID:             GEA1
File Number:             dka300:[spec.GEA1]lg1152.cnf
Geometry:                41
Count Time:              0 00:50:00.00 sec
Real Time:               0 00:51:55.67 sec
Dead Time:               3.7%
```

Verified by: RBachelor 1/4/96

```
      >>>>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<
Sample Count Time:       3-JAN-1996 18:42:29.69
Decayed to:              3-JAN-1996 18:42:29.69
Standard Deviations:     2
Analysis Library:        ENVGEA
Analyst:                 VR
Background Subtract:     DKA300:[SPEC.GEA1]1GBACK

      >>>>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<
 Date of last energy calibration:       13-DEC-1995 10:25:45.49
 Date of last efficiency calibration:   13-DEC-1995 10:49:51.10
*****************************************************************************
```

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/L
0	31.77	69125	1.07	63.89	60	9	1.3			
0	36.28	19654	1.17	72.92	69	10	3.5			
0	661.86*	410819	1.50	1323.68	1315	17	0.3		CS-137	593.
0	1273.91	40	2.76	2547.78	2544	14	61.9		NA-22	8.852E-02
0	1332.57	75	1.85	2665.13	2656	19	33.4			

DATA NOT USED IN PACKAGE

Summary of Nuclide Activity
Sample ID : S95T788-DUP

Acquisition date : 3-JAN-1996 18:42:29

WHC-SD-WM-DP-164, REV.1

Total number of lines in spectrum	5	
Number of unidentified lines	2	
Number of lines tentatively identified by NID	3	60.00%

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/L	Wtd Mean Decay Corr uCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
~~NA-22~~	~~2.60Y~~	~~1.000~~	~~8.852E-02~~	~~8.852E-02~~	~~5.477E-02~~	~~61.87~~	OKG
CS-137	30.00Y	1.000	5.928E+02	5.928E+02	0.019E+02	0.32	
		Total Activity :	5.929E+02	5.929E+02			
		Grand Total Activity :	5.929E+02	5.929E+02			

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

DATA NOT USED IN PACKAGE

Sample ID : S95T788-DUP Acquisition date : 3-JAN-1996 18:42:29

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BE-7	12841.	477.59	4.6352E+00
NA-24	19.	1368.55	4.8987E-02
K-40	603.	1460.75	2.6355E+00
SC-46	87.	1120.55	8.5787E-02
CR-51	9927.	320.08	2.9541E+00
MN-54	86.	834.83	6.5595E-02
CO-56	61.	846.76	5.6331E-02
CO-57	10792.	122.06	2.0199E-01
CO-58	76.	810.78	6.0415E-02
FE-59	53.	1099.25	1.1655E-01
CO-60	72.	1332.50	9.0447E-02
ZN-65	56.	1115.55	1.3542E-01
SE-75	10337.	264.66	4.4694E-01
KR-85	6344.	514.00	8.3066E+01
SR-85	6344.	514.01	3.7560E-01
Y-88	6.	1836.06	3.4350E-02
Y-90	11.	1760.70	1.5494E-01
Y-91	57.	1204.67	2.4631E+01
NB-94	72.	871.09	6.2567E-02
NB-95	96.	765.78	6.4325E-02
ZR-95	101.	756.73	1.1946E-01
RU-103	7747.	497.08	4.2472E-01
RURH-106	1890.	621.93	4.7311E+00
AG-108m	120.	722.94	7.4974E-02
CD-109	10724.	88.03	4.5043E+00
AG-110M	9551.	657.76	5.8746E-01
SN-113	11203.	391.69	5.8647E-01
TE-123m	10269.	159.00	2.2453E-01
SB-124	2052.	602.73	2.4290E-01
SB-125	13088.	427.89	1.4918E+00
TE-125m	10415.	109.27	5.8626E+01
I-129	12276.	39.60	3.0574E+00
I-131	10522.	364.48	4.2151E-01
XE-131m	10183.	163.93	9.7403E+00
BA-133	10431.	356.02	5.3746E-01
CS-134	2107.	604.70	2.4737E-01
CS-136	80.	818.51	6.2565E-02
CS-138	21.	1435.86	1.1249E-01
CE-139	10159.	165.85	2.3992E-01
BA-140	4458.	537.31	1.2920E+00
LA-140	15.	1596.21	4.9525E-02
CE-141	10400.	145.44	3.7780E-01
CE-144	10607.	133.51	1.6005E+00
CEPR-144	10607.	133.51	3.1981E+00
EU-152	28.	1408.01	2.8388E-01
EU-154	64.	1274.51	2.3832E-01
EU-155	10905.	86.54	4.9950E-01
HF-181	10071.	482.18	5.3241E-01
TA-182	10949.	67.75	4.0591E-01
HG-203	10405.	279.20	3.3551E-01
BI-207	2599.	569.70	2.5940E-01

DATA NOT USED IN PACKAGE

Sample ID : S95T788-DUP Acquisition date : 3-JAN-1996 18:42:29

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
TL-208	10244.	277.36	4.2747E+00
PB-210	11867.	46.50	4.9868E+00
BI-212	124.	727.18	1.0441E+00
PB-212	10767.	238.63	5.6726E-01
BI-214	2106.	609.31	5.4254E-01
PB-214	10343.	351.92	1.6694E+00
RA-224	10704.	240.99	6.2770E+00
RA-226	14610.	186.10	7.0001E+00
AC-228	132.	911.21	3.3094E-01
TH-228	10888.	84.37	1.2923E+01
TH-229	10638.	88.47	6.5581E-01
U-232	11328.	57.78	8.8833E+01
PA-233	10048.	312.17	7.6045E-01
PA-234M	62.	1001.03	1.1140E-01
TH-234	11189.	63.29	3.8148E+00
U-235	14416.	185.71	4.2274E-01
NP-237	10919.	86.48	1.3220E+00
U-237	11568.	59.54	5.1606E-01
NP-238	53.	984.45	2.1586E-01
NP-239	10413.	106.12	7.2103E-01
PU-239	10745.	129.30	2.7539E+03
AM-241	11568.	59.54	4.9501E-01
AM-243	11421.	74.67	2.8065E-01

DATA NOT USED IN PACKAGE

```
*****************************************************************************
* 222-S Laboratory Counting Room    3-JAN-1996 22:12:10.55                  *
*****************************************************************************
      >>>>>>>>>> SAMPLE INFORMATION <<<<<<<<<<
Worklist #:              4580
Sample ID:               S95T3789-SAM
Sample Size:             2.00000E-03 L
Dilution Factor:         1.00000E+00

      >>>>>>>>>> COUNT INFORMATION <<<<<<<<<<
Detector ID:             GEA1
File Number:             dka300:[spec.GEA1]1g1153.cnf
Geometry:                41
Count Time:              0 00:50:00.00 sec
Real Time:               0 00:51:02.78 sec
Dead Time:               2.0%

      >>>>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<
Sample Count Time:       3-JAN-1996 21:20:19.92
Decayed to:              3-JAN-1996 21:20:19.92
Standard Deviations:     2
Analysis Library:        ENVGEA
Analyst:                 VR
Background Subtract:     DKA300:[SPEC.GEA1]1GBACK

      >>>>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<
 Date of last energy calibration:       13-DEC-1995 10:25:45.49
 Date of last efficiency calibration:   13-DEC-1995 10:49:51.10
*****************************************************************************
```

WHC-SD-WM-DP-164, REV. 1

Removed by: Raymond

Verified by: Bachelor 1/4/96

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/L
0	31.77	39872	1.07	63.89	60	8	1.5			
0	36.30	11128	1.13	72.95	69	10	4.1			
0	661.89*	234350	1.49	1323.74	1316	16	0.4		CS-137	169.
0	1379.67	37	6.82	2759.35	2747	30	81.9			
0	1461.14*	26	2.02	2922.33	2912	18	207.3		K-40	0.298
0	1765.14*	22	2.48	3530.53	3522	16	88.5			

DATA NOT USED IN PACKAGE

Summary of Nuclide Activity
Sample ID : S95T3789-SAM

Acquisition date : 3-JAN-1996 21:20:19

Total number of lines in spectrum 6
Number of unidentified lines 3
Number of lines tentatively identified by NID 3 50.00%

WHC-SD-WM-DP-164, REV. 1

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/L	Wtd Mean Decay Corr uCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
~~K-40~~	~~1.28E+09Y~~	~~1.000~~	~~2.979E-01~~	~~2.979E-01~~	~~6.175E-01~~	~~207.29~~	BKG
CS-137	30.00Y	1.000	1.691E+02	1.691E+02	0.007E+02	0.43	
		Total Activity :	1.694E+02	1.694E+02			
		Grand Total Activity :	1.694E+02	1.694E+02			

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

DATA NOT USED IN PACKAGE

Sample ID : S95T3789-SAM
Acquisition date : 3-JAN-1996 21:20:19
WHC-SD-WM-DP-164, REV. 1

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BE-7	7243.	477.59	1.7406E+00
NA-22	48.	1274.53	3.5527E-02
NA-24	15.	1368.55	2.1734E-02
SC-46	68.	1120.55	3.8084E-02
CR-51	5678.	320.08	1.1171E+00
MN-54	61.	834.83	2.7628E-02
CO-56	55.	846.76	2.6717E-02
CO-57	5696.	122.06	7.3377E-02
CO-58	59.	810.78	2.6581E-02
FE-59	51.	1099.25	5.7336E-02
CO-60	34.	1332.50	3.1090E-02
ZN-65	46.	1115.55	6.1547E-02
SE-75	5893.	264.66	1.6873E-01
KR-85	3631.	514.00	3.1420E+01
SR-85	3629.	514.01	1.4205E-01
Y-88	9.	1836.06	2.0724E-02
Y-90	12.	1760.70	8.0859E-02
Y-91	43.	1204.67	1.0647E+01
NB-94	58.	871.09	2.8058E-02
NB-95	67.	765.78	2.6876E-02
ZR-95	60.	756.73	4.5963E-02
RU-103	4396.	497.08	1.5997E-01
RURH-106	1137.	621.93	1.8353E+00
AG-108m	89.	722.94	3.2218E-02
CD-109	5100.	88.03	1.5530E+00
AG-110M	5031.	657.76	2.1317E-01
SN-113	6324.	391.69	2.2032E-01
TE-123m	5604.	159.00	8.2931E-02
SB-124	1223.	602.73	9.3760E-02
SB-125	7513.	427.89	5.6512E-01
TE-125m	5293.	109.27	2.0897E+01
I-129	4673.	39.60	9.4313E-01
I-131	5971.	364.48	1.5876E-01
XE-131m	5673.	163.93	3.6351E+00
BA-133	5871.	356.02	2.0162E-01
CS-134	1243.	604.70	9.4999E-02
CS-136	64.	818.51	2.7981E-02
CS-138	16.	1435.86	4.9203E-02
CE-139	5606.	165.85	8.9108E-02
BA-140	2609.	537.31	4.9411E-01
LA-140	7.	1596.21	1.7476E-02
CE-141	5529.	145.44	1.3773E-01
CE-144	5521.	133.51	5.7734E-01
CEPR-144	5521.	133.51	1.1536E+00
EU-152	21.	1408.01	1.2129E-01
EU-154	48.	1274.51	1.0300E-01
EU-155	5207.	86.54	1.7259E-01
HF-181	5793.	482.18	2.0190E-01
TA-182	4825.	67.75	1.3472E-01
HG-203	5807.	279.20	1.2532E-01
BI-207	1529.	569.70	9.9489E-02

DATA NOT USED IN PACKAGE

Sample ID : S95T3789-SAM Acquisition date : 3-JAN-1996 21:20:19

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
TL-208	5787.	277.36	1.6064E+00
PB-210	4704.	46.50	1.5698E+00
BI-212	85.	727.18	4.3132E-01
PB-212	6239.	238.63	2.1592E-01
BI-214	1350.	609.31	2.1719E-01
PB-214	6009.	351.92	6.3060E-01
RA-224	6139.	240.99	2.3767E+00
RA-226	8394.	186.10	2.6531E+00
AC-228	131.	911.21	1.6479E-01
TH-228	5113.	84.37	4.4276E+00
TH-229	5085.	88.47	2.2670E-01
U-232	4653.	57.78	2.8466E+01
PA-233	5779.	312.17	2.8835E-01
PA-234M	40.	1001.03	4.4855E-02
TH-234	4734.	63.29	1.2407E+00
U-235	8241.	185.71	1.5982E-01
NP-237	5209.	86.48	4.5656E-01
U-237	4703.	59.54	1.6452E-01
NP-238	36.	984.45	8.9278E-02
NP-239	5194.	106.12	2.5458E-01
PU-239	5586.	129.30	9.9283E+02
AM-241	4703.	59.54	1.5782E-01
AM-243	5309.	74.67	9.5671E-02

DATA
NOT USED
IN PACKAGE

```
*****************************************************************************
* 222-S Laboratory Counting Room    4-JAN-1996 00:01:42.22                  *
*****************************************************************************
      >>>>>>>>>> SAMPLE INFORMATION <<<<<<<<<<
Worklist #:              4580
Sample ID:               S95T3789-DUP
Sample Size:             2.00000E-03 L
Dilution Factor:         1.00000E+00

      >>>>>>>>>> COUNT INFORMATION <<<<<<<<<<
Detector ID:             GEA1
File Number:             dka300:[spec.GEA1]1g1154.cnf
Geometry:                41
Count Time:              0 00:50:00.00 sec
Real Time:               0 00:51:06.02 sec
Dead Time:               2.2%

      >>>>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<
Sample Count Time:       3-JAN-1996 23:09:55.87
Decayed to:              3-JAN-1996 23:09:55.87
Standard Deviations:     2
Analysis Library:        ENVGEA
Analyst:                 VR
Background Subtract:     DKA300:[SPEC.GEA1]1GBACK

      >>>>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<
 Date of last energy calibration:       13-DEC-1995 10:25:45.49
 Date of last efficiency calibration:   13-DEC-1995 10:49:51.10
*****************************************************************************
```

WHC-SD-WM-DP-164, REV. 1

Removed by: Raymond

Verified by: B Bachelor 1/4/96

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/L
0	31.77	40543	1.06	63.89	60	9	1.6			
0	36.28	11357	1.12	72.91	69	10	4.1			
0	661.89*	241472	1.48	1323.73	1316	16	0.4		CS-137	174.

DATA
NOT USED
IN PACKAGE

Sample ID : S95T3789-DUP Acquisition date : 3-JAN-1996 23:09:55

WHC-SD-WM-DP-164, REV. I

Total number of lines in spectrum	3	
Number of unidentified lines	2	
Number of lines tentatively identified by NID	1	33.33%

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/L	Wtd Mean Decay Corr uCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CS-137	30.00Y	1.000	1.742E+02	1.742E+02	0.007E+02	0.42	
		Total Activity :	1.742E+02	1.742E+02			
		Grand Total Activity :	1.742E+02	1.742E+02			

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

DATA
NOT USED
IN PACKAGE

Minimum Detectable Activity Report
Sample ID : S95T3789-DUP

Acquisition date : 3-JAN-1996 23:09:55

WHC-SD-WM-DP-164, REV. 1

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BE-7	7513.	477.59	1.7728E+00
NA-22	62.	1274.53	4.0562E-02
NA-24	18.	1368.55	2.3821E-02
K-40	585.	1460.75	1.2979E+00
SC-46	95.	1120.55	4.4768E-02
CR-51	6010.	320.08	1.1493E+00
MN-54	58.	834.83	2.7090E-02
CO-56	57.	846.76	2.7032E-02
CO-57	5920.	122.06	7.4800E-02
CO-58	45.	810.78	2.3298E-02
FE-59	44.	1099.25	5.3209E-02
CO-60	31.	1332.50	2.9740E-02
ZN-65	52.	1115.55	6.5450E-02
SE-75	5942.	264.66	1.6943E-01
KR-85	3786.	514.00	3.2084E+01
SR-85	3785.	514.01	1.4506E-01
Y-88	10.	1836.06	2.1591E-02
Y-90	11.	1760.70	7.6890E-02
Y-91	47.	1204.67	1.1165E+01
NB-94	69.	871.09	3.0638E-02
NB-95	67.	765.78	2.6930E-02
ZR-95	81.	756.73	5.3342E-02
RU-103	4562.	497.08	1.6297E-01
RURH-106	1183.	621.93	1.8715E+00
AG-108m	89.	722.94	3.2214E-02
CD-109	5147.	88.03	1.5601E+00
AG-110M	5452.	657.76	2.2192E-01
SN-113	6588.	391.69	2.2486E-01
TE-123m	5604.	159.00	8.2933E-02
SB-124	1229.	602.73	9.3990E-02
SB-125	7862.	427.89	5.7811E-01
TE-125m	5461.	109.27	2.1226E+01
I-129	4809.	39.60	9.5682E-01
I-131	6297.	364.48	1.6303E-01
XE-131m	5824.	163.93	3.6833E+00
BA-133	6131.	356.02	2.0603E-01
CS-134	1232.	604.70	9.4568E-02
CS-136	58.	818.51	2.6598E-02
CS-138	19.	1435.86	5.3791E-02
CE-139	5869.	165.85	9.1176E-02
BA-140	2722.	537.31	5.0478E-01
LA-140	14.	1596.21	2.4546E-02
CE-141	5671.	145.44	1.3948E-01
CE-144	5646.	133.51	5.8386E-01
CEPR-144	5646.	133.51	1.1667E+00
EU-152	25.	1408.01	1.3222E-01
EU-154	63.	1274.51	1.1799E-01
EU-155	5173.	86.54	1.7201E-01
HF-181	6039.	482.18	2.0614E-01
TA-182	4970.	67.75	1.3673E-01
HG-203	5935.	279.20	1.2670E-01

DATA
NOT USED
IN PACKAGE

Sample ID : S95T3789-DUP Acquisition date : 3-JAN-1996 23:09:55

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BI-207	1551.	569.70	1.0020E-01
TL-208	6061.	277.36	1.6440E+00
PB-210	4927.	46.50	1.6065E+00
BI-212	96.	727.18	4.5957E-01
PB-212	6435.	238.63	2.1928E-01
BI-214	1417.	609.31	2.2248E-01
PB-214	6281.	351.92	6.4503E-01
RA-224	6347.	240.99	2.4165E+00
RA-226	8317.	186.10	2.6408E+00
AC-228	117.	911.21	1.5629E-01
TH-228	5363.	84.37	4.5346E+00
TH-229	5125.	88.47	2.2760E-01
U-232	4834.	57.78	2.9014E+01
PA-233	5937.	312.17	2.9226E-01
PA-234M	52.	1001.03	5.0761E-02
TH-234	4826.	63.29	1.2528E+00
U-235	8236.	185.71	1.5977E-01
NP-237	5179.	86.48	4.5527E-01
U-237	4963.	59.54	1.6901E-01
NP-238	45.	984.45	1.0015E-01
NP-239	5293.	106.12	2.5702E-01
PU-239	5878.	129.30	1.0184E+03
AM-241	4963.	59.54	1.6212E-01
AM-243	5392.	74.67	9.6419E-02

DATA
NOT USED
IN PACKAGE

```
*****************************************************************************
* 222-S Laboratory Counting Room    4-JAN-1996 02:19:53.97                  *
*****************************************************************************
     >>>>>>>>>> SAMPLE INFORMATION <<<<<<<<<<
Worklist #:              4580
Sample ID:               S95T3790-SAM
Sample Size:             2.00000E-03 L
Dilution Factor:         1.00000E+00

     >>>>>>>>>> COUNT INFORMATION <<<<<<<<<<
Detector ID:             GEA1
File Number:             dka300:[spec.GEA1]1g1155.cnf
Geometry:                41
Count Time:              0 00:50:00.00 sec
Real Time:               0 00:51:22.01 sec
Dead Time:               2.7%

     >>>>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<
Sample Count Time:       4-JAN-1996 01:27:54.00
Decayed to:              4-JAN-1996 01:27:54.00
Standard Deviations:     2
Analysis Library:        ENVGEA
Analyst:                 VR
Background Subtract:     DKA300:[SPEC.GEA1]1GBACK

     >>>>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<
 Date of last energy calibration:       13-DEC-1995 10:25:45.49
 Date of last efficiency calibration:   13-DEC-1995 10:49:51.10
*****************************************************************************
```

WHC-SD-WM-DP-164, REV. 1

Removed by: Raymond

Verified by: B Bachelor 1/4/96

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/L
0	31.77	51840	1.09	63.90	60	8	1.3			
0	36.30	14752	1.11	72.95	69	10	3.5			
0	74.82*	199	1.12	149.96	148	5	116.0		AM-243	5.614E-02
0	661.88*	303344	1.50	1323.72	1316	16	0.4		CS-137	219.
0	1274.48	32	1.04	2548.92	2542	14	88.2		NA-22	3.581E-02

DATA NOT USED IN PACKAGE

Sample ID : S95T3790-SAM Acquisition date : 4-JAN-1996 01:27:54

Total number of lines in spectrum	5	WHC-SD-WM-DP-164, REV. 1
Number of unidentified lines	2	
Number of lines tentatively identified by NID	3	60.00%

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/L	Wtd Mean Decay Corr uCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
~~NA-22~~	~~2.60Y~~	~~1.000~~	~~3.581E-02~~	~~3.581E-02~~	~~3.160E-02~~	~~88.25~~	BKG
CS-137	30.00Y	1.000	2.189E+02	2.189E+02	0.008E+02	0.38	
~~AM-243~~	~~7380.00Y~~	~~1.000~~	~~5.614E-02~~	~~5.614E-02~~	~~6.512E-02~~	~~115.99~~	BKG
			---	---			
	Total Activity :		2.190E+02	2.190E+02			
	Grand Total Activity :		2.190E+02	2.190E+02			

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

DATA NOT USED IN PACKAGE

Sample ID : S95T3790-SAM Acquisition date : 4-JAN-1996 01:27:54

WHC-SD-WM-DP-164, REV. 1

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BE-7	9513.	477.59	1.9948E+00
NA-24	26.	1368.55	2.8340E-02
K-40	575.	1460.75	1.2865E+00
SC-46	99.	1120.55	4.5751E-02
CR-51	7268.	320.08	1.2638E+00
MN-54	59.	834.83	2.7244E-02
CO-56	61.	846.76	2.7970E-02
CO-57	7498.	122.06	8.4184E-02
CO-58	65.	810.78	2.7953E-02
FE-59	51.	1099.25	5.7371E-02
CO-60	37.	1332.50	3.2402E-02
ZN-65	51.	1115.55	6.4320E-02
SE-75	7419.	264.66	1.8932E-01
KR-85	4642.	514.00	3.5528E+01
SR-85	4640.	514.01	1.6062E-01
Y-88	9.	1836.06	2.0483E-02
Y-90	13.	1760.70	8.4563E-02
Y-91	52.	1204.67	1.1731E+01
NB-94	67.	871.09	3.0158E-02
NB-95	83.	765.78	2.9899E-02
ZR-95	76.	756.73	5.1665E-02
RU-103	5610.	497.08	1.8071E-01
RURH-106	1430.	621.93	2.0575E+00
AG-108m	78.	722.94	3.0115E-02
CD-109	6391.	88.03	1.7386E+00
AG-110M	6859.	657.76	2.4891E-01
SN-113	8360.	391.69	2.5331E-01
TE-123m	7206.	159.00	9.4042E-02
SB-124	1608.	602.73	1.0750E-01
SB-125	9837.	427.89	6.4666E-01
TE-125m	6794.	109.27	2.3675E+01
I-129	6106.	39.60	1.0781E+00
I-131	7834.	364.48	1.8186E-01
XE-131m	7155.	163.93	4.0823E+00
BA-133	7616.	356.02	2.2962E-01
CS-134	1566.	604.70	1.0662E-01
CS-136	60.	818.51	2.7110E-02
CS-138	15.	1435.86	4.7801E-02
CE-139	7139.	165.85	1.0056E-01
BA-140	3376.	537.31	5.6214E-01
LA-140	22.	1596.21	3.0496E-02
CE-141	7076.	145.44	1.5581E-01
CE-144	7168.	133.51	6.5786E-01
CEPR-144	7168.	133.51	1.3145E+00
EU-152	19.	1408.01	1.1474E-01
EU-154	63.	1274.51	1.1794E-01
EU-155	6477.	86.54	1.9248E-01
HF-181	7600.	482.18	2.3124E-01
TA-182	6163.	67.75	1.5227E-01
HG-203	7300.	279.20	1.4052E-01
BI-207	2016.	569.70	1.1425E-01

DATA NOT USED IN PACKAGE

Sample ID : S95T3790-SAM Acquisition date : 4-JAN-1996 01:27:54

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
TL-208	7518.	277.36	1.8310E+00
PB-210	6013.	46.50	1.7748E+00
BI-212	67.	727.18	3.8337E-01
PB-212	7889.	238.63	2.4279E-01
BI-214	1675.	609.31	2.4191E-01
PB-214	7771.	351.92	7.1945E-01
RA-224	7876.	240.99	2.6920E+00
RA-226	10255.	186.10	2.9324E+00
AC-228	133.	911.21	1.6653E-01
TH-228	6516.	84.37	4.9986E+00
TH-229	6386.	88.47	2.5405E-01
U-232	6077.	57.78	3.2532E+01
PA-233	7496.	312.17	3.2839E-01
PA-234M	45.	1001.03	4.7383E-02
TH-234	6060.	63.29	1.4038E+00
U-235	10101.	185.71	1.7693E-01
NP-237	6478.	86.48	5.0915E-01
U-237	6167.	59.54	1.8840E-01
NP-238	44.	984.45	9.8514E-02
NP-239	6587.	106.12	2.8671E-01
PU-239	7220.	129.30	1.1287E+03
AM-241	6167.	59.54	1.8072E-01

DATA NOT USED IN PACKAGE

```
*****************************************************************************
* 222-S Laboratory Counting Room    4-JAN-1996 03:18:47.46                  *
*****************************************************************************
      >>>>>>>>>> SAMPLE INFORMATION <<<<<<<<<<
Worklist #:              4580
Sample ID:               S95T3790-DUP
Sample Size:             2.00000E-03 L
Dilution Factor:         1.00000E+00

      >>>>>>>>>> COUNT INFORMATION <<<<<<<<<<
Detector ID:             GEA1
File Number:             dka300:[spec.GEA1]1g1156.cnf
Geometry:                41
Count Time:              0 00:50:00.00 sec
Real Time:               0 00:51:22.10 sec
Dead Time:               2.7%

      >>>>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<
Sample Count Time:       4-JAN-1996 02:26:25.45
Decayed to:              4-JAN-1996 02:26:25.45
Standard Deviations:     2
Analysis Library:        ENVGEA
Analyst:                 VR
Background Subtract:     DKA300:[SPEC.GEA1]1GBACK

      >>>>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<
 Date of last energy calibration:       13-DEC-1995 10:25:45.49
 Date of last efficiency calibration:   13-DEC-1995 10:49:51.10
*****************************************************************************
```

WHC-SD-WM-DP-164, REV. 1

Removed by: Raymond

Verified by: B Machelor 1/4/96

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/L
0	31.77	51533	1.07	63.90	60	8	1.3			
0	36.32	13765	1.14	72.99	70	9	3.6			
0	661.88*	303685	1.50	1323.71	1316	16	0.4		CS-137	219.

DATA NOT USED IN PACKAGE

Summary of Nuclide Activity
Sample ID : S95T3790-DUP

Acquisition date : 4-JAN-1996 02:26:25

WHC-SD-WM-DP-164, REV. 1

Total number of lines in spectrum	3	
Number of unidentified lines	2	
Number of lines tentatively identified by NID	1	33.33%

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/L	Wtd Mean Decay Corr uCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CS-137	30.00Y	1.000	2.191E+02	2.191E+02	0.008E+02	0.37	
		Total Activity :	2.191E+02	2.191E+02			
		Grand Total Activity :	2.191E+02	2.191E+02			

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

DATA NOT USED IN PACKAGE

Sample ID : S95T3790-DUP Acquisition date : 4-JAN-1996 02:26:25
WHC-SD-WM-DP-164, REV. 1

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BE-7	9384.	477.59	1.9811E+00
NA-22	56.	1274.53	3.8339E-02
NA-24	15.	1368.55	2.1576E-02
K-40	556.	1460.75	1.2649E+00
SC-46	82.	1120.55	4.1678E-02
CR-51	7494.	320.08	1.2834E+00
MN-54	67.	834.83	2.9081E-02
CO-56	54.	846.76	2.6516E-02
CO-57	7251.	122.06	8.2783E-02
CO-58	57.	810.78	2.6179E-02
FE-59	37.	1099.25	4.9059E-02
CO-60	39.	1332.50	3.3293E-02
ZN-65	42.	1115.55	5.8335E-02
SE-75	7557.	264.66	1.9108E-01
KR-85	4678.	514.00	3.5665E+01
SR-85	4677.	514.01	1.6125E-01
Y-88	11.	1836.06	2.3079E-02
Y-90	7.	1760.70	6.1036E-02
Y-91	43.	1204.67	1.0734E+01
NB-94	61.	871.09	2.8788E-02
NB-95	63.	765.78	2.6011E-02
ZR-95	72.	756.73	5.0344E-02
RU-103	5680.	497.08	1.8184E-01
RURH-106	1472.	621.93	2.0882E+00
AG-108m	83.	722.94	3.1118E-02
CD-109	6449.	88.03	1.7465E+00
AG-110M	6755.	657.76	2.4701E-01
SN-113	8330.	391.69	2.5285E-01
TE-123m	7164.	159.00	9.3765E-02
SB-124	1533.	602.73	1.0497E-01
SB-125	9804.	427.89	6.4557E-01
TE-125m	6693.	109.27	2.3498E+01
I-129	6261.	39.60	1.0917E+00
I-131	7883.	364.48	1.8242E-01
XE-131m	7180.	163.93	4.0895E+00
BA-133	7649.	356.02	2.3012E-01
CS-134	1520.	604.70	1.0503E-01
CS-136	40.	818.51	2.2156E-02
CS-138	19.	1435.86	5.2990E-02
CE-139	7269.	165.85	1.0147E-01
BA-140	3412.	537.31	5.6515E-01
LA-140	17.	1596.21	2.6925E-02
CE-141	7212.	145.44	1.5731E-01
CE-144	7156.	133.51	6.5729E-01
CEPR-144	7156.	133.51	1.3134E+00
EU-152	33.	1408.01	1.5345E-01
EU-154	56.	1274.51	1.1147E-01
EU-155	6484.	86.54	1.9258E-01
HF-181	7516.	482.18	2.2997E-01
TA-182	6147.	67.75	1.5207E-01
HG-203	7635.	279.20	1.4370E-01

DATA NOT USED IN PACKAGE

Sample ID : S95T3790-DUP Acquisition date : 4-JAN-1996 02:26:35
WHC-SD-WM-DP-164, REV.7

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BI-207	1918.	569.70	1.1142E-01
TL-208	7616.	277.36	1.8429E+00
PB-210	6068.	46.50	1.7829E+00
BI-212	103.	727.18	4.7504E-01
PB-212	8003.	238.63	2.4453E-01
BI-214	1645.	609.31	2.3973E-01
PB-214	7690.	351.92	7.1566E-01
RA-224	7683.	240.99	2.6588E+00
RA-226	10468.	186.10	2.9626E+00
AC-228	125.	911.21	1.6111E-01
TH-228	6510.	84.37	4.9961E+00
TH-229	6400.	88.47	2.5434E-01
U-232	6116.	57.78	3.2635E+01
PA-233	7260.	312.17	3.2320E-01
PA-234M	50.	1001.03	5.0082E-02
TH-234	6139.	63.29	1.4129E+00
U-235	10262.	185.71	1.7833E-01
NP-237	6486.	86.48	5.0947E-01
U-237	6203.	59.54	1.8895E-01
NP-238	45.	984.45	1.0001E-01
NP-239	6676.	106.12	2.8865E-01
PU-239	7081.	129.30	1.1178E+03
AM-241	6203.	59.54	1.8125E-01
AM-243	6647.	74.67	1.0706E-01

DATA NOT USED IN PACKAGE

BY106

LABCORE Data Entry Template for Worklist# 386

Analyst: AKL **Instrument:** AB00 12 **Method:** LA-220-101 P-1

Worklist Comment: See Scot Fitzgerald for sample size. ~~WHC-SD-WM-DP-103, REV. 1~~ WHC-SD-WM-DP-164, REV. 1 5/04/96

Seg	Type	Sample#	Rep	Al	Test		Matrix	Actual	Found	DL	Unit
1	BLNK-PREP				@SR90-01	SR90-01	SOLID			N/A	uCi/
1	BLNK-PREP				@SR90-01	SR90-01C	SOLID			N/A	% Re
1	BLNK-PREP				@SR90-01	SR90-01E	SOLID			N/A	% Ct
2	STD	51852			@SR90-01	SR90-01	SOLID			N/A	uCi/
2	STD				@SR90-01	SR90-01C	SOLID			N/A	% Re
2	STD				@SR90-01	SR90-01E	SOLID			N/A	% Ct.
3	SAMPLE	S94T000374	0	F	@SR90-01	SR90-01	SOLID	N/A			uCi/
3	SAMPLE	S94T000374	0	F	@SR90-01	SR90-01C	SOLID	N/A			% Re
3	SAMPLE	S94T000374	0	F	@SR90-01	SR90-01E	SOLID	N/A			% Ct.
4	DUP	S94T000374	0	F	@SR90-01	SR90-01	SOLID			N/A	uCi/
4	DUP	S94T000374	0	F	@SR90-01	SR90-01C	SOLID			N/A	% Re
4	DUP	S94T000374	0	F	@SR90-01	SR90-01E	SOLID			N/A	% Ct.
5	SAMPLE	S94T000375	0	F	@SR90-01	SR90-01	SOLID	N/A			uCi/
5	SAMPLE	S94T000375	0	F	@SR90-01	SR90-01C	SOLID	N/A			% Re
5	SAMPLE	S94T000375	0	F	@SR90-01	SR90-01E	SOLID	N/A			% Ct.
6	DUP	S94T000375	0	F	@SR90-01	SR90-01	SOLID			N/A	uCi/g
6	DUP	S94T000375	0	F	@SR90-01	SR90-01C	SOLID			N/A	% Re
6	DUP	S94T000375	0	F	@SR90-01	SR90-01E	SOLID			N/A	% Ct.

LLW 6/04/96

DATA NOT USED IN PACKAGE

Data Entry Comments: Sample 375 will be rerun due to high RPD.

Units shown for QC (SPK) may not reflect the actual units.

~~WHC-SD-WM-DP-103, REV. 1~~ JAW 5/04/96

LABCORE Data Entry Template for Worklist# 386

Analyst: ARL **Instrument:** AB00 12 **Method:** LA-220-101 D-1
WHC-SD-WM-DP-164, REV. 1

Worklist Comment: See Scot Fitzgerald for sample size.

Seg	Type	Sample#	Rep Al	Test	Matrix	Actual	Found	DL	Unit

Final page for worklist # 386

Alta Lewis
Analyst Signature

1-10-95
Date

M Bierman

1-11-95

Data Entry Comments:

JAW 6/04/96

DATA NOT USED IN PACKAGE

Units shown for QC (SPK) may not reflect the actual units.

5/04/96

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY
RADCHEM ANALYTICAL BATCH AND SUMMARY SHEET
STRONTIUM-SOLIDS ERR

TEST CODE:	@SR90-01	SAMPLE POINT:	0
INSTRUMENT:	WB27811	SAMPLE PREP:	0
ANALYST:	AKL	BATCH ID:	0
		ANALYSIS DATE:	January 11, 1995

UNITS: µCi/g

SAMPLE TYPE	SAMPLE NO.	ANALYTE	RESULT #1	DUPLICATE	AVERAGE	RPD%	% REC	DET LIM	%CT ER
STANDARD *	51B52	Sr-90	1.01E-03				91.3%	2.19E-06	2.0%
BLANK	S94T374	Sr-90	1.25E-03					2.17E-03	132.7%
SAMPLE 1	S94T374	Sr-90	6.92E-01	6.72E-01	6.82E-01	2.9%		2.16E-03	2.4%
DUPLICATE 1	S94T374	Sr-90						2.12E-03	2.4%
SAMPLE 2	S94T375	Sr-90	1.78E-01	2.54E-01	2.16E-01	35.2%		1.99E-03	4.6%
DUPLICATE 2	S94T375	Sr-90						2.03E-03	3.9%
STANDARD END									
	STD ID:	STD VOL.:							
STANDARD	0	1.000							

NARRATIVE: Analyst Comments:

Chemist Comments:

DETECTION LIMITS ARE ADJUSTED FOR DIFFERENT SAMPLE SIZES.
* RESULTS FOR STANDARDS ARE IN µCi/mL

Form Completed By:	MC BIERMAN	Signature:		Date:	01/11/95
Chemist Approval:	SL FITZGERALD	Signature:		Date:	1/11/95

Revision 2.1

LAB LEADER INFO:	
Method:	LA-220-101(D-1)
Test Code	@SR90-01
Matrix:	SOLID
Work List #	386
Batch #	
Prepared By:	MC BIERMAN
Date Complete:	01/11/95
Time Complete:	08:30
Chemist:	SL FITZGERALD
Analyst:	AKL
Analysis Date:	01/10/95
Detector Number:	12
Instrument Code:	WB27811
Rerun:	
Sample Prep:	
Sample Point:	
Book Number:	

Sample Type	Sample #
STANDARD	51B52
BLANK	894T374
SAMPLE 1	894T374
DUPLICATE 1	894T374
SAMPLE 2	894T375
DUPLICATE 2	894T375
ST-END	

PRINT

TECH INFO:

Liquids Standard Run

INPUT	
TOTAL COUNTS	9614
COUNT TIME in MINUTES	10
BACKGROUND in cpm	3
SAMPLE VOLUME in mL	1
DILUTION FACTOR	1
DIGEST DILUTION FACTOR	1
SEPARATION TIME	12:12
SEPARATION DATE	01/10/95
TIME OF COUNT	17:10
DATE OF COUNT	01/10/95
CARRIER ADDED in mL	1
GROSS WEIGHT	7.1237
TARE WEIGHT	7.0275
STANDARD VALUE	1.1112

RESULT	
SAMPLE COUNT RATE	9.59E+02
CRITICAL LEVEL	9.90E-01
NET WEIGHT	0.0962
DELTA TIME (hours)	4.97
SR-90 EFFICIENCY FACTOR	0.42
Y-90 EFFICIENCY FACTOR	0.47
Rmax	N/A
DETECTION LIMIT	2.07
Sr-89/90 CONC in µCi/mL	1.01E-03
Relative Counting Error	2.0%
Percent Carrier Recovery	96.2%

Solid-Blank Run:

INPUT	
TOTAL COUNTS	39
COUNT TIME in MINUTES	10
BACKGROUND in cpm	3
SAMPLE VOLUME in mL	0.5
DILUTION FACTOR	1
DIGEST FACTOR (g/L)	2.032
SEPARATION TIME	12:12
SEPARATION DATE	01/10/95
TIME OF COUNT	17:30
DATE OF COUNT	01/10/95
CARRIER ADDED in mL	1
GROSS WEIGHT	7.1248
TARE WEIGHT	7.0293

RESULT	
SAMPLE COUNT RATE	1.20E+00
CRITICAL LEVEL	9.90E-01
NET WEIGHT	0.0955
DELTA TIME (hours)	5.30
SR-90 EFFICIENCY FACTOR	0.42
Y-90 EFFICIENCY FACTOR	0.47
Rmax	N/A
DETECTION LIMIT	2.07
Sr-89/90 CONC in µCi/g	1.25E-03
Relative Counting Error	132.7%
Percent Carrier Recovery	95.5%

Solid-Sample Run 2:

INPUT	
TOTAL COUNTS	1884
COUNT TIME in MINUTES	10
BACKGROUND in cpm	3
SAMPLE VOLUME in mL	0.5
DILUTION FACTOR	1
DIGEST FACTOR (g/L)	2.1472
SEPARATION TIME	12:17
SEPARATION DATE	01/10/95
TIME OF COUNT	18:20
DATE OF COUNT	01/10/95
CARRIER ADDED in mL	1
GROSS WEIGHT	7.1185
TARE WEIGHT	7.0208

RESULT	
SAMPLE COUNT RATE	1.86E+02
CRITICAL LEVEL	9.90E-01
NET WEIGHT	0.0977
DELTA TIME (hours)	6.05
SR-90 EFFICIENCY FACTOR	0.42
Y-90 EFFICIENCY FACTOR	0.47
Rmax	N/A
DETECTION LIMIT	2.07
Sr-89/90 CONC in µCi/g	1.78E-01
Relative Counting Error	4.6%
Percent Carrier Recovery	97.7%

Solid-Duplicate Run 2:

INPUT	
TOTAL COUNTS	2623
COUNT TIME in MINUTES	10
BACKGROUND in cpm	3
SAMPLE VOLUME in mL	0.5
DILUTION FACTOR	1
DIGEST FACTOR (g/L)	2.146
SEPARATION TIME	12:17
SEPARATION DATE	01/10/95
TIME OF COUNT	18:30
DATE OF COUNT	01/10/95
CARRIER ADDED in mL	1
GROSS WEIGHT	7.0278
TARE WEIGHT	6.9322

RESULT	
SAMPLE COUNT RATE	2.60E+02
CRITICAL LEVEL	9.90E-01
NET WEIGHT	0.0956
DELTA TIME (hours)	6.22
SR-90 EFFICIENCY FACTOR	0.42
Y-90 EFFICIENCY FACTOR	0.47
Rmax	N/A
DETECTION LIMIT	2.07
Sr-89/90 CONC in µCi/g	2.54E-01
Relative Counting Error	3.9%
Percent Carrier Recovery	95.6%

Solid-Sample Run:

INPUT	
TOTAL COUNTS	6676
COUNT TIME in MINUTES	10
BACKGROUND in cpm	3
SAMPLE VOLUME in mL	0.5
DILUTION FACTOR	1
DIGEST FACTOR (g/L)	2.032
SEPARATION TIME	12:12
SEPARATION DATE	01/10/95
TIME OF COUNT	17:45
DATE OF COUNT	01/10/95
CARRIER ADDED in mL	1
GROSS WEIGHT	7.0231
TARE WEIGHT	6.9274

RESULT	
SAMPLE COUNT RATE	6.65E+02
CRITICAL LEVEL	9.90E-01
NET WEIGHT	0.0957
DELTA TIME (hours)	5.55
SR-90 EFFICIENCY FACTOR	0.42
Y-90 EFFICIENCY FACTOR	0.47
Rmax	N/A
DETECTION LIMIT	2.07
Sr-89/90 CONC in µCi/g	6.92E-01
Relative Counting Error	2.4%
Percent Carrier Recovery	95.7%

Solid-Duplicate Run:

INPUT	
TOTAL COUNTS	6578
COUNT TIME in MINUTES	10
BACKGROUND in cpm	3
SAMPLE VOLUME in mL	0.5
DILUTION FACTOR	1
DIGEST FACTOR (g/L)	2.0372
SEPARATION TIME	12:12
SEPARATION DATE	01/10/95
TIME OF COUNT	18:00
DATE OF COUNT	01/10/95
CARRIER ADDED in mL	1
GROSS WEIGHT	7.0702
TARE WEIGHT	6.9736

RESULT	
SAMPLE COUNT RATE	6.55E+02
CRITICAL LEVEL	9.90E-01
NET WEIGHT	0.0966
DELTA TIME (hours)	5.80
SR-90 EFFICIENCY FACTOR	0.42
Y-90 EFFICIENCY FACTOR	0.47
Rmax	N/A
DETECTION LIMIT	2.07
Sr-89/90 CONC in µCi/g	6.72E-01
Relative Counting Error	2.4%
Percent Carrier Recovery	96.6%

Liquids Standard End

INPUT	
TOTAL COUNTS	
COUNT TIME in MINUTES	
BACKGROUND in cpm	
SAMPLE VOLUME in mL	
DILUTION FACTOR	
DIGEST DILUTION FACTOR	
SEPARATION TIME	
SEPARATION DATE	
TIME OF COUNT	
DATE OF COUNT	
CARRIER ADDED in mL	
GROSS WEIGHT	
TARE WEIGHT	
STANDARD VALUE	

RESULT	
SAMPLE COUNT RATE	
CRITICAL LEVEL	
NET WEIGHT	
DELTA TIME (hours)	
SR-90 EFFICIENCY FACTOR	
Y-90 EFFICIENCY FACTOR	
Rmax	
DETECTION LIMIT	
Sr-89/90 CONC in µCi/mL	
Relative Counting Error	
Percent Carrier Recovery	

Form Completed By:	MC BIERMAN	Signature:		Date:	11-Jan-95
Chemist Approval:	SL FITZGERALD	Signature:		Date:	1-11-95

Revision 2.1

1901

WHC-SD-WM-DP-103, REV. 1

WHC-SD-WM-DP-164, REV. 1

WHC-SD-WM-DP-164, REV. 1 ~~WHC-SD-WM-DP-103, REV.~~ 5/14/96

Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 104 (D-1) LIQUIDS

							STANDARD
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA		1.000
STANDARD	TOTAL COUNTS	(TC)	9614	GROSS WEIGHT	(W2)		7.1237
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.0275
386	BACKGROUND in cpm	(BKG)	2.7	NET WEIGHT	(W3)		0.0962
Test Code	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)		4.97
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST DILUTION FACTOR	DDF	1				
LIQUID	SAMPLE COUNT RATE	(Rs)	958.70	SR-90 EFFICIENCY FACTO	(C1)		0.4180
Sample #	CRITICAL LEVEL	(Lc)	0.99	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
51B52	SEPARATION TIME	(ST)	12:12	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	01/10/95	DETECTION LIMIT	(Ld)		2.07
WB27811	TIME OF COUNT	(TOC)	17:10	Sr-89/90 CONC. in µCi/L =			1.0149E+00
Analyst	DATE OF COUNT	(DOC)	01/10/95				
AKL							
Date							
01/11/95							
Time							
08:30							

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

v RESULTS v

Sr-89/90 CONCENTRATION =	1.01E-03	µCi/mL
RELATIVE COUNTING ERROR =	2.0%	
PERCENT CARRIER RECOVERY =	96.2%	

DETECTION LEVEL
2.19E-06 µCi/L

Data Entry by:	MC BIERMAN	Date:	11-Jan-95
Approved by:	SL FITZGERALD	Date:	1-11-95

Form WB Rev. 2.1 220-10n_WB

WHC-SD-WM-DP-164, REV. 1

~~WHC-SD-WM-DP-103, REV. 1~~ 5/14/96

LA-220-101 / D-1 **Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 104 (D-1)**

							SAMPLE
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA		1.000
SAMPLE	TOTAL COUNTS	(TC)	1884	GROSS WEIGHT	(W2)		7.1185
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.0208
386	BACKGROUND in cpm	(BKG)	2.7	NET WEIGHT	(W3)		0.0977
Test Code	SAMPLE VOLUME in mL	(SS)	0.500	DELTA TIME (HOURS)	(DT)		6.05
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST DILUTION FACTOR	DDF	2.1472				
SOLID	SAMPLE COUNT RATE	(Rs)	185.70	SR-90 EFFICIENCY FACTO	(C1)		0.4180
Sample #	CRITICAL LEVEL	(Lc)	0.99	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
S94T375	SEPARATION TIME	(ST)	12:17	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	01/10/95	DETECTION LIMIT	(Ld)		2.07
WB27811	TIME OF COUNT	(TOC)	18:20	Sr-89/90 CONC in µCi/g			1.7822E-01
Analyst	DATE OF COUNT	(DOC)	01/10/95				
AKL							
Date							
01/11/95							
Time							
08:30							

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

v RESULTS v

Sr-89/90 CONCENTRATION	=	1.78E-01	µCi/g
RELATIVE COUNTING ERROR	=	4.6%	
PERCENT CARRIER RECOVERY	=	97.7%	

DETECTION LEVEL

1.99E-03 µCi/g

Data Entry by:	MC BIERMAN	Date:	11-Jan-95
Approved by:	SL FITZGERALD	Date:	1-11-95

Form WB Rev. 2.1 220-10n_WB

WHC-SD-WM-DP-164, REV. 1 ~~WHC-SD-WM-DP-103, REV. 1~~ SW 5/4/96

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-2), 104 (D-1)

							DUPLICATE
Type	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA		1.000
DUPLICATE	TOTAL COUNTS	(TC)	2623	GROSS WEIGHT	(W2)		7.0278
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		6.9322
386	BACKGROUND in cpm	(BKG)	2.7	NET WEIGHT	(W3)		0.0956
Test Code	SAMPLE VOLUME in mL	(SS)	0.500	DELTA TIME (HOURS)	(DT)		6.22
@SR90-01	DILUTION FACTOR	(DF)	1				
Matrix	DIGEST DILUTION FACTOR	(Dg/L)	2.146				
SOLID	SAMPLE COUNT RATE	(Rs)	259.60	SR-90 EFFICIENCY FACTO	(C1)		0.4180
Sample #	CRITICAL LEVEL	(Lc)	0.99	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
S94T375	SEPARATION TIME	(ST)	12:17	Rmax			N/A
Instrument Code	SEPARATION DATE	(SD)	01/10/95	DETECTION LIMIT	(Ld)		2.07
WB27811	TIME OF COUNT	(TOC)	18:30	Sr-89/90 CONC in µCi/g			2.5432E-01
Analyst	DATE OF COUNT	(DOC)	01/10/95				
AKL							
Date							
01/11/95							
Time							
08:30							

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

v RESULTS v

Sr-89/90 CONCENTRATION	=	2.54E-01	µCi/g
RELATIVE COUNTING ERROR	=	3.9%	
PERCENT CARRIER RECOVERY	=	95.6%	

DETECTION LEVEL

2.03E-03 µCi/g

Data Entry by:	MC BIERMAN	MC Bierman	Date:	11-Jan-95
Approved by:	SL FITZGERALD	SL Fitzgerald	Date:	1-11-95

Form WB Rev. 2.1 220-10n_WB Page 1 of 1

LABCORE Completed Worklist Report for Worklist# 4363

Analyst: knt **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	1.24E-03	1.20E-3	96.770	% Recovery
1	STD		0		@SR90-01	SR90-01C	SOLID	100	9.01E+01	90.100	% Recovery
1	STD		0		@SR90-01	SR90-01E	SOLID	1.00	1.92E+00	1.920	% Ct. Erro
2	BLNK-PREP		0		@SR90-01	SR90-01	SOLID	1	<4.42E-2		uCi/g
2	BLNK-PREP		0		@SR90-01	SR90-01C	SOLID	100	8.89E+01	88.900	% Recovery
2	BLNK-PREP		0		@SR90-01	SR90-01E	SOLID	1.00	1.53E+02	153.000	uCi/g
3	BLNK/BKG		0		@SR90-01	SR90-01	SOLID	1	1.19E+00	1.190	BLNK/BKG
4	SAMPLE	S95T003530	0	Z	@SR90-01	SR90-01	SOLID	N/A	1.30E+02	4.41e-002	uCi/g
4	SAMPLE	S95T003530	0	Z	@SR90-01	SR90-01C	SOLID	N/A	8.82E+01	1.00e-004	% Recovery
4	SAMPLE	S95T003530	0	Z	@SR90-01	SR90-01E	SOLID	N/A	5.78E-01		% Ct. Error
5	DUP	S95T003530	0	Z	@SR90-01	SR90-01	SOLID	1.30E+2	1.43E+2	9.524	RPD
5	DUP	S95T003530	0	Z	@SR90-01	SR90-01C	SOLID	100	8.77E+01	87.700	% Recovery
5	DUP	S95T003530	0	Z	@SR90-01	SR90-01E	SOLID	1.00	5.17E-01	0.517	% Cnt Err
6	SAMPLE	S95T003649	0	Z	@SR90-01	SR90-01	SOLID	N/A	2.55E+01	3.68e-002	uCi/g
6	SAMPLE	S95T003649	0	Z	@SR90-01	SR90-01C	SOLID	N/A	9.02E+01	1.00e-004	% Recovery
6	SAMPLE	S95T003649	0	Z	@SR90-01	SR90-01E	SOLID	N/A	1.20E+00		% Ct. Error
7	DUP	S95T003649	0	Z	@SR90-01	SR90-01	SOLID	2.55E+1	2.43E+1	4.819	RPD
7	DUP	S95T003649	0	Z	@SR90-01	SR90-01C	SOLID	100	8.81E+01	88.100	% Recovery
7	DUP	S95T003649	0	Z	@SR90-01	SR90-01E	SOLID	1.00	1.27E+00	1.270	% Cnt Err

Final page for worklist# 4363

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

Jennifer Dupper 6/20/96
Reviewer Signature **Date**

This is a revision of Worklist #4363 to reflect a new % standard recovery of 96.77%
Cheryl J. Benar
6/21/96

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

BY104

LABCORE Data Entry Template for Worklist# 4363

Analyst: Kim Thomas **Instrument:** AB00 10 **Book#** 9B56

Method: LA-220-101 Rev/Mod D-1 WHC-SD-WM-DP-164, REV. 1

Worklist Comment: Determine sample size using Ludlum. SLF

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				@SR90-01	SOLID		
2	BLNK-PREP				@SR90-01	SOLID		
3	BLNK/BKG				@SR90-01	SOLID		
4	SAMPLE	S95T003530	0	Z	@SR90-01	SOLID	95000180	BY104 ROTARY
	Analytes Requested:	SR90-01 , SR90-01C, SR90-01E						
5	DUP	S95T003530	0	Z	@SR90-01	SOLID		
6	SAMPLE	S95T003649	0	Z	@SR90-01	SOLID	95000180	BY104 ROTARY
	Analytes Requested:	SR90-01 , SR90-01C, SR90-01E						
7	DUP	S95T003649	0	Z	@SR90-01	SOLID		

Final page for worklist # 4363

Kim Thomas 12-19-95
Analyst Signature **Date**

[illegible] 12/20/95
Analyst Signature **Date**
SE Hogan 12/20/95

Data Entry Comments:

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

LABCORE Completed Worklist Report for Worklist# 4363

Analyst: knt **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	1.15E-03	1.20E-3	104.350	% Recovery
1	STD		0		●SR90-01	SR90-01C	SOLID	100	9.01E+01	90.100	% Recovery
1	STD		0		●SR90-01	SR90-01E	SOLID	1.00	1.92E+00	1.920	% Ct. Error
2	BLNK-PREP		0		●SR90-01	SR90-01	SOLID	1	<4.42E-2		uCi/g
2	BLNK-PREP		0		●SR90-01	SR90-01C	SOLID	100	8.89E+01	88.900	% Recovery
2	BLNK-PREP		0		●SR90-01	SR90-01E	SOLID	1.00	1.53E+02	153.000	% Ct. Error
3	BLNK/BKG		0		●SR90-01	SR90-01	SOLID	1	1.19E+00	1.190	uCi/g
4	SAMPLE	S95T003530	0	Z	●SR90-01	SR90-01	SOLID	N/A	1.30E+02	4.410e-002	uCi/g
4	SAMPLE	S95T003530	0	Z	●SR90-01	SR90-01C	SOLID	N/A	8.82E+01	1.000e-004	% Recovery
4	SAMPLE	S95T003530	0	Z	●SR90-01	SR90-01E	SOLID	N/A	5.78E-01	0.000	% Ct. Error
5	DUP	S95T003530	0	Z	●SR90-01	SR90-01	SOLID	1.30E+2	1.43E+2	9.520	RPD
5	DUP	S95T003530	0	Z	●SR90-01	SR90-01C	SOLID	100	8.77E+01	87.700	% Recovery
5	DUP	S95T003530	0	Z	●SR90-01	SR90-01E	SOLID	1.00	5.17E-01	0.520	% Ct. Error
6	SAMPLE	S95T003649	0	Z	●SR90-01	SR90-01	SOLID	N/A	2.55E+01	3.680e-002	uCi/g
6	SAMPLE	S95T003649	0	Z	●SR90-01	SR90-01C	SOLID	N/A	9.02E+01	1.000e-004	% Recovery
6	SAMPLE	S95T003649	0	Z	●SR90-01	SR90-01E	SOLID	N/A	1.20E+00	0.000	% Ct. Error
7	DUP	S95T003649	0	Z	●SR90-01	SR90-01	SOLID	2.55E+1	2.43E+1	4.820	RPD
7	DUP	S95T003649	0	Z	●SR90-01	SR90-01C	SOLID	100	8.81E+01	88.100	% Recovery
7	DUP	S95T003649	0	Z	●SR90-01	SR90-01E	SOLID	1.00	1.27E+00	1.270	% Ct. Error

Final page for worklist# 4363

Analyst Signature Date

Analyst Signature Date

Reviewer Signature 12/21/95 Date

See page 1905 for the correct % standard recovery of 96.77%. Cheryl J. Benar 6/21/96

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
	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA)		1.000
STD	TOTAL COUNTS	(TC)	10698	GROSS WEIGHT	(W2)		7.8124
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.7223
4363	BACKGROUND in cpm	(BKG)	10.0	NET WEIGHT	(W3)		0.0901
	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)		8.17
@SR90-01	DILUTION FACTOR	(DF)	1				
	DIGEST DILUTION FACTOR	DDF	1				
LIQUID	SAMPLE COUNT RATE	(Rs)	1059.80	SR-90 EFFICIENCY FACTO	(C1)		0.4051
	CRITICAL LEVEL	(Lc)	1.91	Y-90 EFFICIENCY FACTOR	(C2)		0.4503
95004912	TIME.OF SEPARATION	(ST)	11:00	Rmax			N/A
	DATE OF SEPARATION	(SD)	12/19/95	DETECTION LIMIT	(Ld)		3.90
0	TIME OF COUNT	(TOC)	19:10	Sr-89/90 CONC. in µCi/L			1.1957E+00
	DATE OF COUNT	(DOC)	12/19/95				
N/A	STANDARD BOOK #		9B56				
	STANDARD VALUE in µCi/mL		1.1520E-03				
WL4363							

WB26870

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

MCB

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))

SLF

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

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

KNT

NOTE: Expected weight = CVA * 0.1

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

12/20/95

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

12/19/95	Sr-89/90 CONCENTRATION	1.20E-03	µCi/mL	DETECTION LEVEL
11:00 AM	RELATIVE COUNTING ERROR	1.9%		4.40E-06 µCi/L
BY-104 ROTARY	PERCENT CARRIER RECOVERY	90.1%		

Analyst:		KNT	Date:	20-Dec-95
Signature of Chemist:		SLF	Date:	12/21/95

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
	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA)	1.000
BLNK-PREP	TOTAL COUNTS	(TC)	119	GROSS WEIGHT	(W2)	7.8214
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.7325
4363	BACKGROUND in cpm	(BKG)	10.0	NET WEIGHT	(W3)	0.0889
	SAMPLE VOLUME in mL	(SS)	0.050	DELTA TIME (HOURS)	(DT)	8.40
@SR90-01	DILUTION FACTOR	(DF)	1			
	DIGEST FACTOR (g/L)	(D g/L	2.0312			
SOLID	SAMPLE COUNT RATE	(Rs)	1.90	SR-90 EFFICIENCY FACTOR	(C1)	0.4051
	CRITICAL LEVEL	(Lc)	1.91	Y-90 EFFICIENCY FACTOR	(C2)	0.4503
95004912	TIME OF SEPARATION	(ST)	11:00	Rmax		3.94
	DATE OF SEPARATION	(SD)	12/19/95	DETECTION LIMIT	(Ld)	3.90
0	TIME OF COUNT	(TOC)	19:24	Sr-89/90 CONC in µCi/g	<	4.4219E-02
	DATE OF COUNT	(DOC)	12/19/95			

N/A

WL4363

WB26870

MCB

SLF

KNT

12/20/95

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

12/19/95	Sr-89/90 CONCENTRATION	< 4.42E-02	µCi/g	DETECTION LEVEL
	LESS THAN Value was Determined from Rmax.			
11:00 AM	RELATIVE COUNTING ERROR	152.7%		4.38E-02 µCi/g
BY-104 ROTARY	PERCENT CARRIER RECOVERY	88.9%		

Analyst:	KNT	Date:	20-Dec-95
Signature of Chemist:	SLF	Date:	12/21/95

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
	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA)	1.000
SAMPLE	TOTAL COUNTS	(TC)	115267	GROSS WEIGHT	(W2)	7.8737
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.7855
4363	BACKGROUND in cpm	(BKG)	10.0	NET WEIGHT	(W3)	0.0882
	SAMPLE VOLUME in mL	(SS)	0.050	DELTA TIME (HOURS)	(DT)	8.62
@SR90-01	DILUTION FACTOR	(DF)	1			
	DIGEST FACTOR (g/L)	(D g/L	2.0312			
SOLID	SAMPLE COUNT RATE	(Rs)	11516.70	SR-90 EFFICIENCY FACTOR	(C1)	0.4051
	CRITICAL LEVEL	(Lc)	1.91	Y-90 EFFICIENCY FACTOR	(C2)	0.4503
95004912	TIME OF SEPARATION	(ST)	11:00	Rmax		N/A
	DATE OF SEPARATION	(SD)	12/19/95	DETECTION LIMIT	(Ld)	3.90
0	TIME OF COUNT	(TOC)	19:37	Sr-89/90 CONC in µCi/g		1.3011E+02
	DATE OF COUNT	(DOC)	12/19/95			

FUS-ZR01

S95T003530

WB26870

MCB

SLF

KNT

12/20/95

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
12/19/95	Sr-89/90 CONCENTRATION	1.30E+02	µCi/g	
11:00 AM	RELATIVE COUNTING ERROR	0.6%		4.41E-02 µCi/g
BY-104 ROTARY	PERCENT CARRIER RECOVERY	88.2%		

Analyst:	KNT	Date:	20-Dec-95
Signature of Chemist:	SLF	Date:	12/21/95

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
	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA)		1.000
DUP	TOTAL COUNTS	(TC)	143776	GROSS WEIGHT	(W2)		7.8423
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.7546
4363	BACKGROUND in cpm	(BKG)	10.0	NET WEIGHT	(W3)		0.0877
	SAMPLE VOLUME in mL	(SS)	0.050	DELTA TIME (HOURS)	(DT)		8.83
@SR90-01	DILUTION FACTOR	(DF)	1				
	DIGEST FACTOR (g/L)	(D g/L	2.3212				
SOLID	SAMPLE COUNT RATE	(Rs)	14367.60	SR-90 EFFICIENCY FACTOR	(C1)		0.4051
	CRITICAL LEVEL	(Lc)	1.91	Y-90 EFFICIENCY FACTOR	(C2)		0.4503
95004912	TIME OF SEPARATION	(ST)	11:00	Rmax			N/A
	DATE OF SEPARATION	(SD)	12/19/95	DETECTION LIMIT	(Ld)		3.90
0	TIME OF COUNT	(TOC)	19:50	Sr-89/90 CONC in µCi/g			1.4255E+02
	DATE OF COUNT	(DOC)	12/19/95				
FUS-ZR01							
S95T003530							

	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)
WB26870	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)
MCB	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)
SLF	Percent Carrier Recovery = (Net Weight / Expected weight) * 100
	NOTE: Expected weight = CVA * 0.1
KNT	Detection Levels and Less Than Values are determined from Procedure LA-508-002.
	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100
12/20/95	

				DETECTION LEVEL
12/19/95	Sr-89/90 CONCENTRATION	1.43E+02	µCi/g	
11:00 AM	RELATIVE COUNTING ERROR	0.5%		3.87E-02 µCi/g
BY-104 ROTARY	PERCENT CARRIER RECOVERY	87.7%		

Analyst:	KNT	Date:	20-Dec-95
Signature of Chemist:	SLF	Date:	12/21/95

SAMPLE.WB1 REV 1.2 22010NML

WORKBOOK PAGE: SAM6

WHC-SD-WM-DP-164, REV. 1

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

							SAMPLE
	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA)	1.000
SAMPLE	TOTAL COUNTS	(TC)	27137	GROSS WEIGHT	(W2)	7.8848
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.7946
4363	BACKGROUND in cpm	(BKG)	10.0	NET WEIGHT	(W3)	0.0902
	SAMPLE VOLUME in mL	(SS)	0.050	DELTA TIME (HOURS)	(DT)	10.25
@SR90-01	DILUTION FACTOR	(DF)	1			
	DIGEST FACTOR (g/L)	(D g/L	2.3424			
SOLID	SAMPLE COUNT RATE	(Rs)	2703.70	SR-90 EFFICIENCY FACTOR	(C1)	0.4051
	CRITICAL LEVEL	(Lc)	1.91	Y-90 EFFICIENCY FACTOR	(C2)	0.4503
95004912	TIME OF SEPARATION	(ST)	11:00	Rmax		N/A
	DATE OF SEPARATION	(SD)	12/19/95	DETECTION LIMIT	(Ld)	3.90
0	TIME OF COUNT	(TOC)	21:15	Sr-89/90 CONC in µCi/g		2.5490E+01
	DATE OF COUNT	(DOC)	12/19/95			
FUS-ZR01						
S95T003649						

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

WB26870 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)

MCB 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)

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

NOTE: Expected weight = CVA * 0.1

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

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

12/20/95

				DETECTION LEVEL
12/19/95	Sr-89/90 CONCENTRATION	2.55E+01	µCi/g	
11:00 AM	RELATIVE COUNTING ERROR	1.2%		3.68E-02 µCi/g
BY-104 ROTARY	PERCENT CARRIER RECOVERY	90.2%		

Analyst:	KNT	Date:	20-Dec-95
Signature of Chemist:	SLF	Date:	12/21/95

SAMPLE.WB1 REV 1.2 22010NML

1911

WORKBOOK PAGE: DUP7

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

							DUP
	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA)	1.000
DUP	TOTAL COUNTS	(TC)	24161	GROSS WEIGHT	(W2)	7.7898
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.7017
4363	BACKGROUND in cpm	(BKG)	10.0	NET WEIGHT	(W3)	0.0881
	SAMPLE VOLUME in mL	(SS)	0.050	DELTA TIME (HOURS)	(DT)	10.53
@SR90-01	DILUTION FACTOR	(DF)	1			
	DIGEST FACTOR (g/L)	(D g/L	2.2316			
SOLID	SAMPLE COUNT RATE	(Rs)	2406.10	SR-90 EFFICIENCY FACTOR	(C1)	0.4051
	CRITICAL LEVEL	(Lc)	1.91	Y-90 EFFICIENCY FACTOR	(C2)	0.4503
95004912	TIME OF SEPARATION	(ST)	11:00	Rmax		N/A
	DATE OF SEPARATION	(SD)	12/19/95	DETECTION LIMIT	(Ld)	3.90
0	TIME OF COUNT	(TOC)	21:32	Sr-89/90 CONC in µCi/g		2.4312E+01
	DATE OF COUNT	(DOC)	12/19/95			
FUS-ZR01						
S95T003649						

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

WB26870 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)

MCB 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)

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

NOTE: Expected weight = CVA * 0.1

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

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

12/20/95

				DETECTION LEVEL
12/19/95	Sr-89/90 CONCENTRATION	2.43E+01	µCi/g	
11:00 AM	RELATIVE COUNTING ERROR	1.3%		3.94E-02 µCi/g
BY-104 ROTARY	PERCENT CARRIER RECOVERY	88.1%		

Analyst:	KNT	Date:	20-Dec-95
Signature of Chemist:	SLF	Date:	12/21/95

SAMPLE.WB1 REV 1.2 22010NML

1912

WHC-SD-WM-DP-164, REV. /

LABCORE Completed Worklist Report for Worklist# 4523

Analyst: knt **Instrument:** AB12 **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	1.24E-03	1.18E-3	95.160	% Recovery
1	STD		0		@SR90-01	SR90-01C	SOLID	100	9.47E+01	94.700	% Recovery
1	STD		0		@SR90-01	SR90-01E	SOLID	1.00	1.82E+00	1.820	% Ct. Erro
2	BLNK-PREP		0		@SR90-01	SR90-01	SOLID	1	1.41E-2	0.014	uCi/g
2	BLNK-PREP		0		@SR90-01	SR90-01C	SOLID	100	9.33E+01	93.300	% Recovery
2	BLNK-PREP		0		@SR90-01	SR90-01E	SOLID	1.00	6.73E+01	67.300	uCi/g
3	BLNK/BKG		0		@SR90-01	SR90-01	SOLID	1	1.79E+00	1.790	BLNK/BKG
4	SAMPLE	S95T003650	0	Z	@SR90-01	SR90-01	SOLID	N/A	1.91E+01	1.12e-002	uCi/g
4	SAMPLE	S95T003650	0	Z	@SR90-01	SR90-01C	SOLID	N/A	9.54E+01	1.00e-004	% Recovery
4	SAMPLE	S95T003650	0	Z	@SR90-01	SR90-01E	SOLID	N/A	9.62E-01		% Ct. Error
5	DUP	S95T003650	0	Z	@SR90-01	SR90-01	SOLID	1.91E+1	1.78E+1	7.046	RPD
5	DUP	S95T003650	0	Z	@SR90-01	SR90-01C	SOLID	100	9.47E+01	94.700	% Recovery
5	DUP	S95T003650	0	Z	@SR90-01	SR90-01E	SOLID	1.00	1.00E+00	1.000	% Cnt Err
6	SAMPLE	S95T003651	0	Z	@SR90-01	SR90-01	SOLID	N/A	1.93E+01	1.10e-002	uCi/g
6	SAMPLE	S95T003651	0	Z	@SR90-01	SR90-01C	SOLID	N/A	9.53E+01	1.00e-004	% Recovery
6	SAMPLE	S95T003651	0	Z	@SR90-01	SR90-01E	SOLID	N/A	9.46E-01		% Ct. Error
7	DUP	S95T003651	0	Z	@SR90-01	SR90-01	SOLID	1.93E+1	2.26E+1	15.752	RPD
7	DUP	S95T003651	0	Z	@SR90-01	SR90-01C	SOLID	100	9.48E+01	94.800	% Recovery
7	DUP	S95T003651	0	Z	@SR90-01	SR90-01E	SOLID	1.00	8.73E-01	0.873	% Cnt Err
8	SAMPLE	S95T003652	0	Z	@SR90-01	SR90-01	SOLID	N/A	1.67E+01	1.13e-002	uCi/g
8	SAMPLE	S95T003652	0	Z	@SR90-01	SR90-01C	SOLID	N/A	9.49E+01	1.00e-004	% Recovery
8	SAMPLE	S95T003652	0	Z	@SR90-01	SR90-01E	SOLID	N/A	1.03E+00		% Ct. Error
9	DUP	S95T003652	0	Z	@SR90-01	SR90-01	SOLID	1.67E+1	1.73E+1	3.529	RPD
9	DUP	S95T003652	0	Z	@SR90-01	SR90-01C	SOLID	100	9.42E+01	94.200	% Recovery
9	DUP	S95T003652	0	Z	@SR90-01	SR90-01E	SOLID	1.00	1.01E+00	1.010	% Cnt Err
10	SAMPLE	S95T003653	0	Z	@SR90-01	SR90-01	SOLID	N/A	2.43E+01	1.11e-002	uCi/g
10	SAMPLE	S95T003653	0	Z	@SR90-01	SR90-01C	SOLID	N/A	9.39E+01	1.00e-004	% Recovery
10	SAMPLE	S95T003653	0	Z	@SR90-01	SR90-01E	SOLID	N/A	8.50E-01		% Ct. Error
11	DUP	S95T003653	0	Z	@SR90-01	SR90-01	SOLID	2.43E+1	2.54E+1	4.427	RPD
11	DUP	S95T003653	0	Z	@SR90-01	SR90-01C	SOLID	100	9.53E+01	95.300	% Recovery
11	DUP	S95T003653	0	Z	@SR90-01	SR90-01E	SOLID	1.00	8.38E-01	0.838	% Cnt Err

Final page for worklist# 4523

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

6/20/96
Reviewer Signature **Date**

This is a revision of worklist #4523 to reflect the new % standard recovery of 95.16% Cheryl J. Benar 6/21/96

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

LABCORE Data Entry Template for Worklist# 4523

Analyst: KT **Instrument:** AB00 12 **Book#** 9B56
117 N16B-Strontium Carrier

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

Worklist Comment: Determine sample size using Ludlum. SLF

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				@SR90-01	SOLID		
2	BLNK-PREP				@SR90-01	SOLID		
3	BLNK/BKG				@SR90-01	SOLID		
4	SAMPLE	S95T003650	0	Z	@SR90-01	SOLID	95000180	BY104 ROTARY
	Analytes Requested: SR90-01 , SR90-01C, SR90-01E							
5	DUP	S95T003650	0	Z	@SR90-01	SOLID		
6	SAMPLE	S95T003651	0	Z	@SR90-01	SOLID	95000180	BY104 ROTARY
	Analytes Requested: SR90-01 , SR90-01C, SR90-01E							
7	DUP	S95T003651	0	Z	@SR90-01	SOLID		
8	SAMPLE	S95T003652	0	Z	@SR90-01	SOLID	95000180	BY104 ROTARY
	Analytes Requested: SR90-01 , SR90-01C, SR90-01E							
9	DUP	S95T003652	0	Z	@SR90-01	SOLID		
10	SAMPLE	S95T003653	0	Z	@SR90-01	SOLID	95000180	BY104 ROTARY
	Analytes Requested: SR90-01 , SR90-01C, SR90-01E							
11	DUP	S95T003653	0	Z	@SR90-01	SOLID		

Final page for worklist # 4523

Kim Thomas 12-31-95
Analyst Signature **Date**

M C Bill 1/2/95
Analyst Signature **Date**

Data Entry Comments:

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

LABCORE Completed Worklist Report for Worklist# 4523

Analyst: knt **Instrument:** AB12 **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	1.15E-03	1.18E-3	102.610	% Recovery
1	STD		0		@SR90-01	SR90-01C	SOLID	100	9.47E+01	94.700	% Recovery
1	STD		0		@SR90-01	SR90-01E	SOLID	1.00	1.82E+00	1.820	% Ct. Error
2	BLNK-PREP		0		@SR90-01	SR90-01	SOLID	1	1.41E-2	1.000e-002	uCi/g
2	BLNK-PREP		0		@SR90-01	SR90-01C	SOLID	100	9.33E+01	93.300	% Recovery
2	BLNK-PREP		0		@SR90-01	SR90-01E	SOLID	1.00	6.73E+01	67.300	% Ct. Error
3	BLNK/BKG		0		@SR90-01	SR90-01	SOLID	1	1.79E+00	1.790	uCi/g
4	SAMPLE	S95T003650	0	Z	@SR90-01	SR90-01	SOLID	N/A	1.91E+01	1.120e-002	uCi/g
4	SAMPLE	S95T003650	0	Z	@SR90-01	SR90-01C	SOLID	N/A	9.54E+01	1.000e-004	% Recovery
4	SAMPLE	S95T003650	0	Z	@SR90-01	SR90-01E	SOLID	N/A	9.62E-01	0.000	% Ct. Error
5	DUP	S95T003650	0	Z	@SR90-01	SR90-01	SOLID	1.91E+1	1.78E+1	7.050	RPD
5	DUP	S95T003650	0	Z	@SR90-01	SR90-01C	SOLID	100	9.47E+01	94.700	% Recovery
5	DUP	S95T003650	0	Z	@SR90-01	SR90-01E	SOLID	1.00	1.00E+00	1.000	% Ct. Error
6	SAMPLE	S95T003651	0	Z	@SR90-01	SR90-01	SOLID	N/A	1.93E+01	1.100e-002	uCi/g
6	SAMPLE	S95T003651	0	Z	@SR90-01	SR90-01C	SOLID	N/A	9.53E+01	1.000e-004	% Recovery
6	SAMPLE	S95T003651	0	Z	@SR90-01	SR90-01E	SOLID	N/A	9.46E-01	0.000	% Ct. Error
7	DUP	S95T003651	0	Z	@SR90-01	SR90-01	SOLID	1.93E+1	2.26E+1	15.750	RPD
7	DUP	S95T003651	0	Z	@SR90-01	SR90-01C	SOLID	100	9.48E+01	94.800	% Recovery
7	DUP	S95T003651	0	Z	@SR90-01	SR90-01E	SOLID	1.00	8.73E-01	0.870	% Ct. Error
8	SAMPLE	S95T003652	0	Z	@SR90-01	SR90-01	SOLID	N/A	1.67E+01	1.130e-002	uCi/g
8	SAMPLE	S95T003652	0	Z	@SR90-01	SR90-01C	SOLID	N/A	9.49E+01	1.000e-004	% Recovery
8	SAMPLE	S95T003652	0	Z	@SR90-01	SR90-01E	SOLID	N/A	1.03E+00	0.000	% Ct. Error
9	DUP	S95T003652	0	Z	@SR90-01	SR90-01	SOLID	1.67E+1	1.73E+1	3.530	RPD
9	DUP	S95T003652	0	Z	@SR90-01	SR90-01C	SOLID	100	9.42E+01	94.200	% Recovery
9	DUP	S95T003652	0	Z	@SR90-01	SR90-01E	SOLID	1.00	1.01E+00	1.010	% Ct. Error
10	SAMPLE	S95T003653	0	Z	@SR90-01	SR90-01	SOLID	N/A	2.43E+01	1.110e-002	uCi/g
10	SAMPLE	S95T003653	0	Z	@SR90-01	SR90-01C	SOLID	N/A	9.39E+01	1.000e-004	% Recovery
10	SAMPLE	S95T003653	0	Z	@SR90-01	SR90-01E	SOLID	N/A	8.50E-01	0.000	% Ct. Error
11	DUP	S95T003653	0	Z	@SR90-01	SR90-01	SOLID	2.43E+1	2.54E+1	4.430	RPD
11	DUP	S95T003653	0	Z	@SR90-01	SR90-01C	SOLID	100	9.53E+01	95.300	% Recovery
11	DUP	S95T003653	0	Z	@SR90-01	SR90-01E	SOLID	1.00	8.38E-01	0.840	% Ct. Error

Final page for worklist# 4523

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

1/2/96

Reviewer Signature **Date**

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

LABCORE Completed Worklist Report for Worklist# 4523

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit

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
	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
STD	TOTAL COUNTS	(TC)	11693	GROSS WEIGHT	(W2)		7.2600
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.1653
4523	BACKGROUND in cpm	(BKG)	3.8	NET WEIGHT	(W3)		0.0947
	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)		10.67
@SR90-01	DILUTION FACTOR	(DF)	1				
	DIGEST DILUTION FACTOR	DDF	1				
LIQUID	SAMPLE COUNT RATE	(Rs)	1165.50	SR-90 EFFICIENCY FACTO	(C1)		0.4180
	CRITICAL LEVEL	(Lc)	1.17	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
95005084	TIME OF SEPARATION	(ST)	21:05	Rmax			N/A
	DATE OF SEPARATION	(SD)	12/31/95	DETECTION LIMIT	(Ld)		2.44
0	TIME OF COUNT	(TOC)	07:45	Sr-89/90 CONC. in µCi/L			1.1828E+00
	DATE OF COUNT	(DOC)	01/01/96				
N/A	STANDARD BOOK #		9B56				
	STANDARD VALUE in µCi/mL		1.1511E-03				
WL4523							
WB27811	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						
MCB	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))						
SLF	Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)						
	Percent Carrier Recovery = (Net Weight / Expected weight) * 100						
KNT	NOTE: Expected weight = CVA * 0.1						
	Detection Levels and Less Than Values are determined from Procedure LA-508-002.						
01/02/96	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100						
							DETECTION LEVEL
12/31/95	Sr-89/90 CONCENTRATION		1.18E-03		µCi/mL		
09:05 PM	RELATIVE COUNTING ERROR		1.8%				2.48E-06 µCi/L
BY-104 ROTARY	PERCENT CARRIER RECOVERY		94.7%				

Analyst:	KNT	Date:	02-Jan-96
Signature of Chemist:	SLF	Date:	1/2/96

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
	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
BLNK-PREP	TOTAL COUNTS	(TC)	68	GROSS WEIGHT	(W2)	7.2730
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.1797
4523	BACKGROUND in cpm	(BKG)	3.8	NET WEIGHT	(W3)	0.0933
	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)	10.92
@SR90-01	DILUTION FACTOR	(DF)	1			
	DIGEST FACTOR (g/L)	(D g/L	2.1908			
SOLID	SAMPLE COUNT RATE	(Rs)	3.00	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
	CRITICAL LEVEL	(Lc)	1.17	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
95005084	TIME OF SEPARATION	(ST)	21:05	Rmax		N/A
	DATE OF SEPARATION	(SD)	12/31/95	DETECTION LIMIT	(Ld)	2.44
0	TIME OF COUNT	(TOC)	08:00	Sr-89/90 CONC in µCi/g		1.4072E-02
	DATE OF COUNT	(DOC)	01/01/96			

N/A

WL4523

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

WB27811 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)

MCB 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)

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

NOTE: Expected weight = CVA * 0.1

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

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

01/02/96

12/31/95	Sr-89/90 CONCENTRATION	1.41E-02	µCi/g	DETECTION LEVEL
09:05 PM	RELATIVE COUNTING ERROR	67.3%		1.14E-02 µCi/g
BY-104 ROTARY	PERCENT CARRIER RECOVERY	93.3%		

Analyst:	KNT	Date:	02-Jan-96
Signature of Chemist:	SLF	Date:	1/2/96

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
	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
SAMPLE	TOTAL COUNTS	(TC)	41664	GROSS WEIGHT	(W2)		7.3127
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.2173
4523	BACKGROUND in cpm	(BKG)	3.8	NET WEIGHT	(W3)		0.0954
	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)		11.08
@SR90-01	DILUTION FACTOR	(DF)	1				
	DIGEST FACTOR (g/L)	(D g/L	2.1908				
SOLID	SAMPLE COUNT RATE	(Rs)	4162.60	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
	CRITICAL LEVEL	(Lc)	1.17	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
95005084	TIME OF SEPARATION	(ST)	21:05	Rmax			N/A
	DATE OF SEPARATION	(SD)	12/31/95	DETECTION LIMIT	(Ld)		2.44
0	TIME OF COUNT	(TOC)	08:10	Sr-89/90 CONC in µCi/g			1.9066E+01
	DATE OF COUNT	(DOC)	01/01/96				
FUS-ZR01							
S95T003650							

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

WB27811 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)

MCB 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)

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

NOTE: Expected weight = CVA * 0.1

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

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

01/02/96

12/31/95	Sr-89/90 CONCENTRATION	1.91E+01	µCi/g	DETECTION LEVEL
09:05 PM	RELATIVE COUNTING ERROR	1.0%		1.12E-02 µCi/g
BY-104 ROTARY	PERCENT CARRIER RECOVERY	95.4%		

Analyst:	KNT	Date:	02-Jan-96
Signature of Chemist:	SLF	Date:	1/2/96

SAMPLE.WB1 REV 1.2 22010NML

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WORKBOOK PAGE: DUP5

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

							DUP
	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
DUP	TOTAL COUNTS	(TC)	38472	GROSS WEIGHT	(W2)	7.2243
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.1296
4523	BACKGROUND in cpm	(BKG)	3.8	NET WEIGHT	(W3)	0.0947
	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)	11.42
@SR90-01	DILUTION FACTOR	(DF)	1			
	DIGEST FACTOR (g/L)	(D g/L	2.17			
SOLID	SAMPLE COUNT RATE	(Rs)	3843.40	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
	CRITICAL LEVEL	(Lc)	1.17	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
95005084	TIME OF SEPARATION	(ST)	21:05	Rmax		N/A
	DATE OF SEPARATION	(SD)	12/31/95	DETECTION LIMIT	(Ld)	2.44
0	TIME OF COUNT	(TOC)	08:30	Sr-89/90 CONC in µCi/g		1.7847E+01
	DATE OF COUNT	(DOC)	01/01/96			

FUS-ZR01

S95T003650

WB27811

MCB

SLF

KNT

01/02/96

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

12/31/95	Sr-89/90 CONCENTRATION	1.78E+01	µCi/g	DETECTION LEVEL
09:05 PM	RELATIVE COUNTING ERROR	1.0%		1.13E-02 µCi/g
BY-104 ROTARY	PERCENT CARRIER RECOVERY	94.7%		

Analyst:	KNT	Date:	02-Jan-96
Signature of Chemist:	SLF	Date:	1/2/96

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
	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
SAMPLE	TOTAL COUNTS	(TC)	43073	GROSS WEIGHT	(W2)		7.0752
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		6.9799
4523	BACKGROUND in cpm	(BKG)	3.8	NET WEIGHT	(W3)		0.0953
	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)		11.58
@SR90-01	DILUTION FACTOR	(DF)	1				
	DIGEST FACTOR (g/L)	(D g/L	2.2236				
SOLID	SAMPLE COUNT RATE	(Rs)	4303.50	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
	CRITICAL LEVEL	(Lc)	1.17	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
95005084	TIME OF SEPARATION	(ST)	21:05	Rmax			N/A
	DATE OF SEPARATION	(SD)	12/31/95	DETECTION LIMIT	(Ld)		2.44
0	TIME OF COUNT	(TOC)	08:40	Sr-89/90 CONC in µCi/g			1.9349E+01
	DATE OF COUNT	(DOC)	01/01/96				

FUS-ZR01

S95T003651

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

WB27811 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)

MCB 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)

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

NOTE: Expected weight = CVA * 0.1

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

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

01/02/96

12/31/95	Sr-89/90 CONCENTRATION	1.93E+01	µCi/g	DETECTION LEVEL
09:05 PM	RELATIVE COUNTING ERROR	0.9%		1.10E-02 µCi/g
BY-104 ROTARY	PERCENT CARRIER RECOVERY	95.3%		

Analyst:	KNT	Date:	02-Jan-96
Signature of Chemist:	SLF	Date:	1/2/96

SAMPLE.WB1 REV 1.2 22010NML

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WORKBOOK PAGE: DUP7

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

							DUP
	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
DUP	TOTAL COUNTS	(TC)	50567	GROSS WEIGHT	(W2)	7.2031
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.1083
4523	BACKGROUND in cpm	(BKG)	3.8	NET WEIGHT	(W3)	0.0948
	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)	11.75
@SR90-01	DILUTION FACTOR	(DF)	1			
	DIGEST FACTOR (g/L)	(D g/L	2.2396			
SOLID	SAMPLE COUNT RATE	(Rs)	5052.90	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
	CRITICAL LEVEL	(Lc)	1.17	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
95005084	TIME OF SEPARATION	(ST)	21:05	Rmax		N/A
	DATE OF SEPARATION	(SD)	12/31/95	DETECTION LIMIT	(Ld)	2.44
0	TIME OF COUNT	(TOC)	08:50	Sr-89/90 CONC in µCi/g		2.2640E+01
	DATE OF COUNT	(DOC)	01/01/96			

FUS-ZR01

S95T003651

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

WB27811 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)

MCB 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)

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

NOTE: Expected weight = CVA * 0.1

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

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

01/02/96

12/31/95	Sr-89/90 CONCENTRATION	2.26E+01	µCi/g	DETECTION LEVEL
09:05 PM	RELATIVE COUNTING ERROR	0.9%		1.09E-02 µCi/g
BY-104 ROTARY	PERCENT CARRIER RECOVERY	94.8%		

Analyst:	KNT	Date:	02-Jan-96
Signature of Chemist:	SLF	Date:	1/2/96

SAMPLE.WB1 REV 1.2 22010NML

1921

WORKBOOK PAGE: SAM8 WHC-SD-WM-DP-164, REV. 1

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

							SAMPLE
	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
SAMPLE	TOTAL COUNTS	(TC)	36044	GROSS WEIGHT	(W2)	7.2098
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.1149
4523	BACKGROUND in cpm	(BKG)	3.8	NET WEIGHT	(W3)	0.0949
	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)	11.92
@SR90-01	DILUTION FACTOR	(DF)	1			
	DIGEST FACTOR (g/L)	(D g/L	2.156			
SOLID	SAMPLE COUNT RATE	(Rs)	3600.60	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
	CRITICAL LEVEL	(Lc)	1.17	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
95005084	TIME OF SEPARATION	(ST)	21:05	Rmax		N/A
	DATE OF SEPARATION	(SD)	12/31/95	DETECTION LIMIT	(Ld)	2.44
0	TIME OF COUNT	(TOC)	09:00	Sr-89/90 CONC in µCi/g		1.6714E+01
	DATE OF COUNT	(DOC)	01/01/96			
FUS-ZR01						
S95T003652						

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

WB27811 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)

MCB 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)

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

NOTE: Expected weight = CVA * 0.1

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

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

01/02/96

12/31/95	Sr-89/90 CONCENTRATION	1.67E+01	µCi/g	DETECTION LEVEL
09:05 PM	RELATIVE COUNTING ERROR	1.0%		1.13E-02 µCi/g
BY-104 ROTARY	PERCENT CARRIER RECOVERY	94.9%		

Analyst:	KNT	Date:	02-Jan-96
Signature of Chemist:	SLF	Date:	1/2/96

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
	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
DUP	TOTAL COUNTS	(TC)	37795	GROSS WEIGHT	(W2)	7.2466
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.1524
4523	BACKGROUND in cpm	(BKG)	3.8	NET WEIGHT	(W3)	0.0942
	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)	12.67
@SR90-01	DILUTION FACTOR	(DF)	1			
	DIGEST FACTOR (g/L)	(D g/L	2.1812			
SOLID	SAMPLE COUNT RATE	(Rs)	3775.70	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
	CRITICAL LEVEL	(Lc)	1.17	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
95005084	TIME OF SEPARATION	(ST)	21:05	Rmax		N/A
	DATE OF SEPARATION	(SD)	12/31/95	DETECTION LIMIT	(Ld)	2.44
0	TIME OF COUNT	(TOC)	09:45	Sr-89/90 CONC in µCi/g		1.7333E+01
	DATE OF COUNT	(DOC)	01/01/96			
FUS-ZR01						
S95T003652						

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

WB27811 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)

MCB 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)

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

NOTE: Expected weight = CVA * 0.1

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

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

01/02/96

12/31/95	Sr-89/90 CONCENTRATION	1.73E+01	µCi/g	DETECTION LEVEL
09:05 PM	RELATIVE COUNTING ERROR	1.0%		1.12E-02 µCi/g
BY-104 ROTARY	PERCENT CARRIER RECOVERY	94.2%		

Analyst:	KNT	Date:	02-Jan-96
Signature of Chemist:	SLF	Date:	1/2/96

SAMPLE.WB1 REV 1.2 22010NML

1923

WORKBOOK PAGE: SAM10

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

							SAMPLE
	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
SAMPLE	TOTAL COUNTS	(TC)	53228	GROSS WEIGHT	(W2)	7.1472
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.0533
4523	BACKGROUND in cpm	(BKG)	3.8	NET WEIGHT	(W3)	0.0939
	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)	12.83
@SR90-01	DILUTION FACTOR	(DF)	1			
	DIGEST FACTOR (g/L)	(D g/L	2.1952			
SOLID	SAMPLE COUNT RATE	(Rs)	5319.00	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
	CRITICAL LEVEL	(Lc)	1.17	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
95005084	TIME OF SEPARATION	(ST)	21:05	Rmax		N/A
	DATE OF SEPARATION	(SD)	12/31/95	DETECTION LIMIT	(Ld)	2.44
0	TIME OF COUNT	(TOC)	09:55	Sr-89/90 CONC in µCi/g		2.4302E+01
	DATE OF COUNT	(DOC)	01/01/96			

FUS-ZR01

S95T003653

WB27811

MCB

SLF

KNT

01/02/96

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
12/31/95	Sr-89/90 CONCENTRATION	2.43E+01	µCi/g	
09:05 PM	RELATIVE COUNTING ERROR	0.9%		1.11E-02 µCi/g
BY-104 ROTARY	PERCENT CARRIER RECOVERY	93.9%		

Analyst:	KNT	Date:	02-Jan-96
Signature of Chemist:	SLF	Date:	1/2/96

SAMPLE.WB1 REV 1.2 22010NML

WORKBOOK PAGE: DUP11

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

							DUP
	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
DUP	TOTAL COUNTS	(TC)	54837	GROSS WEIGHT	(W2)		7.2516
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.1563
4523	BACKGROUND in cpm	(BKG)	3.8	NET WEIGHT	(W3)		0.0953
	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)		13.08
@SR90-01	DILUTION FACTOR	(DF)	1				
	DIGEST FACTOR (g/L)	(D g/L	2.1276				
SOLID	SAMPLE COUNT RATE	(Rs)	5479.90	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
	CRITICAL LEVEL	(Lc)	1.17	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
95005084	TIME OF SEPARATION	(ST)	21:05	Rmax			N/A
	DATE OF SEPARATION	(SD)	12/31/95	DETECTION LIMIT	(Ld)		2.44
0	TIME OF COUNT	(TOC)	10:10	Sr-89/90 CONC in µCi/g			2.5395E+01
	DATE OF COUNT	(DOC)	01/01/96				
FUS-ZR01							
S95T003653							

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

WB27811 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)

MCB 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)

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

NOTE: Expected weight = CVA * 0.1

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

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

01/02/96

12/31/95	Sr-89/90 CONCENTRATION	2.54E+01	µCi/g	DETECTION LEVEL
09:05 PM	RELATIVE COUNTING ERROR	0.8%		1.13E-02 µCi/g
BY-104 ROTARY	PERCENT CARRIER RECOVERY	95.3%		

Analyst:	KNT	Date:	02-Jan-96
Signature of Chemist:	SLF	Date:	1/2/96

SAMPLE.WB1 REV 1.2 22010NML

LABCORE Completed Worklist Report for Worklist# 4524

Analyst: knt **Instrument:** AB12 **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	1.24E-03	1.16E-3	93.550	% Recovery
1	STD		0		@SR90-01	SR90-01C	SOLID	100	9.46E+01	94.600	% Recovery
1	STD		0		@SR90-01	SR90-01E	SOLID	1.00	1.73E+00	1.730	% Ct. Erro
2	BLNK-PREP		0		@SR90-01	SR90-01	SOLID	1	1.29E-2	0.013	uCi/g
2	BLNK-PREP		0		@SR90-01	SR90-01C	SOLID	100	9.48E+01	94.800	% Recovery
2	BLNK-PREP		0		@SR90-01	SR90-01E	SOLID	1.00	7.67E+01	76.700	uCi/g
3	BLNK/BKG		0		@SR90-01	SR90-01	SOLID	1	1.56E+00	1.560	BLNK/BKG
4	SAMPLE	S95T003654	0	Z	@SR90-01	SR90-01	SOLID	N/A	1.92E+01	1.24e-002	uCi/g
4	SAMPLE	S95T003654	0	Z	@SR90-01	SR90-01C	SOLID	N/A	9.50E+01	1.00e-004	% Recovery
4	SAMPLE	S95T003654	0	Z	@SR90-01	SR90-01E	SOLID	N/A	9.27E-01		% Ct. Error
5	DUP	S95T003654	0	Z	@SR90-01	SR90-01	SOLID	1.92E+1	1.94E+1	1.036	RPD
5	DUP	S95T003654	0	Z	@SR90-01	SR90-01C	SOLID	100	9.41E+01	94.100	% Recovery
5	DUP	S95T003654	0	Z	@SR90-01	SR90-01E	SOLID	1.00	9.38E-01	0.938	% Cnt Err
6	SAMPLE	S95T003655	0	Z	@SR90-01	SR90-01	SOLID	N/A	1.95E+01	1.19e-002	uCi/g
6	SAMPLE	S95T003655	0	Z	@SR90-01	SR90-01C	SOLID	N/A	9.58E+01	1.00e-004	% Recovery
6	SAMPLE	S95T003655	0	Z	@SR90-01	SR90-01E	SOLID	N/A	9.01E-01		% Ct. Error
7	DUP	S95T003655	0	Z	@SR90-01	SR90-01	SOLID	1.95E+1	1.82E+1	6.897	RPD
7	DUP	S95T003655	0	Z	@SR90-01	SR90-01C	SOLID	100	9.51E+01	95.100	% Recovery
7	DUP	S95T003655	0	Z	@SR90-01	SR90-01E	SOLID	1.00	9.45E-01	0.945	% Cnt Err
8	SAMPLE	S95T003656	0	Z	@SR90-01	SR90-01	SOLID	N/A	1.79E+01	1.10e-002	uCi/g
8	SAMPLE	S95T003656	0	Z	@SR90-01	SR90-01C	SOLID	N/A	9.46E+01	1.00e-004	% Recovery
8	SAMPLE	S95T003656	0	Z	@SR90-01	SR90-01E	SOLID	N/A	9.02E-01		% Ct. Error
9	DUP	S95T003656	0	Z	@SR90-01	SR90-01	SOLID	1.79E+1	1.77E+1	1.124	RPD
9	DUP	S95T003656	0	Z	@SR90-01	SR90-01C	SOLID	100	9.49E+01	94.900	% Recovery
9	DUP	S95T003656	0	Z	@SR90-01	SR90-01E	SOLID	1.00	9.16E-01	0.916	% Cnt Err
10	SAMPLE	S95T003657	0	Z	@SR90-01	SR90-01	SOLID	N/A	1.45E+01	9.98e-003	uCi/g
10	SAMPLE	S95T003657	0	Z	@SR90-01	SR90-01C	SOLID	N/A	1.07E+02	1.00e-004	% Recovery
10	SAMPLE	S95T003657	0	Z	@SR90-01	SR90-01E	SOLID	N/A	9.57E-01		% Ct. Error
11	DUP	S95T003657	0	Z	@SR90-01	SR90-01	SOLID	1.45E+1	1.63E+1	11.688	RPD
11	DUP	S95T003657	0	Z	@SR90-01	SR90-01C	SOLID	100	9.54E+01	95.400	% Recovery
11	DUP	S95T003657	0	Z	@SR90-01	SR90-01E	SOLID	1.00	9.47E-01	0.947	% Cnt Err

Final page for worklist# 4524

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

[signature] 6/20/96
Reviewer Signature **Date**

This is a revision of worklist #4524 to reflect the new % standard recovery of 93.55%

Cheryl J. Benar 6/21/96

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

LABCORE Data Entry Template for Worklist# 4524

Analyst: KT **Instrument:** AB00 12 **Book#** 9B56

Method: LA-220-101 Rev/Mod D-1 117N16B-Strontium Carrier

Worklist Comment: Determine sample size using Ludlum. SLF

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				@SR90-01	SOLID		
2	BLNK-PREP				@SR90-01	SOLID		
3	BLNK/BKG				@SR90-01	SOLID		
4	SAMPLE	S95T003654	0	Z	@SR90-01	SOLID	95000180	BY104 ROTARY
	Analytes Requested: SR90-01 , SR90-01C, SR90-01E							
5	DUP	S95T003654	0	Z	@SR90-01	SOLID		
6	SAMPLE	S95T003655	0	Z	@SR90-01	SOLID	95000180	BY104 ROTARY
	Analytes Requested: SR90-01 , SR90-01C, SR90-01E							
7	DUP	S95T003655	0	Z	@SR90-01	SOLID		
8	SAMPLE	S95T003656	0	Z	@SR90-01	SOLID	95000180	BY104 ROTARY
	Analytes Requested: SR90-01 , SR90-01C, SR90-01E							
9	DUP	S95T003656	0	Z	@SR90-01	SOLID		
10	SAMPLE	S95T003657	0	Z	@SR90-01	SOLID	95000180	BY104 ROTARY
	Analytes Requested: SR90-01 , SR90-01C, SR90-01E							
11	DUP	S95T003657	0	Z	@SR90-01	SOLID		

Final page for worklist # 4524

Kim Thomas 1-1-96
Analyst Signature **Date**

GM Bucew 1-2-96
Analyst Signature **Date**

1-2-96

Data Entry Comments:

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

LABCORE Completed Worklist Report for Worklist# 4524

Analyst: knt **Instrument:** AB12 **Book#** _____

Method: _____ Rev/Mod _____ WHC-SD-WM-DP-164, REV. 1

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	1.15E-03	1.16E-3	100.870	% Recovery
1	STD		0		●SR90-01	SR90-01C	SOLID	100	9.46E+01	94.600	% Recovery
1	STD		0		●SR90-01	SR90-01E	SOLID	1.00	1.73E+00	1.730	% Ct. Error
2	BLNK-PREP		0		●SR90-01	SR90-01	SOLID	1	1.29E-2	1.000e-002	uCi/g
2	BLNK-PREP		0		●SR90-01	SR90-01C	SOLID	100	9.48E+01	94.800	% Recovery
2	BLNK-PREP		0		●SR90-01	SR90-01E	SOLID	1.00	7.67E+01	76.700	% Ct. Error
3	BLNK/BKG		0		●SR90-01	SR90-01	SOLID	1	1.56E+00	1.560	uCi/g
4	SAMPLE	S95T003654	0	Z	●SR90-01	SR90-01	SOLID	N/A	1.92E+01	1.240e-002	uCi/g
4	SAMPLE	S95T003654	0	Z	●SR90-01	SR90-01C	SOLID	N/A	9.50E+01	1.000e-004	% Recovery
4	SAMPLE	S95T003654	0	Z	●SR90-01	SR90-01E	SOLID	N/A	9.27E-01	0.000	% Ct. Error
5	DUP	S95T003654	0	Z	●SR90-01	SR90-01	SOLID	1.92E+1	1.94E+1	1.040	RPD
5	DUP	S95T003654	0	Z	●SR90-01	SR90-01C	SOLID	100	9.41E+01	94.100	% Recovery
5	DUP	S95T003654	0	Z	●SR90-01	SR90-01E	SOLID	1.00	9.38E-01	0.940	% Ct. Error
6	SAMPLE	S95T003655	0	Z	●SR90-01	SR90-01	SOLID	N/A	1.95E+01	1.190e-002	uCi/g
6	SAMPLE	S95T003655	0	Z	●SR90-01	SR90-01C	SOLID	N/A	9.58E+01	1.000e-004	% Recovery
6	SAMPLE	S95T003655	0	Z	●SR90-01	SR90-01E	SOLID	N/A	9.01E-01	0.000	% Ct. Error
7	DUP	S95T003655	0	Z	●SR90-01	SR90-01	SOLID	1.95E+1	1.82E+1	6.900	RPD
7	DUP	S95T003655	0	Z	●SR90-01	SR90-01C	SOLID	100	9.51E+01	95.100	% Recovery
7	DUP	S95T003655	0	Z	●SR90-01	SR90-01E	SOLID	1.00	9.45E-01	0.950	% Ct. Error
8	SAMPLE	S95T003656	0	Z	●SR90-01	SR90-01	SOLID	N/A	1.79E+01	1.100e-002	uCi/g
8	SAMPLE	S95T003656	0	Z	●SR90-01	SR90-01C	SOLID	N/A	9.46E+01	1.000e-004	% Recovery
8	SAMPLE	S95T003656	0	Z	●SR90-01	SR90-01E	SOLID	N/A	9.02E-01	0.000	% Ct. Error
9	DUP	S95T003656	0	Z	●SR90-01	SR90-01	SOLID	1.79E+1	1.77E+1	1.120	RPD
9	DUP	S95T003656	0	Z	●SR90-01	SR90-01C	SOLID	100	9.49E+01	94.900	% Recovery
9	DUP	S95T003656	0	Z	●SR90-01	SR90-01E	SOLID	1.00	9.16E-01	0.920	% Ct. Error
10	SAMPLE	S95T003657	0	Z	●SR90-01	SR90-01	SOLID	N/A	1.45E+01	9.980e-003	uCi/g
10	SAMPLE	S95T003657	0	Z	●SR90-01	SR90-01C	SOLID	N/A	1.07E+02	1.000e-004	% Recovery
10	SAMPLE	S95T003657	0	Z	●SR90-01	SR90-01E	SOLID	N/A	9.57E-01	0.000	% Ct. Error
11	DUP	S95T003657	0	Z	●SR90-01	SR90-01	SOLID	1.45E+1	1.63E+1	11.690	RPD
11	DUP	S95T003657	0	Z	●SR90-01	SR90-01C	SOLID	100	9.54E+01	95.400	% Recovery
11	DUP	S95T003657	0	Z	●SR90-01	SR90-01E	SOLID	1.00	9.47E-01	0.950	% Ct. Error

Final page for worklist# 4524

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

1/4/96
Reviewer Signature **Date**

See page 1926 for the correct % standard recovery of 93.55%. Cheryl J. Benton 6/21/96

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

LABCORE Completed Worklist Report for Worklist# 4524

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit

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

WHC-SD-WM-DP-164, REV. 1

WORKBOOK PAGE: STD1

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

							STANDARD
	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
STD	TOTAL COUNTS	(TC)	13036	GROSS WEIGHT	(W2)	7.2417
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.1471
4524	BACKGROUND in cpm	(BKG)	5.4	NET WEIGHT	(W3)	0.0946
	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)	25.83
@SR90-01	DILUTION FACTOR	(DF)	1			
	DIGEST DILUTION FACTOR	DDF	1			
LIQUID	SAMPLE COUNT RATE	(Rs)	1298.20	SR-90 EFFICIENCY FACTO	(C1)	0.4180
	CRITICAL LEVEL	(Lc)	1.40	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
95005085	TIME OF SEPARATION	(ST)	05:00	Rmax		N/A
	DATE OF SEPARATION	(SD)	01/01/96	DETECTION LIMIT	(Ld)	2.89
0	TIME OF COUNT	(TOC)	06:50	Sr-89/90 CONC. in µCi/L		1.1632E+00
	DATE OF COUNT	(DOC)	01/02/96			
N/A	STANDARD BOOK #		9B56			
	STANDARD VALUE in µCi/mL		1.1510E-03			

WL4524

WB27811

EMB

SLF

KNT

01/02/96

01/01/96

05:00 AM

BY104 ROTARY

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	1.16E-03	µCi/mL	DETECTION LEVEL
RELATIVE COUNTING ERROR	1.7%		2.59E-06 µCi/L
PERCENT CARRIER RECOVERY	94.6%		

Analyst:	KNT	Date:	02-Jan-96
Signature of Chemist:	SLF	Date:	1/4/96

STANDARD.WB1 REV 1.2 22010NMU

1923

I:\22010N\OUT\SR4524.WB1 01/02/96

WORKBOOK PAGE: BLANK2

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

						BLNK-PREP
	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
BLNK-PREP	TOTAL COUNTS	(TC)	84	GROSS WEIGHT	(W2)	7.2432
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.1484
4524	BACKGROUND in cpm	(BKG)	5.4	NET WEIGHT	(W3)	0.0948
	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)	26.00
@SR90-01	DILUTION FACTOR	(DF)	1			
	DIGEST FACTOR (g/L)	(D g/L)	2.08			
SOLID	SAMPLE COUNT RATE	(Rs)	3.00	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
	CRITICAL LEVEL	(Lc)	1.40	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
95005085	TIME OF SEPARATION	(ST)	05:00	Rmax		N/A
	DATE OF SEPARATION	(SD)	01/01/96	DETECTION LIMIT	(Ld)	2.89
0	TIME OF COUNT	(TOC)	07:00	Sr-89/90 CONC in µCi/g		1.2881E-02
	DATE OF COUNT	(DOC)	01/02/96			

N/A

WL4524

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

WB27811 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)

EMB 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)

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

NOTE: Expected weight = CVA * 0.1

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

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

01/02/96

01/01/96

05:00 AM

BY104 ROTARY

Sr-89/90 CONCENTRATION	1.29E-02	µCi/g	DETECTION LEVEL
RELATIVE COUNTING ERROR	76.7%		1.24E-02 µCi/g
PERCENT CARRIER RECOVERY	94.8%		

Analyst:	KNT	Date:	02-Jan-96
Signature of Chemist:	SLF	Date:	1/4/96

BLANK.WB1 REV 1.2 22010NML

1930

WORKBOOK PAGE: SAM4

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

							SAMPLE
	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
SAMPLE	TOTAL COUNTS	(TC)	44904	GROSS WEIGHT	(W2)	7.2200
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.1250
4524	BACKGROUND in cpm	(BKG)	5.4	NET WEIGHT	(W3)	0.0950
	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)	26.17
@SR90-01	DILUTION FACTOR	(DF)	1			
	DIGEST FACTOR (g/L)	(D g/L	2.08			
SOLID	SAMPLE COUNT RATE	(Rs)	4485.00	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
	CRITICAL LEVEL	(Lc)	1.40	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
95005085	TIME OF SEPARATION	(ST)	05:00	Rmax		N/A
	DATE OF SEPARATION	(SD)	01/01/96	DETECTION LIMIT	(Ld)	2.89
0	TIME OF COUNT	(TOC)	07:10	Sr-89/90 CONC in µCi/g		1.9193E+01
	DATE OF COUNT	(DOC)	01/02/96			

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S95T003654

WB27811

EMB

SLF

KNT

01/02/96

01/01/96

05:00 AM

BY104 ROTARY

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	1.92E+01	µCi/g	DETECTION LEVEL
RELATIVE COUNTING ERROR	0.9%		1.24E-02 µCi/g
PERCENT CARRIER RECOVERY	95.0%		

Analyst:	KNT	Date:	02-Jan-96
Signature of Chemist:	SLF	Date:	1/4/96

SAMPLE.WB1 REV 1.2 22010NML

1931

WORKBOOK PAGE: DUP5

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

							DUP
	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
DUP	TOTAL COUNTS	(TC)	43843	GROSS WEIGHT	(W2)	7.2612
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.1671
4524	BACKGROUND in cpm	(BKG)	5.4	NET WEIGHT	(W3)	0.0941
	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)	26.42
@SR90-01	DILUTION FACTOR	(DF)	1			
	DIGEST FACTOR (g/L)	(D g/L	2.0268			
SOLID	SAMPLE COUNT RATE	(Rs)	4378.90	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
	CRITICAL LEVEL	(Lc)	1.40	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
95005085	TIME OF SEPARATION	(ST)	05:00	Rmax		N/A
	DATE OF SEPARATION	(SD)	01/01/96	DETECTION LIMIT	(Ld)	2.89
0	TIME OF COUNT	(TOC)	07:25	Sr-89/90 CONC in µCi/g		1.9381E+01
	DATE OF COUNT	(DOC)	01/02/96			

FUS-ZR01

S95T003654

WB27811

EMB

SLF

KNT

01/02/96

01/01/96

05:00 AM

BY104 ROTARY

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	1.94E+01	µCi/g	
RELATIVE COUNTING ERROR	0.9%		1.28E-02 µCi/g
PERCENT CARRIER RECOVERY	94.1%		

Analyst:	KNT	Date:	02-Jan-96
Signature of Chemist:	SLF	Date:	1/4/96

SAMPLE.WB1 REV 1.2 22010NM

WORKBOOK PAGE: SAM6

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

							SAMPLE
	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
SAMPLE	TOTAL COUNTS	(TC)	47442	GROSS WEIGHT	(W2)	7.1739
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.0781
4524	BACKGROUND in cpm	(BKG)	5.4	NET WEIGHT	(W3)	0.0958
	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)	26.75
@SR90-01	DILUTION FACTOR	(DF)	1			
	DIGEST FACTOR (g/L)	(D g/L	2.1316			
SOLID	SAMPLE COUNT RATE	(Rs)	4738.80	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
	CRITICAL LEVEL	(Lc)	1.40	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
95005085	TIME OF SEPARATION	(ST)	05:00	Rmax		N/A
	DATE OF SEPARATION	(SD)	01/01/96	DETECTION LIMIT	(Ld)	2.89
0	TIME OF COUNT	(TOC)	07:45	Sr-89/90 CONC in µCi/g		1.9542E+01
	DATE OF COUNT	(DOC)	01/02/96			

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S95T003655

WB27811

EMB

SLF

KNT

01/02/96

01/01/96

05:00 AM

BY104 ROTARY

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	1.95E+01	µCi/g	1.19E-02 µCi/g
	RELATIVE COUNTING ERROR	0.9%		
	PERCENT CARRIER RECOVERY	95.8%		

Analyst:	KNT	Date:	02-Jan-96
Signature of Chemist:	SLF	Date:	1/4/96

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
[illegible]	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
DUP	TOTAL COUNTS	(TC)	43177	GROSS WEIGHT	(W2)		7.2487
[illegible]	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.1536
4524	BACKGROUND in cpm	(BKG)	5.4	NET WEIGHT	(W3)		0.0951
[illegible]	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)		26.92
@SR90-01	DILUTION FACTOR	(DF)	1				
[illegible]	DIGEST FACTOR (g/L)	(D g/L	2.0916				
SOLID	SAMPLE COUNT RATE	(Rs)	4312.30	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
[illegible]	CRITICAL LEVEL	(Lc)	1.40	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
95005085	TIME OF SEPARATION	(ST)	05:00	Rmax			N/A
[illegible]	DATE OF SEPARATION	(SD)	01/01/96	DETECTION LIMIT	(Ld)		2.89
0	TIME OF COUNT	(TOC)	07:55	Sr-89/90 CONC in µCi/g			1.8236E+01
[illegible]	DATE OF COUNT	(DOC)	01/02/96				
FUS-ZR01							
[illegible]							
S95T003655							
[illegible]	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)						
WB27811	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						
[illegible]	RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*DDF*REC*2220000)						
EMB	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))						
[illegible]	Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)						
SLF	Percent Carrier Recovery = (Net Weight / Expected weight) * 100						
[illegible]	NOTE: Expected weight = CVA * 0.1						
KNT	Detection Levels and Less Than Values are determined from Procedure LA-508-002.						
[illegible]	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100						
01/02/96							
[illegible]							DETECTION LEVEL
01/01/96	Sr-89/90 CONCENTRATION			1.82E+01	µCi/g		
[illegible]							
05:00 AM	RELATIVE COUNTING ERROR			0.9%			1.22E-02 µCi/g
[illegible]							
BY104 ROTARY	PERCENT CARRIER RECOVERY			95.1%			

Analyst:	KNT	Date:	02-Jan-96
Signature of Chemist:	SLF	Date:	1/4/96

SAMPLE.WB1 REV 1.2 22010NML

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WORKBOOK PAGE: SAM8

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

							SAMPLE
	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
SAMPLE	TOTAL COUNTS	(TC)	47340	GROSS WEIGHT	(W2)	7.2754
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.1808
4524	BACKGROUND in cpm	(BKG)	5.4	NET WEIGHT	(W3)	0.0946
	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)	27.33
@SR90-01	DILUTION FACTOR	(DF)	1			
	DIGEST FACTOR (g/L)	(D g/L	2.3364			
SOLID	SAMPLE COUNT RATE	(Rs)	4728.60	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
	CRITICAL LEVEL	(Lc)	1.40	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
95005085	TIME OF SEPARATION	(ST)	05:00	Rmax		N/A
	DATE OF SEPARATION	(SD)	01/01/96	DETECTION LIMIT	(Ld)	2.89
0	TIME OF COUNT	(TOC)	08:20	Sr-89/90 CONC in µCi/g		1.7943E+01
	DATE OF COUNT	(DOC)	01/02/96			

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S95T003656

WB27811

EMB

SLF

KNT

01/02/96

01/01/96

05:00 AM

BY104 ROTARY

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	1.79E+01	µCi/g		
RELATIVE COUNTING ERROR	0.9%			1.10E-02 µCi/g
PERCENT CARRIER RECOVERY	94.6%			

Analyst:	KNT	Date:	02-Jan-96
Signature of Chemist:	SLF	Date:	1/4/96

SAMPLE.WB1 REV 1.2 22010NML

1935

WORKBOOK PAGE: DUP9

WHC-SD-WM-DP-164, REV. 1

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

							DUP
	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
DUP	TOTAL COUNTS	(TC)	45944	GROSS WEIGHT	(W2)	7.2255
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.1306
4524	BACKGROUND in cpm	(BKG)	5.4	NET WEIGHT	(W3)	0.0949
	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)	27.75
@SR90-01	DILUTION FACTOR	(DF)	1			
	DIGEST FACTOR (g/L)	(D g/L	2.2908			
SOLID	SAMPLE COUNT RATE	(Rs)	4589.00	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
	CRITICAL LEVEL	(Lc)	1.40	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
95005085	TIME OF SEPARATION	(ST)	05:00	Rmax		N/A
	DATE OF SEPARATION	(SD)	01/01/96	DETECTION LIMIT	(Ld)	2.89
0	TIME OF COUNT	(TOC)	08:45	Sr-89/90 CONC in µCi/g		1.7653E+01
	DATE OF COUNT	(DOC)	01/02/96			

FUS-ZR01

S95T003656

WB27811

EMB

SLF

KNT

01/02/96

01/01/96

05:00 AM

BY104 ROTARY

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	1.77E+01	µCi/g	DETECTION LEVEL
RELATIVE COUNTING ERROR	0.9%		1.11E-02 µCi/g
PERCENT CARRIER RECOVERY	94.9%		

Analyst:	KNT	Date:	02-Jan-96
Signature of Chemist:	SLF	Date:	1/4/96

SAMPLE.WB1 REV 1.2 22010NML

1936

WORKBOOK PAGE: SAM10

WHC-SD-WM-DP-164, REV. 1

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

							SAMPLE
	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
SAMPLE	TOTAL COUNTS	(TC)	42116	GROSS WEIGHT	(W2)		7.1280
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.0207
4524	BACKGROUND in cpm	(BKG)	5.4	NET WEIGHT	(W3)		0.1073
	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)		28.00
@SR90-01	DILUTION FACTOR	(DF)	1				
	DIGEST FACTOR (g/L)	(D g/L	2.2532				
SOLID	SAMPLE COUNT RATE	(Rs)	4206.20	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
	CRITICAL LEVEL	(Lc)	1.40	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
95005085	TIME OF SEPARATION	(ST)	05:00	Rmax			N/A
	DATE OF SEPARATION	(SD)	01/01/96	DETECTION LIMIT	(Ld)		2.89
0	TIME OF COUNT	(TOC)	09:00	Sr-89/90 CONC in µCi/g			1.4524E+01
	DATE OF COUNT	(DOC)	01/02/96				

FUS-ZR01

S95T003657

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

WB27811 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)

EMB 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)

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

NOTE: Expected weight = CVA * 0.1

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

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

01/02/96

01/01/96

05:00 AM

BY104 ROTARY

Sr-89/90 CONCENTRATION	1.45E+01	µCi/g	DETECTION LEVEL
RELATIVE COUNTING ERROR	1.0%		9.98E-03 µCi/g
PERCENT CARRIER RECOVERY	107.3%		

Analyst:	KNT	Date:	02-Jan-96
Signature of Chemist:	SLF	Date:	1/4/96

SAMPLE.WB1 REV 1.2 22010NML

1937

WORKBOOK PAGE: DUP11

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

							DUP
	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
DUP	TOTAL COUNTS	(TC)	42960	GROSS WEIGHT	(W2)	7.2431
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.1477
4524	BACKGROUND in cpm	(BKG)	5.4	NET WEIGHT	(W3)	0.0954
	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)	28.17
@SR90-01	DILUTION FACTOR	(DF)	1			
	DIGEST FACTOR (g/L)	(D g/L	2.3056			
SOLID	SAMPLE COUNT RATE	(Rs)	4290.60	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
	CRITICAL LEVEL	(Lc)	1.40	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
95005085	TIME OF SEPARATION	(ST)	05:00	Rmax		N/A
	DATE OF SEPARATION	(SD)	01/01/96	DETECTION LIMIT	(Ld)	2.89
0	TIME OF COUNT	(TOC)	09:10	Sr-89/90 CONC in µCi/g		1.6266E+01
	DATE OF COUNT	(DOC)	01/02/96			

FUS-ZR01

S95T003657

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

WB27811 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)

EMB 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)

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

NOTE: Expected weight = CVA * 0.1

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

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

01/02/96

01/01/96

05:00 AM

BY104 ROTARY

Sr-89/90 CONCENTRATION	1.63E+01	µCi/g	DETECTION LEVEL
RELATIVE COUNTING ERROR	0.9%		1.10E-02 µCi/g
PERCENT CARRIER RECOVERY	95.4%		

Analyst:	KNT	Date:	02-Jan-96
Signature of Chemist:	SLF	Date:	1/4/96

SAMPLE.WB1 REV 1.2 22010NML

1938

WHC-SD-WM-DP-164, REV. 1

LABCORE Completed Worklist Report for Worklist# 4525

Analyst: dgg **Instrument:** AB12 **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	1.24E-03	1.18E-3	95.160	% Recovery
1	STD		0		@SR90-01 SR90-01C	SOLID	100	9.42E+01	94.200	% Recovery
1	STD		0		@SR90-01 SR90-01E	SOLID	1.00	1.86E+00	1.860	% Ct. Erro
2	BLNK-PREP		0		@SR90-01 SR90-01	SOLID	1	<4.33E-3		uCi/g
2	BLNK-PREP		0		@SR90-01 SR90-01C	SOLID	100	9.43E+01	94.300	% Recovery
2	BLNK-PREP		0		@SR90-01 SR90-01E	SOLID	1.00	2.55E+02	255.000	uCi/g
3	BLNK/BKG		0		@SR90-01 SR90-01	SOLID	1	1.16E+00	1.160	BLNK/BKG
4	SAMPLE	S95T003658	0	Z	@SR90-01 SR90-01	SOLID	N/A	1.91E+01	5.40e-003	uCi/g
4	SAMPLE	S95T003658	0	Z	@SR90-01 SR90-01C	SOLID	N/A	9.46E+01	1.00e-004	% Recovery
4	SAMPLE	S95T003658	0	Z	@SR90-01 SR90-01E	SOLID	N/A	6.25E-01		% Ct. Error
5	DUP	S95T003658	0	Z	@SR90-01 SR90-01	SOLID	1.91E+1	1.92E+1	0.522	RPD
5	DUP	S95T003658	0	Z	@SR90-01 SR90-01C	SOLID	100	8.36E+01	83.600	% Recovery
5	DUP	S95T003658	0	Z	@SR90-01 SR90-01E	SOLID	1.00	6.64E-01	0.664	% Cnt Err
6	SAMPLE	S95T003659	0	Z	@SR90-01 SR90-01	SOLID	N/A	2.16E+01	5.77e-003	uCi/g
6	SAMPLE	S95T003659	0	Z	@SR90-01 SR90-01C	SOLID	N/A	9.47E+01	1.00e-004	% Recovery
6	SAMPLE	S95T003659	0	Z	@SR90-01 SR90-01E	SOLID	N/A	6.07E-01		% Ct. Error
7	DUP	S95T003659	0	Z	@SR90-01 SR90-01	SOLID	2.16E+1	2.01E+1	7.194	RPD
7	DUP	S95T003659	0	Z	@SR90-01 SR90-01C	SOLID	100	9.48E+01	94.800	% Recovery
7	DUP	S95T003659	0	Z	@SR90-01 SR90-01E	SOLID	1.00	6.21E-01	0.621	% Cnt Err
8	SAMPLE	S95T003660	0	Z	@SR90-01 SR90-01	SOLID	N/A	2.95E+01	5.74e-003	uCi/g
8	SAMPLE	S95T003660	0	Z	@SR90-01 SR90-01C	SOLID	N/A	9.49E+01	1.00e-004	% Recovery
8	SAMPLE	S95T003660	0	Z	@SR90-01 SR90-01E	SOLID	N/A	5.18E-01		% Ct. Error
9	DUP	S95T003660	0	Z	@SR90-01 SR90-01	SOLID	2.95E+1	3.03E+1	2.676	RPD
9	DUP	S95T003660	0	Z	@SR90-01 SR90-01C	SOLID	100	9.61E+01	96.100	% Recovery
9	DUP	S95T003660	0	Z	@SR90-01 SR90-01E	SOLID	1.00	5.08E-01	0.508	% Cnt Err
10	SAMPLE	S95T003661	0	Z	@SR90-01 SR90-01	SOLID	N/A	2.40E+01	5.39e-003	uCi/g
10	SAMPLE	S95T003661	0	Z	@SR90-01 SR90-01C	SOLID	N/A	9.63E+01	1.00e-004	% Recovery
10	SAMPLE	S95T003661	0	Z	@SR90-01 SR90-01E	SOLID	N/A	5.57E-01		% Ct. Error
11	DUP	S95T003661	0	Z	@SR90-01 SR90-01	SOLID	2.40E+1	2.34E+1	2.532	RPD
11	DUP	S95T003661	0	Z	@SR90-01 SR90-01C	SOLID	100	9.48E+01	94.800	% Recovery
11	DUP	S95T003661	0	Z	@SR90-01 SR90-01E	SOLID	1.00	5.70E-01	0.570	% Cnt Err

Final page for worklist# 4525

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

6/20/96

Reviewer Signature **Date**

This is a revision to worklist #4525 to reflect the correct % standard recovery of 95.16%

Cheryl J. Benay

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

LABCORE Data Entry Template for Worklist# 4525

Analyst: DBB **Instrument:** AB00 12 **Book#** 9B56

Method: LA-220-101 Rev/Mod D-1 Carrier # 117N16-B

Worklist Comment: Determine sample size using Ludlum. SLF

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				@SR90-01	SOLID		
2	BLNK-PREP				@SR90-01	SOLID		
3	BLNK/BKG				@SR90-01	SOLID		
4	SAMPLE	S95T003658	0	Z	@SR90-01	SOLID	95000180	BY104 ROTARY
	Analytes Requested: SR90-01 , SR90-01C, SR90-01E							
5	DUP	S95T003658	0	Z	@SR90-01	SOLID		
6	SAMPLE	S95T003659	0	Z	@SR90-01	SOLID	95000180	BY104 ROTARY
	Analytes Requested: SR90-01 , SR90-01C, SR90-01E							
7	DUP	S95T003659	0	Z	@SR90-01	SOLID		
8	SAMPLE	S95T003660	0	Z	@SR90-01	SOLID	95000180	BY104 ROTARY
	Analytes Requested: SR90-01 , SR90-01C, SR90-01E							
9	DUP	S95T003660	0	Z	@SR90-01	SOLID		
10	SAMPLE	S95T003661	0	Z	@SR90-01	SOLID	95000180	BY104 ROTARY
	Analytes Requested: SR90-01 , SR90-01C, SR90-01E							
11	DUP	S95T003661	0	Z	@SR90-01	SOLID		

Final page for worklist # 4525

DB Griffin 1-1-96
Analyst Signature **Date**

Em Barela
Analyst Signature **Date**

Data Entry Comments:

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

LABCORE Completed Worklist Report for Worklist# 4525

Analyst: dgg **Instrument:** AB12 **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	1.15E-03	1.18E-3	102.610	% Recovery
1	STD		0		@SR90-01	SR90-01C	SOLID	100	9.42E+01	94.200	% Recovery
1	STD		0		@SR90-01	SR90-01E	SOLID	1.00	1.86E+00	1.860	% Ct. Error
2	BLNK-PREP		0		@SR90-01	SR90-01	SOLID	1	<4.33E-3		uCi/g
2	BLNK-PREP		0		@SR90-01	SR90-01C	SOLID	100	9.43E+01	94.300	% Recovery
2	BLNK-PREP		0		@SR90-01	SR90-01E	SOLID	1.00	2.55E+02	255.000	% Ct. Error
3	BLNK/BKG		0		@SR90-01	SR90-01	SOLID	1	1.16E+00	1.160	uCi/g
4	SAMPLE	S95T003658	0	Z	@SR90-01	SR90-01	SOLID	N/A	1.91E+01	5.400e-003	uCi/g
4	SAMPLE	S95T003658	0	Z	@SR90-01	SR90-01C	SOLID	N/A	9.46E+01	1.000e-004	% Recovery
4	SAMPLE	S95T003658	0	Z	@SR90-01	SR90-01E	SOLID	N/A	6.25E-01	0.000	% Ct. Error
5	DUP	S95T003658	0	Z	@SR90-01	SR90-01	SOLID	1.91E+1	1.92E+1	0.520	RPD
5	DUP	S95T003658	0	Z	@SR90-01	SR90-01C	SOLID	100	8.36E+01	83.600	% Recovery
5	DUP	S95T003658	0	Z	@SR90-01	SR90-01E	SOLID	1.00	6.64E-01	0.660	% Ct. Error
6	SAMPLE	S95T003659	0	Z	@SR90-01	SR90-01	SOLID	N/A	2.16E+01	5.770e-003	uCi/g
6	SAMPLE	S95T003659	0	Z	@SR90-01	SR90-01C	SOLID	N/A	9.47E+01	1.000e-004	% Recovery
6	SAMPLE	S95T003659	0	Z	@SR90-01	SR90-01E	SOLID	N/A	6.07E-01	0.000	% Ct. Error
7	DUP	S95T003659	0	Z	@SR90-01	SR90-01	SOLID	2.16E+1	2.01E+1	7.190	RPD
7	DUP	S95T003659	0	Z	@SR90-01	SR90-01C	SOLID	100	9.48E+01	94.800	% Recovery
7	DUP	S95T003659	0	Z	@SR90-01	SR90-01E	SOLID	1.00	6.21E-01	0.620	% Ct. Error
8	SAMPLE	S95T003660	0	Z	@SR90-01	SR90-01	SOLID	N/A	2.95E+01	5.740e-003	uCi/g
8	SAMPLE	S95T003660	0	Z	@SR90-01	SR90-01C	SOLID	N/A	9.49E+01	1.000e-004	% Recovery
8	SAMPLE	S95T003660	0	Z	@SR90-01	SR90-01E	SOLID	N/A	5.18E-01	0.000	% Ct. Error
9	DUP	S95T003660	0	Z	@SR90-01	SR90-01	SOLID	2.95E+1	3.03E+1	2.680	RPD
9	DUP	S95T003660	0	Z	@SR90-01	SR90-01C	SOLID	100	9.61E+01	96.100	% Recovery
9	DUP	S95T003660	0	Z	@SR90-01	SR90-01E	SOLID	1.00	5.08E-01	0.510	% Ct. Error
10	SAMPLE	S95T003661	0	Z	@SR90-01	SR90-01	SOLID	N/A	2.40E+01	5.390e-003	uCi/g
10	SAMPLE	S95T003661	0	Z	@SR90-01	SR90-01C	SOLID	N/A	9.63E+01	1.000e-004	% Recovery
10	SAMPLE	S95T003661	0	Z	@SR90-01	SR90-01E	SOLID	N/A	5.57E-01	0.000	% Ct. Error
11	DUP	S95T003661	0	Z	@SR90-01	SR90-01	SOLID	2.40E+1	2.34E+1	2.530	RPD
11	DUP	S95T003661	0	Z	@SR90-01	SR90-01C	SOLID	100	9.48E+01	94.800	% Recovery
11	DUP	S95T003661	0	Z	@SR90-01	SR90-01E	SOLID	1.00	5.70E-01	0.570	% Ct. Error

Final page for worklist# 4525

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

1/2/96

Reviewer Signature **Date**

See page 1939 for the correct 6 standard recovery of 95.18%.

Cheryl J. Benar
6/21/96

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

WHC-SD-WM-DP-164, REV. /

LABCORE Completed Worklist Report for Worklist# 4525

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit

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

WHC-SD-WM-DP-164, REV. 1

WORKBOOK PAGE: STD1

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

	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	STANDARD 1.000
STD	TOTAL COUNTS	(TC)	11251	GROSS WEIGHT	(W2)	7.1943
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.1001
4525	BACKGROUND in cpm	(BKG)	5.0	NET WEIGHT	(W3)	0.0942
	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)	7.42
@SR90-01	DILUTION FACTOR	(DF)	1			
	DIGEST DILUTION FACTOR	DDF	1			
LIQUID	SAMPLE COUNT RATE	(Rs)	1120.10	SR-90 EFFICIENCY FACTO	(C1)	0.4180
	CRITICAL LEVEL	(Lc)	1.35	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
95005086	TIME OF SEPARATION	(ST)	10:45	Rmax		N/A
	DATE OF SEPARATION	(SD)	01/01/96	DETECTION LIMIT	(Ld)	2.79
0	TIME OF COUNT	(TOC)	18:10	Sr-89/90 CONC. in µCi/L		1.1801E+00
	DATE OF COUNT	(DOC)	01/01/96			
N/A	STANDARD BOOK #		9B56			
	STANDARD VALUE in µCi/mL		1.1510E-03			

WL4525

WB27811

EMB

SLF

DGG

01/02/96

01/01/96

10:45 AM

BY104 ROTARY

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	1.18E-03	µCi/mL
RELATIVE COUNTING ERROR	1.9%	
PERCENT CARRIER RECOVERY	94.2%	

DETECTION LEVEL 2.93E-06 µCi/L

Analyst:	DGG	Date:	02-Jan-96
Signature of Chemist:	SLF	Date:	1/2/96

STANDARD.WB1 REV 1.2 22010NML

1942

WORKBOOK PAGE: BLANK2

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

							BLNK-PREP
	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
BLNK-PREP	TOTAL COUNTS	(TC)	58	GROSS WEIGHT	(W2)		7.1696
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.0753
4525	BACKGROUND in cpm	(BKG)	5.0	NET WEIGHT	(W3)		0.0943
	SAMPLE VOLUME in mL	(SS)	0.250	DELTA TIME (HOURS)	(DT)		7.67
@SR90-01	DILUTION FACTOR	(DF)	1				
	DIGEST FACTOR (g/L)	(D g/L)	2.1568				
SOLID	SAMPLE COUNT RATE	(Rs)	0.80	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
	CRITICAL LEVEL	(Lc)	1.35	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
95005086	TIME OF SEPARATION	(ST)	10:45	Rmax			2.23
	DATE OF SEPARATION	(SD)	01/01/96	DETECTION LIMIT	(Ld)		2.79
0	TIME OF COUNT	(TOC)	18:25	Sr-89/90 CONC in µCi/g		<	4.3335E-03
	DATE OF COUNT	(DOC)	01/01/96				

N/A

WL4525

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

WB27811

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)

EMB

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)

SLF

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

NOTE: Expected weight = CVA * 0.1

DGG

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

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

01/02/96

01/01/96

10:45 AM

BY104 ROTARY

Sr-89/90 CONCENTRATION	< 4.33E-03	µCi/g	DETECTION LEVEL
LESS THAN Value was Determined from Rmax.			
RELATIVE COUNTING ERROR	254.6%		5.42E-03 µCi/g
PERCENT CARRIER RECOVERY	94.3%		

Analyst:	DGG	Date:	02-Jan-96
Signature of Chemist:	SLF	Date:	1/2/96

BLANK.WB1 REV 1.2 22010NML

1943

WHC-SD-WM-DP-164, REV. 1

WORKBOOK PAGE: SAM4

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

							SAMPLE
	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
SAMPLE	TOTAL COUNTS	(TC)	98471	GROSS WEIGHT	(W2)	7.2788
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.1842
4525	BACKGROUND in cpm	(BKG)	5.0	NET WEIGHT	(W3)	0.0946
	SAMPLE VOLUME in mL	(SS)	0.250	DELTA TIME (HOURS)	(DT)	7.83
@SR90-01	DILUTION FACTOR	(DF)	1			
	DIGEST FACTOR (g/L)	(D g/L	2.1568			
SOLID	SAMPLE COUNT RATE	(Rs)	9842.10	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
	CRITICAL LEVEL	(Lc)	1.35	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
95005086	TIME OF SEPARATION	(ST)	10:45	Rmax		N/A
	DATE OF SEPARATION	(SD)	01/01/96	DETECTION LIMIT	(Ld)	2.79
0	TIME OF COUNT	(TOC)	18:35	Sr-89/90 CONC in µCi/g		1.9069E+01
	DATE OF COUNT	(DOC)	01/01/96			

FUS-ZR01

S95T003658

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

WB27811 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)

EMB 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)

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

NOTE: Expected weight = CVA * 0.1

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

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

01/02/96

01/01/96

10:45 AM

BY104 ROTARY

Sr-89/90 CONCENTRATION	1.91E+01	µCi/g	DETECTION LEVEL
RELATIVE COUNTING ERROR	0.6%		5.40E-03 µCi/g
PERCENT CARRIER RECOVERY	94.6%		

Analyst:	DGG	Date:	02-Jan-96
Signature of Chemist:	SLF	Date:	1/2/96

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
	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
DUP	TOTAL COUNTS	(TC)	87287	GROSS WEIGHT	(W2)	7.2537
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.1701
4525	BACKGROUND in cpm	(BKG)	5.0	NET WEIGHT	(W3)	0.0836
	SAMPLE VOLUME in mL	(SS)	0.250	DELTA TIME (HOURS)	(DT)	8.02
@SR90-01	DILUTION FACTOR	(DF)	1			
	DIGEST FACTOR (g/L)	(D g/L	2.1392			
SOLID	SAMPLE COUNT RATE	(Rs)	8723.70	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
	CRITICAL LEVEL	(Lc)	1.35	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
95005086	TIME OF SEPARATION	(ST)	10:45	Rmax		N/A
	DATE OF SEPARATION	(SD)	01/01/96	DETECTION LIMIT	(Ld)	2.79
0	TIME OF COUNT	(TOC)	18:46	Sr-89/90 CONC in µCi/g		1.9248E+01
	DATE OF COUNT	(DOC)	01/01/96			

FUS-ZR01

S95T003658

WB27811

EMB

SLF

DGG

01/02/96

01/01/96

10:45 AM

BY104 ROTARY

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	1.92E+01	µCi/g	6.14E-03 µCi/g
RELATIVE COUNTING ERROR	0.7%		
PERCENT CARRIER RECOVERY	83.6%		

Analyst:	DGG	Date:	02-Jan-96
Signature of Chemist:	SLF	Date:	1/2/96

SAMPLE.WB1 REV 1.2 22010NMU

WORKBOOK PAGE: SAM6

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

							SAMPLE
	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
SAMPLE	TOTAL COUNTS	(TC)	104452	GROSS WEIGHT	(W2)	7.1546
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.0599
4525	BACKGROUND in cpm	(BKG)	5.0	NET WEIGHT	(W3)	0.0947
	SAMPLE VOLUME in mL	(SS)	0.250	DELTA TIME (HOURS)	(DT)	8.25
@SR90-01	DILUTION FACTOR	(DF)	1			
	DIGEST FACTOR (g/L)	(D g/L	2.006			
SOLID	SAMPLE COUNT RATE	(Rs)	10440.20	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
	CRITICAL LEVEL	(Lc)	1.35	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
95005086	TIME OF SEPARATION	(ST)	10:45	Rmax		N/A
	DATE OF SEPARATION	(SD)	01/01/96	DETECTION LIMIT	(Ld)	2.79
0	TIME OF COUNT	(TOC)	19:00	Sr-89/90 CONC in µCi/g		2.1634E+01
	DATE OF COUNT	(DOC)	01/01/96			

FUS-ZR01

S95T003659

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

WB27811 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)

EMB 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)

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

NOTE: Expected weight = CVA * 0.1

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

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

01/02/96

01/01/96

10:45 AM

BY104 ROTARY

Sr-89/90 CONCENTRATION	2.16E+01	µCi/g	DETECTION LEVEL
RELATIVE COUNTING ERROR	0.6%		5.77E-03 µCi/g
PERCENT CARRIER RECOVERY	94.7%		

Analyst:	DGG	Date:	02-Jan-96
Signature of Chemist:	SLF	Date:	1/2/96

SAMPLE.WB1 REV 1.2 22010NML

WHC-SD-WM-DP-164, REV. 1

WORKBOOK PAGE: DUP7

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

							DUP
	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
DUP	TOTAL COUNTS	(TC)	99845	GROSS WEIGHT	(W2)	7.1572
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.0624
4525	BACKGROUND in cpm	(BKG)	5.0	NET WEIGHT	(W3)	0.0948
	SAMPLE VOLUME in mL	(SS)	0.250	DELTA TIME (HOURS)	(DT)	8.42
@SR90-01	DILUTION FACTOR	(DF)	1			
	DIGEST FACTOR (g/L)	(D g/L	2.0616			
SOLID	SAMPLE COUNT RATE	(Rs)	9979.50	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
	CRITICAL LEVEL	(Lc)	1.35	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
95005086	TIME OF SEPARATION	(ST)	10:45	Rmax		N/A
	DATE OF SEPARATION	(SD)	01/01/96	DETECTION LIMIT	(Ld)	2.79
0	TIME OF COUNT	(TOC)	19:10	Sr-89/90 CONC in µCi/g		2.0067E+01
	DATE OF COUNT	(DOC)	01/01/96			
FUS-ZR01						
S95T003659						

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

WB27811

EMB

SLF

DGG

01/02/96

01/01/96

10:45 AM

BY104 ROTARY

Sr-89/90 CONCENTRATION	2.01E+01	µCi/g	DETECTION LEVEL
RELATIVE COUNTING ERROR	0.6%		5.60E-03 µCi/g
PERCENT CARRIER RECOVERY	94.8%		

Analyst:	DGG	Date:	02-Jan-96
Signature of Chemist:	SLF	Date:	1/2/96

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
	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
SAMPLE	TOTAL COUNTS	(TC)	143258	GROSS WEIGHT	(W2)	7.1547
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.0598
4525	BACKGROUND in cpm	(BKG)	5.0	NET WEIGHT	(W3)	0.0949
	SAMPLE VOLUME in mL	(SS)	0.250	DELTA TIME (HOURS)	(DT)	8.67
@SR90-01	DILUTION FACTOR	(DF)	1			
	DIGEST FACTOR (g/L)	(D g/L	2.0032			
SOLID	SAMPLE COUNT RATE	(Rs)	14320.80	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
	CRITICAL LEVEL	(Lc)	1.35	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
95005086	TIME OF SEPARATION	(ST)	10:45	Rmax		N/A
	DATE OF SEPARATION	(SD)	01/01/96	DETECTION LIMIT	(Ld)	2.79
0	TIME OF COUNT	(TOC)	19:25	Sr-89/90 CONC in µCi/g		2.9531E+01
	DATE OF COUNT	(DOC)	01/01/96			

FUS-ZR01

S95T003660

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

WB27811 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)

EMB 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)

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

NOTE: Expected weight = CVA * 0.1

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

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

01/02/96

01/01/96

10:45 AM

BY104 ROTARY

Sr-89/90 CONCENTRATION	2.95E+01	µCi/g	DETECTION LEVEL
RELATIVE COUNTING ERROR	0.5%		5.74E-03 µCi/g
PERCENT CARRIER RECOVERY	94.9%		

Analyst:	DGG	Date:	02-Jan-96
Signature of Chemist:	SLF	Date:	1/2/96

SAMPLE.WB1 REV 1.2 22010NML

WORKBOOK PAGE: DUP9

WHC-SD-WM-DP-164, REV. 1

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

							DUP
	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
DUP	TOTAL COUNTS	(TC)	149143	GROSS WEIGHT	(W2)	7.3089
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.2128
4525	BACKGROUND in cpm	(BKG)	5.0	NET WEIGHT	(W3)	0.0961
	SAMPLE VOLUME in mL	(SS)	0.250	DELTA TIME (HOURS)	(DT)	8.83
@SR90-01	DILUTION FACTOR	(DF)	1			
	DIGEST FACTOR (g/L)	(D g/L	2.006			
SOLID	SAMPLE COUNT RATE	(Rs)	14909.30	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
	CRITICAL LEVEL	(Lc)	1.35	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
95005086	TIME OF SEPARATION	(ST)	10:45	Rmax		N/A
	DATE OF SEPARATION	(SD)	01/01/96	DETECTION LIMIT	(Ld)	2.79
0	TIME OF COUNT	(TOC)	19:35	Sr-89/90 CONC in µCi/g		3.0268E+01
	DATE OF COUNT	(DOC)	01/01/96			

FUS-ZR01

S95T003660

WB27811

EMB

SLF

DGG

01/02/96

01/01/96

10:45 AM

BY104 ROTARY

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	3.03E+01	µCi/g	DETECTION LEVEL
RELATIVE COUNTING ERROR	0.5%		5.65E-03 µCi/g
PERCENT CARRIER RECOVERY	96.1%		

Analyst:	DGG	Date:	02-Jan-96
Signature of Chemist:	SLF	Date:	1/2/96

SAMPLE.WB1 REV 1.2 22010NM

WHC-SD-WM-DP-164, REV. 1

WORKBOOK PAGE: SAM10

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

							SAMPLE
	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
SAMPLE	TOTAL COUNTS	(TC)	123978	GROSS WEIGHT	(W2)	7.2036
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.1073
4525	BACKGROUND in cpm	(BKG)	5.0	NET WEIGHT	(W3)	0.0963
	SAMPLE VOLUME in mL	(SS)	0.250	DELTA TIME (HOURS)	(DT)	9.00
@SR90-01	DILUTION FACTOR	(DF)	1			
	DIGEST FACTOR (g/L)	(D g/L	2.0948			
SOLID	SAMPLE COUNT RATE	(Rs)	12392.80	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
	CRITICAL LEVEL	(Lc)	1.35	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
95005086	TIME OF SEPARATION	(ST)	10:45	Rmax		N/A
	DATE OF SEPARATION	(SD)	01/01/96	DETECTION LIMIT	(Ld)	2.79
0	TIME OF COUNT	(TOC)	19:45	Sr-89/90 CONC in µCi/g		2.4003E+01
	DATE OF COUNT	(DOC)	01/01/96			

FUS-ZR01

S95T003661

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

WB27811 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)

EMB 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)

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

NOTE: Expected weight = CVA * 0.1

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

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

01/02/96

01/01/96	Sr-89/90 CONCENTRATION	2.40E+01	µCi/g	DETECTION LEVEL
10:45 AM	RELATIVE COUNTING ERROR	0.6%		5.39E-03 µCi/g
BY104 ROTARY	PERCENT CARRIER RECOVERY	96.3%		

Analyst:	DGG	Date:	02-Jan-96
Signature of Chemist:	SLF	Date:	1/2/96

SAMPLE.WB1 REV 1.2 22010NM

1950

WORKBOOK PAGE: DUP11

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

							DUP
	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
DUP	TOTAL COUNTS	(TC)	118565	GROSS WEIGHT	(W2)		7.2746
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.1798
4525	BACKGROUND in cpm	(BKG)	5.0	NET WEIGHT	(W3)		0.0948
	SAMPLE VOLUME in mL	(SS)	0.250	DELTA TIME (HOURS)	(DT)		9.18
@SR90-01	DILUTION FACTOR	(DF)	1				
	DIGEST FACTOR (g/L)	(D g/L	2.0804				
SOLID	SAMPLE COUNT RATE	(Rs)	11851.50	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
	CRITICAL LEVEL	(Lc)	1.35	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
95005086	TIME OF SEPARATION	(ST)	10:45	Rmax			N/A
	DATE OF SEPARATION	(SD)	01/01/96	DETECTION LIMIT	(Ld)		2.79
0	TIME OF COUNT	(TOC)	19:56	Sr-89/90 CONC in µCi/g			2.3437E+01
	DATE OF COUNT	(DOC)	01/01/96				
FUS-ZR01							
S95T003661							

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

WB27811 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)

EMB 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)

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

NOTE: Expected weight = CVA * 0.1

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

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

01/02/96

01/01/96	Sr-89/90 CONCENTRATION	2.34E+01	µCi/g	DETECTION LEVEL
10:45 AM	RELATIVE COUNTING ERROR	0.6%		5.51E-03 µCi/g
BY104 ROTARY	PERCENT CARRIER RECOVERY	94.8%		

Analyst:	DGG	Date:	02-Jan-96
Signature of Chemist:	SLF	Date:	1/2/96

SAMPLE.WB1 REV 1.2 22010NML

LABCORE Data Entry Template for Worklist# 4526

Analyst: KT **Instrument:** AB00 #12 **Book#** 9B56

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

Worklist Comment: Determine sample size using Ludlum. SLF

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				@SR90-01	SOLID		
2	BLNK-PREP				@SR90-01	SOLID		
3	BLNK/BKG				@SR90-01	SOLID		
4	SAMPLE	S95T003662	0	Z	@SR90-01	SOLID	95000180	BY104 ROTARY
	Analytes Requested: SR90-01 , SR90-01C, SR90-01E							
5	DUP	S95T003662	0	Z	@SR90-01	SOLID		
6	SAMPLE	S95T003663	0	Z	@SR90-01	SOLID	95000180	BY104 ROTARY
	Analytes Requested: SR90-01 , SR90-01C, SR90-01E							
7	DUP	S95T003663	0	Z	@SR90-01	SOLID		
8	SAMPLE	S95T003664	0	Z	@SR90-01	SOLID	95000180	BY104 ROTARY
	Analytes Requested: SR90-01 , SR90-01C, SR90-01E							
9	DUP	S95T003664	0	Z	@SR90-01	SOLID		
10	SAMPLE	S95T003665	0	Z	@SR90-01	SOLID	95000180	BY104 ROTARY
	Analytes Requested: SR90-01 , SR90-01C, SR90-01E							
11	DUP	S95T003665	0	Z	@SR90-01	SOLID		

Final page for worklist # 4526

Kim Thomas 1-2-96
Analyst Signature **Date**

[illegible] 1/3/96
Analyst Signature **Date**
SE Hogan 1/3/96

Data Entry Comments:

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

LABCORE Completed Worklist Report for Worklist# 4526

Analyst: knt **Instrument:** AB12 **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	1.24E-03	1.16E-3	93.557	% Recovery
1	STD		0		@SR90-01	SR90-01C	SOLID	100	9.80E+01	98.000	% Recovery
1	STD		0		@SR90-01	SR90-01E	SOLID	1.00	1.77E+00	1.770	% Ct. Erro
2	BLNK-PREP		0		@SR90-01	SR90-01	SOLID	1	<1.00E-2		uCi/g
2	BLNK-PREP		0		@SR90-01	SR90-01C	SOLID	100	9.75E+01	97.500	% Recovery
2	BLNK-PREP		0		@SR90-01	SR90-01E	SOLID	1.00	1.57E+02	157.000	uCi/g
3	BLNK/BKG		0		@SR90-01	SR90-01	SOLID	1	1.30E+00	1.300	BLNK/BKG
4	SAMPLE	S95T003662	0	Z	@SR90-01	SR90-01	SOLID	N/A	2.37E+01	1.01e-002	uCi/g
4	SAMPLE	S95T003662	0	Z	@SR90-01	SR90-01C	SOLID	N/A	9.51E+01	1.00e-004	% Recovery
4	SAMPLE	S95T003662	0	Z	@SR90-01	SR90-01E	SOLID	N/A	8.10E-01		% Ct. Error
5	DUP	S95T003662	0	Z	@SR90-01	SR90-01	SOLID	2.37E+1	2.60E+1	9.256	RPD
5	DUP	S95T003662	0	Z	@SR90-01	SR90-01C	SOLID	100	9.62E+01	96.200	% Recovery
5	DUP	S95T003662	0	Z	@SR90-01	SR90-01E	SOLID	1.00	7.92E-01	0.792	% Cnt Err
6	SAMPLE	S95T003663	0	Z	@SR90-01	SR90-01	SOLID	N/A	8.57E+02	0.216	uCi/g
6	SAMPLE	S95T003663	0	Z	@SR90-01	SR90-01C	SOLID	N/A	9.73E+01	1.00e-004	% Recovery
6	SAMPLE	S95T003663	0	Z	@SR90-01	SR90-01E	SOLID	N/A	6.23E-01		% Ct. Error
7	DUP	S95T003663	0	Z	@SR90-01	SR90-01	SOLID	8.57E+2	8.02E+2	6.631	RPD
7	DUP	S95T003663	0	Z	@SR90-01	SR90-01C	SOLID	100	9.32E+01	93.200	% Recovery
7	DUP	S95T003663	0	Z	@SR90-01	SR90-01E	SOLID	1.00	6.48E-01	0.648	% Cnt Err
8	SAMPLE	S95T003664	0	Z	@SR90-01	SR90-01	SOLID	N/A	9.44E+02	0.240	uCi/g
8	SAMPLE	S95T003664	0	Z	@SR90-01	SR90-01C	SOLID	N/A	9.80E+01	1.00e-004	% Recovery
8	SAMPLE	S95T003664	0	Z	@SR90-01	SR90-01E	SOLID	N/A	6.25E-01		% Ct. Error
9	DUP	S95T003664	0	Z	@SR90-01	SR90-01	SOLID	9.44E+2	9.04E+2	4.329	RPD
9	DUP	S95T003664	0	Z	@SR90-01	SR90-01C	SOLID	100	9.60E+01	96.000	% Recovery
9	DUP	S95T003664	0	Z	@SR90-01	SR90-01E	SOLID	1.00	6.55E-01	0.655	% Cnt Err
10	SAMPLE	S95T003665	0	Z	@SR90-01	SR90-01	SOLID	N/A	3.14E+02	9.64e-002	uCi/g
10	SAMPLE	S95T003665	0	Z	@SR90-01	SR90-01C	SOLID	N/A	9.54E+01	1.00e-004	% Recovery
10	SAMPLE	S95T003665	0	Z	@SR90-01	SR90-01E	SOLID	N/A	6.87E-01		% Ct. Error
11	DUP	S95T003665	0	Z	@SR90-01	SR90-01	SOLID	3.14E+2	2.61E+2	18.435	RPD
11	DUP	S95T003665	0	Z	@SR90-01	SR90-01C	SOLID	100	9.74E+01	97.400	% Recovery
11	DUP	S95T003665	0	Z	@SR90-01	SR90-01E	SOLID	1.00	7.09E-01	0.709	% Cnt Err

Final page for worklist# 4526

Analyst Signature Date

Analyst Signature Date

Reviewer Signature Date 6/20/96

This is a revision to Worklist #4526 to reflect the correct % standard recovery of 93.557%. Cheryl J. Benar 6/21/96

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

LABCORE Completed Worklist Report for Worklist# 4526

Analyst: knt **Instrument:** AB12 **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	1.15E-03	1.16E-3	100.870	% Recovery
1	STD		0		●SR90-01	SR90-01C	SOLID	100	9.80E+01	98.000	% Recovery
1	STD		0		●SR90-01	SR90-01E	SOLID	1.00	1.77E+00	1.770	% Ct. Error
2	BLNK-PREP		0		●SR90-01	SR90-01	SOLID	1	<1.00E-2		uCi/g
2	BLNK-PREP		0		●SR90-01	SR90-01C	SOLID	100	9.75E+01	97.500	% Recovery
2	BLNK-PREP		0		●SR90-01	SR90-01E	SOLID	1.00	1.57E+02	157.000	% Ct. Error
3	BLNK/BKG		0		●SR90-01	SR90-01	SOLID	1	1.30E+00	1.300	uCi/g
4	SAMPLE	S95T003662	0	Z	●SR90-01	SR90-01	SOLID	N/A	2.37E+01	1.010e-002	uCi/g
4	SAMPLE	S95T003662	0	Z	●SR90-01	SR90-01C	SOLID	N/A	9.51E+01	1.000e-004	% Recovery
4	SAMPLE	S95T003662	0	Z	●SR90-01	SR90-01E	SOLID	N/A	8.10E-01	0.000	% Ct. Error
5	DUP	S95T003662	0	Z	●SR90-01	SR90-01	SOLID	2.37E+1	2.60E+1	9.260	RPD
5	DUP	S95T003662	0	Z	●SR90-01	SR90-01C	SOLID	100	9.62E+01	96.200	% Recovery
5	DUP	S95T003662	0	Z	●SR90-01	SR90-01E	SOLID	1.00	7.92E-01	0.790	% Ct. Error
6	SAMPLE	S95T003663	0	Z	●SR90-01	SR90-01	SOLID	N/A	8.57E+02	0.216	uCi/g
6	SAMPLE	S95T003663	0	Z	●SR90-01	SR90-01C	SOLID	N/A	9.73E+01	1.000e-004	% Recovery
6	SAMPLE	S95T003663	0	Z	●SR90-01	SR90-01E	SOLID	N/A	6.23E-01	0.000	% Ct. Error
7	DUP	S95T003663	0	Z	●SR90-01	SR90-01	SOLID	8.57E+2	8.02E+2	6.630	RPD
7	DUP	S95T003663	0	Z	●SR90-01	SR90-01C	SOLID	100	9.32E+01	93.200	% Recovery
7	DUP	S95T003663	0	Z	●SR90-01	SR90-01E	SOLID	1.00	6.48E-01	0.650	% Ct. Error
8	SAMPLE	S95T003664	0	Z	●SR90-01	SR90-01	SOLID	N/A	9.44E+02	0.240	uCi/g
8	SAMPLE	S95T003664	0	Z	●SR90-01	SR90-01C	SOLID	N/A	9.80E+01	1.000e-004	% Recovery
8	SAMPLE	S95T003664	0	Z	●SR90-01	SR90-01E	SOLID	N/A	6.25E-01	0.000	% Ct. Error
9	DUP	S95T003664	0	Z	●SR90-01	SR90-01	SOLID	9.44E+2	9.04E+2	4.330	RPD
9	DUP	S95T003664	0	Z	●SR90-01	SR90-01C	SOLID	100	9.60E+01	96.000	% Recovery
9	DUP	S95T003664	0	Z	●SR90-01	SR90-01E	SOLID	1.00	6.55E-01	0.660	% Ct. Error
10	SAMPLE	S95T003665	0	Z	●SR90-01	SR90-01	SOLID	N/A	3.14E+02	9.640e-002	uCi/g
10	SAMPLE	S95T003665	0	Z	●SR90-01	SR90-01C	SOLID	N/A	9.54E+01	1.000e-004	% Recovery
10	SAMPLE	S95T003665	0	Z	●SR90-01	SR90-01E	SOLID	N/A	6.87E-01	0.000	% Ct. Error
11	DUP	S95T003665	0	Z	●SR90-01	SR90-01	SOLID	3.14E+2	2.61E+2	18.430	RPD
11	DUP	S95T003665	0	Z	●SR90-01	SR90-01C	SOLID	100	9.74E+01	97.400	% Recovery
11	DUP	S95T003665	0	Z	●SR90-01	SR90-01E	SOLID	1.00	7.09E-01	0.710	% Ct. Error

Final page for worklist# 4526

Analyst Signature Date

Analyst Signature Date

Reviewer Signature 1/4/96 Date

See page 1953 for the correct % standard recovery of 93.55%

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

Cheryl J. Bevan 6/21/96

LABCORE Completed Worklist Report for Worklist# 4526

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit

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
	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
STD	TOTAL COUNTS	(TC)	12397	GROSS WEIGHT	(W2)	7.8192
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.7212
4526	BACKGROUND in cpm	(BKG)	4.0	NET WEIGHT	(W3)	0.0980
	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)	15.58
@SR90-01	DILUTION FACTOR	(DF)	1			
	DIGEST DILUTION FACTOR	DDF	1			
LIQUID	SAMPLE COUNT RATE	(Rs)	1235.70	SR-90 EFFICIENCY FACTO	(C1)	0.4180
	CRITICAL LEVEL	(Lc)	1.20	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
95005087	TIME OF SEPARATION	(ST)	05:30	Rmax		N/A
	DATE OF SEPARATION	(SD)	01/02/96	DETECTION LIMIT	(Ld)	2.50
0	TIME OF COUNT	(TOC)	21:05	Sr-89/90 CONC. in µCi/L		1.1588E+00
	DATE OF COUNT	(DOC)	01/02/96			
N/A	STANDARD BOOK #		9B56			
	STANDARD VALUE in µCi/mL		1.1509E-03			
WL4526						

WB27811

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

MCB

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))

SLF

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

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

KNT

NOTE: Expected weight = CVA * 0.1

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

01/03/96

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

				DETECTION LEVEL
01/02/96	Sr-89/90 CONCENTRATION	1.16E-03	µCi/mL	
05:30 AM	RELATIVE COUNTING ERROR	1.8%		2.34E-06 µCi/L
BY-104 ROTARY	PERCENT CARRIER RECOVERY	98.0%		

Analyst:	KNT	Date:	03-Jan-96
Signature of Chemist:	SLF	Date:	1/4/96

STANDARD.WB1 REV 1.2 22010NM

WORKBOOK PAGE: BLANK2

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

						BLNK-PREP
	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
BLNK-PREP	TOTAL COUNTS	(TC)	52	GROSS WEIGHT	(W2)	7.8122
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.7147
4526	BACKGROUND in cpm	(BKG)	4.0	NET WEIGHT	(W3)	0.0975
	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)	16.25
@SR90-01	DILUTION FACTOR	(DF)	1			
	DIGEST FACTOR (g/L)	(D g/L	2.3672			
SOLID	SAMPLE COUNT RATE	(Rs)	1.20	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
	CRITICAL LEVEL	(Lc)	1.20	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
95005087	TIME OF SEPARATION	(ST)	05:30	Rmax		2.53
	DATE OF SEPARATION	(SD)	01/02/96	DETECTION LIMIT	(Ld)	2.50
0	TIME OF COUNT	(TOC)	21:45	Sr-89/90 CONC in µCi/g	<	1.0031E-02
	DATE OF COUNT	(DOC)	01/02/96			

N/A

WL4526

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

WB27811 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)

MCB 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)

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

NOTE: Expected weight = CVA * 0.1

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

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

01/03/96

01/02/96	Sr-89/90 CONCENTRATION	< 1.00E-02	µCi/g	DETECTION LEVEL
	LESS THAN Value was Determined from Rmax.			
05:30 AM	RELATIVE COUNTING ERROR	156.7%		9.90E-03 µCi/g
BY-104 ROTARY	PERCENT CARRIER RECOVERY	97.5%		

Analyst:	KNT	Date:	03-Jan-96
Signature of Chemist:	SLF	Date:	1/4/96

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
	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
SAMPLE	TOTAL COUNTS	(TC)	58703	GROSS WEIGHT	(W2)	7.1565
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.0614
4526	BACKGROUND in cpm	(BKG)	4.0	NET WEIGHT	(W3)	0.0951
	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)	16.92
@SR90-01	DILUTION FACTOR	(DF)	1			
	DIGEST FACTOR (g/L)	(D g/L	2.3672			
SOLID	SAMPLE COUNT RATE	(Rs)	5866.30	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
	CRITICAL LEVEL	(Lc)	1.20	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
95005087	TIME OF SEPARATION	(ST)	05:30	Rmax		N/A
	DATE OF SEPARATION	(SD)	01/02/96	DETECTION LIMIT	(Ld)	2.50
0	TIME OF COUNT	(TOC)	22:25	Sr-89/90 CONC in µCi/g		2.3675E+01
	DATE OF COUNT	(DOC)	01/02/96			

FUS-ZR01

S95T003662

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

WB27811 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)

MCB 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)

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

NOTE: Expected weight = CVA * 0.1

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

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

01/03/96

				DETECTION LEVEL
01/02/96	Sr-89/90 CONCENTRATION	2.37E+01	µCi/g	
05:30 AM	RELATIVE COUNTING ERROR	0.8%		1.01E-02 µCi/g
BY-104 ROTARY	PERCENT CARRIER RECOVERY	95.1%		

Analyst:	KNT	Date:	03-Jan-96
Signature of Chemist:	SLF	Date:	1/4/96

SAMPLE.WB1 REV 1.2 22010NML

WHC-SD-WM-DP-164, REV. /

WORKBOOK PAGE: DUP5

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

							DUP
	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
DUP	TOTAL COUNTS	(TC)	61441	GROSS WEIGHT	(W2)	7.1108
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.0146
4526	BACKGROUND in cpm	(BKG)	4.0	NET WEIGHT	(W3)	0.0962
	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)	17.25
@SR90-01	DILUTION FACTOR	(DF)	1			
	DIGEST FACTOR (g/L)	(D g/L	2.2204			
SOLID	SAMPLE COUNT RATE	(Rs)	6140.10	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
	CRITICAL LEVEL	(Lc)	1.20	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
95005087	TIME OF SEPARATION	(ST)	05:30	Rmax		N/A
	DATE OF SEPARATION	(SD)	01/02/96	DETECTION LIMIT	(Ld)	2.50
0	TIME OF COUNT	(TOC)	22:45	Sr-89/90 CONC in µCi/g		2.6043E+01
	DATE OF COUNT	(DOC)	01/02/96			
FUS-ZR01						
S95T003662						

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

WB27811 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)

MCB 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)

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

NOTE: Expected weight = CVA * 0.1

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

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

01/03/96

01/02/96	Sr-89/90 CONCENTRATION	2.60E+01	µCi/g	DETECTION LEVEL
05:30 AM	RELATIVE COUNTING ERROR	0.8%		1.06E-02 µCi/g
BY-104 ROTARY	PERCENT CARRIER RECOVERY	96.2%		

Analyst:	KNT	Date:	03-Jan-96
Signature of Chemist:	SLF	Date:	1/4/96

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
	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
SAMPLE	TOTAL COUNTS	(TC)	99238	GROSS WEIGHT	(W2)	7.1582
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.0609
4526	BACKGROUND in cpm	(BKG)	4.0	NET WEIGHT	(W3)	0.0973
	SAMPLE VOLUME in mL	(SS)	0.500	DELTA TIME (HOURS)	(DT)	17.58
@SR90-01	DILUTION FACTOR	(DF)	101			
	DIGEST FACTOR (g/L)	(D g/L	2.1712			
SOLID	SAMPLE COUNT RATE	(Rs)	9919.80	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
	CRITICAL LEVEL	(Lc)	1.20	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
95005087	TIME OF SEPARATION	(ST)	05:30	Rmax		N/A
	DATE OF SEPARATION	(SD)	01/02/96	DETECTION LIMIT	(Ld)	2.50
0	TIME OF COUNT	(TOC)	23:05	Sr-89/90 CONC in µCi/g		8.5695E+02
	DATE OF COUNT	(DOC)	01/02/96			

FUS-ZR01

S95T003663

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

WB27811 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)

MCB 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)

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

NOTE: Expected weight = CVA * 0.1

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

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

01/03/96

				DETECTION LEVEL
01/02/96	Sr-89/90 CONCENTRATION	8.57E+02	µCi/g	
05:30 AM	RELATIVE COUNTING ERROR	0.6%		2.16E-01 µCi/g
BY-104 ROTARY	PERCENT CARRIER RECOVERY	97.3%		

Analyst:		KNT	Date:	03-Jan-96
Signature of Chemist:		SLF	Date:	1/4/96

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
	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
DUP	TOTAL COUNTS	(TC)	91730	GROSS WEIGHT	(W2)	7.3059
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.2127
4526	BACKGROUND in cpm	(BKG)	4.0	NET WEIGHT	(W3)	0.0932
	SAMPLE VOLUME in mL	(SS)	0.500	DELTA TIME (HOURS)	(DT)	17.83
@SR90-01	DILUTION FACTOR	(DF)	101			
	DIGEST FACTOR (g/L)	(D g/L	2.2336			
SOLID	SAMPLE COUNT RATE	(Rs)	9169.00	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
	CRITICAL LEVEL	(Lc)	1.20	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
95005087	TIME OF SEPARATION	(ST)	05:30	Rmax		N/A
	DATE OF SEPARATION	(SD)	01/02/96	DETECTION LIMIT	(Ld)	2.50
0	TIME OF COUNT	(TOC)	23:20	Sr-89/90 CONC in µCi/g		8.0216E+02
	DATE OF COUNT	(DOC)	01/02/96			

FUS-ZR01

S95T003663

WB27811

MCB

SLF

KNT

01/03/96

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
01/02/96	Sr-89/90 CONCENTRATION	8.02E+02	µCi/g	
05:30 AM	RELATIVE COUNTING ERROR	0.6%		2.19E-01 µCi/g
BY-104 ROTARY	PERCENT CARRIER RECOVERY	93.2%		

Analyst:	KNT	Date:	03-Jan-96
Signature of Chemist:	SLF	Date:	1/4/96

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
	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
SAMPLE	TOTAL COUNTS	(TC)	98475	GROSS WEIGHT	(W2)	7.2099
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.1119
4526	BACKGROUND in cpm	(BKG)	4.0	NET WEIGHT	(W3)	0.0980
	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)	18.00
@SR90-01	DILUTION FACTOR	(DF)	101			
	DIGEST FACTOR (g/L)	(D g/L	0.968			
SOLID	SAMPLE COUNT RATE	(Rs)	9843.50	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
	CRITICAL LEVEL	(Lc)	1.20	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
95005087	TIME OF SEPARATION	(ST)	05:30	Rmax		N/A
	DATE OF SEPARATION	(SD)	01/02/96	DETECTION LIMIT	(Ld)	2.50
0	TIME OF COUNT	(TOC)	23:30	Sr-89/90 CONC in µCi/g		9.4358E+02
	DATE OF COUNT	(DOC)	01/02/96			

FUS-ZR01

S95T003664

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

WB27811 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)

MCB 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)

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

NOTE: Expected weight = CVA * 0.1

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

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

01/03/96

				DETECTION LEVEL
01/02/96	Sr-89/90 CONCENTRATION	9.44E+02	µCi/g	
05:30 AM	RELATIVE COUNTING ERROR	0.6%		2.40E-01 µCi/g
BY-104 ROTARY	PERCENT CARRIER RECOVERY	98.0%		

Analyst:	KNT	Date:	03-Jan-96
Signature of Chemist:	SLF	Date:	1/4/96

SAMPLE.WB1 REV 1.2 22010NML

WORKBOOK PAGE: DUP9 WHC-SD-WM-DP-164, REV. 1

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

							DUP
	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
DUP	TOTAL COUNTS	(TC)	89614	GROSS WEIGHT	(W2)	7.2729
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.1769
4526	BACKGROUND in cpm	(BKG)	4.0	NET WEIGHT	(W3)	0.0960
	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)	19.50
@SR90-01	DILUTION FACTOR	(DF)	101			
	DIGEST FACTOR (g/L)	(D g/L	0.9268			
SOLID	SAMPLE COUNT RATE	(Rs)	8957.40	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
	CRITICAL LEVEL	(Lc)	1.20	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
95005087	TIME OF SEPARATION	(ST)	05:30	Rmax		N/A
	DATE OF SEPARATION	(SD)	01/02/96	DETECTION LIMIT	(Ld)	2.50
0	TIME OF COUNT	(TOC)	01:00	Sr-89/90 CONC in µCi/g		9.0436E+02
	DATE OF COUNT	(DOC)	01/03/96			
FUS-ZR01						
S95T003664						

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

WB27811 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)

MCB 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)

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

NOTE: Expected weight = CVA * 0.1

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

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

01/03/96

				DETECTION LEVEL
01/02/96	Sr-89/90 CONCENTRATION	9.04E+02	µCi/g	
05:30 AM	RELATIVE COUNTING ERROR	0.7%		2.52E-01 µCi/g
BY-104 ROTARY	PERCENT CARRIER RECOVERY	96.0%		

Analyst:	KNT	Date:	03-Jan-96
Signature of Chemist:	SLF	Date:	1/4/96

SAMPLE.WB1 REV 1.2 22010NML

WORKBOOK PAGE: SAM10

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

							SAMPLE
	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
SAMPLE	TOTAL COUNTS	(TC)	81516	GROSS WEIGHT	(W2)	7.8757
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.7803
4526	BACKGROUND in cpm	(BKG)	4.0	NET WEIGHT	(W3)	0.0954
	SAMPLE VOLUME in mL	(SS)	0.250	DELTA TIME (HOURS)	(DT)	19.67
@SR90-01	DILUTION FACTOR	(DF)	21			
	DIGEST FACTOR (g/L)	(D g/L	2.028			
SOLID	SAMPLE COUNT RATE	(Rs)	8147.60	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
	CRITICAL LEVEL	(Lc)	1.20	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
95005087	TIME OF SEPARATION	(ST)	05:30	Rmax		N/A
	DATE OF SEPARATION	(SD)	01/02/96	DETECTION LIMIT	(Ld)	2.50
0	TIME OF COUNT	(TOC)	01:10	Sr-89/90 CONC in µCi/g		3.1420E+02
	DATE OF COUNT	(DOC)	01/03/96			
FUS-ZR01						
S95T003665						

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

WB27811 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)

MCB 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)

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

NOTE: Expected weight = CVA * 0.1

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

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

01/03/96

01/02/96	Sr-89/90 CONCENTRATION	3.14E+02	µCi/g	DETECTION LEVEL
05:30 AM	RELATIVE COUNTING ERROR	0.7%		9.64E-02 µCi/g
BY-104 ROTARY	PERCENT CARRIER RECOVERY	95.4%		

Analyst:	KNT	Date:	03-Jan-96
Signature of Chemist:	SLF	Date:	1/4/96

SAMPLE.WB1 REV 1.2 22010NML

WORKBOOK PAGE: DUP11

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

							DUP
	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
DUP	TOTAL COUNTS	(TC)	76453	GROSS WEIGHT	(W2)		7.2701
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.1727
4526	BACKGROUND in cpm	(BKG)	4.0	NET WEIGHT	(W3)		0.0974
	SAMPLE VOLUME in mL	(SS)	0.250	DELTA TIME (HOURS)	(DT)		19.92
@SR90-01	DILUTION FACTOR	(DF)	21				
	DIGEST FACTOR (g/L)	(D g/L	2.2388				
SOLID	SAMPLE COUNT RATE	(Rs)	7641.30	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
	CRITICAL LEVEL	(Lc)	1.20	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
95005087	TIME OF SEPARATION	(ST)	05:30	Rmax			N/A
	DATE OF SEPARATION	(SD)	01/02/96	DETECTION LIMIT	(Ld)		2.50
0	TIME OF COUNT	(TOC)	01:25	Sr-89/90 CONC in µCi/g			2.6092E+02
	DATE OF COUNT	(DOC)	01/03/96				
FUS-ZR01							
S95T003665							
WB27811							
MCB							
SLF							
KNT							
01/03/96							
01/02/96							
05:30 AM							
BY-104 ROTARY							

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	2.61E+02	µCi/g	8.54E-02 µCi/g
	RELATIVE COUNTING ERROR	0.7%		
	PERCENT CARRIER RECOVERY	97.4%		

Analyst:	KNT	Date:	03-Jan-96
Signature of Chemist:	SLF	Date:	1/4/96

SAMPLE.WB1 REV 1.2 22010NML

WHC-SD-WM-DP-164, REV. 1

LABCORE Completed Worklist Report for Worklist# 4527

Analyst: scl **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	1.24E-03	1.24E-3	100.270	% Recovery
1	STD		0		@SR90-01	SR90-01C	SOLID	100	8.82E+01	88.200	% Recovery
1	STD		0		@SR90-01	SR90-01E	SOLID	1.00	1.87E+00	1.870	% Ct. Erro
2	BLNK-PREP		0		@SR90-01	SR90-01	SOLID	1	<1.08E-2		uCi/g
2	BLNK-PREP		0		@SR90-01	SR90-01C	SOLID	100	8.79E+01	87.900	% Recovery
2	BLNK-PREP		0		@SR90-01	SR90-01E	SOLID	1.00	2.84E+02	284.000	uCi/g
3	BLNK/BKG		0		@SR90-01	SR90-01	SOLID	1	9.09E-01	0.909	BLNK/BKG
4	SAMPLE	S95T003786	0	Z	@SR90-01	SR90-01	SOLID	N/A	2.13E+01	2.21e-002	uCi/g
4	SAMPLE	S95T003786	0	Z	@SR90-01	SR90-01C	SOLID	N/A	8.77E+01	1.00e-004	% Recovery
4	SAMPLE	S95T003786	0	Z	@SR90-01	SR90-01E	SOLID	N/A	9.91E-01		% Ct. Error
5	DUP	S95T003786	0	Z	@SR90-01	SR90-01	SOLID	2.13E+1	2.08E+1	2.375	RPD
5	DUP	S95T003786	0	Z	@SR90-01	SR90-01C	SOLID	100	8.73E+01	87.300	% Recovery
5	DUP	S95T003786	0	Z	@SR90-01	SR90-01E	SOLID	1.00	1.00E+00	1.000	% Cnt Err
6	SAMPLE	S95T003787	0	Z	@SR90-01	SR90-01	SOLID	N/A	7.22E+01	2.640	uCi/g
6	SAMPLE	S95T003787	0	Z	@SR90-01	SR90-01C	SOLID	N/A	7.18E+01	1.00e-004	% Recovery
6	SAMPLE	S95T003787	0	Z	@SR90-01	SR90-01E	SOLID	N/A	6.41E+00		% Ct. Error
7	DUP	S95T003787	0	Z	@SR90-01	SR90-01	SOLID	7.22E+1	6.76E+1	6.581	RPD
7	DUP	S95T003787	0	Z	@SR90-01	SR90-01C	SOLID	100	8.85E+01	88.500	% Recovery
7	DUP	S95T003787	0	Z	@SR90-01	SR90-01E	SOLID	1.00	5.85E+00	5.850	% Cnt Err
8	SAMPLE	S95T003788	0	Z	@SR90-01	SR90-01	SOLID	N/A	1.77E+03	0.976	uCi/g
8	SAMPLE	S95T003788	0	Z	@SR90-01	SR90-01C	SOLID	N/A	7.84E+01	1.00e-004	% Recovery
8	SAMPLE	S95T003788	0	Z	@SR90-01	SR90-01E	SOLID	N/A	7.21E-01		% Ct. Error
9	DUP	S95T003788	0	Z	@SR90-01	SR90-01	SOLID	1.77E+3	1.75E+3	1.136	RPD
9	DUP	S95T003788	0	Z	@SR90-01	SR90-01C	SOLID	100	8.84E+01	88.400	% Recovery
9	DUP	S95T003788	0	Z	@SR90-01	SR90-01E	SOLID	1.00	6.84E-01	0.684	% Cnt Err
11	DUP	S95T003789	0	Z	@SR90-01	SR90-01	SOLID	1.47E+2	2.19E+1	148.135	RPD
11	DUP	S95T003789	0	Z	@SR90-01	SR90-01C	SOLID	100	8.87E+01	88.700	% Recovery
11	DUP	S95T003789	0	Z	@SR90-01	SR90-01E	SOLID	1.00	9.68E-01	0.968	% Cnt Err
12	SAMPLE	S95T003790	0	Z	@SR90-01	SR90-01	SOLID	N/A	2.71E+01	2.00e-002	uCi/g
12	SAMPLE	S95T003790	0	Z	@SR90-01	SR90-01C	SOLID	N/A	8.94E+01	1.00e-004	% Recovery
12	SAMPLE	S95T003790	0	Z	@SR90-01	SR90-01E	SOLID	N/A	8.34E-01		% Ct. Error
13	DUP	S95T003790	0	Z	@SR90-01	SR90-01	SOLID	2.71E+1	2.99E+1	9.825	RPD
13	DUP	S95T003790	0	Z	@SR90-01	SR90-01C	SOLID	100	8.96E+01	89.600	% Recovery
13	DUP	S95T003790	0	Z	@SR90-01	SR90-01E	SOLID	1.00	8.02E-01	0.802	% Cnt Err

Final page for worklist# 4527

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

This is a version of Worklist #4527 to reflect the correct % standard recovery of 100.27%. Cheryl Bevan 6/21/96

Reviewer Jennifer Dempsey 6/20/96

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

LABCORE Data Entry Template for Worklist# 4527

Analyst: S.C.L **Instrument:** AB00 #10 **Book#** 1856

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

Worklist Comment: Determine sample size using Ludlum. SLF

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				@SR90-01	SOLID		
2	BLNK-PREP				@SR90-01	SOLID		
3	BLNK/BKG				@SR90-01	SOLID		
4	SAMPLE	S95T003786	0	F	@SR90-01	SOLID	95000200	BY104 ROTARY
	Analytes Requested: SR90-01 , SR90-01C, SR90-01E							
5	DUP	S95T003786	0	F	@SR90-01	SOLID		
6	SAMPLE	S95T003787	0	F	@SR90-01	SOLID	95000200	BY104 ROTARY
	Analytes Requested: SR90-01 , SR90-01C, SR90-01E							
7	DUP	S95T003787	0	F	@SR90-01	SOLID		
8	SAMPLE	S95T003788	0	F	@SR90-01	SOLID	95000200	BY104 ROTARY
	Analytes Requested: SR90-01 , SR90-01C, SR90-01E							
9	DUP	S95T003788	0	F	@SR90-01	SOLID		
10	SAMPLE	S95T003789	0	F	@SR90-01	SOLID	95000200	BY104 ROTARY
	Analytes Requested: SR90-01 , SR90-01C, SR90-01E							
11	DUP	S95T003789	0	F	@SR90-01	SOLID		
12	SAMPLE	S95T003790	0	F	@SR90-01	SOLID	95000200	BY104 ROTARY
	Analytes Requested: SR90-01 , SR90-01C, SR90-01E							
13	DUP	S95T003790	0	F	@SR90-01	SOLID		

Final page for worklist # 4527

Sue C Lai 1-2-96
Analyst Signature **Date**

[illegible] 1/3/96
Analyst Signature **Date**

[illegible] 1/3/96

Data Entry Comments: The RPD for sample 3789 is out of control limits - the sample will be rerun. [illegible] 1/3/96

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

LABCORE Data Entry Template for Worklist# 4527

S	Type	Sample#	R	A	Test	Matrix	Group#	Project

Data Entry Comments:

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

LABCORE Completed Worklist Report for Worklist# 4527

Analyst: scl **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	1.15E-03	1.24E-3	107.830	% Recovery
1	STD		0		●SR90-01	SR90-01C	SOLID	100	8.82E+01	88.200	% Recovery
1	STD		0		●SR90-01	SR90-01E	SOLID	1.00	1.87E+00	1.870	% Ct. Error
2	BLNK-PREP		0		●SR90-01	SR90-01	SOLID	1	<1.08E-2		uCi/g
2	BLNK-PREP		0		●SR90-01	SR90-01C	SOLID	100	8.79E+01	87.900	% Recovery
2	BLNK-PREP		0		●SR90-01	SR90-01E	SOLID	1.00	2.84E+02	284.000	% Ct. Error
3	BLNK/BKG		0		●SR90-01	SR90-01	SOLID	1	9.09E-01	0.910	uCi/g
4	SAMPLE	S95T003786	0	Z	●SR90-01	SR90-01	SOLID	N/A	2.13E+01	2.210e-002	uCi/g
4	SAMPLE	S95T003786	0	Z	●SR90-01	SR90-01C	SOLID	N/A	8.77E+01	1.000e-004	% Recovery
4	SAMPLE	S95T003786	0	Z	●SR90-01	SR90-01E	SOLID	N/A	9.91E-01	0.000	% Ct. Error
5	DUP	S95T003786	0	Z	●SR90-01	SR90-01	SOLID	2.13E+1	2.08E+1	2.380	RPD
5	DUP	S95T003786	0	Z	●SR90-01	SR90-01C	SOLID	100	8.73E+01	87.300	% Recovery
5	DUP	S95T003786	0	Z	●SR90-01	SR90-01E	SOLID	1.00	1.00E+00	1.000	% Ct. Error
6	SAMPLE	S95T003787	0	Z	●SR90-01	SR90-01	SOLID	N/A	7.22E+01	2.640	uCi/g
6	SAMPLE	S95T003787	0	Z	●SR90-01	SR90-01C	SOLID	N/A	7.18E+01	1.000e-004	% Recovery
6	SAMPLE	S95T003787	0	Z	●SR90-01	SR90-01E	SOLID	N/A	6.41E+00	0.000	% Ct. Error
7	DUP	S95T003787	0	Z	●SR90-01	SR90-01	SOLID	7.22E+1	6.76E+1	6.580	RPD
7	DUP	S95T003787	0	Z	●SR90-01	SR90-01C	SOLID	100	8.85E+01	88.500	% Recovery
7	DUP	S95T003787	0	Z	●SR90-01	SR90-01E	SOLID	1.00	5.85E+00	5.850	% Ct. Error
8	SAMPLE	S95T003788	0	Z	●SR90-01	SR90-01	SOLID	N/A	1.77E+03	0.976	uCi/g
8	SAMPLE	S95T003788	0	Z	●SR90-01	SR90-01C	SOLID	N/A	7.84E+01	1.000e-004	% Recovery
8	SAMPLE	S95T003788	0	Z	●SR90-01	SR90-01E	SOLID	N/A	7.21E-01	0.000	% Ct. Error
9	DUP	S95T003788	0	Z	●SR90-01	SR90-01	SOLID	1.77E+3	1.75E+3	1.140	RPD
9	DUP	S95T003788	0	Z	●SR90-01	SR90-01C	SOLID	100	8.84E+01	88.400	% Recovery
9	DUP	S95T003788	0	Z	●SR90-01	SR90-01E	SOLID	1.00	6.84E-01	0.680	% Ct. Error
10	SAMPLE	S95T003789	0	Z	●SR90-01	SR90-01	SOLID	N/A	1.47E+02	0.157	uCi/g
10	SAMPLE	S95T003789	0	Z	●SR90-01	SR90-01C	SOLID	N/A	1.22E+01	1.000e-004	% Recovery
10	SAMPLE	S95T003789	0	Z	●SR90-01	SR90-01E	SOLID	N/A	1.01E+00	0.000	% Ct. Error
11	DUP	S95T003789	0	Z	●SR90-01	SR90-01	SOLID	1.47E+2	2.19E+1	148.130	RPD
11	DUP	S95T003789	0	Z	●SR90-01	SR90-01C	SOLID	100	8.87E+01	88.700	% Recovery
11	DUP	S95T003789	0	Z	●SR90-01	SR90-01E	SOLID	1.00	9.68E-01	0.970	% Ct. Error
12	SAMPLE	S95T003790	0	Z	●SR90-01	SR90-01	SOLID	N/A	2.71E+01	2.000e-002	uCi/g
12	SAMPLE	S95T003790	0	Z	●SR90-01	SR90-01C	SOLID	N/A	8.94E+01	1.000e-004	% Recovery
12	SAMPLE	S95T003790	0	Z	●SR90-01	SR90-01E	SOLID	N/A	8.34E-01	0.000	% Ct. Error
13	DUP	S95T003790	0	Z	●SR90-01	SR90-01	SOLID	2.71E+1	2.99E+1	9.820	RPD
13	DUP	S95T003790	0	Z	●SR90-01	SR90-01C	SOLID	100	8.96E+01	89.600	% Recovery
13	DUP	S95T003790	0	Z	●SR90-01	SR90-01E	SOLID	1.00	8.02E-01	0.800	% Ct. Error

See page 1965 for the correct % standard recovery of 100.27%.
Cheryl J. Beran
6/21/96

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

LABCORE Completed Worklist Report for Worklist# 4527

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit

Final page for worklist# 4527

Analyst Signature **Date**

Analyst Signature **Date**

1/3/96

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
	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA)	1.000
STD	TOTAL COUNTS	(TC)	11294	GROSS WEIGHT	(W2)	7.1987
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.1105
4527	BACKGROUND in cpm	(BKG)	11.0	NET WEIGHT	(W3)	0.0882
	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)	12.08
@SR90-01	DILUTION FACTOR	(DF)	1			
	DIGEST DILUTION FACTOR	DDF	1			
LIQUID	SAMPLE COUNT RATE	(Rs)	1118.40	SR-90 EFFICIENCY FACTO	(C1)	0.4051
	CRITICAL LEVEL	(Lc)	2.00	Y-90 EFFICIENCY FACTOR	(C2)	0.4503
95005088	TIME OF SEPARATION	(ST)	09:00	Rmax		N/A
	DATE OF SEPARATION	(SD)	01/02/96	DETECTION LIMIT	(Ld)	4.09
0	TIME OF COUNT	(TOC)	21:05	Sr-89/90 CONC. in µCi/L		1.2412E+00
	DATE OF COUNT	(DOC)	01/02/96			
N/A	STANDARD BOOK #		9B56			
	STANDARD VALUE in µCi/mL		1.1509E-03			

WL#4527

WB26870

SEH

SLF

SCL

01/03/96

01/02/96

09:00 AM

BY104 ROTARY

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	1.24E-03	µCi/mL	DETECTION LEVEL	
RELATIVE COUNTING ERROR	1.9%		4.54E-06 µCi/L	
PERCENT CARRIER RECOVERY	88.2%			

Analyst:	SCL	Date:	03-Jan-96
Signature of Chemist:	SLF	Date:	1/3/96

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
	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA)		1.000
BLNK-PREP	TOTAL COUNTS	(TC)	100	GROSS WEIGHT	(W2)		7.1847
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.0968
4527	BACKGROUND in cpm	(BKG)	11.0	NET WEIGHT	(W3)		0.0879
	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)		12.75
@SR90-01	DILUTION FACTOR	(DF)	1				
	DIGEST FACTOR (g/L)	(D g/L)	2.04				
SOLID	SAMPLE COUNT RATE	(Rs)	-1.00	SR-90 EFFICIENCY FACTOR	(C1)		0.4051
	CRITICAL LEVEL	(Lc)	2.00	Y-90 EFFICIENCY FACTOR	(C2)		0.4503
95005088	TIME OF SEPARATION	(ST)	09:00	Rmax			N/A
	DATE OF SEPARATION	(SD)	01/02/96	DETECTION LIMIT	(Ld)		4.09
0	TIME OF COUNT	(TOC)	21:45	Sr-89/90 CONC in µCi/g		<	1.0841E-02
	DATE OF COUNT	(DOC)	01/02/96				

N/A

WL#4527

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

WB26870 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)

SEH 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)

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

NOTE: Expected weight = CVA * 0.1

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

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

01/03/96

01/02/96	Sr-89/90 CONCENTRATION	< 1.08E-02	µCi/g	DETECTION LEVEL
	LESS THAN Value was Determined from Lc.			
09:00 AM	RELATIVE COUNTING ERROR	284.0%		2.22E-02 µCi/g
BY104 ROTARY	PERCENT CARRIER RECOVERY	87.9%		

Analyst:	SCL	Date:	03-Jan-96
Signature of Chemist:	SLF	Date:	1/3/96

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
	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA)		1.000
SAMPLE	TOTAL COUNTS	(TC)	39448	GROSS WEIGHT	(W2)		7.1494
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.0617
4527	BACKGROUND in cpm	(BKG)	11.0	NET WEIGHT	(W3)		0.0877
	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)		13.42
@SR90-01	DILUTION FACTOR	(DF)	1				
	DIGEST FACTOR (g/L)	(D g/L	2.04				
SOLID	SAMPLE COUNT RATE	(Rs)	3933.80	SR-90 EFFICIENCY FACTOR	(C1)		0.4051
	CRITICAL LEVEL	(Lc)	2.00	Y-90 EFFICIENCY FACTOR	(C2)		0.4503
95005088	TIME OF SEPARATION	(ST)	09:00	Rmax			N/A
	DATE OF SEPARATION	(SD)	01/02/96	DETECTION LIMIT	(Ld)		4.09
0	TIME OF COUNT	(TOC)	22:25	Sr-89/90 CONC in µCi/g			2.1262E+01
	DATE OF COUNT	(DOC)	01/02/96				

FUS-ZR01

S95T003786

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

WB26870 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)

SEH 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)

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

NOTE: Expected weight = CVA * 0.1

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

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

01/03/96

01/02/96	Sr-89/90 CONCENTRATION	2.13E+01	µCi/g	DETECTION LEVEL
09:00 AM	RELATIVE COUNTING ERROR	1.0%		2.21E-02 µCi/g
BY104 ROTARY	PERCENT CARRIER RECOVERY	87.7%		

Analyst:	SCL	Date:	03-Jan-96
Signature of Chemist:	SLF	Date:	1-3/96

SAMPLE.WB1 REV 1.2 22010NML

I:\22010N\OUT\SR4527.WB1 01/03/96

WORKBOOK PAGE: DUP5

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

							DUP
	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA)		1.000
DUP	TOTAL COUNTS	(TC)	38367	GROSS WEIGHT	(W2)		7.1983
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.1110
4527	BACKGROUND in cpm	(BKG)	11.0	NET WEIGHT	(W3)		0.0873
	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)		13.75
@SR90-01	DILUTION FACTOR	(DF)	1				
	DIGEST FACTOR (g/L)	(D g/L	2.0344				
SOLID	SAMPLE COUNT RATE	(Rs)	3825.70	SR-90 EFFICIENCY FACTOR	(C1)		0.4051
	CRITICAL LEVEL	(Lc)	2.00	Y-90 EFFICIENCY FACTOR	(C2)		0.4503
95005088	TIME OF SEPARATION	(ST)	09:00	Rmax			N/A
	DATE OF SEPARATION	(SD)	01/02/96	DETECTION LIMIT	(Ld)		4.09
0	TIME OF COUNT	(TOC)	22:45	Sr-89/90 CONC in µCi/g			2.0767E+01
	DATE OF COUNT	(DOC)	01/02/96				

FUS-ZR01

S95T003786

WB26870

SEH

SLF

SCL

01/03/96

01/02/96

09:00 AM

BY104 ROTARY

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	2.08E+01	µCi/g		
RELATIVE COUNTING ERROR	1.0%			2.22E-02 µCi/g
PERCENT CARRIER RECOVERY	87.3%			

Analyst:	SCL	Date:	03-Jan-96
Signature of Chemist:	SLF	Date:	1/3/96

SAMPLE.WB1 REV 1.2 22010NMU

WORKBOOK PAGE: SAM6

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

							SAMPLE
	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA)	1.000
SAMPLE	TOTAL COUNTS	(TC)	1228	GROSS WEIGHT	(W2)	7.1592
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.0874
4527	BACKGROUND in cpm	(BKG)	11.0	NET WEIGHT	(W3)	0.0718
	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)	14.08
@SR90-01	DILUTION FACTOR	(DF)	101			
	DIGEST FACTOR (g/L)	(D g/L	2.0932			
SOLID	SAMPLE COUNT RATE	(Rs)	111.80	SR-90 EFFICIENCY FACTOR	(C1)	0.4051
	CRITICAL LEVEL	(Lc)	2.00	Y-90 EFFICIENCY FACTOR	(C2)	0.4503
95005088	TIME OF SEPARATION	(ST)	09:00	Rmax		N/A
	DATE OF SEPARATION	(SD)	01/02/96	DETECTION LIMIT	(Ld)	4.09
0	TIME OF COUNT	(TOC)	23:05	Sr-89/90 CONC in µCi/g		7.2220E+01
	DATE OF COUNT	(DOC)	01/02/96			

FUS-ZR01

S95T003787

WB26870

SEH

SLF

SCL

01/03/96

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
01/02/96	Sr-89/90 CONCENTRATION	7.22E+01	µCi/g	2.64E+00 µCi/g
09:00 AM	RELATIVE COUNTING ERROR	6.4%		
BY104 ROTARY	PERCENT CARRIER RECOVERY	71.8%		

Analyst:	SCL	Date:	03-Jan-96
Signature of Chemist:	SLF	Date:	1/3/96

SAMPLE.WB1 REV 1.2 22010NML

WORKBOOK PAGE: DUP7

WHC-SD-WM-DP-164, REV. 1

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

							DUP
	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA)		1.000
DUP	TOTAL COUNTS	(TC)	1421	GROSS WEIGHT	(W2)		7.1155
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.0270
4527	BACKGROUND in cpm	(BKG)	11.0	NET WEIGHT	(W3)		0.0885
	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)		14.33
@SR90-01	DILUTION FACTOR	(DF)	101				
	DIGEST FACTOR (g/L)	(D g/L	2.1224				
SOLID	SAMPLE COUNT RATE	(Rs)	131.10	SR-90 EFFICIENCY FACTOR	(C1)		0.4051
	CRITICAL LEVEL	(Lc)	2.00	Y-90 EFFICIENCY FACTOR	(C2)		0.4503
95005088	TIME OF SEPARATION	(ST)	09:00	Rmax			N/A
	DATE OF SEPARATION	(SD)	01/02/96	DETECTION LIMIT	(Ld)		4.09
0	TIME OF COUNT	(TOC)	23:20	Sr-89/90 CONC in µCi/g			6.7611E+01
	DATE OF COUNT	(DOC)	01/02/96				
FUS-ZR01							
S95T003787							

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

WB26870 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)

SEH 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)

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

NOTE: Expected weight = CVA * 0.1

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

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

01/03/96

01/02/96	Sr-89/90 CONCENTRATION	6.76E+01	µCi/g	DETECTION LEVEL
09:00 AM	RELATIVE COUNTING ERROR	5.8%		2.11E+00 µCi/g
BY104 ROTARY	PERCENT CARRIER RECOVERY	88.5%		

Analyst:		SCL	Date:	03-Jan-96
Signature of Chemist:		SLF	Date:	1/3/96

SAMPLE.WB1 REV 1.2 22010NML

WHC-SD-WM-DP-164, REV. J

WORKBOOK PAGE: SAM8

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

							SAMPLE
	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA)		1.000
SAMPLE	TOTAL COUNTS	(TC)	74279	GROSS WEIGHT	(W2)		7.1927
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.1143
4527	BACKGROUND in cpm	(BKG)	11.0	NET WEIGHT	(W3)		0.0784
	SAMPLE VOLUME in mL	(SS)	0.250	DELTA TIME (HOURS)	(DT)		14.50
@SR90-01	DILUTION FACTOR	(DF)	101				
	DIGEST FACTOR (g/L)	(D g/L	2.0668				
SOLID	SAMPLE COUNT RATE	(Rs)	7416.90	SR-90 EFFICIENCY FACTOR	(C1)		0.4051
	CRITICAL LEVEL	(Lc)	2.00	Y-90 EFFICIENCY FACTOR	(C2)		0.4503
95005088	TIME OF SEPARATION	(ST)	09:00	Rmax			N/A
	DATE OF SEPARATION	(SD)	01/02/96	DETECTION LIMIT	(Ld)		4.09
0	TIME OF COUNT	(TOC)	23:30	Sr-89/90 CONC in µCi/g			1.7710E+03
	DATE OF COUNT	(DOC)	01/02/96				
FUS-ZR01							
S95T003788							

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

WB26870 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)

SEH 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)

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

NOTE: Expected weight = CVA * 0.1

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

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

01/03/96

01/02/96

09:00 AM

BY104 ROTARY

Sr-89/90 CONCENTRATION	1.77E+03	µCi/g	DETECTION LEVEL 9.76E-01 µCi/g
RELATIVE COUNTING ERROR	0.7%		
PERCENT CARRIER RECOVERY	78.4%		

Analyst:	SCL	Date:	03-Jan-96
Signature of Chemist:	SLF	Date:	1/3/96

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
	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA)		1.000
DUP	TOTAL COUNTS	(TC)	82390	GROSS WEIGHT	(W2)		7.1800
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.0916
4527	BACKGROUND in cpm	(BKG)	11.0	NET WEIGHT	(W3)		0.0884
	SAMPLE VOLUME in mL	(SS)	0.250	DELTA TIME (HOURS)	(DT)		16.00
@SR90-01	DILUTION FACTOR	(DF)	101				
	DIGEST FACTOR (g/L)	(D g/L	2.0348				
SOLID	SAMPLE COUNT RATE	(Rs)	8228.00	SR-90 EFFICIENCY FACTOR	(C1)		0.4051
	CRITICAL LEVEL	(Lc)	2.00	Y-90 EFFICIENCY FACTOR	(C2)		0.4503
95005088	TIME OF SEPARATION	(ST)	09:00	Rmax			N/A
	DATE OF SEPARATION	(SD)	01/02/96	DETECTION LIMIT	(Ld)		4.09
0	TIME OF COUNT	(TOC)	01:00	Sr-89/90 CONC in µCi/g			1.7468E+03
	DATE OF COUNT	(DOC)	01/03/96				
FUS-ZR01							
S95T003788							

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

WB26870

SEH

SLF

SCL

01/03/96

01/02/96

09:00 AM

BY104 ROTARY

Sr-89/90 CONCENTRATION	1.75E+03	µCi/g	DETECTION LEVEL 8.68E-01 µCi/g
RELATIVE COUNTING ERROR	0.7%		
PERCENT CARRIER RECOVERY	88.4%		

Analyst:	SCL	Date:	03-Jan-96
Signature of Chemist:	SLF	Date:	1/3/96

SAMPLE.WB1 REV 1.2 22010NML

1976

WORKBOOK PAGE: SAM10

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

							SAMPLE
	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA)		7.192
SAMPLE	TOTAL COUNTS	(TC)	38234	GROSS WEIGHT	(W2)		7.1923
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.1048
4527	BACKGROUND in cpm	(BKG)	11.0	NET WEIGHT	(W3)		0.0875
	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)		16.17
@SR90-01	DILUTION FACTOR	(DF)	1				
	DIGEST FACTOR (g/L)	(D g/L	2.0152				
SOLID	SAMPLE COUNT RATE	(Rs)	3812.40	SR-90 EFFICIENCY FACTOR	(C1)		0.4051
	CRITICAL LEVEL	(Lc)	2.00	Y-90 EFFICIENCY FACTOR	(C2)		0.4503
95005088	TIME OF SEPARATION	(ST)	09:00	Rmax			N/A
	DATE OF SEPARATION	(SD)	01/02/96	DETECTION LIMIT	(Ld)		4.09
0	TIME OF COUNT	(TOC)	01:10	Sr-89/90 CONC in µCi/g			1.4678E+02
	DATE OF COUNT	(DOC)	01/03/96				
FUS-ZR01							
S95T003789							

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

WB26870				DETECTION LEVEL
SEH	Sr-89/90 CONCENTRATION	1.47E+02	µCi/g	
SLF				
SCL	RELATIVE COUNTING ERROR	1.0%		1.57E-01 µCi/g
01/03/96				
BY104 ROTARY	PERCENT CARRIER RECOVERY	12.2%		
01/02/96				
09:00 AM				

Analyst:	SCL	Date:	03-Jan-96
Signature of Chemist:	SLF	Date:	1/3/96

SAMPLE.WB1 REV 1.2 22010NML

WORKBOOK PAGE: DUP11

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

							DUP
	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA)		1.000
DUP	TOTAL COUNTS	(TC)	41366	GROSS WEIGHT	(W2)		7.1642
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.0755
4527	BACKGROUND in cpm	(BKG)	11.0	NET WEIGHT	(W3)		0.0887
	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)		16.42
@SR90-01	DILUTION FACTOR	(DF)	1				
	DIGEST FACTOR (g/L)	(D g/L	2.0008				
SOLID	SAMPLE COUNT RATE	(Rs)	4125.60	SR-90 EFFICIENCY FACTOR	(C1)		0.4051
	CRITICAL LEVEL	(Lc)	2.00	Y-90 EFFICIENCY FACTOR	(C2)		0.4503
95005088	TIME OF SEPARATION	(ST)	09:00	Rmax			N/A
	DATE OF SEPARATION	(SD)	01/02/96	DETECTION LIMIT	(Ld)		4.09
0	TIME OF COUNT	(TOC)	01:25	Sr-89/90 CONC in µCi/g			2.1896E+01
	DATE OF COUNT	(DOC)	01/03/96				
FUS-ZR01							
S95T003789							

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

WB26870				
SEH				
SLF				
SCL				
01/03/96				
01/02/96	Sr-89/90 CONCENTRATION	2.19E+01	µCi/g	DETECTION LEVEL
09:00 AM	RELATIVE COUNTING ERROR	1.0%		2.17E-02 µCi/g
BY104 ROTARY	PERCENT CARRIER RECOVERY	88.7%		

Analyst:	SCL	Date:	03-Jan-96
Signature of Chemist:	SLF	Date:	1/3/96

SAMPLE.WB1 REV 1.2 22010NML

WORKBOOK PAGE: SAM12

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

							SAMPLE
	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA)		1.000
SAMPLE	TOTAL COUNTS	(TC)	55593	GROSS WEIGHT	(W2)		7.2134
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.1240
4527	BACKGROUND in cpm	(BKG)	11.0	NET WEIGHT	(W3)		0.0894
	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)		17.00
@SR90-01	DILUTION FACTOR	(DF)	1				
	DIGEST FACTOR (g/L)	(D g/L	2.1452				
SOLID	SAMPLE COUNT RATE	(Rs)	5548.30	SR-90 EFFICIENCY FACTOR	(C1)		0.4051
	CRITICAL LEVEL	(Lc)	2.00	Y-90 EFFICIENCY FACTOR	(C2)		0.4503
95005088	TIME OF SEPARATION	(ST)	09:00	Rmax			N/A
	DATE OF SEPARATION	(SD)	01/02/96	DETECTION LIMIT	(Ld)		4.09
0	TIME OF COUNT	(TOC)	02:00	Sr-89/90 CONC in µCi/g			2.7115E+01
	DATE OF COUNT	(DOC)	01/03/96				
FUS-ZR01							
S95T003790							

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

WB26870 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)

SEH 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)

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

NOTE: Expected weight = CVA * 0.1

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

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

01/03/96

01/02/96	Sr-89/90 CONCENTRATION	2.71E+01	µCi/g	DETECTION LEVEL
09:00 AM	RELATIVE COUNTING ERROR	0.8%		2.00E-02 µCi/g
BY104 ROTARY	PERCENT CARRIER RECOVERY	89.4%		

Analyst:	SCL	Date:	03-Jan-96
Signature of Chemist:	SLF	Date:	1/3/96

SAMPLE.WB1 REV 1.2 22010NML

WORKBOOK PAGE: DUP13

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

							DUP
	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA)	1.000
DUP	TOTAL COUNTS	(TC)	60074	GROSS WEIGHT	(W2)	7.2090
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.1194
4527	BACKGROUND in cpm	(BKG)	11.0	NET WEIGHT	(W3)	0.0896
	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)	17.33
@SR90-01	DILUTION FACTOR	(DF)	1			
	DIGEST FACTOR (g/L)	(D g/L	2.0912			
SOLID	SAMPLE COUNT RATE	(Rs)	5996.40	SR-90 EFFICIENCY FACTOR	(C1)	0.4051
	CRITICAL LEVEL	(Lc)	2.00	Y-90 EFFICIENCY FACTOR	(C2)	0.4503
95005088	TIME OF SEPARATION	(ST)	09:00	Rmax		N/A
	DATE OF SEPARATION	(SD)	01/02/96	DETECTION LIMIT	(Ld)	4.09
0	TIME OF COUNT	(TOC)	02:20	Sr-89/90 CONC in µCi/g		2.9911E+01
	DATE OF COUNT	(DOC)	01/03/96			

FUS-ZR01

S95T003790

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

WB26570 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)

SEH 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)

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

NOTE: Expected weight = CVA * 0.1

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

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

01/03/96

				DETECTION LEVEL
01/02/96	Sr-89/90 CONCENTRATION	2.99E+01	µCi/g	
09:00 AM	RELATIVE COUNTING ERROR	0.8%		2.04E-02 µCi/g
BY104 ROTARY	PERCENT CARRIER RECOVERY	89.6%		

Analyst:	SCL	Date:	03-Jan-96
Signature of Chemist:	SLF	Date:	1/3/96

SAMPLE.WB1 REV 1.2 22010NML

LABCORE Data Entry Template for Worklist# 4648

Analyst: KT **Instrument:** AB00 12 **Book#** 9B56

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

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

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				@SR90-01	SOLID		
2	BLNK-PREP				@SR90-01	SOLID		
3	BLNK/BKG				@SR90-01	SOLID		
4	SAMPLE	S95T003789	0	Z	@SR90-01	SOLID	95000200	BY104 ROTARY
		Analytes Requested: SR90-01 , SR90-01C, SR90-01E						
5	DUP	S95T003789	0	Z	@SR90-01	SOLID		

Final page for worklist # 4648

Kim Thomas 1-6-96
Analyst Signature **Date**

M C Bloom 1/8/96
Analyst Signature **Date**

SE Hogan 1/8/96

Data Entry Comments:

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

LABCORE Completed Worklist Report for Worklist# 4648

Analyst: knt **Instrument:** AB12 **Book#** _____

Method: _____ Rev/Mod _____

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

Seq	Type	Sample#	R	A		Test	Matrix	Actual	Found	DL or Yield	Unit
1	STD		0		@SR90-01	SR90-01	SOLID	1.24E-03	1.12E-3	90.323	% Recovery
1	STD		0		@SR90-01	SR90-01C	SOLID	100	9.70E+01	97.000	% Recovery
1	STD		0		@SR90-01	SR90-01E	SOLID	1.00	1.90E+00	1.900	% Ct. Erro
2	BLNK-PREP		0		@SR90-01	SR90-01	SOLID	1	<7.27E-3		uCi/g
2	BLNK-PREP		0		@SR90-01	SR90-01C	SOLID	100	9.66E+01	96.600	% Recovery
2	BLNK-PREP		0		@SR90-01	SR90-01E	SOLID	1.00	5.00E+02	500.000	uCi/g
3	BLNK/BKG		0		@SR90-01	SR90-01	SOLID	1	9.63E-01	0.963	BLNK/BKG
4	SAMPLE	S95T003789	0	Z	@SR90-01	SR90-01	SOLID	N/A	1.83E+01	1.50e-002	uCi/g
4	SAMPLE	S95T003789	0	Z	@SR90-01	SR90-01C	SOLID	N/A	9.67E+01	1.00e-004	% Recovery
4	SAMPLE	S95T003789	0	Z	@SR90-01	SR90-01E	SOLID	N/A	1.04E+00		% Ct. Error
5	DUP	S95T003789	0	Z	@SR90-01	SR90-01	SOLID	1.83E+1	1.93E+1	5.319	RPD
5	DUP	S95T003789	0	Z	@SR90-01	SR90-01C	SOLID	100	9.65E+01	96.500	% Recovery
5	DUP	S95T003789	0	Z	@SR90-01	SR90-01E	SOLID	1.00	1.02E+00	1.020	% Cnt Err

Final page for worklist# 4648

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

Jennifer Schepper 6/20/96
Reviewer Signature **Date**

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

WHC-SD-WM-DP-164, REV. 1

LABCORE Completed Worklist Report for Worklist# 4648

Analyst: knt **Instrument:** AB12 **Book#** _____

Method: _____ Rev/Mod _____

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

Seq	Type	Sample#	R	A	Test		Matrix	Actual	Found	DL or Yield	Unit
1	STD		0		@SR90-01	SR90-01	SOLID	1.24E-03	1.12E-3	90.320	% Recovery
1	STD		0		@SR90-01	SR90-01C	SOLID	100	9.70E+01	97.000	% Recovery
1	STD		0		@SR90-01	SR90-01E	SOLID	1.00	1.90E+00	1.900	% Ct. Error
2	BLNK-PREP		0		@SR90-01	SR90-01	SOLID	1	<7.27E-3		uCi/g
2	BLNK-PREP		0		@SR90-01	SR90-01C	SOLID	100	9.66E+01	96.600	% Recovery
2	BLNK-PREP		0		@SR90-01	SR90-01E	SOLID	1.00	5.00E+02	500.000	% Ct. Error
3	BLNK/BKG		0		@SR90-01	SR90-01	SOLID	1	9.63E-01	0.960	uCi/g
4	SAMPLE	S95T003789	0	Z	@SR90-01	SR90-01	SOLID	N/A	1.83E+01	1.500e-002	uCi/g
4	SAMPLE	S95T003789	0	Z	@SR90-01	SR90-01C	SOLID	N/A	9.67E+01	1.000e-004	% Recovery
4	SAMPLE	S95T003789	0	Z	@SR90-01	SR90-01E	SOLID	N/A	1.04E+00	0.000	% Ct. Error
5	DUP	S95T003789	0	Z	@SR90-01	SR90-01	SOLID	1.83E+1	1.93E+1	5.320	RPD
5	DUP	S95T003789	0	Z	@SR90-01	SR90-01C	SOLID	100	9.65E+01	96.500	% Recovery
5	DUP	S95T003789	0	Z	@SR90-01	SR90-01E	SOLID	1.00	1.02E+00	1.020	% Ct. Error

Final page for worklist# 4648

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

Reviewer Signature 1/9/96 **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
	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
STD	TOTAL COUNTS	(TC)	10765	GROSS WEIGHT	(W2)		7.0501
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		6.9531
4648	BACKGROUND in cpm	(BKG)	5.4	NET WEIGHT	(W3)		0.0970
	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)		5.42
@SR90-01	DILUTION FACTOR	(DF)	1				
	DIGEST DILUTION FACTOR	DDF	1				
LIQUID	SAMPLE COUNT RATE	(Rs)	1071.10	SR-90 EFFICIENCY FACTO	(C1)		0.4180
	CRITICAL LEVEL	(Lc)	1.40	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
96000090	TIME OF SEPARATION	(ST)	11:10	Rmax			N/A
	DATE OF SEPARATION	(SD)	01/06/96	DETECTION LIMIT	(Ld)		2.89
0	TIME OF COUNT	(TOC)	16:35	Sr-89/90 CONC. in µCi/L			1.1191E+00
	DATE OF COUNT	(DOC)	01/06/96				
N/A	STANDARD BOOK #		9B56				
	STANDARD VALUE in µCi/mL		1.2374E-03				

WL4648	
Instrument Code	
WB27811	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)
Prepared By	Sr-89/90 CONC in µCi/mL REPLACE RS WITH RMAX IF RS<=LcAND RS>=0 OR REPLACE RS WITH Lc IF RS<0
MCB	RS*DF*DDF*1000/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)
Analyst	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))
SLF	Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)
Reviewer	Percent Carrier Recovery = (Net Weight / Expected weight) * 100
KNT	NOTE: Expected weight = CVA * 0.1
Date Completed	Detection Levels and Less Than Values are determined from Procedure LA-508-002.
01/08/96	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100
Analysis Date	
01/06/96	Sr-89/90 CONCENTRATION 1.12E-03 µCi/mL
Analysis Time	
11:10 AM	RELATIVE COUNTING ERROR 1.9%
Sample Source	
BY-104 ROTARY	PERCENT CARRIER RECOVERY 97.0%

DETECTION LEVEL

3.02E-06 µCi/L

Analyst:	KNT	Date:	08-Jan-96
Signature of Chemist:	SLF	Date:	1/9/96

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
	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
BLNK-PREP	TOTAL COUNTS	(TC)	52	GROSS WEIGHT	(W2)	7.1436
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.0470
4648	BACKGROUND in cpm	(BKG)	5.4	NET WEIGHT	(W3)	0.0966
	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)	5.67
@SR90-01	DILUTION FACTOR	(DF)	1			
	DIGEST FACTOR (g/L)	(D g/L	2.0152			
SOLID	SAMPLE COUNT RATE	(Rs)	-0.20	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
	CRITICAL LEVEL	(Lc)	1.40	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
96000090	TIME OF SEPARATION	(ST)	11:10	Rmax		N/A
	DATE OF SEPARATION	(SD)	01/06/96	DETECTION LIMIT	(Ld)	2.89
0	TIME OF COUNT	(TOC)	16:50	Sr-89/90 CONC in µCi/g	<	7.2695E-03
	DATE OF COUNT	(DOC)	01/06/96			

N/A

WL4648

WB27811

MCB

SLF

KNT

01/08/96

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

01/06/96	Sr-89/90 CONCENTRATION	< 7.27E-03	µCi/g	DETECTION LEVEL
	LESS THAN Value was Determined from Lc.			
11:10 AM	RELATIVE COUNTING ERROR	500.0%		1.50E-02 µCi/g
BY-104 ROTARY	PERCENT CARRIER RECOVERY	96.6%		

Analyst:	KNT	Date:	08-Jan-96
Signature of Chemist:	SLF	Date:	1/9/96

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
	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
SAMPLE	TOTAL COUNTS	(TC)	35364	GROSS WEIGHT	(W2)		7.0692
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		6.9725
4648	BACKGROUND in cpm	(BKG)	5.4	NET WEIGHT	(W3)		0.0967
	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)		5.83
@SR90-01	DILUTION FACTOR	(DF)	1				
	DIGEST FACTOR (g/L)	(D g/L	2.0152				
SOLID	SAMPLE COUNT RATE	(Rs)	3531.00	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
	CRITICAL LEVEL	(Lc)	1.40	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
96000090	TIME OF SEPARATION	(ST)	11:10	Rmax			N/A
	DATE OF SEPARATION	(SD)	01/06/96	DETECTION LIMIT	(Ld)		2.89
1	TIME OF COUNT	(TOC)	17:00	Sr-89/90 CONC in µCi/g			1.8282E+01
	DATE OF COUNT	(DOC)	01/06/96				
FUS-ZR01							
S95T003789							

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

WB27811 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)

MCB 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)

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

NOTE: Expected weight = CVA * 0.1

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

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

01/08/96

				DETECTION LEVEL
01/06/96	Sr-89/90 CONCENTRATION	1.83E+01	µCi/g	
11:10 AM	RELATIVE COUNTING ERROR	1.0%		1.50E-02 µCi/g
BY-104 ROTARY	PERCENT CARRIER RECOVERY	96.7%		

Analyst:	KNT	Date:	08-Jan-96
Signature of Chemist:	SLF	Date:	1/9/96

SAMPLE.WB1 REV 1.2 22010NML

1985

WORKBOOK PAGE: DUP5

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

							DUP
	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)		1.000
DUP	TOTAL COUNTS	(TC)	36967	GROSS WEIGHT	(W2)		6.9863
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		6.8898
4648	BACKGROUND in cpm	(BKG)	5.4	NET WEIGHT	(W3)		0.0965
	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)		6.00
@SR90-01	DILUTION FACTOR	(DF)	1				
	DIGEST FACTOR (g/L)	(D g/L	2.0008				
SOLID	SAMPLE COUNT RATE	(Rs)	3691.30	SR-90 EFFICIENCY FACTOR	(C1)		0.4180
	CRITICAL LEVEL	(Lc)	1.40	Y-90 EFFICIENCY FACTOR	(C2)		0.4660
96000090	TIME OF SEPARATION	(ST)	11:10	Rmax			N/A
	DATE OF SEPARATION	(SD)	01/06/96	DETECTION LIMIT	(Ld)		2.89
1	TIME OF COUNT	(TOC)	17:10	Sr-89/90 CONC in µCi/g			1.9256E+01
	DATE OF COUNT	(DOC)	01/06/96				
FUS-ZR01							
S95T003789							

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

WB27811 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)

MCB 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)

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

NOTE: Expected weight = CVA * 0.1

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

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

01/08/96

				DETECTION LEVEL
01/06/96	Sr-89/90 CONCENTRATION	1.93E+01	µCi/g	
11:10 AM	RELATIVE COUNTING ERROR	1.0%		1.51E-02 µCi/g
BY-104 ROTARY	PERCENT CARRIER RECOVERY	96.5%		

Analyst:	KNT	Date:	08-Jan-96
Signature of Chemist:	SLF	Date:	1/9/96

SAMPLE.WB1 REV 1.2 22010NML