Attachment C: Data-Validation Cover Sheet

☐ **Rejected Data**

Section I

Request Number: 19509 Validation Date: 4/28/2006 Lab Code: NA

Contract Laboratory Name: Analytical Technologies, Inc Validator: Linda Thal

Organization: Analytical Quality Associates

Analytical Suite (check all that apply):
- ☐ Volatile Organics
- ☐ Semivolatile Organics
- ☐ Organochlorine Pesticides/Polychlorinated Biphenyls
- ☐ High Explosives
- ☐ Inorganics
- ☒ Radiochemistry

Other (describe): _____

Section II - Completeness Check

Yes	No	n/a	(check one)	Yes	No	n/a	(check one)
☒	☐	☐	1. Chain-of-custody form(s)	☒	☐	☐	6. Raw/BSS data
☒	☐	☐	2. Case narrative	☐	☒	☐	7. Quality control forms
☒	☐	☐	3. Sample result forms	☐	☐	☒	8. Quantitation reports
☐	☐	☒	4. Sample chromatograms	☐	☐	☒	9. TICs forms
☐	☐	☒	5. Standard chromatograms	☐	☐	☒	10. TICs mass spectra

Identify any samples in the assigned Request Number that are missing:

None

Comments/problems noted (include information about requests for further information submitted to the contract laboratory and agreed-upon date of resolution and contract laboratory point of contact): **(page 1 of 1)**

1. The MDC values were not reported. Thus, estimated MDCs were calculated using 3X the 1-sigma TPU and hand-entered on the F1s. The reported sample results that were ≤3X the 1-sigma TPU were qualified U, R11.
2. It should be noted that MDC and TPU values were not reported for the gamma spec MB. Thus, it could not be determined whether or not there were any detects. However, all sample results, except for the Eu-152 results for samples AAB3325 and AAB3461 and several Cs-137 results, were non-detects. Thus, no sample data were qualified, based on professional judgment.
3. It should be noted that samples AAB3451, AAB3461 and AAB3476 were reported with collection dates in July 1994. According to the COC, these samples were collected in June 1994. Sample hold times were unaffected, and no data were qualified.

Validator's signature: L Thal Date: 4/28/2006

Attachment D. Gamma Spectroscopy Data-Validation Checklist

Yes	No	n/a	(check one)	Assign qualifier listed below if criteria = Yes: Detected analyte	Undetected analyte
☒	☐	☐	1. MDC and/or TPU were not stated for each radionuclide in each batch for each sample.	[a]	[a]
☐	☐	☒	2. Sample result is ≤MDC.	U, R5	U, R5
☒	☐	☐	3. Sample result is ≤3 times the TPU calculation.	U, R11	N/A
☐	☒	☐	4. Sample results are tentative because of spectral interference.	R, R5b	R, R5b
☐	☒	☐	5. Preparation/method blank is not reported.	R, R4	R, R4
☐	☐	☒	6. Analyte detected in blank and sample result for analyte ≤5x the amount in blank	U, R4a	N/A
☐	☒	☐	7. Duplicate analysis information is not present.	J, R7	UJ, R7
☐	☒	☐	8. DER for detected analytes is ≥2 but ≤4.	J, R7b	N/A
☐	☒	☐	9. DER for detected analytes is >4.	R, R7c	N/A
☐	☒	☐	10. Laboratory Control Sample (LCS) information is not present.	R, R6	R, R6
☐	☒	☐	11. LCS % recovery is >120%.	J+, R6a	N/A
☐	☒	☐	12. LCS % recovery is <80 but ≥10%.	J-, R6c	UJ, R6d
☐	☒	☐	13. LCS % recovery is <10%.	R, R6b	R, R6b
☐	☒	☐	14. Sample was extracted outside of the appropriate hold time.	J-, R9	UJ, R9
☐	☒	☐	15. Sample was extracted >2 times the appropriate holding time.	R, R9a	R, R9a
☐	☒	☐	16. Other obvious data quality issues identified.	__, R19	__, R19

[a] If the laboratory cannot provide the missing MDC, an estimated MDC can be calculated using 3 times the TPU.

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Lab Name: Analytical Technologies, Inc. Date Collected: 07/21/94 12:00

Client Name: Los Alamos Natl Lab/CST-3 Date Analyzed: 12/02/94 14:50

Lab Sample ID: 94-11-164-01 Sample Matrix: Soil

Client Sample ID: 94.18548-3 Count Duration: 180 Min.

Nuclide	Est. MDC	Activity (pCi/gram)			% Uncertainty	
Am-241	0.293	0.146	±	0.195	134	U,R11
Cs-137	0.084	0.187	±	0.056	30.1	
Na-22	0.051	0.032	±	0.034	107	U,R11
Ce-144	0.260	-0.125	±	0.173	138	
Np-237	0.051	0.031	±	0.034	110	
Ba-140	113	9.84	±	75.2	764	
Ru-106	0.414	-0.024	±	0.276	1160	
Co-60	0.053	-0.019	±	0.035	185	
Eu-152	0.230	0.005	±	0.153	3390	

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ). See ATI SOP 743FC for details of the TPU determination.

Reported activities are the calculated net activities, not truncated or censored by an a priori detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

LT 4/28/2006

000018

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Lab Name: Analytical Technologies, Inc.

Date Collected: 07/15/94 12:00

Client Name: Los Alamos Natl Lab/CST-3

Date Analyzed: 12/02/94 14:58

Lab Sample ID: 94-11-164-02

Sample Matrix: Soil

Client Sample ID: 94.18551-3

Count Duration: 180 Min.

Nuclide	Est. MDC	Activity (pCi/gram)			% Uncertainty	
Am-241	0.215	0.003	±	0.143	4520	UR11
Ce-144	0.263	-0.033	±	0.175	522	
Np-237	0.068	-0.017	±	0.045	270	
Ba-140	122	11.7	±	81.6	696	
Ru-106	0.467	-0.064	±	0.311	485	
Cs-137	0.044	-0.004	±	0.029	797	
Co-60	0.047	-0.008	±	0.031	379	
Na-22	0.045	-0.002	±	0.030	1540	
Eu-152	0.204	0.054	±	0.136	252	

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ). See ATI SOP 743PC for details of the TPU determination.

Reported activities are the calculated net activities, not truncated or censored by an a priori detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

LT 4/28/2006

000019

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Lab Name: Analytical Technologies, Inc.

Date Collected: 08/03/94 12:00

Client Name: Los Alamos Natl Lab/CST-3

Date Analyzed: 12/02/94 14:57

Lab Sample ID: 94-11-164-03

Sample Matrix: Soil

Client Sample ID: 94.18557-3

Count Duration: 180 Min.

Nuclide	Est. MDC	Activity (pCi/gram)			% Uncertainty	
Na-22	0.057	0.044	±	0.038	85.0	UR11
Am-241	1.27	-0.446	±	0.848	190	
Ce-144	1.01	-1.65	±	0.670	40.5	
Np-237	0.141	-0.057	±	0.094	164	
Ba-140	191	7.09	±	127	1790	
Ru-106	0.837	0.347	±	0.558	161	
Cs-137	0.078	0.019	±	0.052	275	
Co-60	0.054	-0.006	±	0.036	552	
Eu-152	0.263	0.175	±	0.175	100	

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ). See ATI SOP 743FC for details of the TPU determination.

Reported activities are the calculated net activities, not truncated or censored by an a priori detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

Data stored in file \gdr\prt\S1116403.94P

LT 4/28/2006

000010

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Lab Name: Analytical Technologies, Inc. Date Collected: 07/25/94 12:00

Client Name: Los Alamos Natl Lab/CST-3 Date Analyzed: 12/02/94 15:00

Lab Sample ID: 94-11-164-04 Sample Matrix: Soil

Client Sample ID: 94.18560-3 Count Duration: 180 Min.

Nuclide	Est. MDC	Activity (pCi/gram)			% Uncertainty	
Am-241	0.825	0.083	±	0.550	659	UR11
Ce-144	0.969	-1.539	±	0.646	42.0	
Np-237	0.116	0.013	±	0.077	573	
Ba-140	225	89.4	±	150	167	
Ru-106	0.693	-0.117	±	0.462	397	
Cs-137	0.065	0.026	±	0.043	162	
Co-60	0.054	0.011	±	0.036	318	
Na-22	0.048	-0.012	±	0.032	269	
Eu-152	0.221	0.178	±	0.147	82.3	

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ). See ATI SOP 743FC for details of the TPU determination.

Reported activities are the calculated net activities, not truncated or censored by an a priori detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

LT 4/28/2006

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Lab Name: Analytical Technologies, Inc. Date Collected: 07/25/94 12:00

Client Name: Los Alamos Natl Lab/CST-3 Date Analyzed: 12/02/94 15:02

Lab Sample ID: 94-11-164-05 Sample Matrix: Soil

Client Sample ID: 94.18561-3 Count Duration: 180 Min.

Nuclide	Est. MDC	Activity (pCi/gram)			% Uncertainty	
Am-241	0.251	0.120	±	0.167	139	UR11
Ce-144	0.279	-0.002	±	0.186	11100	
Np-237	0.074	-0.018	±	0.049	274	
Ba-140	134	80.7	±	89.2	111	
Ru-106	0.579	-0.087	±	0.386	442	
Cs-137	0.053	-0.011	±	0.035	314	
Co-60	0.062	-0.019	±	0.041	218	
Na-22	0.063	-0.002	±	0.042	1810	
Eu-152	0.281	0.114	±	0.187	164	

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ). See ATI SOP 743FC for details of the TPU determination.

Reported activities are the calculated net activities, not truncated or censored by an a priori detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

LT 4/28/2006

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Lab Name: Analytical Technologies, Inc.

Date Collected: 07/06/94 12:00

Client Name: Los Alamos Natl Lab/CST-3

Date Analyzed: 12/02/94 15:13

Lab Sample ID: 94-11-164-06

Sample Matrix: Soil

Client Sample ID: 94.20311-2

Count Duration: 180 Min.

Nuclide	Est. MDC	Activity (pCi/gram)			% Uncertainty	
Ru-106	0.402	0.245	±	0.268	110	UR11
Am-241	0.048	0.006	±	0.032	547	
Ce-144	0.164	0.050	±	0.109	219	
Np-237	0.048	-0.002	±	0.032	2000	
Ba-140	104	-33.662	±	69.4	206	
Cs-137	0.032	-0.008	±	0.021	268	
Co-60	0.056	0.003	±	0.037	1430	
Na-22	0.054	-0.003	±	0.036	1210	
Eu-152	0.233	0.182	±	0.155	85.5	

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ). See ATI SOP 743FC for details of the TPU determination.

Reported activities are the calculated net activities, not truncated or censored by an a priori detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

LT 4/28/2006

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Lab Name: Analytical Technologies, Inc. Date Collected: 07/20/94 12:00

Client Name: Los Alamos Natl Lab/CST-3 Date Analyzed: 12/02/94 15:14

Lab Sample ID: 94-11-164-07 Sample Matrix: Soil

Client Sample ID: 94.20312-2 Count Duration: 180 Min.

Nuclide	Est MDC	Activity (pCi/gram)			% Uncertainty
Cs-137	0.098	0.384	±	0.065	16.9
Am-241	0.086	-0.005	±	0.057	1240
Ce-144	0.236	-0.041	±	0.157	382
Np-237	0.065	0.010	±	0.043	423
Ba-140	138	38.4	±	92.0	240
Ru-106	0.453	0.043	±	0.302	700
Co-60	0.053	0.033	±	0.035	106
Na-22	0.053	0.012	±	0.035	297
Eu-152	0.192	0.093	±	0.128	138

UR11

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ). See ATI SOP 743FC for details of the TPU determination.

Reported activities are the calculated net activities, not truncated or censored by an a priori detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

LT 4/28/2006

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Lab Name: Analytical Technologies, Inc.

Date Collected: 07/15/94 12:00

Client Name: Los Alamos Natl Lab/CST-3

Date Analyzed: 12/02/94 15:16

Lab Sample ID: 94-11-164-08

Sample Matrix: Soil

Client Sample ID: 94.20313-2

Count Duration: 180 Min.

Nuclide	Est. MDC	Activity (pCi/g)	% Uncertainty	
Cs-137	0.068	0.217 ± 0.045	20.66	
Am-241	0.161	0.005 ± 0.107	2093.0	ULR11
Ce-144	0.245	-0.170 ± 0.163	96.25	
Np-237	0.050	-0.005 ± 0.033	663.23	
Ba-140	658	0.000 ± 438.51	100.00	
Ru-106	0.348	0.094 ± 0.232	248.16	
Co-60	0.035	0.015 ± 0.023	147.34	
Na-22	0.035	-0.007 ± 0.023	308.69	
Eu-152	0.168	0.178 ± 0.112	62.86	

Reported activities are the calculated net activities, not truncated or censored by an a priori detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ). See ATI SOP 743FC for details of the TPU determination.

LT 4/28/2006

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Lab Name: Analytical Technologies, Inc. Date Collected: 06/30/94 12:00

Client Name: Los Alamos Natl Lab/CST-3 Date Analyzed: 12/02/94 15:18

Lab Sample ID: 94-11-164-09 Sample Matrix: Soil

Client Sample ID: 94.20314-2 Count Duration: 180 Min.

Nuclide	Est. MDC	Activity (pCi/gram)	% Uncertainty
Cs-137	0.068	0.352 ± 0.045	12.8
Am-241	0.122	-0.041 ± 0.081	195
Ce-144	0.195	-0.070 ± 0.130	186
Np-237	0.044	-0.001 ± 0.029	3620
Ba-140	81.5	9.31 ± 54.3	583
Ru-106	0.326	0.015 ± 0.217	1490
Co-60	0.033	0.006 ± 0.022	402
Na-22	0.035	-0.011 ± 0.023	210
Eu-152	0.152	-0.007 ± 0.101	1380

UR11

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ). See ATI SOP 743PC for details of the TPU determination.

Reported activities are the calculated net activities, not truncated or censored by an a priori detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

LT 4/28/2006

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Lab Name: Analytical Technologies, Inc. Date Collected: 06/28/94 12:00

Client Name: Los Alamos Natl Lab/CST-3 Date Analyzed: 12/02/94 16:26

Lab Sample ID: 94-11-164-10 Sample Matrix: Soil

Client Sample ID: 94.20315-2 Count Duration: 180 Min.

Nuclide	Est MDC	Activity (pCi/gram)	% Uncertainty
Ce-144	0.270	0.156 ± 0.180	116
Am-241	0.422	0.060 ± 0.281	468
Np-237	0.065	-0.007 ± 0.043	626
Ba-140	130	21.9 ± 86.5	395
Ru-106	0.479	0.077 ± 0.319	412
Cs-137	0.041	0.004 ± 0.027	619
Co-60	0.053	-0.024 ± 0.035	147
Na-22	0.051	-0.010 ± 0.034	357
Eu-152	0.263	0.138 ± 0.175	127

UR11

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ). See ATI SOP 743FC for details of the TPU determination.

Reported activities are the calculated net activities, not truncated or censored by an a priori detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

LT 4/28/2006

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Lab Name: Analytical Technologies, Inc. Date Collected: 06/30/94 12:00

Client Name: Los Alamos Natl Lab/CST-3 Date Analyzed: 12/02/94 16:27

Lab Sample ID: 94-11-164-11 Sample Matrix: Soil

Client Sample ID: 94.20316-2 Count Duration: 180 Min.

Nuclide	Est MDC	Activity (pCi/gram)	% Uncertainty
Cs-137	0.110	0.660 ± 0.073	11.1
Am-241	0.296	0.048 ± 0.197	408
Ce-144	0.221	-0.007 ± 0.147	2080
Np-237	0.051	0.008 ± 0.034	418
Ba-140	105	-18.061 ± 70.0	388
Ru-106	0.345	-0.141 ± 0.230	163
Co-60	0.038	-0.007 ± 0.025	353
Na-22	0.042	0.018 ± 0.028	153
Eu-152	0.180	0.056 ± 0.120	212

UR11

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ). See ATI SOP 743FC for details of the TPU determination.

Reported activities are the calculated net activities, not truncated or censored by an a priori detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

LT 4/28/2006

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Lab Name: Analytical Technologies, Inc.

Date Collected: 07/24/94 12:00

Client Name: Los Alamos Natl Lab/CST-3

Date Analyzed: 12/03/94 18:41

Lab Sample ID: 94-11-164-12

Sample Matrix: Soil

Client Sample ID: 94.20320-2

Count Duration: 180 Min.

Nuclide	Est. MDC	Activity (pCi/gram)			% Uncertainty	
Na-22	0.039	0.025	±	0.026	101	ULR11
Am-241	0.329	-0.106	±	0.219	207	
Ce-144	0.204	0.019	±	0.136	712	
Np-237	0.050	0.006	±	0.033	568	
Ba-140	103	10.9	±	68.6	632	
Ru-106	0.362	0.130	±	0.241	185	
Cs-137	0.033	0.004	±	0.022	491	
Co-60	0.042	0.021	±	0.028	133	
Eu-152	0.174	0.056	±	0.116	206	

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ). See ATI SOP 743FC for details of the TPU determination.

Reported activities are the calculated net activities, not truncated or censored by an a priori detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

Data stored in file \gdr\prt\S1116412.94P

LT 4/28/2006

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Lab Name: Analytical Technologies, Inc. Date Collected: 07/27/94 12:00

Client Name: Los Alamos Natl Lab/CST-3 Date Analyzed: 12/03/94 18:44

Lab Sample ID: 94-11-164-13 Sample Matrix: Soil

Client Sample ID: 94.20321-2 Count Duration: 180 Min.

Nuclide	Est. MDC	Activity (pCi/gram)			% Uncertainty	
Cs-137	0.101	0.419	±	0.067	16.0	
Am-241	0.569	-0.213	±	0.379	178	UR11
Ce-144	0.360	-0.114	±	0.240	209	
Np-237	0.074	0.000	±	0.049	12100	
Ba-140	135	11.3	±	89.8	794	
Ru-106	0.465	-0.210	±	0.310	148	
Co-60	0.041	-0.004	±	0.027	657	
Na-22	0.047	-0.020	±	0.031	161	
Eu-152	0.200	0.223	±	0.133	59.5	

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ). See ATI SOP 743FC for details of the TPU determination.

Reported activities are the calculated net activities, not truncated or censored by an a priori detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

LT 4/28/2006

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Lab Name: Analytical Technologies, Inc. Date Collected: 07/25/94 12:00

Client Name: Los Alamos Natl Lab/CST-3 Date Analyzed: 12/05/94 09:49

Lab Sample ID: 94-11-164-14 Sample Matrix: Soil

Client Sample ID: 94.20322-2 Count Duration: 180 Min.

Nuclide	Est. MDC	Activity (pCi/gram)			% Uncertainty	
Ru-106	0.429	0.216	±	0.286	133	U.R11
Cs-137	0.083	0.130	±	0.055	42.6	
Am-241	0.054	0.009	±	0.036	429	U.R11
Ce-144	0.183	-0.051	±	0.122	240	
Np-237	0.056	-0.002	±	0.037	2070	
Ba-140	122	-12.107	±	81.4	673	
Co-60	0.062	0.014	±	0.041	285	
Na-22	0.059	-0.013	±	0.039	307	
Eu-152	0.246	0.122	±	0.164	135	

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ). See ATI SOP 743FC for details of the TPU determination.

Reported activities are the calculated net activities, not truncated or censored by an a priori detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

LT 4/28/2006

000023

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Lab Name: Analytical Technologies, Inc. Date Collected: 07/28/94 12:00

Client Name: Los Alamos Natl Lab/CST-3 Date Analyzed: 12/05/94 09:51

Lab Sample ID: 94-11-164-15 Sample Matrix: Soil

Client Sample ID: 94.20323-2 Count Duration: 180 Min.

Nuclide	Est. MDC	Activity (pCi/gram)			% Uncertainty	
Cs-137	0.083	0.277	±	0.055	19.8	
Am-241	0.051	-0.010	±	0.034	356	UR11
Ce-144	0.155	-0.018	±	0.103	569	
Np-237	0.050	-0.003	±	0.033	1100	
Ba-140	106	45.7	±	70.7	155	
Ru-106	0.389	0.174	±	0.259	149	
Co-60	0.042	-0.020	±	0.028	138	
Na-22	0.050	-0.014	±	0.033	233	
Eu-152	0.200	-0.089	±	0.133	149	

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ). See ATI SOP 743PC for details of the TPU determination.

Reported activities are the calculated net activities, not truncated or censored by an a priori detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

LT 4/28/2006

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Lab Name: Analytical Technologies, Inc. Date Collected: 07/08/94 12:00

Client Name: Los Alamos Natl Lab/CST-3 Date Analyzed: 12/05/94 09:52

Lab Sample ID: 94-11-164-16 Sample Matrix: Soil

Client Sample ID: 94.20324-2 Count Duration: 180 Min.

Nuclide	Est. MDC	Activity (pCi/gram)	% Uncertainty	
Cs-137	0.078	0.389 ± 0.052	13.4	
Am-241	0.104	-0.013 ± 0.069	550	UR11
Ce-144	0.221	-0.052 ± 0.147	283	
Np-237	0.053	-0.025 ± 0.035	137	
Ba-140	96.3	-5.000 ± 64.2	1280	
Ru-106	0.374	0.024 ± 0.249	1020	
Co-60	0.041	0.013 ± 0.027	206	
Na-22	0.038	0.006 ± 0.025	420	
Eu-152	0.182	0.181 ± 0.121	66.5	

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ). See ATI SOP 743FC for details of the TPU determination.

Reported activities are the calculated net activities, not truncated or censored by an a priori detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

LT 4/28/2006

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Lab Name: Analytical Technologies, Inc. Date Collected: 07/25/94 12:00

Client Name: Los Alamos Natl Lab/CST-3 Date Analyzed: 12/05/94 09:54

Lab Sample ID: 94-11-164-17 Sample Matrix: Soil

Client Sample ID: 94.20336-2 Count Duration: 180 Min.

Nuclide	Est. MDC	Activity (pCi/gram)	% Uncertainty	
Cs-137	0.048	0.060 ± 0.032	52.2	
Am-241	0.110	-0.039 ± 0.073	190	UR11
Ce-144	0.186	-0.040 ± 0.124	310	
Np-237	0.044	-0.015 ± 0.029	200	
Ba-140	85.8	-41.200 ± 57.2	139	
Ru-106	0.314	-0.090 ± 0.209	232	
Co-60	0.033	0.000 ± 0.022	16900	
Na-22	0.033	-0.005 ± 0.022	445	
Eu-152	0.147	0.108 ± 0.098	91.2	

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ). See ATI SOP 743FC for details of the TPU determination.

Reported activities are the calculated net activities, not truncated or censored by an a priori detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

LT 4/28/2006

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Lab Name: Analytical Technologies, Inc. Date Collected: 07/20/94 12:00

Client Name: Los Alamos Natl Lab/CST-3 Date Analyzed: 12/05/94 10:11

Lab Sample ID: 94-11-164-18 Sample Matrix: Soil

Client Sample ID: 94.20337-2 Count Duration: 180 Min.

Nuclide	Est MDC	Activity (pCi/gram)	% Uncertainty	
Cs-137	0.080	0.158 ± 0.053	33.6	
Na-22	0.047	0.033 ± 0.031	94.3	UR11
Am-241	0.243	-0.012 ± 0.162	1370	
Ce-144	0.272	-0.066 ± 0.181	272	
Np-237	0.065	0.035 ± 0.043	123	
Ba-140	121	51.0 ± 80.4	158	
Ru-106	0.495	-0.108 ± 0.330	307	
Co-60	0.053	-0.026 ± 0.035	137	
Eu-152	0.209	0.062 ± 0.139	224	

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ). See ATI SOP 743FC for details of the TPU determination.

Reported activities are the calculated net activities, not truncated or censored by an a priori detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

LT 4/28/2006

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Lab Name: Analytical Technologies, Inc. Date Collected: 07/19/94 12:00

Client Name: Los Alamos Natl Lab/CST-3 Date Analyzed: 12/05/94 11:24

Lab Sample ID: 94-11-164-19 Sample Matrix: Soil

Client Sample ID: 94.20344-2 Count Duration: 180 Min.

Nuclide	Est. MDC	Activity (pCi/gram)			% Uncertainty	
Cs-137	0.099	0.435	±	0.066	15.1	
Am-241	0.288	-0.031	±	0.192	618	UR11
Ce-144	0.215	-0.039	±	0.143	368	
Np-237	0.054	-0.023	±	0.036	157	
Ba-140	107	22.7	±	71.6	316	
Ru-106	0.413	0.148	±	0.275	185	
Co-60	0.045	-0.003	±	0.030	1100	
Na-22	0.047	-0.016	±	0.031	194	
Eu-152	0.183	0.098	±	0.122	125	

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ). See ATI SOP 743FC for details of the TPU determination.

Reported activities are the calculated net activities, not truncated or censored by an a priori detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

LT 4/28/2006

Attachment C: Data-Validation Cover Sheet

☐ **Rejected Data**

Section I

Request Number: 19509 Validation Date: 4/28/06 Lab Code: NA

Contract Laboratory Name: Analytical Technologies, Inc Validator: Linda Thal

Organization: Analytical Quality Associates, Inc

Analytical Suite (check all that apply):
- ☐ Volatile Organics
- ☐ Semivolatile Organics
- ☐ Organochlorine Pesticides/Polychlorinated Biphenyls
- ☐ High Explosives
- ☒ Inorganics
- ☐ Radiochemistry

Other (describe): Uranium by KPA

Section II - Completeness Check

Yes	No	n/a	(check one)	Yes	No	n/a	(check one)
☒	☐	☐	1. Chain-of-custody form(s)	☒	☐	☐	6. Raw/BSS data
☒	☐	☐	2. Case narrative	☐	☒	☐	7. Quality control forms
☒	☐	☐	3. Sample result forms	☐	☐	☒	8. Quantitation reports
☐	☐	☒	4. Sample chromatograms	☐	☐	☒	9. TICs forms
☐	☐	☒	5. Standard chromatograms	☐	☐	☒	10. TICs mass spectra

Identify any samples in the assigned Request Number that are missing:

None

Comments/problems noted (include information about requests for further information submitted to the contract laboratory and agreed-upon date of resolution and contract laboratory point of contact): (page 1 of 1)

1. It should be noted that Total Uranium was measured by KPA. This technique is not a radiochemical analysis and reported uncertainties are not based on standard radiochemistry calculations. The calculations are not documented, and the uncertainty values may or may not reflect any real measurement uncertainties. Thus, this method was validated as an Inorganic analysis.
2. A series of high range and a series of low range calibration check samples were analyzed before and after the samples and met acceptance criteria.
3. The laboratory reported these analyses as a radiochemical analysis and, thus, there were no ICB/CCB, ICS or serial dilution reported. No sample data were qualified, based on professional judgment.
4. It could not be determined if the result for the preparation blank was a detect, since MDLs were not reported in the data package. The associated sample results were >5X the blank concentration and, thus, were not qualified.
5. It should be noted that sample AAB3353 was reported as having been collected on June 28, 1994. According to the COC, the date of collection was July 28, 1994. Samples AAB3451, AAB3461 and AAB3476 were reported with collection dates in July 1994. According to the COC, these samples were collected in June 1994. Sample hold times were unaffected, and no sample data were qualified.

Validator's signature: L Thal Date: 4/28/06

Attachment D. Inorganic Data-Validation Checklist

Yes	No	(check one)	Assign qualifier listed below if criteria = Yes: Detected analyte	Undetected analyte
☒	☐	1. The preparation Blank (PB), ICB, or CCB was not analyzed with the samples.	R, I4	R, I4
☐	☒	2. The analyte detected in PB and the sample result for the analyte ≤5x the amount in PB.	U, I4a	N/A
☐	☒	3. The initial or continuing calibration verification (ICV or CCV) was not analyzed with the samples.	R, I16	R, I16
☐	☒	4. The ICV or CCV recovery is >UAL.	R, I16a	N/A
☐	☒	5. The ICV or CCV recovery is >UWL and ≤UAL.	J+, I16b	N/A
☐	☒	6. The ICV or CCV recovery is <LWL but ≥LAL.	J-, I16c	UJ, I16c
☐	☒	7. The ICV or CCV recovery is <LAL.	R, I16d	R, I16d
☐	☒	8. For ICPMS and CN analyses: The correlation coefficient is <0.995?	R, I16e	R, I16e
☒	☐	9. The interference check sample (ICS) was not analyzed with the samples.	R, I7	R, I7
☐	☒	10. The ICS recovery is >120%.	J+, I7a	N/A
☐	☒	11. The ICS recovery is ≥50% and <80%.	J-, I7b	UJ, I7b
☐	☒	12. The ICS recovery is <50%.	R, I7c	R, I7d
☐	☒	13. The MS was not analyzed with the sample without explanation.	R, I3	R, I3
☐	☒	14. Insufficient sample volume for MS analyses was provided.	J, I3a	UJ, I3a
☐	☒	15. An MS analysis was performed on a non-LANL sample.	J, I3b	UJ, I3b
☐	☒	16. The MS recovery was > 150%*.	J+, I3c	UJ, I3c
☐	☒	17. The MS recovery was >125% and ≤150%.	J+, I3d	N/A
☐	☒	18. The MS recovery was ≥30% and <75%.	J-, I3e	UJ, I3e
☐	☒	19. The MS recovery was <30%.	R, I3f	R, I3f
☐	☒	20. A duplicate sample was not analyzed without explanation.	J, I10	UJ, I10
☐	☒	21. Insufficient sample volume for duplicate sample analysis was provided.	J, I10a	UJ, I10a
☐	☒	22. A duplicate sample was performed on a non-LANL sample.	J, I10b	UJ, I10b
☐	☒	23. Both the sample and the duplicate are ≥5x RL, and the RPD is >20 for water samples or >35 for soil samples	J, I10c	UJ, I10c
☐	☒	24. Either the sample or Dup is <5x the RL and the sample and Dup results are not within ±1x the RL for water or ±2x the RL for soil.	J, I10d	UJ, I10d
☐	☒	25. The LCS was not analyzed with the samples.	R, I6	R, I6
☐	☒	26. The LCS recovery was >the UWL.	J+, I6a	N/A
☐	☒	27. The LCS recovery was ≥LAL and <LWL.	J-, I6b	UJ, I6b
☐	☒	28. The LCS recovery was <the LAL.	R, I6c	R, I6c
☒	☐	29. The serial dilution sample was not analyzed with the samples.	J, I18	UJ, I18
☐	☒	30. The serial dilution sample was performed on a non-LANL sample.	J, I18a	UJ, I18a
☐	☒	31. The RPD between the sample and the serial dilution sample is >10, and the undiluted sample result is >50x the DL(>100x for ICPMS).	J, I18b	UJ, I18b
☐	☒	32. The sample was analyzed past the appropriate hold time.	J-, I9	UJ, I9
☐	☒	33. The sample was analyzed past double the hold time.	J-, I9a	R, I9a
☐	☒	34. B-flagged sample results are present.	J, I1	N/A
☐	☒	35. Other obvious data quality issues are identified.	__, I19	__, I19

* If the sample result is >4x the spike added, MS recovery criteria do not apply.

TOTAL URANIUM ANALYSIS RESULTS SUMMARY

By Laser-Induced Kinetic Phosphorimetry

Lab Name: Analytical Technologies, Inc. **Date Collected: 07/21/94**

Client Name: Los Alamos Natl Lab/CST-9 **Date Analyzed : 12/07/94**

Client Project ID: 19509 **Sample Matrix : Soil**

Lab Sample ID Series: 94-11-164

Client Sample ID	Lab Sample ID	Total Uranium (ug/g)
94.18548-3	11-164-01	47.5 ± 6.5
94.18551-3	11-164-02	6.47 ± 0.87
94.18557-3	11-164-03	2763 ± 380
94.18560-3	11-164-04	2820 ± 388
94.18561-3	11-164-05	10.3 ± 1.4
94.20311-2	11-164-06	21.7 ± 3.0
94.20312-2	11-164-07	41.1 ± 5.7
94.20313-2	11-164-08	190 ± 26
94.20314-2	11-164-09	46.1 ± 6.3
94.20315-2	11-164-10	3.93 ± 0.53
94.20316-2	11-164-11	49.2 ± 6.8
94.20320-2	11-164-12	3.17 ± 0.43
94.20321-2	11-164-13	66.3 ± 9.1
94.20322-2	11-164-14	15.2 ± 2.1
94.20323-2	11-164-15	21.1 ± 2.9
94.20324-2	11-164-16	21.6 ± 3.0
94.20336-2	11-164-17	12.7 ± 1.8
94.20337-2	11-164-18	39.1 ± 5.4
94.20344-4	11-164-19	12.1 ± 1.6
94.18555-3	11-164-20	659 ± 91
94.20317-2	11-164-21	31.8 ± 4.4
94.20318-2	11-164-22	400 ± 55
94.20319-2	11-164-23	282 ± 38
94.20325-2	11-164-24	310 ± 43
94.20326-2	11-164-25	19.4 ± 2.7

Reported Uncertainties are the Estimated Total Propagated Uncertainties (2σ). See ATI SOP 743FC for details of TPU determinations.

LT 4/28/2006

TOTAL URANIUM ANALYSIS RESULTS SUMMARY

By Laser-Induced Kinetic Phosphorimetry

Lab Name: Analytical Technologies, Inc. **Date Collected:** 07/21/94

Client Name: Los Alamos Natl Lab/CST-9 **Date Analyzed :** 12/13/94

Client Project ID: 19509 **Sample Matrix :** Soil

Lab Sample ID Series: 94-11-164

Client Sample ID	Lab Sample ID	Total Uranium (ug/g)
94.20327-2	11-164-26	93 ± 13
94.20328-2	11-164-27	303 ± 42
94.20329-2	11-164-28	161 ± 22
94.20330-2	11-164-29	349 ± 48
94.20331-2	11-164-30	187 ± 26
94.20332-2	11-164-31	47.1 ± 6.5
94.20333-2	11-164-32	136 ± 19
94.20334-2	11-164-33	42.0 ± 5.8
94.20335-2	11-164-34	130 ± 18
94.25969-1	11-164-35	0.81 ± 0.11
94.25970-1	11-164-36	2.92 ± 0.39
94.25971-1	11-164-37	318 ± 44
Blank	11-164-B1	0.44 ± 0.06
Duplicate 20316	11-164-D1	57.6 ± 7.9
Duplicate 20316	11-164-D2	51.6 ± 7.1
Duplicate 20317	11-164-D3	33.0 ± 4.5
Duplicate 20339	11-164-D4	57.4 ± 7.9

Reported Uncertainties are the Estimated Total Propagated Uncertainties (2σ). See ATI SOP 743FC for details of TPU determinations.

Remarks:

In the set 94-11-164, -D1 is a duplicate of 94-11-164-01; -D2 is a duplicate of 94-11-164-11; -D3 is a duplicate of 94-11-164-21; and -D4 is a duplicate of 94-11-164-31.

LT 4/28/2006

BP

TOTAL URANIUM ANALYSIS RESULTS SUMMARY

By Laser-Induced Kinetic Phosphorimetry

Lab Name: Analytical Technologies, Inc. **Date Collected: 07/21/94**

Client Name: Los Alamos Natl Lab/CST-9 **Date Analyzed : 12/07/94**

Client Project ID: 19509 **Sample Matrix : Soil**

Lab Sample ID Series: 94-11-164

Client Sample ID	Lab Sample ID	Total Uranium (ug/g)
94.18548-3	11-164-01	47.5 ± 6.5
94.18551-3	11-164-02	6.47 ± 0.87
94.18557-3	11-164-03	2763 ± 380
94.18560-3	11-164-04	2820 ± 388
94.18561-3	11-164-05	10.3 ± 1.4
94.20311-2	11-164-06	21.7 ± 3.0
94.20312-2	11-164-07	41.1 ± 5.7
94.20313-2	11-164-08	190 ± 26
94.20314-2	11-164-09	46.1 ± 6.3
94.20315-2	11-164-10	3.93 ± 0.53
94.20316-2	11-164-11	49.2 ± 6.8
94.20320-2	11-164-12	3.17 ± 0.43
94.20321-2	11-164-13	66.3 ± 9.1
94.20322-2	11-164-14	15.2 ± 2.1
94.20323-2	11-164-15	21.1 ± 2.9
94.20324-2	11-164-16	21.6 ± 3.0
94.20336-2	11-164-17	12.7 ± 1.8
94.20337-2	11-164-18	39.1 ± 5.4
94.20344-4	11-164-19	12.1 ± 1.6
94.18555-3	11-164-20	659 ± 91
94.20317-2	11-164-21	31.8 ± 4.4
94.20318-2	11-164-22	400 ± 55
94.20319-2	11-164-23	282 ± 38
94.20325-2	11-164-24	310 ± 43
94.20326-2	11-164-25	19.4 ± 2.7

Reported Uncertainties are the Estimated Total Propagated Uncertainties (2σ). See ATI SOP 743FC for details of TPU determinations.

TOTAL URANIUM ANALYSIS RESULTS SUMMARY

By Laser-Induced Kinetic Phosphorimetry

Lab Name: Analytical Technologies, Inc. Date Collected: 07/21/94

Client Name: Los Alamos Natl Lab/CST-9 Date Analyzed : 12/13/94

Client Project ID: 19509 Sample Matrix : Soil

Lab Sample ID Series: 94-11-164

Client Sample ID	Lab Sample ID	Total Uranium (ug/g)
94.20327-2	11-164-26	93 ± 13
94.20328-2	11-164-27	303 ± 42
94.20329-2	11-164-28	161 ± 22
94.20330-2	11-164-29	349 ± 48
94.20331-2	11-164-30	187 ± 26
94.20332-2	11-164-31	47.1 ± 6.5
94.20333-2	11-164-32	136 ± 19
94.20334-2	11-164-33	42.0 ± 5.8
94.20335-2	11-164-34	130 ± 18
94.25969-1	11-164-35	0.81 ± 0.11
94.25970-1	11-164-36	2.92 ± 0.39
94.25971-1	11-164-37	318 ± 44
Blank	11-164-B1	0.44 ± 0.06
Duplicate 20326	11-164-D1	57.6 ± 7.9
Duplicate 20340	11-164-D2	51.6 ± 7.1
Duplicate 20341	11-164-D3	33.0 ± 4.5
Duplicate 20330	11-164-D4	57.4 ± 7.9

Reported Uncertainties are the Estimated Total Propagated Uncertainties (2σ). See ATI SOP 743FC for details of TPU determinations.

Remarks:

In the set 94-11-164, -D1 is a duplicate of 94-11-164-01; -D2 is a duplicate of 94-11-164-11; -D3 is a duplicate of 94-11-164-21; and -D4 is a duplicate of 94-11-164-31.

BP

Agreement	Sample Nbr	Customer Number	Date Collected
19509	94.25971	00.00515	31-AUG-94
19509	94.25970	00.00576	31-AUG-94
19509	94.25969	00.00596	31-AUG-94
19509	94.20344	AAB3295	19-JUL-94
19509	94.18548	AAB3298	21-JUL-94
19509	94.20311	AAB3304	06-JUL-94
19509	94.20312	AAB3321	20-JUL-94
19509	94.20313	AAB3325	15-JUL-94
19509	94.18551	AAB3332	15-JUL-94
19509	94.20314	AAB3336	30-JUN-94
19509	94.20315	AAB3340	28-JUN-94
19509	94.20316	AAB3342	30-JUN-94
19509	94.20317	AAB3352	28-JUN-94
19509	94.20318	AAB3353	28-JUN-94
19509	94.18555	AAB3355	27-JUL-94
19509	94.20319	AAB3398	27-JUL-94
19509	94.20328	AAB3401	27-JUL-94
19509	94.20329	AAB3428	18-JUL-94
19509	94.20330	AAB3429	18-JUL-94
19509	94.20331	AAB3430	18-JUL-94
19509	94.20332	AAB3431	14-JUL-94
19509	94.20333	AAB3433	18-JUL-94
19509	94.20334	AAB3435	14-JUL-94
19509	94.20335	AAB3438	14-JUL-94
19509	94.18557	AAB3445	03-AUG-94
19509	94.20320	AAB3451	24-JUL-94
19509	94.20321	AAB3461	27-JUL-94
19509	94.20322	AAB3470	25-JUL-94
19509	94.18560	AAB3473	25-JUL-94
19509	94.20323	AAB3476	28-JUL-94
19509	94.18561	AAB3477	25-JUL-94
19509	94.20336	AAB3480	25-JUL-94
19509	94.20324	AAB3485	08-JUL-94
19509	94.20325	AAB3503	28-JUL-94
19509	94.20326	AAB3504	28-JUL-94
19509	94.20337	AAB3525	20-JUL-94
19509	94.20327	AAB3530	27-JUL-94

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/19/94 | Control No. 1086- 29137

Technical Area 15 | Send Lab Report Scott Kinkead | MS J534

Operable Unit 1086 | Site Work Plan LA-UR-92-3968

OU Contact Scott Kinkead | Date Samples Shipped 8/10/94

Contact Phone No. 665-1760 | Date Lab Report Required 11/10/94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3295	7/19/94 1117	✓		500 ml poly	soil	4c	Gamma spec, Total U	200.8	15-2206 C-4 A
AAB 3295	7/19/94 1117	✓		125 ml glass	soil	4c	Hg, Pb, Be	7091, 7471, 7421	

Relinquished by (Signature) T McFarland; Affiliation TM ERM	Date 8/10/94	Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date
Received by (Signature) Kyle Affiliation ERM	Time 1630	Received by (Signature) Affiliation	Time	Received by (Signature) Affiliation	Time

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (Indicate number of months) ___

COMMENTS

SAMPLING TEAM (Print names and initial) R. Garnett, D. Bender, G. Evenson, T. McFarland, F Humbert

WHITE To accompany samples | YELLOW Records Processing Facility | PINK Field Team Leader

SOP 1.04, R0

* U.S.G.P.O.:1993-778-045

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/21/94

Control No. 1086-134

Technical Area 15

Send Lab Report Scott Kinkead MS J534

Operable Unit 1086

Site Work Plan LA-UR-92-3968

OU Contact Scott Kinkead

Date Samples Shipped 8/10/94

Contact Phone No. 665-1760

Date Lab Report Required 11/10/94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3298	7/21/94 0842	✓		500 ml poly	soil	4c	Gamma spec, Total U	200.8	15 2240 Origin
AAB 3298	7/21/94 0842	✓		125 ml glass	soil	4c	Hg, Pb, Be	7091,7471	7421
AAB 3299	7/21/94 0842	✓		125 ml glass	soil	4°C	HE	8330 A	

Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date
TLMcFarland ERM	8/10/94				
Received by (Signature) Affiliation	**Time**	**Received by (Signature) Affiliation**	**Time**	**Received by (Signature) Affiliation**	**Time**
Kyle Day CRW	1630				

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic . Flammable . . Skin Irritant . . Nonhazard . . Other . . . . .

SAMPLE DISPOSAL
Return to client . . Disposal by lab ✓ Archive . . (Indicate number of months) . . .

COMMENTS

SAMPLING TEAM (Print names and initial) R. Garnett, R. Fender, G. Evenson, T. McFarland, F Humbert

WHITE To accompany samples YELLOW Records Processing Facility PINK Field Team Leader

SOP 1.04, RG

U.S.G.P.O.:1993- 775-045

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/06/94 Control No. 1086- 09123

Technical Area ~~15~~ Send Lab Report ~~Scott Kinkead~~ MS J534

Operable Unit 1086 Site Work Plan LA-UR-92-3968

OU Contact Scott Kinkead Date Samples Shipped 8/10/94

Contact Phone No. 665-1760 Date Lab Report Required 11/10/94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3304	07/06/94 0954	✓		500 ml poly	soil	4c	Gamma spec, Total U	200.8	15-2153 9-15 in
AAB 3304	07/06/94 0954	✓		125 ml glass	soil	4c	~~Hg, Pb, Be~~ TAL metals	7091,7471,7421	

Relinquished by (Signature) TLMcFarland Affiliation THMcFarland ERM	Date 8/10/94	Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date
Received by (Signature) Affiliation	Time 1630	Received by (Signature) Affiliation	Time	Received by (Signature) Affiliation	Time

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic __ Flammable __ Skin Irritant __ Nonhazard __ Other __

SAMPLE DISPOSAL
Return to client __ Disposal by lab ✓ Archive __ (Indicate number of months) __

COMMENTS

SAMPLING TEAM (Print names and initial) RKG R. Garnett, D. Sandel, G. Evenson, T. McFarland THM

WHITE To accompany samples YELLOW Records Processing Facility PINK Field Team Leader

SOP 1.04, R0

* U.S.G.P.O.:1993-775-646

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/20/94

Control No. 1086-[illegible]

Technical Area 15

Send Lab Report Scott Kinkead MS J534

Operable Unit 1086

Site Work Plan LA-UR-92-3968

OU Contact Scott Kinkead

Date Samples Shipped 8/10/94

Contact Phone No. 665-1760

Date Lab Report Required 11/10/94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3321	7/20/94 0930	✓		500 ml poly	soil	4c	Gamma spec, Total U	200.8	
AAB 3321	7/20/94 0930	✓		125 ml glass	soil	4c	~~Hg, Pb, Be~~ TAL metals	7091, 7471, 7421	15-2277 0-5 in

Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date
T. McFarland ERM	8/10/94				
Received by (Signature) Affiliation	**Time**	**Received by (Signature) Affiliation**	**Time**	**Received by (Signature) Affiliation**	**Time**
Kyle May CSM	1630				

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological Highly Toxic Flammable Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (Indicate number of months) ___

COMMENTS

SAMPLING TEAM (Print names and initial) R. Garnett, D. Dander, G. Evenson, T. McFarland, F. Humbert

WHITE To accompany samples YELLOW Records Processing Facility PINK Field Team Leader

SOP 1.04, Rev

* U.S.G.P.O.:1993-779-049

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/15/94

Control No. 1086-

Technical Area 15

Send Lab Report Scott Kinkead MS J534

Operable Unit 1086

Site Work Plan LA-UR-92-3968

OU Contact Scott Kinkead

Date Samples Shipped 08-10-94

Contact Phone No. 665-1760

Date Lab Report Required 11-10-94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3325	7/15/94 1128	✓		500 ml poly	soil	4c	Gamma spec, Total U	200.8	
AAB 3325	7/15/94 1128	✓		125 ml glass	soil	4c	~~Hg, Pb, Be~~ TAL metals	7091, 7471, 7421	15-7295

Relinquished by T.L. McFarland (Signature) Affiliation TA-15 EPM — Date 08-10-94 — Time 1630

Received by (Signature) Affiliation CST-9 — Relinquished by (Signature) Affiliation — Date — Received by (Signature) Affiliation — Time

Relinquished by (Signature) Affiliation — Date — Received by (Signature) Affiliation — Time

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if samples are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (Indicate number of months) ___

COMMENTS

SAMPLING TEAM (Print names and initial) R. Garnett, D. Dander, G. Evenson, T. McFarland

WHITE To accompany samples — YELLOW Records Processing Facility — PINK Field Team Leader

SOP 1.04.RO

* U.S.G.P.O.: 1993-770-045

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/15/94

Control No. 1086 - 00000

Technical Area 15

Send Lab Report Scott Kinkead MS J534

Operable Unit 1086

Site Work Plan LA-UR-92-3968

OU Contact Scott Kinkead

Date Samples Shipped 8/10/94

Contact Phone No. 665-1760

Date Lab Report Required 11/10/94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3332	7/15/94 0453	✓		500 ml poly	soil	4C	Gamma spec, Total U	200.8	
AAB 3332	7/15/94 0453	✓		125 ml glass	soil	4C	~~Hg, Pb, Be~~ TAL metals	8/10/94 7091, 7471, 7421	15-2137 18-24.n
AAB 3332	7/15/94 0453	✓		125 ml glass	Soil	4°C	HE	8330 A	

Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date
TLMcFarland ERM	8/10/94				
Received by (Signature) Affiliation	Time 1630	Received by (Signature) Affiliation	Time	Received by (Signature) Affiliation	Time

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic Flammable Skin Irritant ___ Nonhazardous ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (Indicate number of months) ___

COMMENTS

SAMPLING TEAM (Print names and initial) R. Garnett, ~~D. Dander~~ MW 7/15/94, G. Evenson, T. McFarland TLM

WHITE To accompany samples YELLOW Records Processing Facility PINK Field Team Leader

SOP 1.04, R0

U.S.G.P.O.:1993-775-045

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 6/30/94

Control No. 1086-95

Technical Area 15

Send Lab Report Scott Kinkead MS J534

Operable Unit 1086

Site Work Plan LA-UR-92-3968

OU Contact Scott Kinkead

Date Samples Shipped 8/10/94

Contact Phone No. 665-1760

Date Lab Report Required 11/10/94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3336	6/30/94 1300	✓		500 ml poly	soil	4c	Gamma spec, Total U	200.8	
AAB 3336	6/30/94 1302		✓	125 ml glass	soil	4c	~~Hg, Pb, Be~~ TAL metals	~~7091, 7471, 7421~~ TAL metals	15-2178 Q-6in

Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date
TLMcFarland ERM	6/30/94				
Received by (Signature) Affiliation	Time 1630	Received by (Signature) Affiliation	Time	Received by (Signature) Affiliation	Time

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (indicate number of months) ___

COMMENTS RKG

SAMPLING TEAM (Print names and initial) R. Garnett, D. Dander, G. Evenson, T. McFarland

WHITE To accompany samples YELLOW Records Processing Facility PINK Field Team Leader

SOP 1.04.R0

* U.S.G.P.O.:1993-779-048

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 6/28/94 | Control No. 1086- 09091

Technical Area 15 | Send Lab Report Scott Kinkead | MS J534

Operable Unit 1086 | Site Work Plan LA-UR-92-3968

OU Contact Scott Kinkead | Date Samples Shipped 8/10/94

Contact Phone No. 665-1760 | Date Lab Report Required 11/10/94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3340	6/28/94 1020	✓		500 ml poly	soil	4c	Gamma spec, Total U	200.8	15·2127 16·24in
AAB 3340	6/28/94 1020	✓		125 ml glass	soil	4c	~~Hg, Pb, Be~~ TAL metals	7091, 7471, 7421	

Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date
T.L. McFarland EPM	8/10/94				
Received by (Signature) Affiliation	**Time**	**Received by (Signature) Affiliation**	**Time**	**Received by (Signature) Affiliation**	**Time**
[illegible]	1630				

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (indicate number of months) ___

COMMENTS RKG TLM

SAMPLING TEAM (Print names and initial) R. Garnett, D. Dancker, G. Evenson, T. McFarland

WHITE To accompany samples | YELLOW Records Processing Facility | PINK Field Team Leader

SOP 1.04, R0

U.S.G.P.O.:1993-778-045

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 6/30/94

Control No. 03101 (1086)

Technical Area 15

Send Lab Report Scott Kinkead MS J534

Operable Unit 1086

Site Work Plan LA-UR-92-3968

OU Contact Scott Kinkead

Date Samples Shipped 8/10/94

Contact Phone No. 665-1760

Date Lab Report Required 11/10/94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3342	6/30/94 1135	✓		500 ml poly	soil	4C	Gamma spec, Total U	200.8	
AAB 3342	6/30/94 1135	✓		125 ml glass	soil	4C	Hg, Pb, Se, TAL metals	7091, 7471, 7421	15-2166 0-4in

Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date
Received by (Signature) Affiliation	Time	Received by (Signature) Affiliation	Time	Received by (Signature) Affiliation	Time

Relinquished by: Thke Farland (Signature), TRM Affiliation
Date 8/10/94
Received by: Kyle Gay (Signature), LASL Affiliation
Time 1630

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if samples are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic __ Flammable __ Skin Irritant __ Nonhazard __ Other __

SAMPLE DISPOSAL
Return to client __ Disposal by lab ✓ Archive __ (Indicate number of months) __

COMMENTS RKG

SAMPLING TEAM (Print names and initial) R. Garnett, D. Dander, G. Evenson, T. McFarland

WHITE To accompany samples YELLOW Records Processing Facility PINK Field Team Leader

SOP 1.04, R0

* U.S.G.P.O.: 1993- 770-045

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/28/94

Control No. 1086-

Technical Area 15

Send Lab Report Scott Kinkead MS J534

Operable Unit 1086

Site Work Plan LA-UR-92-3968 (R-44)

OU Contact Scott Kinkead

Date Samples Shipped 7-28-10-94

Contact Phone No. 665-1760

Date Lab Report Required 11-10-94

See Rad List RKG

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3352	7/28/94 0937	✓		125 ml poly	soil	4c	Total U	200.8	15-2503
AAB 3352	7/28/94 0937	✓		125 ml ~~glass~~ poly, RKG, 5-23-94	soil	4c	~~Pb, Be~~ TAL metals	7421, 7091	18-24 in
~~AAB 3352~~				~~Plastic Zip~~	~~soil~~	~~4c~~	~~Gross alpha/beta~~ Gamma spec	~~Rad Van~~	TZM 7/27/94
~~AAB 3352~~				~~Plastic Zip~~	~~soil~~	~~4c~~	~~Pb, Be~~	~~Chem Van~~	TZM 7/27/94

Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date
TLMcFarland ERM	7-28-94				
Received by (Signature) Affiliation	Time	Received by (Signature) Affiliation	Time	Received by (Signature) Affiliation	Time
CST-9	1630				

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if samples are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (Indicate number of months) ___

COMMENTS

SAMPLING TEAM (Print names and initial) ~~R. Garnett~~, D. Dander, G. Evenson, T. McFarland, F Humberd

WHITE To accompany samples YELLOW Records Processing Facility PINK Field Team Leader

SOP 1.04, R0

U.S.G.P.O.:1993-776-645

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/28/94

Control No. 1086-

Technical Area 15

Send Lab Report Scott Kinkead MS J534

Operable Unit 1086

Site Work Plan LA-UR-92-3968 (R-44)

OU Contact Scott Kinkead

Contact Phone No. 665-1760

Date Samples Shipped 08-10-94

Date Lab Report Required 11-10-94

Field Unique Sample I/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3553	7/28/94 0935	✓		125 ml poly	soil	4C	Total U	~~200.8~~	
AAB 3553	7/28/94 0935	✓		125 ml ~~glass~~ poly	soil AKG, 5-23-94	4C	~~Pb, Be~~ TAL metals	7421, 7091	15-2903 0-6in
~~AAB 3553~~				~~Plastic Zip~~	~~soil~~	~~4C~~	~~Gross alpha beta~~	~~Rad Van~~	
							Gamma spec		TKM 7/27/94
~~AAB 3553~~				~~Plastic Zip~~	~~soil~~	~~4C~~	~~Pb, Be~~	~~Chem Van~~	
									TKM 7/27/94

Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date
T. McFarland TKM ERM	08-10-94				
Received by (Signature) Affiliation	**Time**	**Received by (Signature) Affiliation**	**Time**	**Received by (Signature) Affiliation**	**Time**
[illegible]	1630				

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (Indicate number of months) ___

COMMENTS

SAMPLING TEAM (Print names and initial) ~~R. Garnett~~ D. Dander, G. Evenson, T. McFarland, F. Humbert

WHITE To accompany samples YELLOW Records Processing Facility PINK Field Team Leader

SOP 1.04, R0

U.S.G.P.O.: 1993-776-948

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/27/94 — Control No. 1086-

Technical Area 15 — Send Lab Report ~~Scott Kinkead~~ — MS ~~J534~~

Operable Unit 1086 — Site Work Plan LA-UR-92-3968 (R-44)

OU Contact Scott Kinkead — Date Samples Shipped 08-10-94

Contact Phone No. 665-1760 — Date Lab Report Required 11-10-94

Shifter Rad List HRG

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3355	7/27/94 1255	✓		125 ml poly	soil	4c	Total U	200.8	15-2502 O-Gin
AAB 3355	7/27/94 1255	✓		125 ml ~~glass~~ poly	soil 8-22-94	4c	~~Pb, Be~~ TAL metals	7421, 7091	
~~AAB 3355~~				~~Plastic Zip~~	~~soil~~	~~4c~~	~~Gross alpha/beta~~ ~~Rad Van~~		
							Gamma spec		
~~AAB 3355~~				Plastic Zip	soil	4c	~~Pb, Be~~	Chem Van	
AAB 3355	7/27/94 1255			125 ml glass	soil	4°C	HE	8330 A	

Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date
TL McFarland ERM	8-10-94				
Received by (Signature) Affiliation	**Time**	**Received by (Signature) Affiliation**	**Time**	**Received by (Signature) Affiliation**	**Time**
[illegible] LSTA	1630				

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (indicate number of months) ___

COMMENTS 17m 7/27/94

SAMPLING TEAM (Print names and initial) ~~R. Garnett, D. Bender~~, G. Swanson, T. McFarland, F. Humbert, E. Trollinger

WHITE To accompany samples — YELLOW Records Processing Facility — PINK Field Team Leader

SOP 1.04, R0

* U.S. G.P.O.:1993-776-045

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/27/94

Control No. 1086-

Technical Area 15

Send Lab Report Scott Kinkead MS J534

Operable Unit 1086

Site Work Plan LA-UR-92-3968 (R-44)

OU Contact Scott Kinkead

Date Samples Shipped 25-10-94

Contact Phone No. 665-1760

Date Lab Report Required 11-12-94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3398	7/27/94 1013	✓		125 ml poly	soil	4c	Total U	200.8	15-2501 C-6.7
AAB 3398	7/27/94 1013	✓		125 ml poly	soil	4c	~~Pb, Be~~ TAL metals	7421, 7091	
~~AAB 3398~~				~~Plastic Zip~~	~~soil~~	~~4c~~	~~Gross alpha/beta~~	~~Rad Van~~	
							Gamma spec		TMM 7/27/94
~~AAB 3398~~				~~Plastic Zip~~	~~soil~~	~~4c~~	~~Pb, Be~~	~~Shem Van~~	TMM 7/27/94

Shelter Rd List KHG

Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date
T. McFarland TERM	7-10-94				
Received by (Signature) Affiliation CST-1	Time 1630	Received by (Signature) Affiliation	Time	Received by (Signature) Affiliation	Time

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if samples are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (Indicate number of months) ___

COMMENTS

SAMPLING TEAM (Print names and initial) ~~R. Garnett, D. Bender~~, G. Evenson, T. McFarland, F Humbert, E Trollinger

WHITE To accompany samples YELLOW Records Processing Facility PINK Field Team Leader

SOP 1.04 A0

* U.S.G.P.O.:1993-770-045

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/27/94

Control No. 1086-

Technical Area 15

Send Lab Report Scott Kinkead MS J534

Operable Unit 1086

Site Work Plan LA-UR-92-3968 (R-44)

OU Contact Scott Kinkead

Date Samples Shipped 8-10-94

Contact Phone No. 665-1760

Date Lab Report Required 11-10-94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3401	7/27/94 1304	✓		125 ml poly	soil	4c	Total U	200.8	15-2502
AAB 3401	7/27/94 1300	✓		125 ml poly	soil	4c	~~Pb, Be~~ TAL metals	7421, 7091	
~~AAB 3401~~				~~Plastic Zip~~	~~soil~~	~~4c~~	~~Gross alpha/beta~~	~~Rad Van~~	TKM 7/29/94
							Gamma spec		
~~AAB 3401~~				~~Plastic Zip~~	~~soil~~	~~4c~~	~~Pb, Be~~	~~Chem Van~~	TKM 7/28/94

Note different Rad Lab kit

18-24 in

Relinquished by (Signature) TL McFarland Affiliation ERM	Date 5-12-94	Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date
Received by (Signature) Affiliation LSTG	Time 1630	Received by (Signature) Affiliation	Time	Received by (Signature) Affiliation	Time

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if samples are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (indicate number of months) ___

COMMENTS

SAMPLING TEAM (Print names and initial) TKM 7/27/94 ~~R. Garnett, Dr Bender~~, G. Evenson, T. McFarland, F Humbert, E Trollinger

WHITE To accompany samples YELLOW Records Processing Facility PINK Field Team Leader

SOP 1.04, R0

* U.S.G.P.O.: 1993-776-046

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/18/94

Control No. 1086-

Technical Area 15

Send Lab Report Scott Kinkead MS J534

Operable Unit 1086

Site Work Plan LA-UR-92-3968 (MDAZ)

OU Contact Scott Kinkead

Date Samples Shipped DS-11-94

Contact Phone No. 665-1760

Date Lab Report Required 11-11-94

Note different Red List RAB

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3428	7/16/94 1003	✓		125 ml poly	soil	4c	Total U	200.8	15-2305 OK
AAB 3428	7/16/94 1003	✓		125 ml glass	soil	4c	~~Hg, Pb, Be~~ TAL metals	7471, 7421, 7091	
~~AAB 3428~~	~~7/16/94 1003~~	✓		~~125 ml glass~~	~~soil~~	~~4c~~	~~SVOC~~	~~8270~~	
~~AAB 3428~~				Plastic Zip	soil	4c	Gross alpha/beta	Rad van	
							Gamma spec		
~~AAB 3428~~				Plastic Zip	soil	4c	~~Hg, Pb, Be~~	Chem van	

Relinquished by (Signature) TLMcFarland Affiliation ERM — Date 7-18-94 — Relinquished by (Signature) Affiliation — Date — Relinquished by (Signature) Affiliation — Date

Received by (Signature) Affiliation CSM — Time 1630 — Received by (Signature) Affiliation — Time — Received by (Signature) Affiliation — Time

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ___ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (Indicate number of months) ___

COMMENTS

SAMPLING TEAM (Print names and initial) R. Garnett, ~~D. Dender~~, G. Evenson, T. McFarland

WHITE To accompany samples — YELLOW Records Processing Facility — PINK Field Team Leader

SOP 1.04, R0

U.S.G.P.O.:1993-775-045

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/18/94

Control No. 1086 - 0210

Technical Area 15

Send Lab Report Scott Kinkead MS J534

Operable Unit ~~1086~~

Site Work Plan ~~LA-UR-92-3968~~ (MDAZ)

OU Contact Scott Kinkead

Date Samples Shipped 08-10-94

Contact Phone No. 665-1760

Date Lab Report Required 11-10-94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3429	7/18/94 0934	✓		125 ml poly	soil	4c	Total U	200.8	15.2310 0.10 in
AAB 3429	7/18/94 0934	✓		125 ml glass	soil	4c	~~Hg, Pb, Be~~ TAL metals	7471,7421,7091	
~~AAB 3429~~	~~7/18/94 0934~~	✓		~~125 ml glass~~	~~soil~~	~~4C~~	~~SVOC~~	~~8270~~ TKM 8/10/94	
~~AAB 3429~~				~~Plastic Ziploc~~	~~soil~~	~~4c~~	~~Gross alpha/beta~~ ~~Rad Van~~	TKM 8/10/94	
							Gamma spec		
~~AAB 3429~~				~~Plastic Zip~~	~~soil~~	~~4c~~	~~Hg, Pb, Be~~	Chem Van TKM 8/18/94	

Note different Rad list

Relinquished by (Signature) TL McFarland Affiliation TKM ERM	Date 08-10-94	Relinquished by (Signature) Affiliation	Date
Received by (Signature) Affiliation [signature] CSM	Time 1630	Received by (Signature) Affiliation	Time

Relinquished by (Signature) Affiliation	Date
Received by (Signature) Affiliation	Time

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiologic ✓ Highly Toxic Flammable Skin Irritant Nonhazard Other

SAMPLE DISPOSAL
Return to client Disposal by lab ✓ Archive (Indicate number of months)

COMMENTS

SAMPLING TEAM (Print names and initial) R. Garnett, ~~D. Bender~~ TKM, G. Evenson, TKM T. McFarland

WHITE To accompany samples YELLOW Records Processing Facility PINK Field Team Leader

SOP 1.04, R0

U.S.G.P.O.: 1993-776-045

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/18/94

Control No. 10860-

Technical Area 15

Send Lab Report Scott Kinkead MS J534

Operable Unit 1086

Site Work Plan LA-UR-92-3968 (MDAZ)

OU Contact Scott Kinkead

Date Samples Shipped 08-10-94

Contact Phone No. 665-1760

Date Lab Report Required 11-10-94

Note different Red list items

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3430	7/18/94 0918	✓		125 ml poly	soil	4c	Total U	200.8 TAM 8/10/94	15-2308
AAB 3430	7/18/94 0918	✓		125 ml glass	soil	4c	~~Hg, Pb, Se~~ TAL metals	7471, 7421, 7091	
~~AAB 3430~~	~~7/18/94 0918~~	✓		~~125 ml glass~~	~~soil~~	~~4c~~	~~SVOC~~	~~8270~~	TAM 8/10/94
~~AAB 3430~~				~~Plastic Zip~~	~~soil~~	~~4c~~	~~Gross alpha/beta~~	~~Rad Vac~~	TAM 7/18/94
							Gamma spec		
~~AAB 3430~~				~~Plastic Zip~~	~~soil~~	~~4c~~	~~Hg, Pb, Se~~	~~Chem Vac~~	TAM 7/18/94

Relinquished by (Signature) T. McFarland Affiliation TAM ERM	Date 08-12-94	Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date
Received by (Signature) Affiliation	Time 1630	Received by (Signature) Affiliation	Time	Received by (Signature) Affiliation	Time

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if samples are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (indicate number of months) ___

COMMENTS

SAMPLING TEAM (Print names and initial) ~~R. Garnett, D. Dander, G. Evenson~~, T. McFarland, G. Evenson

WHITE To accompany samples YELLOW Records Processing Facility PINK Field Team Leader

SOP 1.04, R0

• U.S.G.P.O.:1993- 775-945

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/14/94 | Control No. 1086- 09142

Technical Area 15 | Send Lab Report Scott Kinkead | MS J534

Operable Unit 1086 | Site Work Plan LA-UR-92-3968 (MDAZ)

OU Contact Scott Kinkead | Date Samples Shipped 08-10-94.

Contact Phone No. 665-1760 | Date Lab Report Required 11-10-94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3431	7/14/94 1128	✓		125 ml poly	soil	4c	Total U	200.8	15-23°C. C-(cin)
AAB 3431	7/14/94 1128	✓		125 ml glass	soil	4c	Hg, Pb, Be TAL metals	7471, 7421, 7091	
~~AAB 3431~~	~~7/14/94 1128~~	✓		~~125 ml glass~~	~~soil~~	~~4c~~	~~SVOC~~	~~8270~~	
~~AAB 3431~~				~~Plastic Zip~~	~~soil~~	~~4c~~	~~Gross alpha/beta~~	~~Rad Van~~	
							Gamma spec		
~~AAB 3431~~				~~Plastic Zip~~	~~soil~~	~~4c~~	~~Hg, Pb, Be~~	~~Chem Van~~	

Note different Rush List

Relinquished by (Signature) TLMcFarland ERM | Date 8-10-94 | Relinquished by (Signature) Affiliation | Date | Relinquished by (Signature) Affiliation | Date

Received by (Signature) Affiliation | Time 1630 | Received by (Signature) Affiliation | Time | Received by (Signature) Affiliation | Time

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (Indicate number of months) ___

COMMENTS

SAMPLING TEAM (Print names and initial) R. Garnett, D. Dander, G. Evenson, T. McFarland

SOP 1.04, R0

WHITE To accompany samples | YELLOW Records Processing Facility | PINK Field Team Leader

• U.S.G.P.O.:1993-776-045

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/18/94

Control No. 1086-

Technical Area 15

Send Lab Report Scott Kinkead MS J534

Operable Unit 1086

Site Work Plan LA-UR-92-3968 (MDA Z)

OU Contact Scott Kinkead

Contact Phone No. 665-1760

Date Samples Shipped 8-10-94

Date Lab Report Required 11-10-94

Note: Differing Rad List RLO

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3433	7/18/94 0956	✓		125 ml poly	soil	4c	Total U	200.8	
AAB 3433	7/18/94 0956	✓		125 ml glass	soil	4C	~~Hg, Be, Pb~~ TAL metals	7421,7091,7471	14-2307 O-Gin
~~AAB 3433~~	~~7/18/94 0956~~	✓		~~125 ml glass~~	~~soil~~	~~4c~~	~~SVOC~~	~~8270~~	
~~AAB 3433~~				~~Plastic Zip~~	~~soil~~	~~4c~~	~~Gross alpha/beta~~	~~Rad Van~~	
							Gamma spec		
~~AAB 3433~~				~~Plastic Zip~~	~~soil~~	~~4c~~	~~Hg, Pb, Be~~	~~Chem Van~~	

Relinquished by (Signature) TL McFarland TLM
Affiliation ERM
Date 8-10-94
Time 1630

Received by (Signature) [illegible]
Affiliation CGI-9

Relinquished by (Signature)
Affiliation
Date
Time

Received by (Signature)
Affiliation

Relinquished by (Signature)
Affiliation
Date
Time

Received by (Signature)
Affiliation

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if samples are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic Flammable Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (indicate number of months) ___

COMMENTS

SAMPLING TEAM (Print names and initial) R. Garnett, D. Dander, G. Evenson, T. McFarland TLM 7/18/94

WHITE To accompany samples YELLOW Records Processing Facility PINK Field Team Leader

SOP 1.04 RD

* U.S.G.P.O.:1993-778-045

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/14/94

Control No. 1086-

Technical Area 15

Send Lab Report ~~Scott Kinkead~~ MS J534

Operable Unit 1086

Site Work Plan LA-UR-92-3968 (MDA Z)

OU Contact Scott Kinkead

Date Samples Shipped 08-10-94

Contact Phone No. 665-1760

Date Lab Report Required 11-10-94

Note different Rad list below

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3435	7/14/94 11:45	✓		125 ml poly	soil	4c	Total U	200.8	15-2311
AAB 3435	7/14/94 11:45	✓		125 ml glass	soil	4C	~~TAL metals~~ ~~Hg, Be, Pb~~ TRM 8/10/94	7421,7091,7471	
~~AAB 3435~~	~~7/14/94 11:45~~	~~✓~~		~~125 ml glass~~	~~soil~~	~~4c~~	~~SVOC~~	~~8270~~ TRM 8/10/94	
~~AAB 3435~~				~~Plastic Zip~~	~~soil~~	~~4c~~	~~Gross alpha/beta~~	~~Rad Van~~ TRM 7/14/94	
							Gamma spec		
~~AAB 3435~~				Plastic Zip	~~soil~~	~~4c~~	~~Hg, Pb, Be~~	Chem Van	TRM 7/14/94

Relinquished by (Signature) TLMcFarland Affiliation ERM	Date 8-8-94	Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date
Received by (Signature) Affiliation	Time 1630	Received by (Signature) Affiliation	Time	Received by (Signature) Affiliation	Time

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if samples are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic Flammable Skin Irritant ____ Nonhazard ____ Other ____

SAMPLE DISPOSAL
Return to client ____ Disposal by lab ✓ Archive ____ (Indicate number of months) ____

COMMENTS

SAMPLING TEAM (Print names and initial) ~~R. Garnett, D. Dunder, G. Evenson, T. McFarland~~ TRM 7/14/94 TRM

WHITE To accompany samples YELLOW Records Processing Facility PINK Field Team Leader

SOP 1.04 R0

* U.S.G.P.O.:1993-770-045

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/14/94 | Control No. 1086-

Technical Area 15 | Send Lab Report Scott Kinkead | MS J534

Operable Unit 1086 | Site Work Plan LA-UR-92-3968 (MDA Z)

OU Contact Scott Kinkead | Date Samples Shipped 08-10-94

Contact Phone No. 665-1760 | Date Lab Report Required 11-10-94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3438	7/14/94 1105	✓		125 ml poly	soil	4c	Total U	200.8	15-2301 0-5in
AAB 3438	7/14/94 1105	✓		125 ml glass	soil	4C	~~Hg, Se, Pb~~ TAL metals TKM 8/10/94	7421, 7091, 7471	
~~AAB 3438~~	~~7/14/94 1105~~	✓		~~125 ml glass~~	~~soil~~	~~4c~~	~~SVOC~~	~~8270~~ TKM 8/10/94	
~~AAB 3438~~				~~Plastic Zip~~	~~soil~~	~~4c~~	~~Gross alpha/beta~~	~~Rad Van~~ TKM 7/14/94	
							Gamma spec		
~~AAB 3438~~				~~Plastic Zip~~	~~soil~~	~~4c~~	~~Hg, Pb, Se~~	~~Chem Van~~ TKM 7/14/94	

Note different Rad Lab Lab

Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date
TLMcFarland TKM ERM	08-10-94				
Received by (Signature) Affiliation	Time 1630	Received by (Signature) Affiliation	Time	Received by (Signature) Affiliation	Time

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (Indicate number of months) ___

COMMENTS

SAMPLING TEAM (Print names and initial) R. Garnett, ~~B. Dander~~ TKM 7/14/94, G. Evenson, T. McFarland TKM

WHITE To accompany samples | YELLOW Records Processing Facility | PINK Field Team Leader

SOP 1.04.750

* U.S.G.P.O.:1993-770-045

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 8/3/94

Control No. 1086-

Technical Area 15

Send Lab Report Scott Kinkead MS J534

Operable Unit 1086

Site Work Plan LA-UR-92-3968 ~~(MDA Z)~~ ~~TLM 8/3/94~~ EF

OU Contact Scott Kinkead

Date Samples Shipped 09-10-94

Contact Phone No. 665-1760

Date Lab Report Required 11-10-94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3445	8/3/94 1136	✓		~~125~~ 500 ml poly TLM 8/3/94	soil	4c	Total U	200.8	
AAB 3445	8/3/94 1136	✓		125 ml glass	soil	4C	~~Hg, Be, Pb~~ 4 metals TAL metals	7421, 7091, 7471	15-22 46 O-Ring
~~AAB 3445~~				~~125 ml glass~~	~~soil~~	~~4c~~	~~SVOC~~	~~8270~~	TLM 8/3/94
~~AAB 3445~~				~~2040ml glass~~	~~soil~~	~~4c~~	~~VOC~~		TLM 8/3/94
~~AAB 3445~~				~~Plastic Zip~~	~~soil~~	~~4c~~	~~Gross alpha/beta~~ Gamma spec	~~Rad Van~~	TLM 8/3/94
~~AAB 3445~~				~~Plastic Zip~~	~~soil~~	~~4c~~	~~Hg, Pb, Be~~	~~Chem Van~~	TLM 8/3/94
AAB 3445	8/3/94 1136	✓		125 ml glass	Soil	4°	HE	8330A	

Relinquished by (Signature) / Affiliation	Date	Relinquished by (Signature) / Affiliation	Date	Relinquished by (Signature) / Affiliation	Date
TLMcFarland / ERM	8-10-94				
Received by (Signature) / Affiliation	**Time**	**Received by (Signature) / Affiliation**	**Time**	**Received by (Signature) / Affiliation**	**Time**
Kyle Gray / CMA	1630				

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Physiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Noxious ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (Indicate number of months) ___

COMMENTS

SAMPLING TEAM (Print names and initial) ~~TLM 8/3/94~~ R. Garnett, D. Dander, G. Evenson, T. McFarland, ~~TLM~~ F. Humbert, R. Hooker

WHITE To accompany samples YELLOW Records Processing Facility PINK Field Team Leader

SOP 1.04, R0

* U.S.G.P.O.: 1993- 778-046

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 6/24/94 — Control No. 1086-09062

Technical Area 15 — Send Lab Report Scott Kinkead — MS J534

Operable Unit 1086 — Site Work Plan LA-UR-92-3968 EF Site

OU Contact ~~Scott Kinkead~~ 665-1760 — Date Samples Shipped 8/10/94

Contact Phone No. — Date Lab Report Required 11/10/94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3451	6/24/94 1509	✓		500 ml poly	soil	~~none~~ 4C AKG 5-16-94	Gamma spec, Total U	700.8	13.2100 16 24 in
AAB 3451	6/24/94 1509	✓		125 ml glass	soil	~~none~~ 4C AKG	~~Hg, Pb, Be~~ TAL metals	~~7470 8/10/94~~ 7471, 7421, 7091	

Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date
T.M. McFarland (Signature) ERM	8/10/94				
Received by (Signature) Affiliation: Kyle Hay (Signature)	Time 1630	Received by (Signature) Affiliation	Time	Received by (Signature) Affiliation	Time

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (indicate number of months) ___

COMMENTS
SAMPLING TEAM (Print names and initial) ~~R. Earnest~~, D. ~~Vander~~, G. Evenson, T. McFarland — TM 6/24/94 — TM

WHITE To accompany samples — YELLOW Records Processing Facility — PINK Field Team Leader

SOP 1.04, R0

* U.S.G.P.O.:1993-776-045

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 6/27/94

Control No. 1096-03047

Technical Area 15

Send Lab Report Scott Kinkead MS J534

Operable Unit 1086

Site Work Plan LA-UR-92-3968 EF Site

OU Contact Scott Kinkead

Date Samples Shipped 8/10/94

Contact Phone No. 665-1760

Date Lab Report Required 11/10/94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB3461	6/27/94 1203	✓		500 ml poly	soil	6-16-94 none	Gamma spec, Total U		
AAB 3461	6/27/94 1203	✓		125 ml glass	soil	4C RKG none 4C RKG 8/10/94	~~Hg, Pb, Be~~ ~~TAL metals~~	200.8 ~~8/10/94~~ 7471, 7421, 7091	15 · 2/12 0°C in

Relinquished by (Signature) T. McFarland Affiliation ERM — Date 8/10/94 — Time 1630

Received by (Signature) [signature] Affiliation ERM

Relinquished by (Signature) Affiliation — Date — Time

Received by (Signature) Affiliation

Relinquished by (Signature) Affiliation — Date — Time

Received by (Signature) Affiliation

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (Indicate number of months) ___

COMMENTS RKG

SAMPLING TEAM (Print names and initial) R. Garnett, D. Dander, G. Evenson, T. McFarland

WHITE To accompany samples — YELLOW Records Processing Facility — PINK Field Team Leader

SOP 1.04, R0

* U.S.G.P.O.:1993-776-045

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/25/94

Control No. 1086 - 090058

Technical Area 15

Send Lab Report Scott Kinkead MS J534

Operable Unit 1086

Site Work Plan LA-UR-92-3968

OU Contact Scott Kinkead

Date Samples Shipped 8/10/94

Contact Phone No. 665-1760

Date Lab Report Required 11/10/94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	QRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3470	7/25/94 0930	✓		500 ml poly	soil	~~none~~ 6-16-94	Gamma spec, Total U	200.8	15-2182 18-24-7
AAB 3470	7/25/94 0930	✓		125 ml glass	soil	~~none~~	Hg, Pb, Be TAL metals	7471, 7421	7091

Relinquished by (Signature) TLMcFarland
Affiliation TRC ERM
Date 8/10/94
Time 1630
Received by (Signature) Kyle Gay
Affiliation CMT
Relinquished by (Signature)
Affiliation
Date
Time
Received by (Signature)
Affiliation
Relinquished by (Signature)
Affiliation
Date
Received by (Signature)
Affiliation
Time

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (Indicate number of months) ___

COMMENTS

SAMPLING TEAM (Print names and initial) R. Garnett, D. Dangler, G. Everson, T. McFarland, F. Humbert

WHITE To accompany samples YELLOW Records Processing Facility PINK Field Team Leader

SOP 1.04, R0

* U.S.G.P.O.:1993-779-645

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/25/94 | Control No. 1086-094156

Technical Area 15 | Send Lab Report Scott Kinkead | MS J534

Operable Unit 1086 | Site Work Plan LA-UR-92-3968

OU Contact ~~Scott Kinkead~~ 665-1760 | Date Samples Shipped 8/10/94

Contact Phone No. | Date Lab Report Required 11/10/94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3473	7/25/94 0853	✓		500 ml poly	soil	5-16-94 ~~None~~ 4C RCG	Gamma spec, Total U	200.8	15-2242 1x11 15-2246 1x1 12in
AAB 3473	7/25/94 0853	✓		125 ml glass	soil	~~None~~ 4C RCG	~~Hg, Pb, Be~~ TAL metals	7471, 7421, 7091	
AAB 3473	7/25/94 0853	✓		125 ml glass	soil	8/16/94 4°C	HE	8330 A	

Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date
T.L. McFarland ERM	8/10/94				
Received by (Signature) Affiliation	**Time**	**Received by (Signature) Affiliation**	**Time**	**Received by (Signature) Affiliation**	**Time**
Kyle Mayfield	1630				

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic Flammable Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (Indicate number of months) ___

COMMENTS

SAMPLING TEAM (Print names and initial) R. Garnett, D. Dander, G. Evenson, T. McFarland, F Humbert

WHITE To accompany samples | YELLOW Records Processing Facility | PINK Field Team Leader

SOP 1.04, R0

* U.S.G.P.O.: 1993-776-845

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 6/23/94

Control No. 1086-02063

Technical Area 15

Send Lab Report Scott Kinkead MS J534

Operable Unit 1086

Site Work Plan LA-UR-92-3968

OU Contact Scott Kinkead

Date Samples Shipped 8/10/94

Contact Phone No. 665-1760

Date Lab Report Required 11/10/94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3476	6/23/94 0910	✓		500 ml poly	soil	~~none~~ 5-16-94 4C	~~Gamma spec, Total U~~ RKG	200.8	15-2114
AAB 3476	6/23/94 0912	✓		125 ml glass	soil	none 4C 5/10/94	~~As, Pb, Be, Tl~~ RKG	7471, 7421, 7081	

Relinquished by (Signature) TL McFarland Affiliation ERM — Date 8/10/94 — Time 1630

Received by (Signature) Kyle Affiliation ERM

Relinquished by (Signature) Affiliation — Date — Time

Received by (Signature) Affiliation

Relinquished by (Signature) Affiliation — Date — Time

Received by (Signature) Affiliation

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (indicate number of months) ___

COMMENTS RKG TLM

SAMPLING TEAM (Print names and initial) R. Garnett, D. Dander, G. Evenson, T. McFarland

WHITE To accompany samples — YELLOW Records Processing Facility — PINK Field Team Leader

SOP 1.04, Rev

* U.S.G.P.O.: 1993- 770-048

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/25/94

Control No. 10860-

Technical Area 15

Send Lab Report Scott Kinkead MS J534

Operable Unit 1086

Site Work Plan LA-UR-92-3968

OU Contact Scott Kinkead

Date Samples Shipped 8/10/94

Contact Phone No. 665-1760

Date Lab Report Required 11/10/94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3477	7/25/94 0956	–		500 ml poly	soil	~~none~~ 5-16-94 4C	Gamma spec, Total U	200.8	15-2172
AAB 3477	7/25/94 0956	/		125 ml glass	soil	~~none~~ 4C	~~Hg, Pb, Be~~ TAL metals	7471, 7421	7091
AAB 3477	7/25/94 0956	✓		125ml glass	soil	4°C	HE	8330 A	

Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date
TL McFarland TL McFarland ERM	8/10/94				
Received by (Signature) Affiliation	**Time**	**Received by (Signature) Affiliation**	**Time**	**Received by (Signature) Affiliation**	**Time**
Kyle Kemp	1630				

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if samples are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Dispose by lab ✓ Archive ___ (Indicate number of months) ___

COMMENTS

SAMPLING TEAM (Print names and initial) R. Garnett, D. Dander, G. Evenson, T. McFarland, F Humbert

WHITE To accompany samples YELLOW Records Processing Facility PINK Field Team Leader

SOP 1.04 R0

U.S.G.P.O.:1993-770-049

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/25/94

Control No. 1086-19070

Technical Area 15

Send Lab Report ~~Scott Kinkead~~ MS ~~J534~~

Operable Unit 1086

Site Work Plan LA-UR-92-3968

OU Contact Scott Kinkead

Date Samples Shipped 08-10-94.

Contact Phone No. 665-1760

Date Lab Report Required 11-10-94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested Test	Analysis Requested Method	Remarks (Condition of receipt, etc.)
AAB 3480	7/25/94 0930	✓		500 ml poly	soil	5-16-94 4C ~~none~~	Gamma spec, Total U	200.8	15-2299 18-24 in
AAB 3480	7/25/94 0930	✓		125 ml glass	soil	4C RKE 9/16/94 ~~none~~	~~Hg, Pb, Be~~ TAL metals	7471, 7421, 7091	

Relinquished by (Signature) Affiliation TLMcFarland Time Zone EDT	Date 08-10-94	Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date
Received by (Signature) Affiliation Kyle Hoy CST-9	Time 1630	Received by (Signature) Affiliation	Time	Received by (Signature) Affiliation	Time

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic Flammable Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (indicate number of months) ___

COMMENTS

SAMPLING TEAM (Print names and initial) ~~R. Garnett, D. Bader, G. Svenbeg, T. McFarland~~, F. Humbert

WHITE To accompany samples YELLOW Records Processing Facility PINK Field Team Leader

SOP 1.04 R0

U.S.G.P.O.:1993- 770-640

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/05/94

Control No. 1086-09075

Technical Area 15

Send Lab Report Scott Kinkead MS J534

Operable Unit 1086

Site Work Plan LA-UR-92-3968

OU Contact Scott Kinkead

Date Samples Shipped 8/10/94

Contact Phone No. 665-1760

Date Lab Report Required 11/10/94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3485	7/5/94 1010	✓		500 ml poly	soil	~~none~~ 5-16-94 4C RKG	Gamma spec, Total U	200.8	15-2198
AAB 3485	07/05/94 1010	✓		125 ml glass	soil	~~none~~ 4C RKG	~~Hg, Pb, Be~~ 5/16/94 TAL metals	7471, 7421, 7091	

Relinquished by (Signature) TLMcFarland
Affiliation FERM

Date 8/10/94

Received by (Signature) Kyle Gay
Affiliation CST

Time 1630

Relinquished by (Signature)
Affiliation

Received by (Signature)
Affiliation

Date

Time

Relinquished by (Signature)
Affiliation

Received by (Signature)
Affiliation

Date

Time

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (Indicate number of months) ___

COMMENTS RKG

SAMPLING TEAM (Print names and initial) R. Garnett, D. Dander, G. Evenson, T. McFarland

WHITE To accompany samples YELLOW Records Processing Facility PINK Field Team Leader

SOP 1.04, Rev

U.S.G.P.O.:1993-770-645

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/28/94 | Control No. 1086-

Technical Area 15 | Send Lab Report Scott Kinkead MS J534

Operable Unit 1086 | Site Work Plan LA-UR-92-3968

OU Contact Scott Kinkead | Date Samples Shipped 08-10-94

Contact Phone No. 665-1760 | Date Lab Report Required 11-10-94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3503	7/28/94 0954	✓		125 ml poly	Soil	4°C	Total U	200.8	15-2500 0-6in
AAB 3503	7/28/94 0954	✓		125 ml poly	Soil	4°C	~~Pb, Be~~ TAL alone	7421, 7091	
							TAL metals		

Relinquished by (Signature) TMcFarland Affiliation ERM	Date 8-10-94	Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date
Received by (Signature) Kyle Affiliation	Time 11:30	Received by (Signature) Affiliation	Time	Received by (Signature) Affiliation	Time

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (Indicate number of months) ___

COMMENTS ___

SAMPLING TEAM (Print names and initial) D Dander, G Evenson, F Humbert, TMcFarland

WHITE To accompany samples | YELLOW Records Processing Facility | PINK Field Team Leader

SOP 1.04, R0

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/28/94 | Control No. 1086-

Technical Area 15 | Send Lab Report Scott Kinkead MS J534

Operable Unit 1086 | Site Work Plan LA-UR-92-3968 (R44)

OU Contact Scott Kinkead | Date Samples Shipped 09-10-94

Contact Phone No. 665-1760 | Date Lab Report Required 11-10-94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
Water Rad Light KRG → AAB 3504	7/28/94 1010	✓		125ml poly	Soil	4°C	Total U	200.8	TM 7/28/94 ~~15-20~~ IS 2500
AAB 3504	7/28/94 1010	✓		125ml poly	Soil	4°C	~~Pb, Be~~ TM 8/10/94	7421, 7091	
							TAL metals		

18.24 in

Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date
T L McFarland ERM	8-10-94				
Received by (Signature) Affiliation	**Time**	**Received by (Signature) Affiliation**	**Time**	**Received by (Signature) Affiliation**	**Time**
Kyle May CSF9	1630				

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Dispose by lab ✓ Archive ___ (Indicate number of months) ___

COMMENTS ~~Fragile~~ TM

SAMPLING TEAM (Print names and initial) D Dander, G Evenson, F Humbert, T McFarland

WHITE To accompany samples | YELLOW Records Processing Facility | PINK Field Team Leader

SOP 1.04, R9

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/20/94

Control No. 1086-13038

Technical Area 15

Send Lab Report Scott Kinkead MS J534

Operable Unit 1086

Site Work Plan LA-UR-92-3968

OU Contact Scott Kinkead

Date Samples Shipped 08-10-94

Contact Phone No. 665-1760

Date Lab Report Required 11-10-94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3525	7/20/94 0848	✓		500 ml poly	soil	~~none~~ 4C	Gamma spec, Total U	200.8	15-2279 O-6in
AAB 3525	7/20/94 0848	✓		125 ml glass	soil	~~none~~ 4C	~~Hg, Pb, Be~~ TAL metals	7471, 7421, 7091	

Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date
TL McFarland ERM	8-10-94				
Received by (Signature) Affiliation	**Time**	**Received by (Signature) Affiliation**	**Time**	**Received by (Signature) Affiliation**	**Time**
Kyle Kg CRY	1650				

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (Indicate number of months) ___

COMMENTS RVG

SAMPLING TEAM (Print names and initial) R. Garnett, ~~D. Dander~~, G. Evenson, T. McFarland, F. Humbert

WHITE To accompany samples YELLOW Records Processing Facility PINK Field Team Leader

SOP 1.04, R0

* U.S.G.P.O.: 1989-770-045

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/27/94 | Control No. 1086-

Technical Area 15 | Send Lab Report Scott Kinkead MS J534

Operable Unit 1086 | Site Work Plan LA-UR-92-3968

OU Contact Scott Kinkead | Date Samples Shipped 08-10-94

Contact Phone No. 665-1760 | Date Lab Report Required 11-10-94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3530	7/27/94 1030	✓		125 ml poly	Soil	~~35~~ 4°C	Total U	200.8	15-2501 18-24in
AAB 3530	7/27/94 0830	✓		125 ml poly	Soil	4°C	~~Pb, Ba~~ TAL metals	7421, 7091	
							TAL metals		

Shelter rock visit KRL

Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date
T L McFarland ERM	8-10-94				
Received by (Signature) Affiliation	**Time**	**Received by (Signature) Affiliation**	**Time**	**Received by (Signature) Affiliation**	**Time**
[illegible] CSTM	1630				

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (Indicate number of months) ___

COMMENTS

SAMPLING TEAM (Print names and initial) G Evanson, F Humbert, E Trollinger, T McFarland

WHITE To accompany samples | YELLOW Records Processing Facility | PINK Field Team Leader

SOP 1.04, R0

19307

[1 bundle
+ clips within]

CST OFFSITE

Copy

EM-9 ANALYTICAL SERVICE AGREEMENT
Samples Assigned Report

REQUEST NBR
19509

ANALYTICAL SECTION: RADCM PROGRAM FUND CODE: M78B

PRIORITY CODE: 3

SAMPLE DISPOSAL: Discard AGREEMENT_DATE: 12-OCT-94

SCREENING DATA: Samples Screened: Counts BELOW Background!

CUSTOMER: SAK; Scott A. Kinkead MAIL STOP: J534 PHONE: 665-1760

SIGNATURE: _____ LLS TOTAL SAMPLES: _____

COUNTS:

ANALYSIS	TECHNIQUE	ANALYST	DUE	NBR SAMPLES
GSCAN	G	211	08-DEC-94	19
U	KPA	211	08-DEC-94	37

REMARKS:

TA-15 OU 1086
.
RADIOCHEMISTRY TO BE SHIPPED 11/12/94, UNLESS NOTIFIED
BY CONTRACT LAB TO SHIP EARLIER.
.
SAMPLES TO ATI.

SAMPLES:

ANALYSIS	SAMPLE	TECHNIQUE	MATRX	TYPE	PRESERVATIVES	HAZARDS	COLLECTED	DUE	ANALST
GSCAN	94.18548-Cut-3	G	SS		NO PRESERVS	NO HAZARDS	21-JUL-94	08-DEC-94	211
	94.18551-Cut-3	G	SS		NO PRESERVS	NO HAZARDS	15-JUL-94	08-DEC-94	211
	94.18557-Cut-3	G	SS		NO PRESERVS	NO HAZARDS	03-AUG-94	08-DEC-94	211
	94.18560-Cut-3	G	SS		NO PRESERVS	NO HAZARDS	25-JUL-94	08-DEC-94	211
	94.18561-Cut-3	G	SS		NO PRESERVS	NO HAZARDS	25-JUL-94	08-DEC-94	211
	94.20311-Cut-2	G	SS		NO PRESERVS	NO HAZARDS	06-JUL-94	08-DEC-94	211
	94.20312-Cut-2	G	SS		NO PRESERVS	NO HAZARDS	20-JUL-94	08-DEC-94	211
	94.20313-Cut-2	G	SS		NO PRESERVS	NO HAZARDS	15-JUL-94	08-DEC-94	211
	94.20314-Cut-2	G	SS		NO PRESERVS	NO HAZARDS	30-JUN-94	08-DEC-94	211
	94.20315-Cut-2	G	SS		NO PRESERVS	NO HAZARDS	28-JUN-94	08-DEC-94	211
	94.20316-Cut-2	G	SS		NO PRESERVS	NO HAZARDS	30-JUN-94	08-DEC-94	211
	94.20320-Cut-2	G	SS		NO PRESERVS	NO HAZARDS	24-JUL-94	08-DEC-94	211
	94.20321-Cut-2	G	SS		NO PRESERVS	NO HAZARDS	27-JUL-94	08-DEC-94	211
	94.20322-Cut-2	G	SS		NO PRESERVS	NO HAZARDS	25-JUL-94	08-DEC-94	211
	94.20323-Cut-2	G	SS		NO PRESERVS	NO HAZARDS	28-JUL-94	08-DEC-94	211
	94.20324-Cut-2	G	SS		NO PRESERVS	NO HAZARDS	08-JUL-94	08-DEC-94	211
	94.20336-Cut-2	G	SS		NO PRESERVS	NO HAZARDS	25-JUL-94	08-DEC-94	211
	94.20337-Cut-2	G	SS		NO PRESERVS	NO HAZARDS	20-JUL-94	08-DEC-94	211
	94.20344-Cut-2	G	SS		NO PRESERVS	NO HAZARDS	19-JUL-94	08-DEC-94	211
U	94.18548-Cut-3	KPA	SS		NO PRESERVS	NO HAZARDS	21-JUL-94	08-DEC-94	211
	94.18551-Cut-3	KPA	SS		NO PRESERVS	NO HAZARDS	15-JUL-94	08-DEC-94	211
	94.18555-Cut-3	KPA	SS		NO PRESERVS	NO HAZARDS	27-JUL-94	08-DEC-94	211

EM-9 ANALYTICAL SERVICE AGREEMENT
Samples Assigned Report

REQUEST NBR
19509

SAMPLES:

ANALYSIS	SAMPLE	TECHNIQUE	MATRX	TYPE	PRESERVATIVES	HAZARDS	COLLECTED	DUE	ANALST
U	94.18557-Cut-3	KPA	SS		NO PRESERVS	NO HAZARDS	03-AUG-94	08-DEC-94	211
	94.18560-Cut-3	KPA	SS		NO PRESERVS	NO HAZARDS	25-JUL-94	08-DEC-94	211
	94.18561-Cut-3	KPA	SS		NO PRESERVS	NO HAZARDS	25-JUL-94	08-DEC-94	211
	94.20311-Cut-2	KPA	SS		NO PRESERVS	NO HAZARDS	06-JUL-94	08-DEC-94	211
	94.20312-Cut-2	KPA	SS		NO PRESERVS	NO HAZARDS	20-JUL-94	08-DEC-94	211
	94.20313-Cut-2	KPA	SS		NO PRESERVS	NO HAZARDS	15-JUL-94	08-DEC-94	211
	94.20314-Cut-2	KPA	SS		NO PRESERVS	NO HAZARDS	30-JUN-94	08-DEC-94	211
	94.20315-Cut-2	KPA	SS		NO PRESERVS	NO HAZARDS	28-JUN-94	08-DEC-94	211
	94.20316-Cut-2	KPA	SS		NO PRESERVS	NO HAZARDS	30-JUN-94	08-DEC-94	211
	94.20317-Cut-2	KPA	SS		NO PRESERVS	NO HAZARDS	28-JUN-94	08-DEC-94	211
	94.20318-Cut-2	KPA	SS		NO PRESERVS	NO HAZARDS	28-JUN-94	08-DEC-94	211
	94.20319-Cut-2	KPA	SS		NO PRESERVS	NO HAZARDS	27-JUL-94	08-DEC-94	211
	94.20320-Cut-2	KPA	SS		NO PRESERVS	NO HAZARDS	24-JUL-94	08-DEC-94	211
	94.20321-Cut-2	KPA	SS		NO PRESERVS	NO HAZARDS	27-JUL-94	08-DEC-94	211
	94.20322-Cut-2	KPA	SS		NO PRESERVS	NO HAZARDS	25-JUL-94	08-DEC-94	211
	94.20323-Cut-2	KPA	SS		NO PRESERVS	NO HAZARDS	28-JUL-94	08-DEC-94	211
	94.20324-Cut-2	KPA	SS		NO PRESERVS	NO HAZARDS	08-JUL-94	08-DEC-94	211
	94.20325-Cut-2	KPA	SS		NO PRESERVS	NO HAZARDS	28-JUL-94	08-DEC-94	211
	94.20326-Cut-2	KPA	SS		NO PRESERVS	NO HAZARDS	28-JUL-94	08-DEC-94	211
	94.20327-Cut-2	KPA	SS		NO PRESERVS	NO HAZARDS	27-JUL-94	08-DEC-94	211
	94.20328-Cut-2	KPA	SS		NO PRESERVS	NO HAZARDS	27-JUL-94	08-DEC-94	211
	94.20329-Cut-2	KPA	SS		NO PRESERVS	NO HAZARDS	18-JUL-94	08-DEC-94	211
	94.20330-Cut-2	KPA	SS		NO PRESERVS	NO HAZARDS	18-JUL-94	08-DEC-94	211
	94.20331-Cut-2	KPA	SS		NO PRESERVS	NO HAZARDS	18-JUL-94	08-DEC-94	211
	94.20332-Cut-2	KPA	SS		NO PRESERVS	NO HAZARDS	14-JUL-94	08-DEC-94	211
	94.20333-Cut-2	KPA	SS		NO PRESERVS	NO HAZARDS	18-JUL-94	08-DEC-94	211
	94.20334-Cut-2	KPA	SS		NO PRESERVS	NO HAZARDS	14-JUL-94	08-DEC-94	211
	94.20335-Cut-2	KPA	SS		NO PRESERVS	NO HAZARDS	14-JUL-94	08-DEC-94	211
	94.20336-Cut-2	KPA	SS		NO PRESERVS	NO HAZARDS	25-JUL-94	08-DEC-94	211
	94.20337-Cut-2	KPA	SS		NO PRESERVS	NO HAZARDS	20-JUL-94	08-DEC-94	211
	94.20344-Cut-2	KPA	SS		NO PRESERVS	NO HAZARDS	19-JUL-94	08-DEC-94	211
	94.25969-Cut-1	KPA	SS		NO PRESERVS	NO HAZARDS	31-AUG-94	08-DEC-94	211
	94.25970-Cut-1	KPA	SS		NO PRESERVS	NO HAZARDS	31-AUG-94	08-DEC-94	211
	94.25971-Cut-1	KPA	SS		NO PRESERVS	NO HAZARDS	31-AUG-94	08-DEC-94	211

Agreement	Sample Nbr	Customer Number	Date Collected
19509	94.25971	00.00515	31-AUG-94
19509	94.25970	00.00576	31-AUG-94
19509	94.25969	00.00596	31-AUG-94
19509	94.20344	AAB3295	19-JUL-94
19509	94.18548	AAB3298	21-JUL-94
19509	94.20311	AAB3304	06-JUL-94
19509	94.20312	AAB3321	20-JUL-94
19509	94.20313	AAB3325	15-JUL-94
19509	94.18551	AAB3332	15-JUL-94
19509	94.20314	AAB3336	30-JUN-94
19509	94.20315	AAB3340	28-JUN-94
19509	94.20316	AAB3342	30-JUN-94
19509	94.20317	AAB3352	28-JUN-94
19509	94.20318	AAB3353	28-JUN-94
19509	94.18555	AAB3355	27-JUL-94
19509	94.20319	AAB3398	27-JUL-94
19509	94.20328	AAB3401	27-JUL-94
19509	94.20329	AAB3428	18-JUL-94
19509	94.20330	AAB3429	18-JUL-94
19509	94.20331	AAB3430	18-JUL-94
19509	94.20332	AAB3431	14-JUL-94
19509	94.20333	AAB3433	18-JUL-94
19509	94.20334	AAB3435	14-JUL-94
19509	94.20335	AAB3438	14-JUL-94
19509	94.18557	AAB3445	03-AUG-94
19509	94.20320	AAB3451	24-JUL-94
19509	94.20321	AAB3461	27-JUL-94
19509	94.20322	AAB3470	25-JUL-94
19509	94.18560	AAB3473	25-JUL-94
19509	94.20323	AAB3476	28-JUL-94
19509	94.18561	AAB3477	25-JUL-94
19509	94.20336	AAB3480	25-JUL-94
19509	94.20324	AAB3485	08-JUL-94
19509	94.20325	AAB3503	28-JUL-94
19509	94.20326	AAB3504	28-JUL-94
19509	94.20337	AAB3525	20-JUL-94
19509	94.20327	AAB3530	27-JUL-94

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/19/94

Control No. 10860 09137

Technical Area 15

Send Lab Report Scott Kinkead MS J534

Operable Unit 1086

Site Work Plan LA-UR-92-3968

OU Contact Scott Kinkead

Date Samples Shipped 8/10/94

Contact Phone No. 665-1760

Date Lab Report Required 11/10/94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3295	7/19/94 1117	✓		500 ml poly	soil	4c	Gamma spec, Total U	200.8	15-2206
AAB 3295	7/19/94 1117	✓		125 ml glass	soil	4c	Hg, Pb, Be	7091, 7471, 7421	

Relinquished by (Signature) Affiliation Tim McFarland ERM — Date 8/10/94 — Relinquished by (Signature) Affiliation — Date — Relinquished by (Signature) Affiliation — Date

Received by (Signature) Affiliation Kyle Gay ERM — Time 1630 — Received by (Signature) Affiliation — Time — Received by (Signature) Affiliation — Time

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (Indicate number of months) ___

COMMENTS

SAMPLING TEAM (Print names and initial) R. Garnett, ~~D. Bender~~ Tim Hinta, G. Evenson, T. McFarland Tim, F Humbert

WHITE To accompany samples **YELLOW** Records Processing Facility **PINK** Field Team Leader

SOP 1.04, R0

* U.S.G.P.O.: 1993-776-945

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/21/94

Control No. 1086-[illegible]34

Technical Area 15

Send Lab Report Scott Kinkead MS J534

Operable Unit 1086

Site Work Plan LA-UR-92-3968

OU Contact Scott Kinkead

Date Samples Shipped 8/10/94

Contact Phone No. 665-1760

Date Lab Report Required 11/10/94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3298	7/21/94 0942	✓		500 ml poly	soil	4c	Gamma spec, Total U	200.8	15.2240 OGIN
AAB 3298	7/21/94 0942	✓		125 ml glass	soil	4c	Hg, Pb, Be	7091,7471,7421	
AAB 3298	7/21/94 0942	✓		125 ml glass	soil	4°C	HF	8330A	

Relinquished by (Signature) TLM c Farland Affiliation TZMCF ERM	Date 8/10/94	Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date
Received by (Signature) Kyle Gay CSTG Affiliation	Time 1630	Received by (Signature) Affiliation	Time	Received by (Signature) Affiliation	Time

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)

Radiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL

Return to client ___ Disposal by lab ✓ Archive ___ (Indicate number of months) ___

COMMENTS

SAMPLING TEAM (Print names and initial) R. Garnett RKG, ~~D. Bender~~ Thm 7/21/94, G. Evenson Thm, T. McFarland, ~~RALPH~~ F Humbert

WHITE To accompany samples YELLOW Records Processing Facility PINK Field Team Leader

SOP 1.04, R0

* U.S.G.P.O.: 1993-776-045

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/06/94

Control No. 1086-09123

Technical Area 15

Send Lab Report ~~Scott Kinkead~~ MS J534

Operable Unit 1086

Site Work Plan LA-UR-92-3968

OU Contact Scott Kinkead

Date Samples Shipped 8/10/94

Contact Phone No. 665-1760

Date Lab Report Required 11/10/94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3304	07/06/94 0454	✓		500 ml poly	soil	4c	Gamma spec, Total U	200.8	15-2153 9-15 in
AAB 3304	07/06/94 0954	✓		125 ml glass	soil	4c	~~Hg, Pb, Be~~ TAL metals	7091, 7471, 7421	

Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date
TLMcFarland ERM	8/10/94				
Received by (Signature) Affiliation	Time 1630	Received by (Signature) Affiliation	Time	Received by (Signature) Affiliation	Time

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (Indicate number of months) ___

COMMENTS

SAMPLING TEAM (Print names and initial) ~~R. Garnett, D. Dander, C. Evenson, T. McFarland~~ RKG TLM

WHITE To accompany samples **YELLOW** Records Processing Facility **PINK** Field Team Leader

SOP 1.04, R0

* U.S.G.P.O.: 1993-776-945

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/20/94

Control No. 1086- 03111

Technical Area 15

Send Lab Report Scott Kinkead MS J534

Operable Unit 1086

Site Work Plan LA-UR-92-3968

OU Contact Scott Kinkead

Date Samples Shipped 8/10/94

Contact Phone No. 665-1760

Date Lab Report Required 11/10/94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3321	7/20/94 0930	✓		500 ml poly	soil	4c	Gamma spec, Total U	200.8	
AAB 3321	7/20/94 0930	✓		125 ml glass	soil	4c	~~Hg, Pb, Be~~ TAL metals	7091, 7471, 7421	15-2277 0-5 in

Relinquished by (Signature) T. McFarland
Affiliation ERM
Date 8/10/94
Time 1630
Received by (Signature) Kyle May
Affiliation CSIO

Relinquished by (Signature)
Affiliation
Date
Received by (Signature)
Affiliation
Time

Relinquished by (Signature)
Affiliation
Date
Received by (Signature)
Affiliation
Time

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological Highly Toxic Flammable Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (Indicate number of months) ___

COMMENTS

SAMPLING TEAM (Print names and initial) R. Garnett, D. Dander, G. Evenson, T. McFarland, F. Humbert

WHITE To accompany samples **YELLOW** Records Processing Facility **PINK** Field Team Leader

SOP 1.04, R0

• U.S.G.P.O.: 1993-776-945

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/15/94

Control No. 10860-

Technical Area 15

Send Lab Report Scott Kinkead MS J534

Operable Unit 1086

Site Work Plan LA-UR-92-3968

OU Contact Scott Kinkead

Date Samples Shipped 08-10-94

Contact Phone No. 665-1760

Date Lab Report Required 11-10-94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3325	7/15/94 1128	✓		500 ml poly	soil	4c	Gamma spec, Total U	200.8	15-7295
AAB 3325	7/15/94 1128	✓		125 ml glass	soil	4c	~~Hg, Pb, Be~~ TAL metals	7091, 7471, 7421	

Relinquished by TLMcFarland (Signature) Affiliation TAM ERM — Date 08-10-94 — Relinquished by (Signature) Affiliation — Date — Relinquished by (Signature) Affiliation — Date

Received by (Signature) Kyle Gray Affiliation CST-9 — Time 1630 — Received by (Signature) Affiliation — Time — Received by (Signature) Affiliation — Time

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (Indicate number of months) ___

COMMENTS

SAMPLING TEAM (Print names and initial) R. Garnett, ~~D. Dander~~ TLM 7/15/94, G. Evenson, T. McFarland TLM

WHITE To accompany samples **YELLOW** Records Processing Facility **PINK** Field Team Leader

SOP 1.04, R0

* U.S.G.P.O.:1993-776-645

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/15/94

Control No. 1086 - 00099

Technical Area 15

Send Lab Report Scott Kinkead MS J534

Operable Unit 1086

Site Work Plan LA-UR-92-3968

OU Contact Scott Kinkead

Date Samples Shipped 8/10/94

Contact Phone No. 665-1760

Date Lab Report Required 11/10/94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3332	7/15/94 0953	✓		500 ml poly	soil	4c	Gamma spec, Total U	200.8	
AAB 3332	7/15/94 0953	✓		125 ml glass	soil	4c	~~Hg, Pb, Be~~ TAL metals	7091, 7471, 7421	15·2137 18-24·n
AAB 3332	7/15/94 0953	✓		125 ml glass	Soil	4°C	HE	8330 A	

Relinquished by (Signature) TLMcFarland Affiliation ERM	Date 8/10/94	Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date
Received by (Signature) Affiliation	Time 1630	Received by (Signature) Affiliation	Time	Received by (Signature) Affiliation	Time

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (Indicate number of months) ___

COMMENTS

SAMPLING TEAM (Print names and initial) R. Garnett, ~~D. Dander~~ TLM 7/15/94, G. Evenson, T. McFarland TLM

WHITE To accompany samples YELLOW Records Processing Facility PINK Field Team Leader

SOP 1.04, R0

* U.S.G.P.O.:1993-778-945

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 6/30/94

Control No. 1086-95

Technical Area 15

Send Lab Report Scott Kinkead MS J534

Operable Unit 1086

Site Work Plan LA-UR-92-3968

OU Contact Scott Kinkead

Date Samples Shipped 8/10/94

Contact Phone No. 665-1760

Date Lab Report Required 11/10/94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3336	6/30/94 1200	✓		500 ml poly	soil	4c	Gamma spec, Total U	200.8	
AAB 3336	6/30/94 1200	✓		125 ml glass	soil	4c	~~Hg, Pb, Be~~ TAL metals	7091, 7471, 7421	15-2178 0-6in

Relinquished by (Signature) TLMcFarland
Affiliation ERM

Date 8/10/94

Time 1630

Received by (Signature)
Affiliation

Relinquished by (Signature)
Affiliation

Date

Time

Received by (Signature)
Affiliation

Relinquished by (Signature)
Affiliation

Date

Received by (Signature)
Affiliation

Time

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (Indicate number of months) ___

COMMENTS RKG

SAMPLING TEAM (Print names and initial) R. Garnett, D. Dander, G. Evenson, T. McFarland

WHITE To accompany samples YELLOW Records Processing Facility PINK Field Team Leader

SOP 1.04, R0

* U.S G.P.O.:1993-776-945

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 6/28/94

Control No. 1086-09091

Technical Area 15

Send Lab Report Scott Kinkead MS J534

Operable Unit 1086

Site Work Plan LA-UR-92-3968

OU Contact Scott Kinkead

Date Samples Shipped 8/10/94

Contact Phone No. 665-1760

Date Lab Report Required 11/10/94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt. etc.)
AAB 3340	6/28/94 1020	✓		500 ml poly	soil	4c	Gamma spec, Total U	200.8	
AAB 3340	6/28/94 1020	✓		125 ml glass	soil	4c	~~Hg, Pb, Be~~ TAL metals	7091, 7471, 7421	15·2127 18·24in

Relinquished by (Signature) Affiliation: TMcFarland, ERM — Date 8/10/94

Received by (Signature) Affiliation: [signature] CST-9 — Time 1630

Relinquished by (Signature) Affiliation — Date — Time

Relinquished by (Signature) Affiliation — Date

Received by (Signature) Affiliation — Time

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (Indicate number of months) ___

COMMENTS

SAMPLING TEAM (Print names and initial) R. Garnett, D. Dander, G. Evenson, T. McFarland

WHITE To accompany samples — YELLOW Records Processing Facility — PINK Field Team Leader

SOP 1.04, R0

* U.S.G.P.O.: 1993-776-046

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 6/30/94

Control No. 09101 1086-

Technical Area 15

Send Lab Report Scott Kinkead MS J534

Operable Unit 1086

Site Work Plan LA-UR-92-3968

OU Contact ~~Scott Kinkead~~ 665-1760

Date Samples Shipped 8/10/94

Contact Phone No.

Date Lab Report Required 11/10/94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3342	6/30/94 1135	✓		500 ml poly	soil	4c	Gamma spec, Total U	200.8	
AAB 3342	6/30/94 1135	✓		125 ml glass	soil	4c	~~Hg, Pb, Be~~ TAL metals	~~7131 8100~~ 7091, 7471, 7421	15-2166 0-4in

Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date
T.L. McFarland TFRM	8/10/94				
Received by (Signature) Affiliation: Kyle Gray CTAL	Time 1630	Received by (Signature) Affiliation	Time	Received by (Signature) Affiliation	Time

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)

Radiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL

Return to client ___ Disposal by lab ✓ Archive ___ (Indicate number of months) ___

COMMENTS RKG

SAMPLING TEAM (Print names and initial) R. Garnett, D. Dander, G. Evenson, T. McFarland

WHITE To accompany samples **YELLOW** Records Processing Facility **PINK** Field Team Leader

SOP 1.04, R0

* U.S.G.P.O.:1993-776-045

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/28/94

Control No. 1086-29156

Technical Area 15

Send Lab Report Scott Kinkead MS J534

Operable Unit 1086

Site Work Plan LA-UR-92-3968 (R-44)

OU Contact Scott Kinkead

Date Samples Shipped 08-10-94

Contact Phone No. 665-1760

Date Lab Report Required 11-10-94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3352	7/28/94 0937	✓		125 ml poly	soil	4c	Total U	200.8	15.2503
AAB 3352	7/28/94 0937	✓		125 ml ~~glass~~ Poly	soil	4c	~~Pb, Be~~ TAL metals	7421, 7091	
~~AAB 3352~~				~~Plastic Zip~~	~~soil~~	~~4c~~	~~Gross alpha/beta~~ Rad Van		
							Gamma spec		
~~AAB 3352~~				~~Plastic Zip~~	~~soil~~	~~4c~~	~~Pb, Be~~	~~Chem Van~~	

Relinquished by (Signature) TLMcFarland Affiliation ERM Date 8-10-94 Time 1630

Received by (Signature) [illegible] Affiliation CST-9

Relinquished by (Signature) Affiliation Date Time

Received by (Signature) Affiliation Date Time

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (Indicate number of months) ___

COMMENTS

SAMPLING TEAM (Print names and initial) ~~R. Garnett~~ D. Dander, G. Evenson, T. McFarland, F Humbert

WHITE To accompany samples YELLOW Records Processing Facility PINK Field Team Leader

SOP 1.04, R0

* U.S.G.P.O.:1993- 776-945

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/28/94

Control No. 1086-09157

Technical Area 15

Send Lab Report Scott Kinkead MS J534

Operable Unit 1086

Site Work Plan LA-UR-92-3968 (R-44)

OU Contact Scott Kinkead

Contact Phone No. 665-1760

Date Samples Shipped 08-10-94

Date Lab Report Required 11-10-94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3353	7/28/94 09:35	✓		125 ml poly	soil	4C	Total U	200.8	
AAB 3353	7/23/94 09:35	✓		125 ml ~~glass~~ Poly	soil RKG, 5-23-94	4C	~~Pb, Be~~ TAL metals	7421, 7091 TRM 7/27/94	15-2503 0-6in
~~AAB 3353~~				~~Plastic Zip~~	~~soil~~	~~4C~~	~~Gross alpha/beta~~ Gamma spec	~~Rad Van~~	
~~AAB 3353~~				~~Plastic Zip~~	~~soil~~	~~4C~~	~~Pb, Be~~	~~Chem Van~~	TRM 7/27/94

Shipped Red List RKG

Relinquished by (Signature) TL McFarland TRM ERM Affiliation	Date 08-10-94	Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date
Received by (Signature) Affiliation CST-9	Time 1630	Received by (Signature) Affiliation	Time	Received by (Signature) Affiliation	Time

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (Indicate number of months) ___

COMMENTS

SAMPLING TEAM (Print names and initial) ~~R. Garnett~~ GM 7/28/94, D. Dander, G. Evenson, T. McFarland TRM, ~~Eyoff~~ FHumbert

WHITE To accompany samples YELLOW Records Processing Facility PINK Field Team Leader

SOP 1.04, R0

* U.S.G.P.O.: 1993-776-945

1

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/27/94

Control No. 1086 -

Technical Area 15

Send Lab Report ~~Scott Kinkead~~ MS ~~J534~~

Operable Unit 1086

Site Work Plan LA-UR-92-3968 (R-44)

OU Contact Scott Kinkead

Date Samples Shipped 08-10-94

Contact Phone No. 665-1760

Date Lab Report Required 11-10-94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
Shelter Rad List HRG → AAB 3355	7/27/94 1245	✓		125 ml poly	soil	4c	Total U	200.8	15-2502 O-Gin
AAB 3355	7/27/94 1255	✓		125 ml ~~glass~~ poly	soil HRG 5-23-94	4c	~~Pb, Be~~ TAL metals	7421,7091	
~~AAB 3355~~				~~Plastic Zip~~	~~soil~~	~~4C~~	~~Gross alpha/beta~~ ~~Rad Van~~		
							Gamma spec		7/27/94
~~AAB 3355~~				~~Plastic Zip~~	~~soil~~	~~4c~~	~~Pb, Be~~	~~Chem Van~~	
AAB 3355	7/27/94 1255			125 ml glass	soil	4°C	HE	8330 A	

Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date
TL McFarland ERM	5-10-94				
Received by (Signature) Affiliation	Time	Received by (Signature) Affiliation	Time	Received by (Signature) Affiliation	Time
[illegible] USTG	1630				

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (Indicate number of months) ___

COMMENTS 17in 7/27/94

SAMPLING TEAM (Print names and initial) ~~R. Garnett, D. Bander~~, G. Evenson, T. McFarland, F Humbert, E Trollinger

WHITE To accompany samples **YELLOW** Records Processing Facility **PINK** Field Team Leader

SOP 1.04. R0

* U.S.G.P.O.:1993-776-945

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/27/94

Control No. 1086-

Technical Area 15

Send Lab Report Scott Kinkead MS J534

Operable Unit 1086

Site Work Plan LA-UR-92-3968 (R-44)

OU Contact Scott Kinkead

Date Samples Shipped 08-10-94

Contact Phone No. 665-1760

Date Lab Report Required 11-10-94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
Shelter Rd Lost KKG → AAB 3398	7/27/94 1013	✓		125 ml poly	soil	4c	Total U	200.8	15-2501 C-6:7
AAB 3398	7/27/94 1013	✓		125 ml poly	soil	4c	~~Pb, Be~~ TAL metals	7421, 7091	
~~AAB 3398~~				~~Plastic Zip~~	~~soil~~	~~4c~~	~~Gross alpha/beta~~	~~Rad Van~~	
							Gamma spec		TMM 7/27/94
~~AAB 3398~~				~~Plastic Zip~~	~~soil~~	~~4c~~	~~Pb, Be~~	~~Chem Van~~	TMM 7/27/94

Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date
T.L. McFarland ERM	8-10-94				
Received by (Signature) Affiliation CST-1	Time 1630	Received by (Signature) Affiliation	Time	Received by (Signature) Affiliation	Time

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (Indicate number of months) ___

COMMENTS

SAMPLING TEAM (Print names and initial) ~~R. Garnett, D. Dander~~, G. Evenson, T. McFarland, F Humbert, E Troilinger

TMM 7/27/94 TMM

WHITE To accompany samples **YELLOW** Records Processing Facility **PINK** Field Team Leader

SOP 1.04, R0

* U.S.G.P.O.:1993-776-945

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/27/94

Control No. 1086-19198

Technical Area 15

Send Lab Report Scott Kinkead MS J534

Operable Unit 1086

Site Work Plan LA-UR-92-3968 (R-44)

OU Contact Scott Kinkead

Date Samples Shipped 8-10-94

Contact Phone No. 665-1760

Date Lab Report Required 11-10-94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3401	7/27/94 1304	✓		125 ml poly	soil	4c	Total U	200.8	15-2502
AAB 3401	7/27/94 1304	✓		125 ml poly	soil	4c	~~Pb, Be~~ TAL metals	7421,7091	
~~AAB 3401~~				~~Plastic Zip~~	~~soil~~	~~4c~~	~~Gross alpha/beta~~	~~Rad Van~~	TMM 7/27/94
							Gamma spec		
~~AAB 3401~~				~~Plastic Zip~~	~~soil~~	~~4c~~	~~Pb, Be~~	~~Chem Van~~	TMM 7/27/94

Note different Rad Lab kills

18-24.n

Relinquished by (Signature) TL McFarland Affiliation ERM	Date 8-10-94	Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date
Received by (Signature) Affiliation LATG	Time 1630	Received by (Signature) Affiliation	Time	Received by (Signature) Affiliation	Time

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if samplers) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (Indicate number of months) ___

COMMENTS

SAMPLING TEAM (Print names and initial) ~~R. Garnett, D. Dander~~, G. Evenson, T. McFarland, F Humbert, E Trollinger

TMM 7/27/94

WHITE To accompany samples YELLOW Records Processing Facility PINK Field Team Leader

SOP 1.04, R0

* U.S.G.P.O.:1993-776-945

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/18/94

Control No. 1086-

Technical Area 15

Send Lab Report Scott Kinkead MS J534

Operable Unit 1086

Site Work Plan LA-UR-92-3968 (MDAZ)

OU Contact Scott Kinkead

Date Samples Shipped 08-10-94

Contact Phone No. 665-1760

Date Lab Report Required 11-10-94

Note different Rad List RAB

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3428	7/18/94 1000	✓		125 ml poly	soil	4c	Total U	200.8	15-2305
AAB 3428	7/18/94 1000	✓		125 ml glass	soil	4c	~~Hg, Pb, Be~~ TAL metals	7471, 7421, 7091	
~~AAB~~ 3428	7/18/94 1000	✓		~~125 ml glass~~	soil	4c	SVOC	8270	
~~AAB~~ 3428				Plastic Zip	soil	4c	Gross alpha/beta	Rad Van	
							Gamma spec		
~~AAB~~ 3428				~~Plastic Zip~~	soil	4c	~~Hg, Pb, Be~~	~~Chem Van~~	

Relinquished by (Signature) TLMcFarland
Affiliation ERM

Date 08-10-94

Time 1630

Received by (Signature)
Affiliation CSF

Relinquished by (Signature)
Affiliation

Date

Time

Received by (Signature)
Affiliation

Relinquished by (Signature)
Affiliation

Date

Received by (Signature)
Affiliation

Time

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)

Radiological Highly Toxic Flammable Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL

Return to client ___ Disposal by lab ✓ Archive ___ (Indicate number of months) ___

COMMENTS

SAMPLING TEAM (Print names and initial) R. Garnett, ~~D. Dander~~, G. Evenson, T. McFarland

WHITE To accompany samples **YELLOW** Records Processing Facility **PINK** Field Team Leader

SOP 1.04, R0

* U.S.G.P.O.: 1993 - 778-945

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/18/94

Control No. 1086 - 0 2 1 0

Technical Area 15

Send Lab Report Scott Kinkead MS J534

Operable Unit ~~1086~~

Site Work Plan ~~LA-UR-92-3968~~ (MDAZ)

OU Contact Scott Kinkead

Date Samples Shipped 08-10-94

Contact Phone No. 665-1760

Date Lab Report Required 11-10-94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3429	7/18/94 0934	✓		125 ml poly	soil	4c	Total U	200.8	15-2310 0.6 in
AAB 3429	7/18/94 0934	✓		125 ml glass	soil	4c	Hg, ~~Pb, Be~~ TAL metals	7471, 7421, 7091	
~~AAB 3429~~	~~7/18/94 0934~~	✓		~~125 ml glass~~	~~soil~~	~~4C~~	~~SVOC~~	~~8270~~ TKM 8/10/94	
~~AAB 3429~~				~~Plastic Ziploc~~	~~soil~~	~~4c~~	~~Gross alpha/beta~~	~~Rad Van~~ TKM 8/10/94	
							Gamma spec		
~~AAB 3429~~				~~Plastic Zip~~	~~soil~~	~~4c~~	~~Hg, Pb, Be~~	~~Chem Van~~ TKM 7/18/94	

Note different Rad List BKG

Relinquished by (Signature) TL McFarland Affiliation TKM ERM	Date 08-10-94	Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date
Received by (Signature) Affiliation CSTG	Time 1130	Received by (Signature) Affiliation	Time	Received by (Signature) Affiliation	Time

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (Indicate number of months) ___

COMMENTS

SAMPLING TEAM (Print names and initial) R. Garnett, ~~D. Dander~~ TKM 7/18/94, G. Evenson, T. McFarland TKM

WHITE To accompany samples YELLOW Records Processing Facility PINK Field Team Leader

SOP 1.04, R0

* U.S.G.P.O.:1993-778-945

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/18/94

Control No. 1086c-

Technical Area 15

Send Lab Report Scott Kinkead MS J534

Operable Unit 1086

Site Work Plan LA-UR-92-3968 (MDAZ)

OU Contact Scott Kinkead

Contact Phone No. 665-1760

Date Samples Shipped 08-10-94

Date Lab Report Required 11-10-94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
Note different Rad list ICRB → AAB 3430	7/18/94 0913	✓		125 ml poly	soil	4c	Total U	200.8 TKM 8/10/94	15-2308 O.C.m
AAB 3430	7/18/94 0918	✓		125 ml glass	soil	4c	~~Hg, Pb, Be~~ TAL metals	7471, 7421, 7091	
~~AAB 3430~~	~~7/18/94 0918~~	✓		~~125 ml glass~~	~~soil~~	~~4c~~	~~SVOC~~	~~8270~~	TKM 8/10/94
AAB 3430				Plastic Zip	soil	4c	~~Gross alpha/beta~~	~~Rad Van~~	TKM 7/18/94
							Gamma spec		
~~AAB 3430~~				~~Plastic Zip~~	~~soil~~	~~4c~~	~~Hg, Pb, Be~~	~~Chem Van~~	TKM 7/18/94

Relinquished by (Signature) TL McFarland TKM Affiliation ERM	Date 08-12-94	Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date
Received by (Signature) Kyle Gay Affiliation CST-9	Time 16:30	Received by (Signature) Affiliation	Time	Received by (Signature) Affiliation	Time

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)

Radiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL

Return to client ___ Disposal by lab ✓ Archive ___ (Indicate number of months) ___

COMMENTS

SAMPLING TEAM (Print names and initial) R. Garnett, ~~D. Dander~~, ~~G. Evenson~~, T. McFarland, G Evenson

TKM 7/18/94 TKM

WHITE To accompany samples **YELLOW** Records Processing Facility **PINK** Field Team Leader

SOP 1.04, R0

* U.S.G.P.O.:1993-776-945

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/14/94

Control No. 1086- 09142

Technical Area 15

Send Lab Report Scott Kinkead MS J534

Operable Unit 1086

Site Work Plan LA-UR-92-3968 (MDAZ)

OU Contact Scott Kinkead

Date Samples Shipped 08-10-94

Contact Phone No. 665-1760

Date Lab Report Required 11-10-94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
Note different Rad List → KRD AAB 3431	7/14/94 1128	✓		125 ml poly	soil	4c	Total U	200.8	
AAB 3431	7/14/94 1128	✓		125 ml glass	soil	4c	~~Hg, Pb, Be~~ TAL metals TZM 8/10/94	7471, 7421, 7091	15-23°C C-(in)
~~AAB 3431~~	~~7/14/94 1124~~	✓		~~125 ml glass~~	~~soil~~	~~4c~~	~~SVOC~~	~~8270~~ TZM 8/10/94	
~~AAB 3431~~				~~Plastic Zip~~	~~soil~~	~~4c~~	~~Gross alpha/beta~~	~~Rad Van~~ TMM 7/14/94	
							Gamma spec		
~~AAB 3431~~				~~Plastic Zip~~	~~soil~~	~~4c~~	~~Hg, Pb, Be~~	~~Chem Van~~ TZM 7/14/94	

Relinquished by (Signature) TLMcFarland Affiliation ERM	Date 8-10-94	Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date
Received by (Signature) Affiliation CRA	Time 1630	Received by (Signature) Affiliation	Time	Received by (Signature) Affiliation	Time

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (Indicate number of months) ___

COMMENTS

SAMPLING TEAM (Print names and initial) R. Garnett, ~~D. Dander~~ TMM 7/14/94, G. Evenson, T. McFarland TZM

WHITE To accompany samples YELLOW Records Processing Facility PINK Field Team Leader

SOP 1.04, R0

* U.S.G.P.O.:1993-776-945

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/18/94

Control No. 10860-

Technical Area 15

Send Lab Report Scott Kinkead MS J534

Operable Unit 1086

Site Work Plan LA-UR-92-3968 (MDA Z)

OU Contact Scott Kinkead

Date Samples Shipped 08-10-94

Contact Phone No. 665-1760

Date Lab Report Required 11-10-94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3433	7/18/94 0956	✓		125 ml poly	soil	4c	Total U	200.8	14-2307 O-Gin
AAB 3433	7/18/94 0956	✓		125 ml glass	soil	4C	~~Hg, Be, Pb~~ TAL metals	7421, 7091, 7471	TAM 8/10/94
~~AAB 3433~~	~~7/18/94 0956~~	~~✓~~		~~125 ml glass~~	~~soil~~	~~4c~~	~~SVOC~~	~~8270~~	
~~AAB 3433~~				~~Plastic Zip~~	~~soil~~	~~4c~~	~~Gross alpha/beta~~	~~Rad Van~~	TAM 7/18/94
							Gamma spec		
~~AAB 3433~~				~~Plastic Zip~~	~~soil~~	~~4c~~	~~Hg, Pb, Be~~	~~Chem Van~~	TAM 7/18/94

Note Differing Rad List Reqs

Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date
TL McFarland TAM ERM	08-10-94				
Received by (Signature) Affiliation	**Time**	**Received by (Signature) Affiliation**	**Time**	**Received by (Signature) Affiliation**	**Time**
CSI-9	1630				

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)

Radiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL

Return to client ___ Disposal by lab ✓ Archive ___ (Indicate number of months) ___

COMMENTS

SAMPLING TEAM (Print names and initial) R. Garnett, ~~D. Dander~~ TAM 7/19/94, G. Evenson, T. McFarland TAM

WHITE To accompany samples **YELLOW** Records Processing Facility **PINK** Field Team Leader

SOP 1.04, R0

* U.S.G.P.O.: 1993-776-948

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/14/94

Control No. 10860-10240

Technical Area 15

Send Lab Report ~~Scott Kinkead~~ MS ~~J534~~

Operable Unit 1086

Site Work Plan LA-UR-92-3968 (MDA Z)

OU Contact Scott Kinkead

Date Samples Shipped 08-10-94

Contact Phone No. 665-1760

Date Lab Report Required 11-10-94

Note different Rad list KPK

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3435	7/14/94 1145	✓		125 ml poly	soil	4c	Total U	200.8	15-2311 C-6
AAB 3435	7/14/94 1145	✓		125 ml glass	soil	4C	~~Hg, Be, Pb~~ TAL metals TKM 8/10/94	7421,7091,7471	
~~AAB 3435~~	~~7/14/94 1145~~	✓		~~125 ml glass~~	~~soil~~	~~4c~~	~~SVOC~~	~~8270~~ TKM 8/10/94	
~~AAB 3435~~				~~Plastic Zip~~	~~soil~~	~~4c~~	~~Gross alpha/beta~~ Rad Van TKM 7/14/94		
							Gamma spec		
~~AAB 3435~~				Plastic Zip	~~soil~~	4c	~~Hg, Pb, Be~~	Chem Van	TKM 7/14/94

Relinquished by (Signature) TLMcFarland TKM Affiliation ERM	Date 7-15-94	Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date
Received by (Signature) Affiliation	Time 1630	Received by (Signature) Affiliation	Time	Received by (Signature) Affiliation	Time

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)

Radiological ✓ Highly Toxic ____ Flammable ____ Skin Irritant ____ Nonhazard ____ Other ____

SAMPLE DISPOSAL

Return to client ____ Disposal by lab ✓ Archive ____ (Indicate number of months) ____

COMMENTS

SAMPLING TEAM (Print names and initial) R. Garnett, ~~D. Dander~~ TKM 7/14/94, G. Evenson, T. McFarland TKM

WHITE To accompany samples **YELLOW** Records Processing Facility **PINK** Field Team Leader

SOP 1.04, R0

* U.S.G.P.O.:1993-776-945

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/14/94

Control No. 1086-

Technical Area 15

Send Lab Report Scott Kinkead MS J534

Operable Unit 1086

Site Work Plan LA-UR-92-3968 (MDA Z)

OU Contact Scott Kinkead

Date Samples Shipped 08-10-94

Contact Phone No. 665-1760

Date Lab Report Required 11-10-94

Note different Red List IGRE

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3438	7/14/94 1105	✓		125 ml poly	soil	4c	Total U	200.8	
AAB 3438	7/14/94 1105	✓		125 ml glass	soil	4C	~~Hg, Be, Pb~~ TAL metals TKM 8/10/94	7421,7091,7471	15·23C1 0-5in
~~AAB 3438~~	~~7/14/94 1105~~	✓		~~125 ml glass~~	~~soil~~	~~4c~~	~~SVOC~~	~~8270~~ TKM 8/10/94	
~~AAB 3438~~				~~Plastic Zip~~	~~soil~~	~~4c~~	~~Gross alpha/beta~~	~~Rad Van~~ TKM 7/14/94	
							Gamma spec		
~~AAB 3438~~				~~Plastic Zip~~	~~soil~~	~~4c~~	~~Hg, Pb, Be~~	~~Chem Van~~ TKM 7/14/94	

Relinquished by (Signature) TLMcFarland TKM Affiliation ERM	Date 08-10-94	Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date
Received by (Signature) Affiliation CSC	Time 1630	Received by (Signature) Affiliation	Time	Received by (Signature) Affiliation	Time

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (Indicate number of months) ___

COMMENTS

SAMPLING TEAM (Print names and initial) R. Garnett, ~~D. Dander~~ TKM, G. Evenson, T. McFarland TKM

WHITE To accompany samples **YELLOW** Records Processing Facility **PINK** Field Team Leader

SOP 1.04, R0

U.S.G.P.O.:1993-776-945

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 8/3/94

Control No. 1086-

Technical Area 15

Send Lab Report Scott Kinkead MS J534

Operable Unit 1086

Site Work Plan LA-UR-92-3968 ~~(MDA Z)~~ ~~TLM 8/3/94~~ EF

OU Contact Scott Kinkead

Contact Phone No. 665-1760

Date Samples Shipped 08-10-94

Date Lab Report Required 11-10-94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt. etc.)
AAB 3445	8/3/94 1136	✓		~~125~~ 500 ml poly TLM 8/3/94	soil	4c	Total U	200.8	
AAB 3445	8/3/94 1136	✓		125 ml glass	soil	4C	Gamma spec ~~Hg, Be, Pb~~ TAL metals	8/10/94 7421, 7091, 7471	15-2246 0-6in
~~AAB 3445~~				~~125 ml glass~~	~~soil~~	~~4c~~	~~SVOC~~	~~8270~~	TLM 8/3/94
~~AAB 3445~~				~~2@40ml glass~~	~~soil~~	~~4c~~	~~VOC~~		TLM 8/3/94
~~AAB 3445~~				~~Plastic Zip~~	~~soil~~	~~4c~~	~~Gross alpha/beta~~ Gamma spec	Rad Van	TLM 8/3/94
~~AAB 3445~~		•		~~Plastic Zip~~	~~soil~~	~~4c~~	~~Hg, Pb, Be~~	Chem Van	TLM 8/3/94
AAB 3445	8/3/94 1136	✓		125 ml glass	Soil	4°	HE	8330 A	

Relinquished by (Signature) TLMcFarland Affiliation ERM	Date 8-10-94	Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date
Received by (Signature) Kyle Gray Affiliation CTY	Time 1630	Received by (Signature) Affiliation	Time	Received by (Signature) Affiliation	Time

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (Indicate number of months) ___

COMMENTS

SAMPLING TEAM (Print names and initial) ~~R. Garnett, D. Dander~~ TLM 8/3/94, G. Evenson, T. McFarland TLM, F Humbert, R Hooker

WHITE To accompany samples **YELLOW** Records Processing Facility **PINK** Field Team Leader

SOP 1.04, R0

* U.S.G.P.O.: 1993-778-945

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 6/24/94

Control No. 1086- 09062

Technical Area 15

Send Lab Report Scott Kinkead MS J534

Operable Unit 1086

Site Work Plan LA-UR-92-3968 EF Site

OU Contact Scott Kinkead

Contact Phone No. 665-1760

Date Samples Shipped 8/10/94

Date Lab Report Required 11/10/94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3451	6/24/94 1509	✓		500 ml poly	soil	5-16-94 ~~none~~ 4C AKG	Gamma spec, Total U	700.8	15-2100 B 24in
AAB 3451	6/24/94 1509	✓		125 ml glass	soil	~~none~~ 4C AKG	~~Hg, Pb, Be~~ TAL metals	7471, 7421, 7091	

Relinquished by (Signature) Affiliation THMcFarland ERM	Date 8/10/94	Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date
Received by (Signature) Affiliation Kyle Hay (319)	Time 1630	Received by (Signature) Affiliation	Time	Received by (Signature) Affiliation	Time

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (Indicate number of months) ___

COMMENTS

SAMPLING TEAM (Print names and initial) ~~R. Garnett~~ TKM 6/24/94, D. ~~Dander~~, G. Evenson, T. McFarland THM

WHITE To accompany samples YELLOW Records Processing Facility PINK Field Team Leader

SOP 1.04, R0

* U.S.G.P.O.:1993-776-945

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 6/27/94

Control No. 1096- 09047

Technical Area 15

Send Lab Report Scott Kinkead MS J534

Operable Unit 1086

Site Work Plan LA-UR-92-3968 EF Site

OU Contact Scott Kinkead

Contact Phone No. 665-1760

Date Samples Shipped 8/10/94

Date Lab Report Required 11/10/94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3461	6/27/94 1203	✓		500 ml poly	soil	6-16-94 ~~none~~ 4C RKG	Gamma spec, Total U		
AAB 3461	6/27/94 1203	✓		125 ml glass	soil	~~none~~ 4C RKG 8/10/94	~~Hg, Pb, Be~~ TAL metals	200.8 7471, 7421, 7091	15-2112 Orin

Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date
TL McFarland ERM	8/10/94				
Received by (Signature) Affiliation	Time 1630	Received by (Signature) Affiliation	Time	Received by (Signature) Affiliation	Time

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic __ Flammable __ Skin Irritant __ Nonhazard __ Other __

SAMPLE DISPOSAL
Return to client __ Disposal by lab ✓ Archive __ (Indicate number of months) __

COMMENTS RKG

SAMPLING TEAM (Print names and initial) R. Garnett, D. Dander, G. Evenson, T. McFarland

WHITE To accompany samples **YELLOW** Records Processing Facility **PINK** Field Team Leader

SOP 1.04, R0

* U.S.G.P.O.: 1993-776-045

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/25/94

Control No. 1086 - 19058

Technical Area 15

Send Lab Report ~~Scott Kinkead~~ MS J534

Operable Unit 1086

Site Work Plan LA-UR-92-3968

OU Contact Scott Kinkead

Date Samples Shipped 8/10/94

Contact Phone No. 665-1760

Date Lab Report Required 11/10/94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3470	7/25/94 0930	✓		500 ml poly	soil	~~none~~ 5-16-94 4C RKG	Gamma spec, Total U	200.8	15-2182 18-2417
AAB 3470	7/25/94 0930	✓		125 ml glass	soil	~~none~~ 4C RKG 5/16/94	~~Hg, Pb, Be~~ TAL metals	7471, 7421	7091

Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date
TLMcFarland ERM	8/10/94				
Received by (Signature) Affiliation	Time 1630	Received by (Signature) Affiliation	Time	Received by (Signature) Affiliation	Time

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (Indicate number of months) ___

COMMENTS

SAMPLING TEAM (Print names and initial) ~~R. Garnett, D. Dander, G. Evenson, T. McFarland, F Humberl~~

WHITE To accompany samples **YELLOW** Records Processing Facility **PINK** Field Team Leader

SOP 1.04, R0

* U.S.G.P.O.:1993-778-945

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/25/94

Control No. 1086- 09066

Technical Area 15

Send Lab Report Scott Kinkead MS J534

Operable Unit 1086

Site Work Plan LA-UR-92-3968

OU Contact ~~Scott Kinkead~~

Contact Phone No. 665-1760

Date Samples Shipped 8/10/94

Date Lab Report Required 11/10/94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
~~AAB~~ 3473	7/25/94 0853	✓		500 ml poly	soil	~~none~~ 5-16-94 4C RKG	Gamma spec, Total U	200.8	~~15-2242~~ ~~15-2240~~ 12/21/94 Tim O 12in
~~AAB~~ 3473	7/25/94 0853	✓		125 ml glass	soil	~~none~~ 4C RKG	~~Hg, Pb, Be~~ TAL metals	7471, 7421, 7091	
AAB 3473	7/25/94 0853	✓		125 ml glass	soil	3/16/94 4°C	HE	8330 A	

Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date
TLMcFarland ERM	8/10/94				
Received by (Signature) Affiliation	Time 1630	Received by (Signature) Affiliation	Time	Received by (Signature) Affiliation	Time

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (Indicate number of months) ___

COMMENTS RKG

SAMPLING TEAM (Print names and initial) R. Garnett, D. Dander, G. Evenson, T. McFarland, F Humbert

WHITE To accompany samples YELLOW Records Processing Facility PINK Field Team Leader

SOP 1.04, R0

• U.S.G.P.O.:1993-776-945

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 6/28/94

Control No. 1086- 02063

Technical Area 15

Send Lab Report Scott Kinkead MS J534

Operable Unit 1086

Site Work Plan LA-UR-92-3968

OU Contact Scott Kinkead

Date Samples Shipped 8/10/94

Contact Phone No. 665-1760

Date Lab Report Required 11/10/94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3476	6/28/94 0910	✓		500 ml poly	soil	~~none~~ 4C 5-16-94	Gamma spec, Total U RKG	200.8	15-2114 Gin
AAB 3476	6/28/94 0910	✓		125 ml glass	soil	~~none~~ 4C 5/10/94	~~Hg, Pb, Be~~ RKG TAL metals	7471, 7421, 7091	

Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date
TL McFarland ERM	8/10/94				
Received by (Signature) Affiliation	Time 1630	Received by (Signature) Affiliation	Time	Received by (Signature) Affiliation	Time

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (Indicate number of months) ___

COMMENTS RKG

SAMPLING TEAM (Print names and initial) R. Garnett, D. Dander, G. Evenson, T. McFarland

WHITE To accompany samples **YELLOW** Records Processing Facility **PINK** Field Team Leader

SOP 1.04, R0

* U.S.G.P.O.:1993-776-945

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/25/94

Control No. 1086-09067

Technical Area 15

Send Lab Report Scott Kinkead MS J534

Operable Unit 1086

Site Work Plan LA-UR-92-3968

OU Contact Scott Kinkead

Date Samples Shipped 8/10/94

Contact Phone No. 665-1760

Date Lab Report Required 11/10/94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3477	7/25/94 0956	✓		500 ml poly	soil	~~none~~ 4C 5-16-94	Gamma spec, Total U	200.8	15-2172
AAB 3477	7/25/94 0956	✓		125 ml glass	soil	~~none~~ 4C ~~Hg, Pb, Be~~ RKG 5/16/94	TAL metals	7471, 7421,	7091
AAB 3477	7/25/94 0956	✓		125ml glass	soil	4°C	HE	8330 A	

18-24.n

Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date
TL McFarland TLMcFarland ERM	8/10/94				
Received by (Signature) Affiliation	Time 1630	Received by (Signature) Affiliation	Time	Received by (Signature) Affiliation	Time

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic ____ Flammable ____ Skin Irritant ____ Nonhazard ____ Other ____

SAMPLE DISPOSAL
Return to client ____ Disposal by lab ✓ Archive ____ (Indicate number of months) ____

COMMENTS

SAMPLING TEAM (Print names and initial) R. Garnett, D. Dander, G. Evenson, T. McFarland, F Humbert

WHITE To accompany samples **YELLOW** Records Processing Facility **PINK** Field Team Leader

SOP 1.04, R0

* U.S.G.P.O.:1993-778-945

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/25/94

Control No. 1086-

Technical Area ~~15~~

Send Lab Report ~~Scott Kinkead~~ MS ~~J534~~

Operable Unit ~~1086~~

Site Work Plan LA-UR-92-3968

OU Contact Scott Kinkead

Date Samples Shipped 05-10-94

Contact Phone No. 665-1760

Date Lab Report Required 11-10-94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3480	7/25/94 0930	✓		500 ml poly	soil	5-16-94 4C RKG ~~none~~	Gamma spec, Total U	200.8	15-2299 18-24 in
AAB 3480	7/25/94 0930	✓		125 ml glass	soil	4C RKG 5/16/94 ~~none~~	~~Hg, Pb, Be~~ TAL metals	7471, 7421, 7091	

Relinquished by (Signature) Affiliation TLMcFarland FBM	Date 7-25-94	Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date
Received by (Signature) Affiliation Kyle Hay CST-9	Time 1630	Received by (Signature) Affiliation	Time	Received by (Signature) Affiliation	Time

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)

Radiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL

Return to client ___ Disposal by lab ✓ Archive ___ (Indicate number of months) ___

COMMENTS

SAMPLING TEAM (Print names and initial) ~~R. Garnett, D. Bander, C. Evenson, T. McFarland~~, F Humbert

WHITE To accompany samples YELLOW Records Processing Facility PINK Field Team Leader

SOP 1.04, R0

* U.S.G.P.O.:1993-776-945

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/05/94

Control No. 1086-09075

Technical Area 15

Send Lab Report Scott Kinkead MS J534

Operable Unit 1086

Site Work Plan LA-UR-92-3968

OU Contact Scott Kinkead

Date Samples Shipped 8/10/94

Contact Phone No. 665-1760

Date Lab Report Required 11/10/94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3485	7/5/94 1010	✓		500 ml poly	soil	~~none~~ 5-16-94 4C RKG	Gamma spec, Total U	200.8	15-2148
AAB 3485	07/05/94 1010	✓		125 ml glass	soil	~~none~~ 4C RKG	~~Hg, Pb, Se~~ 5/16/94 TAL metals	7471, 7421, 7091	

Relinquished by (Signature) TLMcFarland Affiliation ERM — Date 8/10/94

Received by (Signature) Affiliation CMT — Time 1630

Relinquished by (Signature) Affiliation — Date

Received by (Signature) Affiliation — Time

Relinquished by (Signature) Affiliation — Date

Received by (Signature) Affiliation — Time

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (Indicate number of months) ___

COMMENTS RKG

SAMPLING TEAM (Print names and initial) R. Garnett, D. Dander, G. Evenson, T. McFarland

WHITE To accompany samples — YELLOW Records Processing Facility — PINK Field Team Leader

SOP 1.04, R0

* U.S.G.P.O.: 1993-776-945

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/28/94

Control No. 1086-

Technical Area 15

Send Lab Report Scott Kinkead MS J534

Operable Unit 1086

Site Work Plan LA-UR-92-3968

OU Contact Scott Kinkead

Date Samples Shipped 08-10-94

Contact Phone No. 665-1760

Date Lab Report Required 1-10-94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
AAB 3503	7/28/94 0954	✓		125 ml poly	Soil	4°C	Total U	200.8	15-2500 O-Gin
AAB 3503	7/28/94 0954	✓		125 ml poly	Soil	4°C	~~Pb, Be~~ TAL alpha	7421, 7091	
							TAL metals		

Relinquished by (Signature) TMcFarland Affiliation ERM	Date 8-10-94	Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date
Received by (Signature) Kyle Affiliation CST-9	Time 1630	Received by (Signature) Affiliation	Time	Received by (Signature) Affiliation	Time

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (Indicate number of months) ___

COMMENTS

SAMPLING TEAM (Print names and initial) D Dander, G Evenson F Humbert, TMcFarland

WHITE To accompany samples YELLOW Records Processing Facility PINK Field Team Leader

SOP 1.04, R0

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/28/94

Control No. 1086-

Technical Area 15

Send Lab Report Scott Kinkead MS J534

Operable Unit 1086

Site Work Plan LA-UR-92-3968 (R44)

OU Contact Scott Kinkead

Date Samples Shipped 09-10-94

Contact Phone No. 665-1760

Date Lab Report Required 11-10-94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
Shaker Rad List KRG → AAB 3504	7/28/94 1010	✓		125 ml poly	soil	4°C	Total U	200.8	TJM 7/28/94 ~~15-20~~ 15-2500
AAB 3504	7/28/94 1010	✓		125 ml poly	soil	4°C	~~Pb, Be~~ TJM 8/10/94	7421, 7091	
							TAL metals		

18-24 in

Relinquished by (Signature) TL McFarland
Affiliation ERM
Date 8-10-94
Time 1630

Received by (Signature) Kyle May
Affiliation CST-9

Relinquished by (Signature)
Affiliation
Date
Time

Received by (Signature)
Affiliation

Relinquished by (Signature)
Affiliation
Date
Time

Received by (Signature)
Affiliation

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (Indicate number of months) ___

COMMENTS

SAMPLING TEAM (Print names and initial) D Dander, G Evenson, F Humbert, TM McFarland

WHITE To accompany samples YELLOW Records Processing Facility PINK Field Team Leader

SOP 1.04, R0

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/20/94

Control No. 1086-13038

Technical Area 15

Send Lab Report Scott Kinkead MS J534

Operable Unit 1086

Site Work Plan LA-UR-92-3968

OU Contact Scott Kinkead

Date Samples Shipped 08-10-94

Contact Phone No. 665-1760

Date Lab Report Required 11-10-94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested Test	Analysis Requested Method	Remarks (Condition of receipt, etc.)
AAB 3525	7/20/94 0948	✓		500 ml poly	soil	~~none~~ 4C	Gamma spec, Total U	200.8	15-2279 O-Gin
AAB 3525	7/20/94 0948	✓		125 ml glass	soil	~~none~~ 4C	~~Hg, Pb, Be~~ TAL metals	7471, 7421, 7091	

Relinquished by (Signature) TL McFarland
Affiliation ERM
Date 8-10-94
Time 1630

Received by (Signature) Kyle Mig
Affiliation CRA

Relinquished by (Signature)
Affiliation
Date
Time

Received by (Signature)
Affiliation

Relinquished by (Signature)
Affiliation
Date
Time

Received by (Signature)
Affiliation

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (Indicate number of months) ___

COMMENTS RKB

SAMPLING TEAM (Print names and initial) R. Garnett, ~~D. Dander~~, G. Evenson, T. McFarland, F Humbert

WHITE To accompany samples **YELLOW** Records Processing Facility **PINK** Field Team Leader

SOP 1.04, R0

* U.S.G.P.O.:1993-776-945

Los Alamos National Laboratory Environmental Restoration
CHAIN OF CUSTODY/REQUEST FOR ANALYSIS

Date 7/27/94 | Control No. 1086-

Technical Area 15 | Send Lab Report Scott Kinkead MS J534

Operable Unit 1086 | Site Work Plan LA-UR-92-3968

OU Contact Scott Kinkead | Date Samples Shipped 08-10-94

Contact Phone No. 665-1760 | Date Lab Report Required 11-10-94

Field Unique Sample #/ID (Write in sample ID number in space below)	Date and Time Collected	GRAB	COMP	Sample Container Volume/Material	Matrix (Liquid, Soil, Core, Sludge, Etc.)	Preservative	Analysis Requested: Test	Analysis Requested: Method	Remarks (Condition of receipt, etc.)
Shelter Rock List → KRb AAB 3530	7/27/94 1030	✓		125 ml poly	Soil	~~N~~ 4°C 7/27/94	Total U	200.8	15-2501 18-24in
AAB 3530	7/27/94 0930	✓		125 ml poly	Soil	4°C	~~Pb, Be~~ TLM 8/10/94	7421, 7091	
							TAL metals		

Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date	Relinquished by (Signature) Affiliation	Date
TLMcFarland ERM	8-10-94				
Received by (Signature) Affiliation	**Time**	**Received by (Signature) Affiliation**	**Time**	**Received by (Signature) Affiliation**	**Time**
Ryk MyCSTG	1630				

POSSIBLE HAZARD IDENTIFICATION
(Please indicate if sample(s) are hazardous materials and/or are suspected to contain high levels of hazardous substances.)
Radiological ✓ Highly Toxic ___ Flammable ___ Skin Irritant ___ Nonhazard ___ Other ___

SAMPLE DISPOSAL
Return to client ___ Disposal by lab ✓ Archive ___ (Indicate number of months) ___

COMMENTS

SAMPLING TEAM (Print names and initial) G Evenson, F Humbert, E Trollinger, T McFarland

WHITE To accompany samples **YELLOW** Records Processing Facility **PINK** Field Team Leader

SOP 1.04, R0

AnalyticalTechnologies,Inc.

19509

QUALITY ASSURANCE
DATA REVIEW

Date: 12-19-94

ATI Workorder: 94-11-164 Analysis: γ-Soil

The data contained in the following report have been reviewed and approved by the personnel listed below:

Radiochemistry Instrumentation/Reporting

Radiochemistry Preparation

JAN 1995 RECEIVED

CERTIFICATION

Analytical Technologies, Inc. certifies that the analyses reported herein are true, complete, and correct within the limits of the methods employed.

Report Sent To:

Approved By:

Date Sent: 3/9/95

ATI FM 145FCO (5/19/94)

000001

RADIOCHEMISTRY DATA PACKAGE CONTENTS CHECKLIST

ANALYTICAL TECHNOLOGIES, INC.

GAMMA SPECTROSCOPY DATA PACKAGE

ITEM	DATA PACKAGE LOCATION (SECTION)
Software Title and Version	Section 5, Raw Data Header
Software Nuclide Library	Section 10, Additional Supporting Documentation
Efficiency File	Section 5, Raw Data, Nuclide Activity Summary
Peak Shape Description	Section 5, Raw Data, 1st Page, Header
Internal Absorption	Included in Efficiency Calibration
Background Correction	Section 5, Raw Data, Background Subtract Results
Software Analysis Reports	Section 2 and Section 5
Sample Mass Documentation	Section 5 and Section 7
Standards Traceability	Section 8
Standards Dilutions	Not Applicable
Narrative, MDA Comments	Section 1

1

ANALYTICAL TECHNOLOGIES, INC.
Radiochemistry Data Package

Section 1

NARRATIVE

Narrative Comments for LANL Request Number 19509
(ATI Work Order 94-11-164)
Gamma Spectroscopy Analysis in Soil
12/20/94

Samples under Request Number 19509 (ATI Work Order 94-11-164) were received on 11/15/94 and scheduled for gamma spectroscopy. The gamma spectroscopy analysis was completed 12/05/94 with no problems encountered.

The samples were prepared under ATI SOP721FC4 and analyzed under ATI SOP713FC2.

Please note review of raw data of several samples included in request number 19509 indicate the presence of ^{234}Th/ ^{234m}Pa and ^{235}U. In addition sample 94.18560-3 contains two peaks at 94.7 keV and 98.6 keV, suggesting the presence of ^{233}Pa, a short-lived decay product of ^{237}Np. The ^{237}Np values should be obtained by alpha spectroscopy because there are a number of gamma ray emissions interfering at those energies. ATI recommends analyzing these sample by alpha spectroscopy for ^{237}Np if additional information is required. Because of other interferences and difficulties quantifying U-chain isotopes by gamma spectroscopy (see attached qualifying comments), these results are better obtained by KPA analysis, which has already been requested by LANL request number 19509.

All daily instrument quality control checks were passed for the analysis system used for these analyses and the accompanying quality control analyses.

Reported sample activities are NET activities; that is, they have not been truncated or censored based on an *a priori* detection limit. Rather, as recommended by ANSI N42.2, the actual values for each measurement have been reported, and Decision Level values for each analyte are reported with the process blank. Each result should be compared to the appropriate decision level for determination of the validity of that measurement.

John Mitchell
Radiochemistry Instrument Technician

Qualifying Comments for Analysis of Naturally Occurring Isotopes by Gamma Spectroscopy

In an effort to identify the presence of naturally occurring radioactive materials in environmental samples using a simple and inexpensive method, it is not uncommon for clients to request analysis for uranium or thorium or U/Th decay products by gamma spectroscopy. While there are gamma emissions from these several of these nuclides or their short-lived decay products which make this possible, a number of complications make it impractical. Some specifics regarding the gamma analysis difficulties are discussed herein.

^{235}U's primary gamma emission energy is listed at 185.7 keV using the reference data[1] employed at ATI. This gamma energy is interfered with by the 186.2 keV gamma emission of ^{226}Ra, which is naturally occurring and abundant in most environmental media. Thus, only secondary, less abundant gamma emissions from ^{235}U are used in the gamma analysis. These emissions are at 144, 163, and 205 keV and are generally free of natural interferences. However, the presence of large amounts of ^{238}U decay products, including ^{230}Th, can result in significant interference at the 144 keV energy line. Several fission products also have gamma emissions near this energy. Thus, the ^{235}U analysis results as reported by gamma spectroscopy can only be considered usable when 1) the 3 energy lines at 144, 163, and 205 keV are identified and quantified with similar activities and 2) the sample is free of large amounts of ^{238}U and its decay products. In cases where the above conditions are not met, the unreliability of the ^{235}U data will be noted in the case narrative. ^{235}U is best analyzed by alpha spectrometry.

The ^{226}Ra interference noted above makes direct analysis for ^{226}Ra difficult or impossible. ATI reports activity of ^{214}Bi and ^{214}Pb, two ^{226}Ra decay products with gamma emissions free of interferences and in relatively large abundance. These are short-lived decay products which are normally in secular equilibrium with ^{226}Ra in environmental media. In relatively undisturbed soils, the ^{214}Bi and ^{214}Pb activity values can be used to estimate the ^{226}Ra activity directly[2].

^{238}U has no measurable gamma emission. It is common to measure ^{238}U using a low abundance 1001 keV gamma emission from ^{234m}Pa, a short-lived decay product of ^{238}U. However, the actual decay scheme for ^{234m}Pa is not well known, and reported abundance values for this gamma emission vary by factors of two or more in published literature. The abundance value for the 1001 keV emission used by ATI is empirically determined through a series of measurements of a ^{238}U standard with ^{234}Th/^{234m}Pa in equilibrium, using the more abundant and better known decay scheme of ^{234}Th to calculate the correct abundance of the 1001 keV ^{234m}Pa emission. This procedure, too, has significant limitations, in that the primary gamma emissions of ^{234}Th are prone to interferences and are of low emission abundance. Though this procedure has resulted in analyses of ^{234}Th and ^{234m}Pa with good agreement at ATI, there remain large uncertainties and all reported

values for ^{238}U, ^{234m}Pa, and ^{234}Th activity by gamma spectroscopy are thus considered to be estimates. ^{238}U and ^{234}U are best analyzed by alpha spectrometry.

^{228}Ra is reported as ^{228}Ac, the nuclide responsible for the related gamma emissions. ^{228}Ac has a short half-life and does not exist in environmental media in the absence of ^{228}Ra.

^{227}Th is a relatively short-lived decay product of the $^{235}U/^{231}Pa$ decay chain, with a number of interferences associated with it's primary gamma energy. ^{227}Th is best analyzed by alpha spectrometry, but even then requires non-standard analysis due to an unusual alpha emission scheme.

References:

(1) Radioactive Decay Data Tables, David C. Kocher, Oak Ridge National Laboratory, 1980.

(2) Determination of ^{226}Ra in soil using ^{214}Pb and ^{214}Bi immediately after sampling, D.J. Van Cleef, *Health Physics 67-3*, 1994.

2

ANALYTICAL TECHNOLOGIES, INC.

Radiochemistry Data Package

Section 2

SAMPLE RESULTS SUMMARY

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Lab Name: Analytical Technologies, Inc.

Date Collected: 07/21/94 12:00

Client Name: Los Alamos Natl Lab/CST-3

Date Analyzed: 12/02/94 14:50

Lab Sample ID: 94-11-164-01

Sample Matrix: Soil

Client Sample ID: 94.18548-3

Count Duration: 180 Min.

Nuclide	Activity (pCi/gram)	% Uncertainty
Am-241	0.146 ± 0.195	134
Cs-137	0.187 ± 0.056	30.1
Na-22	0.032 ± 0.034	107
Ce-144	-0.125 ± 0.173	138
Np-237	0.031 ± 0.034	110
Ba-140	9.84 ± 75.2	764
Ru-106	-0.024 ± 0.276	1160
Co-60	-0.019 ± 0.035	185
Eu-152	0.005 ± 0.153	3390

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ). See ATI SOP 743FC for details of the TPU determination.

Reported activities are the calculated net activities, not truncated or censored by an a priori detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Lab Name: Analytical Technologies, Inc.

Date Collected: 07/15/94 12:00

Client Name: Los Alamos Natl Lab/CST-3

Date Analyzed: 12/02/94 14:58

Lab Sample ID: 94-11-164-02

Sample Matrix: Soil

Client Sample ID: 94.18551-3

Count Duration: 180 Min.

Nuclide	Activity (pCi/gram)	% Uncertainty
Am-241	0.003 ± 0.143	4520
Ce-144	-0.033 ± 0.175	522
Np-237	-0.017 ± 0.045	270
Ba-140	11.7 ± 81.6	696
Ru-106	-0.064 ± 0.311	485
Cs-137	-0.004 ± 0.029	797
Co-60	-0.008 ± 0.031	379
Na-22	-0.002 ± 0.030	1540
Eu-152	0.054 ± 0.136	252

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ). See ATI SOP 743FC for details of the TPU determination.

Reported activities are the calculated net activities, not truncated or censored by an a priori detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Lab Name: Analytical Technologies, Inc.

Date Collected: 08/03/94 12:00

Client Name: Los Alamos Natl Lab/CST-3

Date Analyzed: 12/02/94 14:57

Lab Sample ID: 94-11-164-03

Sample Matrix: Soil

Client Sample ID: 94.18557-3

Count Duration: 180 Min.

Nuclide	Activity (pCi/gram)	% Uncertainty
Na-22	0.044 ± 0.038	85.0
Am-241	-0.446 ± 0.848	190
Ce-144	-1.65 ± 0.670	40.5
Np-237	-0.057 ± 0.094	164
Ba-140	7.09 ± 127	1790
Ru-106	0.347 ± 0.558	161
Cs-137	0.019 ± 0.052	275
Co-60	-0.006 ± 0.036	552
Eu-152	0.175 ± 0.175	100

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ). See ATI SOP 743FC for details of the TPU determination.

Reported activities are the calculated net activities, not truncated or censored by an a priori detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

Data stored in file \gdr\prt\S1116403.94P

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Lab Name: Analytical Technologies, Inc.

Date Collected: 08/03/94 12:00

Client Name: Los Alamos Natl Lab/CST-3

Date Analyzed: 12/03/94 17:23

Lab Sample ID: 94-11-164-D1

Sample Matrix: Soil

Client Sample ID: Duplicate

Count Duration: 180 Min.

Nuclide	Activity (pCi/gram)	% Uncertainty
Am-241	-0.100 ± 0.643	646
Ce-144	-2.05 ± 0.655	32.0
Np-237	-0.038 ± 0.087	229
Ba-140	8.41 ± 128	1530
Ru-106	0.105 ± 0.554	530
Cs-137	-0.022 ± 0.051	229
Co-60	-0.002 ± 0.039	1780
Na-22	-0.014 ± 0.038	278
Eu-152	0.104 ± 0.169	162

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ). See ATI SOP 743FC for details of the TPU determination.

Reported activities are the calculated net activities, not truncated or censored by an a priori detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

Remarks:

Sample 94-11-164-D1 is a duplicate of 94-11-164-03.

Data stored in file \gdr\prt\S11164D1.94P

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Lab Name: Analytical Technologies, Inc.

Date Collected: 07/25/94 12:00

Client Name: Los Alamos Natl Lab/CST-3

Date Analyzed: 12/02/94 15:00

Lab Sample ID: 94-11-164-04

Sample Matrix: Soil

Client Sample ID: 94.18560-3

Count Duration: 180 Min.

Nuclide	Activity (pCi/gram)	% Uncertainty
Am-241	0.083 ± 0.550	659
Ce-144	-1.539 ± 0.646	42.0
Np-237	0.013 ± 0.077	573
Ba-140	89.4 ± 150	167
Ru-106	-0.117 ± 0.462	397
Cs-137	0.026 ± 0.043	162
Co-60	0.011 ± 0.036	318
Na-22	-0.012 ± 0.032	269
Eu-152	0.178 ± 0.147	82.3

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ). See ATI SOP 743FC for details of the TPU determination.

Reported activities are the calculated net activities, not truncated or censored by an a priori detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Lab Name: Analytical Technologies, Inc. Date Collected: 07/25/94 12:00

Client Name: Los Alamos Natl Lab/CST-3 Date Analyzed: 12/02/94 15:02

Lab Sample ID: 94-11-164-05 Sample Matrix: Soil

Client Sample ID: 94.18561-3 Count Duration: 180 Min.

Nuclide	Activity (pCi/gram)	% Uncertainty
Am-241	0.120 ± 0.167	139
Ce-144	-0.002 ± 0.186	11100
Np-237	-0.018 ± 0.049	274
Ba-140	80.7 ± 89.2	111
Ru-106	-0.087 ± 0.386	442
Cs-137	-0.011 ± 0.035	314
Co-60	-0.019 ± 0.041	218
Na-22	-0.002 ± 0.042	1810
Eu-152	0.114 ± 0.187	164

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ). See ATI SOP 743FC for details of the TPU determination.

Reported activities are the calculated net activities, not truncated or censored by an a priori detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Lab Name: Analytical Technologies, Inc.

Date Collected: 07/06/94 12:00

Client Name: Los Alamos Natl Lab/CST-3

Date Analyzed: 12/02/94 15:13

Lab Sample ID: 94-11-164-06

Sample Matrix: Soil

Client Sample ID: 94.20311-2

Count Duration: 180 Min.

Nuclide	Activity (pCi/gram)	% Uncertainty
Ru-106	0.245 ± 0.268	110
Am-241	0.006 ± 0.032	547
Ce-144	0.050 ± 0.109	219
Np-237	-0.002 ± 0.032	2000
Ba-140	-33.662 ± 69.4	206
Cs-137	-0.008 ± 0.021	268
Co-60	0.003 ± 0.037	1430
Na-22	-0.003 ± 0.036	1210
Eu-152	0.182 ± 0.155	85.5

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ). See ATI SOP 743FC for details of the TPU determination.

Reported activities are the calculated net activities, not truncated or censored by an a priori detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Lab Name: Analytical Technologies, Inc. Date Collected: 07/20/94 12:00

Client Name: Los Alamos Natl Lab/CST-3 Date Analyzed: 12/02/94 15:14

Lab Sample ID: 94-11-164-07 Sample Matrix: Soil

Client Sample ID: 94.20312-2 Count Duration: 180 Min.

Nuclide	Activity (pCi/gram)	% Uncertainty
Cs-137	0.384 ± 0.065	16.9
Am-241	-0.005 ± 0.057	1240
Ce-144	-0.041 ± 0.157	382
Np-237	0.010 ± 0.043	423
Ba-140	38.4 ± 92.0	240
Ru-106	0.043 ± 0.302	700
Co-60	0.033 ± 0.035	106
Na-22	0.012 ± 0.035	297
Eu-152	0.093 ± 0.128	138

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ). See ATI SOP 743FC for details of the TPU determination.

Reported activities are the calculated net activities, not truncated or censored by an a priori detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Lab Name: Analytical Technologies, Inc. Date Collected: 07/15/94 12:00

Client Name: Los Alamos Natl Lab/CST-3 Date Analyzed: 12/02/94 15:16

Lab Sample ID: 94-11-164-08 Sample Matrix: Soil

Client Sample ID: 94.20313-2 Count Duration: 180 Min.

Nuclide	Activity (pCi/g)	% Uncertainty
Cs-137	0.217 ± 0.045	20.66
Am-241	0.005 ± 0.107	2093.0
Ce-144	-0.170 ± 0.163	96.25
Np-237	-0.005 ± 0.033	663.23
Ba-140	0.000 ± 438.51	100.00
Ru-106	0.094 ± 0.232	248.16
Co-60	0.015 ± 0.023	147.34
Na-22	-0.007 ± 0.023	308.69
Eu-152	0.178 ± 0.112	62.86

Reported activities are the calculated net activities, not truncated or censored by an a priori detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ). See ATI SOP 743FC for details of the TPU determination.

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Lab Name: Analytical Technologies, Inc. Date Collected: 06/30/94 12:00

Client Name: Los Alamos Natl Lab/CST-3 Date Analyzed: 12/02/94 15:18

Lab Sample ID: 94-11-164-09 Sample Matrix: Soil

Client Sample ID: 94.20314-2 Count Duration: 180 Min.

Nuclide	Activity (pCi/gram)	% Uncertainty
Cs-137	0.352 ± 0.045	12.8
Am-241	-0.041 ± 0.081	195
Ce-144	-0.070 ± 0.130	186
Np-237	-0.001 ± 0.029	3620
Ba-140	9.31 ± 54.3	583
Ru-106	0.015 ± 0.217	1490
Co-60	0.006 ± 0.022	402
Na-22	-0.011 ± 0.023	210
Eu-152	-0.007 ± 0.101	1380

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ). See ATI SOP 743FC for details of the TPU determination.

Reported activities are the calculated net activities, not truncated or censored by an a priori detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Lab Name: Analytical Technologies, Inc. Date Collected: 06/28/94 12:00

Client Name: Los Alamos Natl Lab/CST-3 Date Analyzed: 12/02/94 16:26

Lab Sample ID: 94-11-164-10 Sample Matrix: Soil

Client Sample ID: 94.20315-2 Count Duration: 180 Min.

Nuclide	Activity (pCi/gram)	% Uncertainty
Ce-144	0.156 ± 0.180	116
Am-241	0.060 ± 0.281	468
Np-237	-0.007 ± 0.043	626
Ba-140	21.9 ± 86.5	395
Ru-106	0.077 ± 0.319	412
Cs-137	0.004 ± 0.027	619
Co-60	-0.024 ± 0.035	147
Na-22	-0.010 ± 0.034	357
Eu-152	0.138 ± 0.175	127

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ). See ATI SOP 743FC for details of the TPU determination.

Reported activities are the calculated net activities, not truncated or censored by an a priori detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Lab Name: Analytical Technologies, Inc. Date Collected: 06/30/94 12:00

Client Name: Los Alamos Natl Lab/CST-3 Date Analyzed: 12/02/94 16:27

Lab Sample ID: 94-11-164-11 Sample Matrix: Soil

Client Sample ID: 94.20316-2 Count Duration: 180 Min.

Nuclide	Activity (pCi/gram)	% Uncertainty
Cs-137	0.660 ± 0.073	11.1
Am-241	0.048 ± 0.197	408
Ce-144	-0.007 ± 0.147	2080
Np-237	0.008 ± 0.034	418
Ba-140	-18.061 ± 70.0	388
Ru-106	-0.141 ± 0.230	163
Co-60	-0.007 ± 0.025	353
Na-22	0.018 ± 0.028	153
Eu-152	0.056 ± 0.120	212

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ). See ATI SOP 743FC for details of the TPU determination.

Reported activities are the calculated net activities, not truncated or censored by an a priori detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Lab Name: Analytical Technologies, Inc.

Date Collected: 07/24/94 12:00

Client Name: Los Alamos Natl Lab/CST-3

Date Analyzed: 12/03/94 18:41

Lab Sample ID: 94-11-164-12

Sample Matrix: Soil

Client Sample ID: 94.20320-2

Count Duration: 180 Min.

Nuclide	Activity (pCi/gram)	% Uncertainty
Na-22	0.025 ± 0.026	101
Am-241	-0.106 ± 0.219	207
Ce-144	0.019 ± 0.136	712
Np-237	0.006 ± 0.033	568
Ba-140	10.9 ± 68.6	632
Ru-106	0.130 ± 0.241	185
Cs-137	0.004 ± 0.022	491
Co-60	0.021 ± 0.028	133
Eu-152	0.056 ± 0.116	206

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ). See ATI SOP 743FC for details of the TPU determination.

Reported activities are the calculated net activities, not truncated or censored by an a priori detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

Data stored in file \gdr\prt\S1116412.94P

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Lab Name: Analytical Technologies, Inc. Date Collected: 07/24/94 12:00

Client Name: Los Alamos Natl Lab/CST-3 Date Analyzed: 12/05/94 10:02

Lab Sample ID: 94-11-164-D2 Sample Matrix: Soil

Client Sample ID: Duplicate Count Duration: 180 Min.

0.030

Nuclide	Activity (pCi/gram)	% Uncertainty
Am-241	-0.034 ± 0.153	453
Ce-144	-0.084 ± 0.170	202
Np-237	0.047 ± 0.039	84.4
Ba-140	2.82 ± 76.3	2710
Ru-106	-0.122 ± 0.254	209
Cs-137	-0.002 ± 0.026	1670
Co-60	-0.003 ± 0.030	927
Na-22	-0.017 ± 0.034	200
Eu-152	-0.180 ± 0.140	78.0

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ). See ATI SOP 743FC for details of the TPU determination.

Reported activities are the calculated net activities, not truncated or censored by an a priori detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

Remarks: Sample 94-11-164-D2 is a duplicate of 94-11-164-12.

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Lab Name: Analytical Technologies, Inc. Date Collected: 07/27/94 12:00

Client Name: Los Alamos Natl Lab/CST-3 Date Analyzed: 12/03/94 18:44

Lab Sample ID: 94-11-164-13 Sample Matrix: Soil

Client Sample ID: 94.20321-2 Count Duration: 180 Min.

Nuclide	Activity (pCi/gram)	% Uncertainty
Cs-137	0.419 ± 0.067	16.0
Am-241	-0.213 ± 0.379	178
Ce-144	-0.114 ± 0.240	209
Np-237	0.000 ± 0.049	12100
Ba-140	11.3 ± 89.8	794
Ru-106	-0.210 ± 0.310	148
Co-60	-0.004 ± 0.027	657
Na-22	-0.020 ± 0.031	161
Eu-152	0.223 ± 0.133	59.5

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ). See ATI SOP 743FC for details of the TPU determination.

Reported activities are the calculated net activities, not truncated or censored by an a priori detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Lab Name: Analytical Technologies, Inc. Date Collected: 07/25/94 12:00

Client Name: Los Alamos Natl Lab/CST-3 Date Analyzed: 12/05/94 09:49

Lab Sample ID: 94-11-164-14 Sample Matrix: Soil

Client Sample ID: 94.20322-2 Count Duration: 180 Min.

Nuclide	Activity (pCi/gram)	% Uncertainty
Ru-106	0.216 ± 0.286	133
Cs-137	0.130 ± 0.055	42.6
Am-241	0.009 ± 0.036	429
Ce-144	-0.051 ± 0.122	240
Np-237	-0.002 ± 0.037	2070
Ba-140	-12.107 ± 81.4	673
Co-60	0.014 ± 0.041	285
Na-22	-0.013 ± 0.039	307
Eu-152	0.122 ± 0.164	135

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ). See ATI SOP 743FC for details of the TPU determination.

Reported activities are the calculated net activities, not truncated or censored by an a priori detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Lab Name: Analytical Technologies, Inc.

Date Collected: 07/28/94 12:00

Client Name: Los Alamos Natl Lab/CST-3

Date Analyzed: 12/05/94 09:51

Lab Sample ID: 94-11-164-15

Sample Matrix: Soil

Client Sample ID: 94.20323-2

Count Duration: 180 Min.

Nuclide	Activity (pCi/gram)	% Uncertainty
Cs-137	0.277 ± 0.055	19.8
Am-241	-0.010 ± 0.034	356
Ce-144	-0.018 ± 0.103	569
Np-237	-0.003 ± 0.033	1100
Ba-140	45.7 ± 70.7	155
Ru-106	0.174 ± 0.259	149
Co-60	-0.020 ± 0.028	138
Na-22	-0.014 ± 0.033	233
Eu-152	-0.089 ± 0.133	149

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ). See ATI SOP 743FC for details of the TPU determination.

Reported activities are the calculated net activities, not truncated or censored by an a priori detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Lab Name: Analytical Technologies, Inc.

Date Collected: 07/08/94 12:00

Client Name: Los Alamos Natl Lab/CST-3

Date Analyzed: 12/05/94 09:52

Lab Sample ID: 94-11-164-16

Sample Matrix: Soil

Client Sample ID: 94.20324-2

Count Duration: 180 Min.

Nuclide	Activity (pCi/gram)	% Uncertainty
Cs-137	0.389 ± 0.052	13.4
Am-241	-0.013 ± 0.069	550
Ce-144	-0.052 ± 0.147	283
Np-237	-0.025 ± 0.035	137
Ba-140	-5.000 ± 64.2	1280
Ru-106	0.024 ± 0.249	1020
Co-60	0.013 ± 0.027	206
Na-22	0.006 ± 0.025	420
Eu-152	0.181 ± 0.121	66.5

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ). See ATI SOP 743FC for details of the TPU determination.

Reported activities are the calculated net activities, not truncated or censored by an a priori detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Lab Name: Analytical Technologies, Inc.

Date Collected: 07/25/94 12:00

Client Name: Los Alamos Natl Lab/CST-3

Date Analyzed: 12/05/94 09:54

Lab Sample ID: 94-11-164-17

Sample Matrix: Soil

Client Sample ID: 94.20336-2

Count Duration: 180 Min.

Nuclide	Activity (pCi/gram)	% Uncertainty
Cs-137	0.060 ± 0.032	52.2
Am-241	-0.039 ± 0.073	190
Ce-144	-0.040 ± 0.124	310
Np-237	-0.015 ± 0.029	200
Ba-140	-41.200 ± 57.2	139
Ru-106	-0.090 ± 0.209	232
Co-60	0.000 ± 0.022	16900
Na-22	-0.005 ± 0.022	445
Eu-152	0.108 ± 0.098	91.2

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ). See ATI SOP 743FC for details of the TPU determination.

Reported activities are the calculated net activities, not truncated or censored by an a priori detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Lab Name: Analytical Technologies, Inc.

Date Collected: 07/20/94 12:00

Client Name: Los Alamos Natl Lab/CST-3

Date Analyzed: 12/05/94 10:11

Lab Sample ID: 94-11-164-18

Sample Matrix: Soil

Client Sample ID: 94.20337-2

Count Duration: 180 Min.

Nuclide	Activity (pCi/gram)	% Uncertainty
Cs-137	0.158 ± 0.053	33.6
Na-22	0.033 ± 0.031	94.3
Am-241	-0.012 ± 0.162	1370
Ce-144	-0.066 ± 0.181	272
Np-237	0.035 ± 0.043	123
Ba-140	51.0 ± 80.4	158
Ru-106	-0.108 ± 0.330	307
Co-60	-0.026 ± 0.035	137
Eu-152	0.062 ± 0.139	224

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ). See ATI SOP 743FC for details of the TPU determination.

Reported activities are the calculated net activities, not truncated or censored by an a priori detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Lab Name: Analytical Technologies, Inc.

Date Collected: 07/19/94 12:00

Client Name: Los Alamos Natl Lab/CST-3

Date Analyzed: 12/05/94 11:24

Lab Sample ID: 94-11-164-19

Sample Matrix: Soil

Client Sample ID: 94.20344-2

Count Duration: 180 Min.

Nuclide	Activity (pCi/gram)	% Uncertainty
Cs-137	0.435 ± 0.066	15.1
Am-241	-0.031 ± 0.192	618
Ce-144	-0.039 ± 0.143	368
Np-237	-0.023 ± 0.036	157
Ba-140	22.7 ± 71.6	316
Ru-106	0.148 ± 0.275	185
Co-60	-0.003 ± 0.030	1100
Na-22	-0.016 ± 0.031	194
Eu-152	0.098 ± 0.122	125

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ). See ATI SOP 743FC for details of the TPU determination.

Reported activities are the calculated net activities, not truncated or censored by an a priori detection limit estimate. Sample results should be compared to the decision level calculated from the appropriate blank.

ANALYTICAL TECHNOLOGIES, INC.
Radiochemistry Data Package

3

Section 3

QC RESULTS SUMMARY

GAMMA SPECTROMETRY RESULTS SUMMARY

Method 901.1 (Modified)

Lab Name: Analytical Technologies, Inc.

Date Collected: 11/30/94 12:00

Client Name: Los Alamos Natl Lab/CST-3

Date Analyzed: 12/05/94 10:04

Lab Sample ID: 94-11-164-B1

Sample Matrix: Soil

Client Sample ID: Blank

Count Duration: 180 Min.

Nuclide	Activity (pCi/gram)	% Uncertainty
Am-241	0.057	Decision Level
Ce-144	0.045	Decision Level
Np-237	0.015	Decision Level
Ba-140	0.104	Decision Level
Ru-106	0.164	Decision Level
Cs-137	0.010	Decision Level
Co-60	0.020	Decision Level
Na-22	0.015	Decision Level
Eu-152	0.048	Decision Level

Reported Uncertainties are the Estimated Total Propagated Uncertainty (2σ).
See ATI SOP 743FC for details of the TPU determination.

Decision Level Values calculated as recommended by ANSI N42.2
Reported sample activities should be compared to these Decision Levels

Data stored in file \gdr\prt\S11164B1.94P

GAMMA SPECTROMETRY QA RESULTS SUMMARY

Method 901.1 (Modified)

Lab Name: Analytical Technologies, Inc. Date Collected: 04/01/94 10:00

Client Name: Los Alamos Natl Lab/CST-3 Date Analyzed : 12/05/94 10:07

Lab Sample ID: 94-11-164-S1 Sample Matrix : Soil

Client Sample ID: Lab Control Count Duration: 30 Min.

Nuclide	Reported Activity	Known Value	Percent Recovery	Flag
Am-241	489	501	97.6	Pass
Cd-109	7470	7110	105	Pass
Co-57	152	157	96.6	Pass
Ce-139	207	209	99.0	Pass
Sn-113	471	456	103	Pass
Cs-137	199	205	97.2	Pass
Y-88	685	720	95.1	Pass
Co-60	305	313	97.4	Pass

ATI sets control limits for gamma spectroscopy as follows :
Control Limits = Known ± 10%

Data stored in file \gdr\prt\S11164S1.94P

ANALYTICAL TECHNOLOGIES, INC.
Radiochemistry Data Package

4

Section 4

INDIVIDUAL SAMPLE RESULTS

Due to the nature of Gamma Spectroscopy reports, a summary report is not provided. Thus, the individual sample results data may be found in the summary section of this data package.

ANALYTICAL TECHNOLOGIES, INC.
Radiochemistry Data Package

Section 5

RAW DATA

5

GDR_C Analytical Technologies, Inc. Fort Collins, CO Version 6.2

Sample ID : 94-11-164-01 LANL CS:94.18548-3

Sample Size	1.91e+002 gram	Spectrum File . .	\gdr\spc\s1116401.94s
Sampling Start.	07-21-94 12:00	Counting Start.	12-02-94 14:50
Sampling Stop	07-21-94 12:00	Live Time	10800 Sec
Current Date.	12-03-94 14:01	Real Time	10934 Sec

Detector #: 1

Energy(keV)= -0.93 + 0.500*Ch + 0.00e+000*Ch^2 + 0.00e+000*Ch^3 12-02-94 08:40

FWHM(keV) = 0.74 + 0.000*En + 1.02e-003*En^2 + 0.00e+000*En^3 08-31-93 09:22

Where En = Sqrt(Energy in keV)

Sensitivity	0.20	Search Start / End.	30 / 4000
Sigma Multiplier.	2.00		

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.02	127.82	928	115	83	1089	0.84	
2	74.55	150.85	246	107	91	1096	0.91	a
3	76.91	155.58	226	82	61	768	0.53	b
4	83.75	169.24	82	102	86	1155	0.82	NET < CL
5	92.38	186.50	3130	162	111	1181	0.97	a
6	94.45	190.63	109	90	80	729	0.73	b
7	98.33	198.38	361	98	83	766	1.05	c
8	112.66	227.02	76	74	59	642	0.50	
9	143.62	288.90	192	77	63	552	0.87	
10	185.59	372.78	1047	91	57	445	1.08	
11	205.13	411.84	46	49	39	271	0.56	a
12	209.09	419.76	55	64	55	397	1.01	b NET < CL
13	238.53	478.59	874	83	54	314	1.13	a
14	241.58	484.68	226	76	65	415	1.58	b
15	295.17	591.80	264	71	59	354	0.98	
16	328.00	657.40	59	48	40	221	2.19	
17	338.36	678.12	111	56	47	269	1.26	
18	351.74	704.85	444	64	43	228	1.22	
19	443.40	888.06	32	39	33	137	1.86	NET < CL
20	462.25	925.74	38	54	50	228	2.25	NET < CL
21	510.67	1022.50	243	60	49	222	1.88	
22	550.16	1101.44	24	41	38	120	1.21	a NET < CL
23	554.30	1109.71	9	24	18	71	0.66	b NET < CL
24	558.27	1117.64	24	33	29	105	0.84	c NET < CL
25	583.21	1167.48	239	49	35	132	1.39	
26	609.15	1219.33	244	50	35	153	1.82	
27	661.75	1324.46	165	47	37	136	1.42	
28	727.45	1455.77	74	39	33	110	3.86	
29	766.38	1533.58	97	43	36	130	1.96	
30	785.87	1572.54	8	32	28	96	0.42	NET < CL
31	795.19	1591.16	53	31	26	67	4.21	
32	803.03	1606.82	44	35	30	90	4.29	
33	911.18	1822.97	159	42	32	89	1.52	

34	969.13	1938.80	114	40	33	84	2.76
35	1001.26	2003.02	133	40	31	84	2.31
36	1238.29	2476.76	57	36	32	82	4.38
37	1460.86	2921.60	1013	73	36	86	2.57
38	1644.16	3287.95	15	12	9	7	1.58
39	1764.15	3527.77	71	24	17	20	2.41

GDR/PC Analytical Technologies, Inc. Fort Collins, CO Ver. 6.02a

BACKGROUND SUBTRACT RESULTS

Sample ID : 94-11-164-01 LANL CS:94.18548-3

Bkg File: . . . . . DET01.BKG | Counting Start. 12-02-94 14:50
ID.:. . . . . MCA READ | Current Date 12-03-94 14:01

PK#	ENERGY (keV)	FWHM (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	NEW NET COUNTS	NEW UN-CERTAINTY	FLAG
1	63.02	0.84	928	115	903	117	
5	92.38	0.97	3130	162	3062	165	
6	94.45	0.73	109	90	109	90	
10	185.59	1.08	1047	91	983	97	
13	238.53	1.13	874	83	832	87	
18	351.74	1.22	444	64	417	69	
21	510.67	1.88	243	60	29	71	NET < CL
24	558.27	0.84	24	33	-10	40	NET < CL
25	583.21	1.39	239	49	223	55	
26	609.15	1.82	244	50	231	52	
32	803.03	4.29	44	35	25	40	NET < CL
33	911.18	1.52	159	42	150	46	
37	1460.86	2.57	1013	73	974	75	

GDR/PC Analytical Technologies, Inc. Fort Collins, CO Ver. 6.02a

NUCLIDE ACTIVITY SUMMARY

Sample ID: 94-11-164-01 LANL CS:94.18548-3

Sample Size . . . . . 1.91e+002 gram	Spectrum File . . \gdr\spc\s1116401.94s
Sampling Start. 07-21-94 12:00	Counting Start. 12-02-94 14:50
Sampling Stop 07-21-94 12:00	Buildup Time. . . . . 0.00e+000 Hrs
Current Date. 12-03-94 14:02	Decay Time. . . . . 3.22e+003 Hrs
Efficiency File. DET0110.EFF	Library File. . . . . .LANL.LIB
ID. . . . . 200 g sand/poly jar	ID. . . . . .LANL Gamma Library

Eff.= 1/[2.63e-003*En^-3.69e+000 + 1.04e+002*En^8.62e-001] 08-08-94 08:09

Gamma Fraction Limit >= . . . 75.00 %	Decay Limit <=. . . . 8.000 Halflives
Library Energy Tolerance. . . 2.00	

FINAL ACTIVITY REPORT

Nuclide	Energy (keV)	Conc +- 2.00sigma (pCi/gram)	Halflife (hrs)	Peaks Found
Am-241	59.54	1.46e-001 +-1.94e-001	3.79e+006	1 of 1
Cs-137	661.65	1.87e-001 +-5.31e-002	2.64e+005	1 of 1
Na-22	1274.54	3.16e-002 +-3.37e-002	2.28e+004	1 of 1
Ce-144	133.54	-1.25e-001 +-1.73e-001	6.82e+003	NET
Np-237	311.98	3.13e-002 +-3.44e-002	1.87e+010	NET
Ba-140	537.32	9.84e+000 +-7.52e+001	3.07e+002	NET
Ru-106	621.84	-2.38e-002 +-2.76e-001	8.84e+003	NET
Co-60	1173.22	-1.92e-002 +-3.54e-002	4.62e+004	NET
Eu-152	1407.95	4.51e-003 +-1.53e-001	1.19e+005	NET
TOTAL:		3.65e-001 pCi/gram		

UNKNOWN PEAKS

Energy (keV)	Centroid Channel	Net Counts	Un-Certainty	C.L. Counts	Bkg. Counts	FWHM (keV)	Net Gamma/sec
63.02	127.82	903	117	83	1089	0.84	6.773e+000
74.55	150.85	246	107	91	1096	0.91	1.129e+000
76.91	155.58	226	82	61	768	0.53	9.566e-001
92.38	186.50	3062	165	111	1181	0.97	8.726e+000
94.45	190.63	109	90	80	729	0.73	2.989e-001
98.33	198.38	361	98	83	766	1.05	9.329e-001
112.66	227.02	76	74	59	642	0.50	1.705e-001
143.62	288.90	192	77	63	552	0.87	4.084e-001
185.59	372.78	983	97	57	445	1.08	2.340e+000
205.13	411.84	46	49	39	271	0.56	1.182e-001
238.53	478.59	832	87	54	314	1.13	2.374e+000
241.58	484.68	226	76	65	415	1.58	6.518e-001
295.17	591.80	264	71	59	354	0.98	8.960e-001

328.00	657.40	59	48	40	221	2.19	2.174e-001
338.36	678.12	111	56	47	269	1.26	4.204e-001
351.74	704.85	417	69	43	228	1.22	1.639e+000
583.21	1167.48	223	55	35	132	1.39	1.354e+000
609.15	1219.32	231	52	35	153	1.82	1.454e+000
727.45	1455.77	74	39	33	110	3.86	5.427e-001
766.38	1533.58	97	43	36	130	1.96	7.428e-001
795.19	1591.16	53	31	26	67	4.21	4.193e-001
911.18	1822.97	150	46	32	89	1.52	1.337e+000
969.13	1938.80	114	40	33	84	2.76	1.073e+000
1001.26	2003.02	133	40	31	84	2.31	1.282e+000
1238.29	2476.76	57	36	32	82	4.38	6.650e-001
1460.86	2921.60	974	75	36	86	2.57	1.302e+001
1644.16	3287.96	15	12	9	7	1.58	2.221e-001
1764.15	3527.77	71	24	17	20	2.41	1.120e+000

GDR_C Analytical Technologies, Inc. Fort Collins, CO Version 6.2

Sample ID : 94-11-164-02 LANL CS:94.18551-3

Sample Size	1.63e+002 gram	Spectrum File	GDR03.SPC
Sampling Start.	07-15-94 12:00	Counting Start.	12-02-94 14:58
Sampling Stop	07-15-94 12:00	Live Time	10800 Sec
Current Date.	12-02-94 18:11	Real Time	10939 Sec

Detector #: 3

Energy(keV)= -0.31 + 0.500*Ch + 0.00e+000*Ch^2 + 0.00e+000*Ch^3 12-02-94 09:06

FWHM(keV) = 0.76 + 0.021*En + 2.11e-004*En^2 + 0.00e+000*En^3 08-04-93 09:35
Where En = Sqrt(Energy in keV)

Sensitivity	0.20	Search Start / End.	100 / 4000
Sigma Multiplier.	2.00		

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.33	127.19	43	84	73	732	0.58	NET < CL
2	74.91	150.31	475	99	82	751	1.02	a
3	77.12	154.74	712	97	72	713	1.03	b
4	84.28	169.05	54	78	67	646	0.85	a NET < CL
5	87.26	175.00	165	79	64	637	0.83	b
6	92.80	186.06	313	88	71	668	1.41	
7	129.00	258.40	92	72	61	515	0.91	
8	186.03	372.39	309	83	69	528	1.36	
9	209.22	418.72	138	67	57	399	1.00	
10	238.70	477.63	1501	94	48	281	0.99	a
11	241.39	483.02	414	89	78	441	2.07	b
12	270.26	540.70	134	66	57	332	1.58	
13	277.36	554.89	43	52	44	271	0.68	NET < CL
14	295.31	590.76	402	68	52	271	1.06	a
15	300.12	600.38	58	52	45	251	1.14	b
16	328.16	656.40	120	57	48	257	1.60	
17	338.36	676.79	309	62	46	264	1.07	
18	351.94	703.93	669	71	45	227	1.32	
19	462.87	925.61	151	48	39	154	1.87	
20	511.04	1021.87	424	63	44	196	1.97	
21	583.32	1166.31	511	60	36	142	1.43	
22	609.45	1218.54	532	61	38	145	1.67	
23	693.08	1385.66	43	43	39	138	1.43	
24	727.20	1453.84	132	41	31	99	1.32	
25	755.33	1510.05	30	32	28	81	1.47	
26	795.10	1589.52	40	32	27	80	1.26	
27	803.10	1605.52	32	31	27	80	1.84	
28	860.55	1720.32	48	37	33	100	1.65	
29	911.41	1821.95	328	48	30	92	1.58	
30	933.72	1866.55	17	27	23	66	0.68	NET < CL
31	965.03	1929.11	73	46	44	106	2.22	a
32	969.15	1937.35	154	38	27	68	1.73	b
33	1119.98	2238.76	108	38	31	80	2.04	

34	1237.97	2474.55	42	30	26	60	1.32	
35	1378.02	2754.42	14	23	20	42	1.05	NET < CL
36	1460.96	2920.17	848	61	18	30	1.79	
37	1587.99	3174.02	19	21	19	32	2.07	
38	1630.81	3259.59	15	21	19	30	1.88	NET < CL
39	1764.59	3526.94	87	21	10	8	3.29	

GDR/PC Analytical Technologies, Inc. Fort Collins, CO Ver. 6.02a

BACKGROUND SUBTRACT RESULTS

Sample ID : 94-11-164-02 LANL CS:94.18551-3

Bkg File: . . . . . DET03.BKG | Counting Start. 12-02-94 14:58
ID.:. . . . . MCA READ | Current Date 12-02-94 18:11

PK#	ENERGY (keV)	FWHM (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	NEW NET COUNTS	NEW UN-CERTAINTY	FLAG
1	63.33	0.58	43	84	9	90	NET < CL
6	92.80	1.41	313	88	221	96	
8	186.03	1.36	309	83	247	91	
10	238.70	0.99	1501	94	1452	99	
18	351.94	1.32	669	71	638	76	
20	511.04	1.97	424	63	156	74	
21	583.32	1.43	511	60	475	66	
22	609.45	1.67	532	61	499	70	
27	803.10	1.84	32	31	5	38	NET < CL
29	911.41	1.58	328	48	315	52	
36	1460.96	1.79	848	61	803	64	
39	1764.59	3.29	87	21	79	24	

GDR/PC Analytical Technologies, Inc. Fort Collins, CO Ver. 6.02a

NUCLIDE ACTIVITY SUMMARY

Sample ID: 94-11-164-02 LANL CS:94.18551-3

Sample Size	1.63e+002 gram	Spectrum File	GDR03.SPC
Sampling Start.	07-15-94 12:00	Counting Start.	12-02-94 14:58
Sampling Stop	07-15-94 12:00	Buildup Time.	0.00e+000 Hrs
Current Date.	12-02-94 18:11	Decay Time.	3.36e+003 Hrs

Efficiency File.	.DET0310.EFF	Library File.	.LANL.LIB
ID.	200 g sand/poly jar	ID.	.LANL Gamma Library

Eff.= 1/[3.57e-003*En^-3.47e+000 + 9.25e+001*En^8.15e-001] 08-08-94 09:21

Gamma Fraction Limit >= . . .	75.00 %	Decay Limit <=. . . .	8.000 Halflives
Library Energy Tolerance. . .	2.00		

FINAL ACTIVITY REPORT

Nuclide	Energy (keV)	Conc +- 2.00sigma (pCi/gram)		Halflife (hrs)	Peaks Found
Am-241	59.54	3.16e-003	+-1.43e-001	3.79e+006	NET
Ce-144	133.54	-3.35e-002	+-1.75e-001	6.82e+003	NET
Np-237	311.98	-1.67e-002	+-4.51e-002	1.87e+010	NET
Ba-140	537.32	1.17e+001	+-8.16e+001	3.07e+002	NET
Ru-106	621.84	-6.40e-002	+-3.11e-001	8.84e+003	NET
Cs-137	661.65	-3.61e-003	+-2.87e-002	2.64e+005	NET
Co-60	1173.22	-8.22e-003	+-3.11e-002	4.62e+004	NET
Na-22	1274.54	-1.92e-003	+-2.96e-002	2.28e+004	NET
Eu-152	1407.95	5.39e-002	+-1.36e-001	1.19e+005	NET

TOTAL: 0.00e+000 pCi/gram

UNKNOWN PEAKS

Energy (keV)	Centroid Channel	Net Counts	Un-Certainty	C.L. Counts	Bkg. Counts	FWHM (keV)	Net Gamma/sec
74.91	150.32	475	99	82	751	1.02	1.770e+000
77.12	154.74	712	97	72	713	1.03	2.485e+000
87.26	175.00	165	79	64	637	0.83	4.537e-001
92.80	186.06	221	96	71	668	1.41	5.555e-001
129.00	258.40	92	72	61	515	0.91	1.865e-001
186.03	372.39	247	91	69	528	1.36	5.643e-001
209.22	418.72	138	67	57	399	1.00	3.405e-001
238.70	477.63	1452	99	48	281	0.99	3.937e+000
241.39	483.02	414	89	78	441	2.07	1.132e+000
270.26	540.70	134	66	57	332	1.58	3.996e-001
295.31	590.76	402	68	52	271	1.06	1.283e+000
300.12	600.38	58	52	45	251	1.14	1.866e-001
328.16	656.40	120	57	48	257	1.60	4.173e-001

338.36	676.79	309	62	46	264	1.07	1.098e+000
351.94	703.93	638	76	45	227	1.32	2.341e+000
462.87	925.61	151	48	39	154	1.87	6.908e-001
511.04	1021.87	156	74	44	196	1.97	7.725e-001
583.32	1166.31	475	66	36	142	1.43	2.624e+000
609.45	1218.54	499	70	38	145	1.67	2.856e+000
693.08	1385.66	43	43	39	138	1.43	2.731e-001
727.20	1453.84	132	41	31	99	1.32	8.720e-001
755.33	1510.05	30	32	28	81	1.47	2.067e-001
795.10	1589.52	40	32	27	80	1.26	2.842e-001
860.55	1720.32	48	37	33	100	1.65	3.637e-001
911.41	1821.95	315	52	30	92	1.58	2.504e+000
965.03	1929.11	73	46	44	106	2.22	6.066e-001
969.15	1937.35	154	38	27	68	1.73	1.282e+000
1119.98	2238.76	108	38	31	80	2.04	1.013e+000
1237.97	2474.55	42	30	26	60	1.32	4.281e-001
1460.96	2920.17	803	64	18	30	1.79	9.371e+000
1587.99	3174.02	19	21	19	32	2.07	2.372e-001
1764.59	3526.94	79	24	10	8	3.29	1.071e+000

GDR_C Analytical Technologies, Inc. Fort Collins, CO Version 6.2

Sample ID : 94-11-164-03 LANL CS:94.18557-3

Sample Size	1.56e+002 gram	Spectrum File . .	\gdr\spc\s1116403.94s
Sampling Start.	08-03-94 12:00	Counting Start.	12-02-94 14:57
Sampling Stop	08-03-94 12:00	Live Time	10800 Sec
Current Date.	12-19-94 17:00	Real Time	10939 Sec

Detector #: 2

Energy(keV)= -0.32 + 0.500*Ch + 0.00e+000*Ch^2 + 0.00e+000*Ch^3 12-02-94 08:40

FWHM(keV) = 0.78 + 0.009*En + 4.28e-004*En^2 + 0.00e+000*En^3 07-29-93 12:48

Where En = Sqrt(Energy in keV)

Sensitivity	0.20	Search Start / End.	30 / 4000
Sigma Multiplier.	2.00		

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	62.96	126.58	32434	530	342	16200	1.29	
2	83.85	168.35	2933	470	403	22405	1.41	
3	92.51	185.67	107677	840	462	29468	1.13	
4	98.40	197.46	11196	436	335	15531	0.99	
5	111.21	223.09	5384	498	457	18143	1.60	a
6	112.85	226.37	5460	317	232	9721	0.77	b
7	143.81	288.28	5081	287	219	6628	1.00	
8	163.34	327.36	2443	247	199	5481	1.12	
9	185.72	372.11	27421	390	182	4567	1.00	
10	202.15	404.97	476	209	191	3684	1.08	a
11	205.28	411.24	2168	189	141	3092	0.92	b
12	226.81	454.29	237	196	179	3527	0.87	
13	238.63	477.95	1148	178	145	2887	0.83	
14	258.30	517.28	1717	182	149	2452	1.19	
15	294.93	590.55	292	152	136	2043	0.98	
16	338.36	677.43	237	103	84	1122	1.11	
17	351.89	704.48	770	125	101	1250	1.25	
18	510.75	1022.22	297	97	82	818	1.83	
19	569.54	1139.81	122	90	79	758	1.02	
20	583.28	1167.30	425	91	73	657	1.14	
21	609.37	1219.47	446	95	78	675	1.41	
22	727.34	1455.43	112	93	90	534	1.64	a
23	733.53	1467.81	75	64	54	398	1.03	b
24	740.37	1481.50	103	75	67	460	1.28	c
25	742.98	1486.72	854	102	81	515	1.46	d
26	766.61	1533.99	3264	137	71	506	1.45	
27	782.06	1564.88	104	83	77	504	1.36	a
28	786.43	1573.63	473	84	66	486	1.24	b
29	851.72	1704.23	105	70	64	349	1.49	
30	860.67	1722.12	48	50	44	234	1.88	
31	876.36	1753.51	63	52	48	182	1.18	a
32	880.71	1762.20	176	56	47	201	1.45	b
33	883.40	1767.59	180	55	44	200	1.46	c

34	887.75	1776.28	65	56	51	238	1.79	d	
35	892.43	1785.65	30	45	40	177	1.28	e	NET < CL
36	899.04	1798.87	58	42	36	136	0.88	f	
37	911.37	1823.52	338	61	45	205	1.35		
38	921.97	1844.74	109	48	41	167	1.30	a	
39	926.12	1853.04	210	81	77	338	2.68	b	
40	946.29	1893.37	272	62	50	226	1.77		
41	964.90	1930.60	49	51	48	187	1.35	a	
42	969.17	1939.13	140	51	42	181	1.41	b	
43	1001.25	2003.30	7045	174	43	168	1.63		
44	1120.73	2242.29	74	41	35	132	1.75		
45	1194.01	2388.85	104	39	31	95	3.40		
46	1237.76	2476.36	90	40	34	106	2.45		
47	1377.89	2756.64	42	32	28	74	2.22		
48	1393.66	2788.18	23	30	27	68	2.07		NET < CL
49	1434.20	2869.28	48	29	25	56	1.98		
50	1461.05	2922.97	1081	71	25	54	1.78		
51	1510.33	3021.54	101	31	23	46	2.30		
52	1553.90	3108.70	26	29	26	66	0.77		
53	1588.58	3178.06	30	28	25	50	1.52	a	
54	1593.12	3187.14	33	29	26	55	1.89	b	
55	1729.64	3460.20	16	18	16	21	1.34	a	NET < CL
56	1737.98	3476.88	116	31	22	32	1.88	b	
57	1764.96	3530.85	139	32	21	37	2.24		
58	1809.44	3619.81	21	14	10	11	1.97		
59	1831.61	3664.15	79	24	16	21	1.81		
60	1867.83	3736.60	43	29	27	39	2.17	a	
61	1875.66	3752.25	31	25	22	34	2.03	b	
62	1911.35	3823.65	29	17	12	14	2.33		

GDR/PC Analytical Technologies, Inc. Fort Collins, CO Ver. 6.02a

BACKGROUND SUBTRACT RESULTS

Sample ID : 94-11-164-03 LANL CS:94.18557-3

Bkg File: . . . . . DET02.BKG | Counting Start. 12-02-94 14:57
ID.:. . . . . MCA READ | Current Date 12-19-94 17:00

PK#	ENERGY (keV)	FWHM (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	NEW NET COUNTS	NEW UN-CERTAINTY	FLAG
1	62.96	1.29	32434	530	32395	531	
3	92.51	1.13	107677	840	107584	841	
9	185.72	1.00	27421	390	27367	392	
13	238.63	0.83	1148	178	1091	181	
17	351.89	1.25	770	125	747	129	
18	510.75	1.83	297	97	-8	104	NET < CL
20	583.28	1.14	425	91	399	94	
21	609.37	1.41	446	95	416	99	
37	911.37	1.35	338	61	326	63	
50	1461.05	1.78	1081	71	1037	73	
57	1764.96	2.24	139	32	127	34	

GDR/PC Analytical Technologies, Inc. Fort Collins, CO Ver. 6.02a

NUCLIDE ACTIVITY SUMMARY

Sample ID: 94-11-164-03 LANL CS:94.18557-3

Sample Size . . . . . 1.56e+002 gram	Spectrum File . . \gdr\spc\s1116403.94s
Sampling Start. 08-03-94 12:00	Counting Start. 12-02-94 14:57
Sampling Stop 08-03-94 12:00	Buildup Time. . . . . 0.00e+000 Hrs
Current Date. 12-19-94 17:00	Decay Time. . . . . 2.91e+003 Hrs
Efficiency File. DET0210.EFF	Library File. . . . . .lanl.lib
ID. . . . . 200 g sand/poly jar	ID. . . . . .LANL Gamma Library

Eff.= 1/[3.14e-003*En^-3.55e+000 + 8.50e+001*En^8.02e-001] 08-08-94 07:28

Gamma Fraction Limit >= . . . 75.00 %	Decay Limit <=. . . . 8.000 Halflives
Library Energy Tolerance. . . 2.00	

FINAL ACTIVITY REPORT

Nuclide	Energy (keV)	Conc +- 2.00sigma (pCi/gram)	Halflife (hrs)	Peaks Found
Na-22	1274.54	4.45e-002 +-3.77e-002	2.28e+004	1 of 1
Am-241	59.54	-4.46e-001 +-8.47e-001	3.79e+006	NET
Ce-144	133.54	-1.65e+000 +-6.62e-001	6.82e+003	NET
Np-237	311.98	-5.74e-002 +-9.41e-002	1.87e+010	NET
Ba-140	537.32	7.09e+000 +-1.27e+002	3.07e+002	NET
Ru-106	621.84	3.47e-001 +-5.57e-001	8.84e+003	NET
Cs-137	661.65	1.90e-002 +-5.22e-002	2.64e+005	NET
Co-60	1173.22	-6.49e-003 +-3.58e-002	4.62e+004	NET
Eu-152	1407.95	1.75e-001 +-1.75e-001	1.19e+005	NET
TOTAL:		4.45e-002 pCi/gram		

UNKNOWN PEAKS

Energy (keV)	Centroid Channel	Net Counts	Un-Certainty	C.L. Counts	Bkg. Counts	FWHM (keV)	Net Gamma/sec
62.96	126.58	32395	531	342	16200	1.29	1.992e+002
83.85	168.35	2933	470	403	22405	1.41	8.777e+000
92.51	185.67	107584	841	462	29468	1.13	2.708e+002
98.40	197.46	11196	436	335	15531	0.99	2.587e+001
111.21	223.09	5384	498	457	18143	1.60	1.106e+001
112.85	226.37	5460	317	232	9721	0.77	1.111e+001
143.81	288.28	5081	287	219	6628	1.00	9.873e+000
163.34	327.36	2443	247	199	5481	1.12	4.932e+000
185.72	372.11	27367	392	182	4567	1.00	5.891e+001
202.15	404.97	476	209	191	3684	1.08	1.078e+000
205.28	411.24	2168	189	141	3092	0.92	4.962e+000
226.81	454.29	237	196	179	3527	0.87	5.813e-001
238.63	477.95	1091	181	145	2887	0.83	2.771e+000

258.30	517.28	1717	182	149	2452	1.19	4.622e+000
294.93	590.55	292	152	136	2043	0.98	8.681e-001
338.36	677.43	237	103	84	1122	1.11	7.838e-001
351.89	704.48	747	129	101	1250	1.25	2.550e+000
569.54	1139.81	122	90	79	758	1.02	6.088e-001
583.28	1167.30	399	94	73	657	1.14	2.038e+000
609.37	1219.47	416	99	78	675	1.41	2.200e+000
727.34	1455.43	112	93	90	534	1.64	6.834e-001
733.53	1467.81	75	64	54	398	1.03	4.586e-001
740.37	1481.50	103	75	67	460	1.28	6.375e-001
742.98	1486.72	854	102	81	515	1.46	5.294e+000
766.61	1533.99	3264	137	71	506	1.45	2.075e+001
782.06	1564.88	104	83	77	504	1.36	6.738e-001
786.43	1573.63	473	84	66	486	1.24	3.066e+000
851.72	1704.23	105	70	64	349	1.49	7.275e-001
860.67	1722.12	48	50	44	234	1.88	3.348e-001
876.36	1753.51	63	52	48	182	1.18	4.425e-001
880.71	1762.20	176	56	47	201	1.45	1.251e+000
883.40	1767.59	180	55	44	200	1.46	1.280e+000
887.75	1776.29	65	56	51	238	1.79	4.650e-001
899.04	1798.87	58	42	36	136	0.88	4.191e-001
911.37	1823.52	326	63	45	205	1.35	2.378e+000
921.98	1844.74	109	48	41	167	1.30	8.020e-001
926.12	1853.04	210	81	77	338	2.68	1.552e+000
946.29	1893.37	272	62	50	226	1.77	2.047e+000
964.90	1930.60	49	51	48	187	1.35	3.778e-001
969.17	1939.13	140	51	42	181	1.41	1.075e+000
1001.25	2003.30	7045	174	43	168	1.63	5.548e+001
1120.73	2242.29	74	41	35	132	1.75	6.408e-001
1194.01	2388.85	104	39	31	95	3.40	9.402e-001
1237.76	2476.36	90	40	34	106	2.45	8.402e-001
1377.89	2756.64	42	32	28	74	2.22	4.273e-001
1434.20	2869.28	48	29	25	56	1.98	5.043e-001
1461.05	2922.97	1037	73	25	54	1.78	1.106e+001
1510.33	3021.54	101	31	23	46	2.30	1.101e+000
1553.90	3108.70	26	29	26	66	0.77	2.913e-001
1588.58	3178.06	30	28	25	50	1.52	3.456e-001
1593.12	3187.14	33	29	26	55	1.89	3.746e-001
1737.98	3476.88	116	31	22	32	1.88	1.425e+000
1764.96	3530.85	127	34	21	37	2.24	1.578e+000
1809.44	3619.81	21	14	10	11	1.97	2.659e-001
1831.61	3664.15	79	24	16	21	1.81	1.010e+000
1867.83	3736.60	43	29	27	39	2.17	5.605e-001
1875.66	3752.25	31	25	22	34	2.03	4.057e-001
1911.35	3823.65	29	17	12	14	2.33	3.836e-001

GDR_C Analytical Technologies, Inc. Fort Collins, CO Version 6.2

Sample ID : 94-11-164-D1 LANL CS:Dup of 03

Sample Size . . . . . 1.56e+002 gram	Spectrum File . . \gdr\spc\s11164d1.94s
Sampling Start. 08-03-94 12:00	Counting Start. 12-03-94 17:23
Sampling Stop 08-03-94 12:00	Live Time . . . . . 10800 Sec
Current Date. 12-19-94 14:24	Real Time . . . . . 10885 Sec

Detector #: 4

Energy(keV)= 0.32 + 0.500*Ch + 0.00e+000*Ch^2 + 0.00e+000*Ch^3 12-03-94 14:52

FWHM(keV) = 0.72 + 0.010*En + 4.92e-004*En^2 + 0.00e+000*En^3 11-08-94 15:17
Where En = Sqrt(Energy in keV)

Sensitivity 0.20	Search Start / End. . . . . 30 / 4000
Sigma Multiplier. 2.00	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.22	125.77	34965	518	306	14769	0.87	
2	83.83	166.97	2371	476	410	23259	1.26	
3	92.53	184.37	116045	840	467	20312	0.98	a
4	94.60	188.51	8770	483	430	15565	1.02	b
5	98.38	196.07	14972	410	296	10938	0.94	c
6	108.93	217.17	1240	398	378	11996	1.22	a
7	111.06	221.41	7291	469	421	15043	1.68	b
8	112.80	224.89	7009	316	229	8343	0.88	c
9	114.60	228.49	2432	372	337	11302	1.42	d
10	131.53	262.36	449	292	261	8348	0.69	
11	143.72	286.73	5151	265	191	5740	0.91	
12	163.32	325.91	2772	245	195	5229	1.01	
13	185.67	370.59	27380	388	179	4411	1.07	
14	202.12	403.50	408	188	169	3131	0.93	a
15	205.22	409.70	2274	203	158	3421	1.02	b
16	238.56	476.35	1277	176	142	2767	0.96	
17	258.21	515.64	1549	170	136	2282	1.08	
18	338.35	675.88	222	129	116	1487	0.99	
19	351.81	702.80	688	125	103	1296	1.09	
20	511.02	1021.12	443	110	95	904	2.86	
21	569.51	1138.07	219	86	73	657	1.94	
22	583.17	1165.39	559	95	76	638	1.40	
23	609.30	1217.65	526	89	69	582	1.39	
24	727.44	1453.85	81	76	70	472	1.16	a
25	733.34	1465.65	69	70	60	470	1.07	b
26	742.83	1484.63	707	105	84	715	1.28	
27	766.43	1531.81	3128	137	74	546	1.43	
28	781.70	1562.34	102	67	58	381	1.01	a
29	786.32	1571.59	497	83	65	450	1.32	b
30	805.40	1609.74	102	77	71	462	1.94	
31	851.47	1701.86	105	67	62	323	2.79	
32	860.52	1719.96	48	54	48	255	1.01	NET < CL
33	880.72	1760.34	169	62	54	251	1.62	a

34	883.34	1765.57	109	47	38	185	1.14	b
35	899.09	1797.07	46	64	61	278	1.47	NET < CL
36	911.20	1821.28	280	58	45	202	1.12	
37	921.59	1842.06	114	46	38	141	1.45	a
38	925.93	1850.73	257	73	67	264	2.55	b
39	946.03	1890.93	258	57	44	198	1.44	
40	964.55	1927.95	55	54	51	193	1.60	a
41	968.95	1936.75	187	55	45	186	1.72	b
42	980.48	1959.80	11	45	41	183	0.53	NET < CL
43	1001.03	2000.89	6673	168	35	125	1.57	
44	1120.55	2239.86	83	43	37	138	3.69	
45	1193.93	2386.59	107	39	31	94	1.59	
46	1237.46	2473.64	54	39	33	112	1.85	
47	1434.32	2867.25	38	34	31	74	1.66	
48	1460.81	2920.21	1101	69	18	32	2.11	
49	1509.99	3018.56	79	30	24	48	1.67	
50	1553.65	3105.85	22	25	22	46	1.46	NET < CL
51	1587.87	3174.27	15	26	23	55	1.44	NET < CL
52	1620.66	3239.84	16	22	19	34	1.45	NET < CL
53	1729.68	3457.81	26	20	17	21	1.54	a
54	1737.63	3473.72	110	26	15	19	2.02	b
55	1764.56	3527.57	89	29	21	39	2.62	
56	1808.86	3616.13	18	19	16	22	1.36	
57	1830.92	3660.25	95	26	17	23	1.83	
58	1847.70	3693.80	16	17	15	17	1.25	
59	1867.60	3733.58	51	28	24	34	2.29	a
60	1875.33	3749.04	32	27	25	36	2.65	b
61	1911.09	3820.55	27	19	15	20	1.23	

GDR/PC Analytical Technologies, Inc. Fort Collins, CO Ver. 6.02a

BACKGROUND SUBTRACT RESULTS

Sample ID : 94-11-164-D1 LANL CS:Dup of 03

Bkg File: . . . . . DET04.BKG | Counting Start. 12-03-94 17:23
ID.:. . . . . MCA READ | Current Date 12-19-94 14:24

PK#	ENERGY (keV)	FWHM (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	NEW NET COUNTS	NEW UN-CERTAINTY	FLAG
1	63.22	0.87	34965	518	34942	518	
3	92.53	0.98	116045	840	115993	841	
4	94.60	1.02	8770	483	8770	483	
13	185.67	1.07	27380	388	27335	390	
16	238.56	0.96	1277	176	1231	179	
19	351.81	1.09	688	125	662	128	
20	511.02	2.86	443	110	197	116	
21	569.51	1.94	219	86	201	90	
22	583.17	1.40	559	95	537	98	
23	609.30	1.39	526	89	504	93	
36	911.20	1.12	280	58	268	61	
48	1460.81	2.11	1101	69	1067	71	

GDR/PC Analytical Technologies, Inc. Fort Collins, CO Ver. 6.02a

NUCLIDE ACTIVITY SUMMARY

Sample ID: 94-11-164-D1 LANL CS:Dup of 03

Sample Size . . . . . 1.56e+002 gram	Spectrum File . . \gdr\spc\s11164d1.94s
Sampling Start. 08-03-94 12:00	Counting Start. 12-03-94 17:23
Sampling Stop 08-03-94 12:00	Buildup Time. . . . . 0.00e+000 Hrs
Current Date. 12-19-94 14:24	Decay Time. . . . . 2.93e+003 Hrs

Efficiency File. DET0410.EFF	Library File. . . . . .lanl.lib
ID. . . . . .200g Geometry 10	ID. . . . . .LANL Gamma Library

Eff.= 1/[1.31e-002*En^-3.01e+000 + 8.53e+001*En^8.73e-001] 10-29-94 10:56

Gamma Fraction Limit >= . . . 75.00 %	Decay Limit <=. . . . 8.000 Halflives
Library Energy Tolerance. . . 2.00	

FINAL ACTIVITY REPORT

Nuclide	Energy (keV)	Conc +- 2.00sigma (pCi/gram)		Halflife (hrs)	Peaks Found
Am-241	59.54	-9.95e-002	+-6.43e-001	3.79e+006	NET
Ce-144	133.54	-2.05e+000	+-6.42e-001	6.82e+003	NET
Np-237	311.98	-3.81e-002	+-8.72e-002	1.87e+010	NET
Ba-140	537.32	8.41e+000	+-1.28e+002	3.07e+002	NET
Ru-106	621.84	1.05e-001	+-5.54e-001	8.84e+003	NET
Cs-137	661.65	-2.24e-002	+-5.12e-002	2.64e+005	NET
Co-60	1173.22	-2.19e-003	+-3.89e-002	4.62e+004	NET
Na-22	1274.54	-1.36e-002	+-3.77e-002	2.28e+004	NET
Eu-152	1407.95	1.04e-001	+-1.69e-001	1.19e+005	NET

TOTAL: 0.00e+000 pCi/gram

UNKNOWN PEAKS

Energy (keV)	Centroid Channel	Net Counts	Un-Certainty	C.L. Counts	Bkg. Counts	FWHM (keV)	Net Gamma/sec
63.22	125.77	34942	518	306	14769	0.87	1.990e+002
83.83	166.97	2371	476	410	23259	1.26	7.203e+000
92.53	184.37	115993	841	467	20312	0.98	2.982e+002
94.60	188.51	8770	483	430	15565	1.02	2.182e+001
98.38	196.07	14972	410	296	10938	0.94	3.530e+001
108.93	217.17	1240	398	378	11996	1.22	2.612e+000
111.06	221.41	7291	469	421	15043	1.68	1.510e+001
112.80	224.89	7009	316	229	8343	0.88	1.434e+001
114.60	228.49	2432	372	337	11302	1.42	4.916e+000
131.53	262.36	449	292	261	8348	0.69	8.482e-001
143.72	286.73	5151	265	191	5740	0.91	9.636e+000
163.32	325.91	2772	245	195	5229	1.01	5.288e+000
185.67	370.59	27335	390	179	4411	1.07	5.490e+001

202.12	403.50	408	188	169	3131	0.93	8.595e-001
205.22	409.70	2274	203	158	3421	1.02	4.828e+000
238.56	476.35	1231	179	142	2767	0.96	2.893e+000
258.21	515.64	1549	170	136	2282	1.08	3.858e+000
338.35	675.88	222	129	116	1487	0.99	6.883e-001
351.81	702.80	662	128	103	1296	1.09	2.117e+000
511.02	1021.12	197	116	95	904	2.86	8.678e-001
569.51	1138.07	201	90	73	657	1.94	9.718e-001
583.17	1165.39	537	98	76	638	1.40	2.649e+000
609.30	1217.65	504	93	69	582	1.39	2.584e+000
727.44	1453.85	81	76	70	472	1.16	4.827e-001
733.34	1465.65	69	70	60	470	1.07	4.169e-001
742.83	1484.63	707	105	84	715	1.28	4.307e+000
766.43	1531.81	3128	137	74	546	1.43	1.958e+001
781.70	1562.34	102	67	58	381	1.01	6.508e-001
786.32	1571.59	497	83	65	450	1.32	3.180e+000
805.40	1609.74	102	77	71	462	1.94	6.667e-001
851.47	1701.86	105	67	62	323	2.79	7.216e-001
880.72	1760.34	169	62	54	251	1.62	1.194e+000
883.34	1765.57	109	47	38	185	1.14	7.736e-001
911.20	1821.28	268	61	45	202	1.12	1.953e+000
921.59	1842.06	114	46	38	141	1.45	8.405e-001
925.93	1850.73	257	73	67	264	2.55	1.895e+000
946.03	1890.93	258	57	44	198	1.44	1.941e+000
964.55	1927.95	55	54	51	193	1.60	4.243e-001
968.95	1936.75	187	55	45	186	1.72	1.435e+000
1001.03	2000.89	6673	168	35	125	1.57	5.273e+001
1120.55	2239.86	83	43	37	138	3.69	7.193e-001
1193.93	2386.59	107	39	31	94	1.59	9.815e-001
1237.46	2473.64	54	39	33	112	1.85	5.150e-001
1434.32	2867.25	38	34	31	74	1.66	4.158e-001
1460.81	2920.21	1067	71	18	32	2.11	1.173e+001
1510.00	3018.56	79	30	24	48	1.67	8.975e-001
1729.68	3457.81	26	20	17	21	1.54	3.319e-001
1737.63	3473.72	110	26	15	19	2.02	1.402e+000
1764.56	3527.57	89	29	21	39	2.62	1.154e+000
1808.86	3616.13	18	19	16	22	1.36	2.428e-001
1830.92	3660.25	95	26	17	23	1.83	1.267e+000
1847.70	3693.80	16	17	15	17	1.25	2.125e-001
1867.60	3733.58	51	28	24	34	2.29	7.004e-001
1875.33	3749.04	32	27	25	36	2.65	4.354e-001
1911.09	3820.55	27	19	15	20	1.23	3.752e-001

GDR_C Analytical Technologies, Inc. Fort Collins, CO Version 6.2

Sample ID : 94-11-164-04 LANL CS:94.18560-3

Sample Size	1.92e+002 gram	Spectrum File	GDR04.SPC
Sampling Start.	07-25-94 12:00	Counting Start.	12-02-94 15:00
Sampling Stop	07-25-94 12:00	Live Time	10800 Sec
Current Date.	12-02-94 18:13	Real Time	10940 Sec

Detector #: 4

Energy(keV) = 0.29 + 0.500*Ch + 0.00e+000*Ch^2 + 0.00e+000*Ch^3 12-02-94 08:40

FWHM(keV) = 0.72 + 0.010*En + 4.92e-004*En^2 + 0.00e+000*En^3 11-08-94 15:17

Where En = Sqrt(Energy in keV)

Sensitivity	0.20	Search Start / End.	30 / 4000
Sigma Multiplier.	2.00		

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.20	125.78	29557	513	325	16727	0.87	
2	84.01	167.38	5075	532	452	28205	0.90	
3	89.95	179.25	5006	672	645	31235	1.19	a
4	92.51	184.37	110525	832	463	22899	1.06	b
5	94.57	188.49	11039	535	461	21313	1.19	c
6	98.37	196.09	16908	449	328	13622	0.95	d
7	105.37	210.09	1641	427	402	14212	1.16	a
8	109.04	217.42	4039	497	461	18611	1.66	b
9	111.10	221.54	7332	453	387	16333	1.38	c
10	112.77	224.87	6425	350	266	11115	0.84	d
11	114.50	228.33	2865	430	390	15423	1.48	e
12	143.76	286.82	13386	372	256	9084	0.94	
13	163.32	325.94	6553	311	234	7545	0.95	
14	185.67	370.61	71517	588	215	6371	1.06	
15	194.97	389.20	838	207	175	4220	1.38	
16	202.00	403.26	1354	218	189	3937	1.14	a
17	205.25	409.76	5979	232	150	3386	0.96	b
18	238.57	476.37	1086	168	132	2759	0.91	
19	258.22	515.65	1576	181	147	2649	1.04	
20	295.07	589.33	292	148	130	2066	0.86	
21	338.31	675.78	238	118	101	1396	0.97	
22	351.90	702.94	809	129	105	1352	1.13	
23	463.19	925.43	61	104	95	993	0.74	NET < CL
24	510.95	1020.91	361	116	103	1067	2.17	
25	569.48	1137.93	165	92	80	780	1.64	
26	583.26	1165.46	503	96	79	682	1.47	
27	609.42	1217.77	350	90	74	677	1.10	
28	691.84	1382.53	44	78	69	587	0.64	NET < CL
29	727.53	1453.89	84	60	51	344	0.77	a
30	733.26	1465.34	121	88	81	605	1.61	b
31	739.96	1478.75	121	88	83	565	1.51	a
32	742.90	1484.61	845	95	69	525	1.48	b
33	766.57	1531.94	3293	142	78	616	1.49	

34	786.34	1571.47	465	90	73	592	1.32	
35	805.85	1610.46	47	64	56	389	1.00	NET < CL
36	825.56	1649.87	53	58	52	282	1.01 a	
37	831.37	1661.49	69	77	73	421	1.68 b	NET < CL
38	860.82	1720.37	71	69	64	349	1.33	
39	880.67	1760.04	158	57	48	243	1.26 a	
40	883.18	1765.07	131	65	57	313	1.51 b	
41	911.53	1821.74	247	61	49	242	1.47	
42	922.18	1843.02	103	52	45	195	1.33 a	
43	926.18	1851.03	198	67	59	282	1.89 b	
44	946.26	1891.17	297	59	45	207	1.45	
45	969.20	1937.03	178	56	46	208	1.31	
46	979.92	1958.47	56	45	39	172	1.48	
47	1001.25	2001.11	7082	174	42	174	1.55	
48	1120.54	2239.59	101	49	42	166	1.25	
49	1194.10	2386.64	102	45	37	139	1.35	
50	1237.92	2474.25	94	45	39	130	2.32	
51	1378.26	2754.81	33	34	32	79	6.63	
52	1435.14	2868.52	43	33	30	65	1.88	
53	1461.07	2920.37	1483	81	25	56	1.96	
54	1510.61	3019.41	125	34	25	45	1.78	
55	1554.21	3106.58	43	29	25	49	1.39	
56	1587.94	3174.00	15	26	23	50	4.07	NET < CL
57	1630.59	3259.28	21	25	23	38	1.15	NET < CL
58	1738.04	3474.08	108	30	20	35	1.62	
59	1765.08	3528.14	106	31	23	43	2.08	
60	1832.11	3662.15	88	29	22	35	1.75	
61	1868.09	3734.08	36	25	21	31	1.61 a	
62	1875.03	3747.96	40	21	16	24	1.72 b	
63	1911.13	3820.12	28	21	17	23	1.37	

GDR/PC Analytical Technologies, Inc. Fort Collins, CO Ver. 6.02a

BACKGROUND SUBTRACT RESULTS

Sample ID : 94-11-164-04 LANL CS:94.18560-3

Bkg File: . . . . . DET04.BKG | Counting Start. 12-02-94 15:00
ID.:. . . . . MCA READ | Current Date 12-02-94 18:13

PK#	ENERGY (keV)	FWHM (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	NEW NET COUNTS	NEW UN-CERTAINTY	FLAG
1	63.20	0.87	29557	513	29534	514	
4	92.51	1.06	110526	832	110473	832	
5	94.57	1.19	11039	535	11039	535	
14	185.67	1.06	71517	588	71472	589	
18	238.57	0.91	1086	168	1040	171	
22	351.90	1.13	809	129	783	132	
24	510.95	2.17	361	116	115	123	
25	569.48	1.64	165	92	147	95	
26	583.26	1.47	503	96	481	99	
27	609.42	1.10	350	90	328	94	
41	911.53	1.47	247	61	235	64	
53	1461.07	1.96	1483	81	1449	83	

GDR/PC Analytical Technologies, Inc. Fort Collins, CO Ver. 6.02a

NUCLIDE ACTIVITY SUMMARY

Sample ID: 94-11-164-04 LANL CS:94.18560-3

Sample Size . . . . . 1.92e+002 gram	Spectrum File GDR04.SPC
Sampling Start. 07-25-94 12:00	Counting Start. 12-02-94 15:00
Sampling Stop 07-25-94 12:00	Buildup Time. . . . . 0.00e+000 Hrs
Current Date. 12-02-94 18:13	Decay Time. . . . . 3.12e+003 Hrs
Efficiency File. DET0410.EFF	Library File. . . . . .LANL.LIB
ID. . . . . .200g Geometry 10	ID. . . . . .LANL Gamma Library

Eff.= 1/[1.31e-002*En^-3.01e+000 + 8.52e+001*En^8.73e-001] 10-29-94 10:56

Gamma Fraction Limit >= . . . 75.00 %	Decay Limit <=. . . . 8.000 Halflives
Library Energy Tolerance. . . 2.00	

FINAL ACTIVITY REPORT

Nuclide	Energy (keV)	Conc +- 2.00sigma (pCi/gram)	Halflife (hrs)	Peaks Found
Am-241	59.54	8.35e-002 +-5.50e-001	3.79e+006	NET
Ce-144	133.54	-1.54e+000 +-6.27e-001	6.82e+003	NET
Np-237	311.98	1.34e-002 +-7.66e-002	1.87e+010	NET
Ba-140	537.32	8.94e+001 +-1.49e+002	3.07e+002	NET
Ru-106	621.84	-1.17e-001 +-4.62e-001	8.84e+003	NET
Cs-137	661.65	2.65e-002 +-4.27e-002	2.64e+005	NET
Co-60	1173.22	1.14e-002 +-3.62e-002	4.62e+004	NET
Na-22	1274.54	-1.18e-002 +-3.18e-002	2.28e+004	NET
Eu-152	1407.95	1.78e-001 +-1.46e-001	1.19e+005	NET
TOTAL:		0.00e+000 pCi/gram		

UNKNOWN PEAKS

Energy (keV)	Centroid Channel	Net Counts	Un-Certainty	C.L. Counts	Bkg. Counts	FWHM (keV)	Net Gamma/sec
63.20	125.78	29534	514	325	16727	0.87	1.684e+002
84.01	167.38	5075	532	452	28205	0.90	1.535e+001
89.95	179.25	5006	672	645	31235	1.19	1.345e+001
92.51	184.37	110473	832	463	22899	1.06	2.840e+002
94.57	188.49	11039	535	461	21313	1.19	2.747e+001
98.37	196.09	16908	449	328	13622	0.95	3.987e+001
105.37	210.09	1641	427	402	14212	1.16	3.571e+000
109.04	217.42	4039	497	461	18611	1.66	8.502e+000
111.10	221.54	7332	453	387	16333	1.38	1.518e+001
112.77	224.87	6425	350	266	11115	0.84	1.314e+001
114.50	228.33	2865	430	390	15423	1.48	5.795e+000
143.76	286.82	13386	372	256	9084	0.94	2.504e+001
163.32	325.94	6553	311	234	7545	0.95	1.[illegible]

185.67	370.61	71472	589	215	6371	1.06	1.435e+002
194.97	389.20	838	207	175	4220	1.38	1.727e+000
202.00	403.26	1354	218	189	3937	1.14	2.849e+000
205.25	409.76	5979	232	150	3386	0.96	1.270e+001
238.57	476.37	1040	171	132	2759	0.91	2.443e+000
258.22	515.65	1576	181	147	2649	1.04	3.927e+000
295.07	589.33	292	148	130	2066	0.86	8.066e-001
338.31	675.78	238	118	101	1396	0.97	7.368e-001
351.90	702.94	783	132	105	1352	1.13	2.503e+000
510.95	1020.91	115	123	103	1067	2.17	5.061e-001
569.48	1137.93	147	95	80	780	1.64	7.107e-001
583.26	1165.46	481	99	79	682	1.47	2.376e+000
609.42	1217.77	328	94	74	677	1.10	1.679e+000
727.53	1453.89	84	60	51	344	0.77	5.029e-001
733.26	1465.34	121	88	81	605	1.61	7.300e-001
739.96	1478.75	121	88	83	565	1.51	7.328e-001
742.90	1484.61	845	95	69	525	1.48	5.149e+000
766.57	1531.94	3293	142	78	616	1.49	2.062e+001
786.34	1571.47	465	90	73	592	1.32	2.979e+000
825.56	1649.87	53	58	52	282	1.01	3.562e-001
860.82	1720.37	71	69	64	349	1.33	4.930e-001
880.67	1760.04	158	57	48	243	1.26	1.118e+000
883.18	1765.07	131	65	57	313	1.51	9.262e-001
911.53	1821.74	235	64	49	242	1.47	1.711e+000
922.18	1843.02	103	52	45	195	1.33	7.593e-001
926.18	1851.03	198	67	59	282	1.89	1.459e+000
946.26	1891.17	297	59	45	207	1.45	2.233e+000
969.20	1937.03	178	56	46	208	1.31	1.366e+000
979.92	1958.47	56	45	39	172	1.48	4.369e-001
1001.25	2001.11	7082	174	42	174	1.55	5.597e+001
1120.54	2239.59	101	49	42	166	1.25	8.806e-001
1194.10	2386.64	102	45	37	139	1.35	9.370e-001
1237.92	2474.25	94	45	39	130	2.32	8.941e-001
1378.26	2754.81	33	34	32	79	6.63	3.412e-001
1435.14	2868.52	43	33	30	65	1.88	4.653e-001
1461.07	2920.37	1449	83	25	56	1.96	1.593e+001
1510.61	3019.41	125	34	25	45	1.78	1.415e+000
1554.21	3106.58	43	29	25	49	1.39	4.989e-001
1738.04	3474.08	108	30	20	35	1.62	1.386e+000
1765.08	3528.14	106	31	23	43	2.08	1.373e+000
1832.11	3662.15	88	29	22	35	1.75	1.179e+000
1868.09	3734.08	36	25	21	31	1.61	4.868e-001
1875.03	3747.96	40	21	16	24	1.72	5.422e-001
1911.13	3820.12	28	21	17	23	1.37	3.821e-001

GDR_C Analytical Technologies, Inc. Fort Collins, CO Version 6.2

Sample ID : 94-11-164-05 LANL CS:94.18561-3

Sample Size	1.38e+002 gram	Spectrum File	GDR06.SPC
Sampling Start.	07-25-94 12:00	Counting Start.	12-02-94 15:02
Sampling Stop	07-25-94 12:00	Live Time	10800 Sec
Current Date.	12-02-94 18:12	Real Time	10815 Sec

Detector #: 6

Energy(keV)= 1.55 + 0.499*Ch + 0.00e+000*Ch^2 + 0.00e+000*Ch^3 12-02-94 08:41

FWHM(keV) = 0.77 + 0.020*En + 2.23e-004*En^2 + 0.00e+000*En^3 08-26-93 09:16
Where En = Sqrt(Energy in keV)

Sensitivity	0.20	Search Start / End.	30 / 4000
Sigma Multiplier.	2.00		

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.38	123.78	51	79	68	639	0.58	NET < CL
2	74.76	146.57	400	94	78	695	1.05	a
3	77.02	151.08	614	88	62	599	0.94	b
4	84.04	165.15	127	84	77	557	1.02	a
5	87.16	171.40	217	72	58	475	0.93	b
6	89.96	177.00	162	68	54	462	0.86	c
7	92.87	182.83	311	90	78	578	1.20	d
8	129.17	255.49	94	69	58	463	1.18	
9	186.04	369.36	273	77	64	453	1.29	
10	198.40	394.10	83	73	67	447	1.47	
11	209.07	415.46	132	69	60	400	0.97	
12	238.57	474.53	1493	95	51	289	1.09	a
13	241.35	480.08	300	79	68	410	1.74	b
14	270.41	538.27	101	60	53	305	1.34	
15	295.22	587.95	327	67	54	248	1.35	a
16	299.97	597.45	59	52	46	233	1.24	b
17	328.40	654.37	82	53	46	233	1.05	
18	338.33	674.26	299	60	45	227	1.55	
19	351.89	701.40	434	64	44	234	1.25	
20	410.06	817.86	18	48	43	208	0.63	NET < CL
21	462.89	923.62	66	41	34	140	1.12	
22	510.94	1019.83	363	60	44	194	2.14	
23	557.58	1113.21	36	45	41	154	1.42	NET < CL
24	583.26	1164.62	368	60	43	183	1.42	
25	609.42	1216.98	431	58	37	141	1.55	
26	727.61	1453.61	69	41	35	133	0.99	
27	794.79	1588.12	67	36	31	88	2.31	
28	803.44	1605.44	28	33	29	92	0.97	NET < CL
29	835.41	1669.45	7	31	27	92	0.35	NET < CL
30	860.71	1720.10	88	38	31	88	1.55	
31	911.44	1821.65	326	46	27	72	1.92	
32	964.68	1928.25	48	39	35	93	1.79	a
33	969.05	1937.00	130	40	31	89	1.54	b

34	1120.57	2240.36	98	36	28	77	2.30	
35	1378.18	2756.11	18	23	20	40	0.91	NET < CL
36	1461.08	2922.07	1224	74	23	43	1.84	
37	1587.95	3176.07	7	20	18	33	2.76	NET < CL
38	1764.58	3529.70	63	23	16	21	1.59	

GDR/PC Analytical Technologies, Inc. Fort Collins, CO Ver. 6.02a

BACKGROUND SUBTRACT RESULTS

Sample ID : 94-11-164-05 LANL CS:94.18561-3

Bkg File:	DET06.BKG	Counting Start.	12-02-94 15:02
ID.:.	MCA READ	Current Date	12-02-94 18:12

PK#	ENERGY (keV)	FWHM (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	NEW NET COUNTS	NEW UN-CERTAINTY	FLAG
1	63.38	0.58	51	79	51	79	NET < CL
7	92.87	1.20	311	90	291	90	
9	186.04	1.29	273	77	255	79	
10	198.40	1.47	83	73	58	77	NET < CL
12	238.57	1.09	1493	95	1491	95	
13	241.35	1.74	300	79	300	79	
19	351.89	1.25	434	64	424	65	
22	510.94	2.14	363	60	117	72	
23	557.58	1.42	36	45	32	45	NET < CL
24	583.26	1.42	368	60	343	65	
25	609.42	1.55	431	58	413	64	
28	803.44	0.97	28	33	-1	39	NET < CL
31	911.44	1.92	326	46	314	49	
36	1461.08	1.84	1224	74	1222	74	

GDR/PC Analytical Technologies, Inc. Fort Collins, CO Ver. 6.02a

NUCLIDE ACTIVITY SUMMARY

Sample ID: 94-11-164-05 LANL CS:94.18561-3

Sample Size . . . . . 1.38e+002 gram	Spectrum File GDR06.SPC
Sampling Start. 07-25-94 12:00	Counting Start. 12-02-94 15:02
Sampling Stop 07-25-94 12:00	Buildup Time. . . . . 0.00e+000 Hrs
Current Date. 12-02-94 18:12	Decay Time. . . . . 3.12e+003 Hrs
Efficiency File. DET0610.EFF	Library File. . . . . .LANL.lib
ID. . . . . .200g sand/poly jar	ID. . . . . .LANL Gamma Library

Eff.= 1/[4.05e-003*En^-3.44e+000 + 9.05e+001*En^8.12e-001] 08-08-94 11:29

Gamma Fraction Limit >= . . . 75.00 %	Decay Limit <=. . . . 8.000 Halflives
Library Energy Tolerance. . . 2.00	

FINAL ACTIVITY REPORT

Nuclide	Energy (keV)	Conc +- 2.00sigma (pCi/gram)	Halflife (hrs)	Peaks Found
Am-241	59.54	1.20e-001 +-1.66e-001	3.79e+006	1 of 1
Ce-144	133.54	-1.67e-003 +-1.86e-001	6.82e+003	NET
Np-237	311.98	-1.80e-002 +-4.93e-002	1.87e+010	NET
Ba-140	537.32	8.07e+001 +-8.89e+001	3.07e+002	NET
Ru-106	621.84	-8.73e-002 +-3.86e-001	8.84e+003	NET
Cs-137	661.65	-1.11e-002 +-3.50e-002	2.64e+005	NET
Co-60	1173.22	-1.88e-002 +-4.10e-002	4.62e+004	NET
Na-22	1274.54	-2.34e-003 +-4.23e-002	2.28e+004	NET
Eu-152	1407.95	1.14e-001 +-1.86e-001	1.19e+005	NET
TOTAL:		1.20e-001 pCi/gram		

UNKNOWN PEAKS

Energy (keV)	Centroid Channel	Net Counts	Un-Certainty	C.L. Counts	Bkg. Counts	FWHM (keV)	Net Gamma/sec
74.76	146.57	400	94	78	695	1.05	1.521e+000
77.02	151.08	614	88	62	599	0.94	2.183e+000
84.04	165.15	127	84	77	557	1.02	3.783e-001
87.16	171.40	217	72	58	475	0.93	6.075e-001
89.96	177.00	162	68	54	462	0.86	4.317e-001
92.87	182.83	291	90	78	578	1.20	7.386e-001
129.17	255.49	94	69	58	463	1.18	1.901e-001
186.04	369.36	255	79	64	453	1.29	5.757e-001
209.07	415.46	132	69	60	400	0.97	3.212e-001
238.57	474.53	1491	95	51	289	1.09	3.980e+000
241.35	480.08	300	79	68	410	1.74	8.084e-001
270.41	538.27	101	60	53	305	1.34	2.961e-001
295.22	587.95	327	67	54	248	1.35	1.024e+000

299.97	597.45	59	52	46	233	1.24	1.862e-001
328.40	654.37	82	53	46	233	1.05	2.785e-001
338.33	674.26	299	60	45	227	1.55	1.045e+000
351.89	701.40	424	65	44	234	1.25	1.528e+000
462.89	923.62	66	41	34	140	1.12	2.941e-001
510.94	1019.83	117	72	44	194	2.14	5.673e-001
583.26	1164.62	343	65	43	183	1.42	1.855e+000
609.42	1216.98	413	64	37	141	1.55	2.315e+000
727.61	1453.61	69	41	35	133	0.99	4.446e-001
794.79	1588.12	67	36	31	88	2.31	4.660e-001
860.71	1720.10	88	38	31	88	1.55	6.530e-001
911.44	1821.65	314	49	27	72	1.92	2.437e+000
964.68	1928.25	48	39	35	93	1.79	3.889e-001
969.05	1937.00	130	40	31	89	1.54	1.065e+000
1120.57	2240.36	98	36	28	77	2.30	9.009e-001
1461.08	2922.07	1222	74	23	43	1.84	1.393e+001
1764.58	3529.70	63	23	16	21	1.59	8.373e-001

GDR_C Analytical Technologies, Inc. Fort Collins, CO Version 6.2

Sample ID : 94-11-164-06 LANL CS:94.20311-2

Sample Size	1.71e+002 gram	Spectrum File	GDR07.SPC
Sampling Start.	07-06-94 12:00	Counting Start.	12-02-94 15:13
Sampling Stop	07-06-94 12:00	Live Time	10800 Sec
Current Date.	12-02-94 18:18	Real Time	10864 Sec

Detector #: 7

Energy(keV)= -0.03 + 0.500*Ch + 1.60e-007*Ch^2 + 0.00e+000*Ch^3 12-02-94 09:01

FWHM(keV) = 0.51 + 0.022*En + 3.95e-004*En^2 + 0.00e+000*En^3 10-31-94 19:16
Where En = Sqrt(Energy in keV)

Sensitivity	0.20	Search Start / End.	70 / 4000
Sigma Multiplier.	2.00		

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.24	126.58	537	86	60	663	0.91	
2	74.75	149.60	829	98	69	688	0.69	a
3	77.04	154.19	1277	101	60	639	0.76	b
4	84.00	168.10	147	78	68	541	0.83	a
5	87.13	174.37	386	85	66	612	0.91	b
6	89.85	179.81	265	79	61	591	0.85	c
7	92.72	185.55	760	93	68	570	1.00	d
8	105.69	211.50	49	71	61	517	0.59	NET < CL
9	128.56	257.24	92	69	58	471	0.74	
10	143.83	287.79	-4	67	60	489	0.07	NET < CL
11	185.87	371.86	354	67	47	349	0.95	
12	209.10	418.33	143	59	47	309	1.10	
13	238.53	477.19	1518	95	50	275	0.92	a
14	241.26	482.66	286	68	56	306	1.48	b
15	270.13	540.38	101	56	46	288	0.88	
16	277.41	554.96	67	49	41	229	1.01	
17	295.22	590.58	353	60	41	233	1.10	
18	327.72	655.57	56	42	34	177	0.93	
19	338.30	676.73	288	58	43	225	1.09	
20	351.85	703.83	502	65	43	222	1.02	
21	409.74	819.57	52	46	40	177	0.91	
22	463.08	926.22	87	46	38	160	1.16	
23	510.86	1021.77	336	59	43	185	2.28	
24	558.30	1116.60	10	42	39	156	0.42	NET < CL
25	583.25	1166.48	444	56	33	123	1.44	
26	609.45	1218.86	402	54	33	135	1.21	
27	651.72	1303.35	1	24	20	72	0.16	NET < CL
28	665.62	1331.15	33	36	32	110	1.92	
29	727.40	1454.62	92	37	29	92	1.50	
30	767.53	1534.83	32	43	40	139	0.98	NET < CL
31	794.81	1589.37	49	37	33	100	6.39	
32	803.60	1606.91	17	34	31	94	0.89	NET < CL
33	860.46	1720.56	72	33	26	70	1.38	

34	904.47	1808.50	12	25	21	61	1.63	NET < CL
35	911.21	1821.97	245	45	30	90	1.27	
36	964.79	1929.03	48	31	27	64	1.50 a	
37	969.04	1937.53	149	42	33	85	2.06 b	
38	1120.37	2239.88	84	37	30	84	1.41	
39	1237.78	2474.42	29	34	31	86	17.03	NET < CL
40	1377.39	2753.26	19	20	17	29	1.38	
41	1460.89	2919.99	1007	68	23	44	1.83	
42	1588.58	3174.95	13	20	17	29	0.81	NET < CL
43	1729.54	3456.36	22	17	13	16	1.34	
44	1765.05	3527.25	53	24	18	26	2.25	

GDR/PC Analytical Technologies, Inc. Fort Collins, CO Ver. 6.02a

BACKGROUND SUBTRACT RESULTS

Sample ID : 94-11-164-06 LANL CS:94.20311-2

Bkg File: . . . . . DET07.BKG | Counting Start. 12-02-94 15:13
ID.:. . . . . MCA READ | Current Date 12-02-94 18:18

PK#	ENERGY (keV)	FWHM (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	NEW NET COUNTS	NEW UN-CERTAINTY	FLAG
1	63.24	0.91	537	86	459	92	
7	92.72	1.00	760	93	672	101	
11	185.87	0.95	354	67	304	74	
13	238.53	0.92	1518	95	1480	100	
20	351.85	1.02	502	65	478	71	
23	510.86	2.28	336	59	115	70	
24	558.30	0.42	10	42	-13	49	NET < CL
25	583.25	1.44	444	56	426	61	
32	803.60	0.89	17	34	-6	39	NET < CL
35	911.21	1.27	245	45	236	48	
41	1460.89	1.83	1007	68	977	70	

GDR/PC Analytical Technologies, Inc. Fort Collins, CO Ver. 6.02a

NUCLIDE ACTIVITY SUMMARY

Sample ID: 94-11-164-06 LANL CS:94.20311-2

Sample Size	1.71e+002 gram	Spectrum File	GDR07.SPC
Sampling Start.	07-06-94 12:00	Counting Start.	12-02-94 15:13
Sampling Stop	07-06-94 12:00	Buildup Time.	0.00e+000 Hrs
Current Date.	12-02-94 18:18	Decay Time.	3.58e+003 Hrs

Efficiency File.	.DET0710.EFF	Library File.	.Lanl.lib
ID.	200 g sand/poly jar	ID.	.LANL Gamma Library

Eff.= 1/[3.40e-001*En^-1.26e+000 + 9.48e+001*En^9.72e-001] 08-08-94 13:33

Gamma Fraction Limit >= . . .	75.00 %	Decay Limit <=. . . .	8.000 Halflives
Library Energy Tolerance. . .	2.00		

FINAL ACTIVITY REPORT

Nuclide	Energy (keV)	Conc +- 2.00sigma (pCi/gram)	Halflife (hrs)	Peaks Found
Ru-106	621.84	2.45e-001 +-2.68e-001	8.84e+003	1 of 2
Am-241	59.54	5.91e-003 +-3.23e-002	3.79e+006	NET
Ce-144	133.54	5.01e-002 +-1.09e-001	6.82e+003	NET
Np-237	311.98	-1.62e-003 +-3.23e-002	1.87e+010	NET
Ba-140	537.32	-3.37e+001 +-6.93e+001	3.07e+002	NET
Cs-137	661.65	-7.96e-003 +-2.13e-002	2.64e+005	NET
Co-60	1173.22	2.57e-003 +-3.68e-002	4.62e+004	NET
Na-22	1274.54	-2.94e-003 +-3.55e-002	2.28e+004	NET
Eu-152	1407.95	1.82e-001 +-1.55e-001	1.19e+005	NET
TOTAL:		2.45e-001 pCi/gram		

UNKNOWN PEAKS

Energy (keV)	Centroid Channel	Net Counts	Un-Certainty	C.L. Counts	Bkg. Counts	FWHM (keV)	Net Gamma/sec
63.24	126.58	459	92	60	663	0.91	7.478e-001
74.75	149.60	829	98	69	688	0.69	1.276e+000
77.04	154.19	1277	101	60	639	0.76	1.952e+000
84.00	168.10	147	78	68	541	0.83	2.226e-001
87.13	174.37	386	85	66	612	0.91	5.814e-001
89.85	179.81	265	79	61	591	0.85	3.983e-001
92.72	185.55	672	101	68	570	1.00	1.011e+000
128.56	257.24	92	69	58	471	0.74	1.491e-001
185.87	371.86	304	74	47	349	0.95	6.000e-001
209.10	418.33	143	59	47	309	1.10	3.058e-001
238.53	477.19	1480	100	50	275	0.92	3.507e+000
241.26	482.66	286	68	56	306	1.48	6.841e-001
270.13	540.38	101	56	46	288	0.88	2.649e-001

277.41	554.96	67	49	41	229	1.01	1.788e-001
295.22	590.58	353	60	41	233	1.10	9.968e-001
327.72	655.57	56	42	34	177	0.93	1.723e-001
338.30	676.72	288	58	43	225	1.09	9.166e-001
351.85	703.83	478	71	43	222	1.02	1.575e+000
409.74	819.57	52	46	40	177	0.91	1.979e-001
463.08	926.22	87	46	38	160	1.16	3.667e-001
510.86	1021.77	115	70	43	185	2.28	5.328e-001
583.25	1166.48	426	61	33	123	1.44	2.238e+000
609.45	1218.85	402	54	33	135	1.21	2.203e+000
665.62	1331.15	33	36	32	110	1.92	1.967e-001
727.40	1454.62	92	37	29	92	1.50	5.989e-001
794.81	1589.36	49	37	33	100	6.39	3.460e-001
860.46	1720.56	72	33	26	70	1.38	5.511e-001
911.21	1821.97	236	48	30	90	1.27	1.901e+000
964.79	1929.03	48	31	27	64	1.50	4.056e-001
969.04	1937.53	149	42	33	85	2.06	1.272e+000
1120.37	2239.88	84	37	30	84	1.41	8.254e-001
1377.39	2753.26	19	20	17	29	1.38	2.240e-001
1460.89	2919.99	977	70	23	44	1.83	1.241e+001
1729.54	3456.36	22	17	13	16	1.34	3.292e-001
1765.05	3527.25	53	24	18	26	2.25	8.138e-001

GDR_C Analytical Technologies, Inc. Fort Collins, CO Version 6.2

Sample ID : 94-11-164-07 LANL CS:94.20312-2

Sample Size	1.53e+002 gram	Spectrum File	GDR08.SPC
Sampling Start.	07-20-94 12:00	Counting Start.	12-02-94 15:14
Sampling Stop	07-20-94 12:00	Live Time	10800 Sec
Current Date.	12-02-94 18:20	Real Time	10864 Sec

Detector #: 8

Energy(keV)= 0.55 + 0.499*Ch + 2.17e-007*Ch^2 + 0.00e+000*Ch^3 12-02-94 08:37

FWHM(keV) = 0.37 + 0.043*En + 0.00e+000*En^2 + 0.00e+000*En^3 11-16-93 15:26
Where En = Sqrt(Energy in keV)

Sensitivity	0.20	Search Start / End.	70 / 4000
Sigma Multiplier.	2.00		

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.52	92.11	346	119	97	1481	0.75	
2	63.39	125.91	4858	195	116	2133	0.79	
3	74.96	149.10	842	167	141	2503	0.84	a
4	77.25	153.69	1159	145	106	2042	0.81	b
5	84.20	167.61	489	165	145	2429	0.91	a
6	87.20	173.61	212	103	74	1448	0.39	b
7	90.11	179.46	303	107	76	1514	0.40	c
8	92.72	184.69	8113	247	154	2755	0.90	d
9	98.67	196.61	1300	160	129	2033	0.84	
10	112.97	225.24	92	100	77	1316	0.27	
11	143.81	287.03	659	100	74	861	0.76	
12	163.26	326.00	252	93	77	825	0.86	
13	185.79	371.14	4033	150	70	684	0.96	
14	205.39	410.38	304	86	72	590	0.86	a
15	209.39	418.40	87	65	52	463	0.73	b
16	238.66	477.02	1551	101	57	410	0.98	a
17	241.65	483.01	296	89	77	589	1.61	b
18	258.11	515.98	-14	63	56	433	0.25	NET < CL
19	270.27	540.34	114	67	57	402	1.05	
20	277.26	554.34	60	50	39	286	0.97	
21	295.21	590.28	352	68	52	300	0.97	a
22	300.25	600.39	96	60	50	325	1.08	b
23	338.37	676.73	285	65	50	303	1.43	
24	352.00	704.01	687	77	52	302	1.17	
25	409.53	819.21	67	52	44	240	1.54	
26	463.20	926.69	68	49	42	218	1.14	
27	510.96	1022.31	423	70	54	272	1.89	
28	558.25	1116.97	46	52	48	212	0.79	NET < CL
29	583.36	1167.23	463	65	46	213	1.26	
30	609.53	1219.63	447	67	49	237	1.44	
31	661.78	1324.21	374	59	41	182	1.49	
32	727.07	1454.87	98	44	36	134	1.25	
33	743.11	1486.97	50	40	34	126	5.17	

34	766.51	1533.80	144	52	44	193	1.42	
35	786.10	1573.00	20	41	38	143	0.72	NET < CL
36	795.43	1591.66	31	41	37	134	0.82	NET < CL
37	860.63	1722.13	37	33	28	93	1.18	
38	911.16	1823.22	290	50	35	110	1.58	
39	934.28	1869.48	31	35	31	99	0.91	NET < CL
40	969.24	1939.41	92	45	38	145	1.46	
41	1001.14	2003.22	393	50	29	78	1.87	
42	1120.29	2241.53	93	38	32	85	1.77	
43	1238.41	2477.74	24	39	36	108	1.28	NET < CL
44	1377.61	2756.03	19	26	24	44	1.51	NET < CL
45	1460.99	2922.69	1303	77	26	54	2.25	
46	1510.08	3020.81	18	25	23	40	0.68	NET < CL
47	1730.04	3460.31	8	21	20	30	2.02	NET < CL
48	1764.87	3529.89	81	25	16	20	2.43	

GDR/PC Analytical Technologies, Inc. Fort Collins, CO Ver. 6.02a

BACKGROUND SUBTRACT RESULTS

Sample ID : 94-11-164-07 LANL CS:94.20312-2

Bkg File: . . . . . DET08.BKG | Counting Start. 12-02-94 15:14
ID.:. . . . . MCA READ | Current Date 12-02-94 18:20

PK#	ENERGY (keV)	FWHM (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	NEW NET COUNTS	NEW UN-CERTAINTY	FLAG
1	46.52	0.75	346	119	218	124	
2	63.39	0.79	4858	195	4767	198	
3	74.96	0.84	842	167	798	172	
4	77.25	0.81	1159	145	1110	150	
8	92.72	0.90	8113	247	7969	250	
13	185.79	0.96	4033	150	3978	154	
16	238.66	0.98	1551	101	1482	108	
21	295.21	0.97	352	68	341	72	
24	352.00	1.17	687	77	647	85	
27	510.96	1.89	423	70	117	82	
28	558.25	0.79	46	52	9	60	NET < CL
29	583.36	1.26	463	65	437	71	
30	609.53	1.44	447	67	420	75	
38	911.16	1.58	290	50	264	54	
45	1460.99	2.25	1303	77	1257	79	
48	1764.87	2.43	81	25	73	28	

GDR/PC Analytical Technologies, Inc. Fort Collins, CO Ver. 6.02a

NUCLIDE ACTIVITY SUMMARY

Sample ID: 94-11-164-07 LANL CS:94.20312-2

Sample Size . . . . . 1.53e+002 gram	Spectrum File GDR08.SPC
Sampling Start. 07-20-94 12:00	Counting Start. 12-02-94 15:14
Sampling Stop 07-20-94 12:00	Buildup Time. . . . . 0.00e+000 Hrs
Current Date. 12-02-94 18:20	Decay Time. . . . . 3.24e+003 Hrs
Efficiency File. DET0810.EFF	Library File. . . . . .lanl.lib
ID. . . . . 200 g sand/poly jar	ID. . . . . .LANL Gamma Library

Eff.= 1/[1.80e-001*En^-1.45e+000 + 7.66e+001*En^9.11e-001] 06-24-94 11:43

Gamma Fraction Limit >= . . . 75.00 %	Decay Limit <=. . . . 8.000 Halflives
Library Energy Tolerance. . . 2.00	

FINAL ACTIVITY REPORT

Nuclide	Energy (keV)	Conc +- 2.00sigma (pCi/gram)	Halflife (hrs)	Peaks Found
Cs-137	661.65	3.84e-001 +-6.01e-002	2.64e+005	1 of 1
Am-241	59.54	-4.59e-003 +-5.70e-002	3.79e+006	NET
Ce-144	133.54	-4.11e-002 +-1.57e-001	6.82e+003	NET
Np-237	311.98	1.01e-002 +-4.27e-002	1.87e+010	NET
Ba-140	537.32	3.84e+001 +-9.20e+001	3.07e+002	NET
Ru-106	621.84	4.31e-002 +-3.02e-001	8.84e+003	NET
Co-60	1173.22	3.30e-002 +-3.51e-002	4.62e+004	NET
Na-22	1274.54	1.17e-002 +-3.48e-002	2.28e+004	NET
Eu-152	1407.95	9.28e-002 +-1.28e-001	1.19e+005	NET
TOTAL:		3.84e-001 pCi/gram		

UNKNOWN PEAKS

Energy (keV)	Centroid Channel	Net Counts	Un-Certainty	C.L. Counts	Bkg. Counts	FWHM (keV)	Net Gamma/sec
46.52	92.11	218	124	97	1481	0.75	4.087e-001
63.39	125.91	4767	198	116	2133	0.79	7.135e+000
74.96	149.10	798	172	141	2503	0.84	1.111e+000
77.25	153.69	1110	150	106	2042	0.81	1.532e+000
84.20	167.61	489	165	145	2429	0.91	6.631e-001
87.20	173.61	212	103	74	1448	0.39	2.857e-001
90.11	179.46	303	107	76	1514	0.40	4.070e-001
92.72	184.69	7969	250	154	2755	0.90	1.071e+001
98.67	196.61	1300	160	129	2033	0.84	1.748e+000
112.97	225.24	92	100	77	1316	0.27	1.264e-001
143.81	287.03	659	100	74	861	0.76	9.840e-001
163.26	326.00	252	93	77	825	0.86	4.013e-001
185.79	371.14	3978	154	70	684	0.96	6.861e+000

205.39	410.38	304	86	72	590	0.86	5.609e-001
209.39	418.40	87	65	52	463	0.73	1.632e-001
238.66	477.02	1482	108	57	410	0.98	3.050e+000
241.65	483.01	296	89	77	589	1.61	6.154e-001
270.27	540.34	114	67	57	402	1.05	2.584e-001
277.26	554.34	60	50	39	286	0.97	1.388e-001
295.21	590.28	341	72	52	300	0.97	8.300e-001
300.25	600.39	96	60	50	325	1.08	2.360e-001
338.37	676.73	285	65	50	303	1.43	7.767e-001
352.00	704.01	647	85	52	302	1.17	1.824e+000
409.53	819.21	67	52	44	240	1.54	2.149e-001
463.20	926.69	68	49	42	218	1.14	2.411e-001
510.96	1022.30	117	82	54	272	1.89	4.556e-001
583.36	1167.23	437	71	46	213	1.26	1.915e+000
609.53	1219.63	420	75	49	237	1.44	1.911e+000
727.07	1454.87	98	44	36	134	1.25	5.237e-001
743.11	1486.97	50	40	34	126	5.17	2.707e-001
766.51	1533.80	144	52	44	193	1.42	8.028e-001
860.63	1722.13	37	33	28	93	1.18	2.298e-001
911.16	1823.22	264	54	35	110	1.58	1.726e+000
969.24	1939.41	92	45	38	145	1.46	6.373e-001
1001.14	2003.22	393	50	29	78	1.87	2.798e+000
1120.29	2241.53	93	38	32	85	1.77	7.292e-001
1460.99	2922.69	1257	79	26	54	2.25	1.261e+001
1764.87	3529.89	73	28	16	20	2.43	8.696e-001

GDR_C Analytical Technologies, Inc. Fort Collins, CO Version 6.2

Sample ID : 94-11-164-08 LANL CS:94.20313-2

Sample Size	1.67e+002 gram	Spectrum File	GDR09.SPC
Sampling Start.	07-15-94 12:00	Counting Start.	12-02-94 15:16
Sampling Stop	07-15-94 12:00	Live Time	10800 Sec
Current Date.	12-02-94 18:21	Real Time	10865 Sec

Detector #: 9

Energy(keV)= 0.32 + 0.499*Ch + 1.65e-007*Ch^2 + 0.00e+000*Ch^3 12-02-94 08:37

FWHM(keV) = 0.95 + 0.006*En + 6.96e-004*En^2 + 0.00e+000*En^3 07-29-94 17:53
Where En = Sqrt(Energy in keV)

Sensitivity	0.20	Search Start / End.	30 / 4000
Sigma Multiplier.	2.00		

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.53	92.53	63	177	155	3333	0.28	NET < CL
2	63.28	126.06	9379	296	202	4992	1.04	
3	74.86	149.24	879	219	193	4229	0.94	a
4	77.06	153.64	1437	201	159	4005	0.86	b
5	83.94	167.42	323	215	186	4799	0.62	
6	92.60	184.75	18698	354	204	4867	1.21	
7	112.30	224.19	1128	175	146	2601	1.43	
8	143.76	287.16	1052	156	130	1873	1.13	
9	163.39	326.46	347	126	109	1461	0.94	
10	185.72	371.16	5515	195	116	1493	1.26	
11	198.25	396.23	117	104	89	1099	0.88	
12	205.29	410.33	380	108	92	971	0.94	a
13	209.13	418.01	191	92	75	869	0.84	b
14	238.60	477.00	2905	152	101	1011	1.25	a
15	241.56	482.92	653	117	97	1032	1.48	b
16	258.20	516.22	233	94	81	800	1.43	
17	270.25	540.35	147	101	90	898	1.08	
18	295.14	590.15	1042	106	78	649	1.10	a
19	300.12	600.13	101	96	88	776	1.40	b
20	327.82	655.55	140	83	72	638	1.63	
21	338.28	676.49	637	97	77	650	1.50	
22	351.94	703.82	1997	116	67	546	1.40	
23	462.66	925.39	260	82	71	502	1.73	
24	510.92	1021.95	1306	112	83	585	2.56	
25	558.51	1117.15	76	74	67	451	0.89	
26	583.23	1166.62	1081	97	67	451	1.71	
27	609.39	1218.95	1499	109	72	519	1.59	
28	661.73	1323.65	448	81	65	422	1.61	
29	727.34	1454.90	269	68	56	314	1.92	
30	742.69	1485.60	101	65	58	337	1.51	
31	766.79	1533.80	625	85	67	379	2.10	
32	786.18	1572.58	111	67	61	328	1.53	
33	795.07	1590.36	82	70	67	326	1.61	a

34	803.22	1606.67	41	67	64	349	1.40	b NET < CL
35	860.63	1721.48	79	63	58	308	1.02	
36	911.23	1822.66	748	79	54	251	1.92	
37	934.29	1868.78	86	62	57	259	1.97	
38	969.04	1938.27	355	74	61	342	2.03	
39	1001.09	2002.35	1252	90	54	226	2.31	
40	1120.45	2240.99	409	68	53	224	2.04	
41	1238.21	2476.39	161	58	50	217	2.27	
42	1378.14	2756.06	80	46	42	128	1.47	
43	1406.99	2813.73	54	45	41	135	1.64	
44	1460.90	2921.44	3099	124	54	220	2.46	
45	1729.70	3458.49	71	38	34	85	2.17	
46	1764.89	3528.78	308	52	38	103	2.00	
47	1847.73	3694.23	63	30	26	45	1.71	

GDR/PC Analytical Technologies, Inc. Fort Collins, CO Ver. 6.02a

BACKGROUND SUBTRACT RESULTS

Sample ID : 94-11-164-08 LANL CS:94.20313-2

Bkg File: . . . . . DET09.BKG | Counting Start. 12-02-94 15:16
ID.:. . . . . MCA READ | Current Date 12-02-94 18:22

PK#	ENERGY (keV)	FWHM (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	NEW NET COUNTS	NEW UN-CERTAINTY	FLAG
1	46.53	0.28	63	177	-182	192	NET < CL
2	63.28	1.04	9379	296	9242	302	
3	74.86	0.94	879	219	739	227	
4	77.06	0.86	1437	201	1186	212	
5	83.94	0.62	323	215	291	222	
6	92.60	1.21	18698	354	18443	360	
10	185.72	1.26	5515	195	5241	206	
11	198.25	0.88	117	104	-35	120	NET < CL
14	238.60	1.25	2905	152	2690	163	
15	241.56	1.48	653	117	511	126	
18	295.14	1.10	1042	106	736	118	
22	351.94	1.40	1997	116	1377	131	
24	510.92	2.56	1306	112	462	133	
25	558.51	0.89	76	74	-46	86	NET < CL
26	583.23	1.71	1081	97	965	107	
27	609.39	1.59	1499	109	1063	127	
31	766.79	2.10	625	85	612	86	
34	803.22	1.40	41	67	-28	78	NET < CL
35	860.63	1.02	79	63	41	75	NET < CL
36	911.23	1.92	748	79	708	89	
37	934.29	1.97	86	62	52	72	NET < CL
38	969.04	2.03	355	74	327	81	
39	1001.09	2.31	1252	90	1237	95	
40	1120.45	2.04	409	68	302	78	
41	1238.21	2.27	161	58	114	66	
42	1378.14	1.47	80	46	54	54	
44	1460.90	2.46	3099	124	2831	130	
45	1729.70	2.17	71	38	37	47	
46	1764.89	2.00	308	52	184	60	
47	1847.73	1.71	63	30	45	38	

GDR/PC Analytical Technologies, Inc. Fort Collins, CO Ver. 6.02a

NUCLIDE ACTIVITY SUMMARY

Sample ID: 94-11-164-08 LANL CS:94.20313-2

Sample Size	1.67e+002 gram	Spectrum File	GDR09.SPC
Sampling Start.	07-15-94 12:00	Counting Start.	12-02-94 15:16
Sampling Stop	07-15-94 12:00	Buildup Time.	0.00e+000 Hrs
Current Date.	12-02-94 18:22	Decay Time.	3.36e+003 Hrs
Efficiency File.	DET0910.EFF	Library File.	LANL.LIB
ID.	200 g Sand	ID.	LANL Gamma Library

Eff.= 1/[2.56e-002*En^-2.26e+000 + 3.61e+001*En^6.84e-001] 11-03-94 12:40

Gamma Fraction Limit >= . . .	75.00 %	Decay Limit <=. . . .	8.000 Halflives
Library Energy Tolerance. . .	2.00		

FINAL ACTIVITY REPORT

Nuclide	Energy (keV)	Conc +- 2.00sigma (pCi/gram)	Halflife (hrs)	Peaks Found
Cs-137	661.65	2.17e-001 +-3.93e-002	2.64e+005	1 of 1
Am-241	59.54	5.10e-003 +-1.07e-001	3.79e+006	NET
Ce-144	133.54	-1.70e-001 +-1.62e-001	6.82e+003	NET
Np-237	311.98	-4.95e-003 +-3.28e-002	1.87e+010	NET
Ba-140	537.32	0.00e+000 +-6.26e+001	3.07e+002	NET
Ru-106	621.84	9.37e-002 +-2.32e-001	8.84e+003	NET
Co-60	1173.22	1.54e-002 +-2.27e-002	4.62e+004	NET
Na-22	1274.54	-7.31e-003 +-2.26e-002	2.28e+004	NET
Eu-152	1407.95	1.78e-001 +-1.11e-001	1.19e+005	NET
TOTAL:		2.17e-001 pCi/gram		

UNKNOWN PEAKS

Energy (keV)	Centroid Channel	Net Counts	Un-Certainty	C.L. Counts	Bkg. Counts	FWHM (keV)	Net Gamma/sec
63.28	126.06	9242	302	202	4992	1.04	1.593e+001
74.86	149.24	739	227	193	4229	0.94	1.035e+000
77.06	153.64	1186	212	159	4005	0.86	1.612e+000
83.94	167.42	291	222	186	4799	0.62	3.660e-001
92.60	184.75	18443	360	204	4867	1.21	2.160e+001
112.30	224.19	1128	175	146	2601	1.43	1.220e+000
143.76	287.16	1052	156	130	1873	1.13	1.133e+000
163.39	326.46	347	126	109	1461	0.94	3.852e-001
185.72	371.16	5241	206	116	1493	1.26	6.095e+000
205.29	410.33	380	108	92	971	0.94	4.622e-001
209.13	418.01	191	92	75	869	0.84	2.339e-001
238.60	477.00	2690	163	101	1011	1.25	3.535e+000
241.56	482.92	511	126	97	1032	1.48	6.767e-001

258.20	516.22	233	94	81	800	1.43	3.194e-001
270.25	540.35	147	101	90	898	1.08	2.069e-001
295.14	590.15	736	118	78	649	1.10	1.094e+000
300.12	600.13	101	96	88	776	1.40	1.514e-001
327.82	655.55	140	83	72	638	1.63	2.214e-001
338.28	676.49	637	97	77	650	1.50	1.031e+000
351.94	703.82	1377	131	67	546	1.40	2.287e+000
462.66	925.39	260	82	71	502	1.73	5.155e-001
510.92	1021.95	462	133	83	585	2.56	9.799e-001
583.23	1166.62	965	107	67	451	1.71	2.237e+000
609.39	1218.95	1063	127	72	519	1.59	2.539e+000
727.34	1454.90	269	68	56	314	1.92	7.227e-001
742.69	1485.60	101	65	58	337	1.51	2.748e-001
766.79	1533.80	612	86	67	379	2.10	1.707e+000
786.18	1572.58	111	67	61	328	1.53	3.147e-001
795.07	1590.36	82	70	67	326	1.61	2.344e-001
911.23	1822.66	708	89	54	251	1.92	2.220e+000
969.04	1938.27	327	81	61	342	2.03	1.070e+000
1001.09	2002.35	1237	95	54	226	2.31	4.137e+000
1120.45	2240.99	302	78	53	224	2.04	1.091e+000
1238.21	2476.40	114	66	50	217	2.27	4.422e-001
1378.14	2756.06	54	54	42	128	1.47	2.226e-001
1406.99	2813.73	54	45	41	135	1.64	2.265e-001
1460.90	2921.44	2831	130	54	220	2.46	1.226e+001
1729.70	3458.49	37	47	34	85	2.17	1.798e-001
1764.89	3528.78	184	60	38	103	2.00	9.073e-001
1847.73	3694.23	45	38	26	45	1.71	2.305e-001

GDR_C Analytical Technologies, Inc. Fort Collins, CO Version 6.2

Sample ID : 94-11-164-09 LANL CS:94.20314-2

Sample Size	1.73e+002 gram	Spectrum File	GDR10.SPC
Sampling Start.	.06-30-94 12:00	Counting Start.	12-02-94 15:18
Sampling Stop	.06-30-94 12:00	Live Time	10800 Sec
Current Date.	.12-02-94 18:23	Real Time	10865 Sec

Detector #: 10

Energy(keV)= 0.53 + 0.500*Ch + 2.31e-007*Ch^2 + 0.00e+000*Ch^3 12-02-94 08:37

FWHM(keV) = 0.73 + 0.025*En + 3.81e-004*En^2 + 0.00e+000*En^3 08-26-94 10:33
Where En = Sqrt(Energy in keV)

Sensitivity	0.20	Search Start / End.	30 / 4000
Sigma Multiplier.	2.00		

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.43	125.81	1443	154	118	1929	1.12	
2	75.00	148.96	944	154	129	1909	1.13	a
3	77.29	153.53	1392	141	103	1607	0.96	b
4	84.22	167.39	222	130	113	1675	0.84	a
5	87.31	173.57	215	109	85	1406	0.51	b
6	92.83	184.61	3350	186	133	2058	1.35	
7	98.82	196.59	195	120	106	1368	1.13	
8	112.64	224.23	115	121	107	1412	0.88	
9	129.16	257.27	111	105	91	1136	0.92	
10	139.99	278.93	108	95	83	886	0.93	a
11	143.97	286.89	285	106	90	1046	1.10	b
12	163.41	325.77	40	95	83	955	0.53	NET < CL
13	185.90	370.75	1731	127	87	923	1.36	
14	198.74	396.42	163	104	91	1020	1.20	
15	209.54	418.01	254	107	94	987	1.01	
16	238.71	476.35	3021	148	93	854	1.20	a
17	241.60	482.12	617	116	98	955	1.55	b
18	270.70	540.30	210	99	89	796	1.42	
19	277.48	553.86	96	77	66	601	1.28	
20	295.30	589.50	865	106	84	646	1.19	a
21	300.23	599.35	153	70	57	480	0.87	b
22	327.96	654.79	134	87	77	652	1.13	
23	338.37	675.61	629	95	74	607	1.43	
24	351.96	702.76	1447	107	68	576	1.35	
25	409.41	817.60	78	80	73	543	2.08	
26	463.18	925.08	219	83	74	502	1.68	
27	511.06	1020.77	1232	105	74	510	2.45	
28	558.34	1115.27	114	66	58	368	1.23	
29	583.25	1165.04	1194	98	66	404	1.74	
30	609.50	1217.49	1269	109	78	560	1.68	
31	661.76	1321.91	799	89	65	420	1.41	
32	727.39	1453.02	297	76	65	358	1.90	
33	767.46	1533.07	160	74	67	384	2.94	

000080

34	786.42	1570.95	92	65	60	301	2.76	
35	795.24	1588.57	113	66	60	310	1.20	
36	860.18	1718.28	136	69	64	320	2.36	
37	911.18	1820.13	776	79	54	268	1.82	
38	934.43	1866.55	66	65	62	301	1.38	
39	964.78	1927.17	144	72	68	306	1.85	a
40	969.01	1935.62	439	71	55	268	1.69	b
41	1001.16	1999.81	259	65	53	262	1.62	
42	1120.17	2237.41	254	70	60	306	1.60	
43	1238.23	2473.06	115	66	61	312	2.25	
44	1377.85	2751.69	61	49	45	166	1.26	
45	1460.95	2917.50	5536	162	63	264	2.15	
46	1588.50	3171.92	42	45	42	138	1.64	
47	1620.86	3236.46	30	32	30	67	3.98	
48	1631.15	3256.98	37	30	27	57	1.63	a
49	1637.72	3270.10	17	27	24	54	1.51	b NET < CL
50	1661.76	3318.03	45	36	33	71	5.54	
51	1730.11	3454.34	100	38	32	72	1.92	
52	1764.83	3523.57	258	50	38	101	2.21	
53	1847.67	3688.72	68	33	29	54	3.63	

GDR/PC Analytical Technologies, Inc. Fort Collins, CO Ver. 6.02a

BACKGROUND SUBTRACT RESULTS

Sample ID : 94-11-164-09 LANL CS:94.20314-2

Bkg File: . . . . . DET10.BKG | Counting Start. 12-02-94 15:18
ID.:. . . . . MCA READ | Current Date 12-02-94 18:23

PK#	ENERGY (keV)	FWHM (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	NEW NET COUNTS	NEW UN-CERTAINTY	FLAG
1	63.43	1.12	1443	154	1299	170	
6	92.83	1.35	3350	186	3108	196	
10	139.99	0.93	108	95	17	103	NET < CL
11	143.97	1.10	285	106	237	120	
13	185.90	1.36	1731	127	1539	140	
14	198.74	1.20	163	104	-7	119	NET < CL
16	238.71	1.20	3021	148	2813	159	
20	295.30	1.19	865	106	819	117	
24	351.96	1.35	1447	107	1338	117	
27	511.06	2.45	1232	105	314	128	
28	558.34	1.23	114	66	-18	80	NET < CL
29	583.25	1.74	1194	98	1075	109	
30	609.50	1.68	1269	109	1134	125	
37	911.18	1.82	776	79	718	87	
40	969.01	1.69	439	71	417	76	
41	1001.16	1.62	259	65	241	71	
45	1460.95	2.15	5536	162	5291	166	
52	1764.83	2.21	258	50	212	56	

GDR/PC Analytical Technologies, Inc. Fort Collins, CO Ver. 6.02a

NUCLIDE ACTIVITY SUMMARY

Sample ID: 94-11-164-09 LANL CS:94.20314-2

Sample Size . . . . . 1.73e+002 gram	Spectrum File GDR10.SPC
Sampling Start. 06-30-94 12:00	Counting Start. 12-02-94 15:18
Sampling Stop 06-30-94 12:00	Buildup Time. . . . . 0.00e+000 Hrs
Current Date. 12-02-94 18:23	Decay Time. . . . . 3.72e+003 Hrs
Efficiency File. DET1010.EFF	Library File. . . . . .LANL.LIB
ID. . . . . 200 g sand/poly jar	ID. . . . . .LANL Gamma Library

Eff.= 1/[9.88e-003*En^-2.71e+000 + 3.37e+001*En^6.62e-001] 10-27-94 10:59

Gamma Fraction Limit >= . . . 75.00 %	Decay Limit <=. . . . 8.000 Halflives
Library Energy Tolerance. . . 2.00	

FINAL ACTIVITY REPORT

Nuclide	Energy (keV)	Conc +- 2.00sigma (pCi/gram)	Halflife (hrs)	Peaks Found
Cs-137	661.65	3.52e-001 +-3.93e-002	2.64e+005	1 of 1
Am-241	59.54	-4.13e-002 +-8.07e-002	3.79e+006	NET
Ce-144	133.54	-7.01e-002 +-1.30e-001	6.82e+003	NET
Np-237	311.98	-7.91e-004 +-2.86e-002	1.87e+010	NET
Ba-140	537.32	9.31e+000 +-5.43e+001	3.07e+002	NET
Ru-106	621.84	1.46e-002 +-2.17e-001	8.84e+003	NET
Co-60	1173.22	5.55e-003 +-2.23e-002	4.62e+004	NET
Na-22	1274.54	-1.09e-002 +-2.29e-002	2.28e+004	NET
Eu-152	1407.95	-7.33e-003 +-1.01e-001	1.19e+005	NET
TOTAL:		3.52e-001 pCi/gram		

UNKNOWN PEAKS

Energy (keV)	Centroid Channel	Net Counts	Un-Certainty	C.L. Counts	Bkg. Counts	FWHM (keV)	Net Gamma/sec
63.43	125.81	1299	170	118	1929	1.12	2.742e+000
75.00	148.96	944	154	129	1909	1.13	1.494e+000
77.29	153.53	1392	141	103	1607	0.96	2.109e+000
84.22	167.39	222	130	113	1675	0.84	3.003e-001
87.31	173.57	215	109	85	1406	0.51	2.796e-001
92.83	184.61	3108	196	133	2058	1.35	3.792e+000
98.82	196.59	195	120	106	1368	1.13	2.259e-001
112.64	224.23	115	121	107	1412	0.88	1.231e-001
129.16	257.27	111	105	91	1136	0.92	1.154e-001
143.97	286.89	237	120	90	1046	1.10	2.464e-001
185.90	370.75	1539	140	87	923	1.36	1.711e+000
209.54	418.01	254	107	94	987	1.01	2.982e-001
238.71	476.35	2813	159	93	854	1.20	3.527e+000

241.60	482.12	617	116	98	955	1.55	7.785e-001
270.70	540.30	210	99	89	796	1.42	2.831e-001
277.48	553.86	96	77	66	601	1.28	1.307e-001
295.30	589.50	819	117	84	646	1.19	1.161e+000
300.23	599.35	153	70	57	480	0.87	2.197e-001
327.96	654.79	134	87	77	652	1.13	2.030e-001
338.37	675.61	629	95	74	607	1.43	9.699e-001
351.96	702.76	1338	117	68	576	1.35	2.114e+000
409.41	817.60	78	80	73	543	2.08	1.362e-001
463.18	925.08	219	83	74	502	1.68	4.125e-001
511.06	1020.77	314	128	74	510	2.45	6.306e-001
583.25	1165.04	1075	109	66	404	1.74	2.354e+000
609.50	1217.49	1134	125	78	560	1.68	2.556e+000
727.39	1453.02	297	76	65	358	1.90	7.508e-001
767.46	1533.07	160	74	67	384	2.94	4.184e-001
786.42	1570.95	92	65	60	301	2.76	2.448e-001
795.24	1588.57	113	66	60	310	1.20	3.039e-001
860.18	1718.28	136	69	64	320	2.36	3.856e-001
911.18	1820.13	718	87	54	268	1.82	2.110e+000
934.43	1866.56	66	65	62	301	1.38	1.972e-001
964.78	1927.17	144	72	68	306	1.85	4.397e-001
969.01	1935.62	417	76	55	268	1.69	1.275e+000
1001.16	1999.81	241	71	53	262	1.62	7.536e-001
1120.17	2237.42	254	70	60	306	1.60	8.539e-001
1238.23	2473.06	115	66	61	312	2.25	4.139e-001
1377.85	2751.69	61	49	45	166	1.26	2.363e-001
1460.95	2917.50	5291	166	63	264	2.15	2.125e+001
1588.50	3171.92	42	45	42	138	1.64	1.797e-001
1620.86	3236.46	30	32	30	67	3.98	1.302e-001
1631.15	3256.98	37	30	27	57	1.63	1.605e-001
1661.76	3318.03	45	36	33	71	5.54	1.975e-001
1730.11	3454.34	100	38	32	72	1.92	4.492e-001
1764.83	3523.57	212	56	38	101	2.21	9.634e-001
1847.67	3688.72	68	33	29	54	3.63	3.198e-001

GDR_C Analytical Technologies, Inc. Fort Collins, CO Version 6.2

Sample ID : 94-11-164-10 LANL CS:94.20315-2

Sample Size . . . . . 1.23e+002 gram	Spectrum File GDR11.SPC
Sampling Start. 06-28-94 12:00	Counting Start. 12-02-94 16:26
Sampling Stop 06-28-94 12:00	Live Time . . . . . 10800 Sec
Current Date. 12-02-94 19:31	Real Time . . . . . 11927 Sec

Detector #: 11

Energy(keV)= 0.26 + 0.500*Ch + 0.00e+000*Ch^2 + 0.00e+000*Ch^3 12-02-94 10:07

FWHM(keV) = 0.59 + 0.016*En + 4.98e-004*En^2 + 0.00e+000*En^3 11-16-94 13:53
Where En = Sqrt(Energy in keV)

Sensitivity 0.20	Search Start / End. . . . . 100 / 4000
Sigma Multiplier. 2.00	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.89	149.27	267	89	75	652	0.84 a	
2	77.12	153.73	466	77	52	508	0.71 b	
3	87.14	173.77	160	67	53	432	0.66 a	
4	90.02	179.53	140	52	35	323	0.40 b	
5	92.99	185.47	235	84	71	595	1.06 c	
6	99.13	197.76	82	76	67	551	1.21	
7	129.21	257.92	54	63	53	439	0.70	
8	185.97	371.43	277	73	57	447	1.12	
9	209.29	418.07	98	62	50	401	0.71	
10	238.71	476.92	1709	103	56	369	0.99 a	
11	241.72	482.94	310	75	60	436	1.24 b	
12	270.50	540.49	113	56	45	284	1.12	
13	277.36	554.21	31	56	49	325	0.40	NET < CL
14	295.38	590.26	452	69	49	275	1.00 a	
15	300.14	599.77	89	62	55	315	1.19 b	
16	328.33	656.16	88	64	57	326	0.89	
17	338.42	676.34	345	61	42	247	1.17	
18	352.07	703.64	768	74	44	243	1.22	
19	409.74	818.97	51	51	45	223	1.28	
20	463.32	926.15	86	46	38	177	1.05	
21	511.01	1021.52	456	66	47	220	1.68	
22	583.19	1165.88	643	61	32	113	1.64	
23	609.27	1218.04	551	65	41	185	1.34	
24	727.15	1453.80	126	43	35	121	1.61	
25	768.50	1536.51	34	45	41	156	0.95	NET < CL
26	795.05	1589.61	73	42	37	124	1.29	
27	803.29	1606.09	38	35	30	98	1.47	
28	860.81	1721.13	9	41	38	145	0.21	NET < CL
29	911.32	1822.15	387	49	27	73	1.48	
30	964.71	1928.93	79	41	35	101	1.62 a	
31	969.09	1937.69	233	45	32	93	1.79 b	
32	1120.91	2241.34	156	41	32	79	1.73	
33	1229.22	2457.97	10	27	23	72	2.50	NET < CL

34	1237.74	2475.00	34	35	31	95	1.28	
35	1377.84	2755.21	42	28	25	43	1.61	
36	1461.11	2921.75	1196	74	26	53	1.94	
37	1630.18	3259.88	12	19	17	26	0.96	NET < CL
38	1764.51	3528.55	105	28	18	25	1.95	
39	1847.17	3693.88	9	20	18	31	1.28	NET < CL

GDR/PC Analytical Technologies, Inc. Fort Collins, CO Ver. 6.02a

BACKGROUND SUBTRACT RESULTS

Sample ID : 94-11-164-10 LANL CS:94.20315-2

Bkg File: . . . . . DET11.BKG | Counting Start. 12-02-94 16:26
ID.:. . . . . MCA READ | Current Date 12-02-94 19:31

PK#	ENERGY (keV)	FWHM (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	NEW NET COUNTS	NEW UN-CERTAINTY	FLAG
5	92.99	1.06	235	84	164	92	
8	185.97	1.12	277	73	215	83	
10	238.71	0.99	1709	103	1623	110	
18	352.07	1.22	768	74	708	82	
21	511.01	1.68	456	66	146	80	
22	583.19	1.64	643	61	606	67	
23	609.27	1.34	551	65	511	73	
27	803.29	1.47	38	35	-8	43	NET < CL
36	1461.11	1.94	1196	74	1124	77	
38	1764.51	1.95	105	28	94	31	

GDR/PC Analytical Technologies, Inc. Fort Collins, CO Ver. 6.02a

NUCLIDE ACTIVITY SUMMARY

Sample ID: 94-11-164-10 LANL CS:94.20315-2

Sample Size . . . . . 1.23e+002 gram	Spectm File GDR11.SPC
Sampling Start. 06-28-94 12:00	Counting Start. 12-02-94 16:26
Sampling Stop 06-28-94 12:00	Buildup Time. . . . . 0.00e+000 Hrs
Current Date. 12-02-94 19:31	Decay Time. . . . . 3.77e+003 Hrs
Efficiency File. DET1110.EFF	Library File. . . . . .LANL.LIB
ID. . . . . 200 g sand/poly jar	ID. . . . . .LANL Gamma Library

Eff.= 1/[6.87e-004*En^-4.29e+000 + 6.55e+001*En^7.37e-001] 11-18-94 10:17

Gamma Fraction Limit >= . . . 75.00 %	Decay Limit <=. . . . 8.000 Halflives
Library Energy Tolerance. . . 2.00	

FINAL ACTIVITY REPORT

Nuclide	Energy (keV)	Conc +- 2.00sigma (pCi/gram)	Halflife (hrs)	Peaks Found
Ce-144	133.54	1.56e-001 +-1.80e-001	6.82e+003	1 of 1
Am-241	59.54	6.01e-002 +-2.81e-001	3.79e+006	NET
Np-237	311.98	-6.86e-003 +-4.29e-002	1.87e+010	NET
Ba-140	537.32	2.19e+001 +-8.65e+001	3.07e+002	NET
Ru-106	621.84	7.74e-002 +-3.19e-001	8.84e+003	NET
Cs-137	661.65	4.28e-003 +-2.65e-002	2.64e+005	NET
Co-60	1173.22	-2.41e-002 +-3.53e-002	4.62e+004	NET
Na-22	1274.54	-9.54e-003 +-3.41e-002	2.28e+004	NET
Eu-152	1407.95	1.38e-001 +-1.75e-001	1.19e+005	NET
TOTAL:		1.56e-001 pCi/gram		

UNKNOWN PEAKS

Energy (keV)	Centroid Channel	Net Counts	Un-Certainty	C.L. Counts	Bkg. Counts	FWHM (keV)	Net Gamma/sec
74.89	149.27	267	89	75	652	0.84	1.390e+000
77.12	153.73	466	77	52	508	0.71	2.197e+000
87.14	173.77	160	67	53	432	0.66	5.199e-001
90.02	179.53	140	52	35	323	0.40	4.177e-001
92.99	185.47	164	92	71	595	1.06	4.516e-001
99.13	197.76	82	76	67	551	1.21	1.953e-001
129.21	257.92	54	63	53	439	0.70	9.552e-002
185.97	371.43	215	83	57	447	1.12	3.971e-001
209.29	418.07	98	62	50	401	0.71	1.924e-001
238.71	476.92	1623	110	56	369	0.99	3.476e+000
241.72	482.94	310	75	60	436	1.24	6.706e-001
270.50	540.49	113	56	45	284	1.12	2.637e-001
295.38	590.26	452	69	49	275	1.00	1.123e+000

000088

300.14	599.77	89	62	55	315	1.19	2.243e-001
328.33	656.16	88	64	57	326	0.89	2.349e-001
338.42	676.34	345	61	42	247	1.17	9.456e-001
352.07	703.64	708	82	44	243	1.22	1.995e+000
409.74	818.97	51	51	45	223	1.28	1.595e-001
463.32	926.15	86	46	38	177	1.05	2.962e-001
511.01	1021.52	146	80	47	220	1.68	5.404e-001
583.19	1165.88	606	67	32	113	1.64	2.471e+000
609.27	1218.04	511	73	41	185	1.34	2.153e+000
727.15	1453.80	126	43	35	121	1.61	6.046e-001
795.05	1589.61	73	42	37	124	1.29	3.741e-001
911.32	1822.15	387	49	27	73	1.48	2.191e+000
964.71	1928.93	79	41	35	101	1.62	4.672e-001
969.09	1937.69	233	45	32	93	1.79	1.384e+000
1120.91	2241.34	156	41	32	79	1.73	1.027e+000
1237.74	2475.00	34	35	31	95	1.28	2.390e-001
1377.84	2755.21	42	28	25	43	1.61	3.253e-001
1461.11	2921.75	1124	77	26	53	1.94	9.020e+000
1764.51	3528.55	94	31	18	25	1.95	8.666e-001

GDR_C Analytical Technologies, Inc. Fort Collins, CO Version 6.2

Sample ID : 94-11-164-11 LANL CS:94.20316-2

Sample Size	1.85e+002 gram	Spectrum File	GDR12.SPC
Sampling Start.	.06-30-94 12:00	Counting Start.	12-02-94 16:27
Sampling Stop	.06-30-94 12:00	Live Time	10800 Sec
Current Date.	.12-02-94 19:32	Real Time	11936 Sec

Detector #: 12

Energy(keV)= 0.66 + 0.499*Ch + 0.00e+000*Ch^2 + 0.00e+000*Ch^3 12-02-94 10:47

FWHM(keV) = 0.54 + 0.021*En + 3.02e-004*En^2 + 0.00e+000*En^3 07-13-94 16:35
Where En = Sqrt(Energy in keV)

Sensitivity	0.20	Search Start / End.	30 / 4000
Sigma Multiplier.	2.00		

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.88	148.62	345	91	69	844	0.61	a
2	77.08	153.02	542	100	73	972	0.75	b
3	87.16	173.19	-117	109	95	1427	1.07	NET < CL
4	92.64	184.16	2251	147	100	1302	0.99	
5	98.56	196.03	63	103	92	1034	0.53	NET < CL
6	112.86	224.67	106	76	60	661	0.91	
7	143.77	286.57	260	88	73	727	1.04	
8	163.55	326.17	122	80	68	633	0.73.	
9	185.81	370.74	1407	106	66	595	1.02	
10	205.48	410.12	130	95	88	684	1.36	a
11	209.23	417.65	144	69	57	464	0.98	b
12	238.72	476.70	1774	104	55	401	0.96	a
13	241.71	482.68	347	87	73	561	1.45	b
14	270.58	540.49	145	67	57	398	1.22	
15	277.65	554.64	69	57	47	344	0.83	
16	295.34	590.07	512	75	56	338	0.93	a
17	300.21	599.81	100	59	49	328	1.15	b
18	327.85	655.16	36	63	56	386	0.49	NET < CL
19	338.42	676.34	285	64	48	317	1.02	
20	352.02	703.56	887	79	46	264	1.32	
21	409.54	818.75	45	49	42	241	1.10	
22	463.02	925.84	106	53	44	236	1.21	
23	510.89	1021.70	534	67	44	215	2.01	
24	583.13	1166.34	575	64	39	170	1.36	
25	609.27	1218.70	678	67	39	183	1.32	
26	661.60	1323.47	771	70	40	175	1.37	
27	727.28	1454.99	129	46	37	150	1.79	
28	766.33	1533.20	44	46	41	167	1.38	a
29	768.29	1537.12	49	39	32	140	1.13	b
30	794.89	1590.39	51	35	29	101	0.88	
31	860.32	1721.39	64	39	34	114	1.23	
32	911.25	1823.38	406	53	32	105	1.51	
33	964.81	1930.63	55	36	31	92	1.05	a

34	969.22	1939.47	228	41	25	73	1.44 b	
35	1001.10	2003.29	135	42	32	106	2.09	
36	1120.40	2242.19	144	41	31	107	1.37	
37	1238.55	2478.77	77	40	34	106	1.79	
38	1377.75	2757.52	22	26	23	51	1.39	NET < CL
39	1460.95	2924.13	1964	91	20	38	1.78	
40	1588.16	3178.84	24	22	19	38	0.90	
41	1620.39	3243.38	19	21	19	30	1.31	NET < CL
42	1730.09	3463.06	19	18	15	22	1.44	
43	1764.52	3532.00	102	25	14	15	1.83	
44	1895.05	3793.38	4	13	12	13	0.63	NET < CL

GDR/PC Analytical Technologies, Inc. Fort Collins, CO Ver. 6.02a

BACKGROUND SUBTRACT RESULTS

Sample ID : 94-11-164-11 LANL CS:94.20316-2

Bkg File: . . . . . DET12.BKG | Counting Start. 12-02-94 16:27
ID.:. . . . . MCA READ | Current Date 12-02-94 19:32

PK#	ENERGY (keV)	FWHM (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	NEW NET COUNTS	NEW UN-CERTAINTY	FLAG
4	92.64	0.99	2251	147	2164	153	
9	185.81	1.02	1407	106	1317	113	
12	238.72	0.96	1774	104	1692	110	
16	295.34	0.93	512	75	493	80	
20	352.02	1.32	887	79	828	85	
23	510.89	2.01	534	67	193	80	
24	583.13	1.36	575	64	531	69	
25	609.27	1.32	678	67	628	74	
32	911.25	1.51	406	53	386	56	
36	1120.40	1.37	144	41	134	44	
39	1460.95	1.78	1964	91	1883	94	
42	1730.09	1.44	19	18	11	22	NET < CL
43	1764.52	1.83	102	25	92	28	

GDR/PC Analytical Technologies, Inc. Fort Collins, CO Ver. 6.02a

NUCLIDE ACTIVITY SUMMARY

Sample ID: 94-11-164-11 LANL CS:94.20316-2

Sample Size . . . . . 1.85e+002 gram	Spectrum File GDR12.SPC
Sampling Start. 06-30-94 12:00	Counting Start. 12-02-94 16:27
Sampling Stop 06-30-94 12:00	Buildup Time. . . . . 0.00e+000 Hrs
Current Date. 12-02-94 19:32	Decay Time. . . . . 3.72e+003 Hrs
Efficiency File. DET1210.EFF	Library File. . . . . .LANL.lib
ID. . . . . 200 g sand/poly jar	ID. . . . . .LANL Gamma Library

Eff.= 1/[1.40e-003*En^-3.94e+000 + 7.35e+001*En^7.77e-001] 10-31-94 13:59

Gamma Fraction Limit >= . . . 75.00 %	Decay Limit <=. . . . 8.000 Halflives
Library Energy Tolerance. . . 2.00	

FINAL ACTIVITY REPORT

Nuclide	Energy (keV)	Conc +- 2.00sigma (pCi/gram)	Halflife (hrs)	Peaks Found
Cs-137	661.65	6.60e-001 +-6.02e-002	2.64e+005	1 of 1
Am-241	59.54	4.84e-002 +-1.97e-001	3.79e+006	NET
Ce-144	133.54	-7.06e-003 +-1.47e-001	6.82e+003	NET
Np-237	311.98	8.03e-003 +-3.36e-002	1.87e+010	NET
Ba-140	537.32	-1.81e+001 +-7.00e+001	3.07e+002	NET
Ru-106	621.84	-1.41e-001 +-2.30e-001	8.84e+003	NET
Co-60	1173.22	-7.14e-003 +-2.52e-002	4.62e+004	NET
Na-22	1274.54	1.84e-002 +-2.82e-002	2.28e+004	NET
Eu-152	1407.95	5.65e-002 +-1.20e-001	1.19e+005	NET
TOTAL:		6.60e-001 pCi/gram		

UNKNOWN PEAKS

Energy (keV)	Centroid Channel	Net Counts	Un-Certainty	C.L. Counts	Bkg. Counts	FWHM (keV)	Net Gamma/sec
74.88	148.62	345	91	69	844	0.61	1.533e+000
77.08	153.02	542	100	73	972	0.75	2.217e+000
92.64	184.16	2164	153	100	1302	0.99	5.632e+000
112.86	224.67	106	76	60	661	0.91	2.070e-001
143.77	286.57	260	88	73	727	1.04	4.634e-001
163.55	326.17	122	80	68	633	0.73	2.228e-001
185.81	370.74	1317	113	66	595	1.02	2.556e+000
205.48	410.12	130	95	88	684	1.36	2.665e-001
209.23	417.65	144	69	57	464	0.98	2.994e-001
238.72	476.70	1692	110	55	401	0.96	3.848e+000
241.71	482.68	347	87	73	561	1.45	7.962e-001
270.58	540.49	145	67	57	398	1.22	3.596e-001
277.65	554.64	69	57	47	344	0.83	1.746e-001

295.34	590.07	493	80	56	338	0.93	1.310e+000
300.21	599.81	100	59	49	328	1.15	2.676e-001
338.42	676.34	285	64	48	317	1.02	8.380e-001
352.02	703.56	828	85	46	264	1.32	2.512e+000
409.54	818.75	45	49	42	241	1.10	1.522e-001
463.02	925.84	106	53	44	236	1.21	3.952e-001
510.89	1021.70	193	80	44	215	2.01	7.802e-001
583.13	1166.34	531	69	39	170	1.36	2.378e+000
609.27	1218.69	628	74	39	183	1.32	2.910e+000
727.28	1454.99	129	46	37	150	1.79	6.858e-001
766.33	1533.20	44	46	41	167	1.38	2.448e-001
768.29	1537.12	49	39	32	140	1.13	2.720e-001
794.89	1590.39	51	35	29	101	0.88	2.876e-001
860.32	1721.39	64	39	34	114	1.23	3.896e-001
911.25	1823.38	386	56	32	105	1.51	2.441e+000
964.81	1930.63	55	36	31	92	1.05	3.639e-001
969.23	1939.47	228	41	25	73	1.44	1.512e+000
1001.10	2003.29	135	42	32	106	2.09	9.198e-001
1120.40	2242.19	134	44	31	107	1.37	9.988e-001
1238.55	2478.77	77	40	34	106	1.79	6.189e-001
1460.95	2924.13	1883	94	20	38	1.78	1.720e+001
1588.16	3178.84	24	22	19	38	0.90	2.307e-001
1764.52	3532.00	92	28	14	15	1.83	9.688e-001

GDR_C Analytical Technologies, Inc. Fort Collins, CO Version 6.2

Sample ID : 94-11-164-12 LANL CS:94.20320-2

Sample Size . . . . . 1.57e+002 gram	Spectrum File . . \gdr\spc\s1116412.94s
Sampling Start. 07-24-94 12:00	Counting Start. 12-03-94 18:41
Sampling Stop 07-24-94 12:00	Live Time . . . . . 10800 Sec
Current Date. 12-19-94 17:02	Real Time . . . . . 11823 Sec

Detector #: 11

Energy(keV)= 0.25 + 0.500*Ch + 0.00e+000*Ch^2 + 0.00e+000*Ch^3 12-03-94 16:15

FWHM(keV) = 0.59 + 0.016*En + 4.98e-004*En^2 + 0.00e+000*En^3 11-16-94 13:53
Where En = Sqrt(Energy in keV)

Sensitivity 0.20	Search Start / End. . . . . 100 / 4000
Sigma Multiplier. 2.00	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.80	149.10	286	81	63	618	0.71	a
2	77.12	153.75	510	82	57	591	0.74	b
3	87.24	174.00	37	82	69	755	0.26	NET < CL
4	92.85	185.22	219	88	73	710	0.89	
5	185.96	371.46	454	83	64	504	1.44	
6	209.31	418.17	141	68	56	435	0.78	
7	238.70	476.97	1917	110	60	436	0.97	a
8	241.61	482.77	348	87	73	581	1.40	b
9	270.43	540.43	203	68	57	355	1.55	
10	277.78	555.12	140	58	46	299	1.71	
11	295.29	590.14	532	68	44	249	0.94	a
12	300.23	600.03	108	50	39	226	0.82	b
13	328.05	655.69	62	51	41	268	1.17	
14	338.44	676.46	375	72	56	348	1.13	
15	351.96	703.52	954	83	51	288	1.13	
16	409.45	818.51	6	52	46	264	0.14	NET < CL
17	462.97	925.56	69	55	50	248	0.99	
18	510.87	1021.38	528	65	42	193	1.80	
19	583.12	1165.89	665	65	35	153	1.27	
20	609.19	1218.04	677	69	42	197	1.41	
21	727.13	1453.95	126	49	41	167	1.26	
22	743.35	1486.39	-15	47	47	173	0.86	NET < CL
23	768.34	1536.38	37	33	29	93	1.11	a
24	772.22	1544.14	46	41	37	125	1.78	b
25	795.24	1590.19	75	37	31	97	1.52	
26	802.76	1605.24	-1	34	30	113	0.02	NET < CL
27	860.41	1720.55	57	37	31	105	1.14	
28	911.20	1822.14	434	51	27	75	1.57	
29	934.03	1867.81	25	36	32	105	1.77	NET < CL
30	964.81	1929.38	76	34	27	78	1.09	a
31	968.93	1937.62	262	48	33	101	1.67	b
32	1120.36	2240.53	137	46	38	124	1.86	
33	1238.49	2476.81	83	39	34	91	2.00	

34	1377.95	2755.78	36	28	25	52	2.11	
35	1460.97	2921.83	1411	79	24	50	1.81	
36	1587.59	3175.11	21	28	26	52	3.08	NET < CL
37	1630.53	3261.00	26	20	17	23	1.47	
38	1729.61	3459.19	23	21	17	26	0.98	
39	1764.61	3529.20	131	28	16	21	2.73	
40	1847.17	3694.35	10	22	20	32	1.25	NET < CL

GDR/PC Analytical Technologies, Inc. Fort Collins, CO Ver. 6.02a

BACKGROUND SUBTRACT RESULTS

Sample ID : 94-11-164-12 LANL CS:94.20320-2

Bkg File: . . . . . DET11.BKG | Counting Start. 12-03-94 18:41
ID.:. . . . . MCA READ | Current Date 12-19-94 17:03

PK#	ENERGY (keV)	FWHM (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	NEW NET COUNTS	NEW UN-CERTAINTY	FLAG
4	92.85	0.89	219	88	148	95	
5	185.96	1.44	454	83	392	92	
7	238.70	0.97	1917	110	1831	117	
15	351.96	1.13	954	83	894	90	
18	510.87	1.80	528	65	218	79	
19	583.12	1.27	665	65	628	70	
20	609.19	1.41	677	69	637	77	
26	802.77	0.02	-1	34	-47	42	NET < CL
35	1460.97	1.81	1411	79	1339	82	
39	1764.61	2.73	131	28	120	32	

GDR/PC Analytical Technologies, Inc. Fort Collins, CO Ver. 6.02a

NUCLIDE ACTIVITY SUMMARY

Sample ID: 94-11-164-12 LANL CS:94.20320-2

Sample Size . . . . . 1.57e+002 gram	Spectrum File . . \gdr\spc\s1116412.94s
Sampling Start. 07-24-94 12:00	Counting Start. 12-03-94 18:41
Sampling Stop 07-24-94 12:00	Buildup Time. . . . . 0.00e+000 Hrs
Current Date. 12-19-94 17:03	Decay Time. . . . . 3.17e+003 Hrs
Efficiency File. DET1110.EFF	Library File. . . . . .lanl.lib
ID. . . . . 200 g sand/poly jar	ID. . . . . .LANL Gamma Library

Eff.= 1/[6.87e-004*En^-4.29e+000 + 6.55e+001*En^7.37e-001] 11-18-94 10:17

Gamma Fraction Limit >= . . . 75.00 %	Decay Limit <=. . . . 8.000 Halflives
Library Energy Tolerance. . . 2.00	

FINAL ACTIVITY REPORT

Nuclide	Energy (keV)	Conc +- 2.00sigma (pCi/gram)	Halflife (hrs)	Peaks Found
Na-22	1274.54	2.55e-002 +-2.56e-002	2.28e+004	1 of 1
Am-241	59.54	-1.06e-001 +-2.19e-001	3.79e+006	NET
Ce-144	133.54	1.91e-002 +-1.36e-001	6.82e+003	NET
Np-237	311.98	5.76e-003 +-3.27e-002	1.87e+010	NET
Ba-140	537.32	1.09e+001 +-6.86e+001	3.07e+002	NET
Ru-106	621.84	1.30e-001 +-2.40e-001	8.84e+003	NET
Cs-137	661.65	4.41e-003 +-2.17e-002	2.64e+005	NET
Co-60	1173.22	2.07e-002 +-2.76e-002	4.62e+004	NET
Eu-152	1407.95	5.64e-002 +-1.16e-001	1.19e+005	NET
TOTAL:		2.55e-002 pCi/gram		

UNKNOWN PEAKS

Energy (keV)	Centroid Channel	Net Counts	Un-Certainty	C.L. Counts	Bkg. Counts	FWHM (keV)	Net Gamma/sec
74.80	149.10	286	81	63	618	0.71	1.495e+000
77.12	153.75	510	82	57	591	0.74	2.402e+000
92.85	185.22	148	95	73	710	0.89	4.080e-001
185.96	371.46	392	92	64	504	1.44	7.229e-001
209.31	418.17	141	68	56	435	0.78	2.784e-001
238.70	476.97	1831	117	60	436	0.97	3.923e+000
241.61	482.77	348	87	73	581	1.40	7.517e-001
270.43	540.43	203	68	57	355	1.55	4.736e-001
277.78	555.12	140	58	46	299	1.71	3.336e-001
295.29	590.14	532	68	44	249	0.94	1.322e+000
300.23	600.03	108	50	39	226	0.82	2.706e-001
328.05	655.69	62	51	41	268	1.17	1.651e-001
338.44	676.46	375	72	56	348	1.13	1.026e+000

351.96	703.52	894	90	51	288	1.13	2.518e+000
462.97	925.56	69	55	50	248	0.99	2.358e-001
510.87	1021.38	218	79	42	193	1.80	8.056e-001
583.12	1165.89	628	70	35	153	1.27	2.562e+000
609.19	1218.04	637	77	42	197	1.41	2.685e+000
727.13	1453.95	126	49	41	167	1.26	6.054e-001
768.34	1536.38	37	33	29	93	1.11	1.850e-001
772.22	1544.14	46	41	37	125	1.78	2.299e-001
795.24	1590.19	75	37	31	97	1.52	3.836e-001
860.41	1720.55	57	37	31	105	1.14	3.096e-001
911.20	1822.15	434	51	27	75	1.57	2.461e+000
964.81	1929.38	76	34	27	78	1.09	4.490e-001
968.93	1937.61	262	48	33	101	1.67	1.555e+000
1120.36	2240.53	137	46	38	124	1.86	9.006e-001
1238.49	2476.81	83	39	34	91	2.00	5.896e-001
1377.95	2755.78	36	28	25	52	2.11	2.766e-001
1460.97	2921.83	1339	82	24	50	1.81	1.074e+001
1630.53	3261.00	26	20	17	23	1.47	2.249e-001
1729.61	3459.19	23	21	17	26	0.98	2.089e-001
1764.61	3529.20	120	32	16	21	2.73	1.106e+000

GDR_C Analytical Technologies, Inc. Fort Collins, CO Version 6.2

Sample ID : 94-11-164-D2 LANL CS:Dup of 12

Sample Size	1.57e+002 gram	Spectrum File	GDR02.SPC
Sampling Start.	07-24-94 12:00	Counting Start.	12-05-94 10:02
Sampling Stop	07-24-94 12:00	Live Time	10800 Sec
Current Date.	12-05-94 13:13	Real Time	10850 Sec

Detector #: 2

Energy(keV)= -0.25 + 0.501*Ch + 0.00e+000*Ch^2 + 0.00e+000*Ch^3 12-05-94 09:20

FWHM(keV) = 0.78 + 0.009*En + 4.28e-004*En^2 + 0.00e+000*En^3 07-29-93 12:48
Where En = Sqrt(Energy in keV)

Sensitivity	0.20	Search Start / End.	30 / 4000
Sigma Multiplier.	2.00		

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.70	149.74	469	103	86	784	1.28 a	
2	77.04	154.41	749	102	78	747	1.17 b	
3	87.29	174.90	101	81	67	711	0.53	
4	129.18	258.58	55	64	53	452	0.81	
5	186.24	372.59	326	77	61	462	1.48	
6	209.46	418.97	195	69	57	399	1.21	
7	238.88	477.74	1747	115	77	478	1.51 a	
8	241.90	483.77	322	79	66	435	1.54 b	
9	277.65	555.21	20	50	42	279	0.45	NET < CL
10	295.59	591.04	371	72	58	310	1.30 a	
11	300.56	600.98	80	48	39	219	0.96 b	
12	328.01	655.81	33	50	43	253	0.69	NET < CL
13	338.65	677.08	300	63	48	279	1.37	
14	352.39	704.53	830	78	49	263	1.49	
15	410.45	820.53	32	46	40	195	0.78	NET < CL
16	463.80	927.09	103	49	42	174	1.83	
17	511.84	1023.07	376	62	45	202	2.22	
18	559.99	1119.28	18	34	29	113	0.42	NET < CL
19	571.29	1141.84	-0	41	38	158	0.02	NET < CL
20	581.86	1162.96	132	53	47	158	1.81 a	
21	584.42	1168.08	450	56	34	125	1.34 b	
22	608.20	1215.59	150	75	73	298	2.84 a	
23	610.63	1220.44	411	56	35	144	1.24 b	
24	728.94	1456.82	74	40	33	120	1.03	
25	796.63	1592.05	33	35	30	102	1.60	
26	862.15	1722.94	59	35	30	84	2.77	
27	900.65	1799.86	28	29	25	70	1.87	
28	909.65	1817.83	82	55	54	139	2.69 a	
29	913.24	1825.00	246	41	24	63	1.45 b	
30	966.85	1932.11	95	47	43	122	2.14 a	
31	970.95	1940.31	132	36	25	76	1.25 b	
32	1122.61	2243.29	63	35	29	86	1.35	
33	1241.21	2480.24	9	31	29	84	0.44	NET < CL

34	1345.46	2688.53	3	22	20	42	0.26	NET < CL
35	1381.00	2759.53	22	27	24	47	3.97	NET < CL
36	1458.38	2914.12	263	71	69	120	5.13 a	
37	1463.92	2925.18	740	59	22	39	1.85 b	
38	1469.37	2936.06	14	22	21	27	1.86 c	NET < CL
39	1732.73	3462.22	31	18	15	14	2.75	
40	1768.36	3533.41	55	25	19	34	1.22	
41	1851.14	3698.79	33	14	9	5	2.00	

GDR/PC Analytical Technologies, Inc. Fort Collins, CO Ver. 6.02a

BACKGROUND SUBTRACT RESULTS

Sample ID : 94-11-164-D2 LANL CS:Dup of 12

Bkg File: . . . . . DET02.BKG | Counting Start. 12-05-94 10:02
ID.:. . . . . MCA READ | Current Date 12-05-94 13:13

PK#	ENERGY (keV)	FWHM (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	NEW NET COUNTS	NEW UN-CERTAINTY	FLAG
5	186.24	1.48	326	77	272	84	
7	238.88	1.51	1747	115	1693	120	
14	352.39	1.49	830	78	810	83	
17	511.84	2.22	376	62	72	73	
18	559.99	0.42	18	34	18	34	NET < CL
20	581.86	1.81	132	53	128	53	
21	584.42	1.34	450	56	450	56	
22	608.20	2.84	150	75	123	80	
23	610.63	1.24	411	56	411	56	
28	909.65	2.69	82	55	76	56	

GDR/PC Analytical Technologies, Inc. Fort Collins, CO Ver. 6.02a

NUCLIDE ACTIVITY SUMMARY

Sample ID: 94-11-164-D2 LANL CS:Dup of 12

Sample Size . . . . . 1.57e+002 gram	Spectrum File GDR02.SPC
Sampling Start. 07-24-94 12:00	Counting Start. 12-05-94 10:02
Sampling Stop 07-24-94 12:00	Buildup Time. . . . . 0.00e+000 Hrs
Current Date. 12-05-94 13:13	Decay Time. . . . . 3.21e+003 Hrs
Efficiency File. DET0210.EFF	Library File. . . . . .LANL.LIB
ID. . . . . 200 g sand/poly jar	ID. . . . . .LANL Gamma Library

Eff.= 1/[3.14e-003*En^-3.55e+000 + 8.50e+001*En^8.02e-001] 08-08-94 07:28

Gamma Fraction Limit >= . . . 75.00 %	Decay Limit <=. . . . 8.000 Halflives
Library Energy Tolerance. . . 2.00	

FINAL ACTIVITY REPORT

Nuclide	Energy (keV)	Conc +- 2.00sigma (pCi/gram)		Halflife (hrs)	Peaks Found
Am-241	59.54	-3.37e-002	+-1.53e-001	3.79e+006	NET
Ce-144	133.54	-8.40e-002	+-1.70e-001	6.82e+003	NET
Np-237	311.98	4.67e-002	+-3.91e-002	1.87e+010	NET
Ba-140	537.32	2.82e+000	+-7.63e+001	3.07e+002	NET
Ru-106	621.84	-1.22e-001	+-2.54e-001	8.84e+003	NET
Cs-137	661.65	-1.54e-003	+-2.57e-002	2.64e+005	NET
Co-60	1173.22	-3.23e-003	+-3.00e-002	4.62e+004	NET
Na-22	1274.54	-1.69e-002	+-3.38e-002	2.28e+004	NET
Eu-152	1407.95	-1.80e-001	+-1.39e-001	1.19e+005	NET

TOTAL: 0.00e+000 pCi/gram

UNKNOWN PEAKS

Energy (keV)	Centroid Channel	Net Counts	Un-Certainty	C.L. Counts	Bkg. Counts	FWHM (keV)	Net Gamma/sec
74.70	149.74	469	103	86	784	1.28	1.814e+000
77.04	154.41	749	102	78	747	1.17	2.693e+000
87.29	174.90	101	81	67	711	0.53	2.787e-001
129.18	258.58	55	64	53	452	0.81	1.056e-001
186.24	372.59	272	84	61	462	1.48	5.865e-001
209.46	418.97	195	69	57	399	1.21	4.523e-001
238.88	477.74	1693	120	77	478	1.51	4.302e+000
241.90	483.77	322	79	66	435	1.54	8.252e-001
295.59	591.04	371	72	58	310	1.30	1.106e+000
300.56	600.98	80	48	39	219	0.96	2.418e-001
338.65	677.08	300	63	48	279	1.37	9.943e-001
352.39	704.53	810	83	49	263	1.49	2.769e+000
463.80	927.09	103	49	42	174	1.83	4.373e-001

511.84	1023.07	72	73	45	202	2.22	3.328e-001
581.86	1162.96	128	53	47	158	1.81	6.533e-001
584.42	1168.08	450	56	34	125	1.34	2.303e+000
608.20	1215.59	123	80	73	298	2.84	6.505e-001
610.63	1220.44	411	56	35	144	1.24	2.177e+000
728.94	1456.82	74	40	33	120	1.03	4.518e-001
796.63	1592.05	33	35	30	102	1.60	2.185e-001
862.15	1722.94	59	35	30	84	2.77	4.121e-001
900.65	1799.86	28	29	25	70	1.87	2.026e-001
909.65	1817.83	76	56	54	139	2.69	5.544e-001
913.24	1825.00	246	41	24	63	1.45	1.800e+000
966.85	1932.11	95	47	43	122	2.14	7.276e-001
970.95	1940.31	132	36	25	76	1.25	1.012e+000
1122.61	2243.29	63	35	29	86	1.35	5.424e-001
1458.38	2914.12	263	71	69	120	5.13	2.797e+000
1463.92	2925.19	740	59	22	39	1.85	7.900e+000
1732.73	3462.22	31	18	15	14	2.75	3.804e-001
1768.36	3533.41	55	25	19	34	1.22	6.836e-001
1851.14	3698.79	33	14	9	5	2.00	4.212e-001

GDR_C Analytical Technologies, Inc. Fort Collins, CO Version 6.2

Sample ID : 94-11-164-13 LANL CS:94.20321-2

Sample Size	1.58e+002 gram	Spectrum File	GDR12.SPC
Sampling Start.	.07-27-94 12:00	Counting Start.	12-03-94 18:44
Sampling Stop	.07-27-94 12:00	Live Time	10800 Sec
Current Date.	.12-03-94 21:48	Real Time	11849 Sec

Detector #: 12

Energy(keV)= 0.59 + 0.499*Ch + 0.00e+000*Ch^2 + 0.00e+000*Ch^3 12-03-94 16:36

FWHM(keV) = 0.54 + 0.021*En + 3.02e-004*En^2 + 0.00e+000*En^3 07-13-94 16:35

Where En = Sqrt(Energy in keV)

Sensitivity	0.20	Search Start / End.	30 / 4000
Sigma Multiplier.	2.00		

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	77.05	153.10	111	158	129	3059	0.28	NET < CL
2	92.51	184.05	11411	293	171	4628	0.94	
3	98.37	195.78	1842	209	172	3624	0.75	
4	111.17	221.41	803	192	170	3096	1.21 a	
5	112.76	224.60	631	138	107	2054	0.75 b	
6	143.74	286.63	384	107	82	1227	0.74	
7	163.22	325.64	273	116	98	1320	1.04	
8	185.72	370.68	2752	157	105	1356	1.02	
9	205.22	409.73	179	100	88	922	0.92 a	
10	209.29	417.89	77	72	56	637	0.52 b	
11	238.67	476.71	1593	118	79	742	0.95 a	
12	241.73	482.84	274	100	85	876	1.19 b	
13	258.36	516.14	221	84	69	664	0.99	
14	270.22	539.90	96	73	60	568	1.07	
15	295.32	590.14	357	84	69	526	0.87 a	
16	300.21	599.94	73	53	40	335	0.65 b	
17	328.12	655.82	83	80	72	575	1.23	
18	338.25	676.10	316	79	63	494	1.16	
19	351.89	703.42	755	92	68	513	1.13	
20	462.96	925.83	121	57	48	278	1.08	
21	510.78	1021.58	441	78	61	380	1.98	
22	569.31	1138.78	50	53	47	247	7.42	
23	583.10	1166.38	537	71	49	270	1.27	
24	609.27	1218.79	559	67	43	227	1.24	
25	661.57	1323.51	419	62	42	198	1.30	
26	727.33	1455.18	100	49	41	190	1.06	
27	742.63	1485.83	94	46	37	173	1.07	
28	766.62	1533.86	537	66	44	180	1.66	
29	786.42	1573.50	78	50	44	194	1.72	
30	794.72	1590.12	81	51	45	190	2.23	
31	802.68	1606.06	22	39	34	144	1.44	NET < CL
32	860.77	1722.38	69	43	38	130	1.40	
33	911.21	1823.38	333	51	33	112	1.45	

34	964.77	1930.64	46	35	29	101	0.93	a
35	968.95	1939.00	151	42	30	112	1.20	b
36	1001.06	2003.29	997	73	35	110	1.69	
37	1120.13	2241.72	88	38	31	94	1.07	
38	1238.04	2477.80	23	35	32	101	2.83	NET < CL
39	1281.97	2565.79	16	30	28	67	0.58	NET < CL
40	1378.05	2758.16	3	25	23	55	0.23	NET < CL
41	1407.63	2817.40	23	26	24	48	2.05	NET < CL
42	1460.95	2924.16	1296	75	21	41	1.71	
43	1509.18	3020.73	20	24	21	40	1.66	NET < CL
44	1587.80	3178.17	40	23	18	30	5.34	
45	1621.26	3245.15	10	18	16	27	0.87	NET < CL
46	1729.19	3461.26	17	18	15	20	1.83	
47	1737.50	3477.91	9	17	15	22	1.98	NET < CL
48	1764.72	3532.42	100	25	14	18	1.64	
49	1885.66	3774.59	5	12	10	12	2.87	NET < CL

GDR/PC Analytical Technologies, Inc. Fort Collins, CO Ver. 6.02a

BACKGROUND SUBTRACT RESULTS

Sample ID : 94-11-164-13 LANL CS:94.20321-2

Bkg File: . . . . . DET12.BKG | Counting Start. 12-03-94 18:44
ID.:. . . . . MCA READ | Current Date 12-03-94 21:48

PK#	ENERGY (keV)	FWHM (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	NEW NET COUNTS	NEW UN-CERTAINTY	FLAG
2	92.51	0.94	11411	293	11324	296	
8	185.72	1.02	2752	157	2662	161	
11	238.67	0.95	1593	118	1507	123	
15	295.32	0.87	357	84	338	88	
19	351.89	1.13	755	92	696	98	
21	510.78	1.98	441	78	100	90	
23	583.10	1.27	537	71	493	75	
24	609.27	1.24	559	67	509	74	
31	802.68	1.44	22	39	-25	48	NET < CL
33	911.21	1.45	333	51	313	54	
37	1120.13	1.07	88	38	78	40	
42	1460.95	1.71	1296	75	1215	78	
46	1729.19	1.83	17	18	9	21	NET < CL
48	1764.72	1.64	100	25	90	28	

GDR/PC Analytical Technologies, Inc. Fort Collins, CO Ver. 6.02a

NUCLIDE ACTIVITY SUMMARY

Sample ID: 94-11-164-13 LANL CS:94.20321-2

Sample Size . . . . . 1.58e+002 gram	Spectrum File GDR12.SPC
Sampling Start. 07-27-94 12:00	Counting Start. 12-03-94 18:44
Sampling Stop 07-27-94 12:00	Buildup Time. . . . . 0.00e+000 Hrs
Current Date. 12-03-94 21:48	Decay Time. . . . . 3.10e+003 Hrs
Efficiency File. DET1210.EFF	Library File. . . . . .LANL.lib
ID. . . . . 200 g sand/poly jar	ID. . . . . .LANL Gamma Library

Eff.= 1/[1.40e-003*En^-3.94e+000 + 7.35e+001*En^7.77e-001] 10-31-94 13:59

Gamma Fraction Limit >= . . . 75.00 %	Decay Limit <=. . . . 8.000 Halflives
Library Energy Tolerance. . . 2.00	

FINAL ACTIVITY REPORT

Nuclide	Energy (keV)	Conc +- 2.00sigma (pCi/gram)	Halflife (hrs)	Peaks Found
Cs-137	661.65	4.19e-001 +-6.16e-002	2.64e+005	1 of 1
Am-241	59.54	-2.13e-001 +-3.79e-001	3.79e+006	NET
Ce-144	133.54	-1.14e-001 +-2.39e-001	6.82e+003	NET
Np-237	311.98	-4.09e-004 +-4.94e-002	1.87e+010	NET
Ba-140	537.32	1.13e+001 +-8.98e+001	3.07e+002	NET
Ru-106	621.84	-2.10e-001 +-3.10e-001	8.84e+003	NET
Co-60	1173.22	-4.14e-003 +-2.72e-002	4.62e+004	NET
Na-22	1274.54	-1.96e-002 +-3.15e-002	2.28e+004	NET
Eu-152	1407.95	2.23e-001 +-1.32e-001	1.19e+005	NET

TOTAL: 4.19e-001 pCi/gram

UNKNOWN PEAKS

Energy (keV)	Centroid Channel	Net Counts	Un-Certainty	C.L. Counts	Bkg. Counts	FWHM (keV)	Net Gamma/sec
92.51	184.05	11324	296	171	4628	0.94	2.956e+001
98.37	195.78	1842	209	172	3624	0.75	4.295e+000
111.17	221.41	803	192	170	3096	1.21	1.591e+000
112.76	224.60	631	138	107	2054	0.75	1.233e+000
143.74	286.63	384	107	82	1227	0.74	6.835e-001
163.22	325.64	273	116	98	1320	1.04	4.995e-001
185.72	370.68	2662	161	105	1356	1.02	5.164e+000
205.22	409.73	179	100	88	922	0.92	3.673e-001
209.29	417.89	77	72	56	637	0.52	1.593e-001
238.67	476.71	1507	123	79	742	0.95	3.427e+000
241.73	482.84	274	100	85	876	1.19	6.295e-001
258.36	516.14	221	84	69	664	0.99	5.318e-001
270.22	539.90	96	73	60	568	1.07	2.383e-001

295.32	590.14	338	88	69	526	0.87	8.964e-001
300.21	599.94	73	53	40	335	0.65	1.961e-001
328.12	655.82	83	80	72	575	1.23	2.387e-001
338.25	676.10	316	79	63	494	1.16	9.284e-001
351.89	703.42	696	98	68	513	1.13	2.110e+000
462.96	925.83	121	57	48	278	1.08	4.513e-001
510.78	1021.58	100	90	61	380	1.98	4.021e-001
569.31	1138.79	50	53	47	247	7.42	2.213e-001
583.10	1166.38	493	75	49	270	1.27	2.208e+000
609.27	1218.79	509	74	43	227	1.24	2.356e+000
727.33	1455.18	100	49	41	190	1.06	5.316e-001
742.63	1485.82	94	46	37	173	1.07	5.052e-001
766.62	1533.86	537	66	44	180	1.66	2.974e+000
786.42	1573.50	78	50	44	194	1.72	4.387e-001
794.72	1590.12	81	51	45	190	2.23	4.613e-001
860.77	1722.38	69	43	38	130	1.40	4.181e-001
911.21	1823.38	313	54	33	112	1.45	1.983e+000
964.77	1930.64	46	35	29	101	0.93	3.064e-001
968.95	1939.00	151	42	30	112	1.20	1.006e+000
1001.06	2003.30	997	73	35	110	1.69	6.792e+000
1120.13	2241.72	78	40	31	94	1.07	5.761e-001
1460.95	2924.16	1215	78	21	41	1.71	1.110e+001
1587.80	3178.17	40	23	18	30	5.34	3.899e-001
1764.72	3532.42	90	28	14	18	1.64	9.523e-001

GDR_C Analytical Technologies, Inc. Fort Collins, CO Version 6.2

Sample ID : 94-11-164-14 LANL CS:94.20322-2

Sample Size	1.56e+002 gram	Spectrum File	GDR07.SPC
Sampling Start.	.07-25-94 12:00	Counting Start.	12-05-94 09:49
Sampling Stop	.07-25-94 12:00	Live Time	10800 Sec
Current Date.	.12-05-94 12:54	Real Time	10859 Sec

Detector #: 7

Energy(keV)= 0.26 + 0.500*Ch + 2.15e-007*Ch^2 + 0.00e+000*Ch^3 12-05-94 09:23

FWHM(keV) = 0.51 + 0.022*En + 3.95e-004*En^2 + 0.00e+000*En^3 10-31-94 19:16
Where En = Sqrt(Energy in keV)

Sensitivity	0.20	Search Start / End.	70 / 4000
Sigma Multiplier.	2.00		

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.61	92.76	235	72	54	529	0.67	
2	63.46	126.48	558	98	73	841	0.91	
3	74.99	149.57	928	107	77	822	0.76	a
4	77.27	154.13	1382	107	63	743	0.76	b
5	84.31	168.23	161	97	88	783	0.93	a
6	87.40	174.40	465	93	72	733	0.91	b
7	90.14	179.88	221	75	56	589	0.76	c
8	92.98	185.57	1025	108	80	729	1.08	d
9	99.06	197.73	80	84	74	666	0.74	
10	129.37	258.39	73	65	54	454	0.56	
11	144.18	288.03	47	74	65	527	0.67	NET < CL
12	154.41	308.49	67	62	51	415	0.76	
13	185.94	371.58	354	74	56	435	1.11	
14	209.34	418.41	103	51	38	273	0.80	
15	238.70	477.16	1674	100	52	330	0.89	a
16	241.49	482.73	281	77	64	445	1.43	b
17	270.42	540.61	137	55	43	260	1.38	
18	277.33	554.44	71	55	48	279	0.95	
19	295.24	590.26	457	64	41	237	1.12	
20	328.32	656.45	70	54	47	267	1.08	
21	338.26	676.33	328	61	44	240	1.13	
22	351.97	703.75	672	70	42	221	1.10	
23	409.38	818.60	28	42	36	177	0.88	NET < CL
24	463.29	926.41	38	44	38	182	0.68	NET < CL
25	510.87	1021.58	401	58	39	165	1.81	
26	558.59	1117.00	21	45	41	171	0.43	NET < CL
27	583.27	1166.35	459	61	39	172	1.30	
28	609.30	1218.40	488	60	37	150	1.36	
29	661.37	1322.51	107	45	38	134	1.96	
30	727.14	1454.00	73	40	34	125	1.29	
31	767.72	1535.11	22	36	32	115	0.67	NET < CL
32	785.93	1571.51	22	38	35	116	1.64	NET < CL
33	795.11	1589.85	53	36	30	100	1.55	

34	860.75	1721.05	50	35	30	90	1.40	
35	911.23	1821.94	303	47	29	86	1.61	
36	964.40	1928.19	47	40	38	99	1.92	a
37	968.88	1937.14	194	46	36	103	1.91	b
38	1000.48	2000.30	37	34	30	84	3.49	
39	1120.59	2240.27	74	36	30	90	1.46	
40	1460.85	2919.81	1204	74	25	50	1.85	
41	1588.20	3174.04	7	19	17	33	0.54	NET < CL
42	1630.57	3258.61	28	17	13	14	3.29	
43	1764.70	3526.31	57	25	19	28	1.68	
44	1847.76	3692.04	10	15	13	15	2.49	NET < CL

GDR/PC Analytical Technologies, Inc. Fort Collins, CO Ver. 6.02a

BACKGROUND SUBTRACT RESULTS

Sample ID : 94-11-164-14 LANL CS:94.20322-2

Bkg File: . . . . . DET07.BKG | Counting Start. 12-05-94 09:49
ID.:. . . . . MCA READ | Current Date 12-05-94 12:54

PK#	ENERGY (keV)	FWHM (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	NEW NET COUNTS	NEW UN-CERTAINTY	FLAG
1	46.61	0.67	235	72	128	81	
2	63.46	0.91	558	98	480	102	
8	92.98	1.08	1025	108	937	115	
13	185.94	1.11	354	74	304	81	
15	238.70	0.89	1674	100	1636	105	
22	351.97	1.10	672	70	648	75	
25	510.87	1.81	401	58	180	69	
26	558.59	0.43	21	45	-3	51	NET < CL
27	583.27	1.30	459	61	441	65	
35	911.23	1.61	303	47	294	50	
40	1460.85	1.85	1204	74	1174	76	

GDR/PC Analytical Technologies, Inc. Fort Collins, CO Ver. 6.02a

NUCLIDE ACTIVITY SUMMARY

Sample ID: 94-11-164-14 LANL CS:94.20322-2

Sample Size . . . . . 1.56e+002 gram	Spectrum File GDR07.SPC
Sampling Start. 07-25-94 12:00	Counting Start. 12-05-94 09:49
Sampling Stop 07-25-94 12:00	Buildup Time. . . . . 0.00e+000 Hrs
Current Date. 12-05-94 12:54	Decay Time. . . . . 3.19e+003 Hrs
Efficiency File. DET0710.EFF	Library File. . . . . .lanl.lib
ID. . . . . 200 g sand/poly jar	ID. . . . . .LANL Gamma Library

Eff.= 1/[3.40e-001*En^-1.26e+000 + 9.48e+001*En^9.72e-001] 08-08-94 13:33

Gamma Fraction Limit >= . . . 75.00 %	Decay Limit <=. . . . 8.000 Halflives
Library Energy Tolerance. . . 2.00	

FINAL ACTIVITY REPORT

Nuclide	Energy (keV)	Conc +- 2.00sigma (pCi/gram)	Halflife (hrs)	Peaks Found
Ru-106	621.84	2.16e-001 +-2.86e-001	8.84e+003	1 of 2
Cs-137	661.65	1.30e-001 +-5.49e-002	2.64e+005	1 of 1
Am-241	59.54	8.50e-003 +-3.65e-002	3.79e+006	NET
Ce-144	133.54	-5.09e-002 +-1.22e-001	6.82e+003	NET
Np-237	311.98	-1.77e-003 +-3.68e-002	1.87e+010	NET
Ba-140	537.32	-1.21e+001 +-8.14e+001	3.07e+002	NET
Co-60	1173.22	1.43e-002 +-4.07e-002	4.62e+004	NET
Na-22	1274.54	-1.28e-002 +-3.92e-002	2.28e+004	NET
Eu-152	1407.95	1.22e-001 +-1.64e-001	1.19e+005	NET

TOTAL: 3.46e-001 pCi/gram

UNKNOWN PEAKS

Energy (keV)	Centroid Channel	Net Counts	Un-Certainty	C.L. Counts	Bkg. Counts	FWHM (keV)	Net Gamma/sec
46.61	92.76	128	81	54	529	0.67	2.509e-001
63.46	126.48	480	102	73	841	0.91	7.806e-001
74.99	149.57	928	107	77	822	0.76	1.427e+000
77.27	154.13	1382	107	63	743	0.76	2.111e+000
84.31	168.23	161	97	88	783	0.93	2.436e-001
87.40	174.40	465	93	72	733	0.91	6.998e-001
90.14	179.88	221	75	56	589	0.76	3.329e-001
92.98	185.57	937	115	80	729	1.08	1.410e+000
99.06	197.73	80	84	74	666	0.74	1.209e-001
129.37	258.39	73	65	54	454	0.56	1.184e-001
154.41	308.49	67	62	51	415	0.76	1.174e-001
185.94	371.58	304	81	56	435	1.11	6.005e-001
209.34	418.41	103	51	38	273	0.80	2.210e-001

238.70	477.16	1636	105	52	330	0.89	3.879e+000
241.49	482.73	281	77	64	445	1.43	6.733e-001
270.42	540.61	137	55	43	260	1.38	3.596e-001
277.33	554.44	71	55	48	279	0.95	1.903e-001
295.24	590.26	457	64	41	237	1.12	1.291e+000
328.32	656.45	70	54	47	267	1.08	2.170e-001
338.26	676.33	328	61	44	240	1.13	1.045e+000
351.97	703.75	648	75	42	221	1.10	2.135e+000
510.87	1021.58	180	69	39	165	1.81	8.352e-001
583.27	1166.35	441	65	39	172	1.30	2.320e+000
609.30	1218.40	488	60	37	150	1.36	2.674e+000
727.14	1454.00	73	40	34	125	1.29	4.733e-001
795.11	1589.85	53	36	30	100	1.55	3.743e-001
860.75	1721.05	50	35	30	90	1.40	3.824e-001
911.23	1821.94	294	50	29	86	1.61	2.366e+000
964.40	1928.19	47	40	38	99	1.92	3.967e-001
968.88	1937.14	194	46	36	103	1.91	1.656e+000
1000.48	2000.30	37	34	30	84	3.49	3.259e-001
1120.59	2240.27	74	36	30	90	1.46	7.289e-001
1460.85	2919.81	1174	76	25	50	1.85	1.491e+001
1630.57	3258.61	28	17	13	14	3.29	3.957e-001
1764.70	3526.31	57	25	19	28	1.68	8.696e-001

GDR_C Analytical Technologies, Inc. Fort Collins, CO Version 6.2

Sample ID : 94-11-164-15 LANL CS:94.20323-2

Sample Size	1.78e+002 gram	Spectrum File	GDR08.SPC
Sampling Start.	07-28-94 12:00	Counting Start.	12-05-94 09:51
Sampling Stop	07-28-94 12:00	Live Time	10800 Sec
Current Date.	12-05-94 12:57	Real Time	10859 Sec

Detector #: 8

Energy(keV)= 0.76 + 0.499*Ch + 2.65e-007*Ch^2 + 0.00e+000*Ch^3 12-05-94 09:23

FWHM(keV) = 0.37 + 0.043*En + 0.00e+000*En^2 + 0.00e+000*En^3 11-16-93 15:26
Where En = Sqrt(Energy in keV)

Sensitivity	0.20	Search Start / End.	70 / 4000
Sigma Multiplier.	2.00		

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.86	92.39	403	94	73	835	0.80	
2	53.44	105.57	131	81	64	747	0.86	
3	63.55	125.84	1552	122	80	1002	0.85	
4	75.10	148.98	1021	124	96	1149	0.86	a
5	77.37	153.54	1680	119	71	917	0.80	b
6	84.41	167.64	194	108	98	981	0.88	a
7	87.43	173.69	504	102	80	927	0.92	b
8	90.17	179.18	348	86	64	751	0.73	c
9	92.95	184.75	2162	136	91	950	1.00	d
10	99.12	197.11	194	90	77	731	1.11	
11	105.58	210.05	12	82	72	707	0.20	NET < CL
12	129.16	257.31	85	70	58	527	0.75	
13	144.13	287.29	162	78	65	583	0.88	
14	185.98	371.15	797	89	61	509	1.01	
15	209.48	418.22	123	75	65	512	0.87	
16	238.78	476.91	1955	106	51	358	0.94	a
17	241.81	482.99	330	80	66	479	1.25	b
18	270.12	539.69	134	70	61	405	1.04	
19	277.80	555.06	82	61	53	341	1.00	
20	295.29	590.10	564	72	50	270	1.07	a
21	300.29	600.11	126	52	41	233	0.96	b
22	316.55	632.69	35	49	42	247	0.71	NET < CL
23	327.91	655.44	124	58	48	285	1.41	
24	338.46	676.57	336	70	55	335	1.01	
25	352.03	703.74	908	82	50	306	1.11	
26	409.37	818.57	56	51	45	225	1.28	
27	463.07	926.09	116	51	43	200	1.39	
28	511.21	1022.47	497	67	48	208	2.11	
29	558.93	1118.00	14	47	43	189	0.33	NET < CL
30	583.38	1166.93	602	67	43	170	1.32	
31	609.51	1219.24	690	70	42	197	1.37	
32	661.80	1323.88	314	59	44	196	1.28	
33	727.63	1455.62	154	47	38	133	1.72	

34	768.47	1537.34	57	45	39	156	1.42	
35	794.82	1590.06	52	40	35	125	1.39	
36	860.72	1721.91	78	41	35	114	1.78	
37	911.29	1823.07	341	54	38	130	1.41	
38	934.04	1868.58	20	37	34	114	1.10	NET < CL
39	965.13	1930.75	40	43	40	122	1.35 a	
40	969.17	1938.84	169	45	35	116	1.71 b	
41	1001.13	2002.75	58	37	32	96	1.52	
42	1120.46	2241.37	139	40	31	79	1.63	
43	1238.31	2476.98	41	39	35	116	1.36	
44	1378.12	2756.39	52	24	19	30	2.27	
45	1461.08	2922.15	1256	74	21	34	2.16	
46	1621.38	3242.38	17	20	17	26	1.60	NET < CL
47	1661.77	3323.03	2	18	17	26	0.78	NET < CL
48	1730.42	3460.13	45	21	16	15	2.34	
49	1764.98	3529.13	129	30	19	28	2.76	
50	1847.79	3694.47	30	19	15	16	2.37	

GDR/PC Analytical Technologies, Inc. Fort Collins, CO Ver. 6.02a

BACKGROUND SUBTRACT RESULTS

Sample ID : 94-11-164-15 LANL CS:94.20323-2

Bkg File: . . . . . DET08.BKG | Counting Start. 12-05-94 09:51
ID.:. . . . . MCA READ | Current Date 12-05-94 12:57

PK#	ENERGY (keV)	FWHM (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	NEW NET COUNTS	NEW UN-CERTAINTY	FLAG
1	46.86	0.80	403	94	275	101	
3	63.55	0.85	1552	122	1461	128	
4	75.10	0.86	1021	124	981	129	
5	77.37	0.80	1680	119	1631	124	
9	92.95	1.00	2162	136	2018	142	
14	185.98	1.01	797	89	742	96	
16	238.78	0.94	1955	106	1893	111	
20	295.29	1.07	564	72	551	77	
25	352.03	1.11	908	82	868	89	
28	511.21	2.11	497	67	191	79	
29	558.93	0.33	14	47	-23	55	NET < CL
30	583.38	1.32	602	67	576	72	
31	609.51	1.37	690	70	663	77	
37	911.29	1.41	341	54	315	58	
45	1461.08	2.16	1256	74	1210	76	
49	1764.98	2.76	129	30	121	32	

GDR/PC Analytical Technologies, Inc. Fort Collins, CO Ver. 6.02a

NUCLIDE ACTIVITY SUMMARY

Sample ID: 94-11-164-15 LANL CS:94.20323-2

Sample Size	1.78e+002 gram	Spectrum File	GDR08.SPC
Sampling Start.	07-28-94 12:00	Counting Start.	12-05-94 09:51
Sampling Stop	07-28-94 12:00	Buildup Time.	0.00e+000 Hrs
Current Date.	12-05-94 12:57	Decay Time.	3.12e+003 Hrs

Efficiency File.	.DET0810.EFF	Library File.	.lanl.lib
ID.	200 g sand/poly jar	ID.	.LANL Gamma Library

Eff.= 1/[1.80e-001*En^-1.45e+000 + 7.66e+001*En^9.11e-001] 06-24-94 11:43

Gamma Fraction Limit >= . . . 75.00 % | Decay Limit <=. . . . 8.000 Halflives
Library Energy Tolerance. . . 2.00

FINAL ACTIVITY REPORT

Nuclide	Energy (keV)	Conc +- 2.00sigma (pCi/gram)	Halflife (hrs)	Peaks Found
Cs-137	661.65	2.77e-001 +-5.20e-002	2.64e+005	1 of 1
Am-241	59.54	-9.53e-003 +-3.39e-002	3.79e+006	NET
Ce-144	133.54	-1.81e-002 +-1.03e-001	6.82e+003	NET
Np-237	311.98	-3.01e-003 +-3.30e-002	1.87e+010	NET
Ba-140	537.32	4.57e+001 +-7.07e+001	3.07e+002	NET
Ru-106	621.84	1.74e-001 +-2.59e-001	8.84e+003	NET
Co-60	1173.22	-2.05e-002 +-2.81e-002	4.62e+004	NET
Na-22	1274.54	-1.43e-002 +-3.34e-002	2.28e+004	NET
Eu-152	1407.95	-8.94e-002 +-1.33e-001	1.19e+005	NET

TOTAL: 2.77e-001 pCi/gram

UNKNOWN PEAKS

Energy (keV)	Centroid Channel	Net Counts	Un-Certainty	C.L. Counts	Bkg. Counts	FWHM (keV)	Net Gamma/sec
46.86	92.39	275	101	73	835	0.80	5.127e-001
53.44	105.57	131	81	64	747	0.86	2.192e-001
63.55	125.84	1461	128	80	1002	0.85	2.183e+000
75.10	148.98	981	129	96	1149	0.86	1.365e+000
77.37	153.54	1631	124	71	917	0.80	2.250e+000
84.41	167.64	194	108	98	981	0.88	2.626e-001
87.43	173.69	504	102	80	927	0.92	6.799e-001
90.17	179.18	348	86	64	751	0.73	4.683e-001
92.95	184.75	2018	142	91	950	1.00	2.711e+000
99.12	197.11	194	90	77	731	1.11	2.603e-001
129.16	257.31	85	70	58	527	0.75	1.209e-001
144.13	287.29	162	78	65	583	0.88	2.426e-001
185.98	371.15	742	96	61	509	1.01	1.280e+000

209.48	418.22	123	75	65	512	0.87	2.292e-001
238.78	476.91	1893	111	51	358	0.94	3.899e+000
241.81	482.99	330	80	66	479	1.25	6.865e-001
270.12	539.69	134	70	61	405	1.04	3.037e-001
277.80	555.06	82	61	53	341	1.00	1.889e-001
295.29	590.10	551	77	50	270	1.07	1.340e+000
300.29	600.11	126	52	41	233	0.96	3.117e-001
327.91	655.44	124	58	48	285	1.41	3.292e-001
338.46	676.57	336	70	55	335	1.01	9.159e-001
352.03	703.74	868	89	50	306	1.11	2.446e+000
409.37	818.57	56	51	45	225	1.28	1.796e-001
463.07	926.09	116	51	43	200	1.39	4.142e-001
511.21	1022.47	191	79	48	208	2.11	7.440e-001
583.38	1166.93	576	72	43	170	1.32	2.523e+000
609.51	1219.24	663	77	42	197	1.37	3.021e+000
727.63	1455.62	154	47	38	133	1.72	8.210e-001
768.47	1537.34	57	45	39	156	1.42	3.205e-001
794.82	1590.06	52	40	35	125	1.39	3.025e-001
860.72	1721.91	78	41	35	114	1.78	4.843e-001
911.29	1823.07	315	58	38	130	1.41	2.060e+000
965.13	1930.75	40	43	40	122	1.35	2.770e-001
969.17	1938.84	169	45	35	116	1.71	1.169e+000
1001.13	2002.75	58	37	32	96	1.52	4.130e-001
1120.46	2241.37	139	40	31	79	1.63	1.096e+000
1238.31	2476.98	41	39	35	116	1.36	3.540e-001
1378.12	2756.39	52	24	19	30	2.27	4.916e-001
1461.08	2922.15	1210	76	21	34	2.16	1.214e+001
1730.42	3460.13	45	21	16	15	2.34	5.261e-001
1764.98	3529.13	121	32	19	28	2.76	1.441e+000
1847.79	3694.47	30	19	15	16	2.37	3.726e-001

GDR_C Analytical Technologies, Inc. Fort Collins, CO Version 6.2

Sample ID : 94-11-164-16 LANL CS:94.20324-2

Sample Size	1.46e+002 gram	Spectrum File	GDR09.SPC
Sampling Start.	07-08-94 12:00	Counting Start.	12-05-94 09:52
Sampling Stop	07-08-94 12:00	Live Time	10800 Sec
Current Date.	12-05-94 12:58	Real Time	10859 Sec

Detector #: 9

Energy(keV)= 0.52 + 0.499*Ch + 1.92e-007*Ch^2 + 0.00e+000*Ch^3 12-05-94 09:23

FWHM(keV) = 0.95 + 0.006*En + 6.96e-004*En^2 + 0.00e+000*En^3 07-29-94 17:53
Where En = Sqrt(Energy in keV)

Sensitivity	0.20	Search Start / End.	30 / 4000
Sigma Multiplier.	2.00		

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	46.70	92.47	411	129	111	1511	1.23	
2	63.34	125.78	1151	153	124	1887	1.01	
3	75.01	149.15	1118	160	136	1892	1.24	a
4	77.26	153.66	1718	148	108	1611	1.04	b
5	84.39	167.93	113	108	91	1311	0.81	a
6	87.36	173.88	283	116	94	1483	0.72	b
7	92.88	184.94	2122	169	133	1791	1.21	
8	143.68	286.65	60	96	84	969	0.51	NET < CL
9	186.02	371.41	1188	125	96	1013	1.45	
10	198.54	396.47	174	95	82	827	1.19	
11	209.57	418.55	236	96	82	831	1.17	
12	238.69	476.85	2653	141	91	818	1.20	a
13	241.59	482.65	633	107	87	828	1.42	b
14	270.09	539.70	210	83	70	602	1.09	
15	277.64	554.80	106	93	85	726	1.24	
16	295.27	590.10	1127	107	80	591	1.29	a
17	300.13	599.82	131	81	72	568	1.21	b
18	328.17	655.95	111	86	79	620	1.51	
19	338.44	676.51	579	92	72	570	1.58	
20	352.02	703.69	1985	115	66	487	1.38	
21	463.37	926.53	121	75	67	455	1.28	
22	510.93	1021.70	1115	105	78	518	2.33	
23	558.63	1117.13	155	75	68	397	1.59	
24	583.31	1166.52	920	89	61	376	1.53	
25	609.43	1218.76	1469	104	66	442	1.51	
26	661.55	1323.05	702	83	61	342	1.65	
27	727.33	1454.63	227	68	58	310	1.56	
28	767.45	1534.88	192	71	63	340	3.50	
29	795.03	1590.03	113	53	45	207	2.29	
30	803.34	1606.65	41	50	44	234	0.77	NET < CL
31	836.02	1672.01	47	66	62	329	0.93	NET < CL
32	860.66	1721.30	128	59	52	248	1.81	
33	911.18	1822.33	753	76	50	230	1.95	

34	933.84	1867.64	76	54	50	211	1.83	
35	968.99	1937.91	320	71	59	299	1.67	
36	1001.49	2002.91	150	59	52	215	1.89	
37	1064.77	2129.41	24	60	59	253	0.82	NET < CL
38	1120.52	2240.87	322	64	50	217	2.01	
39	1238.45	2476.59	120	61	55	258	2.00	
40	1378.24	2755.96	110	46	40	120	2.72	
41	1401.27	2801.98	53	50	48	131	2.86 a	
42	1408.18	2815.80	43	45	44	121	1.93 b	NET < CL
43	1460.86	2921.06	3529	130	53	198	2.41	
44	1509.09	3017.42	23	38	35	110	3.80	NET < CL
45	1588.32	3175.70	66	41	37	100	1.69	
46	1729.41	3457.51	56	43	40	112	1.74	
47	1764.59	3527.77	326	47	30	68	2.05	
48	1847.48	3693.30	35	36	33	83	1.89	

GDR/PC Analytical Technologies, Inc. Fort Collins, CO Ver. 6.02a

BACKGROUND SUBTRACT RESULTS

Sample ID : 94-11-164-16 LANL CS:94.20324-2

Bkg File: . . . . . DET09.BKG | Counting Start. 12-05-94 09:52
ID.:. . . . . MCA READ | Current Date 12-05-94 12:58

PK#	ENERGY (keV)	FWHM (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	NEW NET COUNTS	NEW UN-CERTAINTY	FLAG
1	46.70	1.23	411	129	166	149	
2	63.34	1.01	1151	153	1014	166	
3	75.01	1.24	1118	160	950	176	
4	77.26	1.04	1718	148	1467	162	
5	84.39	0.81	113	108	87	117	NET < CL
6	87.36	0.72	283	116	225	127	
7	92.88	1.21	2122	169	1867	183	
9	186.02	1.45	1188	125	914	142	
10	198.54	1.19	174	95	22	112	NET < CL
12	238.69	1.20	2653	141	2438	153	
13	241.59	1.42	633	107	491	117	
16	295.27	1.29	1127	107	793	122	
20	352.02	1.38	1985	115	1365	130	
22	510.93	2.33	1115	105	271	127	
23	558.63	1.59	155	75	33	88	NET < CL
24	583.31	1.53	920	89	804	100	
25	609.43	1.51	1469	104	1033	123	
28	767.45	3.50	192	71	158	80	
30	803.34	0.77	41	50	-28	64	NET < CL
32	860.66	1.81	128	59	90	72	
33	911.18	1.95	753	76	713	86	
34	933.84	1.83	76	54	42	66	NET < CL
35	968.99	1.67	320	71	292	78	
36	1001.49	1.89	150	59	135	66	
38	1120.52	2.01	322	64	215	74	
39	1238.45	2.00	120	61	73	69	
40	1378.24	2.72	110	46	84	54	
43	1460.86	2.41	3529	130	3261	136	
44	1509.09	3.80	23	38	2	45	NET < CL
46	1729.41	1.74	56	43	22	51	NET < CL
47	1764.59	2.05	326	47	202	56	
48	1847.48	1.89	35	36	17	43	NET < CL

GDR/PC Analytical Technologies, Inc. Fort Collins, CO Ver. 6.02a

NUCLIDE ACTIVITY SUMMARY

Sample ID: 94-11-164-16 LANL CS:94.20324-2

Sample Size . . . . . 1.46e+002 gram	Spectrum File GDR09.SPC
Sampling Start. 07-08-94 12:00	Counting Start. 12-05-94 09:52
Sampling Stop 07-08-94 12:00	Buildup Time. . . . . 0.00e+000 Hrs
Current Date. 12-05-94 12:58	Decay Time. . . . . 3.60e+003 Hrs
Efficiency File. DET0910.EFF	Library File. . . . . .LANL.LIB
ID. . . . . .200 g Sand	ID. . . . . .LANL Gamma Library

Eff.= 1/[2.56e-002*En^-2.26e+000 + 3.61e+001*En^6.84e-001] 11-03-94 12:40

Gamma Fraction Limit >= . . . 75.00 %	Decay Limit <=. . . . 8.000 Halflives
Library Energy Tolerance. . . 2.00	

FINAL ACTIVITY REPORT

Nuclide	Energy (keV)	Conc +- 2.00sigma (pCi/gram)	Halflife (hrs)	Peaks Found
Cs-137	661.65	3.89e-001 +-4.61e-002	2.64e+005	1 of 1
Am-241	59.54	-1.26e-002 +-6.94e-002	3.79e+006	NET
Ce-144	133.54	-5.19e-002 +-1.47e-001	6.82e+003	NET
Np-237	311.98	-2.53e-002 +-3.46e-002	1.87e+010	NET
Ba-140	537.32	-5.00e+000 +-6.42e+001	3.07e+002	NET
Ru-106	621.84	2.43e-002 +-2.49e-001	8.84e+003	NET
Co-60	1173.22	1.31e-002 +-2.70e-002	4.62e+004	NET
Na-22	1274.54	5.98e-003 +-2.51e-002	2.28e+004	NET
Eu-152	1407.95	1.81e-001 +-1.20e-001	1.19e+005	NET
TOTAL:		3.89e-001 pCi/gram		

UNKNOWN PEAKS

Energy (keV)	Centroid Channel	Net Counts	Un-Certainty	C.L. Counts	Bkg. Counts	FWHM (keV)	Net Gamma/sec
46.70	92.47	166	149	111	1511	1.23	4.685e-001
63.34	125.78	1014	166	124	1887	1.01	1.745e+000
75.01	149.15	950	176	136	1892	1.24	1.327e+000
77.26	153.66	1467	162	108	1611	1.04	1.988e+000
87.36	173.88	225	127	94	1483	0.72	2.740e-001
92.88	184.94	1867	183	133	1791	1.21	2.182e+000
186.02	371.41	914	142	96	1013	1.45	1.063e+000
209.57	418.55	236	96	82	831	1.17	2.899e-001
238.69	476.85	2438	153	91	818	1.20	3.205e+000
241.59	482.65	491	117	87	828	1.42	6.501e-001
270.09	539.70	210	83	70	602	1.09	2.955e-001
277.64	554.80	106	93	85	726	1.24	1.520e-001
295.27	590.10	793	122	80	591	1.29	1.179e+000

300.13	599.82	131	81	72	568	1.21	1.965e-001
328.17	655.95	111	86	79	620	1.51	1.769e-001
338.44	676.51	579	92	72	570	1.58	9.378e-001
352.02	703.69	1365	130	66	487	1.38	2.268e+000
463.37	926.53	121	75	67	455	1.28	2.411e-001
510.93	1021.70	271	127	78	518	2.33	5.752e-001
583.31	1166.52	804	100	61	376	1.53	1.864e+000
609.43	1218.76	1033	123	66	442	1.51	2.467e+000
727.33	1454.63	227	68	58	310	1.56	6.110e-001
767.45	1534.88	158	80	63	340	3.50	4.406e-001
795.03	1590.03	113	53	45	207	2.29	3.226e-001
860.66	1721.30	90	72	52	248	1.81	2.716e-001
911.18	1822.33	713	86	50	230	1.95	2.237e+000
968.99	1937.91	292	78	59	299	1.67	9.568e-001
1001.49	2002.91	135	66	52	215	1.89	4.529e-001
1120.52	2240.86	215	74	50	217	2.01	7.779e-001
1238.45	2476.59	73	69	55	258	2.00	2.830e-001
1378.24	2755.96	84	54	40	120	2.72	3.495e-001
1401.27	2801.98	53	50	48	131	2.86	2.249e-001
1460.86	2921.06	3261	136	53	198	2.41	1.412e+001
1588.32	3175.70	66	41	37	100	1.69	3.026e-001
1764.59	3527.77	202	56	30	68	2.05	9.927e-001

GDR_C Analytical Technologies, Inc. Fort Collins, CO Version 6.2

Sample ID : 94-11-164-17 LANL CS:94.20336-2

Sample Size	1.62e+002 gram	Spectrum File	GDR10.SPC
Sampling Start.	.07-25-94 12:00	Counting Start.	12-05-94 09:54
Sampling Stop	.07-25-94 12:00	Live Time	10800 Sec
Current Date.	.12-05-94 13:00	Real Time	10859 Sec

Detector #: 10

Energy(keV)= 0.40 + 0.500*Ch + 1.69e-007*Ch^2 + 0.00e+000*Ch^3 12-05-94 09:23

FWHM(keV) = 0.73 + 0.025*En + 3.81e-004*En^2 + 0.00e+000*En^3 08-26-94 10:33

Where En = Sqrt(Energy in keV)

Sensitivity	0.20	Search Start / End.	30 / 4000
Sigma Multiplier.	2.00		

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.24	125.62	480	126	104	1507	0.95	
2	74.91	148.94	1032	148	124	1595	1.07	a
3	77.17	153.46	1634	143	104	1490	1.06	b
4	84.25	167.60	117	89	69	982	0.50	a
5	87.25	173.60	312	102	78	1166	0.55	b
6	92.84	184.78	1057	137	106	1563	1.20	
7	128.93	256.91	59	89	75	881	0.31	NET < CL
8	143.98	286.99	115	108	97	1050	0.87	
9	185.92	370.81	786	110	85	894	1.22	
10	209.41	417.75	196	105	94	967	0.89	
11	238.66	476.21	3390	145	78	710	1.11	a
12	241.52	481.92	724	114	95	892	1.63	b
13	270.19	539.22	246	90	78	675	1.04	
14	277.46	553.74	96	82	72	633	1.26	
15	295.24	589.28	869	102	79	571	1.25	a
16	300.29	599.37	191	87	77	601	1.35	b
17	328.14	655.01	195	79	66	539	1.57	
18	338.35	675.41	748	95	71	563	1.61	
19	351.98	702.65	1546	104	62	465	1.34	
20	409.26	817.09	68	69	61	452	0.66	
21	462.71	923.88	128	72	63	442	1.06	
22	510.99	1020.34	1243	104	73	490	2.14	
23	558.49	1115.22	122	69	61	372	1.54	
24	583.32	1164.82	1213	98	64	413	1.41	
25	609.45	1217.00	1186	106	76	578	1.64	
26	661.85	1321.66	128	67	58	367	1.06	
27	727.51	1452.80	279	68	56	312	1.76	
28	767.71	1533.09	74	62	56	315	1.65	
29	795.08	1587.75	145	64	58	255	1.59	a
30	803.32	1604.19	74	60	55	261	1.60	b
31	840.46	1678.36	65	64	59	316	1.64	
32	860.65	1718.67	130	67	61	314	1.66	
33	911.32	1819.84	870	81	54	249	1.73	

34	964.78	1926.59	146	57	49	215	1.59 a	
35	969.05	1935.11	529	68	48	214	1.56 b	
36	1001.17	1999.23	26	54	49	246	0.64	NET < CL
37	1064.44	2125.52	57	50	45	188	3.19	
38	1120.55	2237.53	206	73	65	334	1.35	
39	1238.20	2472.35	140	69	64	305	2.15	
40	1377.65	2750.63	62	47	43	145	4.42	
41	1407.78	2810.75	33	43	40	126	1.41	NET < CL
42	1461.00	2916.92	4392	141	48	168	2.23	
43	1509.66	3014.01	20	42	40	118	1.49	NET < CL
44	1588.44	3171.17	52	43	39	121	1.19	
45	1620.98	3236.06	42	30	27	52	1.94 a	
46	1631.03	3256.11	35	43	43	93	2.39 b	NET < CL
47	1729.82	3453.16	61	37	33	80	3.05	
48	1764.78	3522.88	291	48	34	80	2.11	
49	1847.49	3687.83	64	30	25	43	2.50	

GDR/PC Analytical Technologies, Inc. Fort Collins, CO Ver. 6.02a

BACKGROUND SUBTRACT RESULTS

Sample ID : 94-11-164-17 LANL CS:94.20336-2

Bkg File: . . . . . DET10.BKG | Counting Start. 12-05-94 09:54
ID.:. . . . . MCA READ | Current Date 12-05-94 13:00

PK#	ENERGY (keV)	FWHM (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	NEW NET COUNTS	NEW UN-CERTAINTY	FLAG
1	63.24	0.95	480	126	336	145	
6	92.84	1.20	1057	137	815	150	
8	143.98	0.87	115	108	67	121	NET < CL
9	185.92	1.22	786	110	594	125	
11	238.66	1.11	3390	145	3181	157	
15	295.24	1.25	869	102	819	115	
19	351.98	1.34	1546	104	1437	114	
22	510.99	2.14	1243	104	325	127	
23	558.49	1.54	122	69	-10	82	NET < CL
24	583.32	1.41	1213	98	1094	108	
25	609.45	1.64	1186	106	1051	123	
30	803.32	1.60	74	60	-18	72	NET < CL
33	911.32	1.73	870	81	812	89	
35	969.05	1.56	529	68	507	74	
36	1001.17	0.64	26	54	8	61	NET < CL
37	1064.44	3.19	57	50	27	61	NET < CL
42	1461.00	2.23	4392	141	4147	146	
48	1764.78	2.11	291	48	245	55	

GDR/PC Analytical Technologies, Inc. Fort Collins, CO Ver. 6.02a

NUCLIDE ACTIVITY SUMMARY

Sample ID: 94-11-164-17 LANL CS:94.20336-2

Sample Size . . . . . 1.62e+002 gram	Spectrum File GDR10.SPC
Sampling Start. 07-25-94 12:00	Counting Start. 12-05-94 09:54
Sampling Stop 07-25-94 12:00	Buildup Time. . . . . 0.00e+000 Hrs
Current Date. 12-05-94 13:00	Decay Time. . . . . 3.19e+003 Hrs
Efficiency File. DET1010.EFF	Library File. . . . . .LANL.LIB
ID. . . . . 200 g sand/poly jar	ID. . . . . .LANL Gamma Library

Eff.= 1/[9.88e-003*En^-2.71e+000 + 3.37e+001*En^6.62e-001] 10-27-94 10:59

Gamma Fraction Limit >= . . . 75.00 %	Decay Limit <=. . . . 8.000 Halflives
Library Energy Tolerance. . . 2.00	

FINAL ACTIVITY REPORT

Nuclide	Energy (keV)	Conc +- 2.00sigma (pCi/gram)	Halflife (hrs)	Peaks Found
Cs-137	661.65	6.04e-002 +-3.13e-002	2.64e+005	1 of 1
Am-241	59.54	-3.86e-002 +-7.31e-002	3.79e+006	NET
Ce-144	133.54	-3.99e-002 +-1.24e-001	6.82e+003	NET
Np-237	311.98	-1.47e-002 +-2.93e-002	1.87e+010	NET
Ba-140	537.32	-4.12e+001 +-5.72e+001	3.07e+002	NET
Ru-106	621.84	-8.99e-002 +-2.09e-001	8.84e+003	NET
Co-60	1173.22	1.30e-004 +-2.19e-002	4.62e+004	NET
Na-22	1274.54	-4.95e-003 +-2.20e-002	2.28e+004	NET
Eu-152	1407.95	1.08e-001 +-9.81e-002	1.19e+005	NET
TOTAL:		6.04e-002 pCi/gram		

UNKNOWN PEAKS

Energy (keV)	Centroid Channel	Net Counts	Un-Certainty	C.L. Counts	Bkg. Counts	FWHM (keV)	Net Gamma/sec
63.24	125.62	336	145	104	1507	0.95	7.141e-001
74.91	148.94	1032	148	124	1595	1.07	1.637e+000
77.17	153.46	1634	143	104	1490	1.06	2.480e+000
84.25	167.60	117	89	69	982	0.50	1.582e-001
87.25	173.60	312	102	78	1166	0.55	4.057e-001
92.84	184.78	815	150	106	1563	1.20	9.947e-001
185.92	370.80	594	125	85	894	1.22	6.606e-001
209.41	417.75	196	105	94	967	0.89	2.301e-001
238.66	476.21	3181	157	78	710	1.11	3.988e+000
241.52	481.92	724	114	95	892	1.63	9.138e-001
270.19	539.22	246	90	78	675	1.04	3.308e-001
277.46	553.74	96	82	72	633	1.26	1.311e-001
295.24	589.28	819	115	79	571	1.25	1.161e+000

300.29	599.37	191	87	77	601	1.35	2.736e-001
328.14	655.01	195	79	66	539	1.57	2.941e-001
338.35	675.41	748	95	71	563	1.61	1.152e+000
351.98	702.65	1437	114	62	465	1.34	2.270e+000
409.26	817.09	68	69	61	452	0.66	1.174e-001
462.71	923.88	128	72	63	442	1.06	2.416e-001
510.99	1020.34	325	127	73	490	2.14	6.526e-001
583.32	1164.82	1094	108	64	413	1.41	2.395e+000
609.45	1217.00	1051	123	76	578	1.64	2.368e+000
727.51	1452.81	279	68	56	312	1.76	7.074e-001
767.71	1533.09	74	62	56	315	1.65	1.933e-001
795.08	1587.75	145	64	58	255	1.59	3.883e-001
840.46	1678.36	65	64	59	316	1.64	1.811e-001
860.65	1718.67	130	67	61	314	1.66	3.674e-001
911.32	1819.84	812	89	54	249	1.73	2.386e+000
964.78	1926.59	146	57	49	215	1.59	4.455e-001
969.05	1935.11	507	74	48	214	1.56	1.551e+000
1120.55	2237.53	206	73	65	334	1.35	6.952e-001
1238.20	2472.35	140	69	64	305	2.15	5.039e-001
1377.65	2750.63	62	47	43	145	4.42	2.408e-001
1461.00	2916.92	4147	146	48	168	2.23	1.665e+001
1588.44	3171.17	52	43	39	121	1.19	2.193e-001
1620.98	3236.06	42	30	27	52	1.94	1.801e-001
1729.82	3453.16	61	37	33	80	3.05	2.740e-001
1764.78	3522.88	245	55	34	80	2.11	1.115e+000
1847.49	3687.83	64	30	25	43	2.50	3.019e-001

GDR_C Analytical Technologies, Inc. Fort Collins, CO Version 6.2

Sample ID : 94-11-164-18 LANL CS:94.20337-2

Sample Size	1.74e+002 gram	Spectrum File	GDR03.SPC
Sampling Start.	07-20-94 12:00	Counting Start.	12-05-94 10:11
Sampling Stop	07-20-94 12:00	Live Time	10800 Sec
Current Date.	12-05-94 13:22	Real Time	10842 Sec

Detector #: 3

Energy(keV)= -0.41 + 0.501*Ch + 0.00e+000*Ch^2 + 0.00e+000*Ch^3 12-05-94 09:47

FWHM(keV) = 0.76 + 0.021*En + 2.11e-004*En^2 + 0.00e+000*En^3 08-04-93 09:35
Where En = Sqrt(Energy in keV)

Sensitivity	0.20	Search Start / End.	100 / 4000
Sigma Multiplier.	2.00		

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	63.18	126.97	549	105	83	955	0.93	
2	74.74	150.04	469	105	86	923	0.99	a
3	76.96	154.49	818	112	85	996	1.11	b
4	84.16	168.85	74	96	82	976	0.88	a NET < CL
5	87.16	174.85	123	93	76	963	0.68	b
6	92.58	185.67	1665	138	101	1187	1.27	
7	98.57	197.63	137	91	79	770	1.27	
8	112.67	225.79	93	96	87	830	0.75	
9	128.96	258.32	58	85	75	698	0.52	NET < CL
10	143.82	287.98	110	76	64	564	0.76	
11	163.87	328.01	124	91	83	693	1.31	
12	185.77	371.74	968	96	65	525	1.21	
13	209.29	418.70	102	67	56	440	0.98	
14	238.62	477.28	1656	103	58	382	1.05	a
15	241.58	483.18	353	82	68	466	1.60	b
16	270.32	540.58	115	65	57	357	1.22	
17	277.49	554.88	72	55	46	291	1.38	
18	295.23	590.31	452	69	50	273	1.15	a
19	300.10	600.02	97	57	48	276	1.13	b
20	328.07	655.87	57	53	45	254	0.83	
21	338.39	676.49	248	61	46	288	0.98	
22	351.90	703.46	785	80	53	308	1.20	
23	409.75	818.98	22	49	44	233	0.77	NET < CL
24	463.30	925.88	82	47	40	192	1.26	
25	511.05	1021.24	376	60	43	202	2.11	
26	583.35	1165.60	535	61	37	139	1.66	
27	609.54	1217.88	563	64	41	165	1.70	
28	661.92	1322.47	141	45	35	138	1.25	
29	727.79	1454.00	47	43	37	152	0.89	
30	767.13	1532.55	74	43	37	136	2.10	
31	795.52	1589.24	56	38	33	106	2.15	
32	861.10	1720.18	-4	36	33	123	0.20	NET < CL
33	911.59	1820.99	305	47	29	84	1.59	

000130

34	934.53	1866.80	42	29	24	62	3.48	
35	965.24	1928.11	67	35	30	76	1.40	a
36	969.35	1936.32	223	46	34	89	2.04	b
37	1001.24	1999.99	76	35	28	83	1.42	
38	1120.65	2238.43	117	40	32	94	1.56	
39	1238.46	2473.66	66	36	31	75	2.70	
40	1378.27	2752.82	24	25	22	44	1.79	
41	1401.94	2800.09	13	23	22	37	1.37	NET < CL
42	1461.41	2918.83	1216	73	21	37	2.06	
43	1509.92	3015.68	21	19	15	22	1.92	
44	1607.04	3209.61	7	15	13	16	0.58	NET < CL
45	1730.46	3456.04	26	19	15	20	1.93	
46	1765.19	3525.39	90	27	18	26	2.63	

GDR/PC Analytical Technologies, Inc. Fort Collins, CO Ver. 6.02a

BACKGROUND SUBTRACT RESULTS

Sample ID : 94-11-164-18 LANL CS:94.20337-2

Bkg File: . . . . . DET03.BKG | Counting Start. 12-05-94 10:11
ID.:. . . . . MCA READ | Current Date 12-05-94 13:22

PK#	ENERGY (keV)	FWHM (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	NEW NET COUNTS	NEW UN-CERTAINTY	FLAG
1	63.18	0.93	549	105	515	110	
6	92.58	1.27	1665	138	1573	143	
12	185.77	1.21	968	96	906	103	
14	238.62	1.05	1656	103	1601	108	
22	351.90	1.20	785	80	754	85	
25	511.05	2.11	376	60	108	73	
26	583.35	1.66	535	61	499	67	
27	609.54	1.70	563	64	530	73	
33	911.59	1.59	305	47	292	50	
42	1461.41	2.06	1216	73	1171	75	
46	1765.19	2.63	90	27	82	29	

GDR/PC Analytical Technologies, Inc. Fort Collins, CO Ver. 6.02a

NUCLIDE ACTIVITY SUMMARY

Sample ID: 94-11-164-18 LANL CS:94.20337-2

Sample Size . . . . . 1.74e+002 gram	Spectrum File GDR03.SPC
Sampling Start. 07-20-94 12:00	Counting Start. 12-05-94 10:11
Sampling Stop 07-20-94 12:00	Buildup Time. . . . . 0.00e+000 Hrs
Current Date. 12-05-94 13:22	Decay Time. . . . . 3.31e+003 Hrs
Efficiency File. DET0310.EFF	Library File. . . . . .LANL.LIB
ID. . . . . 200 g sand/poly jar	ID. . . . . .LANL Gamma Library

Eff.= 1/[3.57e-003*En^-3.47e+000 + 9.25e+001*En^8.15e-001] 08-08-94 09:21

Gamma Fraction Limit >= . . . 75.00 %	Decay Limit <=. . . . 8.000 Halflives
Library Energy Tolerance. . . 2.00	

FINAL ACTIVITY REPORT

Nuclide	Energy (keV)	Conc +- 2.00sigma (pCi/gram)	Halflife (hrs)	Peaks Found
Cs-137	661.65	1.58e-001 +-5.08e-002	2.64e+005	1 of 1
Na-22	1274.54	3.29e-002 +-3.09e-002	2.28e+004	1 of 1
Am-241	59.54	-1.18e-002 +-1.62e-001	3.79e+006	NET
Ce-144	133.54	-6.64e-002 +-1.80e-001	6.82e+003	NET
Np-237	311.98	3.51e-002 +-4.30e-002	1.87e+010	NET
Ba-140	537.32	5.10e+001 +-8.02e+001	3.07e+002	NET
Ru-106	621.84	-1.08e-001 +-3.30e-001	8.84e+003	NET
Co-60	1173.22	-2.57e-002 +-3.53e-002	4.62e+004	NET
Eu-152	1407.95	6.20e-002 +-1.38e-001	1.19e+005	NET
TOTAL:		1.91e-001 pCi/gram		

UNKNOWN PEAKS

Energy (keV)	Centroid Channel	Net Counts	Un-Certainty	C.L. Counts	Bkg. Counts	FWHM (keV)	Net Gamma/sec
63.18	126.97	515	110	83	955	0.93	2.970e+000
74.74	150.04	469	105	86	923	0.99	1.756e+000
76.96	154.49	818	112	85	996	1.11	2.871e+000
87.16	174.85	123	93	76	963	0.68	3.399e-001
92.58	185.67	1573	143	101	1187	1.27	3.963e+000
98.57	197.63	137	91	79	770	1.27	3.183e-001
112.67	225.79	93	96	87	830	0.75	1.949e-001
143.82	287.98	110	76	64	564	0.76	2.245e-001
163.87	328.01	124	91	83	693	1.31	2.650e-001
185.77	371.74	906	103	65	525	1.21	2.071e+000
209.29	418.70	102	67	56	440	0.98	2.518e-001
238.62	477.28	1601	108	58	382	1.05	4.339e+000
241.58	483.18	353	82	68	466	1.60	9.652e-001

270.32	540.58	115	65	57	357	1.22	3.435e-001
277.49	554.88	72	55	46	291	1.38	2.199e-001
295.23	590.31	452	69	50	273	1.15	1.442e+000
300.10	600.02	97	57	48	276	1.13	3.125e-001
328.07	655.87	57	53	45	254	0.83	1.959e-001
338.39	676.49	248	61	46	288	0.98	8.814e-001
351.90	703.46	754	85	53	308	1.20	2.764e+000
463.30	925.88	82	47	40	192	1.26	3.754e-001
511.05	1021.24	108	73	43	202	2.11	5.371e-001
583.35	1165.60	499	67	37	139	1.66	2.753e+000
609.54	1217.88	530	73	41	165	1.70	3.032e+000
727.79	1454.00	47	43	37	152	0.89	3.129e-001
767.13	1532.55	74	43	37	136	2.10	5.129e-001
795.52	1589.24	56	38	33	106	2.15	3.956e-001
911.59	1820.99	292	50	29	84	1.59	2.316e+000
934.53	1866.80	42	29	24	62	3.48	3.431e-001
965.24	1928.11	67	35	30	76	1.40	5.557e-001
969.35	1936.32	223	46	34	89	2.04	1.864e+000
1001.24	1999.99	76	35	28	83	1.42	6.518e-001
1120.65	2238.43	117	40	32	94	1.56	1.100e+000
1238.46	2473.66	66	36	31	75	2.70	6.763e-001
1378.27	2752.82	24	25	22	44	1.79	2.652e-001
1461.41	2918.83	1171	75	21	37	2.06	1.367e+001
1509.92	3015.68	21	19	15	22	1.92	2.516e-001
1730.46	3456.04	26	19	15	20	1.93	3.544e-001
1765.19	3525.39	82	29	18	26	2.63	1.121e+000

GDR_C Analytical Technologies, Inc. Fort Collins, CO Version 6.2

Sample ID : 94-11-164-19 LANL CS:94.20344-2

Sample Size	1.61e+002 gram	Spectrum File	GDR12.SPC
Sampling Start.	07-19-94 12:00	Counting Start.	12-05-94 11:24
Sampling Stop	07-19-94 12:00	Live Time	10800 Sec
Current Date.	12-05-94 14:28	Real Time	11881 Sec

Detector #: 12

Energy(keV)= 0.67 + 0.499*Ch + 0.00e+000*Ch^2 + 0.00e+000*Ch^3 12-05-94 10:39

FWHM(keV) = 0.54 + 0.021*En + 3.02e-004*En^2 + 0.00e+000*En^3 07-13-94 16:35

Where En = Sqrt(Energy in keV)

Sensitivity	0.20	Search Start / End.	30 / 4000
Sigma Multiplier.	2.00		

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.77	148.38	321	86	66	707	0.63	a
2	77.09	153.02	543	91	65	762	0.73	b
3	87.06	172.99	-57	93	80	1016	0.49	NET < CL
4	92.68	184.25	615	108	85	989	1.01	
5	129.07	257.09	106	65	51	479	1.09	
6	185.79	370.67	548	84	62	527	1.05	
7	209.44	418.03	151	79	68	572	1.03	
8	238.69	476.59	1790	108	63	422	1.01	a
9	241.62	482.45	384	81	65	461	1.38	b
10	270.31	539.91	139	65	54	362	1.86	
11	295.32	589.97	495	67	43	287	1.00	
12	328.32	656.06	63	68	62	391	1.03	
13	338.42	676.28	256	62	46	297	0.90	
14	352.00	703.47	880	80	49	291	1.29	
15	409.39	818.37	39	60	55	308	0.65	NET < CL
16	463.12	925.96	85	53	46	233	0.91	
17	510.88	1021.58	463	67	47	245	1.96	
18	583.20	1166.38	529	65	43	203	1.32	
19	609.30	1218.64	633	67	40	195	1.34	
20	661.60	1323.37	443	61	40	180	1.32	
21	727.52	1455.37	123	43	34	128	1.40	
22	767.75	1535.92	72	43	37	141	2.22	
23	795.29	1591.04	43	38	33	120	0.88	
24	835.37	1671.30	33	39	35	123	1.79	NET < CL
25	860.54	1721.70	70	39	33	108	1.21	
26	911.32	1823.37	335	52	35	113	1.49	
27	934.65	1870.08	11	38	35	121	0.43	NET < CL
28	964.86	1930.57	58	43	39	126	1.47	a
29	968.95	1938.77	184	42	30	100	1.34	b
30	1001.40	2003.73	49	40	36	120	1.80	
31	1120.46	2242.12	132	44	35	121	1.55	
32	1238.02	2477.51	52	45	40	150	0.96	
33	1282.38	2566.33	10	32	29	80	0.89	NET < CL

34	1378.25	2758.30	42	28	23	50	2.90	
35	1408.14	2818.15	13	27	25	49	1.73	NET < CL
36	1461.01	2924.00	2121	94	20	35	1.79	
37	1588.23	3178.74	14	24	21	42	0.69	NET < CL
38	1729.88	3462.35	26	17	13	17	1.41	
39	1764.68	3532.03	125	26	13	14	1.88	

GDR/PC Analytical Technologies, Inc. Fort Collins, CO Ver. 6.02a

BACKGROUND SUBTRACT RESULTS

Sample ID : 94-11-164-19 LANL CS:94.20344-2

Bkg File: . . . . . DET12.BKG | Counting Start. 12-05-94 11:24
ID.:. . . . . MCA READ | Current Date 12-05-94 14:28

PK#	ENERGY (keV)	FWHM (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	NEW NET COUNTS	NEW UN-CERTAINTY	FLAG
4	92.68	1.01	615	108	528	116	
6	185.79	1.05	548	84	458	93	
8	238.69	1.01	1790	108	1703	114	
11	295.32	1.00	495	67	475	73	
14	352.00	1.29	880	80	821	86	
17	510.88	1.96	463	67	122	80	
18	583.20	1.32	529	65	485	70	
19	609.30	1.34	633	67	583	73	
26	911.32	1.49	335	52	315	55	
31	1120.45	1.55	132	44	122	46	
36	1461.01	1.79	2121	94	2040	97	
38	1729.88	1.41	26	17	18	21	
39	1764.68	1.88	125	26	115	29	

GDR/PC Analytical Technologies, Inc. Fort Collins, CO Ver. 6.02a

NUCLIDE ACTIVITY SUMMARY

Sample ID: 94-11-164-19 LANL CS:94.20344-2

Sample Size . . . . . 1.61e+002 gram	Spectrum File GDR12.SPC
Sampling Start. 07-19-94 12:00	Counting Start. 12-05-94 11:24
Sampling Stop 07-19-94 12:00	Buildup Time. . . . . 0.00e+000 Hrs
Current Date. 12-05-94 14:28	Decay Time. . . . . 3.34e+003 Hrs
Efficiency File. DET1210.EFF	Library File. . . . . .LANL.lib
ID. . . . . 200 g sand/poly jar	ID. . . . . .LANL Gamma Library

Eff.= 1/[1.40e-003*En^-3.94e+000 + 7.35e+001*En^7.77e-001] 10-31-94 13:59

Gamma Fraction Limit >= . . . 75.00 %	Decay Limit <=. . . . 8.000 Halflives
Library Energy Tolerance. . . 2.00	

FINAL ACTIVITY REPORT

Nuclide	Energy (keV)	Conc +- 2.00sigma (pCi/gram)	Halflife (hrs)	Peaks Found
Cs-137	661.65	4.35e-001 +-5.97e-002	2.64e+005	1 of 1
Am-241	59.54	-3.11e-002 +-1.92e-001	3.79e+006	NET
Ce-144	133.54	-3.90e-002 +-1.43e-001	6.82e+003	NET
Np-237	311.98	-2.29e-002 +-3.58e-002	1.87e+010	NET
Ba-140	537.32	2.27e+001 +-7.16e+001	3.07e+002	NET
Ru-106	621.84	1.48e-001 +-2.74e-001	8.84e+003	NET
Co-60	1173.22	-2.72e-003 +-2.98e-002	4.62e+004	NET
Na-22	1274.54	-1.60e-002 +-3.10e-002	2.28e+004	NET
Eu-152	1407.95	9.79e-002 +-1.22e-001	1.19e+005	NET
TOTAL:		4.35e-001 pCi/gram		

UNKNOWN PEAKS

Energy (keV)	Centroid Channel	Net Counts	Un-Certainty	C.L. Counts	Bkg. Counts	FWHM (keV)	Net Gamma/sec
74.77	148.38	321	86	66	707	0.63	1.435e+000
77.09	153.02	543	91	65	762	0.73	2.221e+000
92.68	184.25	528	116	85	989	1.01	1.372e+000
129.07	257.09	106	65	51	479	1.09	1.910e-001
185.79	370.67	458	93	62	527	1.05	8.893e-001
209.44	418.03	151	79	68	572	1.03	3.135e-001
238.69	476.59	1703	114	63	422	1.01	3.873e+000
241.62	482.45	384	81	65	461	1.38	8.814e-001
270.31	539.91	139	65	54	362	1.86	3.445e-001
295.32	589.97	475	73	43	287	1.00	1.261e+000
328.32	656.06	63	68	62	391	1.03	1.798e-001
338.42	676.28	256	62	46	297	0.90	7.526e-001
352.00	703.47	821	86	49	291	1.29	2.490e+000

463.12	925.96	85	53	46	233	0.91	3.172e-001
510.88	1021.58	122	80	47	245	1.96	4.932e-001
583.20	1166.38	485	70	43	203	1.32	2.171e+000
609.30	1218.64	583	73	40	195	1.34	2.701e+000
727.52	1455.37	123	43	34	128	1.40	6.523e-001
767.75	1535.92	72	43	37	141	2.22	3.983e-001
795.29	1591.04	43	38	33	120	0.88	2.450e-001
860.54	1721.70	70	39	33	108	1.21	4.230e-001
911.32	1823.37	315	55	35	113	1.49	1.993e+000
964.86	1930.57	58	43	39	126	1.47	3.869e-001
968.95	1938.77	184	42	30	100	1.34	1.222e+000
1001.40	2003.73	49	40	36	120	1.80	3.339e-001
1120.45	2242.12	122	46	35	121	1.55	9.071e-001
1238.02	2477.51	52	45	40	150	0.96	4.178e-001
1378.25	2758.30	42	28	23	50	2.90	3.668e-001
1461.01	2924.00	2040	97	20	35	1.79	1.864e+001
1729.88	3462.35	18	21	13	17	1.41	1.823e-001
1764.68	3532.03	115	29	13	14	1.88	1.215e+000

GDR_C Analytical Technologies, Inc. Fort Collins, CO Version 6.2

Sample ID : 94-11-164-B1 LANL CS:Blank

Sample Size	2.01e+002 gram	Spectrum File	GDR04.SPC
Sampling Start.	11-30-94 12:00	Counting Start.	12-05-94 10:04
Sampling Stop	11-30-94 12:00	Live Time	10800 Sec
Current Date.	12-05-94 13:15	Real Time	10848 Sec

Detector #: 4

Energy(keV) = 0.45 + 0.500*Ch + 0.00e+000*Ch^2 + 0.00e+000*Ch^3 12-05-94 09:20

FWHM(keV) = 0.72 + 0.010*En + 4.92e-004*En^2 + 0.00e+000*En^3 11-08-94 15:17

Where En = Sqrt(Energy in keV)

Sensitivity	0.20	Search Start / End.	30 / 4000
Sigma Multiplier.	2.00		

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	74.82	148.62	42	31	22	108	0.46	a
2	77.20	153.38	48	42	34	183	0.96	b
3	92.55	184.06	83	41	32	158	1.31	
4	117.30	233.53	24	34	27	119	0.63	NET < CL
5	185.57	369.94	62	49	43	202	1.13	
6	238.65	476.01	46	47	41	204	0.52	
7	295.43	589.48	60	39	32	129	0.81	
8	352.11	702.75	78	37	29	104	1.09.	
9	511.04	1020.36	203	45	33	110	2.87	
10	558.88	1115.94	26	28	24	62	1.26	
11	583.61	1165.36	34	28	24	61	0.94	
12	609.52	1217.15	94	34	26	75	1.96	
13	803.49	1604.76	22	23	19	44	1.64	
14	911.55	1820.70	22	17	13	20	1.72	
15	1461.18	2919.07	25	20	17	26	4.07	
16	1559.60	3115.74	7	9	7	4	2.06	

GDR/PC Analytical Technologies, Inc. Fort Collins, CO Ver. 6.02a

BACKGROUND SUBTRACT RESULTS

Sample ID : 94-11-164-B1 LANL CS:Blank

Bkg File: . . . . . DET04.BKG | Counting Start. 12-05-94 10:04
ID.:. . . . . MCA READ | Current Date 12-05-94 13:15

PK#	ENERGY (keV)	FWHM (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	NEW NET COUNTS	NEW UN-CERTAINTY	FLAG
3	92.55	1.31	83	41	5	54	NET < CL
5	185.57	1.13	62	49	17	59	NET < CL
6	238.65	0.52	46	47	0	56	NET < CL
8	352.11	1.09	78	37	52	46	
9	511.05	2.87	203	45	-43	60	NET < CL
10	558.88	1.26	26	28	-2	35	NET < CL
11	583.61	0.94	34	28	12	36	NET < CL
12	609.52	1.96	94	34	72	43	
13	803.49	1.64	22	23	-8	30	NET < CL
14	911.55	1.72	22	17	10	25	NET < CL
15	1461.18	4.07	25	20	-9	26	NET < CL

GDR/PC Analytical Technologies, Inc. Fort Collins, CO Ver. 6.02a

NUCLIDE ACTIVITY SUMMARY

Sample ID: 94-11-164-B1 LANL CS:Blank

Sample Size	2.01e+002 gram	Spectrum File	GDR04.SPC
Sampling Start.	11-30-94 12:00	Counting Start.	12-05-94 10:04
Sampling Stop	11-30-94 12:00	Buildup Time.	0.00e+000 Hrs
Current Date.	12-05-94 13:15	Decay Time.	1.18e+002 Hrs

Efficiency File.	.DET0410.EFF	Library File.	.LANLdl.lib
ID.	.200g Geometry 10	ID.	.LANL Gamma Library

Eff.= 1/[1.31e-002*En^-3.01e+000 + 8.52e+001*En^8.73e-001] 10-29-94 10:56

Gamma Fraction Limit >= . . .	75.00 %	Decay Limit <=. . . .	8.000 Halflives
Library Energy Tolerance. . .	2.00		

FINAL ACTIVITY REPORT

Nuclide	Energy (keV)	Conc +- 2.00sigma (pCi/gram)	Halflife (hrs)	Peaks Found
Am-241	59.54	< 5.69e-002	3.79e+006 LTL	
Ce-144	133.54	< 4.48e-002	6.82e+003 LTL	
Np-237	311.98	< 1.50e-002	1.87e+010 LTL	
Ba-140	537.32	< 1.04e-001	3.07e+002 LTL	
Ru-106	621.84	< 1.64e-001	8.84e+003 LTL	
Cs-137	661.65	< 9.95e-003	2.64e+005 LTL	
Co-60	1173.22	< 1.96e-002	4.62e+004 LTL	
Na-22	1274.54	< 1.51e-002	2.28e+004 LTL	
Eu-152	1407.95	< 4.76e-002	1.19e+005 LTL	

TOTAL: 0.00e+000 pCi/gram

UNKNOWN PEAKS

Energy (keV)	Centroid Channel	Net Counts	Un-Certainty	C.L. Counts	Bkg. Counts	FWHM (keV)	Net Gamma/sec
74.82	148.62	42	31	22	108	0.46	1.610e-001
77.20	153.38	48	42	34	183	0.96	1.707e-001
295.43	589.48	60	39	32	129	0.81	1.662e-001
352.11	702.75	52	46	29	104	1.09	1.648e-001
609.52	1217.15	72	43	26	75	1.96	3.692e-001
1559.60	3115.74	7	9	7	4	2.06	8.146e-002

GDR_C Analytical Technologies, Inc. Fort Collins, CO Version 6.2

Sample ID : 94-11-164-S1 LANL CS:LCS

Sample Size . . . . . 2.00e+002 gram	Spectrum File GDR06.SPC
Sampling Start. 04-01-94 10:00	Counting Start. 12-05-94 10:07
Sampling Stop 04-01-94 10:00	Live Time . . . . . 1800 Sec
Current Date. 12-05-94 10:48	Real Time . . . . . 1882 Sec

Detector #: 6

Energy(keV)= 1.64 + 0.500*Ch + 0.00e+000*Ch^2 + 0.00e+000*Ch^3 12-05-94 09:20

FWHM(keV) = 0.77 + 0.020*En + 2.23e-004*En^2 + 0.00e+000*En^3 08-26-93 09:16
Where En = Sqrt(Energy in keV)

Sensitivity 0.20	Search Start / End. . . . . 30 / 4000
Sigma Multiplier. 2.00	

PEAK SEARCH RESULTS

PK. #	ENERGY (keV)	ADDRESS CHANNEL	NET COUNTS	UN-CERTAINTY	C.L. COUNTS	BKG COUNTS	FWHM (keV)	FLAG
1	59.51	115.83	31190	494	295	13740	0.99	
2	88.03	172.90	85967	695	337	13836	0.98	
3	122.03	240.95	41558	499	253	8861	1.01	
4	136.45	269.81	5631	314	248	7581	1.08	
5	165.85	328.65	27627	426	241	7131	1.14	
6	238.29	473.63	479	270	245	6647	0.82	
7	255.14	507.35	1020	257	229	5817	1.33	
8	279.19	555.47	3608	249	196	4733	1.23	
9	391.73	780.70	21582	351	173	3680	1.28	
10	510.66	1018.73	545	174	151	2802	1.73	
11	661.78	1321.18	36317	424	173	3012	1.48	
12	813.88	1625.57	434	164	149	2226	2.38	
13	898.26	1794.44	20412	336	166	2765	1.72	
14	1173.50	2345.29	36013	401	123	1386	1.86	
15	1325.54	2649.58	707	179	182	1203	4.09	a
16	1332.81	2664.14	32488	372	90	570	1.94	b
17	1836.39	3671.96	12242	229	58	243	2.25	

GDR/PC Analytical Technologies, Inc. Fort Collins, CO Ver. 6.02a

BACKGROUND SUBTRACT RESULTS

Sample ID : 94-11-164-S1 LANL CS:LCS

Bkg File: DET06.BKG
ID.:. . . . . MCA READ

Counting Start. 12-05-94 10:07
Current Date 12-05-94 10:49

PK#	ENERGY (keV)	FWHM (keV)	OLD NET COUNTS	OLD UN-CERTAINTY	NEW NET COUNTS	NEW UN-CERTAINTY	FLAG
6	238.29	0.82	479	270	479	270	
10	510.66	1.73	545	174	504	174	

GDR/PC Analytical Technologies, Inc. Fort Collins, CO Ver. 6.02a

NUCLIDE ACTIVITY SUMMARY

Sample ID: 94-11-164-S1 LANL CS:LCS

Sample Size . . . . . 2.00e+002 gram	Spectrum File GDR06.SPC
Sampling Start. 04-01-94 10:00	Counting Start. 12-05-94 10:07
Sampling Stop 04-01-94 10:00	Buildup Time. . . . . 0.00e+000 Hrs
Current Date. 12-05-94 10:49	Decay Time. . . . . 5.95e+003 Hrs

Efficiency File. DET0610.EFF	Library File. . . . . .analytic.lib
ID. . . . . .200g sand/poly jar	ID. . ATI Cross Checks Analysis Library

Eff.= 1/[4.05e-003*En^-3.44e+000 + 9.05e+001*En^8.12e-001] 08-08-94 11:29

Gamma Fraction Limit >= . . . 75.00 %	Decay Limit <=. . . . 8.000 Halflives
Library Energy Tolerance. . . 2.00	

FINAL ACTIVITY REPORT

Nuclide	Energy (keV)	Conc +- 2.00sigma (pCi/gram)	Halflife (hrs)	Peaks Found
Am-241	59.54	4.89e+002 +-7.74e+000	3.79e+006	1 of 1
Cd-109	88.03	7.47e+003 +-6.04e+001	1.11e+004	1 of 1
Co-57	Average:	1.52e+002 +-1.78e+000	6.50e+003	2 of 2
	122.06	1.51e+002 +-1.82e+000		
	136.48	1.64e+002 +-9.12e+000		
Ce-139	165.85	2.07e+002 +-3.19e+000	3.30e+003	1 of 1
Sn-113	391.69	4.71e+002 +-7.66e+000	2.76e+003	1 of 1
Cs-137	661.65	1.99e+002 +-2.32e+000	2.64e+005	1 of 1
Y-88	Average:	6.85e+002 +-8.46e+000	2.56e+003	2 of 2
	898.02	6.83e+002 +-1.12e+001		
	1836.01	6.88e+002 +-1.29e+001		
Co-60	Average:	3.05e+002 +-2.43e+000	4.62e+004	2 of 2
	1173.22	3.05e+002 +-3.39e+000		
	1332.49	3.05e+002 +-3.49e+000		
TOTAL:		9.97e+003 pCi/gram		

UNKNOWN PEAKS

Energy (keV)	Centroid Channel	Net Counts	Un-Certainty	C.L. Counts	Bkg. Counts	FWHM (keV)	Net Gamma/sec
238.29	473.63	479	270	245	6647	0.82	7.671e+000
255.14	507.35	1020	257	229	5817	1.33	1.718e+001
279.19	555.47	3608	249	196	4733	1.23	6.503e+001
510.66	1018.72	504	174	151	2802	1.73	1.470e+001
813.88	1625.57	434	164	149	2226	2.38	1.848e+001
1325.54	2649.58	707	179	182	1203	4.09	4.471e+001

ANALYTICAL TECHNOLOGIES, INC.
Radiochemistry Data Package

Section 6

QUALITY ASSURANCE SUMMARY REPORTS

6

There are no Quality Assurance Summary Reports included in this data package.

ANALYTICAL TECHNOLOGIES, INC.
Radiochemistry Data Package

Section 7

LABORATORY BENCH SHEETS

7

p582

GAMMA SPEC ANALYSIS WORKSHEET

Prep Analyst MPC
Preparation Date and Time 11/30/94 1530
SOP Used

Data Filename NA
Count Date 12-2-94/12-3-94/12-5-94

000149

ATI Workorder Number	Client Sample ID	Sample Date/Time	Sample Matrix	Sample Aliquot (g) or (L)	Remarks	Det. No	Geom No	Count Dur (min)	Count Time	Spec Rev
94-11-164-01	94.18548-3	7/21/94	Soil	190.5	Lanl.lib	1 ~~2~~	G10	180	12-2-94	
02	94.18551-3	7/15/94		162.5		3				
03	94.18557-3	8/3/94		155.6		2 ~~1~~				
04	94.18560-3	7/25/94		191.8		4				
05	94.18561-3			138.3		6				
06	94.20311-2	7/6/94		170.5		7		180	12-2-94	
07	94.20312-2	~~7/15/94~~		153.1	7/20/94 Sample Date	8				
08	94.20313-2			166.5	7/15/94	9				
09	94.20314-2			172.7	6/30/94	10				
10	94.20315-2			123.3	6/28/94	11				
11	94.20316-2	6/30/94		185.4		12		180	12-3-94	
12	94.20320-2	7/24/94		157.1		11 ~~12~~				
13	94.20321-2	7/27/94		158.0		12 ~~12~~				
14	94.20322-2	7/25/94		155.6		7			12-5-94	
15	94.20323-2	7/28/94		178.3		8				
16	94.20324-2	7/8/94		146.4		9				
17	94.20336-2	7/25/94		161.6		10				

Balance No. 19

continued on page 917007

Relinquished by MPC Date 12/1/94
Received by Date 12-1-94
Reviewed by Date 12-19-94

917006

ATI Form 700FC4 (3/23/94)

Cont. from pg: 917006

GAMMA SPEC ANALYSIS WORKSHEET

Prep Analyst MRC
Preparation Date and Time 11/30/94 1530
SOP Used

Data Filename NA
Count Date 12-5-94

ATI Workorder Number	Client Sample ID	Sample Date/Time	Sample Matrix	Sample Aliquot (g) or (L)	Remarks	Det. No.	Geom No	Count Dur (min)	Count Time	Spec Rev
94-11-164-18	94.20337-2	~~07/29/94~~	Soil	174.2	7/20/94 Sample Date	3	G10	180	12-5-94	hr
19	94.20344-2	7/19/94		161.4		12				
94-11-164-D1	Dup of 03	08/03/94	s	155.6		4	10	180	12-3-94	
D2	Dup of 12	07/24/94		157.1		2			12-5-94	
B1	Blank	11-30-94 12:00		201.2g		4				
S1	LCS	04-01-94 10:00		200g		6		30		

2-19-94

Balance No. 19

Relinquished by MRC Date 12/1/94
Received by Date
Reviewed by Date

ATI FRM 700FC4 (3/23/04)

000150

917007

SAMPLE CONDITION FORM

METHOD X Spec MATRIX Soil EXT. DATE 11/30/94 TECH MRC

WORK ORDER #	SAMPLE #	SAMPLE CONDITION	SAMPLE ODOR
94-11-164-	01	fine soil + rocks	
	02		
	03		
	04		
	05		
	06		
	07	w/roots	
	08		
	09		
	10		
	11	w/roots	
	12		
	13	w/roots	
	14		
	15		
	16		
	17		

000151

SAMPLE CONDITION FORM

continued from 917006

METHOD 1 Spec MATRIX Soil EXT. DATE 11/30/94 TECH MRC

WORK ORDER #	SAMPLE #	SAMPLE CONDITION	SAMPLE ODOR
94-11-164-	18	fine soil w/ rocks	
↓	19	ashlike soil w/ rocks	

000152

ANALYTICAL TECHNOLOGIES, INC.
Radiochemistry Data Package

Section 8

STANDARDS TRACEABILITY DOCUMENTS

8

ANALYTICS

Analytics, Inc.
1380 Seaboard Industrial Boulevard
Atlanta, Georgia 30318
404 352-8677

CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

48183B-307

200 Grams Sand in Tall Wide Mouth Poly Jar

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

Calibration date: April 1, 1994 12:00 EST

Source prepared by: E. W. Belvin
E. W. Belvin, Production Manager

ISOTOPE	GAMMA-RAY ENERGY	HALF-LIFE		GAMMA-RAYS PER SECOND	TOTAL UNCERTAINTY %
Am-241	59.5	432	y	1331	5.0
Cd-109	88	462.6	d	1956	4.7
Co-57	122	271.7	d	993.9	4.4
Ce-139	166	137.64	d	1241	4.5
Hg-203	279	46.60	d	2682	4.8
Sn-113	392	115.08	d	2188	4.9
Cs-137	662	30.0	y	1290	4.7
Y-88	898	106.61	d	4974	4.6
Co-60	1173	5.2714	y	2313	4.7
Co-60	1332	5.2714	y	2314	4.7
Y-88	1836	106.61	d	5231	4.7

This standard will expire one year after the calibration date.
P O NUMBER 40514, Item 2

Q A APPROVED D.M. Martyn 5-25-94

ANALYTICAL TECHNOLOGIES, INC.
Radiochemistry Data Package

Section 9

CHAIN OF CUSTODY

9

94-11-164

Los Alamos
NATIONAL LABORATORY

October 12, 1994

Steve Fry
ATI
225 Commerce Drive
Fort Collins, CO 80524

Dear Steve :

Please analyze the enclosed samples according to the schedule below. These samples are on Request Number: 19509

WE WILL SHIP THESE SAMPLES ONE MONTH FROM TODAY (11/12/94) UNLESS NOTIFIED BY YOU THAT WE CAN SHIP EARLIER.

Cost Center: 4609 Program Fund Code: M78B

ANALYTES	SAMPLE-CUT	MATRIX CODE	DATE COLLECTED
GSCAN, U	01 94.18548-3	S	21-JUL-94
	02 94.18551-3	S	15-JUL-94
	03 94.18557-3	S	03-AUG-94
	04 94.18560-3	S	25-JUL-94
	05 94.18561-3	S	25-JUL-94
	06 94.20311-2	S	06-JUL-94
	07 94.20312-2	S	20-JUL-94
	08 94.20313-2	S	15-JUL-94
	09 94.20314-2	S	30-JUN-94
	10 94.20315-2	S	28-JUN-94
	11 94.20316-2	S	30-JUN-94
	12 94.20320-2	S	24-JUL-94
	13 94.20321-2	S	27-JUL-94
	14 94.20322-2	S	25-JUL-94
	15 94.20323-2	S	28-JUL-94
	16 94.20324-2	S	08-JUL-94
	17 94.20336-2	S	25-JUL-94
	18 94.20337-2	S	20-JUL-94
	19 94.20344-2	S	19-JUL-94
U	20 94.18555-3	S	27-JUL-94
	21 94.20317-2	S	28-JUN-94
	22 94.20318-2	S	28-JUN-94
	23 94.20319-2	S	27-JUL-94
	24 94.20325-2	S	28-JUL-94
	25 94.20326-2	S	28-JUL-94
	26 94.20327-2	S	27-JUL-94
	27 94.20328-2	S	27-JUL-94
	28 94.20329-2	S	18-JUL-94
	29 94.20330-2	S	18-JUL-94
	30 94.20331-2	S	18-JUL-94
	31 94.20332-2	S	14-JUL-94

94-11-164

Cost Center: 4609 Program Fund Code: M78B

ANALYTES	SAMPLE-CUT	MATRIX CODE	DATE COLLECTED
U			
32	94.20333-2	S	18-JUL-94
33	94.20334-2	S	14-JUL-94
34	94.20335-2	S	14-JUL-94
35	94.25969-1	S	31-AUG-94
36	94.25970-1	S	31-AUG-94
37	94.25971-1	S	31-AUG-94

SAMPLES ARE INCLUSIVE !

SINCERELY,

Laurel L. Shastri

Laurel L. Shastri
File (2)

74-11 101

LOS ALAMOS
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

EM-9 CHAIN OF CUSTODY DOCUMENT

NBR: 15653

Request: 19509

Desc: SAK TA-15 -- RADIOCHEMISTRY TO ATI

Sample	Cut	Type	Size	Comments
1 94.18548	3	POLYETHYLENE	500 ML	GAMMA SPECTROSCOPY, TOTAL U
2 94.18551	3	POLYETHYLENE	500 ML	GAMMA SPECTROSCOPY, TOTAL U
10 94.18555	3	POLYETHYLENE	125 ML	TOTAL U
3 94.18557	3	POLYETHYLENE	500 ML	GAMMA SPECTROSCOPY, TOTAL U
4 94.18560	3	POLYETHYLENE	500 ML	GAMMA SPECTROSCOPY, TOTAL U
5 94.18561	3	POLYETHYLENE	500 ML	GAMMA SPECTROSCOPY, TOTAL U
6 94.20311	2	POLYETHYLENE	500 ML	GAMMA SPECTROSCOPY, TOTAL U
7 94.20312	2	POLYETHYLENE	500 ML	GAMMA SPECTROSCOPY, TOTAL U
8 94.20313	2	POLYETHYLENE	500 ML	GAMMA SPECTROSCOPY, TOTAL U
9 94.20314	2	POLYETHYLENE	500 ML	GAMMA SPECTROSCOPY, TOTAL U
94.20315	2	POLYETHYLENE	500 ML	GAMMA SPECTROSCOPY, TOTAL U
1 94.20316	2	POLYETHYLENE	500 ML	GAMMA SPECTROSCOPY, TOTAL U
1 94.20317	2	POLYETHYLENE	125 ML	TOTAL U
2 94.20318	2	POLYETHYLENE	125 ML	TOTAL U
3 94.20319	2	POLYETHYLENE	125 ML	TOTAL U
2 94.20320	2	POLYETHYLENE	500 ML	GAMMA SCECTROSCOPY, TOTAL U
3 94.20321	2	POLYETHYLENE	500 ML	GAMMA SCECTROSCOPY, TOTAL U
4 94.20322	2	POLYETHYLENE	500 ML	GAMMA SCECTROSCOPY, TOTAL U
5 94.20323	2	POLYETHYLENE	500 ML	GAMMA SCECTROSCOPY, TOTAL U
6 94.20324	2	POLYETHYLENE	500 ML	GAMMA SCECTROSCOPY, TOTAL U

Relinquished By(Print Name & Sign)	Date	Time	Received By(Print Name & Sign)
Jaylene Valez	11/11/94	4:30	FED EX
FED EX	11/15/94	9:00a	Debi Burdick DEBI BURDICK

Received for Disposal By(Print Name and Sign)	Remarks

Los Alamos National Laboratory

000158

14 " 147

LOS ALAMOS
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

EM-9 CHAIN OF CUSTODY DOCUMENT

NBR: 15654

Request: 19509 Desc: SAK TA-15 -- RADIOCHEMISTRY TO ATI

Sample	Cut	Type	Size	Comments
24 94.20325	2	POLYETHYLENE	125 ML	TOTAL U
25 94.20326	2	POLYETHYLENE	125 ML	TOTAL U
26 94.20327	2	POLYETHYLENE	125 ML	TOTAL U
27 94.20328	2	POLYETHYLENE	125 ML	TOTAL U
28 94.20329	2	POLYETHYLENE	125 ML	TOTAL U
29 94.20330	2	POLYETHYLENE	125 ML	TOTAL U
30 94.20331	2	POLYETHYLENE	125 ML	TOTAL U
31 94.20332	2	POLYETHYLENE	125 ML	TOTAL U
32 94.20333	2	POLYETHYLENE	125 ML	TOTAL U
33 94.20334	2	POLYETHYLENE	125 ML	TOTAL U
34 94.20335	2	POLYETHYLENE	125 ML	TOTAL U
17 94.20336	2	POLYETHYLENE	500 ML	GAMMA SCECTROSCOPY, TOTAL U
18 94.20337	2	POLYETHYLENE	500 ML	GAMMA SCECTROSCOPY, TOTAL U
19 94.20344	2	POLYETHYLENE	500 ML	GAMMA SCECTROSCOPY, TOTAL U
35 94.25969	1	POLYETHYLENE	60 ML	TOTAL U
36 94.25970	1	POLYETHYLENE	60 ML	TOTAL U
37 94.25971	1	POLYETHYLENE	60 ML	TOTAL U

Relinquished By(Print Name & Sign)	Date	Time	Received By(Print Name & Sign)
Jaylene Delaq	11/11/94	9:30	FED EX
FED EX	11/15/94	9:00a	Debi Burdick DEBI BURDICK

Received for Disposal By(Print Name and Sign) Remarks

Los Alamos National Laboratory

ANALYTICAL TECHNOLOGIES, INC.
Radiochemistry Data Package

Section 10

ADDITIONAL SUPPORTING DOCUMENTATION

10

Library file: lanl.lib

ID.: LANL Gamma Library

Isotope Name	Halflife (S/M/H/D/Y)	None (uCi/ml)		Energy (keV)	Gamma Fraction	Type	Calc Cntrb	Subt Cntrb
Na-22	2.6020e+000 Y	0.0e+000	1	1274.54	0.9994	NET	N	N
Co-60	5.2710e+000 Y	0.0e+000	1	1173.22	1.0000	NET	N	N
			2	1332.49	1.0000	QUANT	N	N
Ru-106	3.6820e+002 D	0.0e+000	1	621.84	0.0980	NET	N	N
			2	1050.47	0.0173	QUANT	N	N
Cs-137	3.0170e+001 Y	0.0e+000	1	661.65	0.8512	NET	N	N
Ba-140	1.2789e+001 D	0.0e+000	1	162.64	0.0670	QUANT	N	N
			2	537.32	0.2500	NET	N	N
Ce-144	2.8430e+002 D	0.0e+000	1	133.54	0.1080	NET	N	N
Eu-152	1.3600e+001 Y	0.0e+000	1	964.01	0.1440	QUANT	N	N
			2	1085.78	0.1000	QUANT	N	N
			3	1112.02	0.1330	QUANT	N	N
			4	1407.95	0.2070	NET	N	N
Np-237	2.1400e+006 Y	0.0e+000	1	94.67	0.1080	QUANT	N	N
			2	98.44	0.1760	QUANT	N	N
			3	111.00	0.0820	QUANT	N	N
			4	311.98	0.3860	NET	N	N
Am-241	4.3220e+002 Y	0.0e+000	1	59.54	0.3590	NET	N	N

AnalyticalTechnologies,Inc.

19509

QUALITY ASSURANCE
DATA REVIEW

Date: 12-15-94

ATI Workorder: 94-11-164 Analysis: KPA (U)

The data contained in the following report have been reviewed and approved by the personnel listed below:

B. pirasteh.
Radiochemistry Instrumentation/Reporting

Shirley A Carr
Radiochemistry Preparation

JAN 1995
RECEIVED

CERTIFICATION

Analytical Technologies. Inc. certifies that the analyses reported herein are true, complete, and correct within the limits of the methods employed.

ATI FM 145FCO (5/19/94)

RADIOCHEMISTRY DATA PACKAGE CONTENTS CHECKLIST

ANALYTICAL TECHNOLOGIES, INC.

TOTAL URANIUM ANALYSIS DATA PACKAGE

ITEM	DATA PACKAGE LOCATION (SECTION)
Sample Results	Section 2
Quality Assurance Sample Results	Section 3
Instrument Raw Data, including Current Calibration Data	Section 5
Standards Documentation	Section 8
Calibration Verification Data	Section 10

1

ANALYTICAL TECHNOLOGIES, INC.
Radiochemistry Data Package

Section 1

NARRATIVE

Narrative Comments for LANL Request Number 19509
(ATI Work Order 94-11-164)
Total Uranium in Water by Kinetic Phosphorescence Analysis
12/19/94

Samples under Request Number 19509 (ATI Work Order 94-11-164) were received on 11/15/94 and scheduled for several analyses including total uranium by KPA, which was completed 12/14/94.

The samples were prepared under ATI SOP721FC3 and ATI SOP741FC3 (under revision), and analyzed under ATI SOP 747FC1.

During the sample digestion process, a portion of 94.25971-1 (ATI ID# 94-11-164-37) was spilled (see QASS). The estimated loss was 3 or 4 milliliters out of a total of 29 milliliters. Assuming the loss was 4 ml, this represents 13.8% of the sample. The uranium concentration, as determined by the KPA instrument, was therefore increased by 13.8% and this adjusted amount was placed in the final report.

An additional four aliquots of sample 94.25971-1 were prepped at a later date. The DER for the two outlying samples of this set of four was determined to be 0.41. The original sample results + the 13.8% adjustment falls within the outlying numbers. The raw data and benchsheets associated with the additional four aliquots are included in this package.

All daily instrument quality control checks were passed for the analysis system used for these analyses and the accompanying quality control analyses.

Reported sample activities are NET activities; that is, they have not been truncated or censored based on an *a priori* detection limit. Sample results should be compared to the appropriate blank for determination of net activity.

B. Pirasteh

Bahman Pirasteh
Radiochemistry Analyst

ANALYTICAL TECHNOLOGIES, INC.

Radiochemistry Data Package

2

Section 2

SAMPLE RESULTS SUMMARY

TOTAL URANIUM ANALYSIS RESULTS SUMMARY

By Laser-Induced Kinetic Phosphorimetry

Lab Name: Analytical Technologies, Inc. Date Collected: 07/21/94

Client Name: Los Alamos Natl Lab/CST-9 Date Analyzed : 12/07/94

Client Project ID: 19509 Sample Matrix : Soil

Lab Sample ID Series: 94-11-164

Client Sample ID	Lab Sample ID	Total Uranium (ug/g)
94.18548-3	11-164-01	47.5 ± 6.5
94.18551-3	11-164-02	6.47 ± 0.87
94.18557-3	11-164-03	2763 ± 380
94.18560-3	11-164-04	2820 ± 388
94.18561-3	11-164-05	10.3 ± 1.4
94.20311-2	11-164-06	21.7 ± 3.0
94.20312-2	11-164-07	41.1 ± 5.7
94.20313-2	11-164-08	190 ± 26
94.20314-2	11-164-09	46.1 ± 6.3
94.20315-2	11-164-10	3.93 ± 0.53
94.20316-2	11-164-11	49.2 ± 6.8
94.20320-2	11-164-12	3.17 ± 0.43
94.20321-2	11-164-13	66.3 ± 9.1
94.20322-2	11-164-14	15.2 ± 2.1
94.20323-2	11-164-15	21.1 ± 2.9
94.20324-2	11-164-16	21.6 ± 3.0
94.20336-2	11-164-17	12.7 ± 1.8
94.20337-2	11-164-18	39.1 ± 5.4
94.20344-4	11-164-19	12.1 ± 1.6
94.18555-3	11-164-20	659 ± 91
94.20317-2	11-164-21	31.8 ± 4.4
94.20318-2	11-164-22	400 ± 55
94.20319-2	11-164-23	282 ± 38
94.20325-2	11-164-24	310 ± 43
94.20326-2	11-164-25	19.4 ± 2.7

Reported Uncertainties are the Estimated Total Propagated Uncertainties (2σ).
See ATI SOP 743FC for details of TPU determinations.

TOTAL URANIUM ANALYSIS RESULTS SUMMARY

By Laser-Induced Kinetic Phosphorimetry

Lab Name: Analytical Technologies, Inc. Date Collected: 07/21/94

Client Name: Los Alamos Natl Lab/CST-9 Date Analyzed : 12/13/94

Client Project ID: 19509 Sample Matrix : Soil

Lab Sample ID Series: 94-11-164

Client Sample ID	Lab Sample ID	Total Uranium (ug/g)
94.20327-2	11-164-26	93 ± 13
94.20328-2	11-164-27	303 ± 42
94.20329-2	11-164-28	161 ± 22
94.20330-2	11-164-29	349 ± 48
94.20331-2	11-164-30	187 ± 26
94.20332-2	11-164-31	47.1 ± 6.5
94.20333-2	11-164-32	136 ± 19
94.20334-2	11-164-33	42.0 ± 5.8
94.20335-2	11-164-34	130 ± 18
94.25969-1	11-164-35	0.81 ± 0.11
94.25970-1	11-164-36	2.92 ± 0.39
94.25971-1	11-164-37	318 ± 44
Blank	11-164-B1	0.44 ± 0.06
Duplicate 20326	11-164-D1	57.6 ± 7.9
Duplicate 20310	11-164-D2	51.6 ± 7.1
Duplicate 20321	11-164-D3	33.0 ± 4.5
Duplicate 20334	11-164-D4	57.4 ± 7.9

Reported Uncertainties are the Estimated Total Propagated Uncertainties (2σ). See ATI SOP 743FC for details of TPU determinations.

Remarks:

In the set 94-11-164, -D1 is a duplicate of 94-11-164-01; -D2 is a duplicate of 94-11-164-11; -D3 is a duplicate of 94-11-164-21; and -D4 is a duplicate of 94-11-164-31.

BL

ANALYTICAL TECHNOLOGIES, INC.
Radiochemistry Data Package

3

Section 3

QC RESULTS SUMMARY

TOTAL URANIUM BLANK SPIKE RESULTS SUMMARY

By Laser-Induced Kinetic Phosphorimetry

Lab Name: Analytical Technologies, Inc. Date Collected: 12/05/94

Client Name: Los Alamos Natl Lab/CST-9 Date Analyzed : 12/07/94

Client Project ID: 19509 Sample Matrix : Soil

Lab Sample ID Series: 94-11-164

Lab Sample ID	Spike Conc. (ug/g)	Rep't Conc. (ug/g)
94-11-164-S1	125.00 ±18.75	129.49 ±17.82

Reported Uncertainties are the Estimated Total Propagated Uncertainties (2σ). See ATI SOP 743FC for details of TPU determinations.

ATI sets control limits for KPA Uranium measurements as follows:
Blank Spike Control Limits = Known (μ) ± 0.15 * μ.

Matrix Spike Control Limits = Known (μ) + Native Concentration ± 0.25 * (μ + Native Concentration).

ATI uses these control limits for all KPA Uranium measurements

Acceptance Range for spike samples is the known value ± the control limits stated above. The reported value, without the uncertainty, should be compared to that range.

TOTAL URANIUM BLANK SPIKE RESULTS SUMMARY

By Laser-Induced Kinetic Phosphorimetry

Lab Name: Analytical Technologies, Inc. Date Collected: 12/07/94

Client Name: Los Alamos Natl Lab/CST-9 Date Analyzed : 12/13/94

Client Project ID: 19509 Sample Matrix : Soil

Lab Sample ID Series: 94-11-194

Lab Sample ID	Spike Conc. (ug/g)	Rep't Conc. (ug/g)
94-11-194-S1	125.00 ±18.75	133.72 ±18.40

Reported Uncertainties are the Estimated Total Propagated Uncertainties (2σ). See ATI SOP 743FC for details of TPU determinations.

ATI sets control limits for KPA Uranium measurements as follows:
Blank Spike Control Limits = Known (μ) ± 0.15 * μ.

Matrix Spike Control Limits = Known (μ) + Native Concentration ± 0.25 * (μ + Native Concentration).

ATI uses these control limits for all KPA Uranium measurements

Acceptance Range for spike samples is the known value ± the control limits stated above. The reported value, without the uncertainty, should be compared to that range.

Remarks:

Blank spike for work orders 94-11-194 and 94-11-164.

SAC

TOTAL URANIUM MATRIX SPIKE RESULTS SUMMARY

By Laser-Induced Kinetic Phosphorimetry

Lab Name: Analytical Technologies, Inc. Date Collected: 07/28/94

Client Name: Los Alamos Natl Lab/CST-9 Date Analyzed : 12/07/94

Client Project ID: 19509 Sample Matrix : Soil

Lab Sample ID Series: 94-11-164

Lab Sample ID	Known Conc. (ug/g)	Rep't Conc. (ug/g)
94-11-164-M1	146.10 ±36.52	139.29 ±19.17

Reported Uncertainties are the Estimated Total Propagated Uncertainties (2σ). See ATI SOP 743FC for details of TPU determinations.

ATI sets control limits for KPA Uranium measurements as follows:
Blank Spike Control Limits = Known (μ) ± 0.15 * μ.

Matrix Spike Control Limits = Known (μ) + Native Concentration ± 0.25 * (μ + Native Concentration).

ATI uses these control limits for all KPA Uranium measurements

Acceptance Range for spike samples is the known value ± the control limits stated above. The reported value, without the uncertainty, should be compared to that range.

Remarks:

Sample 94-11-164-M1 is a matrix spike of 94-11-164-15.

SAC

ANALYTICAL TECHNOLOGIES, INC.
Radiochemistry Data Package

4

Section 4

INDIVIDUAL SAMPLE RESULTS

Due to the nature of Total Uranium reports, individual report pages are not provided. Thus, the individual sample results data may be found in the summary section of this data package.

ANALYTICAL TECHNOLOGIES, INC.
Radiochemistry Data Package

Section 5

RAW DATA

5

Calibration

Range: LOW
Background Measured Intensity 763

Concentration	Intercept	Uncert.	% Disc.	Intensity	Lifetime	R2
+ 50 ug/L	6.15E+05	784.03	3.26E-02	204643	345.4088	.9999
+ 25 ug/L	3.13E+05	559.8	-3.04E-01	205030	343.3766	1
+ 10 ug/L	1.28E+05	358.2	0.37	105787	337.3098	1
+ 5 ug/L	6.65E+04	257.96	3	54191	322.4066	1
+ 1 ug/L	1.33E+04	115.31	-2.51E+00	11044	339.7162	.9997
+ .5 ug/L	6769.63	82.28	-6.53E+00	5438	308.0435	.9996

Zero Point Included. Y=-1.07E+01X2+1.28E+04X +842.517

Calibration

Range: HIGH
Background Measured Intensity 6

Concentration	Intercept	Uncert.	% Disc.	Intensity	Lifetime	R2
+ 500 ug/L	8.47E+04	291.05	3.99E-02	67449	295.0242	.9999
+ 200 ug/L	3.34E+04	182.88	-1.00E+00	27266	309.7819	.9998
+ 100 ug/L	1.75E+04	132.17	3.03	14294	329.4662	.9999
+ 50 ug/L	8564.55	92.54	-4.11E-02	7044	328.4559	.9998
+ 25 ug/L	4373.4	66.13	-1.60E-01	3612	334.7337	.9997

Zero Point Included. Y=3.41E-03X2+167.251X +196.995

Sample ID 500 PPB CCV
Description #138 A
Ref. Ratio 1.005
Laser Pulses 1000
Lifetime 289 + .393 us
R2 .9999
Integrated 1318202
Range: HIGH

Date/Time 12/07/94/09:42:47
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 66853 (t= 52 us)
Conc 495.53522 + 15.1548 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 495.535 + 15.155 ug/L

Sample ID 100 PPB CCV
Description #165 A
Ref. Ratio 1.001
Laser Pulses 1000
Lifetime 329 + .719 us
R2 .9998
Integrated 301642
Range: HIGH

Date/Time 12/07/94/09:44:43
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 13991 (t= 52 us)
Conc 101.4679 + 3.1084 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 101.468 + 3.108 ug/L

Sample ID 50 PPB CCV
Description #165 B
Ref. Ratio 1.001
Laser Pulses 1000
Lifetime 328 + .645 us
R2 .9999
Integrated 149694
Range: HIGH

Date/Time 12/07/94/09:46:35
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 7015 (t= 52 us)
Conc 49.91651 + 1.5274 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 49.917 + 1.527 ug/L

Sample ID 50 PPB CCV
Description #165 B
Ref. Ratio 1.003
Laser Pulses 1000
Lifetime 336 + .987 us
R2 .9996
Integrated 4524777
Range: LOW

Date/Time 12/07/94/09:48:45
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 207044 (t= 351 us)
Conc 50.18994 + .6439 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 50.19 + .644 ug/L

000015
BP

Sample ID 10 PPB CCV
Description #156 F
Ref. Ratio 1.015
Laser Pulses 1000
Lifetime 334 + .477 us
R2 1
Integrated 2287841
Range: LOW

Date/Time 12/07/94/09:51:32
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 105492 (t= 52 us)
Conc 10.0708 + .1132 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 10.071 + .113 ug/L

Sample ID 1 PPB CCV
Description #166
Ref. Ratio 1.011
Laser Pulses 1000
Lifetime 330 + .921 us
R2 .9997
Integrated 241987
Range: LOW

Date/Time 12/07/94/09:56:01
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 11057 (t= 52 us)
Conc 1.00993 + 1.18E-02 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 1.01 + 1.18E-02 ug/L

Sample ID 0 PPB CCV
Description #138 K
Ref. Ratio 1.021
Laser Pulses 1000
Lifetime + us
R2
Integrated 64
Range: LOW
Sample <= Blank

Date/Time 12/07/94/10:00:52
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 64 (t= 52 us)
Conc + ug/L
Dilution Factor X mL/mL

FINAL RESULT

Sample ID TEST
Description
Ref. Ratio 1.011
Laser Pulses 1000
Lifetime + us
R2
Integrated 93
Range: LOW
Sample <= Blank

Date/Time 12/07/94/10:10:59
Cal Y=-1.07E+01X+1.28E+04
Intensity 93 (t= 52 us)
Conc + ug/L
Dilution Factor X mL/mL

FINAL RESULT

Sample ID 10 PPB CCV 2ND
Description #157
Ref. Ratio 1.017
Laser Pulses 1000
Lifetime 332 + .247 us
R2 1
Integrated 2197948
Range: LOW

Date/Time 12/07/94/10:15:54
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 101714 (t= 52 us)
Conc 9.71153 + .1088 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 9.712 + .109 ug/L

BP

Sample ID 94-11-025-02
Description 94.13637-3
Ref. Ratio 1.021
Laser Pulses 1000
Lifetime 271 + .487 us
R2 .9998
Integrated 3871388
Range: LOW

Date/Time 12/07/94/10:55:23
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 206450 (t= 156 us)
Conc 30.73287 + .3571 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 30.733 + .357 ug/L

Sample ID 94-11-025-02
Description 94.13637-3
Ref. Ratio 1.009
Laser Pulses 1000
Lifetime 258 + 1.153 us
R2 .9991
Integrated 75561
Range: HIGH

Date/Time 12/07/94/10:57:31
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 4240 (t= 52 us)
Conc 30.73402 + .9612 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 30.734 + .961 ug/L

Sample ID 25 PPB CCV
Description #156 E
Ref. Ratio 1.033
Laser Pulses 1000
Lifetime 336 + .356 us
R2 .9999
Integrated 4424521
Range: LOW

Date/Time 12/07/94/11:17:19
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 202426 (t= 130 us)
Conc 24.87467 + .2828 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 24.875 + .283 ug/L

Sample ID 94-11-164-01
Description 94.18548-3
Ref. Ratio 1.02
Laser Pulses 1000
Lifetime 228 + .154 us
R2 1
Integrated 3299758
Range: LOW

Date/Time 12/07/94/11:24:54
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 197073 (t= 390 us)
Conc 99.48785 + 1.1281 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 99.488 + 1.128 ug/L

Sample ID 94-11-164-01
Description 94.18548-3
Ref. Ratio 1.023
Laser Pulses 1000
Lifetime 222 + .104 us
R2 1
Integrated 200052
Range: HIGH

Date/Time 12/07/94/11:26:12
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 12199 (t= 52 us)
Conc 97.27222 + 2.9688 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 97.272 + 2.969 ug/L

BP

2

BP

Sample ID 94-11-164-D1
Description 94.18548-3 → Duplicate of 01
Ref. Ratio 1.021
Laser Pulses 1000
Lifetime 232 + .494 us
R2 .9998
Integrated 256358
Range: HIGH

Date/Time 12/07/94/11:28:12
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 14963 (t= 52 us)
Conc 119.27493 + 3.6652 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 119.275 + 3.665 ug/L

Sample ID 94-11-164-D1
Description 94.18548-3
Ref. Ratio 1.012
Laser Pulses 1000
Lifetime 231 + .306 us
R2 .9999
Integrated 255785
Range: HIGH

Date/Time 12/07/94/11:34:54
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 15254 (t= 52 us)
Conc 119.67526 + 3.6639 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 119.675 + 3.664 ug/L

Sample ID 94-11-164-01
Description 94.18548-3
Ref. Ratio 1.036
Laser Pulses 1000
Lifetime 226 + .229 us
R2 1
Integrated 3266850
Range: LOW

Date/Time 12/07/94/11:41:01
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 195385 (t= 390 us)
Conc 100.11055 + 1.149 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 100.111 + 1.149 ug/L

Sample ID 94-11-164-01
Description 94.18548-3
Ref. Ratio 1.022
Laser Pulses 1000
Lifetime 223 + .47 us
R2 .9998
Integrated 203094
Range: HIGH

Date/Time 12/07/94/11:44:28
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 12279 (t= 52 us)
Conc 98.09301 + 3.0153 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 98.093 + 3.015 ug/L

Sample ID 94-11-164-02
Description 94.18551-3
Ref. Ratio 1.025
Laser Pulses 1000
Lifetime 234 + .245 us
R2 .9999
Integrated 2167233
Range: LOW

Date/Time 12/07/94/11:46:28
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 128053 (t= 52 us)
Conc 13.25949 + .1508 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 13.259 + .151 ug/L

Sample ID 94-11-164-03
Description 94.18557-3
Ref. Ratio 1.031
Laser Pulses 1000
Lifetime 236 + .463 us
R2 .9999
Integrated 3052739
Range: LOW
Concentration Too High

Date/Time 12/07/94/11:52:03
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 201183 (t=1261 us)
Conc + ug/L
Dilution Factor 1 mL/mL

FINAL RESULT

Sample ID 94-11-164-03
Description 94.18557-3
Ref. Ratio 1.038
Laser Pulses 1000
Lifetime 224 + .259 us
R2 .9999
Integrated 3215649

Date/Time 12/07/94/11:53:08
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 194755 (t= 299 us)
Conc 4340.40332 + 1.33E+02 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT [illegible]

000918

3

Sample ID 94-11-164-03
Description 94.18557-3 DIL 1:10
Ref. Ratio 1.02
Laser Pulses 1000
Lifetime 309 + .39 us
R2 1
Integrated 1592442
Range: HIGH

Date/Time 12/07/94/12:03:39
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 76845 (t= 52 us)
Conc 563.38623 + 17.2054 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 563.386 + 17.205 ug/L above calib range

Sample ID 94-11-164-03
Description 94.18557-3 DIL 1:100
Ref. Ratio 1.022
Laser Pulses 1000
Lifetime 318 + .77 us
R2 .9997
Integrated 169106
Range: HIGH

Date/Time 12/07/94/12:09:37
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 7973 (t= 52 us)
Conc 58.02383 + 1.7791 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 58.024 + 1.779 ug/L

Sample ID 94-11-164-04
Description 94.18560-3 ~~DIL 1:100~~ BP 12/07/94
Ref. Ratio 1.033
Laser Pulses 1000
Lifetime 204 + .124 us
R2 1
Integrated 3113085
Range: LOW
Sample <= Blank

Date/Time 12/07/94/12:11:51
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 202003 (t= 975 us)
Conc + ug/L
Dilution Factor 1 mL/mL

FINAL RESULT

Sample ID 94-11-164-04
Description 94.18560-3 ~~DIL 1:100~~ BP
Ref. Ratio 1.032
Laser Pulses 1000
Lifetime 180 + .581 us
R2 .9996
Integrated 2573062
Range: HIGH

Date/Time 12/07/94/12:13:36
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 194762 (t= 182 us)
Conc 3101.05884 + 98.746 ~~ug/L~~
Dilution Factor 1 mL/mL

FINAL RESULT 3.10E+03 + 98.746 ug/L

Sample ID 94-11-164-04
Description 94.18560-3 DIL 1:10
Ref. Ratio 1.019
Laser Pulses 1000
Lifetime 296 + .391 us
R2 1
Integrated 1495720
Range: HIGH

Date/Time 12/07/94/12:20:58
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 74450 (t= 52 us)
Conc 550.40558 + 16.8205 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 550.406 + 16.821 ug/L above calib range

Sample ID 94-11-164-04
Description 94.18560-3 DIL 1:100
Ref. Ratio 1.03
Laser Pulses 1000
Lifetime 316 + .575 us
R2 .9999
Integrated 165234
Range: HIGH

Date/Time 12/07/94/12:24:22
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 7941 (t= 52 us)
Conc 56.95478 + 1.7422 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 56.955 + 1.742 ug/L

Sample ID 94-11-164-05
Description 94.18561-3
Ref. Ratio 1.031
Laser Pulses 1000
Lifetime 265 + .517 us
R2 .9999
Integrated 3811549

Date/Time 12/07/94/12:27:01
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 204897 (t= 52 us)
Conc 20.83627 + .2401 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 20.836 + .24 ug/L

BP

4

Sample ID 94-11-164-06
Description 94.20311-2
Ref. Ratio 1.026
Laser Pulses 1000
Lifetime 242 + us
R2 1
Integrated 3439280
Range: LOW

Date/Time 12/07/94/12:30:59
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 196355 (t= 234 us)
Conc 44.44039 + .4989 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 44.44 + .499 ug/L

Sample ID 94-11-164-06
Description 94.20311-2
Ref. Ratio 1.021
Laser Pulses 1000
Lifetime 232 + .567 us
R2 .9997
Integrated 97702
Range: HIGH

Date/Time 12/07/94/12:32:40
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 5711 (t= 52 us)
Conc 44.64283 + 1.3749 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 44.643 + 1.375 ug/L

Sample ID 94-11-164-07
Description 94.20312-2
Ref. Ratio 1.032
Laser Pulses 1000
Lifetime 213 + .223 us
R2 1
Integrated 3111820
Range: LOW

Date/Time 12/07/94/12:35:00
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 195994 (t= 338 us)
Conc 86.87627 + .9973 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 86.876 + .997 ug/L

Sample ID 94-11-164-07
Description 94.20312-2
Ref. Ratio 1.039
Laser Pulses 1000
Lifetime 205 + .444 us
R2 .9998
Integrated 161789
Range: HIGH

Date/Time 12/07/94/12:36:19
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 10485 (t= 52 us)
Conc 85.41651 + 2.6305 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 85.417 + 2.63 ug/L

Sample ID 94-11-164-08
Description 94.20313-2
Ref. Ratio 1.049
Laser Pulses 1000
Lifetime 227 + .344 us
R2 1
Integrated 3231018
Range: LOW
Sample <= Blank

Date/Time 12/07/94/12:39:03
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 193054 (t= 689 us)
Conc + ug/L
Dilution Factor 1 mL/mL

FINAL RESULT

Sample ID 94-11-164-08
Description 94.20313-2
Ref. Ratio 1.035
Laser Pulses 1000
Lifetime 218 + .15 us
R2 1
Integrated 765550
Range: HIGH

Date/Time 12/07/94/12:40:25
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 47407 (t= 52 us)
Conc 380.46268 + 11.6158 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 380.463 + 11.616 ug/L

Sample ID 94-11-164-09
Description 94.20314-2
Ref. Ratio 1.04
Laser Pulses 1000
Lifetime 224 + .3 us
R2 1
Integrated 3273684

Date/Time 12/07/94/12:42:30
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 197306 (t= 377 us)
Conc 96.39246 + 1.0797 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 96.392 + 1.08 ug/L

5

Sample ID 94-11-164-09
Description 94.20314-2
Ref. Ratio 1.043
Laser Pulses 1000
Lifetime 216 + .294 us
R2 .9999
Integrated 188659
Range: HIGH

Date/Time 12/07/94/12:43:56
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 11879 (t= 52 us)
Conc 94.58617 + 2.8959 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 94.586 + 2.896 ug/L

Sample ID 94-11-164-10
Description 94.20315-2
Ref. Ratio 1.039
Laser Pulses 1000
Lifetime 242 + .107 us
R2 1
Integrated 1372458
Range: LOW

Date/Time 12/07/94/12:46:38
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 79290 (t= 52 us)
Conc 8.05685 + 9.02E-02 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 8.057 + 9.02E-02 ug/L

Sample ID 94-11-164-11
Description 94.20316-2
Ref. Ratio 1.04
Laser Pulses 1000
Lifetime 220 + .176 us
R2 1
Integrated 3299153
Range: LOW

Date/Time 12/07/94/12:48:45
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 202141 (t= 377 us)
Conc 103.43952 + 1.1587 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 103.44 + 1.159 ug/L

Sample ID 94-11-164-11
Description 94.20316-2
Ref. Ratio 1.039
Laser Pulses 1000
Lifetime 212 + .309 us
R2 .9999
Integrated 195976
Range: HIGH

Date/Time 12/07/94/12:50:05
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 12543 (t= 52 us)
Conc 100.35412 + 3.0742 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 100.354 + 3.074 ug/L

Sample ID 94-11-164-D2
Description DUPLICATE 164-11
Ref. Ratio 1.036
Laser Pulses 1000
Lifetime 216 + .266 us
R2 .9999
Integrated 213530
Range: HIGH

Date/Time 12/07/94/12:55:36
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 13308 (t= 52 us)
Conc 106.77959 + 3.2696 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 106.78 + 3.27 ug/L

Sample ID 94-11-164-12
Description 94.20320-2
Ref. Ratio 1.034
Laser Pulses 1000
Lifetime 232 + .126 us
R2 1
Integrated 1086868
Range: LOW

Date/Time 12/07/94/12:57:50
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 64533 (t= 52 us)
Conc 6.65739 + 7.49E-02 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 6.657 + 7.49E-02 ug/L

Sample ID 94-11-164-13
Description 94.20321-2
Ref. Ratio 1.047
Laser Pulses 1000
Lifetime 214 + .193 us
R2 1
Integrated 3052524
Range: LOW

Date/Time 12/07/94/13:02:49
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 191463 (t= 442 us)
Conc 143.86952 + 1.6115 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 143.87 + 1.612 ug/L

BP

6

Sample ID 94-11-164-13
Description 94.20321-2
Ref. Ratio 1.038
Laser Pulses 1000
Lifetime 205 + .255 us
R2 .9999
Integrated 262139
Range: HIGH

Date/Time 12/07/94/13:04:24
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 17102 (t= 52 us)
Conc 139.11942 + 4.2597 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 139.119 + 4.26 ug/L

Sample ID 94-11-164-14
Description 94.20322-2
Ref. Ratio 1.038
Laser Pulses 1000
Lifetime 233 + .309 us
R2 1
Integrated 3284971
Range: LOW

Date/Time 12/07/94/13:06:17
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 192597 (t= 156 us)
Conc 32.15746 + .3602 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 32.157 + .36 ug/L

Sample ID 94-11-164-14
Description 94.20322-2
Ref. Ratio 1.048
Laser Pulses 1000
Lifetime 226 + .633 us
R2 .9997
Integrated 68115
Range: HIGH

Date/Time 12/07/94/13:07:32
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 4164 (t= 52 us)
Conc 31.81202 + .9835 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 31.812 + .984 ug/L

Sample ID 94-11-164-15
Description 94.20323-2
Ref. Ratio 1.045
Laser Pulses 1000
Lifetime 234 + .407 us
R2 .9999
Integrated 3306417
Range: LOW

Date/Time 12/07/94/13:09:11
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 194089 (t= 221 us)
Conc 43.04001 + .5117 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 43.04 + .512 ug/L

Sample ID 94-11-164-15
Description 94.20323-2
Ref. Ratio 1.048
Laser Pulses 1000
Lifetime 224 + .551 us
R2 .9997
Integrated 90407
Range: HIGH

Date/Time 12/07/94/13:10:27
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 5581 (t= 52 us)
Conc 42.93862 + 1.3242 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 42.939 + 1.324 ug/L

Sample ID 94-11-164-16
Description 94.20324-2
Ref. Ratio 1.048
Laser Pulses 1000
Lifetime 184 + .133 us
R2 1
Integrated 2828121
Range: LOW

Date/Time 12/07/94/13:15:13
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 199732 (t= 169 us)
Conc 44.19912 + .4951 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 44.199 + .495 ug/L

Sample ID 94-11-164-16
Description 94.20324-2
Ref. Ratio 1.043
Laser Pulses 1000
Lifetime 182 + .504 us
R2 .9997
Integrated 71938
Range: HIGH (Range: High 12-14-94)

Date/Time 12/07/94/13:16:27
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 5354 (t= 52 us)
Conc 43.02361 + 1.338 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 43.024 + 1.338 ug/L

000022
BP

7

Sample ID 94-11-164-17
Description 94.20336-2
Ref. Ratio 1.04
Laser Pulses 1000
Lifetime 235 + .165 us
R2 1
Integrated 3354981
Range: LOW

Date/Time 12/07/94/13:18:15
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 195089 (t= 117 us)
Conc 27.36466 + .3065 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 27.365 + .307 ug/L

Sample ID 94-11-164-17
Description 94.20336-2
Ref. Ratio 1.054
Laser Pulses 1000
Lifetime 230 + .569 us
R2 .9997
Integrated 58583
Range: HIGH

Date/Time 12/07/94/13:19:27
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 3588 (t= 52 us)
Conc 26.61438 + .8198 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 26.614 + .82 ug/L

Sample ID 94-11-164-18
Description 94.20337-2
Ref. Ratio 1.048
Laser Pulses 1000
Lifetime 232 + .24 us
R2 .9999
Integrated 3392645
Range: LOW

Date/Time 12/07/94/13:21:10
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 199652 (t= 351 us)
Conc 81.38642 + .9495 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 81.386 + .95 ug/L

Sample ID 94-11-164-18
Description 94.20337-2 DIL 1:10
Ref. Ratio 1.037
Laser Pulses 1000
Lifetime 296 + .521 us
R2 .9999
Integrated 1764032
Range: LOW

Date/Time 12/07/94/13:32:38
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 87632 (t= 52 us)
Conc 8.58529 + 9.78E-02 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 8.585 + 9.78E-02 ug/L

Sample ID 94-11-164-18
Description 94.20337-2
Ref. Ratio 1.031
Laser Pulses 1000
Lifetime 223 + .217 us
R2 1
Integrated 168752
Range: HIGH

Date/Time 12/07/94/13:36:33
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 10364 (t= 52 us)
Conc 81.3103 + 2.4855 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 81.31 + 2.486 ug/L

Sample ID 94-11-164-19
Description 94.20344-4
Ref. Ratio 1.025
Laser Pulses 1000
Lifetime 222 + .315 us
R2 .9999
Integrated 3338302
Range: LOW

Date/Time 12/07/94/13:45:44
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 203445 (t= 78 us)
Conc 24.63715 + .2841 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 24.637 + .284 ug/L

NOTE: t=78μs is fine; repeat this result. DCS 12-19-94

Sample ID 94-11-164-19
Description 94.20344-4
Ref. Ratio 1.037
Laser Pulses 1000
Lifetime 218 + .58 us
R2 .9997
Integrated 49631
Range: HIGH

OK SAC 12-15-94

Date/Time 12/07/94/13:46:59
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 3031 (t= 52 us)
Conc 23.76731 + .7339 ug/L
Dilution Factor 1 mL/mL
Too high for curve

Reprep. Report New different

FINAL RESULT 23.767 + .734 ug/L

Don't report the above - see note above DCS 12-19-94 BJP

000023

8

Sample ID 94-11-164-20
Description 94.18555-3
Ref. Ratio 1.038
Laser Pulses 1000
Lifetime 121 + .228 us
R2 .9998
Integrated 1878032
Range: LOW
Sample <= Blank

Date/Time 12/07/94/13:49:47
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 194506 (t= 442 us)
Conc + ug/L
Dilution Factor 1 mL/mL

FINAL RESULT

Sample ID 94-11-164-20
Description 94.18555-3
Ref. Ratio 1.032
Laser Pulses 1000
Lifetime 107 + .484 us
R2 .9991
Integrated 834239
Range: HIGH

Date/Time 12/07/94/13:51:10
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 102389 (t= 52 us)
Conc 999.91132 + 34.626 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 999.911 + 34.626 ug/L

Sample ID 94-11-164-20
Description 94.18555-3DIL 1:10
Ref. Ratio 1.026
Laser Pulses 1000
Lifetime 282 + .446 us
R2 .9999
Integrated 359075
Range: HIGH

Date/Time 12/07/94/13:54:59
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 18388 (t= 52 us)
Conc 138.28745 + 4.2335 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 138.287 + 4.233 ug/L

Sample ID 94-11-164-M1
Description MATRIX SPIKE -15
Ref. Ratio 1.036
Laser Pulses 1000
Lifetime 223 + .399 us
R2 .9999
Integrated 599721
Range: HIGH

Date/Time 12/07/94/14:08:42
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 36602 (t= 52 us)
Conc 291.11664 + 8.934 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 291.117 + 8.934 ug/L

Sample ID 94-11-164-B1
Description BLANK
Ref. Ratio 1.027
Laser Pulses 1000
Lifetime 308 + .627 us
R2 .9998
Integrated 208018
Range: LOW

Date/Time 12/07/94/14:11:27
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 10027 (t= 52 us)
Conc .91329 + 1.05E-02 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT .913 + 1.05E-02 ug/L

Sample ID 94-11-164-B1
Description Blank
Ref. Ratio 1.021
Laser Pulses 1000
Lifetime 309 + .486 us
R2 .9999
Integrated 209530
Range: LOW

Date/Time 12/07/94/14:17:12
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 9941 (t= 52 us)
Conc .91806 + 1.04E-02 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT .918 + 1.04E-02 ug/L

Sample ID 94-11-164-S1
Description Blank spike
Ref. Ratio 1.019
Laser Pulses 1000
Lifetime 306 + .569 us
R2 .9998
Integrated 747053

Date/Time 12/07/94/14:19:54
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 36660 (t= 52 us)
Conc 268.04709 + 8.211 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 268.047 + 8.211 ug/L

9

Sample ID 25 PPB CCV
Description #156 E
Ref. Ratio 1.017
Laser Pulses 1000
Lifetime 310 + .416 us
R2 .9999
Integrated 4231805
Range: LOW

Date/Time 12/07/94/14:31:52
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 203589 (t= 117 us)
Conc 24.88049 + .2837 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 24.88 + .284 ug/L

Sample ID 25 PPB CCV
Description #156 E
Ref. Ratio 1.013
Laser Pulses 1000
Lifetime 300 + .864 us
R2 .9997
Integrated 69954
Range: HIGH

Date/Time 12/07/94/14:40:55
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 3460 (t= 52 us)
Conc 24.55009 + .7547 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 24.55 + .755 ug/L

Sample ID 25 PPB CCV
Description #156 E
Ref. Ratio 1.009
Laser Pulses 1000
Lifetime 333 + 1.413 us
R2 .9992
Integrated 72056
Range: HIGH

accept this
BP

Date/Time 12/07/94/17:24:11
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 3298 (t= 52 us)
Conc 23.13886 + .7154 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 23.139 + .715 ug/L

Sample ID 25 PPB CCV
Description #156 E
Ref. Ratio 1.022
Laser Pulses 1000
Lifetime 322 + .577 us
R2 1
Integrated 4314568
Range: LOW

Date/Time 12/07/94/17:26:10
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 202837 (t= 117 us)
Conc 24.34692 + .2727 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 24.347 + .273 ug/L

Sample ID 94-11-064-03
Description 94-07-180-01 #40
Ref. Ratio 1.002
Laser Pulses 1000
Lifetime 232 + 1.964 us
R2 .9969
Integrated 518583
Range: LOW

Date/Time 12/07/94/17:29:13
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 33505 (t= 52 us)
Conc 3.10498 + 5.63E-02 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 3.105 + 5.63E-02 ug/L

Sample ID 94-11-064-04
Description 94-07-180-01FLOC 10
Ref. Ratio 1.009
Laser Pulses 1000
Lifetime 291 + 1.618 us
R2 .9987
Integrated 127859
Range: LOW

Repeat

Date/Time 12/07/94/17:32:29
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 7025 (t= 52 us)
Conc .56557 + 7.64E-03 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT .566 + 7.64E-03 ug/L

Sample ID 94-11-064-04
Description 94-07-180-01FLOC
Ref. Ratio 1.004
Laser Pulses 1000
Lifetime 184 + .357 us
R2 .9998
Integrated 676017
Range: LOW

Date/Time 12/07/94/17:38:45
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 50053 (t= 52 us)
Conc 5.30826 + 6.33E-02 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 5.308 + 6.33E-02 ug/L

BP

Calibration

Range: LOW
Background Measured Intensity 763

Concentration	Intercept	Uncert.	% Disc.	Intensity	Lifetime	R2
+ 50 ug/L	6.15E+05	784.03	3.26E-02	204643	345.4088	.9999
+ 25 ug/L	3.13E+05	559.8	-3.04E-01	205030	343.3766	1
+ 10 ug/L	1.28E+05	358.2	0.37	105787	337.3098	1
+ 5 ug/L	6.65E+04	257.96	3	54191	322.4066	1
+ 1 ug/L	1.33E+04	115.31	-2.51E+00	11044	339.7162	.9997
+ .5 ug/L	6769.63	82.28	-6.53E+00	5438	308.0435	.9996

Zero Point Included. Y=-1.07E+01X2+1.28E+04X +842.517

Calibration

Range: HIGH
Background Measured Intensity 6

Concentration	Intercept	Uncert.	% Disc.	Intensity	Lifetime	R2
+ 500 ug/L	8.47E+04	291.05	3.99E-02	67449	295.0242	.9999
+ 200 ug/L	3.34E+04	182.88	-1.00E+00	27266	309.7819	.9998
+ 100 ug/L	1.75E+04	132.17	3.03	14294	329.4662	.9999
+ 50 ug/L	8564.55	92.54	-4.11E-02	7044	328.4559	.9998
+ 25 ug/L	4373.4	66.13	-1.60E-01	3612	334.7337	.9997

Zero Point Included. Y=3.41E-03X2+167.251X +196.995

Sample ID 500 PPB CCV
Description #138 A
Ref. Ratio .965
Laser Pulses 1000
Lifetime 271 + .219 us
R2 1
Integrated 1284862
Range: HIGH

Date/Time 12/13/94/08:42:57
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 67824 (t= 52 us)
Conc 512.06519 + 15.6348 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 512.065 + 15.635 ug/L

Sample ID 100 PPB CCV
Description #165 A
Ref. Ratio .967
Laser Pulses 1000
Lifetime 311 + .323 us
R2 .9999
Integrated 297549
Range: HIGH

Date/Time 12/13/94/08:45:16
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 14284 (t= 52 us)
Conc 104.69517 + 3.1974 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 104.695 + 3.197 ug/L

Sample ID 50 PPB CCV
Description #165 B
Ref. Ratio .97
Laser Pulses 1000
Lifetime 306 + .576 us
R2 .9999
Integrated 142527
Range: HIGH

Date/Time 12/13/94/08:52:00
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 7047 (t= 52 us)
Conc 50.31908 + 1.5394 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 50.319 + 1.539 ug/L

Sample ID 50 PPB CCV
Description #165 B
Ref. Ratio .983
Laser Pulses 1000
Lifetime 311 + .268 us
R2 1
Integrated 4354273
Range: LOW

Date/Time 12/13/94/08:53:30
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 209356 (t= 325 us)
Conc 51.08549 + .5722 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 51.085 + .572 ug/L

Sample ID 10 PPB CCV
Description #157
Ref. Ratio .984
Laser Pulses 1000
Lifetime 309 + .318 us
R2 1
Integrated 2126917
Range: LOW

Date/Time 12/13/94/08:55:39
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 104126 (t= 52 us)
Conc 9.98806 + .1122 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 9.988 + .112 ug/L

Sample ID 1 PPB CCV
Description #166
Ref. Ratio .989
Laser Pulses 1000
Lifetime 318 + 1.372 us
R2 .9992
Integrated 243066
Range: LOW

Date/Time 12/13/94/08:57:17
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 11773 (t= 52 us)
Conc 1.04445 + 1.29E-02 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 1.044 + 1.29E-02 ug/L

Sample ID 0 PPB CCV
Description #138 K
Ref. Ratio .986
Laser Pulses 1000
Lifetime 418 + 15.999 us
R2 .9407
Integrated 9133
Range: LOW
Sample <= Blank

Date/Time 12/13/94/08:59:34
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 505 (t= 52 us)
Conc -3.23E-02 + 1.21E-03 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT -3.23E-02 + 1.21E-03 ug/L

Sample ID 25 PPB CCV
Description #156 E
Ref. Ratio .952
Laser Pulses 1000
Lifetime 318 + .464 us
R2 1
Integrated 4488742
Range: LOW

Date/Time 12/13/94/10:30:14
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 212779 (t= 117 us)
Conc 25.68477 + .2877 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 25.685 + .288 ug/L

Sample ID 25 PPB CCV
Description #156 E
Ref. Ratio .944
Laser Pulses 1000
Lifetime 302 + .893 us
R2 .9996
Integrated 71139
Range: HIGH

Date/Time 12/13/94/10:32:47
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 3510 (t= 52 us)
Conc 24.84531 + .764 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 24.845 + .764 ug/L

Sample ID 10 PPB CCV 2ND
Description #157
Ref. Ratio .942
Laser Pulses 1000
Lifetime 317 + .54 us
R2 .9999
Integrated 2258928
Range: LOW

Date/Time 12/13/94/10:35:29
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 108078 (t= 52 us)
Conc 10.38346 + .1184 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 10.383 + .118 ug/L

Sample ID 94-11-164-21
Description 94.20317-2
Ref. Ratio .974
Laser Pulses 1000
Lifetime 261 + .429 us
R2 1
Integrated 3879882
Range: LOW

Date/Time 12/13/94/12:10:38
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 210311 (t= 338 us)
Conc 67.35506 + .7545 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 67.355 + .754 ug/L

000027

Sample ID 94-11-164-21
Description 94.20317-2
Ref. Ratio .986
Laser Pulses 1000
Lifetime 252 + .351 us
R2 .9999
Integrated 157273
Range: HIGH

Date/Time 12/13/94/12:11:49
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 8759 (t= 52 us)
Conc 66.75066 + 2.0426 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 66.751 + 2.043 ug/L

Sample ID 94-11-164-22
Description 94.20318-2
Ref. Ratio .97
Laser Pulses 1000
Lifetime 188 + 7.47E-02 us
low
R2 1
Integrated 3089004
Range: LOW
Sample <= Blank

Date/Time 12/13/94/12:13:59
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 215389 (t= 598 us)
high
Conc + ug/L
Dilution Factor 1 mL/mL

FINAL RESULT

Sample ID 94-11-164-22
Description 94.20318-2
Ref. Ratio .973
Laser Pulses 1000
Lifetime 166 + .689 us
R2 .9993
Integrated 971155
Range: HIGH

Date/Time 12/13/94/12:16:04
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 79525 (t= 52 us)
Conc 653.76776 + 20.9486 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 653.768 + 20.949 ug/L
above calib range

Sample ID 94-11-164-22
Description 94.20318-2 1:10
Ref. Ratio .971
Laser Pulses 1000
Lifetime 282 + .439 us
R2 .9999
Integrated 212869
Range: HIGH

Date/Time 12/13/94/12:19:53
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 10818 (t= 52 us)
Conc 81.525 + 2.4937 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 81.525 + 2.494 ug/L

Sample ID 94-11-164-23
Description 94.20319-2
Ref. Ratio .971
Laser Pulses 1000
Lifetime 165 + .628 us
low
R2 .9994
Integrated 673086
Range: HIGH

Date/Time 12/13/94/12:22:00
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 54746 (t= 52 us)
Conc 457.17471 + 14.5375 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 457.175 + 14.538 ug/L

Sample ID 94-11-164-23
Description 94.20319-2 1:10
Ref. Ratio .933
Laser Pulses 1000
Lifetime 1037 + 9.93E+02 us
R2 .1199
Integrated 136
Range: HIGH
Sample <= Blank

Computer error

Date/Time 12/13/94/12:25:50
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 12 (t= 52 us)
Conc -1.09E+00 + .1347 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT -1.09E+00 + .135 ug/L

SAC

Sample ID 94-11-164-23
Description 94.20319-2 1:10
Ref. Ratio .945
Laser Pulses 1000
Lifetime 300 + .134 us
R2 1
Integrated 4431229
Range: LOW

Date/Time 12/13/94/12:31:35
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 217599 (t= 325 us)
Conc 55.53075 + .622 ug/L
Dilution Factor 1 mL/mL

high

FINAL RESULT 55.531 + .622 ug/L

Sample ID 94-11-164-23
Description 94.20319-2 1:100
Ref. Ratio .95
Laser Pulses 1000
Lifetime 301 + .53 us
R2 .9999
Integrated 1225715
Range: LOW

Date/Time 12/13/94/12:34:49
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 60839 (t= 52 us)
Conc 5.84518 + 6.68E-02 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 5.845 + 6.68E-02 ug/L

Sample ID 94-11-164-24
Description 94.20325-2
Ref. Ratio .978
Laser Pulses 1000
Lifetime 197 + .712 us
R2 .9994
Integrated 944854
Range: HIGH

low

Date/Time 12/13/94/12:37:23
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 66277 (t= 52 us)
Conc 521.44061 + 16.345 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 521.441 + 16.345 ug/L

above calib range

Sample ID 94-11-164-24
Description 94.20325-2 1:10
Ref. Ratio .978
Laser Pulses 1000
Lifetime 282 + .47 us
R2 .9999
Integrated 168899
Range: HIGH

Date/Time 12/13/94/12:42:41
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 8738 (t= 52 us)
Conc 64.43588 + 1.9729 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 64.436 + 1.973 ug/L

Sample ID 94-11-164-25
Description 94.20326-2
Ref. Ratio .982
Laser Pulses 1000
Lifetime 268 + .826 us
R2 .9996
Integrated 105818
Range: HIGH

Date/Time 12/13/94/12:45:06
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 5669 (t= 52 us)
Conc 41.9881 + 1.2949 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 41.988 + 1.295 ug/L

Sample ID 94-11-164-26
Description 94.20327-2
Ref. Ratio .982
Laser Pulses 1000
Lifetime 266 + .149 us
R2 1
Integrated 456733
Range: HIGH

Date/Time 12/13/94/12:47:14
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 24413 (t= 52 us)
Conc 185.97862 + 5.6802 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 185.979 + 5.68 ug/L

Sample ID 94-11-164-27
Description 94.20328-2
Ref. Ratio .985
Laser Pulses 1000
Lifetime 238 + .315 us
R2 .9999
Integrated 1259654
Range: HIGH

Date/Time 12/13/94/12:49:17
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 74178 (t= 52 us)
Conc 569.8609 + 17.426 ug/L
Dilution Factor 1 mL/mL

above calib range

FINAL RESULT 569.861 + 17.426 ug/L

above calib range

SPC

Sample ID 94-11-164-27
Description 94.20328-2 1:10
Ref. Ratio .996
Laser Pulses 1000
Lifetime 297 + .91 us
R2 .9996
Integrated 173566
Range: HIGH

Date/Time 12/13/94/12:55:11
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 8822 (t= 52 us)
Conc 63.24606 + 1.9473 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 63.246 + 1.947 ug/L

Sample ID 94-11-164-28
Description 94.20329-2
Ref. Ratio .992
Laser Pulses 1000
Lifetime 243 + .29 us
R2 1
Integrated 737109
Range: HIGH

Date/Time 12/13/94/12:57:21
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 42355 (t= 52 us)
Conc 328.22021 + 10.0174 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 328.22 + 10.017 ug/L

Sample ID 94-11-164-29
Description 94.20330-2
Ref. Ratio .995
Laser Pulses 1000
Lifetime 251 + .396 us
R2 .9999
Integrated 1435005
Range: HIGH

Date/Time 12/13/94/12:59:42
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 80832 (t= 52 us)
Conc 615.89484 + 18.8622 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 615.895 + 18.862 ug/L

about calib range

Sample ID 94-11-164-29
Description 94.20330-2 1:10
Ref. Ratio .943
Laser Pulses 1000
Lifetime 294 + .536 us
R2 .9998
Integrated 190906
Range: HIGH

Date/Time 12/13/94/13:04:31
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 9516 (t= 52 us)
Conc 70.39393 + 2.1556 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 70.394 + 2.156 ug/L

Sample ID 94-11-164-30
Description 94.20331-2
Ref. Ratio .984
Laser Pulses 1000
Lifetime 240 + .349 us
R2 .9999
Integrated 838032
Range: HIGH

Date/Time 12/13/94/13:06:27
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 48281 (t= 52 us)
Conc 376.34528 + 11.5137 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 376.345 + 11.514 ug/L

Sample ID 94-11-164-31
Description 94.20332-2
Ref. Ratio .981
Laser Pulses 1000
Lifetime 225 + .438 us
R2 .9998
Integrated 196094
Range: HIGH

Date/Time 12/13/94/13:18:46
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 11890 (t= 52 us)
Conc 94.1098 + 2.8889 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 94.11 + 2.889 ug/L

Sample ID 94-11-164-32
Description 94.20333-2
Ref. Ratio .977
Laser Pulses 1000
Lifetime 251 + .297 us
R2 .9999
Integrated 654042
Range: HIGH

Date/Time 12/13/94/13:23:19
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 36674 (t= 52 us)
Conc 280.98975 + 8.5915 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 280.99 + 8.591 ug/L

Sample ID 94-11-164-33
Description 94.20334-2
Ref. Ratio .987
Laser Pulses 1000
Lifetime 221 + .875 us
R2 .9993
Integrated 181125
Range: HIGH

Date/Time 12/13/94/13:25:31
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 11408 (t= 52 us)
Conc 88.18754 + 2.7619 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 88.188 + 2.762 ug/L

Sample ID 94-11-164-34
Description 94.20335-2
Ref. Ratio .989
Laser Pulses 1000
Lifetime 221 + .376 us
R2 .9999
Integrated 533399
Range: HIGH

Date/Time 12/13/94/13:27:17
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 33139 (t= 52 us)
Conc 260.689 + 7.9975 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 260.689 + 7.998 ug/L

Sample ID 94-11-164-35
Description 94.25969-1
Ref. Ratio .98
Laser Pulses 1000
Lifetime 113 + 2.097 us
R2 .9915
~~Integrated 1572~~
Range: HIGH

Date/Time 12/13/94/13:31:47
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 195 (t= 52 us)
Conc .71344 + 3.70E-02 ug/L
Dilution Factor 1 mL/mL

below high calib range

FINAL RESULT .713 + 3.70E-02 ug/L

Sample ID 94-11-164-35
Description 94.25969-1
Ref. Ratio 1.013
Laser Pulses 1000
Lifetime 127 + 2.647 us
R2 .9817 low
~~Integrated 110836~~
Range: LOW

Date/Time 12/13/94/13:32:54
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 13132 (t= 52 us)
Conc 1.22975 + 7.98E-02 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 1.23 + 7.98E-02 ug/L

Sample ID 94-11-164-35
Description 94.25969-1 1:10
Ref. Ratio .978
Laser Pulses 1000
Lifetime 248 + 1.19 us
R2 .999
Integrated 40627
Range: LOW

Date/Time 12/13/94/13:36:36
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 2272 (t= 52 us)
Conc .1677 + 2.26E-03 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT .168 + 2.26E-03 ug/L

Sample ID 94-11-164-36
Description 94.25970-1
Ref. Ratio .989
Laser Pulses 1000
Lifetime 176 + .315 us
R2 .9999 low
Integrated 723571
Range: LOW

Date/Time 12/13/94/13:38:35
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 53944 (t= 52 us)
Conc 6.02796 + 7.16E-02 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 6.028 + 7.16E-02 ug/L

Sample ID 94-11-164-36
Description 94.25970-1 1:10
Ref. Ratio .981
Laser Pulses 1000
Lifetime 283 + .607 us
R2 .9998
Integrated 132392
Range: LOW

Date/Time 12/13/94/13:44:00
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 6885 (t= 52 us)
Conc .60527 + 7.01E-03 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT .605 + 7.01E-03 ug/L

Sample ID 94-11-164-37
Description 94.25971-1
Ref. Ratio 1.009
Laser Pulses 1000
Lifetime 237 + .119 us
R2 1
Integrated 3575123
Range: LOW
Sample <= Blank

Date/Time 12/13/94/13:45:36
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 207247 (t= 754 us)
Conc + ug/L
Dilution Factor 1 mL/mL

FINAL RESULT

Sample ID 94-11-164-37
Description 94.25971-1 1:10
Ref. Ratio .961
Laser Pulses 1000
Lifetime 304 + .513 us
R2 .9999
Integrated 4419108
Range: LOW

Date/Time 12/13/94/13:47:06
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 215308 (t= 351 us)
Conc 59.18484 + .6858 ug/L
Dilution Factor 1 mL/mL

above low calib curve

FINAL RESULT 59.185 + .686 ug/L

Sample ID 94-11-164-37
Description 94.25971-1 1:10
Ref. Ratio .965
Laser Pulses 1000
Lifetime 295 + .689 us
R2 .9998
Integrated 162088
Range: HIGH

See QASS + Narrative 13,8c/c details

SAC 12-13-94

Date/Time 12/13/94/13:48:18
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 8003 (t= 52 us)
Conc 59.31653 + 1.8192 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 59.317 + 1.819 ug/L

Sample ID 94-11-164-D3
Description Duplicate -21
Ref. Ratio .982
Laser Pulses 1000
Lifetime 249 + .104 us
R2 1
Integrated 159279
Range: HIGH

Date/Time 12/13/94/13:52:18
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 8931 (t= 52 us)
Conc 68.37884 + 2.0881 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 68.379 + 2.088 ug/L

Sample ID 94-11-164-D4
Description Duplicate -31
Ref. Ratio .982
Laser Pulses 1000
Lifetime 231 + .514 us
R2 .9998
Integrated 257815
Range: HIGH

Recount

Date/Time 12/13/94/13:54:58
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 15437 (t= 52 us)
Conc 120.59894 + 3.7085 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 120.599 + 3.708 ug/L

Sample ID 94-11-164-31
Description 94.20332-2
Ref. Ratio .997
Laser Pulses 1000
Lifetime 220 + .357 us
R2 .9999
Integrated 189358
Range: HIGH

Use 1st results

Date/Time 12/13/94/13:58:53
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 11621 (t= 52 us)
Conc 92.87972 + 2.8476 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 92.88 + 2.848 ug/L

Sample ID 94-11-164-D4
Description Duplicate -31
Ref. Ratio .999
Laser Pulses 1000
Lifetime 229 + .66 us
R2 .9996
Integrated 252609
Range: HIGH

Date/Time 12/13/94/14:00:33
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 15377 (t= 52 us)
Conc 118.86565 + 3.6744 ug/L
Dilution Factor 1 mL/mL

SAC

FINAL RESULT 118.866 + 3.674 ug/L

Sample ID 25 PPB
Description #156 E
Ref. Ratio .989
Laser Pulses 1000
Lifetime 308 + .264 us
R2 1
Integrated 4288818
Range: LOW

Date/Time 12/13/94/14:06:28
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 207381 (t= 117 us)
Conc 25.36877 + .2849 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 25.369 + .285 ug/L

Sample ID 25 PPB
Description #156 E
Ref. Ratio 1
Laser Pulses 1000
Lifetime 300 + 1.149 us
R2 .9994
Integrated 71622
Range: HIGH

Date/Time 12/13/94/14:07:52
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 3552 (t= 52 us)
Conc 25.16737 + .778 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 25.167 + .778 ug/L

Sample ID 94-11-193-03
Description 94.17825-3
Ref. Ratio .954
Laser Pulses 1000
Lifetime 268 + .371 us
R2 .9999
Integrated 1191073
Range: LOW

Date/Time 12/13/94/14:10:05
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 63580 (t= 52 us)
Conc 6.30623 + 7.18E-02 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 6.306 + 7.18E-02 ug/L

Sample ID 94-11-193-04
Description 94.17826-3
Ref. Ratio .999
Laser Pulses 1000
Lifetime 270 + .171 us
R2 1
Integrated 1120521
Range: LOW

Date/Time 12/13/94/14:11:53
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 59661 (t= 52 us)
Conc 5.89442 + 6.60E-02 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 5.894 + 6.60E-02 ug/L

Sample ID 94-11-193-M1
Description Matrix Spike -03
Ref. Ratio .989
Laser Pulses 1000
Lifetime 261 + .387 us
R2 .9999
Integrated 646756
Range: HIGH

Date/Time 12/13/94/14:15:51
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 35224 (t= 52 us)
Conc 267.5752 + 8.1889 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 267.575 + 8.189 ug/L

Sample ID 94-11-193-M1
Description Matrix Spike 03 1:10
Ref. Ratio .992
Laser Pulses 1000
Lifetime 302 + .451 us
R2 .9999
Integrated 4224152
Range: LOW

Date/Time 12/13/94/14:18:46
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 206844 (t= 156 us)
Conc 29.13688 + .3324 ug/L high
Dilution Factor 1 mL/mL

void dil error

FINAL RESULT 29.137 + .332 ug/L

Sample ID 94-11-193-M1
Description Matrix Spike 03 1:10
Ref. Ratio .996
Laser Pulses 1000
Lifetime 294 + .78 us
R2 .9997
Integrated 80401
Range: HIGH

Date/Time 12/13/94/14:20:17
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 4025 (t= 52 us)
Conc 28.96942 + .8899 ug/L
Dilution Factor 1 mL/mL

void dil error

FINAL RESULT 28.969 + .89 ug/L

Sample ID 94-11-194-02
Description 94.29046-3
Ref. Ratio 1.01
Laser Pulses 1000
Lifetime 261 + .175 us
R2 1
Integrated 1318468
Range: LOW

Date/Time 12/13/94/14:22:20
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 71515 (t= 52 us)
Conc 7.19697 + 8.06E-02 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 7.197 + 8.06E-02 ug/L

Sample ID 94-11-194-B1
Description Blank
Ref. Ratio .993
Laser Pulses 1000
Lifetime 300 + .549 us
R2 .9999
Integrated 217206
Range: LOW

Date/Time 12/13/94/14:26:14
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 10818 (t= 52 us)
Conc .97839 + 1.12E-02 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT .978 + 1.12E-02 ug/L

Sample ID 94-11-194-S1
Description Blank Spike
Ref. Ratio .963
Laser Pulses 1000
Lifetime 303 + .32 us
R2 1
Integrated 812341
Range: HIGH

Date/Time 12/13/94/14:28:02
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 40117 (t= 52 us)
Conc 293.69531 + 8.9637 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 293.695 + 8.964 ug/L

Range: HIGH

Sample ID 94-11-194-S1
Description Blank Spike
Ref. Ratio .993
Laser Pulses 1000
Lifetime 301 + .481 us
R2 .9999
Integrated 760820
Range: HIGH

recounted

Date/Time 12/13/94/14:31:40
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 37658 (t= 52 us)
Conc 276.80746 + 8.473 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 276.807 + 8.473 ug/L

Sample ID 25 PPB CCV
Description #156 E
Ref. Ratio .995
Laser Pulses 1000
Lifetime 317 + .716 us
R2 .9998
Integrated 4401288
Range: LOW

Date/Time 12/13/94/14:34:33
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 209154 (t= 117 us)
Conc 25.27309 + .2932 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 25.273 + .293 ug/L

Sample ID 25 PPB CCV
Description #156 E
Ref. Ratio 1.005
Laser Pulses 1000
Lifetime 307 + 1.18 us
R2 .9993
Integrated 72529
Range: HIGH

Date/Time 12/13/94/14:35:44
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 3483 (t= 52 us)
Conc 25.00187 + .7728 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 25.002 + .773 ug/L

Calibration

Range: LOW
Background Measured Intensity 763

Concentration	Intercept	Uncert.	% Disc.	Intensity	Lifetime	R2
+ 50 ug/L	6.15E+05	784.03	3.26E-02	204643	345.4088	.9999
+ 25 ug/L	3.13E+05	559.8	-3.04E-01	205030	343.3766	1
+ 10 ug/L	1.28E+05	358.2	0.37	105787	337.3098	1
+ 5 ug/L	6.65E+04	257.96	3	54191	322.4066	1
+ 1 ug/L	1.33E+04	115.31	-2.51E+00	11044	339.7162	.9997
+ .5 ug/L	6769.63	82.28	-6.53E+00	5438	308.0435	.9996

Zero Point Included. Y=-1.07E+01X2+1.28E+04X +842.517

Calibration

Range: HIGH
Background Measured Intensity 6

Concentration	Intercept	Uncert.	% Disc.	Intensity	Lifetime	R2
+ 500 ug/L	8.47E+04	291.05	3.99E-02	67449	295.0242	.9999
+ 200 ug/L	3.34E+04	182.88	-1.00E+00	27266	309.7819	.9998
+ 100 ug/L	1.75E+04	132.17	3.03	14294	329.4662	.9999
+ 50 ug/L	8564.55	92.54	-4.11E-02	7044	328.4559	.9998
+ 25 ug/L	4373.4	66.13	-1.60E-01	3612	334.7337	.9997

Zero Point Included. Y=3.41E-03X2+167.251X +196.995

Sample ID 500 PPB CCV
Description #138 A
Ref. Ratio .988
Laser Pulses 1000
Lifetime 285 + .226 us
R2 1
Integrated 1304255
Range: HIGH

Date/Time 12/14/94/13:20:33
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 66678 (t= 52 us)
Conc 497.15668 + 15.1734 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 497.157 + 15.173 ug/L

Sample ID 100 PPB CCV
Description #165 A
Ref. Ratio .974
Laser Pulses 1000
Lifetime 319 + .454 us
R2 .9999
Integrated 301938
Range: HIGH

Date/Time 12/14/94/13:22:14
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 14304 (t= 52 us)
Conc 104.13604 + 3.1825 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 104.136 + 3.182 ug/L

Sample ID 50 PPB CCV
Description #165 B
Ref. Ratio .943
Laser Pulses 1000
Lifetime 322 + .882 us
R2 .9997
Integrated 150678
Range: HIGH

Date/Time 12/14/94/13:23:58
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 7126 (t= 52 us)
Conc 51.04147 + 1.5672 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 51.041 + 1.567 ug/L

Sample ID 50 PPB CCV
Description #165 B
Ref. Ratio .961
Laser Pulses 1000
Lifetime 326 + .317 us
R2 1
Integrated 4595680
Range: LOW

Date/Time 12/14/94/13:25:42
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 214379 (t= 338 us)
Conc 51.65588 + .5907 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 51.656 + .591 ug/L

Sample ID 10 PPB CCV
Description #156 F
Ref. Ratio 1.002
Laser Pulses 1000
Lifetime 320 + .356 us
R2 1
Integrated 2168040
Range: LOW

Date/Time 12/14/94/13:27:34
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 102283 (t= 52 us)
Conc 9.89857 + .1116 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 9.899 + .112 ug/L

Sample ID 1 PPB CCV
Description #166
Ref. Ratio 1.009
Laser Pulses 1000
Lifetime 322 + .671 us
R2 .9998
Integrated 231555
Range: LOW

Date/Time 12/14/94/13:29:09
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 11107 (t= 52 us)
Conc .98403 + 1.13E-02 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT .984 + 1.13E-02 ug/L

Sample ID 0 PPB CCV
Description #138 K
Ref. Ratio .994
Laser Pulses 1000
Lifetime 431 + 14.357 us
R2 .9544
Integrated 65477
Range: LOW

Date/Time 12/14/94/13:31:00
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 3388 (t= 52 us)
Conc .17031 + 5.49E-03 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT .17 + 5.49E-03 ug/L

Sample ID 10 PPB CCV 2ND
Description #157
Ref. Ratio 1.007
Laser Pulses 1000
Lifetime 323 + .597 us
R2 .9999
Integrated 2203663
Range: LOW

Date/Time 12/14/94/13:32:56
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 104036 (t= 52 us)
Conc 9.96348 + .1138 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 9.963 + .114 ug/L

Sample ID 25 PPB CCV
Description #156 E
Ref. Ratio 1.011
Laser Pulses 1000
Lifetime 325 + .521 us
R2 1
Integrated 4305245
Range: LOW

Date/Time 12/14/94/13:34:37
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 201310 (t= 117 us)
Conc 24.05806 + .2695 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 24.058 + .269 ug/L

Sample ID 25 PPB CCV
Description #156 E
Ref. Ratio 1.016
Laser Pulses 1000
Lifetime 311 + .835 us
R2 .9997
Integrated 70850
Range: HIGH

Date/Time 12/14/94/13:36:00
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 3431 (t= 52 us)
Conc 24.12068 + .7408 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 24.121 + .741 ug/L

Sample ID 94-11-091-01
Description 94.13713-3
Ref. Ratio 1.015
Laser Pulses 1000
Lifetime 269 + .229 us
R2 1
Integrated 1717648
Range: LOW

Date/Time 12/14/94/13:42:00
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 91483 (t= 52 us)
Conc 9.11222 + .1023 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 9.112 + .102 ug/L

SAC

Sample ID 25 PPB CCV
Description #156 E
Ref. Ratio 1.017
Laser Pulses 1000
Lifetime 352 + .692 us
R2 1
Integrated 4600223
Range: LOW

Date/Time 12/14/94/21:34:35
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 204837 (t= 130 us)
Conc 24.60946 + .2757 ug/L
Dilution Factor 1 mL/mL
FINAL RESULT 24.609 + .276 ug/L

Sample ID 25 PPB CCV
Description #156 E
Ref. Ratio 1.005
Laser Pulses 1000
Lifetime 321 + 1.581 us
R2 .999
Integrated 72071
Range: HIGH

Date/Time 12/14/94/21:43:57
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 3463 (t= 52 us)
Conc 23.82323 + .7406 ug/L
Dilution Factor 1 mL/mL
FINAL RESULT 23.823 + .741 ug/L

Sample ID 94-23-164-D2
Description Duplicate 11-164-37
Ref. Ratio 1.008
Laser Pulses 1000
Lifetime 219 + .278 us
R2 .9999
Integrated 1169784
Range: HIGH

Date/Time 12/14/94/21:57:03
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 72675 (t= 52 us)
Conc 575.60425 + 17.6054 ug/L
Dilution Factor 1 mL/mL
above calibration range
FINAL RESULT 575.604 + 17.605 ug/L

Sample ID 94-23-164-D3
Description Duplicate 11-164-37
Ref. Ratio 1.015
Laser Pulses 1000
Lifetime 229 + 7.80E-02 us
R2 1
Integrated 1142265
Range: HIGH

Date/Time 12/14/94/21:59:24
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 69050 (t= 52 us)
Conc 537.56134 + 16.4066 ug/L
Dilution Factor 1 mL/mL
above calib range
FINAL RESULT 537.561 + 16.407 ug/L

Sample ID 94-23-164-D4
Description Duplicate 11-164-37
Ref. Ratio 1.009
Laser Pulses 1000
Lifetime 223 + .223 us
R2 1
Integrated 1120202
Range: HIGH

Date/Time 12/14/94/22:01:08
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 68600 (t= 52 us)
Conc 541.23816 + 16.5188 ug/L
Dilution Factor 1 mL/mL
above calib range
FINAL RESULT 541.238 + 16.519 ug/L

Sample ID 94-23-164-D5
Description Duplicate 11-164-37
Ref. Ratio 1.02
Laser Pulses 1000
Lifetime 225 + .266 us
R2 .9999
Integrated 1182952
Range: HIGH

Date/Time 12/14/94/22:02:53
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 72140 (t= 52 us)
Conc 566.99146 + 17.3476 ug/L
Dilution Factor 1 mL/mL
above calib range
FINAL RESULT 566.991 + 17.348 ug/L

Sample ID 94-11-050-B1
Description Blank
Ref. Ratio 1.023
Laser Pulses 1000
Lifetime 319 + .311 us
R2 1
Integrated 444325
Range: LOW

Date/Time 12/14/94/22:07:29
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 21475 (t= 52 us)
Conc 1.96691 + 2.21E-02 ug/L
Dilution Factor 1 mL/mL
FINAL RESULT 1.967 + 2.21E-02 ug/L

Sample ID 94-11-050-B2
Description Blank
Ref. Ratio 1.022
Laser Pulses 1000
Lifetime 322 + .416 us
R2 .9999
Integrated 350246
Range: LOW

Date/Time 12/14/94/22:09:10
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 16572 (t= 52 us)
Conc 1.52017 + 1.72E-02 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 1.52 + 1.72E-02 ug/L

Sample ID 94-11-050-s1
Description Blank Spike
Ref. Ratio 1.015
Laser Pulses 1000
Lifetime 298 + .239 us
R2 1
Integrated 710534
Range: HIGH

Date/Time 12/14/94/22:13:27
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 35191 (t= 52 us)
Conc 260.50113 + 7.9571 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 260.501 + 7.957 ug/L

Sample ID 94-11-050-S2
Description Blank Spike
Ref. Ratio 1.026
Laser Pulses 1000
Lifetime 305 + .563 us
R2 .9999
Integrated 750476
Range: HIGH

Date/Time 12/14/94/22:14:58
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 36769 (t= 52 us)
Conc 269.58582 + 8.2449 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 269.586 + 8.245 ug/L

Sample ID 25 PPB CCV
Description #156 E
Ref. Ratio 1.029
Laser Pulses 1000
Lifetime 322 + .408 us
R2 1
Integrated 4306729
Range: LOW

Date/Time 12/14/94/22:16:49
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 202568 (t= 117 us)
Conc 24.30181 + .2746 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 24.302 + .275 ug/L

Sample ID 25 PPB CCV
Description #156 E
Ref. Ratio 1.032
Laser Pulses 1000
Lifetime 310 + 1.001 us
R2 .9996
Integrated 70862
Range: HIGH

Date/Time 12/14/94/22:17:57
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 3375 (t= 52 us)
Conc 24.13634 + .743 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 24.136 + .743 ug/L

Sample ID 94-23-164-D5
Description Dup 11-164-37 1:10
Ref. Ratio .999
Laser Pulses 1000
Lifetime 297 + .799 us
R2 .9997
Integrated 179690
Range: HIGH

Date/Time 12/14/94/22:31:23
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 9075 (t= 52 us)
Conc 65.45573 + 2.0109 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 65.456 + 2.011 ug/L

Sample ID 94-23-164-D4
Description Dup 11-164-37 1:10
Ref. Ratio 1.006
Laser Pulses 1000
Lifetime 298 + .682 us
R2 .9998
Integrated 171999
Range: HIGH

Date/Time 12/14/94/22:33:02
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 8460 (t= 52 us)
Conc 62.48341 + 1.9166 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 62.483 + 1.917 ug/L

Sample ID 94-23-164-D3
Description Dup 11-164-37 1:10
Ref. Ratio 1.01
Laser Pulses 1000
Lifetime 308 + .721 us
R2 .9998
Integrated 178188
Range: HIGH

Date/Time 12/14/94/22:34:31
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 8809 (t= 52 us)
Conc 62.83231 + 1.9261 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 62.832 + 1.926 ug/L

Sample ID 94-23-164-D2
Description Dup 11-164-37 1:10
Ref. Ratio 1.009
Laser Pulses 1000
Lifetime 299 + .424 us
R2 .9999
Integrated 188295
Range: HIGH

Date/Time 12/14/94/22:36:29
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 9353 (t= 52 us)
Conc 68.38331 + 2.091 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 68.383 + 2.091 ug/L

Sample ID 25 PPB CCV
Description #156 E
Ref. Ratio .974
Laser Pulses 1000
Lifetime 335 + .772 us
R2 .9998
Integrated 4540643
Range: LOW

Date/Time 12/14/94/22:38:25
Cal Y=-1.07E+01X2+1.28E+04X+842.517
Intensity 208926 (t= 117 us)
Conc 24.63917 + .2863 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 24.639 + .286 ug/L

Sample ID 25 PPB CCV
Description #156 E
Ref. Ratio .979
Laser Pulses 1000
Lifetime 318 + 1.102 us
R2 .9995
Integrated 74514
Range: HIGH

Date/Time 12/14/94/22:39:43
Cal Y=3.41E-03X2+167.251X+196.995
Intensity 3563 (t= 52 us)
Conc 24.89898 + .767 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 24.899 + .767 ug/L

SAC

ANALYTICAL TECHNOLOGIES, INC.
Radiochemistry Data Package

Section 6

QUALITY ASSURANCE SUMMARY REPORTS

6

QUALITY ASSURANCE (QA) SUMMARY SHEET

ATI-FTC WORKORDER NO. 94-11-164-

Please explain briefly any QA or other problems associated with the analysis of samples. Problems could result from log-in, matrix, color, odor, dilution, consistency, scheduling, equipment or instrumentation.

Sample 94-11-164-37 was spilled, catching the edge of the steam water bath after sample was dryed down, addition of 4 ml HNO3 (conc) and 25 ml of milli Q water was added (last step) approximately 3 ml of the solution was spilled and therefore sample reading may be ~10% off (short).

12-13-94

TECHNICIAN/ANALYST Gerald H. Ellis DATE 12-13-94

SUPERVISOR _____ DATE _____

The purpose of the QA Summary Sheet is to document any problems associated with the analysis of the samples. Documentation of problems will greatly increase the communication from group to group. But more importantly, it will help our Project Managers communicate with our clients.

ATI FRM 302FC
04/20/92

ANALYTICAL TECHNOLOGIES, INC.
Radiochemistry Data Package

Section 7

LABORATORY BENCH SHEETS

7

TOTAL URANIUM BY KPA IN SOILS ANALYSIS WORKSHEET

000043

Analyst GE
Prep Date 12-5-94

U Spike Std No. 135
U Spike Std Vol 0.5 ml
Spike Witness RS Date 12-5-94

Count Date 12/07/94

ATI WORKORDER NUMBER	CLIENT SAMPLE ID	INITIAL MASS (G)	DIGESTION VOLUME (mL)	ALIQUOT (mL)	FINAL VOLUME (mL)	REMARKS	POS CK'D
94-11-164-01	94.18 548-3	0.2048	100	1.0			BP
.02	94.18 551-3	0.2049					
-03	94.18 557-3	0.2045				Dil 1:10, 1:100	
-04	94.18 560-3	0.2024				Dil 1:10, 1:100	
-05	94.18 561-3	0.2031					
-06	94.20 311-2	0.2058					
-07	94.20 312-2	0.2079					
-08	94.20 313-2	0.1997					
-09	94.20 314-2	0.2049					
-10	94.20 315-2	0.2045					
-11	94.20 316-2	0.2037					
-12	94.20 320-2	0.2103					
-13	94.20 321-2	0.2102					
-14	94.20 322-2	0.2104					
-15	94.20 323-2	0.2041					
-16	94.20 324-2	0.1993					
-17	94.20 336-2	0.2089					
-18	94.20 337-2	0.2084				Dil 1:10	J

U Spike Std Pipet RS-007
Instrument Pipet C002
Uraplex Pipet C001
Balance # 13
DI Pipettor RS-0004

*: refer to ATI SOP 747FC

(con't on page 910020)

ATI FORM 729FC - Revision 0 - 11\17\93

Relinquished by GE Date 12-07-94
Received by BP Date 12-07-94
Reviewed by BP Date 12-11-94

SAMPLE CONDITION FORM

METHOD Total KPA MATRIX Soil EXT. DATE 12-5-94 TECH GE

WORK ORDER #	SAMPLE #	SAMPLE CONDITION	SAMPLE ODOR
94-11-164-01		light brown-grey soil	
-02		Brown soil	
-03			
-04			
-05		Grey	
-06		Brown	
-07			
-08			
-09		Dark Grey	
-10		Brown	
-11		Grey-brown soil	
-12		brown soil	
-13			
-14			
-15			
-16		grey soil	
-17		brown soil	
-18			
	12-5-94		
GE			

000044

ATI FRM 811 PC

(Con't from page 910019)

TOTAL URANIUM BY KPA IN SOILS ANALYSIS WORKSHEET

000045

Analyst GE
Prep Date 12-5-94

U Spike Std No. 135
U Spike Std Vol 0.5 ml
Spike Witness _____ Date _____
see page 910019

Count Date 12/07/94

ATI WORKORDER NUMBER	CLIENT SAMPLE ID	INITIAL MASS (G)	DIGESTION VOLUME (mL)	ALIQUOT (mL)	FINAL VOLUME (mL)	REMARKS	POS CK'D
94-11-164 - 19	94, 20344-4	0.2027	100	1.0			BP
- 20	94, 18555-3	0.2100				1:10 Diluted.	
94-11-164 - d1	Dupl. 94-11-164-01	0.2067					
- d2	Dupl. 94-11-164-11	0.2067					
- M1	Matrix Spike 94-11-164-15	0.2085					
- B1	Blank	0.2074					
- S1	Blank Spike	0.2065					

GE 12-5-94

U Spike Std Pipet RS-007
Instrument Pipet C002
Uraplex Pipet C001
Balance # 16
DI Pipettor RS-0004
see page 910019

* : refer to ATI SOP 747FC

ATI FORM 729FC - Revision 0 - 11\17\93

Relinquished by GE Date 12-07-94
Received by BP Date 12-07-94
Reviewed by BP Date 12-11-94

910020

SAMPLE CONDITION FORM

METHOD Total-KPA MATRIX Soil EXT. DATE 12-5-94 TECH GE

WORK ORDER #	SAMPLE #	SAMPLE CONDITION	SAMPLE ODOR
94-11-164-19		Brown-grey Soil	
-20		grey soil	
-d1			
-d2			
-M1			
-B1			
-S1			

GE 12-5-94

All FRM 011 FC

000046

TOTAL URANIUM BY KPA IN SOILS ANALYSIS WORKSHEET

000047

Analyst GS
Prep Date 12-7-94

U Spike Std No. 135
U Spike Std Vol 0.5 ml
Spike Witness [illegible] Date 12/7/94

Count Date 12-13-94

ATI WORKORDER NUMBER	CLIENT SAMPLE ID	INITIAL MASS (G)	DIGESTION VOLUME (mL)	ALIQUOT (mL)	FINAL VOLUME (mL)	REMARKS	POS CK'D
94-11-164-21	94,20317-2	0.2100	100	1.0	N/A		[illegible]
-22	94,20318-2	0.2043				1:10	
-23	94,20319-2	0.2068				1:10 1:100	
-24	94,20325-2	0.2076				1:10	
-25	94,20326-2	0.2100					
-26	94,20327-2	0.2008					
-27	94,20328-2	0.2090				1:10	
-28	94,20329-2	0.2035					
-29	94,20330-2	0.2020				1:10	
-30	94,20331-2	0.2012					
-31	94,20332-2	0.1995					
-32	94,20333-2	0.2069					
-33	94,20334-2	0.2101					
-34	94,20335-2	0.2010					
-35	94,25969-1	0.2066				P.E. 1:10	
-36	94,25970-1	0.2065				P.E. 1:10	
-37	94,25971-1	0.2089				P.E. spilled ≈ 3 ml after 1st stn. Cold 4ml 1:10 1:100	
94-11-193-03	94,17825-3	0.2064					

U Spike Std Pipet RS-007
Instrument Pipet C-002
Uraplex Pipet C-001
Balance # 13
DI Pipettor RS-004

*: refer to ATI SOP 747FC

ATI FORM 729FC - Revision 0 - 11\17\93

(Con't on page 830072)

Relinquished by GS Date 12-13-94
Received by [illegible] Date 12-13-94
Reviewed by [illegible] Date 12-13-94

830071

000048

SAMPLE CONDITION FORM

METHOD Tot.U-KPA MATRIX Soil EXT. DATE 12-7-94 TECH GE

WORK ORDER #	SAMPLE #	SAMPLE CONDITION	SAMPLE ODOR
94-11-164-21		Light brown-grey soil	
-22			
-23			
-24			
-25		Grey soil	
-26			
-27			
-28		Light brown-grey soil	
-29			
-30			
-31		Brown soil	
-32		Grey soil	
-33			
-34		Brown soil	
-35			
-36		Grey soil	
-37			
94-11-193-03			
		GE 12-8-94	

AD FRM 651PC

(Con't from page 830071)

TOTAL URANIUM BY KPA IN SOILS ANALYSIS WORKSHEET

000049

Analyst GE
Prep Date 12-7-94

U Spike Std No.
U Spike Std Vol
Spike Witness Date
See page 830071

Count Date 12-13-94

ATI WORKORDER NUMBER	CLIENT SAMPLE ID	INITIAL MASS (G)	DIGESTION VOLUME (mL)	ALIQUOT (mL)	FINAL VOLUME (mL)	REMARKS	POS CK'D
94-11-193-04	94-17826-3	0.2010	100	1.0	N/A		SM
94-11-194-02	94-29046-3	0.2013					
94-11-164-d3	dupl. 94-11-164-31	0.2069					
94-11-164-d4	dupl. 94-11-164-31	0.2069					
94-11-193-M1	matrix Spike 94-11-193-03	0.2005				1:10	
94-11-194-B1	Blank	0.2040					
94-11-194-S1	Blank Spike	0.2068					

12-8-94
GE

U Spike Std Pipet
Instrument Pipet
Uraplex Pipet
Balance #
DI Pipettor
See page 830071

*: refer to ATI SOP 747FC

ATI FORM 729FC - Revision 0 - 11\17\93

Relinquished by Date
Received by Date
Reviewed by Date
See pg 7

830072

SAMPLE CONDITION FORM

METHOD Tot.4-KPA MATRIX Soil EXT. DATE 12-7-94 TECH GE

WORK ORDER #	SAMPLE #	SAMPLE CONDITION	SAMPLE ODOR
94-11-193-04		grey soil	
94-11-194-02			
94-11-164-d3			
94-11-164-d4			
94-11-193-M1		QC	
94-11-194-B1			
94-11-194-S1			

GE 12-8-94

000050

TOTAL URANIUM BY KPA IN SOILS ANALYSIS WORKSHEET

Analyst GE
Prep Date 12-14-94

U Spike Std No. 135
U Spike Std Vol 0.5 ml
Spike Witness EFS Date 12/14/94

Count Date 12-14-94

ATI WORKORDER NUMBER	CLIENT SAMPLE ID	INITIAL MASS (G)	DIGESTION VOLUME (mL)	ALIQUOT (mL)	FINAL VOLUME (mL)	REMARKS	POS CK'D
94-11-029-01	94.11918-3	0.2059	100	1.0			
-02	94.11919-3	0.2100					
-03	94.16136-3	0.2032					
94-11-030-01	94.12810-3	0.2065					
-02	94.12812-3	0.2038					
-03	94.12811-3	0.2054					
94-11-032-01	94.12085-4	0.2091					
-02	94.12086-4	0.2004					
-03	94.12087-4	0.2007					
-04	94.12088-4	0.2009					
94-11-046-01	94.21936-3	0.2030					
-02	94.21937-3	0.2023					
-03	94.21938-3	0.2020					
-04	94.21939-3	0.2045					
94-11-047-01	94.12815-3	0.2102					
-02	94.12855-3	0.2029					
-03	94.12856-3	0.2088					
94-11-050-01	94.12532-3	0.2060					

U Spike Std Pipet RS-007
Instrument Pipet C-002
Uraplex Pipet C-001
Balance # 13
DI Pipettor RS-0004

*: refer to ATI SOP 747FC

ATI FORM 729FC - Revision 0 - 11\17\93 CZ - 12-15-94

(cont to page 910032)

Relinquished by GE Date 12-~~15~~ 14-94
Received by SAC Date 12-14-94
Reviewed by BP Date 12-15-94

000051

SAMPLE CONDITION FORM

METHOD Total-KPA MATRIX Soil EXT. DATE 12-14-94 TECH GE

WORK ORDER #	SAMPLE #	SAMPLE CONDITION	SAMPLE ODOR
94-11-029-01		Light grey soil	
-02		↓	
-03		Light Grey-brown soil	
94-11-030-01		↓	
-02			
-03			
94-11-032-01		Grey soil	
-02		↓	
-03			
-04		Brown grey soil	
94-11-046-01		GE 12-14-94 ~~Grey~~ ↓	
-02		Grey soil	
-03		Brown soil	
-04		grey soil	
94-11-047-01		Light brown	
-02		Light grey	
-03		grey soil	
94-11-050-01		↓	
GE	12-14-94		

ATI FRM 611 FC

000052

(Cont from page 910031)

TOTAL URANIUM BY KPA IN SOILS ANALYSIS WORKSHEET

000053

Analyst GE
Prep Date 12-14-94

U Spike Std No. _____
U Spike Std Vol _____
Spike Witness _____ Date _____
} See page 910031

Count Date _____

ATI WORKORDER NUMBER	CLIENT SAMPLE ID	INITIAL MASS (G)	DIGESTION VOLUME (mL)	ALIQUOT (mL)	FINAL VOLUME (mL)	REMARKS	POS CK'D
94-11-050-02	94.12535-3	0.2072	100	1.0			
-03	94.12537-3	0.2096					
94-11-164-37	94.25971-1	0.2107					
94-11-029-d1	dupl. 94-11-029-01	0.2088					
94-11-032-d1	dupl. 94-11-032-01	0.2017					
94-11-046-d1	dupl. 94-11-046-01	0.2032					
94-~~11~~23-164-d2	dupl. 94-11-164-37	0.2107				1:10 dilution	See
94-~~11~~23-164-d3	dupl. 94-11-164-37	0.2017				1:10 dilution	
94-~~11~~23-164-d4	dupl. 94-11-164-37	0.2042				1:10 dilution	
94-~~11~~23-164-d5	dupl. 94-11-164-37	0.2117				1:10 dilution	
94-11-030-M1	Matrix Spike 94-11-030-01	0.2049					
94-11-047-M2	Matrix Spike 94-11-047-01	0.2032					
94-11-050-B1	Blank	0.2014					See
94-11-050-B2	Blank	0.2038					
94-11-050-S1	Blank Spike	0.2099					
94-11-050-S2	Blank Spike	0.2035					
	GE 12-14-94						

Correction 12-14-94

U Spike Std Pipet _____
Instrument Pipet _____
Uraplex Pipet _____
Balance # _____
DI Pipettor _____
} See page 910031

*: refer to ATI SOP 747FC

ATI FORM 729FC - Revision 0 - 11\17\93

See page # 910031

Relinquished by _____ Date _____
Received by _____ Date _____
Reviewed by _____ Date _____

SAMPLE CONDITION FORM

METHOD Tot.U-KPA MATRIX Soil EXT. DATE 12-14-94 TECH GE

WORK ORDER #	SAMPLE #	SAMPLE CONDITION	SAMPLE ODOR
94-11-050-01		Light Grey Soil	
-03		Light Grey to Brown Soil	
94-11-164-37		Light Grey	
029-d1			
032-d1			
046-d1			
164-d2			
164-d3			
164-d4			
164-d5		QC	
030-M1			
047-M2			
050-B1			
050-B2			
050-S1			
051-S2			

GE 12-14-94

ATI FRM 631 FC

000054

ANALYTICAL TECHNOLOGIES, INC.
Radiochemistry Data Package

Section 8

STANDARDS TRACEABILITY DOCUMENTS

8

P.O. Box 30188
Charleston, SC 29417
TEL: (803) 556-3411
FAX: (803) 769-7399

ATID # 00101

HIGH-PURITY STANDARDS

Certificate of Analysis

Uranium

Lot # 490125

Source	Source Purity	Acid	Standard Concentration
Uranium Oxide	99.968%	HNO_3, 2%	1000 ± 3 µg/mL

This spectrometric standard solution has been prepared from high-purity reference materials. Subboiled high-purity acid has been used to place the materials in solution and to stabilize the standard. The matrix is nitric acid as stated above in 18 megaohm deionized water. The reference materials have been assayed by optical emission spectrometry and atomic absorption spectrometry and are certified to contain less than 300 µg/g total impurities.

The standard has been prepared gravimetrically by weighing the reference material to 5 significant figures. Volumetric glassware has been calibrated gravimetrically to 5 significant figures.

The Standard Concentration has been certified by spectrometric analysis against an independent source which is traceable to National Institute of Standards and Technology, Standard Reference Material No. 3164

This standard is valid for one year from the shipping date provided the solution is kept tightly capped and stored under normal laboratory conditions.

Theodore C. Rains

Theodore C. Rains
President

Notebook No. _____

PROJECT U Spiking Solution for KPA #135

Continued From Page _____

5.00 mL of 1000 µg/mL U std (ID: ATI-000101) was pipetted into a 100 mL vol. flask (class A)
3.75 mL of conc HNO_3 was added.
Solution was brought to 100 mL final volume with DI H_2O

Resulting Solution:

~~500~~ 50 µg/mL (1.0 mL = 50 µg)
5-31-94
0.6 N HNO_3

pipet used EP-004
exp date 6/95

Continued on Page

Read and Understood By

Robert Thomas — Signed — 5-31-94 — Date — Signed — Date

PROJECT U intermediate stock std for KPA

Continued From Page _____

WTI-000101

A 0.50 mL aliquot of std #~~130~~ 5-31-94 1000 µg/mL U

was pipetted into a 500 mL vol. flask. 18.75 mL of conc HNO_3 was added to flask. Solution was brought to ~~505~~ 500 mL final volume with DI H_2O (Milli-Q water)

Resulting Solution:

1.0 µg/mL U, 0.6 N HNO_3

pipet used: AS-001
expires 6/95

Continued on Page

Read and Understood By

Signed: [signature] Date: 5-31-94 Signed: _____ Date: _____

PROJECT U Calibration Stds for KPA

Continued From Page _____

Calib Std ID	aliquot vol of std #136 mL	final volume mL	final sol'n concentration µg/L (ppb)	pipet used
138 A	50	100	500	* gravimetric
138 B	20		200	* gravim.
138 C	10		100	EP-004
138 D	5		50	EP-004
138 E	2.5		25	EP-004
138 F	1.0		10	AS-001
138 G	0.5		5	AS-001
138 H	0.1		1	RS-001

Calib Std ID	aliquot vol of std #138C (mL)	final vol (mL)	final sol'n concentration µg/L (ppb)	pipet used
138 I	0.5	100	0.5	AS-001
138 J	0.1	100	0.1	RS-001

All solutions were diluted in 0.6 N HNO_3 that was made up in Milli-Q water

All standards expire 6-95

Continued on Page

Read and Understood By

Robert Murray 6-1-94

Signed Date Signed Date

30 #156 Notebook No. _____

PROJECT U Calibration Stds for KPA Continued From Page _____

(conc = 1.0 µg U/mL)

Calib Std ID	aliquot vol of std #136	final volume	final sol'n concentration	pipet used:
156 E	12.5 mL	500 mL	25 ppb	EP-004
156 F	5.0 mL	↓	10 ppb	EP-004

All solutions were made to volume with 0.6 N HNO_3 in 500 mL volumetric flask. The 0.6 N HNO_3 was prepared in "Milli-Q" water

All standards expire 6-95

Continued on Page

Read and Understood By

Robert Trump 8-24-94

Signed Date Signed Date

50 µg/L NOTEBOOK NO. _____

PROJECT U Calib Stds for KPA 100 µg/L

Continued From Page _____

#165A 0.20 (1000 ppm)

~~0.25~~ mL aliquot of 1000 mg/L U std (primary std ID # ATI 000101)
RF 10-4-94

was pipetted into a 2000 mL class A vol flask. 75 mL conc HNO_3 was added & this solution was brought to 2000 mL final volume with Milli-Q DI H_2O

1000 ppm = 1000 µg/mL

1000 µg/mL × 0.2 mL = 200 µg

$\frac{200\ \mu g}{2000\ mL} = \frac{0.1\ \mu g}{mL}$

= 100 µg/L

solution = 0.6 N HNO_3

= 100 µg U/Liter

pipet used: RS-001
exp date - June 1995

#165 B

0.10 mL aliquot of 1000 ppm U std (ATI 000101)
into 2000 mL vol flask
+ 75 mL conc HNO_3
- bring to vol w/ Milli-Q DI H_2O

final solution = 50 µg/L (50 ppb)
0.6 N in HNO_3

pipet used: RS-001
exp date June 1995

Continued on Page

Read and Understood By

Signed: [signature] Date: 10-4-94 Signed: [signature] Date: [signature]

PLASMACHEM™
ASSOCIATES, INC

5142 W. Hurley Pond Road
Farmingdale, New Jersey USA 07727

Tel: 908-919-0509 Fax: 908-919-0806

CERTIFICATE OF ANALYSIS

URANIUM

Catalog # : D92012
Description : 1000ug/ml U in 2% HNO3
Lot # : N2M92N1PE

The following information is provided for your records. Should you have ar questions please refer to the above referenced lot number.

The starting material used to prepare this standard was:

Uranium (IV,VI) Oxide
U3O8

Lot # : C9811
Purity : 99.998%
Assay : 84.50%
Trace Impurities:
Si 5-10ppm
Fe,Mg 4-8ppm each

The standard was then stoichiometrically prepared using electronic grad acids, 18 megohm double de-ionized water, re-calibrated (by weight) Clas A glassware and packaged in pre-cleaned bottles.

The resulting solution standard was assayed via Classical Wet Assay Method EDTA TITRATION

NIST TRACEABILITY: EDTA standardized against SRM 928 Lead Nitrate Method corroborated against SRM 3164 U spectrometric solution.

ACTUAL ASSAY OF STANDARD: 1000ug/ml (+/- 0.5% relative)

The resulting solution standard was verified on ICP at 385.958nm.

Certificate : COA922 Expiration: 30 DEC 1994
P.O.# : 35322
Date : AUG 10 1993

Authorized Signature: Susan C. Tyminski
Title : President

A 5.0 mL aliquot of Std #093 (1.0 µg/mL U) was pipetted (pipet = EP-004) into a glass class-A 500 mL volumetric flask and diluted to the 500 mL mark with 0.6 N HNO_3.

final conc = 10 ppb (µg/L)

expiration date = 12-30-94

Continued on Page

Read and Understood By

Signed	Date	Signed	Date
Robert Pump	8-24-94		

 1.0 µg U/mL for KPA = U43 Notebook No. _____

PROJECT U intermediate stock std - second source Continued From Page _____

0.50 mL of primary std ØØØ7Ø (Health physics second source from PLASMACHEM inventory system) was pipeted into 500 mL vol flask

conc. of primary std = 1000 µg/mL U
solvent = 2% nitric acid
U chemical form = U (IV, VI) oxides dissolved in HNO_3

0.50 mL aliquot
+ 18.75 mL conc HNO_3

brought to 500 mL final volume with DI H_2O

pipet used: AS-001

exp date 12-30-94

date prepared 11-3-93

$$\frac{1000\,\mu g}{mL} \times 0.50\,mL = 0.500\,\mu g \qquad \frac{0.500\,\mu g}{500\,mL} = \frac{1\,\mu g}{1000\,mL}$$

$$= \frac{1\,\mu g}{L}$$

Continued on Page

Read and Understood By

Robert Thomas — Signed — 11-3-93 — Date

Signed — 11/17/93 — Date

#166

Notebook No. _____

PROJECT U Calib Std for KPA

Continued From Page _____

0.5 mL aliquot of 1.0 µg/mL (1.0 ppm) U Std (ID # 136) was pipetted into a Class A 500 mL volumetric flask. 18.75 mL conc HNO_3 was added and solution was brought to 500 mL final volume with Milli-Q DI H_2O

$$\frac{1.00\,\mu g}{mL} \times 0.5\,mL = 0.5\,\mu g \qquad \frac{0.5\,\mu g}{500\,mL} = \frac{0.001\,\mu g}{mL} = \frac{1\,\mu g}{L}$$

pipet used: G-004
exp date: June 1995
acid conc: 0.6 N HNO_3

Continued on Page

Read and Understood By

Robert Gum 10-4-94 [illegible] 10/4/94

Signed Date Signed Date

ANALYTICAL TECHNOLOGIES, INC.
Radiochemistry Data Package

Section 9

CHAIN OF CUSTODY

9

94-11-169

Los Alamos
NATIONAL LABORATORY

October 12, 1994

Steve Fry
ATI
225 Commerce Drive
Fort Collins, CO 80524

Dear Steve :

Please analyze the enclosed samples according to the schedule below. These samples are on Request Number: 19509

WE WILL SHIP THESE SAMPLES ONE MONTH FROM TODAY (11/12/94) UNLESS NOTIFIED BY YOU THAT WE CAN SHIP EARLIER.

Cost Center: 4609 Program Fund Code: M78B

ANALYTES	SAMPLE-CUT	MATRIX CODE	DATE COLLECTED
GSCAN, U	01 94.18548-3	S	21-JUL-94
	02 94.18551-3	S	15-JUL-94
	03 94.18557-3	S	03-AUG-94
	04 94.18560-3	S	25-JUL-94
	05 94.18561-3	S	25-JUL-94
	06 94.20311-2	S	06-JUL-94
	07 94.20312-2	S	20-JUL-94
	08 94.20313-2	S	15-JUL-94
	09 94.20314-2	S	30-JUN-94
	10 94.20315-2	S	28-JUN-94
	11 94.20316-2	S	30-JUN-94
	12 94.20320-2	S	24-JUL-94
	13 94.20321-2	S	27-JUL-94
	14 94.20322-2	S	25-JUL-94
	15 94.20323-2	S	28-JUL-94
	16 94.20324-2	S	08-JUL-94
	17 94.20336-2	S	25-JUL-94
	18 94.20337-2	S	20-JUL-94
	19 94.20344-2	S	19-JUL-94
U	20 94.18555-3	S	27-JUL-94
	21 94.20317-2	S	28-JUN-94
	22 94.20318-2	S	28-JUN-94
	23 94.20319-2	S	27-JUL-94
	24 94.20325-2	S	28-JUL-94
	25 94.20326-2	S	28-JUL-94
	26 94.20327-2	S	27-JUL-94
	27 94.20328-2	S	27-JUL-94
	28 94.20329-2	S	18-JUL-94
	29 94.20330-2	S	18-JUL-94
	30 94.20331-2	S	18-JUL-94
	31 94.20332-2	S	14-JUL-94

94-11-164

Cost Center: 4609 Program Fund Code: M78B

ANALYTES		SAMPLE-CUT	MATRIX CODE	DATE COLLECTED
U	32	94.20333-2	S	18-JUL-94
	33	94.20334-2	S	14-JUL-94
	34	94.20335-2	S	14-JUL-94
	35	94.25969-1	S	31-AUG-94
	36	94.25970-1	S	31-AUG-94
	37	94.25971-1	S	31-AUG-94

SAMPLES ARE INCLUSIVE !

SINCERELY,

Laurel L. Shastri

Laurel L. Shastri
File (2)

LOS ALAMOS
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

EM-9 CHAIN OF CUSTODY DOCUMENT

NBR: 15654

Request: 19509 Desc: SAK TA-15 -- RADIOCHEMISTRY TO ATI

Sample	Cut	Type	Size	Comments
24 94.20325	2	POLYETHYLENE	125 ML	TOTAL U
25 94.20326	2	POLYETHYLENE	125 ML	TOTAL U
26 94.20327	2	POLYETHYLENE	125 ML	TOTAL U
27 94.20328	2	POLYETHYLENE	125 ML	TOTAL U
28 94.20329	2	POLYETHYLENE	125 ML	TOTAL U
29 94.20330	2	POLYETHYLENE	125 ML	TOTAL U
30 94.20331	2	POLYETHYLENE	125 ML	TOTAL U
31 94.20332	2	POLYETHYLENE	125 ML	TOTAL U
2 94.20333	2	POLYETHYLENE	125 ML	TOTAL U
33 94.20334	2	POLYETHYLENE	125 ML	TOTAL U
34 94.20335	2	POLYETHYLENE	125 ML	TOTAL U
7 94.20336	2	POLYETHYLENE	500 ML	GAMMA SCECTROSCOPY, TOTAL U
18 94.20337	2	POLYETHYLENE	500 ML	GAMMA SCECTROSCOPY, TOTAL U
9 94.20344	2	POLYETHYLENE	500 ML	GAMMA SCECTROSCOPY, TOTAL U
35 94.25969	1	POLYETHYLENE	60 ML	TOTAL U
36 94.25970	1	POLYETHYLENE	60 ML	TOTAL U
37 94.25971	1	POLYETHYLENE	60 ML	TOTAL U

Relinquished By(Print Name & Sign)	Date	Time	Received By(Print Name & Sign)
Jaylene Udlo	11/11/94	9:30a	FED EX
FED EX	11/15/94	9:00a	Debi Burdick DEBI BURDICK

Received for Disposal By(Print Name and Sign)	Remarks

94-11-164

LOS ALAMOS
Los Alamos National Laboratory
Los Alamos, New Mexico 87545

EM-9 CHAIN OF CUSTODY DOCUMENT

NBR: 15653

Request: 19509 Desc: SAK TA-15 -- RADIOCHEMISTRY TO ATI

Sample	Cut	Type	Size	Comments
94.18548	3	POLYETHYLENE	500 ML	GAMMA SPECTROSCOPY, TOTAL U
94.18551	3	POLYETHYLENE	500 ML	GAMMA SPECTROSCOPY, TOTAL U
94.18555	3	POLYETHYLENE	125 ML	TOTAL U
94.18557	3	POLYETHYLENE	500 ML	GAMMA SPECTROSCOPY, TOTAL U
94.18560	3	POLYETHYLENE	500 ML	GAMMA SPECTROSCOPY, TOTAL U
94.18561	3	POLYETHYLENE	500 ML	GAMMA SPECTROSCOPY, TOTAL U
94.20311	2	POLYETHYLENE	500 ML	GAMMA SPECTROSCOPY, TOTAL U
94.20312	2	POLYETHYLENE	500 ML	GAMMA SPECTROSCOPY, TOTAL U
94.20313	2	POLYETHYLENE	500 ML	GAMMA SPECTROSCOPY, TOTAL U
94.20314	2	POLYETHYLENE	500 ML	GAMMA SPECTROSCOPY, TOTAL U
94.20315	2	POLYETHYLENE	500 ML	GAMMA SPECTROSCOPY, TOTAL U
94.20316	2	POLYETHYLENE	500 ML	GAMMA SPECTROSCOPY, TOTAL U
94.20317	2	POLYETHYLENE	125 ML	TOTAL U
94.20318	2	POLYETHYLENE	125 ML	TOTAL U
94.20319	2	POLYETHYLENE	125 ML	TOTAL U
94.20320	2	POLYETHYLENE	500 ML	GAMMA SCECTROSCOPY, TOTAL U
94.20321	2	POLYETHYLENE	500 ML	GAMMA SCECTROSCOPY, TOTAL U
94.20322	2	POLYETHYLENE	500 ML	GAMMA SCECTROSCOPY, TOTAL U
94.20323	2	POLYETHYLENE	500 ML	GAMMA SCECTROSCOPY, TOTAL U
94.20324	2	POLYETHYLENE	500 ML	GAMMA SCECTROSCOPY, TOTAL U

Relinquished By(Print Name & Sign)	Date	Time	Received By(Print Name & Sign)
Jaylene Valdez	11/11/94	4:30	FED EX
FED EX	11/15/94	9:00A	Debi Burdick DEBI BURDICK

Received for Disposal By(Print Name and Sign) Remarks

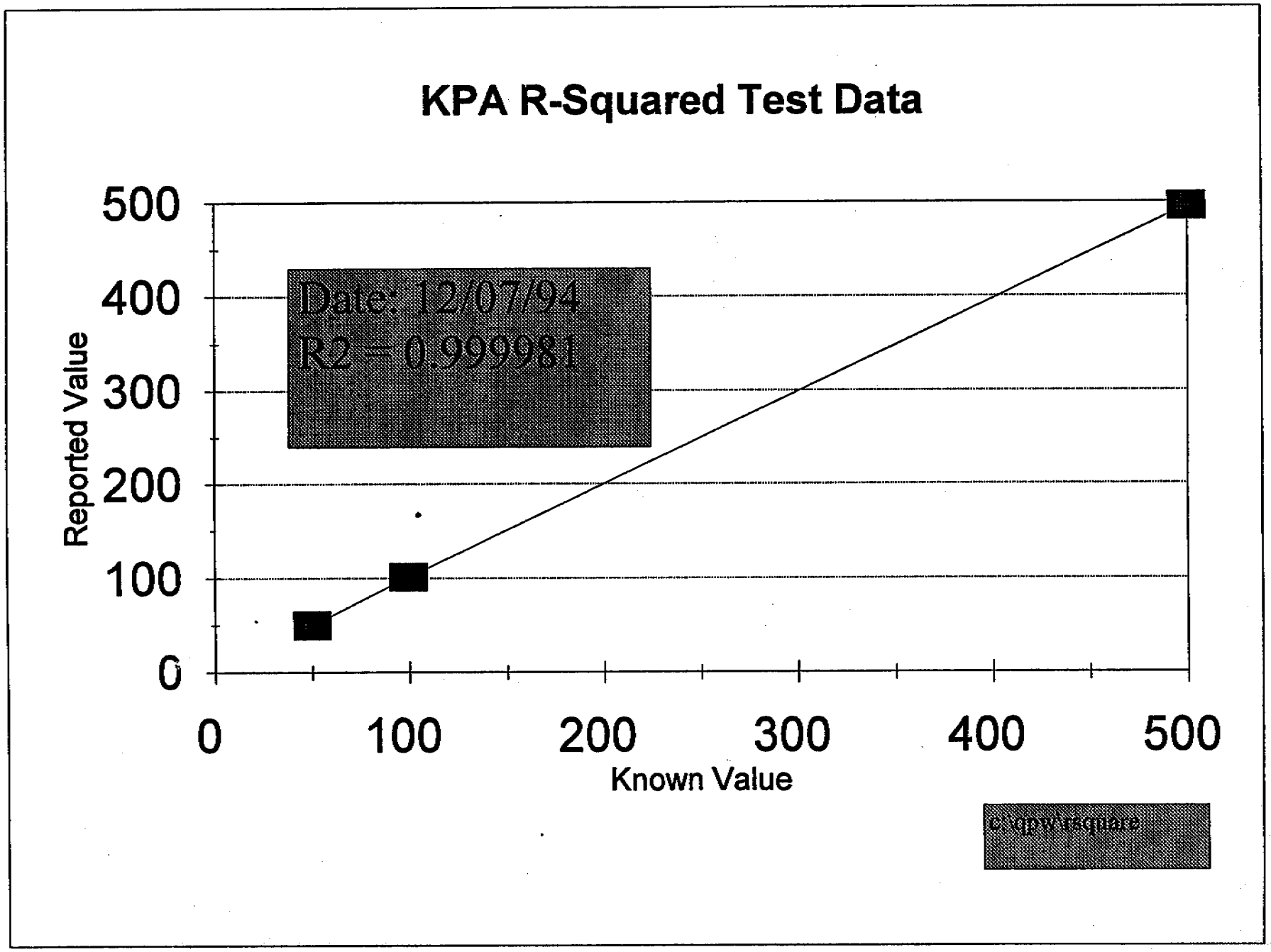
000070

ANALYTICAL TECHNOLOGIES, INC.
Radiochemistry Data Package

Section 10

ADDITIONAL SUPPORTING DOCUMENTATION

10

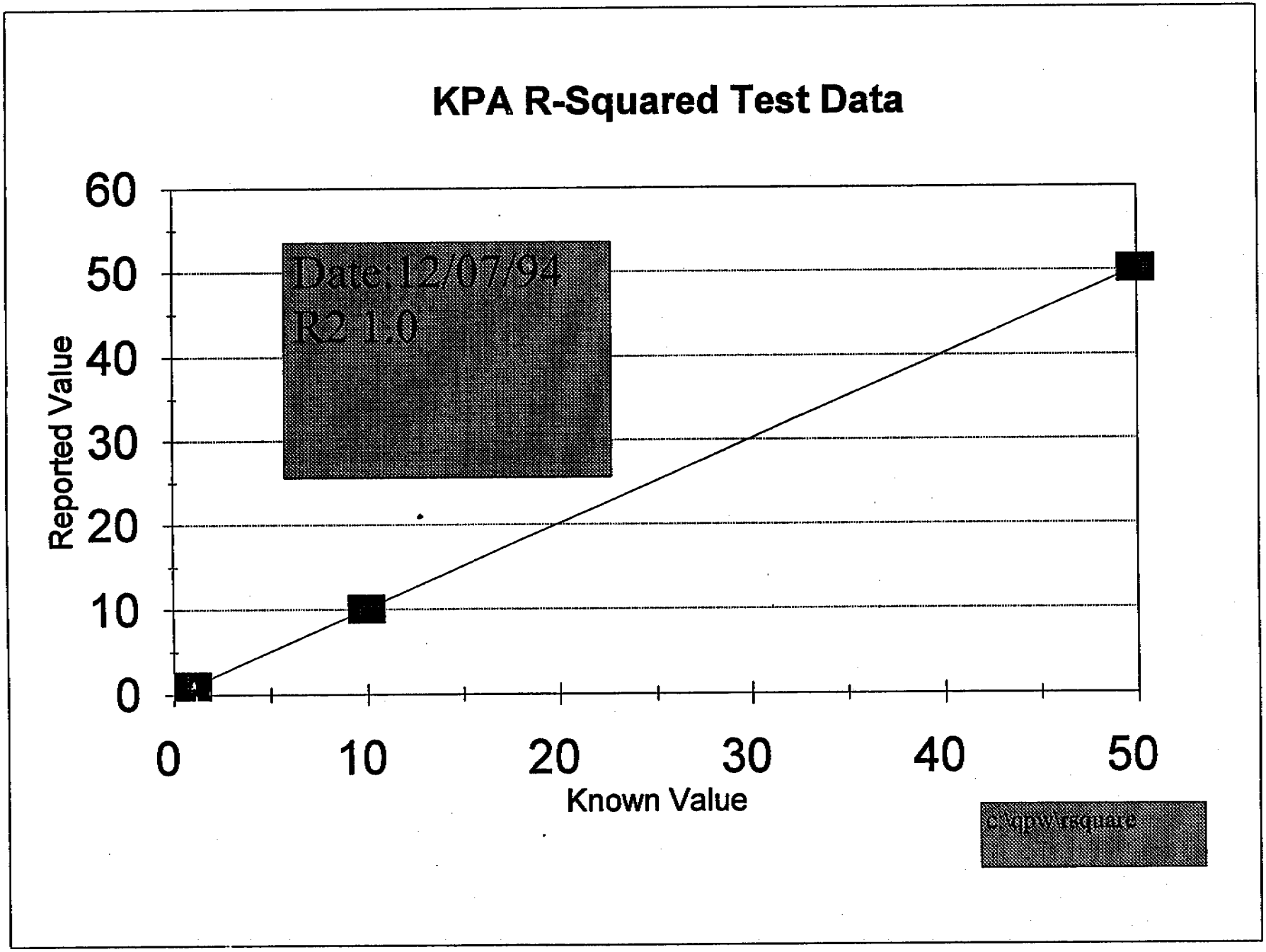

KPA R-Squared Test Data
Date: 12/07/94
R2 = 0.99981
Reported Value
Known Value
0
100
200
300
400
500
c:\qpw\rsquare

000072

KPA Calibration Verification Data 12/07/94

50	49.917	Regression Output:	
100	101.468	Constant	1.506582
500	495.535	Std Err of Y Est	1.517912
		R Squared	0.999981
		No. of Observations	3
		Degrees of Freedom	1
		X Coefficient(s)	0.988308
		Std Err of Coef.	0.004352

BP

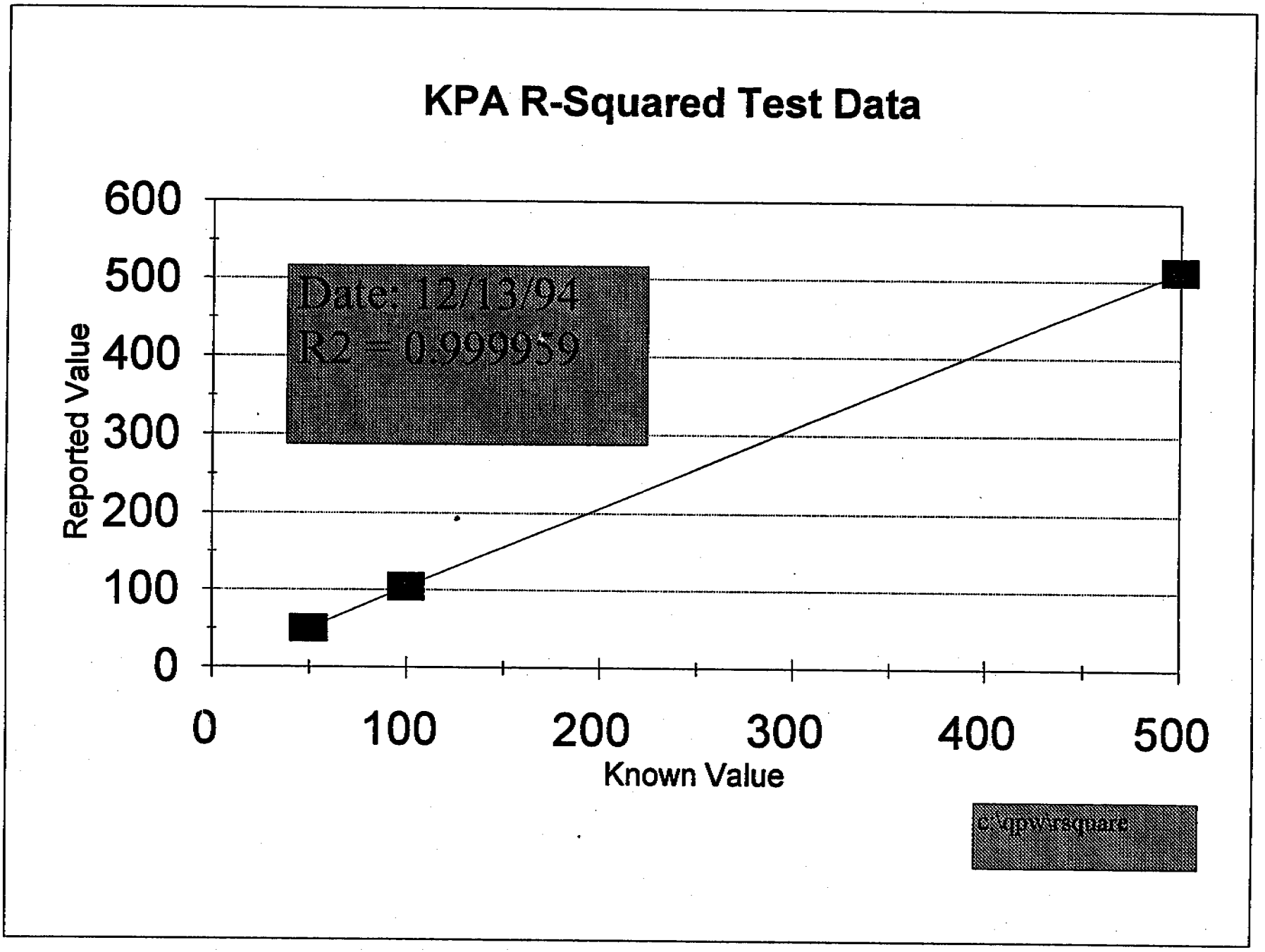

KPA R-Squared Test Data
Date:12/07/94
R2 1.0
Reported Value
60
50
40
30
20
10
0
0
10
20
30
40
50
Known Value
c:\qpw\rsqpaxe

000074

KPA Calibration Verification Data 12/07/94

1	1.01	Regression Output:	
10	10.07	Constant	0.019466
50	50.19	Std Err of Y Est	0.02066
		R Squared	1
		No. of Observations	3
		Degrees of Freedom	1
		X Coefficient(s)	1.003469
		Std Err of Coef.	0.00056

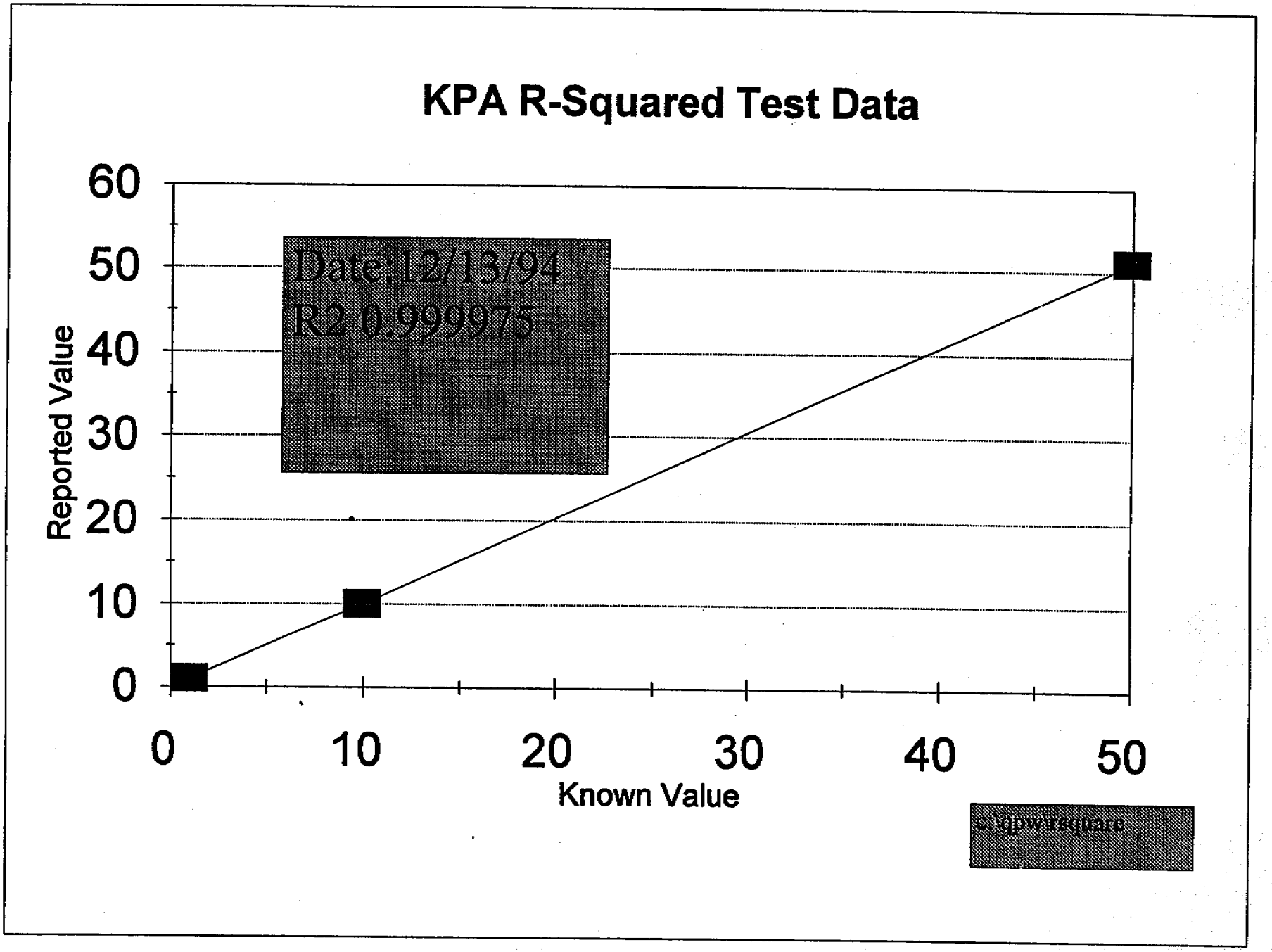
3p


KPA R-Squared Test Data
Date: 12/13/94
R2 = 0.999959
Reported Value
600
500
400
300
200
100
0
0
100
200
300
400
500
Known Value
c:\qpw\rsquare

KPA Calibration Verification Data 12/13/94

50	50.319	Regression Output:		
100	104.694	Constant		0.674993
500	512.065	Std Err of Y Est		2.286592
		R Squared		0.999959
		No. of Observations		3
		Degrees of Freedom		1
		X Coefficient(s)	1.023158	
		Std Err of Coef.	0.006555	

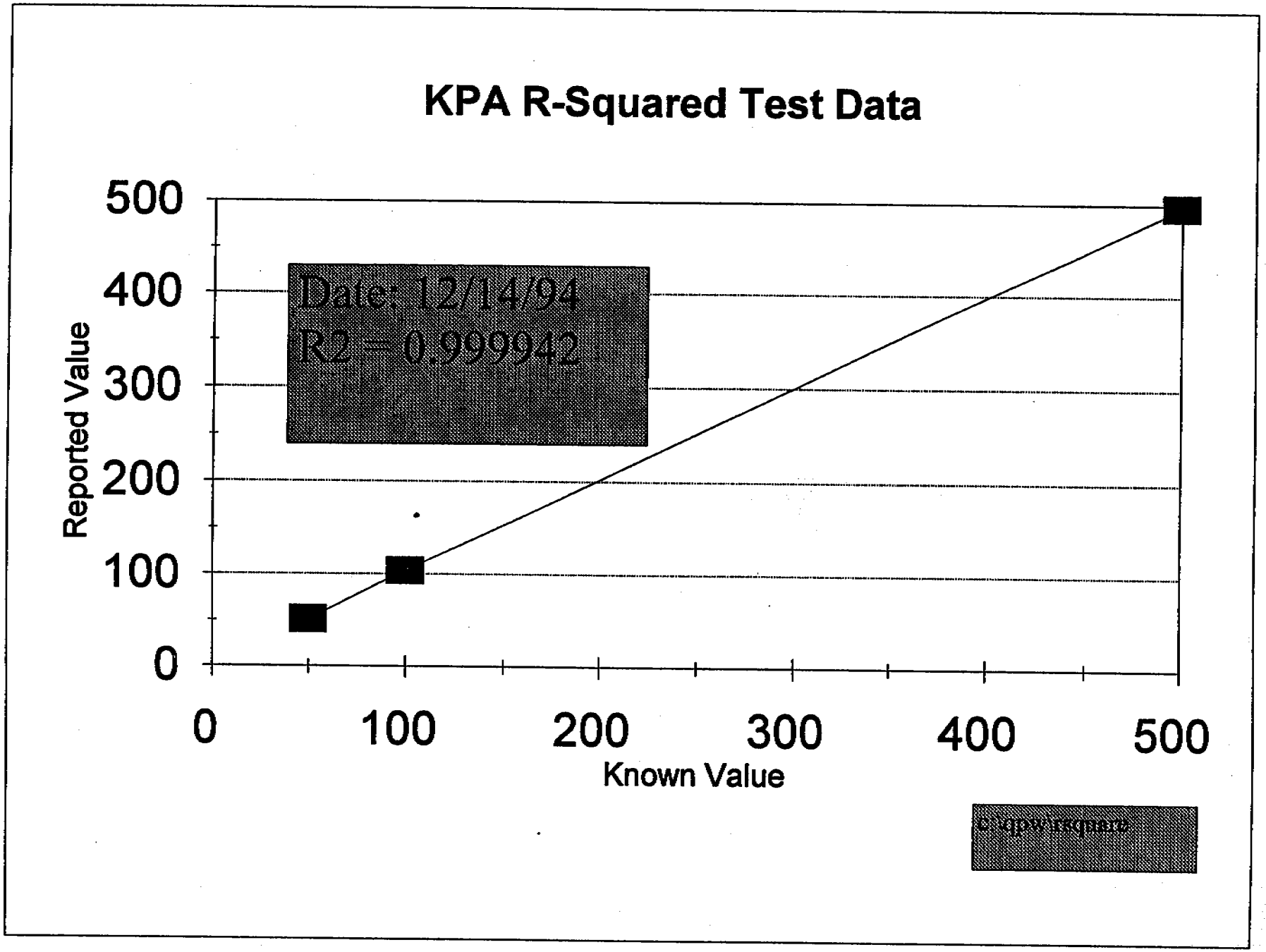
Ac


KPA R-Squared Test Data
Date:12/13/94
R2 0.999975
Reported Value
60
50
40
30
20
10
0
0
10
20
30
40
50
Known Value
c:\qpw\rsquare

KPA Calibration Verification Data 12/13/94

1	1.044	Regression Output:	
10	9.988	Constant	-0.09782
50	51.085	Std Err of Y Est	0.18959
		R Squared	0.999975
		No. of Observations	3
		Degrees of Freedom	1
		X Coefficient(s)	1.023122
		Std Err of Coef.	0.00514

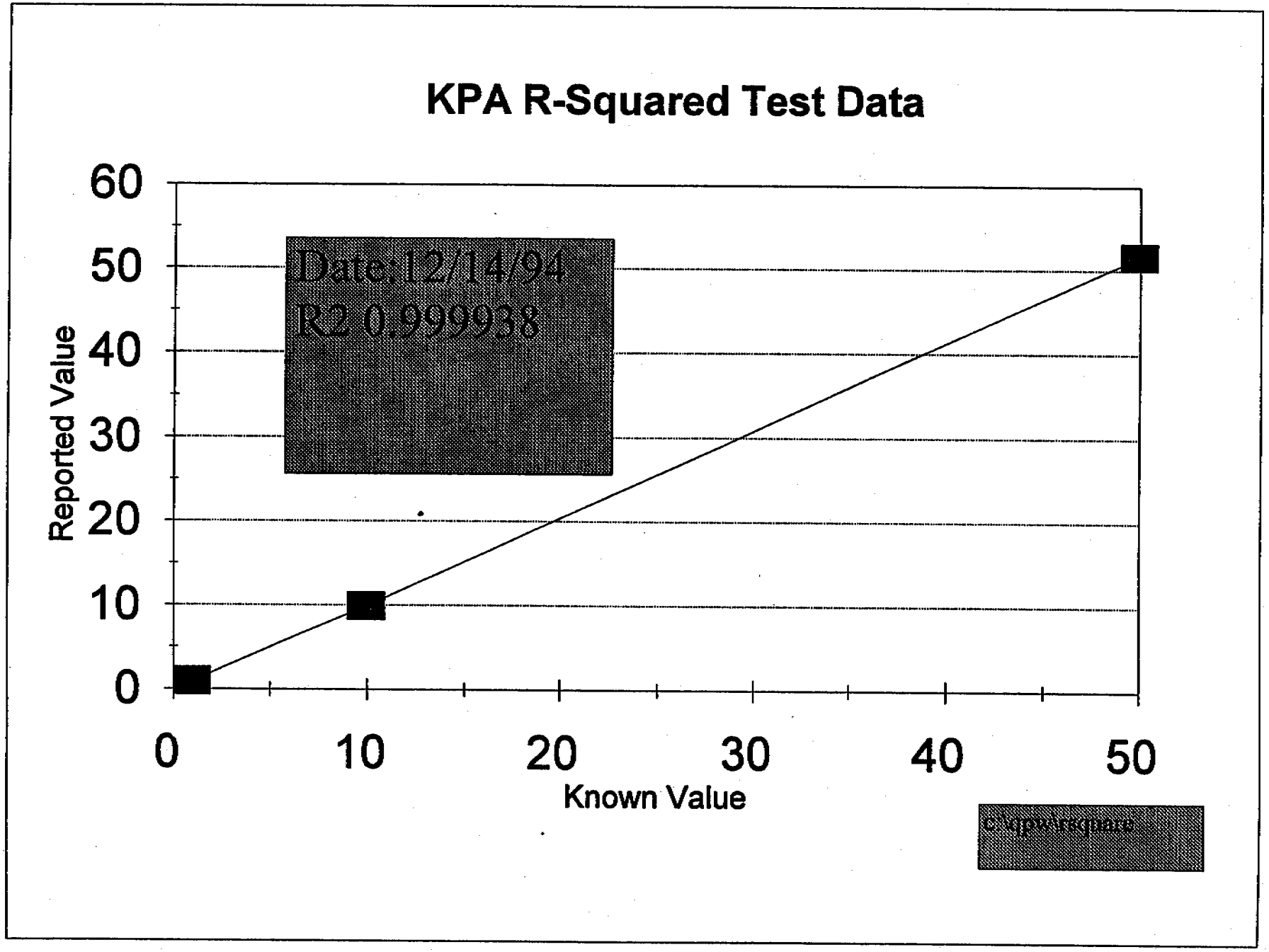
Sac


KPA R-Squared Test Data
Date: 12/14/94
R2 = 0.999942
Reported Value
Known Value
0
100
200
300
400
500
c:\qpw\rsquare

080000

KPA Calibration Verification Data 12/14/94

50	51.041	Regression Output:	
100	104.136	Constant	3.38076
500	497.157	Std Err of Y Est	2.626738
		R Squared	0.999942
		No. of Observations	3
		Degrees of Freedom	1
		X Coefficient(s)	0.987987
		Std Err of Coef.	0.007531


KPA R-Squared Test Data
Date:12/14/94
R2 0.999938
Reported Value
60
50
40
30
20
10
0
0
10
20
30
40
50
Known Value
c:\kpa\rsqpart

000082

KPA Calibration Verification Data 12/14/94

1	0.984	Regression Output:	
10	9.899	Constant	-0.24137
50	51.656	Std Err of Y Est	0.300717
		R Squared	0.999938
		No. of Observations	3
		Degrees of Freedom	1
		X Coefficient(s)	1.0371
		Std Err of Coef.	0.008152

000093 SAC