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WHC-SD-WM-DP-062, REV. 0

222-S ANALYTICAL LABORATORY

Project: 105-KE FILTER BACKWASH PIT (SFBWP)
SECOND CAMPAIGN

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Employee payroll numbers have been eliminated from this data package to protect the privacy of WHC employees. The elimination of these numbers in no way compromises the integrity of the raw data or information contained herein.

L. R. Webb — 2/11/94

L. R. Webb
Records Management Specialist
Program Support

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105-KE BASIN
SAND FILTER BACKWASH PIT (SFBWP)
SECOND CAMPAIGN
NARRATIVE

1.0 INTRODUCTION

Data for the Sand Filter Backwash Pit (SFBWP) Second Campaign samples are being reported in accordance with **WHC-SD-NR-PLN-013**, which provides the strategy and methods to be used to sample and analyze the sludge on the floor of the 105-KE Irradiated Fuel Storage Basin Sand Filter Backwash Pit and transfer channel. The primary goal of this activity is to provide characterization data of the solid residual materials from the 105-KE Basin sand filtering process as the materials have accumulated in the SFBWP.

2.0 SAMPLES

The seven samples of the SFBWP Second Campaign arrived at the lab in three shipments, two shipments on 11/10/94, and one on 11/12. These samples arrived in two jars each, with identifying numbers S3062-02, S3062-03, S3062-04, S3062-05, S3062-06, S3062-07 and S3062-08, as expected from separate communications. All sample jar pairs were easily identified by the sample numbers above, and all jar contents appeared to contain the materials expected; namely varying amounts of sand, brown "mud", and water, accompanied by significant radiation fields. The sand was on the bottom, covered by mud, then water. The water was clear, and its interface with mud sharp and level. The samples could be moved about carefully without disturbing this interface. All seven were understood to have come from the KE backwash pit.

Another sample in the shipments, S3062-01, consisted of two jars of clear KE basin water, and was not used or processed further.

Sample S3062-07 and S3062-08 were understood to have been taken at the same location in a manner to ensure the former would contain mostly water and backwash pit "mud", and the latter would contain water and the underlying "sand".

3.0 SAMPLE PROCESSING

3.1 Consolidation

Since these samples were each in two jars, the individual jar contents needed to be consolidated into a single settling jar for each sample. This was done by first pipetting off and saving the excess water from each sample jar, then agitating the jar and pouring the contents into a new consolidation jar. The saved water was then used in a rinse bottle to rinse the remaining sludge out of the sample jar and into the consolidation jar, As a result, each consolidation jar was nearly filled with consolidated sludge and excess water. For samples S3062-02 and S3062-07, the consolidation jar was 250 mL in volume, while for the remaining samples it was 500 mL.

During the consolidation operations, it was observed that oil films would show up on many of the consolidated samples' water surfaces.

3.2 Settling

The consolidated sludge samples contained sufficient excess water to permit sample suspension. Each sludge sample was shaken to suspend the sludge, then placed on a level surface and twisted back and forth a few times to level the sand layer, then left still to settle. Tamper tape was applied to the jars to assure no disturbances. Small plastic rulers were taped vertically to the outside of each consolidation jar to monitor the settling of sludge layers as time passed. Data on the water, mud and sand layer heights above the jar bottom was logged on several occasions during the settling period. The water levels did not change, nor did the sand levels after initial settling, while the mud layer heights slowly decreased over the entire settling period. The mud-water interface became very sharp and clear in a very short time. The total settling time for these samples was 138 hours.

After settling, marks were made on each consolidation jar opposite the top of each discernible sludge layer. In S3062-02, S3062-03, S3062-04, S3062-05 and S3062-06, there appeared to be one sand layer and two mud layers; a "coarse" mud having a darker brown color, and a "fine" mud on the very top of the sludge having a lighter brown color. The remaining two samples (S3062-07 and S3062-08) had only one discernable sand layer and one mud layer. The mud-water interfaces of all samples were reasonably level.

After marks were made delineating the levels of each sludge layer in the samples, the marks were overlaid with clear tape for their protection. It was estimated by eye that the uncertainties in making the sludge level marks would be approximately equivalent to a 10 mL standard deviation in determining sludge volume thereby.

3.3 Sludge Volumes, Weights and Digestions

The radiation fields from the sludges by themselves did not warrant their being processed in a hot cell. Therefore the sample processing was completed in the radioactive service hoods.

The drying vessels for these samples were 500 mL PTFE beakers with PTFE "watchglass" covers and PTFE standoffs (to allow venting). Each settled sludge sample was relieved of its excess water by careful pipetting, and then weighed in its settling jar. Next, the sludge was rinsed out of its settling jar into a tare weighed drying beaker using lab deionized water, to be dried at hot plate setting 1½ - 2 (low heat) to constant weight. Each time a sludge was weighed, it was mixed before reheating.

Each empty consolidation jar was cleaned out by rinsing, swabbing with towels and drying in the hood draft. Its tare weight was taken, then it was weighed again with laboratory water added up to each of the sludge levels previously marked in order to provide data for sludge volume calculations.

Once dried, the solids were mixed a final time and split for archiving and digestion. The digest portion, approximately 10 grams, was weighed in the same 500 mL PTFE beaker by difference after removing the archive portion. Sample S3062-07 had fewer than 10 grams of net dried solids, so its entire solids were digested, leaving none for archival.

Digestion for this campaign contrasted with that in previous campaigns in that both digests of a sample were placed in a single 1-Liter flask to be diluted to 1 Liter, and no sequential digest total-alpha samples were withdrawn. Before, digests were diluted to 500 mL, total alpha samples withdrawn, and digests were then combined into a 2-Liter volume. This change was instituted to reduce the amount of time needed to digest the samples, and was based on campaign one experience which showed that the digestion procedure developed for these samples was very effective at placing the alpha bearing materials in solution.

Digestion was begun by adding 125-150 mL of digestion acid, which is 1 part by volume 10 M HCl and 1 part 10M HNO_3, followed by 2 drops of concentrated aqueous HF, and placing on the heat to simmer for four hours total. The digesting mixtures were typically observed to consist of a sand on the bottom containing bits of dark foreign material, and a floc, which convected with the colored digesting acid. It was observed that a thin, oily "bathtub ring" appeared inside the digester when these samples were digested, which was not rinsed into the flask.

After digesting, each mixture was cooled and poured into four 50 mL plastic centrifuge cones. The digester and its undissolved residue were rinsed three times with digesting acid, and the rinses added to the cones. The cones were centrifuged 15 minutes. The clarified centrifugate was then carefully decanted into a 1-

Liter volumetric flask. The cones and their residue contents were then rinsed twice more by adding a portion of acid, agitating, centrifuging for 15 minutes, and decanting without loss of residue into the flask.

Next, the cone residues were rinsed back into the digester with digesting acid and the residues were digested a second time in the same manner as the first digestion, and the digestate and rinsates added to the same flask used for the first digestion. Finally, the 1-Liter flask was made up to volume with deionized water. Samples of this combined digest were submitted to both 222-S and PNL for chemical and radiochemical analyses.

Each sample's digest residue was rinsed back into the digester and dried to constant weight to obtain an acid-insoluble residue percentage. The dried residue was observed to consist of a reasonably clean-looking sand contaminated by gray fines, a few black bits, and a few paint chips. At least two sample residues were observed to contain ion exchange resin beads. A portion of each residue was submitted for x-ray diffraction, x-ray florescence and polarized light microscopic analyses. The remainder was archived.

4.0 SAMPLE PROCESSING RESULTS

Those results generated by sample processing have been summarized in Table 4.1. Some of the calculations therein depend on the assumption that the density of water be 0.998 g/mL. Most items are self-explanatory, while a few bear additional comment:

CALCULATED HEIGHT IN SAMPLER assumes that the sample sludge volume made a column of that height in the 1 inch i.d. sample isolation tube used for this campaign. It can be compared with measured values of sludge height in the pit to gauge the efficiency of sampling, although there may be differences between settling in the laboratory and settling in the pit.

SOLIDS CONCENTRATION is the factor to use, together with PCL DILUTION FACTOR and DIGEST RATE, to convert reported chemical concentrations in units of grams/mL digestate to grams/mL sludge. The PCL DILUTION FACTOR in this campaign was unity due to the change in digestion procedure.

AVERAGE PARTICLE DENSITY is the pycnometric calculation of the density required of the solids which displace water to produce the sludge density as found. Given that most of the solids are expected to be sand, (hydrous) iron oxide, aluminum oxide and uranium oxide, the density ought to be that of sand or higher. The tendency to be lower than sand in particle density may be due to the presence of lighter foreign matter such as paint chips. The result for S3062-07 is highly improbable, and is probably due to the fact it was almost entirely mud, which is extremely watery and therefore difficult to measure by this method.

Table 4.1 KE BACKWASH PIT SAMPLE PROCESSING DATA AND CALCULATED SLUDGE PROPERTIES -- S3062- SERIES

DATUM (units)	SAMPLE S3062-02	SAMPLE S3062-03	SAMPLE S3062-04	SAMPLE S3062-05	SAMPLE S3062-06	SAMPLE S3062-07	SAMPLE S3062-08
SLUDGE NET WEIGHT (g)	159.14	228.44	173.58	227.75	412.18	116.41	198.15
DRY NET WEIGHT (g dry solids)	41.41	88.40	39.87	91.44	220.56	6.20	56.23
DIGEST NET WEIGHT (g)	10.07	9.95	10.05	10.18	10.58	6.20	10.06
RESIDUE NET WEIGHT (g residue)	8.78	9.02	8.09	9.58	9.86	2.42	8.78
SLUDGE VOLUME (mL)	135	185	139	154	270	110	145
VOL. % WET SAND (% by vol. in sludge)	23	28	5	31	57	3	12
VOL. % WET MUD (% by vol. in sludge)	77	72	95	69	43	97	88
WT. % SOLIDS (% by wt. in sludge)	26.02	38.70	22.97	40.15	53.51	5.33	28.38
WT % WATER (% by wt. in sludge)	73.98	61.30	77.03	59.85	46.49	94.67	71.62
WT % RESIDUE OF DIGEST (wt % of dry solids)	87.19	90.65	80.50	94.11	93.19	39.03	87.28
SLUDGE DENSITY (g sludge per mL sludge)	1.18	1.24	1.25	1.48	1.53	1.05	1.36
CALCULATED HEIGHT IN SAMPLER (inches)	10.46	14.35	10.77	11.95	20.96	8.58	11.30
SOLIDS CONCENTRATION (g solids per mL sludge)	0.308	0.479	0.288	0.594	0.818	0.056	0.386
WATER CONCENTRATION (g water per mL sludge)	0.875	0.758	0.965	0.886	0.710	0.998	0.975
AVERAGE PARTICLE DENSITY (g particle per mL particle)	1.79	1.44	3.14	1.94	1.43	16.39 (improbable result)	3.07
DIGEST RATE (mL digest per g solids digested)	99.30	100.50	99.50	98.23	94.52	161.29	99.40
PCL DILUTION FACTOR (no units)	1.000	1.000	1.000	1.000	1.000	1.000	1.000

5.0 INORGANIC AND RADIOCHEMICAL ANALYSIS RESULTS

Spreadsheets have been provided which summarize the inorganic and radiochemical results for the samples submitted to the 222-S laboratory. In addition, a spreadsheet is provided which relates the Sample Analysis Plan (SAP) sample ID to the various other identification codes used by Process Chemistry Laboratories and the 222-S Laboratories, and what analyses were required by the SAP for each sample.

Sample precision as defined by the Sample Analysis Plan (SAP) **WHC-SD-NR-PLN-013** is represented on the data spreadsheets under the column heading "PRECISION 2RSD (%)". This value was derived by determining the standard deviation (SD) of the three results (sample, duplicate, triplicate), multiplying the SD times two, and relating this value as a percentage of the mean of the three results. If the 2RSD exceeded the percentage stated in Table 3-3 of the SAP for that particular analysis, the analysis was rerun until acceptable precision was obtained, or until it was determined that additional analysis could not be justified due to ALARA principles and/or the low probability of achieving acceptable results. "Qualitative" analyses such as the nondestructive examination (X-Ray Diffraction) did not require duplicate and triplicate runs.

Accuracy as defined by the Sample Analysis Plan (SAP) **WHC-SD-NR-PLN-013** is represented on the data spreadsheets under the column headings "SPIKE %REC" and "SPIKE DUP %REC". If the recoveries for either of the spikes were outside the range specified in the SAP Table 3-3, then the analysis was rerun until acceptable accuracy was obtained, or until it was determined that additional analysis could not be justified due to ALARA principles and/or the low probability of achieving acceptable results. Spikes and spike duplicates were required for the plutonium, americium, and uranium analyses. Analyses which did not require spikes and spike duplicates will have the letters "NA" (not applicable) in these columns.

The "REAGENT BLK" column of each spreadsheet lists results which provide assurance that the material used to prepare the digestate for analysis (usually water) was not contaminated with the analyte of interest. These results are always reported by volume.

5.1 Alpha Total

A spreadsheet is provided which summarizes the total alpha results for the SFBWP Campaign Two samples. A rerun was requested for J1427 (S3062-04) due to failure of the accuracy criteria. The rerun was performed successfully. A rerun was requested for J1445 (S3062-07) to determine if the alpha analysis was beta sensitive. No beta sensitivity was found.

It was determined, based on experience with the first set of SFBWP samples, that the digestion procedure developed specifically for these

samples was sufficient to place over 99% of the available alpha bearing material in solution. As a result, no alpha digestion results appear in this package, as they did in previous data packages (see sec. 3.3).

5.2 Total Beta

No unusual circumstances were encountered while analyzing the SFBWP Campaign Two samples for total beta. One batch was rerun because the replicate analyses were not performed. The rerun results varied by less than 5% from the initial batch.

5.3 Gamma Energy Analysis

Results for all of the SFBWP Campaign Two samples are presented on the GEA spreadsheet, although only one analysis was required by the SAP. No special problems or method variations were noted. The major gamma emitting isotope detected for each sample was Cs-137, which accounted for approximately 90% of the total gamma activity. The Am-241 values determined by gamma emission compared well with the values derived by separation and alpha energy analysis (see sec. 5.5). One isotope for two samples (Eu-155/J1425,J1428) failed the precision criteria because it was present at low concentrations.

During the period that these samples were analyzed it was determined that the GEA detector calibrations had lapsed. Calibrations were performed under the chemist's direction, and no problems were encountered.

5.4 Plutonium 238/239/240

During the first campaign of K-Basin samples it became apparent that the available stock of Pu-236 tracer would be depleted before all K-Basin samples would be analyzed. As a result, the amount of tracer used for each batch was cut in half. To improve counting statistics, the count time for the Alpha Energy Analysis (AEA) was increased from eight hours to twenty-four. Analyses which were candidates for rerun were postponed until all initial analyses were completed. Reruns were performed serially to ensure that the most serious analytical errors were resolved before moving on to the next.

Two plutonium reruns were performed. Sample J1426 (S3062-03) failed the precision criteria. The rerun was successful, and appears on the spreadsheet. Sample J1446 (S3062-08) was rerun due to failure of the LMCS standard. An Off-Standard Condition Report (OSCR) was generated 1/19/94 and completed on 1/21/94. A reanalysis was successfully performed, and appears on the spreadsheet.

Sample J1428 (S3062-05) spike duplicate exceeded the accuracy criteria, and the standard mount was of poor quality. The standard results, however, met acceptance criteria, as did the precision results. The Pu-239/40 concentration also fell within the expected range when compared with other analytes. Due to concerns about tracer material and sample delays, no rerun was requested.

Pu-238 was present at concentrations only slightly above detection limits in the majority of samples. For this reason, the precision criteria was not met for J1446. Increasing the sample size would result in better detection limits, but would also result in greater amounts of tracer material being consumed. Precision results were not calculated for those samples that did not provide three results (sample, duplicate, and triplicate) above detection limits.

5.5 Americium 241

One rerun analysis was requested for sample J1445 (S3062-08) due to failure of the precision and accuracy criteria. The rerun was successful and appears on the spreadsheet. Sample J1427 (S3062-04) results were acceptable in all regards with the exception of the spike, which exceeded the accuracy criteria by a small (2%) margin. Results compared well with the GEA (see below) so a rerun was not requested.

The following table summarizes the Am-241 results for the Campaign Two samples by two separate detection techniques, alpha energy analysis (AEA), and gamma energy analysis (GEA).

SAMPLE	AEA(uCi/g)	GEA(uCi/g)
J1424	.793	.806
J1425	2.51	2.70
J1426	1.76	1.83
J1427	4.72	4.56
J1428	1.41	1.46
J1445	29.6	30.3
J1446	3.20	3.18

5.6 Uranium

Reruns for samples J1424, J1426 and J1445 were requested due to failure of the accuracy criteria. The rerun results appear on the spreadsheet.

Uranium results by laser fluorometry for the SFBWP Second Campaign samples vary significantly from results obtained by ICP. The laser results are approximately 20-100% higher than the ICP results, as summarized in the table below.

SAMPLE	LASER(ug/g)	ICP(ug/g)
J1424	6.0E+03	4.3E+03
J1425	3.2E+04	2.1E+04
J1426	1.7E+04	1.3E+04
J1427	5.3E+04	3.1E+04
J1428	1.3E+04	8.0E+03
J1445	1.3E+05	1.1E+05
J1446	3.2E+04	1.6E+04

The laser fluorometry method used to analyze for uranium (LA-925-106) is subject to interference due to the matrix of the K-Basin samples. The samples are approximately 4M aqua regia with large amounts of dissolved solids, iron, and organics. Adequate pH adjustment of the sample was not possible due to the acid concentration. Steps were taken to remove chloride and organics prior to analysis. Large dilutions were performed to minimize the remaining interferences. This reduced the precision of the analysis. A second uranium procedure which utilizes laser induced phosphorescence was performed, but significant matrix problems occurred with this analysis also.

5.7 ICP

All instrument calibration and calibration blank requirements were within the specified control limits. All precision requirements were met, with the following exceptions: cadmium (J1424), lead (J1425, J1426, J1427, J1428, J1446), samarium (J1427), zinc (J1448), thallium (J1445), and sodium (J1446). The failures for cadmium, lead, samarium, and thallium are attributed to the low levels (<5xIDL) of these analytes in the samples. Failures for zinc and sodium cannot be explained at this time. The initial interference check samples were inadvertently omitted from the first batch of ICP analyses, and none were performed with the second batch. There is no practical significance to the error for the first batch. A final interference check sample was analyzed, and no problems were encountered. The second batch (J1445, J1446) may have experienced some unusual interference, but problems with the interelement correction factors have not been observed with any of the other K-Basin Samples.

5.8 Nondestructive Examination

Samples of the residue remaining from the digestions were submitted for X-Ray Diffraction (XRD) analysis. The results indicated the presence of primarily silicon oxide (SiO2) in each case.

X-Ray Fluorescence (XRF) analysis was requested but was not performed because the XRF instrument has not been functional during this project.

Polarized Light Microscopy (PLM) work is in progress and will be detailed in a separate report.

5.9 Mass Balance

Information on mass balance determinations will be presented in a separate report.

5.10 Practical Quantitation Limit (PQL) Evaluation

The following analyses did not meet the PQL requirement stated in the SAP.

Analysis	PQL	Report Value	Sample
B (ICP)	5 ug/g	< 12-21 ug/g	all samples
Sm (ICP)	10 ug/g	< 71-75 ug/g	J1424/25/26/28/46
Tl (ICP)	40 ug/g	< 167-178 ug/g	all except J1445
Pb (ICP)	42 ug/g	< 66 ug/g	J1424
Pu-238	3 uCi/g	< 4.3 uCi/g	J1445(sam)

6.0 REFERENCES

WHC-SD-NR-PLN-013 Rev 1, Sampling and Analysis Plan for 105-KE Basin Filter Backwash Pit, Westinghouse Hanford Company, Richland, Washington.

SAMPLE DATA SUMMARY

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SAP ID	Field ID	PCL ID	RSA Lab ID	ANALYSIS
quadrant 1	S3062-02			
dry residue		KE 64D	J1409	XRD,XRF,PLM
digestate		KE 64A	J1425	AT,TB,GEA,Pu,Am,U,ICP
quadrant 2	S3062-03			
dry residue		KE 65C	J1410	XRD,XRF,PLM
digestate		KE 65A	J1426	AT,TB,Pu,Am,U,ICP
quadrant 4	S3062-04			
dry residue		KE 77A	J1411	XRD,XRF,PLM
digestate		KE 71A	J1427	AT,TB,Pu,Am,U,ICP
quadrant 3	S3062-05			
dry residue		KE 77B	J1412	XRD,XRF,PLM
digestate		KE 72A	J1428	AT,TB,GEA,Pu,Am,U,ICP
quadrant 1	S3062-06			
dry residue		KE 64C	J1408	XRD,XRF,PLM
digestate		KE 65D	J1424	AT,TB,Pu,Am,U,ICP
research (upper)	S3062-07			
dry residue		KE 84A	J1414	XRD,XRF,PLM
digestate		KE 83B	J1445	AT,TB,Pu,Am,U,ICP
research (lower)	S3062-08			
dry residue		KE 83A	J1413	XRD,XRF,PLM
digestate		KE 83D	J1446	AT,TB,Pu,Am,U,ICP

SFBWP CAMPAIGN 2
ALPHA TOTAL

SAMPLE ID	LAB ID	SAMPLE	DUPLICATE	TRIPLICATE	MEAN	PRECISION	SPIKE	SPIKE DUP	STANDARD	BLANK
		uCi/g	uCi/g	uCi/g	uCi/g	2RSD (%)	% REC	% REC	%REC	uCi/ml
S3062-02	J1425	4.22E+00	4.33E+00	4.65E+00	4.40E+00	10.1	NA	NA	97.5	<1.12E-05
S3062-03	J1426	3.34E+00	2.75E+00	2.99E+00	3.03E+00	19.3	NA	NA	99.4	<7.42E-06
S3062-04	J1427	8.03E+00	8.15E+00	8.17E+00	8.12E+00	1.8	NA	NA	96.5	<8.03E-06
S3062-05	J1428	2.49E+00	2.27E+00	2.22E+00	2.32E+00	12.1	NA	NA	99.4	<7.42E-06
S3062-06	J1424	1.32E+00	1.12E+00	1.17E+00	1.20E+00	17.9	NA	NA	97.5	<1.12E-05
S3062-07	J1445	5.27E+01	4.82E+01	5.73E+01	5.27E+01	17.1	NA	NA	98.2	<1.17E-05
S3062-08	J1446	5.14E+00	5.11E+00	4.51E+00	4.92E+00	14.4	NA	NA	98.2	<1.17E-05

SFBWP CAMPAIGN 2
TOTAL BETA

SAMPLE ID	LAB ID	SAMPLE	DUPLICATE	TRIPLICATE	MEAN	PRECISION	SPIKE	SPIKE DUP	STANDARD	BLANK
		uCi/g	uCi/g	uCi/g	uCi/g	2RSD (%)	% REC	% REC	%REC	uCi/ml
S3062-02	J1425	9.76E+01	1.00E+02	9.62E+01	9.80E+01	4.2	NA	NA	92.9	<1.03E-04
S3062-03	J1426	5.83E+01	5.70E+01	5.63E+01	5.72E+01	3.6	NA	NA	95.9	<9.14E-05
S3062-04	J1427	1.23E+02	1.25E+02	1.26E+02	1.25E+02	2.4	NA	NA	95.9	<9.14E-05
S3062-05	J1428	3.55E+01	3.41E+01	3.52E+01	3.49E+01	4.2	NA	NA	95.9	<9.14E-05
S3062-06	J1424	2.16E+01	2.14E+01	2.01E+01	2.10E+01	7.3	NA	NA	92.9	<1.03E-04
S3062-07	J1445	3.08E+02	3.11E+02	3.21E+02	3.13E+02	4.3	NA	NA	94.7	<5.56E-04
S3062-08	J1446	4.00E+01	4.12E+01	4.15E+01	4.09E+01	3.9	NA	NA	94.7	<5.56E-04

SFBWP CAMPAIGN 2
GEA

SAMPLE ID	LAB ID	ISOTOPE	SAMPLE uCi/g	DUPLICATE uCi/g	TRIPLICATE uCi/g	MEAN uCi/g	PRECISION 2RSD (%)	STANDARD %REC	BLANK uCi/ml
S3062-02	J1425	Am-241	2.68E+00	2.72E+00	2.70E+00	2.70E+00	1.5	NA	<9.38E-05
		Co-60	6.26E-01	6.57E-01	6.75E-01	6.53E-01	7.7	99.2	<9.35E-05
		Cs-137	3.19E+01	3.24E+01	3.22E+01	3.21E+01	1.5	101.0	<1.22E-04
		Eu-154	4.83E-01	5.37E-01	5.78E-01	5.33E-01	18.0	NA	<2.84E-04
		Eu-155*	2.84E-01	3.25E-01	2.23E-01	2.77E-01	36.7	NA	<2.20E-04
S3062-03	J1426	Am-241	1.83E+00	1.84E+00	1.82E+00	1.83E+00	1.1	NA	<3.26E-04
		Co-60	4.84E-01	4.79E-01	5.15E-01	4.93E-01	7.7	99.2	<4.54E-05
		Cs-137	1.48E+01	1.47E+01	1.48E+01	1.47E+01	0.8	103.0	<6.36E-05
		Eu-154	3.85E-01	3.61E-01	3.73E-01	3.73E-01	6.5	NA	<1.48E-04
		Eu-155	2.07E-01	1.78E-01	1.94E-01	1.92E-01	15.1	NA	<1.29E-04
S3062-04	J1427	Am-241	4.65E+00	4.50E+00	4.55E+00	4.56E+00	3.3	NA	<3.26E-04
		Co-60	1.00E+00	1.05E+00	1.05E+00	1.04E+00	5.5	99.2	<4.54E-05
		Cs-137	4.32E+01	4.35E+01	4.37E+01	4.35E+01	1.1	103.0	<6.36E-05
		Eu-154	9.52E-01	9.33E-01	1.04E+00	9.77E-01	12.2	NA	<1.48E-04
		Eu-155	5.20E-01	4.20E-01	5.25E-01	4.89E-01	24.4	NA	<1.29E-04
S3062-05	J1428	Am-241	1.49E+00	1.51E+00	1.37E+00	1.46E+00	10.9	NA	<3.26E-04
		Co-60	3.07E-01	3.36E-01	3.25E-01	3.23E-01	8.9	99.2	<4.54E-05
		Cs-137	1.49E+01	1.51E+01	1.52E+01	1.51E+01	2.0	103.0	<6.36E-05
		Eu-154	2.65E-01	2.91E-01	2.55E-01	2.70E-01	13.7	NA	<1.48E-04
		Eu-155*	1.39E-01	2.01E-01	1.75E-01	1.70E-01	52.3	NA	<1.29E-04
S3062-06	J1424	Am-241	8.55E-01	7.83E-01	7.81E-01	8.06E-01	10.6	NA	<9.38E-05
		Co-60	3.25E-01	3.25E-01	3.23E-01	3.25E-01	0.7	99.2	<9.35E-05
		Cs-137	1.26E+01	1.20E+01	1.19E+01	1.22E+01	5.9	101.0	<1.22E-04
		Eu-154	<3.33E-02	<1.47E-01	1.77E-01	NA	NA	NA	<2.84E-04
		Eu-155	9.22E-02	8.37E-02	9.92E-02	9.17E-02	17.0	NA	<2.20E-04
S3062-07	J1445	Am-241	3.05E+01	2.97E+01	3.06E+01	3.03E+01	3.4	NA	<3.16E-04
		Co-60	2.61E+00	2.58E+00	2.63E+00	2.61E+00	1.9	102.0	<6.93E-05
		Cs-137	1.18E+02	1.17E+02	1.19E+02	1.18E+02	1.2	104.0	<7.88E-05
		Eu-154	6.42E+00	6.18E+00	6.35E+00	6.32E+00	4.0	NA	<2.33E-04
		Eu-155	3.53E+00	3.39E+00	3.26E+00	3.39E+00	8.1	NA	<1.34E-04
S3062-08	J1446	Am-241	3.28E+00	3.07E+00	3.20E+00	3.18E+00	6.7	NA	<3.16E-04
		Co-60	7.12E-01	7.10E-01	7.06E-01	7.09E-01	0.9	102.0	<6.93E-05
		Cs-137	1.31E+01	1.30E+01	1.29E+01	1.30E+01	1.4	104.0	<7.88E-05
		Eu-154	6.33E-01	6.40E-01	5.99E-01	6.24E-01	7.0	NA	<2.33E-04
		Eu-155	3.22E-01	3.51E-01	3.21E-01	3.31E-01	10.2	NA	<1.34E-04

*Failed the precision criteria due to low sample concentration.

SFBWP CAMPAIGN 2
Pu-239/40

SAMPLE ID	LAB ID	SAMPLE	DUPLICATE	TRIPLICATE	MEAN	PRECISION	SPIKE	SPIKE DUP	STANDARD	REAGENT BLK
		uCi/g	uCi/g	uCi/g	uCi/g	2RSD (%)	% REC	% REC	%REC	uCi/ml
S3062-02	J1425	3.15E+00	3.06E+00	2.83E+00	3.01E+00	10.9	101.6	106.2	104.2	<1.28E-03
S3062-03	J1426	2.16E+00	2.14E+00	2.25E+00	2.18E+00	5.4	101.2	115.5	95.0	<6.91E-04
S3062-04	J1427	5.94E+00	6.07E+00	5.53E+00	5.85E+00	9.6	112.3	110.3	109.6	<1.81E-03
S3062-05	J1428*	2.21E+00	2.11E+00	2.28E+00	2.20E+00	7.6	116.0	128.0	120.3	<8.01E-04
S3062-06	J1424	8.66E-01	1.02E+00	9.32E-01	9.40E-01	16.6	96.0	96.4	105.0	<3.75E-06
S3062-07	J1445	3.31E+01	3.19E+01	3.60E+01	3.37E+01	12.4	99.9	97.3	97.5	<8.40E-03
S3062-08	J1446	3.84E+00	4.13E+00	3.89E+00	3.95E+00	7.8	99.0	107.8	93.5	<1.76E-03

SFBWP CAMPAIGN 2
Pu-238

SAMPLE ID	LAB ID	SAMPLE	DUPLICATE	TRIPLICATE	MEAN	PRECISION	SPIKE	SPIKE DUP	STANDARD	REAGENT BLK
		uCi/g	uCi/g	uCi/g	uCi/g	2RSD (%)	% REC	% REC	%REC	uCi/ml
S3062-02	J1425	<5.22E-01	<4.04E-01	<5.57E-01	NA	NA	NA	NA	NA	<5.93E-03
S3062-03	J1426	4.23E-01	<2.25E-01	3.41E-01	3.82E-01	NA	NA	NA	NA	<1.35E-03
S3062-04	J1427	9.08E-01	1.08E+00	<5.73E-01	9.96E-01	NA	NA	NA	NA	<1.39E-02
S3062-05	J1428	<4.56E-01	<2.59E-01	3.08E-01	NA	NA	NA	NA	NA	<2.92E-03
S3062-06	J1424	<1.46E-01	<2.70E-01	<2.17E-01	NA	NA	NA	NA	NA	<2.62E-05
S3062-07	J1445	<4.27E+00	4.00E+00	5.10E+00	4.55E+00	NA	NA	NA	NA	<1.45E-02
S3062-08	J1446**	5.46E-01	8.18E-01	5.53E-01	6.39E-01	48.6	NA	NA	NA	<2.77E-03

* Spike duplicate failed accuracy criteria.

** Exceeds precision criteria due to low relative concentration.

SFBWP CAMPAIGN 2
Am-241

SAMPLE ID	LAB ID	SAMPLE	DUPLICATE	TRIPLICATE	MEAN	PRECISION	SPIKE	SPIKE DUP	STANDARD	REAGENT BLK
		uCi/g	uCi/g	uCi/g	uCi/g	2RSD (%)	% REC	% REC	%REC	uCi/ml
S3062-02	J1425	2.80E+00	2.51E+00	2.22E+00	2.51E+00	22.9	101.4	104.9	123.5	<3.73E-03
S3062-03	J1426	1.81E+00	1.70E+00	1.78E+00	1.76E+00	6.5	89.5	115.5	108.9	<1.87E-02
S3062-04	J1427*	4.46E+00	4.97E+00	4.75E+00	4.72E+00	10.7	122.3	107.6	112.0	<5.71E-03
S3062-05	J1428	1.38E+00	1.41E+00	1.44E+00	1.41E+00	4.9	109.7	102.8	112.0	1.97E-03
S3062-06	J1424	7.79E-01	8.17E-01	7.83E-01	7.93E-01	5.3	112.1	101.9	120.2	<2.63E-03
S3062-07	J1445	3.11E+01	2.85E+01	2.92E+01	2.96E+01	9.1	103.8	88.0	104.4	<1.71E-01
S3062-08	J1446	3.08E+00	3.03E+00	3.49E+00	3.20E+00	15.7	116.4	89.8	90.7	<8.28E-03

* Spike failed accuracy criteria.

SFBWP CAMPAIGN 2
URANIUM (LASER FLUOROMETRY)

SAMPLE ID	LAB ID	SAMPLE	DUPLICATE	TRIPLICATE	MEAN	PRECISION	SPIKE	SPIKE DUP	STANDARD	REAGENT BLK
		ug/g	ug/g	ug/g	ug/g	2RSD (%)	% REC	% REC	%REC	ug/ml
S3062-02	J1425	3.23E+04	3.23E+04	3.23E+04	3.23E+04	0.0	102.9	102.9	102.3	<3.24E+00
S3062-03	J1426	1.67E+04	1.67E+04	1.83E+04	1.72E+04	10.8	102.4	102.4	97.9	<3.24E-01
S3062-04	J1427*	5.14E+04	5.37E+04	5.14E+04	5.26E+04	5.1	123.2	117.2	102.3	<2.58E+01
S3062-05	J1428	1.18E+04	1.41E+04	1.41E+04	1.33E+04	19.9	101.0	107.0	102.3	<2.58E+01
S3062-06	J1424	5.98E+03	6.12E+03	5.98E+03	6.03E+03	2.7	112.2	111.8	97.9	<3.24E-01
S3062-07	J1445	1.37E+05	1.37E+05	1.22E+05	1.32E+05	13.7	88.0	88.0	118.9	<1.43E+01
S3062-08	J1446	3.07E+04	3.07E+04	3.38E+04	3.17E+04	11.2	90.4	98.7	102.3	<3.12E+00

* Spike failed accuracy criteria.

SAND FILTER BACKWASH PIT CAMPAIGN 2
ICP

	J1424 ug/g	dup ug/g	trip ug/g	2RSD (%)	DL ug/g
Ag	< DL	< DL	< DL	NA	6.24E+00
Al	6.25E+03	6.39E+03	6.42E+03	2.9	3.95E+01
B	< DL	< DL	< DL	NA	1.25E+01
Ba	4.12E+01	4.17E+01	4.29E+01	4.3	6.24E+00
Be	3.21E+00	3.58E+00	3.70E+00	14.6	3.12E+00
Ca	5.34E+03	5.53E+03	5.56E+03	4.2	1.98E+01
Cd	3.86E+01	3.01E+01	3.32E+01	25.5	8.32E+00
Cr	5.66E+01	5.54E+01	5.44E+01	4.0	1.14E+01
Cu	9.83E+01	9.54E+01	9.40E+01	4.6	5.20E+00
Fe	1.90E+04	1.98E+04	1.99E+04	5.2	2.18E+01
Mg	6.41E+02	6.69E+02	6.70E+02	5.0	5.20E+00
Mn	1.96E+02	2.04E+02	2.04E+02	4.8	3.12E+00
Na	2.42E+02	2.43E+02	2.46E+02	1.7	2.91E+01
Pb	1.09E+02	< DL	< DL	NA	6.66E+01
Si	1.05E+03	1.07E+03	1.08E+03	3.3	3.02E+01
Sm	< DL	7.09E+01	< DL	NA	7.07E+01
Tl	< DL	< DL	< DL	NA	1.67E+02
Zn	1.98E+02	2.08E+02	2.17E+02	9.1	3.12E+00

	J1425 ug/g	dup ug/g	trip ug/g	2RSD (%)	DL ug/g
Ag	< DL	< DL	< DL	NA	6.55E+00
Al	1.37E+04	1.35E+04	1.32E+04	3.6	4.15E+01
B	< DL	< DL	< DL	NA	1.31E+01
Ba	1.82E+02	1.80E+02	1.74E+02	4.9	6.55E+00
Be	8.76E+00	9.63E+00	7.63E+00	23.1	3.28E+00
Ca	1.23E+04	1.22E+04	1.18E+04	4.3	2.07E+01
Cd	1.29E+02	1.26E+02	1.18E+02	9.1	8.74E+00
Cr	1.55E+02	1.55E+02	1.43E+02	9.2	1.20E+01
Cu	8.03E+02	7.95E+02	7.73E+02	3.8	5.46E+00
Fe	3.09E+04	3.07E+04	2.93E+04	5.7	2.29E+01
Mg	1.88E+03	1.85E+03	1.77E+03	5.8	5.46E+00
Mn	7.08E+02	7.02E+02	6.74E+02	5.2	3.28E+00
Na	7.31E+02	7.16E+02	7.06E+02	3.4	3.06E+01
Pb*	1.68E+02	1.64E+02	1.12E+02	42.7	6.99E+01
Si	1.13E+03	1.11E+03	1.07E+03	5.3	3.17E+01
Sm	< DL	< DL	< DL	NA	7.43E+01
Tl	< DL	< DL	< DL	NA	1.76E+02
Zn	3.70E+02	3.56E+02	3.63E+02	3.8	3.28E+00

	J1426 ug/g	dup ug/g	trip ug/g	2RSD (%)	DL ug/g
Ag	< DL	< DL	< DL	NA	6.64E+00
Al	9.47E+03	9.30E+03	9.31E+03	2.0	4.20E+01
B	1.67E+01	< DL	< DL	NA	1.33E+01
Ba	1.29E+02	1.27E+02	1.27E+02	2.1	6.64E+00
Be	6.73E+00	7.11E+00	6.98E+00	5.6	3.32E+00
Ca	7.67E+03	7.58E+03	7.57E+03	1.4	2.10E+01
Cd	9.13E+01	8.54E+01	8.86E+01	6.7	8.85E+00
Cr	8.85E+01	8.80E+01	8.40E+01	5.7	1.22E+01
Cu	5.88E+02	5.81E+02	5.78E+02	1.7	5.53E+00
Fe	2.39E+04	2.36E+04	2.36E+04	1.5	2.32E+01
Mg	1.17E+03	1.15E+03	1.15E+03	1.8	5.53E+00
Mn	5.55E+02	5.47E+02	5.46E+02	1.7	3.32E+00
Na	5.90E+02	5.84E+02	5.87E+02	1.0	3.10E+01
Pb*	1.28E+02	9.91E+01	9.74E+01	31.6	7.08E+01
Si	1.08E+03	1.07E+03	1.07E+03	1.6	3.21E+01
Sm	< DL	< DL	7.88E+01	NA	7.52E+01
Tl	< DL	< DL	< DL	NA	1.78E+02
Zn	2.75E+02	2.69E+02	2.49E+02	10.4	3.32E+00

	J1427 ug/g	dup ug/g	trip ug/g	2RSD (%)	DL ug/g
Ag	< DL	< DL	< DL	NA	6.57E+00
Al	1.83E+04	1.79E+04	1.77E+04	3.6	4.16E+01
B	< DL	< DL	< DL	NA	1.31E+01
Ba	2.76E+02	2.69E+02	2.63E+02	4.9	6.57E+00
Be	1.50E+01	1.39E+01	1.39E+01	8.1	3.29E+00
Ca	1.28E+04	1.25E+04	1.21E+04	5.2	2.08E+01
Cd	1.83E+02	1.82E+02	1.71E+02	7.7	8.76E+00
Cr	9.89E+02	9.56E+02	9.27E+02	6.6	1.20E+01
Cu	8.02E+02	7.87E+02	7.71E+02	4.0	5.48E+00
Fe	4.25E+04	4.14E+04	4.00E+04	6.1	2.30E+01
Mg	1.31E+03	1.27E+03	1.23E+03	6.2	5.48E+00
Mn	9.94E+02	9.65E+02	9.35E+02	6.0	3.29E+00
Na	9.39E+02	9.15E+02	8.92E+02	5.2	3.07E+01
Pb*	2.21E+02	2.04E+02	1.45E+02	41.7	7.01E+01
Si	9.13E+02	8.94E+02	8.73E+02	4.4	3.18E+01
Sm*	1.15E+02	8.39E+01	7.73E+01	44.3	7.45E+01
Tl	< DL	< DL	< DL	NA	1.76E+02
Zn	5.29E+02	5.21E+02	5.04E+02	4.9	3.29E+00

	J1428 ug/g	dup ug/g	trip ug/g	2RSD (%)	DL ug/g
Ag	< DL	< DL	< DL	NA	6.49E+00
Al	6.69E+03	6.74E+03	6.85E+03	2.4	4.11E+01
B	< DL	< DL	< DL	NA	1.30E+01
Ba	8.43E+01	8.61E+01	8.74E+01	3.6	6.49E+00
Be	4.96E+00	5.33E+00	4.59E+00	15.0	3.24E+00
Ca	4.30E+03	4.31E+03	4.42E+03	3.0	2.05E+01
Cd	4.13E+01	4.50E+01	4.61E+01	11.2	8.65E+00
Cr	4.68E+01	4.11E+01	4.43E+01	13.0	1.19E+01
Cu	1.59E+02	1.60E+02	1.64E+02	3.4	5.41E+00
Fe	1.13E+04	1.13E+04	1.17E+04	3.8	2.27E+01
Mg	4.60E+02	4.63E+02	4.75E+02	3.4	5.41E+00
Mn	2.42E+02	2.41E+02	2.49E+02	3.6	3.24E+00
Na	3.66E+02	3.63E+02	4.06E+02	12.7	3.03E+01
Pb*	8.27E+01	8.23E+01	1.14E+02	39.6	6.92E+01
Si	9.75E+02	9.82E+02	1.01E+03	3.4	3.13E+01
Sm	< DL	< DL	< DL	NA	7.35E+01
Tl	< DL	< DL	< DL	NA	1.74E+02
Zn*	1.43E+02	1.49E+02	1.84E+02	27.8	3.24E+00

* Failed precision criteria.

	J1445 ug/g	dup ug/g	trip ug/g	2RSD (%)	DL ug/g
Ag	< DL	< DL	< DL	NA	1.06E+01
Al	6.32E+04	6.46E+04	6.49E+04	2.9	6.74E+01
B	< DL	< DL	< DL	NA	2.13E+01
Ba	1.80E+02	1.84E+02	1.87E+02	3.7	1.06E+01
Be	2.90E+01	3.05E+01	3.14E+01	8.0	5.32E+00
Ca	3.21E+03	3.31E+03	3.40E+03	5.6	3.37E+01
Cd	1.18E+02	1.18E+02	1.23E+02	4.8	1.42E+01
Cr	5.40E+02	5.43E+02	5.50E+02	1.9	1.95E+01
Cu	1.41E+03	1.44E+03	1.45E+03	3.0	8.87E+00
Fe	1.14E+05	1.19E+05	1.20E+05	6.3	3.73E+01
Mg	1.13E+03	1.18E+03	1.19E+03	5.8	8.87E+00
Mn	7.08E+02	7.45E+02	7.49E+02	6.1	5.32E+00
Na	8.09E+02	8.28E+02	8.45E+02	4.4	4.97E+01
Pb	1.09E+03	1.06E+03	1.10E+03	4.1	1.14E+02
Si	1.42E+03	1.47E+03	1.47E+03	4.1	5.14E+01
Sm	2.93E+02	3.63E+02	3.46E+02	21.7	1.21E+02
Tl*	4.38E+02	5.23E+02	5.95E+02	30.2	2.86E+02
Zn	1.11E+03	1.18E+03	1.18E+03	6.9	5.32E+00

	J1446 ug/g	dup ug/g	trip ug/g	2RSD (%)	DL ug/g
Ag	< DL	< DL	< DL	NA	6.56E+00
Al	9.45E+03	9.31E+03	9.53E+03	2.4	4.15E+01
B	< DL	< DL	< DL	NA	1.31E+01
Ba	9.31E+01	9.16E+01	9.05E+01	2.8	6.56E+00
Be	8.12E+00	7.21E+00	7.89E+00	12.3	3.28E+00
Ca	7.31E+03	7.10E+03	7.03E+03	4.1	2.08E+01
Cd	7.12E+01	6.67E+01	6.43E+01	10.4	8.74E+00
Cr	7.90E+01	8.08E+01	7.79E+01	3.6	1.20E+01
Cu	1.44E+02	1.40E+02	1.38E+02	4.4	5.47E+00
Fe	2.86E+04	2.76E+04	2.73E+04	4.8	2.30E+01
Mg	7.46E+02	7.25E+02	7.21E+02	3.7	5.47E+00
Mn	4.49E+02	4.33E+02	4.30E+02	4.7	3.28E+00
Na*	3.67E+02	3.69E+02	2.88E+03	240.5	3.06E+01
Pb	1.27E+02	1.18E+02	9.71E+01	27.1	7.00E+01
Si	1.00E+03	9.78E+02	9.81E+02	2.5	3.17E+01
Sm	< DL	< DL	< DL	NA	7.43E+01
Tl	< DL	< DL	< DL	NA	1.76E+02
Zn	3.14E+02	3.04E+02	3.09E+02	3.2	3.28E+00

* Failed precision criteria.

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UNDIGESTED SAMPLE ANALYSES

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10A 37

WESTINGHOUSE HANFORD COMPANY

WHC-SD-WM-DP-062, REV. 0

222-S LABORATORY

ANALYTICAL BATCH # 2410

Lab Segment Serial No. J1424, J1425	Customer ID: KE 60SD, KE 60SA
Analysis: AT	Sample Prep: Direct Liquid

Instrument: WA45709	Procedure/ Rev: LA-548-101/Rev 0-E
Technologist: Cynthia Johnson C R Johnson	Date: 12 / 20 / 93
Starting Time: 1200	Temperature N/A
Ending Time: 1600	Chemist: S. Fitzgerald

Comments: _____

	Description	Lab ID
1	INITIAL LMCS CHECK STD	J1401-SS25
2	REAGENT BLANK	J1402-S625
3	Sample	J1424-S125
4	Sample dup	J1424-S125
5	Sample trip	J1424-S125
6	Sample	J1425-S125
7	Sample dup	J1425-S125
8	Sample trip	J1425-S125
9		
10		

	Description	Lab ID
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS check std	119351/10ml			

A-6000-081 (03/93)

CA

ANALYTICAL BATCH SUMMARY SHEET

WHC-SD-WM-DP-062, REV. 0

METHOD: LA-508-101

DATE START: DECEMBER 20, 1993

PREPARED BY: S.L. FITZGERALD

DATE COMPLETE: DECEMBER 27, 1993

	UNITS:	uCi/mL										
SPL NAME	SPL ID	ANALYTE	RESULT #1	RESULT #2	RESULT #3	AVERAGE	2*SD	PREC	ACCU	%REC	DET LIM	% CT ER
STD 119B51	J1401	ALPHA	8.24E-03							97.5	2.48E-07	2.9
BLANK	J1402	ALPHA	<1.12E-05								2.48E-05	332
KE65D	J1424	ALPHA	1.40E-02	1.18E-02	1.24E-02	1.27E-02	2.27E-03	17.86			2.48E-05	0.7
											2.48E-05	0.7
											2.48E-05	0.7
KE64A	J1425	ALPHA	4.25E-02	4.36E-02	4.68E-02	4.43E-02	4.47E-03	10.09			2.48E-05	0.4
											2.48E-05	0.4
											2.48E-05	0.4

NARRATIVE: [ ] NO SPECIAL PROBLEMS/METHOD VARIATIONS IN THIS BATCH

LIST SPECIFIC PROBLEMS/VARIATIONS FOR THIS BATCH:

Standard results are reported as uCi/L

For the triplicate run of sample J1424 the replicate value was not reported
because the count value was very low with respect to the other values obtained for this sample.
This indicates there was an unknown problem with the replicate mount.
Because the other five mounts for this sample gave consisted results no action is requested for the replicate mount.

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

1-2 Batch 2410

Serial No	Sample Point	Date	Time Issued	Priority
J 1401.-5525	BECHTOLD	12-15-93	9: 0	22

Determination	Method/Standard	Result Units	Charge Code	Reruns
AT	LA-508-101	% RECOVERY	E14157	0

Sample Size	Customer ID
? 10 ml	STD

Remarks Calculations Results

S510 EV-CRB

119851 8.24E-3

8.45E-3 97.53

WHC-SD-WM-DP-062, REV. 0

C Johnson

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	Em Barela			
Hrs	Hrs	Hrs	Hrs	Hrs
			E.C.J.	
Date	Time Completed	Lab Unit Mgr		
12/20/93	1600		E. C. J.	

54 6800-061 (R-10-83)

AT: LA-508-101 (D-0) LIQUIDS

			STANDARD	REPLICATE
Serial No.	DETECTOR NUMBER		13	13
J1401-5525	DISH SIZE 1, 2, or 5	(MS)	2	2
Batch ID	TOTAL COUNTS	(TC)	1278	1312
2410	COUNT TIME in MINUTES	(CT)	30	30
AT or TE ?	BACKGROUND in cpm	(BKG)	0.7	0.7
AT	SAMPLE SIZE in mL	(SS)	10.000	10.000
Rerun No.	DILUTION FACTOR	(DF)	1	1
0	DIGEST DILUTION FACTOR	(DDF)	1	1
Analyst	EFFICIENCY FACTOR	(EFF)	0.2322	0.2322
C JOHNSON	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE		41.900	43.033
Date	SAMPLE CONCENTRATION in µCi/L		8.13E-03	8.35E-03
12/20/93	AVG. µCi/L in SAMPLE and REPLICATE =			8.2382E-03

Rs (Sample Count Rate) = (TC / CT) - BKG

ALPHA TOTAL µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

ALPHA TOTAL µCi/mL = ALPHA TOTAL µCi/L / 1000mL/L

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

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

		DETECTION LEVEL
ALPHA TOTAL in µCi/L (AVERAGE) =	8.24E-03	
ALPHA TOTAL in µCi/mL (AVERAGE) =	8.24E-06	
		2.48E-07 µCi/mL
RELATIVE COUNTING ERROR =	2.9%	

Data Entry by:	R Gibbs	Date:	22-Dec-93
Approved by:	C Johnson	Date:	27-Dec-93

Form 1 Rev. 1.1

WHC-SD-WM-DP-062, REV. 0

13/2

J1401-5525

Alpha Calculation (CRPC_CAL 2.0)
By: EM BARELA, on 12-21-1993 at 08:22:16
Det ~~#3~~ 7 2 -inch mount Alpha eff. : .2322
Sample size : 10 mL Dilution : 1

1278/30

Sample # J1401 Mount # 1

1312/30

$$\frac{1278}{30} - 0.7 = 8.1283E\text{-}03 \text{ uCi/L alpha}$$

Sample # J1401 Mount # 2

$$\frac{1312}{30} - 0.7 = 8.5481E\text{-}03 \text{ uCi/L alpha}$$

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

3-4

WHC-SD-WM-DP-062, REV. 0

Serial No	Sample Point	Date	Time Issued	Priority
J 1402.-5625	BECHTOLD	12-15-93	9: 4	22

Determination	Method/Standard	Result Units	Charge Code	Reruns
AT	LA-508-101	uCi/ML	E14157	0

Sample Size	Customer ID
?.100 ml	BLK

Remarks Calculations Results

COUNT AS uCI/L
USE 13.14.15 OR 16

$< 1.12 \times 10^{-5}$ uCi/ml

C dol

Analyst 1	Analyst 2	Analyst 3	Analyst 4	Analyst 5
	Em Barela			
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Laboratory Mgr
12/20/93	11600	E. C

54-6800-061 R 10-83

AT: LA-508-101 (D-0) LIQUIDS

Serial No.		BLANK	REPLICATE
	DETECTOR NUMBER	13	13
J1402-5625	DISH SIZE 1, 2, or 5 (MS)	2	2
Batch ID	TOTAL COUNTS (TC)	23	16
2410	COUNT TIME in MINUTES (CT)	30	30
AT or TB ?	BACKGROUND in cpm (BKG)	0.7	0.7
AT	SAMPLE SIZE in mL (SS)	0.100	0.100
Rerun No.	DILUTION FACTOR (DF)	1	1
0	DIGEST DILUTION FACTOR (DDF)	1	1
Analyst	EFFICIENCY FACTOR (EFF)	0.2322	0.2322
C JOHNSON	Lc, Rmax, or Rs (SAMPLE RATE) as APPROPRIATE	0.577	0.504
Date	SAMPLE CONCENTRATION in µCi/L	1.12E-02	9.78E-03
12/20/93	AVG. µCi/L in SAMPLE and REPLICATE =	<	1.0483E-02

Rs (Sample Count Rate) = (TC / CT) - BKG

ALPHA TOTAL µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

ALPHA TOTAL µCi/mL = ALPHA TOTAL µCi/L / 1000mL/L

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

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

		DETECTION LEVEL
ALPHA TOTAL in µCi/L (AVERAGE) =	< 1.12E-02	
ALPHA TOTAL in µCi/mL (AVERAGE) =	< 1.12E-05	
LESS THAN Value was Determined from Rmax.		2.48E-05 µCi/mL
RELATIVE COUNTING ERROR =	331.7%	

Data Entry by:		Date:	22-Dec-93
Approved by:		Date:	27-Dec-93

Form 1 Rev. 1.1

TOTAL ALPHA ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-062, REV. 0

13/2

J1402-5625

23/30

Alpha Calculation (CRPC_CAL 2.0)
By: EM BARELA, on 12-21-1993 at 08:23:35
Det #13 2 -inch mount Alpha eff. : .2322
Sample size : 1 mL Dilution : 10

Sample # J1402 Mount # 1

16/30

23
---------- - 0.7 < 8.3707E-03 uCi/L alpha
30

Sample # J1402 Mount # 2

16
---------- - 0.7 < 6.9045E-03 uCi/L alpha
30

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

5-6

WHC-SD-WM-DP-062, REV. 0

Serial No	Sample Point	Date	Time Issued	Priority
J 1424.-5725	BECHTOLD	12-16-93	13: 7	22

Determination	Method Standard	Result Units	Charge Code	Reruns
AT	LA-508-101	uCi/ML	E14157	0

Sample Size	Customer ID
? .100 ml	KE65D

Remarks, Calculations, Results

COUNT AS uCI/L
USE 13.14.15 OR 16

1.40 x 10^{-2} uCi/ml

Analyst 1	Analyst 2	Analyst 3	Analyst 4	Analyst 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
12/20/93	1600	

54-SPDC-061 (R 10-83)

AT: LA-508-101 (D-0) LIQUIDS

Serial No.			SAMPLE	REPLICATE
	DETECTOR NUMBER		13	13
J1424-5725	DISH SIZE 1, 2, or 5	(MS)	2	2
Batch ID	TOTAL COUNTS	(TC)	22288	21177
2410	COUNT TIME in MINUTES	(CT)	30	30
AT or TB ?	BACKGROUND in cpm	(BKG)	0.7	0.7
AT	SAMPLE SIZE in mL	(SS)	0.100	0.100
Rerun No.	DILUTION FACTOR	(DF)	1	1
0	DIGEST DILUTION FACTOR	(DDF)	1	1
Analyst	EFFICIENCY FACTOR	(EFF)	0.2322	0.2322
C JOHNSON	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE		742.233	705.200
Date	SAMPLE CONCENTRATION in µCi/L		1.44E+01	1.37E+01
12/20/93	AVG. µCi/L in SAMPLE and REPLICATE =			1.4040E+01

Rs (Sample Count Rate) = (TC / CT) - BKG

ALPHA TOTAL µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

ALPHA TOTAL µCi/mL = ALPHA TOTAL µCi/L / 1000mL/L

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

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

		DETECTION LEVEL
ALPHA TOTAL in µCi/L (AVERAGE) =	1.40E+01	
ALPHA TOTAL in µCi/mL (AVERAGE) =	1.40E-02	2.48E-05 µCi/mL
RELATIVE COUNTING ERROR =	0.7%	

Data Entry by:		Date:	22-Dec-93
Approved by:		Date:	27-Dec-93

Form 1 Rev. 1.1

WHC-SD-WM-DP-062, REV. 0

13/2 J1424-5725

Alpha Calculation (CRPC_CAL 2.0)
By: EM BARILA, on 12-21-1993 at 08:24:00
22288 Det #13 2 -inch mount Alpha eff. : .2322
Sample size : 1 mL Dilution : 10

Sample # J1424 Mount # 1

22288
21177 ---------- - 0.7 = 1.4399E+01 uCi/L alpha
30

Sample # J1424 Mount # 2

21177
---------- - 0.7 = 1.3680E+01 uCi/L alpha
30

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

7-8

WHC-SD-WM-DP-062, REV. 0

Serial No	Sample Point	Date	Time Issued	Priority
J 1424.-5725	BECHTOLD	12-16-93	13: 7	22

Determination	Method Standard	Result Units	Charge Code	Reruns
AT	LA-508-101	uCi/ML	E14157	0

Sample Size	Customer ID
? .100 ml	KE65D

Remarks, Calculations, Results

COUNT AS uCI/L
USE 13,14,15 OR 16

DUP

1.18×10^{-2} uCi/ml

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	Em Baeler			
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
12/20/93	1600	[signature]	E.C.

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

AT: LA-508-101 (D-0) LIQUIDS

			SAMPLE	REPLICATE
Serial No.	DETECTOR NUMBER		13	13
J1424-5725	DISH SIZE 1, 2, or 5	(MS)	2	2
Batch ID	TOTAL COUNTS	(TC)	18796	17880
2410	COUNT TIME in MINUTES	(CT)	30	30
AT or TB ?	BACKGROUND in cpm	(BKG)	0.7	0.7
AT	SAMPLE SIZE in mL	(SS)	0.100	0.100
Rerun No.	DILUTION FACTOR	(DF)	1	1
0	DIGEST DILUTION FACTOR	(DDF)	1	1
Analyst	EFFICIENCY FACTOR	(EFF)	0.2322	0.2322
C JOHNSON	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE		625.833	595.300
Date	SAMPLE CONCENTRATION in µCi/L		1.21E+01	1.15E+01
12/20/93	AVG. µCi/L in SAMPLE and REPLICATE =			1.1845E+01

Rs (Sample Count Rate) = (TC / CT) - BKG
ALPHA TOTAL µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)
ALPHA TOTAL µCi/mL = ALPHA TOTAL µCi/L / 1000mL/L
Relative Counting Error = (The Square Root of TC + BKG * CT) / (TC - BKG * CT)
Detection Levels and Less Than Values are determined from Procedure LA-508-002.

ALPHA TOTAL in µCi/L (AVERAGE) =	1.18E+01	DETECTION LEVEL 2.48E-05 µCi/mL
ALPHA TOTAL in µCi/mL (AVERAGE) =	1.18E-02	
RELATIVE COUNTING ERROR =	0.7%	

Data Entry by:	[signature]	Date:	22-Dec-93
Approved by:	[signature]	Date:	27-Dec-93

Form 1 Rev. 1.1

WHC-SD-WM-DP-062, REV. 0

13/2

J1424-5725

18796

17880

Alpha Calculation (CRPC_CAL 2.0)
By: KM BARELA, , on 12-21-1993 at 08:24:28
Det #13 2-inch mount Alpha eff. : .2322
Sample size : 1 mL Dilution : 10

Sample # J1424 Mount # 1

$$\frac{18796}{30} - 0.7 = 1.2141E+01 \text{ uCi/L alpha}$$

Sample # J1424 Mount # 2

$$\frac{17880}{30} - 0.7 = 1.1548E+01 \text{ uCi/L alpha}$$

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

9-10

WHC-SD-WM-DP-062, REV. 0

Serial No	Sample Point	Date	Time Issued	Priority
J 1424.-5725	BECHTOLD	12-16-93	13: 7	22

Determination	Method/Standard	Result Units	Charge Code	Reruns
AT	LA-508-101	uCi/ML	E14157	0

Sample Size	Customer ID
?, 100 ml	KE65D

Remarks, Calculations, Results

COUNT AS uCI/L
USE 13,14,15 OR 16

TRIP

1.24×10^{-2} uCi/ml

Analyst 1	Analyst 2	Analyst 3	Analyst 4	Analyst 5
	Eva Lucas			
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Anl Mgr	
12/20/93	1602		E.C.

54-6800-061 R-10-831

AT: LA-508-101 (D-0) LIQUIDS

			SAMPLE	REPLICATE
Serial No.	DETECTOR NUMBER		13	0
J1424-5725	DISH SIZE 1, 2, or 5	(MS)	2	0
Batch ID	TOTAL COUNTS	(TC)	19167	0
2410	COUNT TIME in MINUTES	(CT)	30	0
AT or TR ?	BACKGROUND in cpm	(BKG)	0.7	0
AT	SAMPLE SIZE in mL	(SS)	0.100	0.000
Rerun No.	DILUTION FACTOR	(DF)	1	0
0	DIGEST DILUTION FACTOR	(DDF)	1	0
Analyst	EFFICIENCY FACTOR	(EFF)	0.2322	N/A
C JOHNSON	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE		638.200	N/A
Date	SAMPLE CONCENTRATION in µCi/L		1.24E+01	N/A
12/20/93	µCi/L in SAMPLE =			1.2381E+01

Rs (Sample Count Rate) = (TC / CT) - BKG

ALPHA TOTAL µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

ALPHA TOTAL µCi/mL = ALPHA TOTAL µCi/L / 1000mL/L

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

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

ALPHA TOTAL	in µCi/L	=	1.24E+01
ALPHA TOTAL	in µCi/mL	=	1.24E-02
RELATIVE COUNTING ERROR		=	0.7%

DETECTION LEVEL

2.48E-05 µCi/mL

Data Entry by:		Date: 22-Dec-93
Approved by:		Date: 27-Dec-93

Form 1 Rev. 1.1

13/2

WHC-SD-WM-DP-062, REV. 0

J1424-5725

981

Alpha Calculation (CRPC_CAL 2.0)
By: EM BERELA, . on 12-21-1993 at 08:24:55
Det #13 2 -inch mount Alpha eff. : .2322
Sample ~~size~~ : 7 mL Dilution : 10

Sample # J1424 Mount # 1

$$\frac{981}{30} - 0.7 = 6.2678E-01 \text{ uCi/L alpha}$$

19167

Sample # J1424 Mount # 2

$$\frac{19167}{30} - 0.7 = 1.2381E+01 \text{ uCi/L alpha}$$

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

1-2

WHC-SD-WM-DP-062, REV. 0

Serial No	Sample Point	Date	Time Issued	Priority
J 1425.-5725	BECHTOLD	12-16-93	13:17	22

Determination	Method Standard	Result Units	Charge Code	Reruns
AT	LA-508-101	uCi/ML	E14157	0

Sample Size	Customer ID
?.100ml	KE64A

Remarks, Calculations, Results

COUNT AS uCI/L
USE 13,14,15 OR 16

Sam

4.25×10^{-2} uCi/ml

Analyst 1	Analyst 2	Analyst 3	Analyst 4	Analyst 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
12/20/93	1600	EC J

54-6800-061 R 10 83)

AT: LA-508-101 (D-0) LIQUIDS

Serial No.			SAMPLE	REPLICATE
	DETECTOR NUMBER		13	13
J1425-5725	DISH SIZE 1, 2, or 5	(MS)	2	2
Batch ID	TOTAL COUNTS	(TC)	61177	70416
2410	COUNT TIME in MINUTES	(CT)	30	30
AT or TB ?	BACKGROUND in cpm	(BKG)	0.7	0.7
AT	SAMPLE SIZE in mL	(SS)	0.100	0.100
Rerun No.	DILUTION FACTOR	(DF)	1	1
0	DIGEST DILUTION FACTOR	(DDF)	1	1
Analyst	EFFICIENCY FACTOR	(EFF)	0.2322	0.2322
C JOHNSON	Lc, Rmax, or Rs (SAMPLE RATE) as APPROPRIATE		2038.533	2346.500
Date	SAMPLE CONCENTRATION in µCi/L		3.95E+01	4.55E+01
12/20/93	AVG. µCi/L in SAMPLE and REPLICATE =			4.2533E+01

Rs (Sample Count Rate) = (TC / CT) - BKG
ALPHA TOTAL µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)
ALPHA TOTAL µCi/mL = ALPHA TOTAL µCi/L / 1000mL/L
Relative Counting Error = (The Square Root of TC + BKG * CT) / (TC - BKG * CT)
Detection Levels and Less Than Values are determined from Procedure LA-508-002.

			DETECTION LEVEL
ALPHA TOTAL	in µCi/L (AVERAGE) =	4.25E+01	
ALPHA TOTAL	in µCi/mL (AVERAGE) =	4.25E-02	2.48E-05 µCi/mL
RELATIVE COUNTING ERROR	=	0.4%	

Data Entry by:		Date:	22-Dec-93
Approved by:		Date:	27-Dec-93

Form 1 Rev. 1.1

13/2

WHC-SD-WM-DP-062, REV. 0

J1425-5725

Alpha Calculation (CRPC_C&L 2.0)
By: BM BARELA, , on 12-21-1993 at 08:23:08
Det #13 - 2-inch mount Alpha eff. : .2322
Sample size : 1 mL Dilution : 10

61177
30

Sample # J1425 Mount # 1

$$\frac{61177}{30} - 0.7 = 3.9546E+01 \text{ uCi/L alpha}$$

70416
30

Sample # J1425 Mount # 2

$$\frac{70416}{30} - 0.7 = 4.5523E+01 \text{ uCi/L alpha}$$

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

1-2

WHC-SD-WM-DP-062, REV. 0

Serial No	Sample Point	Date	Time Issued	Priority
J 1425.-5725	BECHTOLD	12-16-93	13:17	22

Determination	Method Standard	Result Units	Charge Code	Reruns
AT	LA-508-101	uCi/ML	E14157	0

Sample Size	Customer ID
?, 100 ml	KE64A

Remarks, Calculations, Results

COUNT AS uCi/L
USE 13,14,15 OR 16

DUP

4.36 x 10^2 uCi/ml

Analyst 1	Analyst 2	Analyst 3	Analyst 4	Analyst 5
	Em Bacon			
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Supervisor/Mgr
12/20/93	1600	

54-6800-061 R-10-831

AT: LA-508-101 (D-0) LIQUIDS

Serial No.	DETECTOR NUMBER		SAMPLE	REPLICATE
J1425-5725	DISH SIZE 1, 2, or 5	(MS)	2	2
Batch ID	TOTAL COUNTS	(TC)	67374	67495
2410	COUNT TIME in MINUTES	(CT)	30	30
AT or TB ?	BACKGROUND in cpm	(BKG)	0.7	0.7
AT	SAMPLE SIZE in mL	(SS)	0.100	0.100
Rerun No.	DILUTION FACTOR	(DF)	1	1
0	DIGEST DILUTION FACTOR	(DDF)	1	1
Analyst	EFFICIENCY FACTOR	(EFF)	0.2322	0.2322
C JOHNSON	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE		2245.100	2249.133
Date	SAMPLE CONCENTRATION in µCi/L		4.36E+01	4.36E+01
12/20/93	AVG. µCi/L in SAMPLE and REPLICATE =			4.3592E+01

Rs (Sample Count Rate) = (TC / CT) - BKG
ALPHA TOTAL µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)
ALPHA TOTAL µCi/mL = ALPHA TOTAL µCi/L / 1000mL/L
Relative Counting Error = (The Square Root of TC + BKG * CT) / (TC - BKG * CT)
Detection Levels and Less Than Values are determined from Procedure LA-508-002.

			DETECTION LEVEL
ALPHA TOTAL	in µCi/L (AVERAGE) =	4.36E+01	
ALPHA TOTAL	in µCi/mL (AVERAGE) =	4.36E-02	2.48E-05 µCi/mL
RELATIVE COUNTING ERROR	=	0.4%	

Data Entry by:		Date:	22-Dec-93
Approved by:		Date:	27-Dec-93

Form 1 Rev. 1.1

13/2

J1425-5725

67374
30

Alpha Calculation (CRPC_CAL 2.0)
By: EM BARELA, on 12-21-1993 at 10:22:40
Det. # 2 -inch mount Alpha eff. : .2322
Sample size : 1 mL Dilution : 10

Sample # J1425 Mount # 1

67495
30

67374
---------- - 0.7 = 4.3553E+01 uCi/L alpha
30

Sample # J1425 Mount # 2

67495
---------- - 0.7 = 4.2631E+01 uCi/L alpha
30

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

1 3-4

WHC-SD-WM-DP-062, REV. 0

Serial No	Sample Point	Date	Time Issued	Priority
J 1425.-5725	BECHTOLD	12-16-93	13:17	22

Determination	Method Standard	Result Units	Charge Code	Reruns
AT	LA-508-101	uCi/ML	E14157	0

Sample Size	Customer ID
? .100 ml	KE64A

Remarks, Calculations, Results

COUNT AS uCI/L
USE 13,14,15 OR 16

TRIP

4.68 x 10^{-2} uCi/ml

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
12/20/93	1600		

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

AT: LA-508-101 (D-0) LIQUIDS

Serial No.			SAMPLE	REPLICATE
J1425-5725	DETECTOR NUMBER		13	13
Batch ID	DISH SIZE 1, 2, or 5	(MS)	2	2
2410	TOTAL COUNTS	(TC)	77268	67620
AT or TB ?	COUNT TIME in MINUTES	(CT)	30	30
AT	BACKGROUND in cpm	(BKG)	0.7	0.7
Rerun No.	SAMPLE SIZE in mL	(SS)	0.100	0.100
0	DILUTION FACTOR	(DF)	1	1
Analyst	DIGEST DILUTION FACTOR	(DDF)	1	1
C JOHNSON	EFFICIENCY FACTOR	(EFF)	0.2322	0.2322
Date	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE		2574.900	2253.300
12/20/93	SAMPLE CONCENTRATION in µCi/L		5.00E+01	4.37E+01
	AVG. µCi/L in SAMPLE and REPLICATE =			4.6832E+01

Rs (Sample Count Rate) = (TC / CT) - BKG

ALPHA TOTAL µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

ALPHA TOTAL µCi/mL = ALPHA TOTAL µCi/L / 1000mL/L

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

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

ALPHA TOTAL	in µCi/L (AVERAGE) =	4.68E+01	DETECTION LEVEL 2.48E-05 µCi/mL
ALPHA TOTAL	in µCi/mL (AVERAGE) =	4.68E-02	
RELATIVE COUNTING ERROR	=	0.4%	

Data Entry by:		Date:	22-Dec-93
Approved by:		Date:	27-Dec-93

Form 1 Rev. 1.1

13/2

J1425 - 5725

Alpha Calculation (CRPC_CAL 2.0)
By: EM BARELA, on 12-21-1993 at 10:22:12
Det #13 2 -inch count Alpha eff. : .2322
Sample size : 1 mL Dilution : 10

77268/30

Sample # J1425 Mount # 1

77268/30 - 0.7 = 4.995?E+01 uCi/L alpha

67620/30

Sample # J1425 Mount # 2

67620/30 - 0.7 = 4.3712E+01 uCi/L alpha

WESTINGHOUSE HANFORD COMPANY

WHC-SD-WM-DP-062, REV. 0

222-S LABORATORY

ANALYTICAL BATCH #2411

Lab Segment Serial No. J1426, J1427, J1428	Customer ID: KE65A, KE71A, KE72A
Analysis: AT	Sample Prep: Direct Liquid

Instrument: WA63999	Procedure/ Rev: LA 508-101 / Rev D
Technologist: Cynthia Johnson C.R. Johnson	Date: 12 / 20 / 90
Starting Time: 1200	Temperature N/A
Ending Time: 1600	Chemist: S. Fitzgerald

Comments:

	Description	Lab ID
1	INITIAL LMCS CHECK STD	J1415-5525 ~~J1416~~ 12-20-90
2	REAGENT BLANK	J1416-5625
3	sample	J1426-5725
4	sample dup	J1426-5725
5	sample trip	J1426-5725
6	sample	J1427-5725
7	sample dup	J1427-5725
8	sample trip	J1427-5725
9	sample	J1428-5725
10	sample dup	J1428-5725

	Description	Lab ID
11	sample trip	J1428-5725
12		
13		
14		
15		
16		
17		
18		
19		
20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS check std	119B51 / 10ml			

A-6000-801 (03/92)

01

ANALYTICAL BATCH SUMMARY SHEET

METHOD: LA-508-101

DATE START: DECEMBER 20, 1993

PREPARED BY: S.L. FITZGERALD

DATE COMPLETE: DECEMBER 27, 1993

	UNITS:	uCi/mL										
SPL NAME	SPL ID	ANALYTE	RESULT #1	RESULT #2	RESULT #3	AVERAGE	2*SD	PREC	ACCU	%REC	DET LIM	% CT ER
STD 119B51	J1415	ALPHA	8.40E-03							99.4	1.23E-07	2.8
BLANK	J1416	ALPHA	<7.42E-06								1.23E-05	100
KE65A	J1426	ALPHA	3.32E-02	2.74E-02	2.98E-02	3.01E-02	5.83E-03	19.34			1.23E-05	0.4
											1.23E-05	0.5
											1.23E-05	0.5
KE71A	J1427	ALPHA	9.43E-02	7.10E-02	8.68E-02	8.40E-02	2.38E-02	28.31			1.23E-05	0.3
											1.23E-05	0.3
											1.23E-05	0.3
KE72A	J1428	ALPHA	2.53E-02	2.31E-02	2.26E-02	2.37E-02	2.87E-03	12.14			1.23E-05	0.5
											1.23E-05	0.5
											1.23E-05	0.5

NARRATIVE: [ ] NO SPECIAL PROBLEMS/METHOD VARIATIONS IN THIS BATCH

LIST SPECIFIC PROBLEMS/VARIATIONS FOR THIS BATCH:

Standard results are reported as uCi/L

The prec. for sample J1427 exceeds control limits. Sample needs to be rerun in Triplicate. A blank also needs to be included in this rerun

SLF
2-11-94

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

1-2 Batch 2411

Serial No	Sample Point	Date	Time Issued	Priority
J 1415.-5525	BECHTOLD	12-15-93	11:23	22

Determination	Method-Standard	Result Units	Charge Code	Reruns
AT	LA-508-101	% RECOVERY	E14157	0

Sample Size	Customer ID
? 10 ml	STD

Remarks, Calculations, Results

S510 EV-CRB WHC-SD-WM-DP-062, REV. 0

STD# 119BS1 RESULT 8.40E-3

STD VAL 8.44E-3 %REC 99.42

C J

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	D H Milligan	Gm Bucca		
Hrs	Hrs	Hrs	Hrs	Hrs
			E C J	
Date	Time Completed	Lab Unit Mgr		
12/20/93	1600	A H Gil	E C J	

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

AT: LA-508-101 (D-0) LIQUIDS

Serial No.			STANDARD	REPLICATE
J1415-5525	DETECTOR NUMBER		16	16
Batch ID	DISH SIZE 1, 2, or 5	(MS)	2	2
2411	TOTAL COUNTS	(TC)	1298	1380
AT or TB ?	COUNT TIME in MINUTES	(CT)	30	30
AT	BACKGROUND in cpm	(BKG)	0.1	0.1
Rerun No.	SAMPLE SIZE in mL	(SS)	10.000	10.000
0	DILUTION FACTOR	(DF)	1	1
Analyst	DIGEST DILUTION FACTOR	(DDF)	1	1
C JOHNSON	EFFICIENCY FACTOR	(EFF)	0.2389	0.2389
	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE		43.167	45.900
Date	SAMPLE CONCENTRATION in µCi/L		8.14E-03	8.65E-03
12/20/93	AVG. µCi/L in SAMPLE and REPLICATE =			8.3968E-03

Rs (Sample Count Rate) = (TC / CT) - BKG

ALPHA TOTAL µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

ALPHA TOTAL µCi/mL = ALPHA TOTAL µCi/L / 1000mL/L

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

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

ALPHA TOTAL	in µCi/L (AVERAGE) =	8.40E-03	DETECTION LEVEL 1.23E-07 µCi/mL
ALPHA TOTAL	in µCi/mL (AVERAGE) =	8.40E-06	
RELATIVE COUNTING ERROR	=	2.8%	

Data Entry by:	P Rhoads-Fitz	Date:	21-Dec-93
Approved by:	A H Gil	Date:	27-Dec-93

Form 1 Rev. 1.1

16/2 12-20-93 PM

1298/30

J1415 - 5525

1380/30

Alpha Calculation (CRPC_CAL 2.0)
By: KM BARRILA, on 12-21-1993 at 08:30:53
Det #16 2 -inch mount Alpha eff. : .2389
Sample size : 10 mL Dilution : 1

Sample # J1415 Mount # 1

$$\frac{1298}{30} - 0.1 = 8.1392E\text{-}03 \text{ uCi/L alpha}$$

Sample # J1415 Mount # 2

$$\frac{1380}{30} - 0.1 = 8.6545E\text{-}03 \text{ uCi/L alpha}$$

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

3-4

Serial No	Sample Point	Date	Time Issued	Priority
J 1416-5625	METROLD	12-15-93	11:34	22

Determination	Method/Standard	Result Units	Charge Code	Reruns
AT	LA-508-101	uCi/ML	E14157	0

Sample Size	Customer ID
.100 ml	BLK

Remarks, Calculations, Results

COUNT AS uCi/L
USE 13,14,15 OR 16

WHC-SD-WM-DP-062, REV. 0

$< 7.42 \times 10^{-6}$ uCi/ml

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
12/20/93	1600	

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

AT: LA-508-101 (D-0) LIQUIDS

Serial No.			BLANK	REPLICATE
J1416-5625	DETECTOR NUMBER		16	16
	DISH SIZE 1, 2, or 5 .	(MS)	2	2
Batch ID	TOTAL COUNTS	(TC)	8	6
2411	COUNT TIME in MINUTES	(CT)	30	30
AT or TB ?	BACKGROUND in cpm	(BKG)	0.1	0.1
AT	SAMPLE SIZE in mL	(SS)	0.100	0.100
Rerun No.	DILUTION FACTOR	(DF)	1	1
0	DIGEST DILUTION FACTOR	(DDF)	1	1
Analyst	EFFICIENCY FACTOR	(EFF)	0.2389	0.2389
C JOHNSON	Lc, Rmax, or Rs (SAMPLE RATE) as APPROPRIATE		0.393	0.313
Date	SAMPLE CONCENTRATION in µCi/L		7.42E-03	5.90E-03
12/20/93	AVG. µCi/L in SAMPLE and REPLICATE =		<	6.6601E-03

Rs (Sample Count Rate) = (TC / CT) - BKG

ALPHA TOTAL µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

ALPHA TOTAL µCi/mL = ALPHA TOTAL µCi/L / 1000mL/L

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

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

ALPHA TOTAL in µCi/L (AVERAGE) =	< 7.42E-03	DETECTION LEVEL
ALPHA TOTAL in µCi/mL (AVERAGE) =	< 7.42E-06	
LESS THAN Value was Determined from Rmax.		1.23E-05 µCi/mL
RELATIVE COUNTING ERROR =	100.0%	

Data Entry by:	Date:	21-Dec-93
Approved by:	Date:	27-Dec-93

16/2 12-20-93 DM

J1416-5625

8/30 --.1

6/30

Alpha Calculation (CRPC_CAL 2.0)
By: EM BARELA, on 12-21-1993 at 08:41:07
Det #16 2 -inch mount Alpha eff. : .2389
Sample size : 1 mL Dilution : 10

Sample # J1416 Mount # 1

8
---------- - 0.1 = 3.1425E-03 uCi/L alpha
30

Sample # J1416 Mount # 2

6
---------- - 0.1 < 4.9966E-03 uCi/L alpha
30

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

5-6 WHC-SD-WM-DP-062, REV. 0

Serial No	Sample Point	Date	Time Issued	Priority
J 1426.-5725	BECHTOLD	12-16-93	13:18	22

Determination	Method Standard	Result Units	Charge Code	Reruns
AT	LA-508-101	~~CI/ML~~	E14157	0

Sample Size	Customer ID
?.100ml	KE65A

Remarks, Calculations, Results

COUNT AS uCI/L
USE 13,14,15 OR 16

SAM

3.32×10^{-2} ul/ml

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	D Hamilton	Em Bowles		
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
12/20/93	1600	

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

AT: LA-508-101 (D-0) LIQUIDS

Serial No.			SAMPLE	REPLICATE
J1426-5725	DETECTOR NUMBER		16	16
	DISH SIZE 1, 2, or 5	(MS)	2	2
Batch ID	TOTAL COUNTS	(TC)	52931	52745
2411	COUNT TIME in MINUTES	(CT)	30	30
AT or TB ?	BACKGROUND in cpm	(BKG)	0.1	0.1
AT	SAMPLE SIZE in mL	(SS)	0.100	0.100
Rerun No.	DILUTION FACTOR	(DF)	1	1
0	DIGEST DILUTION FACTOR	(DDF)	1	1
Analyst	EFFICIENCY FACTOR	(EFF)	0.2389	0.2389
C JOHNSON	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE		1764.267	1758.067
Date	SAMPLE CONCENTRATION in µCi/L		3.33E+01	3.31E+01
12/20/93	AVG. µCi/L in SAMPLE and REPLICATE =			3.3207E+01

Rs (Sample Count Rate) = (TC / CT) - BKG
ALPHA TOTAL µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)
ALPHA TOTAL µCi/mL = ALPHA TOTAL µCi/L / 1000mL/L
Relative Counting Error = (The Square Root of TC + BKG * CT) / (TC - BKG * CT)
Detection Levels and Less Than Values are determined from Procedure LA-508-002.

			DETECTION LEVEL
ALPHA TOTAL	in µCi/L (AVERAGE) =	3.32E+01	
ALPHA TOTAL	in µCi/mL (AVERAGE) =	3.32E-02	1.23E-05 µCi/mL
RELATIVE COUNTING ERROR	=	0.4%	

Data Entry by:		Date:	21-Dec-93
Approved by:		Date:	27-Dec-93

Form 1 Rev. 1.1

16/2 12-20-93 DM

J1426-5725

52931
30

52745
30

Alpha Calculation (CRPC_CAL 2.0)
By: KM BARKLA, on 12-21-1993 at 08:39:17
Det #16 2 -inch mount Alpha eff. : .2389
Sample size : 1 mL Dilution : 10

Sample # J1426 Mount # 1

$$\frac{52931}{30} - 0.1 = 3.3266E+01 \text{ uCi/L alpha}$$

Sample # J1426 Mount # 2

$$\frac{52745}{30} - 0.1 = 3.3149E+01 \text{ uCi/L alpha}$$

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

1-3

Serial No	Sample Point	Date	Time Issued	Priority
J 1426.-5725	BECHTOLD	12-16-93	13:18	22

Determination	Method/Standard	Result Units	Charge Code	Reruns
AT	LA-508-101	uCi/ML	E14157	0

Sample Size	Customer ID
? .100 ml	KE65A

Remarks, Calculations, Results

COUNT AS uCI/L
USE 13,14,15 OR 16

DLP

WHC-SD-WM-DP-062, REV. 0

2.74×10^{-2} uCi/ml

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	D.H. Milian	Em Barela		
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
12/20/93	1600	[signature]	[signature]

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

AT: LA-508-101 (D-0) LIQUIDS

			SAMPLE	REPLICATE
Serial No.	DETECTOR NUMBER		16	16
J1426-5725	DISH SIZE 1, 2, or 5	(MS)	2	2
Batch ID	TOTAL COUNTS	(TC)	42503	44693
2411	COUNT TIME in MINUTES	(CT)	30	30
AT or TB ?	BACKGROUND in cpm	(BKG)	0.1	0.1
AT	SAMPLE SIZE in mL	(SS)	0.100	0.100
Rerun No.	DILUTION FACTOR	(DF)	1	1
0	DIGEST DILUTION FACTOR	(DDF)	1	1
Analyst	EFFICIENCY FACTOR	(EFF)	0.2389	0.2389
C JOHNSON	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE		1416.667	1489.667
Date	SAMPLE CONCENTRATION in µCi/L		2.67E+01	2.81E+01
12/20/93	AVG. µCi/L in SAMPLE and REPLICATE =			2.7400E+01

Rs (Sample Count Rate) = (TC / CT) - BKG
ALPHA TOTAL µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)
ALPHA TOTAL µCi/mL = ALPHA TOTAL µCi/L / 1000mL/L
Relative Counting Error = (The Square Root of TC + BKG * CT) / (TC - BKG * CT)
Detection Levels and Less Than Values are determined from Procedure LA-508-002.

ALPHA TOTAL in µCi/L (AVERAGE) =	2.74E+01	DETECTION LEVEL 1.23E-05 µCi/mL
ALPHA TOTAL in µCi/mL (AVERAGE) =	2.74E-02	
RELATIVE COUNTING ERROR =	0.5%	

Data Entry by:	[signature]	Date:	21-Dec-93
Approved by:	[signature]	Date:	27-Dec-93

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16/2 12-20-93 DM

J1426-5725

42503 / 30

Alpha Calculation (CRPC_CAL 2.0)
By: KM BARRELA, on 12-21-1993 at 08:37:59
Det #16 2 -inch mount Alpha eff. : .2389
Sample size : 1 mL Dilution : 10

44693 / 30

Sample # J1426 Mount # 1

$$\frac{42503}{30} \times 0.1 = 2.6712E+01 \text{ uCi/L alpha}$$

Sample # J1426 Mount # 2

$$\frac{44693}{30} \times 0.1 = 2.8088E+01 \text{ uCi/L alpha}$$

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

5-7

Serial No	Sample Point	Date	Time Issued	Priority
J 1426.-5725	BECHTOLD	12-16-93	13:18	22

Determination	Method-Standard	Result Units	Charge Code	Reruns
AT	LA-508-101	uCi/ML	E14157	0

Sample Size	Customer ID
?,100 ml	KE65A

Remarks, Calculations, Results

COUNT AS uCI/L
USE 13,14,15 OR 16

RMP

2.98×10^{-2} uCi/ml

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	D H Milian	Eva Davela		
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
12/20/93	1600		E.C.

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

AT: LA-508-101 (D-0) LIQUIDS

Serial No.			SAMPLE	REPLICATE
	DETECTOR NUMBER		16	16
J1426-5725	DISH SIZE 1, 2, or 5	(MS)	2	2
Batch ID	TOTAL COUNTS	(TC)	47391	47547
2411	COUNT TIME in MINUTES	(CT)	30	30
AT or TB ?	BACKGROUND in cpm	(BKG)	0.1	0.1
AT	SAMPLE SIZE in mL	(SS)	0.100	0.100
Rerun No.	DILUTION FACTOR	(DF)	1	1
0	DIGEST DILUTION FACTOR	(DDF)	1	1
Analyst	EFFICIENCY FACTOR	(EFF)	0.2389	0.2389
C JOHNSON	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE		1579.600	1584.800
Date	SAMPLE CONCENTRATION in µCi/L		2.98E+01	2.99E+01
12/20/93	AVG. µCi/L in SAMPLE and REPLICATE =			2.9833E+01

Rs (Sample Count Rate) = (TC / CT) - BKG
ALPHA TOTAL µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)
ALPHA TOTAL µCi/mL = ALPHA TOTAL µCi/L / 1000mL/L
Relative Counting Error = (The Square Root of TC + BKG * CT) / (TC - BKG * CT)
Detection Levels and Less Than Values are determined from Procedure LA-508-002.

ALPHA TOTAL	in µCi/L (AVERAGE) =	2.98E+01	DETECTION LEVEL 1.23E-05 µCi/mL
ALPHA TOTAL	in µCi/mL (AVERAGE) =	2.98E-02	
RELATIVE COUNTING ERROR	=	0.5%	

Data Entry by:		Date:	21-Dec-93
Approved by:		Date:	27-Dec-93

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WHC-SD-WM-DP-062, REV. 0

16/2 12-20-93 DM

J1426-5725

47391
30

Alpha Calculation (CRPC_CAL 2.0)
By: EM BARELA, on 12-21-1993 at 08:37:25
Det #16 2-inch mount Alpha eff. : .2389
Sample size : 1 mL Dilution : 10

47547
30

Sample # J1426 Mount # 1

$$\frac{47391}{30} - 0.1 = 2.9784E+01 \text{ uCi/L alpha}$$

Sample # J1426 Mount # 2

$$\frac{47547}{30} - 0.1 = 2.9882E+01 \text{ uCi/L alpha}$$

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

1-2

WHC-SD-WM-DP-062, REV. 0

Serial No	Sample Point	Date	Time Issued	Priority
J 1427.-5725	BECHTOLD	12-16-93	13:18	22

Determination	Method Standard	Result Units	Charge Code	Reruns
AT	LA-508-101	uCi/ML	E14157	0

Sample Size	Customer ID
?,100 ml	KE71A

Remarks, Calculations, Results

COUNT AS uCI/L
USE 13,14,15 OR 16

5mm

9.43×10^{2} uCi/ml

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	Em Bacon			
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
12/20/93	1600		E. C

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

AT: LA-508-101 (D-0) LIQUIDS

			SAMPLE	REPLICATE
Serial No.	DETECTOR NUMBER		16	16
J1427-5725	DISH SIZE 1, 2, or 5	(MS)	2	2
Batch ID	TOTAL COUNTS	(TC)	150161	150041
2411	COUNT TIME in MINUTES	(CT)	30	30
AT or TB ?	BACKGROUND in cpm	(BKG)	0.1	0.1
AT	SAMPLE SIZE in mL	(SS)	0.100	0.100
Rerun No.	DILUTION FACTOR	(DF)	1	1
0	DIGEST DILUTION FACTOR	(DDF)	1	1
Analyst	EFFICIENCY FACTOR	(EFF)	0.2389	0.2389
C JOHNSON	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE		5005.267	5001.267
Date	SAMPLE CONCENTRATION in µCi/L		9.44E+01	9.43E+01
12/20/93	AVG. µCi/L in SAMPLE and REPLICATE =			9.4338E+01

Rs (Sample Count Rate) = (TC / CT) - BKG

ALPHA TOTAL µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

ALPHA TOTAL µCi/mL = ALPHA TOTAL µCi/L / 1000mL/L

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

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

			DETECTION LEVEL
ALPHA TOTAL	in µCi/L (AVERAGE) =	9.43E+01	
ALPHA TOTAL	in µCi/mL (AVERAGE) =	9.43E-02	1.23E-05 µCi/mL
RELATIVE COUNTING ERROR	=	0.3%	

Data Entry by:		Date: 21-Dec-93
Approved by:		Date: 27-Dec-93

Form 1 Rev. 1.1

WHC-SD-WM-DP-062, REV. 0

16/2

J1427-5725

150161/30

Alpha Calculation (CRPC_CAL 2.0)
By: EM BARELA, on 12-21-1993 at 08:42:17
Det #16 2 -inch mount Alpha eff. : .2389
Sample size : 1 aL Dilution : 10

Sample # J1427 Mount # 1

150041/30

$$\frac{150161}{30} - 0.1 = 9.4375E+01 \text{ uCi/L alpha}$$

Sample # J1427 Mount # 2

$$\frac{150041}{30} - 0.1 = 9.4300E+01 \text{ uCi/L alpha}$$

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

3-4

WHC-SD-WM-DP-062, REV 0

Serial No	Sample Point	Date	Time Issued	Priority
J 1427.-5725	BECHTOLD	12-16-93	13:19	22

Determination	Method/Standard	Result Units	Charge Code	Reruns
AT	LA-508-101	uCi/ML	E14157	0

Sample Size	Customer ID
? .100 ml	KE71A

Remarks, Calculations, Results

COUNT AS uCI/L
USE 13,14,15 OR 16

DUP

7.10×10^{-2} ul./ml

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	Em Bauer			
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Mgr.	
12/20/93	1600		E.C.

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

AT: LA-508-101 (D-0) LIQUIDS

Serial No.		SAMPLE	REPLICATE
J1427-5725	DETECTOR NUMBER	16	16
Batch ID	DISH SIZE 1, 2, or 5 (MS)	2	2
2411	TOTAL COUNTS (TC)	113814	112147
AT or TB ?	COUNT TIME in MINUTES (CT)	30	30
AT	BACKGROUND in cpm (BKG)	0.1	0.1
Rerun No.	SAMPLE SIZE in mL (SS)	0.100	0.100
0	DILUTION FACTOR (DF)	1	1
Analyst	DIGEST DILUTION FACTOR (DDF)	1	1
C JOHNSON	EFFICIENCY FACTOR (EFF)	0.2389	0.2389
Date	Lc, Rmax, or Rs (SAMPLE RATE) as APPROPRIATE	3793.700	3738.133
12/20/93	SAMPLE CONCENTRATION in µCi/L	7.15E+01	7.05E+01
	AVG. µCi/L in SAMPLE and REPLICATE =		7.1007E+01

Rs (Sample Count Rate) = (TC / CT) - BKG

ALPHA TOTAL µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

ALPHA TOTAL µCi/mL = ALPHA TOTAL µCi/L / 1000mL/L

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

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

		DETECTION LEVEL
ALPHA TOTAL in µCi/L (AVERAGE) =	7.10E+01	
ALPHA TOTAL in µCi/mL (AVERAGE) =	7.10E-02	1.23E-05 µCi/mL
RELATIVE COUNTING ERROR =	0.3%	

Data Entry by:	Date:	21-Dec-93
Approved by:	Date:	27-Dec-93

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WHC-SD-WM-DP-062, REV. 0

1/6/2

J1427-5725

113814
30

Alpha Calculation (CRPC_CAL 2.0)
By: RM BARELA, ..., on 12-21-1993 at 08:35:47
Det 16 2 -inch mount Alpha eff. : .2389
Sample size : 1 mL Dilution : 10

Sample # J1427 Mount # 1

112147
30

$$\frac{113814}{30} - 0.1 = 7.1531E+01 \text{ uCi/L alpha}$$

Sample # J1427 Mount # 2

$$\frac{112147}{30} - 0.1 = 7.0483E+01 \text{ uCi/L alpha}$$

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

5-6 WHC-SD-WM-DP-062, REV. 0

Serial No	Sample Point	Date	Time Issued	Priority
J 1427.-5725	BECHTOLD	12-16-93	13:19	22

Determination	Method Standard	Result Units	Charge Code	Reruns
AT	LA-508-101	uCi/ML	E14157	0

Sample Size	Customer ID
? .100 ml	KE71A

Remarks, Calculations, Results

COUNT AS uCI/L
USE 13,14,15 OR 16

TRIP

8.68×10^{-2} uCi/ml

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	Em Bosch			
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
12/20/93	1600		E. C.

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

AT: LA-508-101 (D-0) LIQUIDS

Serial No.			SAMPLE	REPLICATE
J1427-5725	DETECTOR NUMBER		16	16
Batch ID	DISH SIZE 1, 2, or 5	(MS)	2	2
2411	TOTAL COUNTS	(TC)	132152	144073
AT or TB ?	COUNT TIME in MINUTES	(CT)	30	30
AT	BACKGROUND in cpm	(BKG)	0.1	0.1
Rerun No.	SAMPLE SIZE in mL	(SS)	0.100	0.100
0	DILUTION FACTOR	(DF)	1	1
Analyst	DIGEST DILUTION FACTOR	(DDF)	1	1
C JOHNSON	EFFICIENCY FACTOR	(EFF)	0.2389	0.2389
Date	Lc, Pmax, or Rs, (SAMPLE RATE) as APPROPRIATE		4404.967	4802.333
12/20/93	SAMPLE CONCENTRATION in µCi/L		8.31E+01	9.05E+01
	AVG. µCi/L in SAMPLE and REPLICATE =			8.6803E+01

Rs (Sample Count Rate) = (TC / CT) - BKG
ALPHA TOTAL µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)
ALPHA TOTAL µCi/mL = ALPHA TOTAL µCi/L / 1000mL/L
Relative Counting Error = (The Square Root of TC + BKG * CT) / (TC - BKG * CT)
Detection Levels and Less Than Values are determined from Procedure LA-508-002.

ALPHA TOTAL in µCi/L (AVERAGE) =	8.68E+01	DETECTION LEVEL 1.23E-05 µCi/mL
ALPHA TOTAL in µCi/mL (AVERAGE) =	8.68E-02	
RELATIVE COUNTING ERROR =	0.3%	

Data Entry by:	Date:	21-Dec-93
Approved by:	Date:	27-Dec-93

Form 1 Rev. 1.1

WHC-SD-WM-DP-062, REV. 0

16/2

J1427-5725

132152
30

Alpha Calculation (CRPC_CAL 2.0)
By: RM BARELA, on 12-21-1993 at 08:34:57
Det #26/ 2 -inch mount Alpha eff. : .2389
Sample size : 1 mL Dilution : 10

Sample # J1427 Mount # 1

144073
30

$$\frac{132152}{30} - 0.1 = 8.3056E+01 \text{ uCi/L alpha}$$

Sample # J1427 Mount # 2

$$\frac{144073}{30} - 0.1 = 9.0549E+01 \text{ uCi/L alpha}$$

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

7-8

Serial No	Sample Point	Date	Time Issued	Priority
J 1428.-5725	BECHTOLD	12-16-93	13:20	22

Determination	Method Standard	Result Units	Charge Code	Reruns
AT	LA-508-101	uCi/ML	E14157	0

Sample Size	Customer ID
? 100 ml	KE72A

Remarks, Calculations, Results

COUNT AS uCI/L
USE 13,14,15 OR 16

SAM

WHC-SD-WM-DP-062, REV. 0

2.53×10^{2} uCi/ml

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	Em Lucas			
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
12/20/93	1600		E. C

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

AT: LA-508-101 (D-0) LIQUIDS

Serial No.		SAMPLE	REPLICATE
J1428-5725	DETECTOR NUMBER	16	16
Batch ID	DISH SIZE 1, 2, or 5 (MS)	2	2
2411	TOTAL COUNTS (TC)	38110	42272
AT or TB ?	COUNT TIME in MINUTES (CT)	30	30
AT	BACKGROUND in cpm (BKG)	0.1	0.1
Rerun No.	SAMPLE SIZE in mL (SS)	0.100	0.100
0	DILUTION FACTOR (DF)	1	1
Analyst	DIGEST DILUTION FACTOR (DDF)	1	1
C JOHNSON	EFFICIENCY FACTOR (EFF)	0.2389	0.2389
Date	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	1270.233	1408.967
12/20/93	SAMPLE CONCENTRATION in µCi/L	2.40E+01	2.66E+01
	AVG. µCi/L in SAMPLE and REPLICATE =		2.5258E+01

Rs (Sample Count Rate) = (TC / CT) - BKG
ALPHA TOTAL µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)
ALPHA TOTAL µCi/mL = ALPHA TOTAL µCi/L / 1000mL/L
Relative Counting Error = (The Square Root of TC + BKG * CT) / (TC - BKG * CT)
Detection Levels and Less Than Values are determined from Procedure LA-508-002.

			DETECTION LEVEL
ALPHA TOTAL	in µCi/L (AVERAGE) =	2.53E+01	
ALPHA TOTAL	in µCi/mL (AVERAGE) =	2.53E-02	
			1.23E-05 µCi/mL
RELATIVE COUNTING ERROR	=	0.5%	

Data Entry by:		Date:	21-Dec-93
Approved by:		Date:	22-Dec-93

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16/2

J1428 5725

Alpha Calculation (CRPC_CAL 2.0)
By: BM BARELA, on 12-21-1993 at 08:34:17
Det #16/ 2 -inch mount Alpha eff. : .2389
Sample size : 1 mL Dilution : 10

38110
30

Sample # J1428 Mount # 1

38110
---------- - 0.1 = 2.3950E+01 uCi/L alpha
30

42272
30

Sample # J1428 Mount # 2

42272
---------- - 0.1 = 2.6566E+01 uCi/L alpha
30

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

9-10

Serial No	Sample Point	Date	Time Issued	Priority
J 1428.-5725	BECHTOLD	12-16-93	13:20	22

Determination	Method Standard	Result Units	Charge Code	Reruns
AT	LA-508-101	uCi/ML	E14157	0

Sample Size	Customer ID
?, 100 mL	KE72A

Remarks, Calculations, Results

COUNT AS µCI/L
USE 13,14,15 OR 16

DUP

WHC-SD-WM-DP-062, REV. 0

2.31×10^{2} uCi/mL

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	Em Bacala			
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
12/20/93	1600		E C J

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

AT: LA-508-101 (D-0) LIQUIDS

Serial No.			SAMPLE	REPLICATE
J1428-5725	DETECTOR NUMBER		16	16
Batch ID	DISH SIZE 1, 2, or 5	(MS)	2	2
2411	TOTAL COUNTS	(TC)	38837	34784
AT or TB ?	COUNT TIME in MINUTES	(CT)	30	30
AT	BACKGROUND in cpm	(BKG)	0.1	0.1
Rerun No.	SAMPLE SIZE in mL	(SS)	0.100	0.100
0	DILUTION FACTOR	(DF)	1	1
Analyst	DIGEST DILUTION FACTOR	(DDF)	1	1
C JOHNSON	EFFICIENCY FACTOR	(EFF)	0.2389	0.2389
Date	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE		1294.467	1159.367
12/20/93	SAMPLE CONCENTRATION in µCi/L		2.44E+01	2.19E+01
	AVG. µCi/L in SAMPLE and REPLICATE =			2.3134E+01

Rs (Sample Count Rate) = (TC / CT) - BKG

ALPHA TOTAL µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

ALPHA TOTAL µCi/mL = ALPHA TOTAL µCi/L / 1000mL/L

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

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

		DETECTION LEVEL
ALPHA TOTAL in µCi/L (AVERAGE) =	2.31E+01	
ALPHA TOTAL in µCi/mL (AVERAGE) =	2.31E-02	1.23E-05 µCi/mL
RELATIVE COUNTING ERROR =	0.5%	

Data Entry by:		Date:	21-Dec-93
Approved by:		Date:	27-Dec-93

Form 1 Rev. 1.1

TOTAL ALPHA ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-062, REV. 0

16/2

'J1428-5725

Alpha Calculation (CRPC_CAL 2.0)
By: EM BARELA, on 12-21-1993 at 08:36:47
Det #16 2 -inch mount Alpha eff. : .2389
Sample size : 1 mL Dilution : 10

38837
30

Sample # J1428 Mount # 1

38837
---------- - 0.1 = 2.4407E+01 uCi/L alpha
30

34784
30

Sample # J1428 Mount # 2

34784
---------- - 0.1 = 2.1860E+01 uCi/L alpha
30

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

1-2

Serial No	Sample Point	Date	Time Issued	Priority
J 1428.-5725	EECHOLD	12-16-93	13:20	99

Determination	Method Standard	Result Units	Charge Code	Reruns
AT	LA-508-101	uCi/ML	E14157	0

Sample Size	Customer ID
? .100 ml	KE72A

Remarks Calculations, Results

COUNT AS uCI/L
USE 13,14,15 OR 16

TRIP

WHC-SD-WM-DP-062, REV. 0

2.26×10^{2} uCi/ml

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
12/20/93	1600	E.C

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

AT: LA-508-101 (D-0) LIQUIDS

Serial No			SAMPLE	REPLICATE
J1428-5725	DETECTOR NUMBER		16	16
Batch ID	DISH SIZE 1, 2, or 5	(MS)	2	2
2411	TOTAL COUNTS	(TC)	35484	36350
AT or TB ?	COUNT TIME in MINUTES	(CT)	30	30
AT	BACKGROUND in cpm	(BKG)	0.1	0.1
Rerun No.	SAMPLE SIZE in mL	(SS)	0.100	0.100
0	DILUTION FACTOR	(DF)	1	1
Analyst	DIGEST DILUTION FACTOR	(DDF)	1	1
C JOHNSON	EFFICIENCY FACTOR	(EFF)	0.2389	0.2389
Date	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE		1182.700	1211.567
12/20/93	SAMPLE CONCENTRATION in µCi/L		2.23E+01	2.28E+01
	AVG. µCi/L in SAMPLE and REPLICATE =			2.2572E+01

Rs (Sample Count Rate) = (TC / CT) - BKG

ALPHA TOTAL µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

ALPHA TOTAL µCi/mL = ALPHA TOTAL µCi/L / 1000mL/L

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

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

		DETECTION LEVEL
ALPHA TOTAL in µCi/L (AVERAGE) =	2.26E+01	
ALPHA TOTAL in µCi/mL (AVERAGE) =	2.26E-02	
		1.23E-05 µCi/mL
RELATIVE COUNTING ERROR =	0.5%	

Data Entry by:		Date:	21-Dec-93
Approved by:		Date:	27-Dec-93

Form 1 Rev. 1.1

TOTAL ALPHA ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-062, REV. 0

16/2

J1428-5725

35484
30

36350
30

Alpha Calculation (CEPC_CAL 2.0)
By: EM BARELA, , on 12-21-1993 at 08:36:16
Det #16 2 -inch mount Alpha eff. : .2389
Sample size : 1 mL Dilution : 10

Sample # J1428 Mount # 1

35484
---------- - 0.1 = 2.2300E+01 uCi/L alpha
30

Sample # J1428 Mount # 2

36350
---------- - 0.1 = 2.2844E+01 uCi/L alpha
30

WESTINGHOUSE HANFORD COMPANY

222-S LABORATORY

ANALYTICAL BATCH #2457

Lab Segment Serial No.	Customer ID:
J1427	KE71A
Analysis:	**Sample Prep:**
AT	Direct liquid

Instrument: A 63999	Procedure/ Rev: LA-508-101 / Rev D-0
Technologist: Cynthia Johnson	Date: 12/29/93
Starting Time: 0800	Temperature N/A
Ending Time: CC5	Chemist: S. Fitzgerald

Comments: _____

	Description	Lab ID
1	Initial LMCS check std	J1415-5525
2	Reagent Blk	J1416-5005
3	Sample	J1427-5725
4	Sample duplicate	J1427-5725
5	Sample triplicate	J1427-5725
6		
7		
8		
9		
10		

	Description	Lab ID
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS check std	11913-51/10mL			

CC5

ANALYTICAL BATCH SUMMARY SHEET

METHOD: LA-508-101

DATE START: DECEMBER 29, 1993

PREPARED BY: S.L. FITZGERALD

DATE COMPLETE: JANUARY 4, 1994

	UNITS:	uCi/mL										
SPL NAME	SPL ID	ANALYTE	RESULT #1	RESULT #2	RESULT #3	AVERAGE	2*SD	PREC	ACCU	%REC	DET LIM	% CT ER
STD 119851	J1415	ALPHA	8.15E-03							96.5	2.12E-07	5.5
BLANK	J1416	ALPHA	<8.03E-06								2.12E-05	250
KE71A	J1427	ALPHA	8.07E-02	8.19E-02	8.21E-02	8.16E-02	1.51E-03	1.857			2.12E-05	0.6
											2.12E-05	0.5
											2.12E-05	0.6

NARRATIVE: [X] NO SPECIAL PROBLEMS/METHOD VARIATIONS IN THIS BATCH

LIST SPECIFIC PROBLEMS/VARIATIONS FOR THIS BATCH:

Standard results are reported as uCi/L

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

1-2 #2457

Serial No	Sample Point	Date	Time Issued	Priority
J 1415.-5525	BECHTOLD	12-15-93	11:23	22

Determination	Method Standard	Result Units	Charge Code	Reruns
AT	LA-508-101	% RECOVERY	E14157	1

Sample Size	Customer ID
10 ML	STD

Remarks, Calculations, Results

S510 EV-CRB

STD# 119BS1 RESULT 8.15 E-3

STD VAL 8.4483 -3 %REC 96.5%

WHC-SD-WM-DP-062, REV. 0

C Johnson

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	[signature]	[signature]		
Hrs	Hrs	Hrs	Hrs	Hrs
				[signature]

Date	Time Completed	Lab Unit Mgr	
12-29-93	1005	[signature]	[signature]

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

AT: LA-508-101 (D-0) LIQUIDS

			STANDARD	REPLICATE
Serial No.	DETECTOR NUMBER		16	16
J1415-5525	DISH SIZE 1, 2, or 5	(MS)	2	2
Batch ID	TOTAL COUNTS	(TC)	1297	1327
2457	COUNT TIME in MINUTES	(CT)	30	30
AT or TB ?	BACKGROUND in cpm	(BKG)	0.5	0.5
AT	SAMPLE SIZE in mL	(SS)	10.000	10.000
Rerun No.	DILUTION FACTOR	(DF)	1	1
1	DIGEST DILUTION FACTOR	(DDF)	1	1
Analyst	EFFICIENCY FACTOR	(EFF)	0.2389	0.2389
C JOHNSON	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE		42.733	43.733
Date	SAMPLE CONCENTRATION in µCi/L		8.06E-03	8.25E-03
12/29/93	AVG. µCi/L in SAMPLE and REPLICATE =			8.1517E-03

Rs (Sample Count Rate) = (TC / CT) - BKG

ALPHA TOTAL µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

ALPHA TOTAL µCi/mL = ALPHA TOTAL µCi/L / 1000mL/L

Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100

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

ALPHA TOTAL in µCi/L (AVERAGE) =	8.15E-03	DETECTION LEVEL 2.12E-07 µCi/mL
ALPHA TOTAL in µCi/mL (AVERAGE) =	8.15E-06	
RELATIVE COUNTING ERROR =	5.5%	

Data Entry by:	[signature]	Date:	03-Jan-94
Approved by:	[signature]	Date:	04-Jan-94

Form 1 Rev. 1.2

Page 1 of 1

TOTAL ALPHA ANALYSIS - UNDIGESTED SAMPLE

14/2

J1415-5525

1297
30

Alpha Calculation (CRPC_CAL 2.0)
By: MC-BERMAN, , on 12-30-1993 at 03:04:06
Det #16 2 -inch mount Alpha eff. : .2389
Sample size : 10 mL Dilution : 1

Sample # J1415-5525 Mount # 1

1327
30

$$\frac{1297}{30} - 0.5 = 8.0574\text{E-}03 \text{ uCi/L alpha}$$

Sample # J1415-5525 Mount # 2

$$\frac{1327}{30} - 0.5 = 8.2460\text{E-}03 \text{ uCi/L alpha}$$

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

3-4

Serial No	Sample Point	Date	Time Issued	Priority
J 1416.-5625	BECHTOLD	12-15-93	11:24	22

Determination	Method Standard	Result Units	Charge Code	Reruns
AT	LA-508-101	uCi/ML	E14157	1

Sample Size	Customer ID
100	BLK

Remarks, Calculations, Results

COUNT AS uCI/L
USE 13,14,15 OR 16

WHC-SD-WM-DP-062, REV. 0

C Johnson

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
12-29-93	1005	

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

AT: LA-508-101 (D-0) LIQUIDS

Serial No.			BLANK	REPLICATE
	DETECTOR NUMBER		16	16
J1416-5625	DISH SIZE 1, 2, or 5	(MS)	2	2
Batch ID	TOTAL COUNTS	(TC)	8	11
2457	COUNT TIME in MINUTES	(CT)	30	30
AT or T8 ?	BACKGROUND in cpm	(BKG)	0.5	0.5
AT	SAMPLE SIZE in mL	(SS)	0.100	0.100
Rerun No.	DILUTION FACTOR	(DF)	1	1
1	DIGEST DILUTION FACTOR	(DDF)	1	1
Analyst	EFFICIENCY FACTOR	(EFF)	0.2389	0.2389
C JOHNSON	Lc, Rmax, or Rs (SAMPLE RATE) as APPROPRIATE		0.426	0.426
Date	SAMPLE CONCENTRATION in µCi/L		8.03E-03	8.03E-03
12/29/93	AVG. µCi/L in SAMPLE and REPLICATE =		<	8.0328E-03

Rs (Sample Count Rate) = (TC / CT) - BKG

ALPHA TOTAL µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

ALPHA TOTAL µCi/mL = ALPHA TOTAL µCi/L / 1000mL/L

Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100

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

		DETECTION LEVEL
ALPHA TOTAL in µCi/L (AVERAGE) =	< 8.03E-03	
ALPHA TOTAL in µCi/mL (AVERAGE) =	< 8.03E-06	
LESS Than Value was Determined from Lc.		2.12E-05 µCi/mL
RELATIVE COUNTING ERROR =	249.9%	

Data Entry by:		Date:	04-Jan-94
Approved by:		Date:	04-Jan-94

Form 1 Rev. 1.2

TOTAL ALPHA ANALYSIS - UNDIGESTED SAMPLE

14/2

J1416-5625

Alpha Calculation (CRPC_CAL 2.0)
By: MC BIERMAN, , on 12-30-1993 at 03:05:27
Det #16 2 -inch mount Alpha eff. : .2389
Sample size : .1 mL Dilution : 1

8/30

Sample # J 1416-5625 Mount # 1

11/30

$$\frac{8}{30} - 0.5 < 5.6717E\text{-}03 \text{ uCi/L alpha}$$

Sample # J 1416-5625 Mount # 2

$$\frac{11}{30} - 0.5 < 5.6717E\text{-}03 \text{ uCi/L alpha}$$

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

5-6

Serial No	Sample Point	Date	Time Issued	Priority
J 1427.-5725	BECHTOLT	12-16-93	13:19	32

Determination	Method Standard	Result Units	Charge Code	Reruns
AT	LA-508-101	uCi/ML	E14157	1

Sample Size	Customer ID
100	KE71A

Remarks Calculations Results

COUNT AS µCI/L
USE 13,14,15 OR 16

WHC-SD-WM-DP-062, REV. 0

C Johnson

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr.
12-29-93	1005	

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

AT: LA-508-101 (D-0) LIQUIDS

Serial No.		SAMPLE	REPLICATE
J1427-5725	DETECTOR NUMBER	16	16
Batch ID	DISH SIZE 1, 2, or 5 (MS)	2	2
2457	TOTAL COUNTS (TC)	130817	125938
AT or TB ?	COUNT TIME in MINUTES (CT)	30	30
AT	BACKGROUND in cpm (BKG)	0.5	0.5
Rerun No.	SAMPLE SIZE in mL (SS)	0.100	0.100
1	DILUTION FACTOR (DF)	1	1
Analyst	DIGEST DILUTION FACTOR (DDF)	1	1
C JOHNSON	EFFICIENCY FACTOR (EFF)	0.2389	0.2389
Date	Lc, Rmax, or Rs (SAMPLE RATE) as APPROPRIATE	4360.067	4197.433
12/29/93	SAMPLE CONCENTRATION in µCi/L	8.22E+01	7.91E+01
	AVG. µCi/L in SAMPLE and REPLICATE =		8.0677E+01

Rs (Sample Count Rate) = (TC / CT) - BKG

ALPHA TOTAL µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

ALPHA TOTAL µCi/mL = ALPHA TOTAL µCi/L / 1000mL/L

Relative Counting Error = ((The Square Root of TC + BKG * CT) / (TC - BKG * CT)) * 1.96 * 100

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

ALPHA TOTAL in µCi/L (AVERAGE) =	8.07E+01	DETECTION LEVEL 2.12E-05 µCi/mL
ALPHA TOTAL in µCi/mL (AVERAGE) =	8.07E-02	
RELATIVE COUNTING ERROR =	0.6%	

Data Entry by:		Date:	04-Jan-94
Approved by:		Date:	04-Jan-94

Form 1 Rev. 1.2

TOTAL ALPHA ANALYSIS - UNDIGESTED SAMPLE

16/2

J1427-5725

Alpha Calculation (CRPC_CAL 2.0)
By: MC BIERMAN, , on 12-30-1993 at 03:06:32
Det #16 — 2 5 inch mount Alpha eff. : .2389
Sample size : .1 mL Dilution : 1

130817 / 30

Sample # J 1427-5725 Mount # 1

125938 / 30

$$\frac{130817}{30} - 0.5 = 8.2210E+01 \text{ uCi/L alpha}$$

Sample # J 1427-5725 Mount # 2

$$\frac{125938}{30} - 0.5 = 7.9143E+01 \text{ uCi/L alpha}$$

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

7-8

Serial No	Sample Point	Date	Time Issued	Priority
J 1427.-5725	BECHTOLD	12-16-93	13:13	22

Determination	Method Standard	Result Units	Charge Code	Reruns
AT	LA-508-101	uCi/ML	E14157	2

Sample Size	Customer ID
100	KE71A

Remarks Calculations Results

COUNT AS uCI/L
USE 13,14,15 OR 16

WHC-SD-WM-DP-062, REV. 0

C Johnson

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
12-29-93	1005	

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

AT: LA-508-101 (D-0) LIQUIDS

Serial No.		SAMPLE	REPLICATE
J1427-5725	DETECTOR NUMBER	16	16
Batch ID	DISH SIZE 1, 2, or 5 (MS)	2	2
2457	TOTAL COUNTS (TC)	130466	130262
AT or TB ?	COUNT TIME in MINUTES (CT)	30	30
AT	BACKGROUND in cpm (BKG)	0.5	0.5
Rerun No.	SAMPLE SIZE in mL (SS)	0.100	0.100
1	DILUTION FACTOR (DF)	1	1
Analyst	DIGEST DILUTION FACTOR (DDF)	1	1
C JOHNSON	EFFICIENCY FACTOR (EFF)	0.2389	0.2389
Date	Lc, Rmax, or Rs (SAMPLE RATE) as APPROPRIATE	4348.367	4341.567
12/29/93	SAMPLE CONCENTRATION in µCi/L	8.20E+01	8.19E+01
	AVG. µCi/L in SAMPLE and REPLICATE =		8.1925E+01

Rs (Sample Count Rate) = (TC / CT) - BKG

ALPHA TOTAL µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

ALPHA TOTAL µCi/mL = ALPHA TOTAL µCi/L / 1000mL/L

Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100

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

ALPHA TOTAL in µCi/L (AVERAGE) =	8.19E+01	DETECTION LEVEL
ALPHA TOTAL in µCi/mL (AVERAGE) =	8.19E-02	2.12E-05 µCi/mL
RELATIVE COUNTING ERROR =	0.5%	

Data Entry by:	Date:	04-Jan-94
Approved by:	Date:	04-Jan-94

SCF

Form 1 Rev. 1.2

Page 1 of 1

TOTAL ALPHA ANALYSIS - UNDIGESTED SAMPLE

16/3 - J1427-5725

Alpha Calculation (CRPC_CAL 2.0)
By: MC BIERMAN, ..., on 12-30-1993 at 03:07:31
130466 Det #16 2 5inch mount Alpha eff. : .2389
30 Sample size : .1 mL Dilution : 1

Sample # J 1427-5725 Mount # 1

130262 130466
---------- - 0.5 = 8.1989E+01 uCi/L alpha
30 30

Sample # J 1427-5725 Mount # 2

130262
---------- - 0.5 = 8.1861E+01 uCi/L alpha
30

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

9-10

Serial No	Sample Point	Date	Time Issued	Priority
J 1427.-5725	BECHTOLD	12-16-93	13:19	22

Determination	Method Standard	Result Units	Charge Code	Reruns
AT	LA-508-101	uCi/ML	E14157	3

Sample Size	Customer ID
100	KE71A

Remarks, Calculations, Results

COUNT AS uCI/L
USE 13,14,15 OR 16

WHC-SD-WM-DP-062, REV. 0

C Johnson

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	Em Lucla	M Bu...		
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
12-29-93	1005	[signature]	[signature]

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

AT: LA-508-101 (D-0) LIQUIDS

			SAMPLE	REPLICATE
Serial No.	DETECTOR NUMBER		16	16
J1427-5725	DISH SIZE 1, 2, or 5	(MS)	2	2
Batch ID	TOTAL COUNTS	(TC)	137573	123798
2457	COUNT TIME in MINUTES	(CT)	30	30
AT or TB ?	BACKGROUND in cpm	(BKG)	0.5	0.5
AT	SAMPLE SIZE in mL	(SS)	0.100	0.100
Rerun No.	DILUTION FACTOR	(DF)	1	1
1	DIGEST DILUTION FACTOR	(DDF)	1	1
Analyst	EFFICIENCY FACTOR	(EFF)	0.2389	0.2389
C JOHNSON	Lc, Rmax, or Rs (SAMPLE RATE) as APPROPRIATE		4585.267	4126.100
Date	SAMPLE CONCENTRATION in µCi/L		8.65E+01	7.78E+01
12/29/93	AVG. µCi/L in SAMPLE and REPLICATE =			8.2127E+01

Rs (Sample Count Rate) = (TC / CT) - BKG

ALPHA TOTAL µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

ALPHA TOTAL µCi/mL = ALPHA TOTAL µCi/L / 1000mL/L

Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100

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

ALPHA TOTAL in µCi/L (AVERAGE) =	8.21E+01	DETECTION LEVEL 2.12E-05 µCi/mL
ALPHA TOTAL in µCi/mL (AVERAGE) =	8.21E-02	
RELATIVE COUNTING ERROR =	0.6%	

Data Entry by:	[signature]	Date:	04-Jan-94
Approved by:	[signature]	Date:	04-Jan-94

Form 1 Rev. 1.2

Page 1 of 1

TOTAL ALPHA ANALYSIS - UNDIGESTED SAMPLE

14/2

J1427-5725 4-10

Alpha Calculation (CRPC_CAL 2.0)
By: MC BIERMAN, ., on 12-30-1993 at 03:08:24
137573 / 30 Det #16 2 5 inch mount Alpha eff. : .2389
Sample size : .1 mL Dilution : 1

Sample # J 1427-5725 Mount # 1

123798 / 30 137573 / 30 - 0.5 = 8.6456E+01 uCi/L alpha

Sample # J 1427-5725 Mount # 2

123798 / 30 - 0.5 = 7.7798E+01 uCi/L alpha

WESTINGHOUSE HANFORD COMPANY

222-S LABORATORY

WHC-SD-WM-DP-062, REV. 0

ANALYTICAL BATCH

Lab Segment Serial No. J1445, J1446	Customer ID: KE83B, KE83D
Analysis: AT	Sample Prep: Direct Liquid

Instrument: WA 45709	Procedure/ Rev: LA 508-101 / Rev D-0
Technologist: Cynthia Johnson [signature]	Date: 1/7/94
Starting Time: 1115	Temperature N/A
Ending Time: 1245	Chemist: S Fitzgerald

Comments:

	Description	Lab ID		Description	Lab ID
1	Initial ~~[illegible]~~ LMCS check std	J1439-5525	11		
2	Blank	J1440-5625	12		
3	Sample	J1445-5725	13		
4	sample dup	J1445-5725	14		
5	Sample trip	J1445-5725	15		
6	Sample	J1446-5725	16		
7	Sample dup	J1446-5725	17		
8	Sample trip	J1446-5725	18		
9			19		
10			20		

4-24
2-14-94

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS Check Std	119B51 / 10 ml			

A-6000-881 (03/92)

ANALYTICAL BATCH SUMMARY SHEET

METHOD: LA-508-101

DATE START: JANUARY 7, 1994

PREPARED BY: S.L. FITZGERALD

DATE COMPLETE: JANUARY 13, 1994

	UNITS:	uCi/mL										
SPL NAME	SPL ID	ANALYTE	RESULT #1	RESULT #2	RESULT #3	AVERAGE	2*SD	PREC	ACCU	%REC	DET LIM	% CT ER
STD 119B51	J1439	ALPHA	8.30E-03							98.2	2.87E-07	5.7
BLANK	J1440	ALPHA	<1.17E-05								2.87E-05	113
KE83B	J1445	ALPHA	3.27E-01	2.99E-01	3.55E-01	3.27E-01	5.60E-02	17.13			2.87E-05	0.3
											2.87E-05	0.3
											2.87E-05	0.3
KE83D	J1446	ALPHA	5.17E-02	5.14E-02	4.54E-02	4.95E-02	7.11E-03	14.36			2.87E-05	0.7
											2.87E-05	0.7
											2.87E-05	0.8

NARRATIVE: [X] NO SPECIAL PROBLEMS/METHOD VARIATIONS IN THIS BATCH

LIST SPECIFIC PROBLEMS/VARIATIONS FOR THIS BATCH:

Standard results are reported as uCi/L

Rerun requested to determine if beta sensitivity is present. None was found.

1-31-94

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

1-2 Batch 2514

Serial No	Sample Point	Date	Time Issued	Priority
J 1439.-5525	ECONOLY	1- 4-94	10:40	29

Determination	Method Standard	Result Units	Charge Code	Reruns
AT	LA-508-101	% RECOVERY	E14157	0

Sample Size	Customer ID
? 10 ml	STD

Remarks Calculations Results

WHC-SD-WM-DP-062, REV. 0

8510 EV-CRB

STD# 119B51 RESULT 8.30E-3

STD VAL ~~8.45E-3~~ 8.45E-3 %REC 98.25%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs 1-8-94	Hrs	Hrs	Hrs
Date 1/7/94	Time Completed 1245	Lab Unit Mgr		

54 6800-061 (R-10-83)

AT: LA-508-101 (D-0) LIQUIDS

Serial No.			STANDARD	REPLICATE
	DETECTOR NUMBER		13	13
J1439-5525	DISH SIZE 1, 2, or 5	(MS)	2	2
Batch ID	TOTAL COUNTS	(TC)	1279	1349
2514	COUNT TIME in MINUTES	(CT)	30	30
AT or TB ?	BACKGROUND in cpm	(BKG)	1	1
AT	SAMPLE SIZE in mL	(SS)	10.000	10.000
Rerun No.	DILUTION FACTOR	(DF)	1	1
0	DIGEST DILUTION FACTOR	(DDF)	1	1
Analyst	EFFICIENCY FACTOR	(EFF)	0.2322	0.2322
C JOHNSON	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE		41.633	43.967
Date	SAMPLE CONCENTRATION in µCi/L		8.08E-03	8.53E-03
01/07/94	AVG. µCi/L in SAMPLE and REPLICATE =			8.3029E-03

Rs (Sample Count Rate) = (TC / CT) - BKG

ALPHA TOTAL µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

ALPHA TOTAL µCi/mL = ALPHA TOTAL µCi/L / 1000mL/L

Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100

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

ALPHA TOTAL	in µCi/L (AVERAGE) =	8.30E-03	DETECTION LEVEL 2.87E-07 µCi/mL
ALPHA TOTAL	in µCi/mL (AVERAGE) =	8.30E-06	
RELATIVE COUNTING ERROR	=	5.7%	

Data Entry by:	C Johnson	Date:	11-Jan-94
Approved by:		Date:	13-Jan-94

Form 1 Rev. 1.2

TOTAL ALPHA ANALYSIS - UNDIGESTED SAMPLE

13/2

J 1439 5525 10 ml

1279/30 — 1.0

Alpha Calculation (CRPC_CAL 2.0)
By: AL JOHANSEN, on 01-08-1994 at 02:42:03
Det #13 2 -inch mount Alpha eff. : .2322
Sample size : 10 mL Dilution : 1

Sample # J1439-5525 Mount # 1

1349/30

$$\frac{1279}{30} \times 1.0 = 8.0766E\text{-}03 \text{ uCi/L alpha}$$

Sample # J1439-5525 Mount # 2

$$\frac{1349}{30} \times 1.0 = 8.5292E\text{-}03 \text{ uCi/L alpha}$$

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

3-4

Serial No	Sample Point	Date	Time Issued	Priority
J 1440.-5625	BECHTOLD	1- 4-94	10:50	09

Determination	Method Standard	Result Units	Charge Code	Reruns
AT	LA-508-101	uCi/ML	E14157	0

Sample Size	Customer ID
? ,100 ml	BLANK

Remarks, Calculations, Results

COUNT AS uCI/L
SEE 13,14,15 OR 16

WHC-SD-WM-DP-062, REV. 0

< 1.17E-5 uci/ML

C Johnson

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
	1-8-94			

Date	Time Completed	Lab Unit Mgr.	
1/7/94	1245		Stu Peterson

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

AT: LA-508-101 (D-0) LIQUIDS

			BLANK	REPLICATE
Serial No.	DETECTOR NUMBER		13	13
J1440-5625	DISH SIZE 1, 2, or 5	(MS)	2	2
Batch ID	TOTAL COUNTS	(TC)	23	18
2514	COUNT TIME in MINUTES	(CT)	30	30
AT or TB ?	BACKGROUND in cpm	(BKG)	1	1
AT	SAMPLE SIZE in mL	(SS)	0.100	0.100
Rerun No.	DILUTION FACTOR	(DF)	1	1
0	DIGEST DILUTION FACTOR	(DDF)	1	1
Analyst	EFFICIENCY FACTOR	(EFF)	0.2322	0.2322
C JOHNSON	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE		0.602	0.602
Date	SAMPLE CONCENTRATION in µCi/L		1.17E-02	1.17E-02
01/07/94	AVG. µCi/L in SAMPLE and REPLICATE =		<	1.1688E-02

Rs (Sample Count Rate) = (TC / CT) - BKG

ALPHA TOTAL µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

ALPHA TOTAL µCi/mL = ALPHA TOTAL µCi/L / 1000mL/L

Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100

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

		DETECTION LEVEL
ALPHA TOTAL in µCi/L (AVERAGE) =	< 1.17E-02	
ALPHA TOTAL in µCi/mL (AVERAGE) =	< 1.17E-05	
LESS Than Value was Determined from Lc.		2.87E-05 µCi/mL
RELATIVE COUNTING ERROR =	203.8%	

Data Entry by:		Date:	13-Jan-94
Approved by:		Date:	13-Jan-94

Form 1 Rev. 1.2

TOTAL ALPHA ANALYSIS - UNDIGESTED SAMPLE

13/2 - J 1440-5625

Alpha Calculation (CRPC_C&L 2.0)
By: MC BIERMAN, , on 01-08-1994 at 10:03:01
Det #13 2 -inch mount Alpha eff. : .2322
Sample size : .1 mL Dilution : 1

23/30

Sample # J 1440-5625 Mount # 1

$$\frac{23}{30} - 1.0 < 8.2524E\text{-}03 \text{ uCi/L alpha}$$

18/30

Sample # J 1440-5625 Mount # 2

$$\frac{18}{30} - 1.0 < 8.2524E\text{-}03 \text{ uCi/L alpha}$$

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

5-6

Serial No	Sample Point	Date	Time Issued	Priority
J 1445.-5725	EECHTOLD	1- 4-94	12: 3	2S

Determination	Method Standard	Result Units	Charge Code	Reruns
AT	LA-508-101	uCi/ML	E14157	0

Sample Size	Customer ID
? .100 ml	KE83B

Remarks, Calculations, Results

COUNT AS uCI/L
USE 13,14,15 OR 16
SAM

WHC-SD-WM-DP-062, REV. 0

3.27E-1 uci/ml

C Johnson

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs 1-8-94	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr.	
1/7/94	1245		

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

AT: LA-508-101 (D-0) LIQUIDS

			SAMPLE	REPLICATE
Serial No.	DETECTOR NUMBER		13	13
J1445-5725	DISH SIZE 1, 2, or 5	(MS)	2	2
Batch ID	TOTAL COUNTS	(TC)	560027	450519
2514	COUNT TIME in MINUTES	(CT)	30	30
AT or TB ?	BACKGROUND in cpm	(BKG)	1	1
AT	SAMPLE SIZE in mL	(SS)	0.100	0.100
Rerun No.	DILUTION FACTOR	(DF)	1	1
0	DIGEST DILUTION FACTOR	(DDF)	1	1
Analyst	EFFICIENCY FACTOR	(EFF)	0.2322	0.2322
C JOHNSON	Lc, Rmax, or Ps, (SAMPLE RATE) as APPROPRIATE		18666.567	15016.300
Date	SAMPLE CONCENTRATION in µCi/L		3.62E+02	2.91E+02
01/07/94	AVG. µCi/L in SAMPLE and REPLICATE =			3.2671E+02

Ps (Sample Count Rate) = (TC / CT) - BKG

ALPHA TOTAL µCi/L = Ps * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

ALPHA TOTAL µCi/mL = ALPHA TOTAL µCi/L / 1000mL/L

Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100

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

ALPHA TOTAL	in µCi/L (AVERAGE) =	3.27E+02	DETECTION LEVEL
ALPHA TOTAL	in µCi/mL (AVERAGE) =	3.27E-01	2.87E-05 µCi/mL
RELATIVE COUNTING ERROR	=	0.3%	

Data Entry by:	C A Clark	Date:	11-Jan-94
Approved by:		Date:	13-Jan-94

Form 1 Rev. 1.2

TOTAL ALPHA ANALYSIS - UNDIGESTED SAMPLE

13/2

J 1445- 5725

Alpha Calculation (CRPC_CAL 2.0)
By: MC BIERMAN, on 01-08-1994 at 10:05:08
Det #3 2 -inch mount Alpha eff. : .2322
Sample size : .1 mL Dilution : 1

560027 / 30

Sample # J 1445-5725 Mount # 1

$$\frac{560027}{30} - 1.0 = 3.6212E+02 \text{ uCi/L alpha}$$

450519 / 30

Sample # J 1445-5725 Mount # 2

$$\frac{450519}{30} - 1.0 = 2.5130E+02 \text{ uCi/L alpha}$$

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

7-8

Serial No	Sample Point	Date	Time Issued	Priority
J 1445.-5725	BECHTOLD	1- 4-94	12: 3	26

Determination	Method Standard	Result Units	Charge Code	Reruns
AT	LA-508-101	uCi/ML	E14157	0

Sample Size	Customer ID
? ,100 ml	KE83B

Remarks, Calculations, Results

COUNT AS µCI/L
USE 13,14,15 OR 16
DUP

WHC-SD-WM-DP-062, REV. 0

2.99E-1 uci/ML

C Johnson

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs 1-8-94	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr.	
1/7/94	1245		

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

AT: LA-508-101 (D-0) LIQUIDS

Serial No.		SAMPLE	REPLICATE
J1445-5725	DETECTOR NUMBER	13	13
Batch ID	DISH SIZE 1, 2, or 5 (MS)	2	2
2514	TOTAL COUNTS (TC)	486672	436757
AT or TB ?	COUNT TIME in MINUTES (CT)	30	30
AT	BACKGROUND in cpm (BKG)	1	1
Rerun No.	SAMPLE SIZE in mL (SS)	0.100	0.100
0	DILUTION FACTOR (DF)	1	1
Analyst	DIGEST DILUTION FACTOR (DDF)	1	1
C JOHNSON	EFFICIENCY FACTOR (EFF)	0.2322	0.2322
Date	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	16221.400	14557.567
01/07/94	SAMPLE CONCENTRATION in µCi/L	3.15E+02	2.82E+02
	AVG. µCi/L in SAMPLE and REPLICATE =		2.9854E+02

Rs (Sample Count Rate) = (TC / CT) - BKG

ALPHA TOTAL µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

ALPHA TOTAL µCi/mL = ALPHA TOTAL µCi/L / 1000mL/L

Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100

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

		DETECTION LEVEL
ALPHA TOTAL in µCi/L (AVERAGE) =	2.99E+02	
ALPHA TOTAL in µCi/mL (AVERAGE) =	2.99E-01	
		2.87E-05 µCi/mL
RELATIVE COUNTING ERROR =	0.3%	

Data Entry by:	CA Clark	Date:	11-Jan-94
Approved by:		Date:	13-Jan-94

Form 1 Rev. 1.2

TOTAL ALPHA ANALYSIS - UNDIGESTED SAMPLE

13/2

J1445 - 5725

486672 / 30

436757 / 30

Alpha Calculation (CRPC_CAL 2.0)
By: MC BIERMAN, , on 01-08-1994 at 10:06:23
Det #3 2 -inch mount Alpha eff. : .2322
Sample size : .1 mL Dilution : 1

Sample # J 1445-5725 Mount # 1

$$\frac{486672}{30} - 1.0 = 3.1468E+02 \text{ uCi/L alpha}$$

Sample # J 1445-5725 Mount # 2

$$\frac{436757}{30} - 1.0 = 2.8241E+02 \text{ uCi/L alpha}$$

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

9-10

Serial No	Sample Point	Date	Time Issued	Priority
J 1445.-5725	BECHTOLD .	1- 4-94	12: 3	28

Determination	Method Standard	Result Units	Charge Code	Reruns
AT	LA-508-101	uCi/ML	E14157	0

Sample Size	Customer ID
? .100 ml	KE82B

Remarks, Calculations, Results

COUNT AS uCI/L
USE 13,14,15 OR 16
TRIP

WHC-SD-WM-DP-062, REV. 0

$3.55E^{-1}$ uci/ml

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs 1-8-94	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr.
1/7/94	1245	

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

AT: LA-508-101 (D-0) LIQUIDS

Serial No.			SAMPLE	REPLICATE
J1445-5725	DETECTOR NUMBER		13	13
Batch ID	DISH SIZE 1, 2, or 5	(MS)	2	2
2514	TOTAL COUNTS	(TC)	563249	535211
AT or TB ?	COUNT TIME in MINUTES	(CT)	30	30
AT	BACKGROUND in cpm	(BKG)	1	1
Rerun No.	SAMPLE SIZE in mL	(SS)	0.100	0.100
0	DILUTION FACTOR	(DF)	1	1
Analyst	DIGEST DILUTION FACTOR	(DDF)	1	1
C JOHNSON	EFFICIENCY FACTOR	(EFF)	0.2322	0.2322
Date	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE		18773.967	17839.367
01/07/94	SAMPLE CONCENTRATION in µCi/L		3.64E+02	3.46E+02
	AVG. µCi/L in SAMPLE and REPLICATE =			3.5514E+02

Rs (Sample Count Rate) = (TC / CT) - BKG
ALPHA TOTAL µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)
ALPHA TOTAL µCi/mL = ALPHA TOTAL µCi/L / 1000mL/L
Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100
Detection Levels and Less Than Values are determined from Procedure LA-508-002.

		DETECTION LEVEL
ALPHA TOTAL in µCi/L (AVERAGE) =	3.55E+02	
ALPHA TOTAL in µCi/mL (AVERAGE) =	3.55E-01	
		2.87E-05 µCi/mL
RELATIVE COUNTING ERROR =	0.3%	

Data Entry by:	C A Clark	Date:	11-Jan-94
Approved by:		Date:	13-Jan-94

Form 1 Rev. 1.2 Page 1 of 1

TOTAL ALPHA ANALYSIS - UNDIGESTED SAMPLE

13/2

J 1445- 5725

563249
30

535211
30

Alpha Calculation (CRPC_CAL 2.0)
By: MC BIERMAN, , on 01-08-1994 at 10:07:15
Det #13 - 2-inch mount Alpha eff. : .2322
Sample size : .1 mL Dilution : 1

Sample # J 1445-5725 Mount # 1

$$\frac{563249}{30} - 1.0 = 3.6420E+02 \text{ uCi/L alpha}$$

Sample # J 1445-5725 Mount # 2

$$\frac{535211}{30} - 1.0 = 3.4607E+02 \text{ uCi/L alpha}$$

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

187

Serial No	Sample Point	Date	Time Issued	Priority
J 1446.-5725	BECHTOLD	1- 4-94	12:38	25

Determination	Method Standard	Result Units	Charge Code	Reruns
AT	LA-508-101	uCi/ML	E14157	0

Sample Size	Customer ID
? .100 ml	KE83D

Remarks Calculations Results

COUNT AS uCi/L
USE 13,14,15 OR 16
SAM

WHC-SD-WM-DP-062, REV. 0

5.17E-2 uci/ml

C Johnson

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
	1-8-94			

Date	Time Completed	Lab Unit Mgr
1/7/94	1045	

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

AT: LA-508-101 (D-0) LIQUIDS

Serial No.			SAMPLE	REPLICATE
J1446-5725	DETECTOR NUMBER		13	13
Batch ID	DISH SIZE 1, 2, or 5	(MS)	2	2
2514	TOTAL COUNTS	(TC)	73819	86279
AT or TB ?	COUNT TIME in MINUTES	(CT)	30	30
AT	BACKGROUND in cpm	(BKG)	1	1
Rerun No.	SAMPLE SIZE in mL	(SS)	0.100	0.100
0	DILUTION FACTOR	(DF)	1	1
Analyst	DIGEST DILUTION FACTOR	(DDF)	1	1
C JOHNSON	EFFICIENCY FACTOR	(EFF)	0.2322	0.2322
Date	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE		2459.633	2874.967
01/07/94	SAMPLE CONCENTRATION in µCi/L		4.77E+01	5.58E+01
	AVG. µCi/L in SAMPLE and REPLICATE =			5.1744E+01

Rs (Sample Count Rate) = (TC / CT) - BKG

ALPHA TOTAL µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

ALPHA TOTAL µCi/mL = ALPHA TOTAL µCi/L / 1000mL/L

Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100

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

ALPHA TOTAL	in µCi/L (AVERAGE) =	5.17E+01	DETECTION LEVEL
ALPHA TOTAL	in µCi/mL (AVERAGE) =	5.17E-02	2.87E-05 µCi/mL
RELATIVE COUNTING ERROR	=	0.7%	

Data Entry by:	DA Clark	Date:	11-Jan-94
Approved by:		Date:	13-Jan-94

Form 1 Rev. 1.2

TOTAL ALPHA ANALYSIS - UNDIGESTED SAMPLE

13/2 1-8-94 AJ

J1446-5725

73819 - 1.0
30

86279
30

```
Alpha Calculation          (CRPC_CAL 2.0)
By: MC BIKKMAN,       on 01-08-1994 at 10:08:10
Det #13   2 -inch mount    Alpha eff. : .2322
Sample size :  .1  mL      Dilution :  1

 Sample # J 1446-5725      Mount # 1

   73619
 ----------  -   1.0  =  4.7715E+01 uCi/L  alpha
    30

 Sample # J 1446-5725      Mount # 2

   86279
 ----------  -   1.0  =  5.5772E+01 uCi/L  alpha
    30
```

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

3 & 4

Serial No	Sample Point	Date	Time Issued	Priority
J 1446.-5725	RECHOLD	1- 4-94	12:38	38

Determination	Method Standard	Result Units	Charge Code	Reruns
AT	LA-508-101	uCi/ML	E14157	0

Sample Size	Customer ID
? ,100 ml	KE83D

Remarks, Calculations, Results

COUNT AS uCI/L
USE 13,14,15 OR 16
DUP

WHC-SD-WM-DP-062, REV. 0

$5.14E^{-2}$ uci/ml

C Johnson

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
	1-8-94			

Date	Time Completed	Lab Unit Mgr
1/7/94	1245	

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

AT: LA-508-101 (D-0) LIQUIDS

Serial No.			SAMPLE	REPLICATE
	DETECTOR NUMBER		13	13
J1446-5725	DISH SIZE 1, 2, or 5	(MS)	2	2
Batch ID	TOTAL COUNTS	(TC)	75634	83425
2514	COUNT TIME in MINUTES	(CT)	30	30
AT or TB ?	BACKGROUND in cpm	(BKG)	1	1
AT	SAMPLE SIZE in mL	(SS)	0.100	0.100
Rerun No.	DILUTION FACTOR	(DF)	1	1
0	DIGEST DILUTION FACTOR	(DDF)	1	1
Analyst	EFFICIENCY FACTOR	(EFF)	0.2322	0.2322
C JOHNSON	Lc, Rmax, or Ps, (SAMPLE RATE) as APPROPRIATE		2520.133	2779.833
Date	SAMPLE CONCENTRATION in µCi/L		4.89E+01	5.39E+01
01/07/94	AVG. µCi/L in SAMPLE and REPLICATE =			5.1408E+01

Ps (Sample Count Rate) = (TC / CT) - BKG
ALPHA TOTAL µCi/L = Ps * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)
ALPHA TOTAL µCi/mL = ALPHA TOTAL µCi/L / 1000mL/L
Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100
Detection Levels and Less Than Values are determined from Procedure LA-508-002.

			DETECTION LEVEL
ALPHA TOTAL	in µCi/L (AVERAGE) =	5.14E+01	
ALPHA TOTAL	in µCi/mL (AVERAGE) =	5.14E-02	2.87E-05 µCi/mL
RELATIVE COUNTING ERROR	=	0.7%	

Data Entry by:	C Johnson	Date:	11-Jan-94
Approved by:		Date:	13-Jan-94

Form 1 Rev. 1.2

TOTAL ALPHA ANALYSIS - UNDIGESTED SAMPLE

13/2 1-8-94 AG . J1446-5725

75634/30 - 1.

83425/30

Alpha Calculation (CRPC_CAL 2.0)
By: MC BIERMAN, on 01-08-1994 at 10:08:56
Det #13 2 -inch mount Alpha eff. : .2322
Sample size : .1 mL Dilution : 1

Sample # J 1446-5725 Mount # 1

$$\frac{75634}{30} - 1.0 = 4.8889E+01 \text{ uCi/L alpha}$$

Sample # J 1446-5725 Mount # 2

$$\frac{83425}{30} - 1.0 = 5.3927E+01 \text{ uCi/L alpha}$$

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

586

Serial No	Sample Point	Date	Time Issued	Priority
J 1446-5725	BSCHTOLD .	1- 4-94	12:26	26

Determination	Method/Standard	Result Units	Charge Code	Reruns
AT	LA-508-101	µCi/ML	E14157	0

Sample Size	Customer ID
.100 ml	KE83D

Remarks Calculations, Results

COUNT AS µCi/L
USE 10,14,15 OR 16
TRIP

WHC-SD-WM-DP-062, REV. 0

$4.54E^{-2}$ µci/ml

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
	1-8-94			

Date	Time Completed	Lab Unit Mgr
1/7/94	1045	

54-6800-061 R 10 83)

AT: LA-508-101 (D-0) LIQUIDS

			SAMPLE	REPLICATE
Serial No.	DETECTOR NUMBER		13	13
J1446-5725	DISH SIZE 1, 2, or 5	(MS)	2	2
Batch ID	TOTAL COUNTS	(TC)	66927	73499
2514	COUNT TIME in MINUTES	(CT)	30	30
AT or TB ?	BACKGROUND in cpm	(BKG)	1	1
AT	SAMPLE SIZE in mL	(SS)	0.100	0.100
Rerun No.	DILUTION FACTOR	(DF)	1	1
0	DIGEST DILUTION FACTOR	(DDF)	1	1
Analyst	EFFICIENCY FACTOR	(EFF)	0.2322	0.2322
C JOHNSON	Lc, Rmax, or Rs (SAMPLE RATE) as APPROPRIATE		2229.900	2448.967
Date	SAMPLE CONCENTRATION in µCi/L		4.33E+01	4.75E+01
01/07/94	AVG. µCi/L in SAMPLE and REPLICATE =			4.5383E+01

Rs (Sample Count Rate) = (TC / CT) - BKG

ALPHA TOTAL µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

ALPHA TOTAL µCi/mL = ALPHA TOTAL µCi/L / 1000mL/L

Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100

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

		DETECTION LEVEL
ALPHA TOTAL in µCi/L (AVERAGE) =	4.54E+01	
ALPHA TOTAL in µCi/mL (AVERAGE) =	4.54E-02	
		2.87E-05 µCi/mL
RELATIVE COUNTING ERROR =	0.8%	

Data Entry by:		Date:	11-Jan-94
Approved by:		Date:	13-Jan-94

Form 1 Rev. 1.2

TOTAL ALPHA ANALYSIS - UNDIGESTED SAMPLE

13/2 1-8-94 AJ J1446-5725

66927 ~~73425~~ 1-8-94 -1.
30

73499
30

Alpha Calculation (CRPC_CAL 2.0)
By: MC BIERMAN, , on 01-08-1994 at 10:09:51
Pnt #13 2 -inch mount Alpha eff. : .2322
Sample size : .1 mL Dilution : 1

Sample # J 1446-5725 Mount # 1

$$\frac{66927}{30} - 1.0 = 4.3258E+01 \text{ uCi/L alpha}$$

Sample # J 1446-5725 Mount # 2

$$\frac{73499}{30} - 1.0 = 4.7508E+01 \text{ uCi/L alpha}$$

Batch 2574

WESTINGHOUSE HANFORD COMPANY

222-S LABORATORY

WHC-SD-WM-DP-062, REV. 0

ANALYTICAL BATCH

Lab Segment Serial No.	Customer ID:
[illegible]	KEJJB
Analysis: AT	Sample Prep: Direct

Instrument: WA 57276	Procedure/ Rev: LA-505-101 D-0
Technologist: [illegible]	Date: 1-21-94
Starting Time: 0800	Temperature [illegible]
Ending Time: 1500	Chemist: S. Fitzgerald

Comments: _____

	Description	Lab ID
1	STD	[illegible]
2	[illegible] Blank	[illegible]
3	[illegible]	[illegible]
4	[illegible]	[illegible]
5	[illegible]	[illegible]
6		
7		
8		
9		
10		

	Description	Lab ID
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
[illegible]	[illegible]			

ANALYTICAL BATCH SUMMARY SHEET

METHOD: **LA-508-101**

DATE START: **JANUARY 21, 1994**

PREPARED BY: **S.L. FITZGERALD**

DATE COMPLETE: **JANUARY 26, 1994**

	UNITS:	uCi/mL										
SPL NAME	SPL ID	ANALYTE	RESULT #1	RESULT #2	RESULT #3	AVERAGE	2*SD	PREC	ACCU	%REC	DET LIM	% CT ER
STD 129B51	J1439	ALPHA	8.97E-03							98.5	2.23E-07	5.4
BLANK	J1440	ALPHA	<9.26E-05								2.25E-04	500
KE83B	J1445	ALPHA	4.07E-01	4.23E-01	4.18E-01	4.16E-01	1.62E-02	3.89			2.25E-04	0.8
											2.25E-04	0.8
											2.25E-04	0.8

NARRATIVE: [X] NO SPECIAL PROBLEMS/METHOD VARIATIONS IN THIS BATCH

LIST SPECIFIC PROBLEMS/VARIATIONS FOR THIS BATCH:

Standard results are reported as uCi/L

This rerun was performed to check on possible beta sensitivity. None was found. AR 1-27-94

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

12 Batch 2574

Serial No	Sample Point	Date	Time Issued	Priority
J 1439-5525	BECHTOLD	1- 4-94	10:49	26

Determination	Method Standard	Result Units	Charge Code	Reruns
AT	LA-508-101	% RECOVERY	E14157	1

Sample Size	Customer ID
10mL	STD

Remarks Calculations Results

8510 EV-CRP

STD# 129B51 RESULT 8.97E-3

STD VAL 9.1046E-3 %REC 98.52%

WHC-SD-WM-DP-062, REV. 0

William K Syth

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	[signature]	D H Milicia		
Hrs	Hrs	Hrs	Hrs	1-25-94 K M Farland
Date 1-21-94	Time Completed 1500	Lab Unit Mgr [signature]		1-25-94 K M Farland

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

AT: LA-508-101 (D-0) LIQUIDS

			STANDARD	REPLICATE
Serial No.	DETECTOR NUMBER		14	14
J1439-5525	DISH SIZE 1, 2, or 5	(MS)	2	2
Batch ID	TOTAL COUNTS	(TC)	1375	1372
2574	COUNT TIME in MINUTES	(CT)	30	30
AT or TB ?	BACKGROUND in cpm	(BKG)	0.5	0.5
AT	SAMPLE SIZE in mL	(SS)	10.000	10.000
Rerun No.	DILUTION FACTOR	(DF)	1	1
01	DIGEST DILUTION FACTOR	(DDF)	1	1
Analyst	EFFICIENCY FACTOR	(EFF)	0.2274	0.2274
W SYTH	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE		45.333	45.233
Date	SAMPLE CONCENTRATION in µCi/L		8.98E-03	8.96E-03
01/21/94	AVG. µCi/L in SAMPLE and REPLICATE =			8.9701E-03

S K McFarland 1-25-94

Rs (Sample Count Rate) = (TC / CT) – BKG

ALPHA TOTAL µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

ALPHA TOTAL µCi/mL = ALPHA TOTAL µCi/L / 1000mL/L

Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC – BKG * CT)] * 1.96 * 100

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

ALPHA TOTAL in µCi/L (AVERAGE) =	8.97E-03	DETECTION LEVEL 2.23E-07 µCi/mL
ALPHA TOTAL in µCi/mL (AVERAGE) =	8.97E-06	
RELATIVE COUNTING ERROR =	5.4%	

Data Entry by:	[signature]	Date:	24-Jan-94
Approved by:	[signature]	Date:	26-Jan-94

Form 1 Rev. 1.2 Page 1 of 1

TOTAL ALPHA ANALYSIS - UNDIGESTED SAMPLE

14/2 1-21-94 MS

J 1439-5525

1375 - .5
30

1372
30

Alpha Calculation (CEPC_CAL 2.0)
By: DH MILICIA, on 01-22-1994 at 03:33:37
Det #14 2 -inch mount Alpha eff. : .2274
Sample size : 10 mL Dilution : 1

Sample # J-1439 Mount # 1

$$\frac{1375}{30} - 0.5 = 8.9800E\text{-}03 \text{ uCi/L alpha}$$

Sample # J-1439 Mount # 2

$$\frac{1372}{30} - 0.5 = 8.9601E\text{-}03 \text{ uCi/L alpha}$$

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

34

Serial No	Sample Point	Date	Time Issued	Priority
J 1440.-5625	BECHTOLD	1- 4-94	10:[illegible]	[illegible]

Determination	Method Standard	Result Units	Charge Code	Reruns
AT	LA-508-101	µCi/ML	E14157	1

Sample Size	Customer ID
.100-10-1ml	BLANK

Remarks, Calculations, Results

COUNT AS µCI/L
USE 13,14,15 OR 16

WHC-SD-WM-DP-062, REV. 0

< 9.26×10^{-5} uCi/ml

William K Syth

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	[signature]	D.H Milicia		
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	Reviewed	
1-21-94	1500	[signature]		1-25-94 [signature]

54-6800-061 R-10-831

AT: LA-508-101 (D-0) LIQUIDS

			BLANK	REPLICATE
Serial No.	DETECTOR NUMBER		14	14
J1440-5625	DISH SIZE 1, 2, or 5	(MS)	2	2
Batch ID	TOTAL COUNTS	(TC)	15	16
2574	COUNT TIME in MINUTES	(CT)	30	30
AT or TB ?	BACKGROUND in cpm	(BKG)	0.5	0.5
AT	SAMPLE SIZE in mL	(SS)	1.000	1.000
Rerun No.	DILUTION FACTOR	(DF)	101	101
1	DIGEST DILUTION FACTOR	(DDF)	1	1
Analyst	EFFICIENCY FACTOR	(EFF)	0.2274	0.2274
W SYTH	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE		0.426	0.463
Date	SAMPLE CONCENTRATION in µCi/L		8.52E-02	9.26E-02
01/21/94	AVG. µCi/L in SAMPLE and REPLICATE =		<	8.8923E-02

Rs (Sample Count Rate) = (TC / CT) - BKG

ALPHA TOTAL µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

ALPHA TOTAL µCi/mL = ALPHA TOTAL µCi/L / 1000mL/L

Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100

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

ALPHA TOTAL in µCi/L (AVERAGE) =	< 9.26E-02		DETECTION LEVEL
ALPHA TOTAL in µCi/mL (AVERAGE) =	< 9.26E-05		
LESS THAN Value was Determined from Rmax.			2.25E-04 µCi/mL
RELATIVE COUNTING ERROR =	500.0%		

Data Entry by:	[signature]	Date:	25-Jan-94
Approved by:	[signature]	Date:	26-Jan-94

Form 1 Rev. 1.2

TOTAL ALPHA ANALYSIS - UNDIGESTED SAMPLE

14/2 1-21-94 MB J-1440 - 5625

15/30 - .5

16/30

Alpha Calculation (CRPC_CAL 2.0)
By: DH MILICIA, , on 01-22-1994 at 03:34:22
Det #14 2 -inch mount Alpha eff. : .2274
Sample size : 1 mL Dilution : 101

Sample # J-1440 Mount # 1

15
---------- - 0.5 < 6.0270E-02 uCi/L alpha
30

Sample # J-1440 Mount # 2

16
---------- - 0.5 < 6.7935E-02 uCi/L alpha
30

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

5 6 1,2

Serial No	Sample Point	Date	Time Issued	Priority
J 1445.-5725	BECHTOLD	1- 4-94	12: 3	26

Determination	Method Standard	Result Units	Charge Code	Reruns
AT	LA-508-101	uCi/ML	E14157	1

Sample Size	Customer ID
.1 ml - 10. ml - 1. ml	KE83B

Remarks Calculations Results

COUNT AS uCI/L
USE 13,14,15 OR 16
SAM

WHC-SD-WM-DP-062, REV. 0

4.07 x 10⁻¹ uCi/ml

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	[signature]	D.H. [signature]		
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1-21-94	1500	[signature]	1-25-94 [signature]

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

AT: LA-508-101 (D-0) LIQUIDS

			SAMPLE	REPLICATE
Serial No.	DETECTOR NUMBER		14	14
J1445-5725	DISH SIZE 1, 2, or 5	(MS)	2	2
Batch ID	TOTAL COUNTS	(TC)	59497	62632
2574	COUNT TIME in MINUTES	(CT)	30	30
AT or TB ?	BACKGROUND in cpm	(BKG)	0.5	0.5
AT	SAMPLE SIZE in mL	(SS)	1.000	1.000
Rerun No.	DILUTION FACTOR	(DF)	101	101
Ø 1	DIGEST DILUTION FACTOR	(DDF)	1	1
Analyst	EFFICIENCY FACTOR	(EFF)	0.2274	0.2274
W SYTH	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE		1982.733	2087.233
Date	SAMPLE CONCENTRATION in µCi/L		3.97E+02	4.18E+02
01/21/94	AVG. µCi/L in SAMPLE and REPLICATE =			4.0714E+02

SKM [signature] 1-25-94

Rs (Sample Count Rate) = (TC / CT) - BKG
ALPHA TOTAL µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)
ALPHA TOTAL µCi/mL = ALPHA TOTAL µCi/L / 1000mL/L
Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100
Detection Levels and Less Than Values are determined from Procedure LA-508-002.

ALPHA TOTAL in µCi/L (AVERAGE) =	4.07E+02	DETECTION LEVEL 2.25E-04 µCi/mL
ALPHA TOTAL in µCi/mL (AVERAGE) =	4.07E-01	
RELATIVE COUNTING ERROR =	0.8%	

Data Entry by:	[signature]	Date:	24-Jan-94
Approved by:	[signature]	Date:	26-Jan-94

Form 1 Rev. 1.2

TOTAL ALPHA ANALYSIS - UNDIGESTED SAMPLE

14/2 1-21-94 MB3 J1445-5725

59497/30 - 62632/30

Alpha Calculation (CRPC_CAL 2.0)
By: SH MILICIA, on 01-22-1994 at 03:36:09
Det #14 2-inch mount Alpha eff. : .2274
Sample size : 1 mL Dilution : 101

Sample # J-1445 Mount # 1

$$\frac{59497}{30} - 0.5 = 3.9668E+02 \text{ uCi/L alpha}$$

Sample # J-1445 Mount # 2

$$\frac{62632}{30} - 0.5 = 4.1759E+02 \text{ uCi/L alpha}$$

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

3,4

Serial No	Sample Point	Date	Time Issued	Priority
J 1445.-5725	BECHTOLD	1- 4-94	12: 3	26

Determination	Method Standard	Result Units	Charge Code	Reruns
AT	LA-508-101	uCi/ML	E14157	1

SKMcFarland 1-25-94

Sample Size	Customer ID
.1 ml - 10. ml - 1. ml	KE83B

Remarks, Calculations, Results

COUNT AS uCI/L
USE 13,14,15 OR 16
DUP

WHC-SD-WM-DP-062, REV. 0

4.23 x 10⁻⁵ uCi/ml

William K Syth

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	[signature]	D.H. Malicia		
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1-21-94	1500	[signature]	1-25-94 SK McFarland

54-6800-061 R-10-831

AT: LA-508-101 (D-0) LIQUIDS

			SAMPLE	REPLICATE
Serial No.	DETECTOR NUMBER		14	14
J1445-5725	DISH SIZE 1, 2, or 5	(MS)	2	2
Batch ID	TOTAL COUNTS	(TC)	61650	65203
2574	COUNT TIME in MINUTES	(CT)	30	30
AT or TB ?	BACKGROUND in cpm	(BKG)	0.5	0.5
AT	SAMPLE SIZE in mL	(SS)	1.000	1.000
Rerun No.	DILUTION FACTOR	(DF)	101	101
01	DIGEST DILUTION FACTOR	(DDF)	1	1
Analyst	EFFICIENCY FACTOR	(EFF)	0.2274	0.2274
W SYTH	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE		2054.500	2172.933
Date	SAMPLE CONCENTRATION in µCi/L		4.11E+02	4.35E+02
01/21/94	AVG. µCi/L in SAMPLE and REPLICATE =			4.2289E+02

SKMcFarland 1-25-94

Rs (Sample Count Rate) = (TC / CT) - BKG
ALPHA TOTAL µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)
ALPHA TOTAL µCi/mL = ALPHA TOTAL µCi/L / 1000mL/L
Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100
Detection Levels and Less Than Values are determined from Procedure LA-508-002.

ALPHA TOTAL in µCi/L (AVERAGE) =	4.23E+02	DETECTION LEVEL 2.25E-04 µCi/mL
ALPHA TOTAL in µCi/mL (AVERAGE) =	4.23E-01	
RELATIVE COUNTING ERROR =	0.8%	

Data Entry by:	[signature]	Date:	24-Jan-94
Approved by:	[signature]	Date:	26-Jan-94

Form 1 Rev. 1.2

TOTAL ALPHA ANALYSIS - UNDIGESTED SAMPLE

14/2 1-21-94 WB.

J1445-5725

$\frac{61650}{30}$ -

Alpha Calculation (CRPC_CAL 2.0)
By: DH MILICIA, , on 01-22-1994 at 03:36:37
Det #14 2 -inch mount Alpha eff. : .2274
Sample size : 1 mL Dilution : 101

$\frac{65203}{30}$

Sample # J-1445 Mount # 1

$$\frac{61650}{30} - 0.5 = 4.1104E+02 \text{ uCi/L alpha}$$

Sample # J-1445 Mount # 2

$$\frac{65203}{30} - 0.5 = 4.3473E+02 \text{ uCi/L alpha}$$

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

~~gms~~ 5,6

Serial No	Sample Point	Date	Time Issued	Priority
J 1445.-5725	BECKHOLD	1- 4-94	10: 8	2

Determination	Method Standard	Result Units	Charge Code	Reruns
AT	LA-508-101	uCi/ML	E14157	1

SKM Forland 1-25-94

Sample Size: .1 ml - 10. ml - 1. ml

Customer ID: KE65B

Remarks Calculations Results

[illegible] AS ATT [illegible] PER LA-[illegible]-[illegible] TR 1B

TRIP

WHC-SD-WM-DP-062, REV. 0

4.18 X 10^2 uCi/ml

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
1-27-94	1500	1-25-94

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

AT: LA-508-101 (D-0) LIQUIDS

Serial No.		SAMPLE	REPLICATE
	DETECTOR NUMBER	14	14
J1445-5725	DISH SIZE 1, 2, or 5 (MS)	2	2
Batch ID	TOTAL COUNTS (TC)	62488	62974
2574	COUNT TIME in MINUTES (CT)	30	30
AT or TB ?	BACKGROUND in cpm (BKG)	0.5	0.5
AT	SAMPLE SIZE in mL (SS)	1.000	1.000
Rerun No.	DILUTION FACTOR (DF)	101	101
01	DIGEST DILUTION FACTOR (DDF)	1	1
Analyst	EFFICIENCY FACTOR (EFF)	0.2274	0.2274
W SYTH	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	2082.433	2098.633
Date	SAMPLE CONCENTRATION in µCi/L	4.17E+02	4.20E+02
01/21/94	AVG. µCi/L in SAMPLE and REPLICATE =		4.1825E+02

SKM Forland 1-25-94

Rs (Sample Count Rate) = (TC / CT) - BKG

ALPHA TOTAL µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

ALPHA TOTAL µCi/mL = ALPHA TOTAL µCi/L / 1000mL/L

Relative Counting Error = ((The Square Root of TC + BKG * CT) / (TC - BKG * CT)) * 1.96 * 100

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

ALPHA TOTAL in µCi/L (AVERAGE) =	4.18E+02	
ALPHA TOTAL in µCi/mL (AVERAGE) =	4.18E-01	DETECTION LEVEL 2.25E-04 µCi/mL
RELATIVE COUNTING ERROR =	0.8%	

Data Entry by:	R Abel	Date:	24-Jan-94
Approved by:	[illegible]	Date:	26-Jan-94

Form 1 Rev. 1.2

TOTAL ALPHA ANALYSIS - UNDIGESTED SAMPLE

14/2 1-21-94 MS J1445-5725

62488
30

62974
30

Alpha Calculation (CRPC_CAL 2.0)
By: DH MILICIA, , on 01-22-1994 at 03:37:05
Det #14 2 -inch mount Alpha eff. : .2274
Sample size : 1 mL Dilution : 101

Sample # J-1445 Mount # 1

$$\frac{62488}{30} - 0.5 = 4.1663E+02 \text{ uCi/L alpha}$$

Sample # J-1445 Mount # 2

$$\frac{62374}{30} - 0.5 = 4.1987E+02 \text{ uCi/L alpha}$$

WESTINGHOUSE HANFORD COMPANY

222-S LABORATORY

ANALYTICAL BATCH #2412

Lab Segment Serial No. J1424, J1425	Customer ID: KE 65D, KE 64A
Analysis: TB	Sample Prep: Direct Liquid

Instrument: WA 57276	Procedure/ Rev: LA 508-101 / Rev 0
Technologist: [illegible]	Date: 12 / 20 / 93
Starting Time: 1200	Temperature N/A
Ending Time: 1600	Chemist: S. Fitzgerald

Comments:

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	J1401-5520	11		
2	REAGENT BLANK	J1402-5520	12		
3	~~[illegible]~~	~~J1425~~	13		
4	sample	J1424-5520	14		
5	sample drop	J1424-5520	15		
6	sample trap	J1424-5520	16		
7	sample	J1425-5520	17		
8	sample drop	[illegible]	18		
9	sample trap	[illegible]	19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
[illegible]	119731 [illegible]			

A-6000-881 (03/92)

ANALYTICAL BATCH SUMMARY SHEET

METHOD: **LA-508-101**

DATE START: **DECEMBER 20, 1993**

PREPARED BY: **S.L. FITZGERALD**

DATE COMPLETE: **DECEMBER 27, 1993**

	UNITS:	uCi/mL										
SPL NAME	SPL ID	ANALYTE	RESULT #1	RESULT #2	RESULT #3	AVERAGE	2*SD	PREC	ACCU	%REC	DET LIM	% CT ER
STD 119B51	J1401	BETA	2.13E-01							92.9	7.46E-07	0.5
BLANK	J1402	BETA	<1.03E-04								7.46E-05	108
KE65D	J1424	BETA	2.28E-01	2.26E-01	2.13E-01	2.22E-01	1.83E-02	7.326			9.04E-05	0.3
											9.04E-05	0.3
											9.04E-05	0.3
KE64A	J1425	BETA	9.83E-01	1.01E+00	9.69E-01	9.87E-01	4.17E-02	4.222			9.04E-05	0.1
											9.04E-05	0.1
											9.04E-05	0.1

NARRATIVE: [X] NO SPECIAL PROBLEMS/METHOD VARIATIONS IN THIS BATCH

LIST SPECIFIC PROBLEMS/VARIATIONS FOR THIS BATCH:

Standard results are reported as uCi/L

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

1-2 Batch 2412

Serial No	Sample Point	Date	Time Issued	Priority
J 1401.-5520	BECHTOLD	12-15-93	9: 0	22

Determination	Method Standard	Result Units	Charge Code	Reruns
TB	LA-508-101	% RECOVERY	E14157	0

Sample Size	Customer ID
? 10ml	STD

Remarks, Calculations, Results

S515 EV-CRB

STD# 119B51 RESULT .213

STD VAL 2.29E-1 %REC 92.90

WHC-SD-WM-DP-062, REV. 0

C John

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	Em Bureau			
Hrs	Hrs	Hrs	Hrs	Hrs
			E.C.	

Date	Time Completed	Lab Unit Mgr	
12/20/93	1600	[signature]	E.C.

54-6800-061 (R-10 83)

TB: LA-508-101 (D-0) LIQUIDS

			STANDARD	REPLICATE
Serial No.	DETECTOR NUMBER		14	14
J1401-5520	DISH SIZE 1, 2, or 5	(MS)	2	2
Batch ID	TOTAL COUNTS	(TC)	43978	44337
2412	COUNT TIME in MINUTES	(CT)	30	30
AT or TB ?	BACKGROUND in cpm	(BKG)	16	16
TB	SAMPLE SIZE in mL	(SS)	10.000	10.000
Rerun No.	DILUTION FACTOR	(DF)	1	1
0	DIGEST DILUTION FACTOR	(DDF)	1	1
Analyst	EFFICIENCY FACTOR	(EFF)	0.3076	0.3076
C JOHNSON	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE		1449.933	1461.900
Date	SAMPLE CONCENTRATION in µCi/L		2.12E-01	2.14E-01
12/20/93	AVG. µCi/L in SAMPLE and REPLICATE =			2.1320E-01

Rs (Sample Count Rate) = (TC / CT) - BKG

TOTAL BETA µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

TOTAL BETA µCi/mL = TOTAL BETA µCi/L / 1000mL/L

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

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

TOTAL BETA in µCi/L (AVERAGE) =	2.13E-01	DETECTION LEVEL
TOTAL BETA in µCi/mL (AVERAGE) =	2.13E-04	7.46E-07 µCi/mL
RELATIVE COUNTING ERROR =	0.5%	

Data Entry by:	[signature]	Date:	22-Dec-93
Approved by:	[signature]	Date:	27-Dec-93

Form 1 Rev. 1.1 Page 1 of 1

TOTAL BETA ANALYSIS - UNDIGESTED SAMPLE

14/2

J1401-5520

43978
30

Beta Calculation (CRPC_CAL 2.0)
By: EM BARELA, on 12-21-1993 at 10:13:21
Det.# 62 -inch mount Beta eff. : .3076
Sample size : 10 mL Dilution : 1

Sample # J1401 Mount # 1

44337
30

43978
---------- - 16.0 = 2.1233E-01 uCi/L beta
30

Sample # J1401 Mount # 2

44337
---------- - 16.0 = 2.1408E-01 uCi/L beta
30

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

3-4

Serial No	Sample Point	Date	Time Issued	Priority
J 1402-5620	BECHTOLD	12-15-93	9: 4	22

Determination	Method Standard	Result Units	Charge Code	Reruns
TB	LA-508-101	uCi/ML	E14157	0

Sample Size	Customer ID
? .100 ml	BLK

Remarks Calculations Results

COUNT AS uCI/L
USE 13,14,15 OR 16

WHC-SD-WM-DP-062, REV. 0

$< 1.03 \times 10^{-4}$ uCi/ml

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
12/20/93	1600		

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

TB: LA-508-101 (D-0) LIQUIDS

Serial No.			BLANK	REPLICATE
J1402-5620	DETECTOR NUMBER		14	14
Batch ID	DISH SIZE 1, 2, or 5	(MS)	2	2
2412	TOTAL COUNTS	(TC)	691	509
AT or TB ?	COUNT TIME in MINUTES	(CT)	30	30
TB	BACKGROUND in cpm	(BKG)	16	16
Rerun No.	SAMPLE SIZE in mL	(SS)	0.100	0.100
0	DILUTION FACTOR	(DF)	1	1
Analyst	DIGEST DILUTION FACTOR	(DDF)	1	1
C JOHNSON	EFFICIENCY FACTOR	(EFF)	0.3076	0.3076
Date	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE		7.033	3.395
12/20/93	SAMPLE CONCENTRATION in µCi/L		1.03E-01	4.97E-02
	AVG. µCi/L in SAMPLE and REPLICATE =		<	7.6355E-02

Rs (Sample Count Rate) = (TC / CT) - BKG

TOTAL BETA µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

TOTAL BETA µCi/mL = TOTAL BETA µCi/L / 1000mL/L

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

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

		DETECTION LEVEL
TOTAL BETA in µCi/L (AVERAGE) =	< 1.03E-01	
TOTAL BETA in µCi/mL (AVERAGE) =	< 1.03E-04	
LESS THAN Value was Determined from Rs.		7.46E-05 µCi/mL
RELATIVE COUNTING ERROR =	108.4%	

Data Entry by:	Date:	22-Dec-93
Approved by:	Date:	27-Dec-93

Form 1 Rev. 1.1

TOTAL BETA ANALYSIS - UNDIGESTED SAMPLE

14/2

J1425-5720

680888
10

694364
10

Beta Calculation (CRPC_CAL 2.0)
By: EM BARELA, ., on 12-21-1993 at 10:18:44
Det # 6 2 -inch mount Beta eff. : .3076
Sample size : 1 mL Dilution : 10

Sample # J1425 Mount # 1

$$\frac{680888}{10} - 16.0 = 9.9686E+02 \text{ uCi/L beta}$$

Sample # J1425 Mount # 2

$$\frac{694364}{10} - 16.0 = 1.0166E+03 \text{ uCi/L beta}$$

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

5-6

Serial No	Sample Point	Date	Time Issued	Priority
J 1424.-5720	BECHTOLD	12-16-93	13: 7	22

Determination	Method Standard	Result Units	Charge Code	Reruns
TB	LA-508-101	uCi/ML	E14157	0

Sample Size	Customer ID
?.100ml	KE65D

Remarks Calculations Results

COUNT AS uCI/L
USE 13,14,15 OR 16

Sam

WHC-SD-WM-DP-062, REV. 0

2.28×10^{-1} uCi/ml

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	Em Bauer			
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr.	
12/20/93	1600		E. Cant

54-6800-061 (R-10 83)

TB: LA-508-101 (D-0) LIQUIDS

			SAMPLE	REPLICATE
Serial No.	DETECTOR NUMBER		14	14
J1424-5720	DISH SIZE 1, 2, or 5	(MS)	2	2
Batch ID	TOTAL COUNTS	(TC)	157702	154600
2412	COUNT TIME in MINUTES	(CT)	10	10
AT or TB ?	BACKGROUND in cpm	(BKG)	16	16
TB	SAMPLE SIZE in mL	(SS)	0.100	0.100
Rerun No.	DILUTION FACTOR	(DF)	1	1
0	DIGEST DILUTION FACTOR	(DDF)	1	1
Analyst	EFFICIENCY FACTOR	(EFF)	0.3076	0.3076
C JOHNSON	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE		15754.200	15444.000
Date	SAMPLE CONCENTRATION in µCi/L		2.31E+02	2.26E+02
12/20/93	AVG. µCi/L in SAMPLE and REPLICATE =			2.2843E+02

Rs (Sample Count Rate) = (TC / CT) - BKG

TOTAL BETA µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

TOTAL BETA µCi/mL = TOTAL BETA µCi/L / 1000mL/L

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

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

TOTAL BETA	in µCi/L	(AVERAGE) =	2.28E+02
TOTAL BETA	in µCi/mL	(AVERAGE) =	2.28E-01
RELATIVE COUNTING ERROR		=	0.3%

DETECTION LEVEL

9.04E-05 µCi/mL

Data Entry by:		Date:	22-Dec-93
Approved by:		Date:	27-Dec-93

Form 1 Rev. 1.1

Page 1 of 1

TOTAL BETA ANALYSIS - UNDIGESTED SAMPLE

14/2

J1424-5720

157702
10

154600
10

Beta Calculation (CRPC_CAL 2.0)
By: EM BARELA, , on 12-21-1993 at 10:19:15
Det #14 2 -inch mount Beta eff. : .3076
Sample size : 1 mL Dilution : 10

Sample # J1424 Mount # 1

157702
---------- - 16.0 = 2.3071E+02 uCi/L beta
10

Sample # J1424 Mount # 2

154600
---------- - 16.0 = 2.2616E+02 uCi/L beta
10

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

7-8

Serial No	Sample Point	Date	Time Issued	Priority
J 1424.-5720	BECHTOLD	12-16-93	13: 7	22

Determination	Method Standard	Result Units	Charge Code	Reruns
TB	LA-508-101	uCi/ML	E14157	0

Sample Size	Customer ID
?,100 ml	KE65D

Remarks, Calculations, Results

COUNT AS uCI/L
USE 13,14,15 OR 16

DP

WHC-SD-WM-DP-062, REV. 0

2.26×10^{-4} uCi/ml

C Johnson

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab/Unit Mgr.	
12/20/93	1600		EC

54-6800-061 R-10-83)

TB: LA-508-101 (D-0) LIQUIDS

Serial No.			SAMPLE	REPLICATE
J1424-5720	DETECTOR NUMBER		14	14
Batch ID	DISH SIZE 1, 2, or 5	(MS)	2	2
2412	TOTAL COUNTS	(TC)	154028	155067
AT or TB ?	COUNT TIME in MINUTES	(CT)	10	10
TB	BACKGROUND in cpm	(BKG)	16	16
Rerun No.	SAMPLE SIZE in mL	(SS)	0.100	0.100
0	DILUTION FACTOR	(DF)	1	1
Analyst	DIGEST DILUTION FACTOR	(DDF)	1	1
C JOHNSON	EFFICIENCY FACTOR	(EFF)	0.3076	0.3076
Date	Ic, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE		15386.800	15490.700
12/20/93	SAMPLE CONCENTRATION in µCi/L		2.25E+02	2.27E+02
	AVG. µCi/L in SAMPLE and REPLICATE =			2.2609E+02

Rs (Sample Count Rate) = (TC / CT) - BKG

TOTAL BETA µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

TOTAL BETA µCi/mL = TOTAL BETA µCi/L / 1000mL/L

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

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

			DETECTION LEVEL
TOTAL BETA	in µCi/L (AVERAGE) =	2.26E+02	
TOTAL BETA	in µCi/mL (AVERAGE) =	2.26E-01	9.04E-05 µCi/mL
RELATIVE COUNTING ERROR	=	0.3%	

Data Entry by:		Date:	22-Dec-93
Approved by:		Date:	27-Dec-93

Form 1 Rev. 1.1

TOTAL BETA ANALYSIS - UNDIGESTED SAMPLE

14/2

J1424-5720

Beta Calculation (CRPC_CAL 2.0)
By: EM BARELA, , on 12-21-1993 at 10:19:44
Det #14 2 -inch mount Beta eff. : .3076
Sample size : 1 mL Dilution : 10

154028 / 10 = 16.0

Sample # J1424 Mount # 1

154028
---------- = 16.0 = 2.2532E+02 uCi/L beta
10

155067 / 10

Sample # J1424 Mount # 2

155067
---------- = 16.0 = 2.2685E+02 uCi/L beta
10

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

9-10

Serial No	Sample Point	Date	Time Issued	Priority
J 1424.-5720	BECHTOLD	12-16-93	13: 7	22

Determination	Method Standard	Result Units	Charge Code	Reruns
TB	LA-508-101	uCi/ML	E14157	0

Sample Size	Customer ID
? .100 ml	KE65D

Remarks, Calculations, Results

COUNT AS uCI/L
USE 13,14,15 OR 16

TRIP

WHC-SD-WM-DP-062, REV. 0

2.13 x 10² uCi/ml

C Johnson

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	Em Bowles			
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr.	
12/20/93	1600		

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

TB: LA-508-101 (D-0) LIQUIDS

Serial No.		SAMPLE	REPLICATE
J1424-5720	DETECTOR NUMBER	14	14
Batch ID	DISH SIZE 1, 2, or 5 (MS)	2	2
2412	TOTAL COUNTS (TC)	149202	142521
AT or TB ?	COUNT TIME in MINUTES (CT)	10	10
TB	BACKGROUND in cpm (BKG)	16	16
Rerun No.	SAMPLE SIZE in mL (SS)	0.100	0.100
0	DILUTION FACTOR (DF)	1	1
Analyst	DIGEST DILUTION FACTOR (DDF)	1	1
C JOHNSON	EFFICIENCY FACTOR (EFF)	0.3076	0.3076
Date	Lc, Rmax, or Rs (SAMPLE RATE) as APPROPRIATE	14904.200	14236.100
12/20/93	SAMPLE CONCENTRATION in µCi/L	2.18E+02	2.08E+02
	AVG. µCi/L in SAMPLE and REPLICATE =		2.1337E+02

Rs (Sample Count Rate) = (TC / CT) - BKG

TOTAL BETA µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

TOTAL BETA µCi/mL = TOTAL BETA µCi/L / 1000mL/L

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

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

		DETECTION LEVEL
TOTAL BETA in µCi/L (AVERAGE) =	2.13E+02	
TOTAL BETA in µCi/mL (AVERAGE) =	2.13E-01	
		9.04E-05 µCi/mL
RELATIVE COUNTING ERROR =	0.3%	

Data Entry by:	R Arms	Date:	22-Dec-93
Approved by:		Date:	27-Dec-93

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TOTAL BETA ANALYSIS - UNDIGESTED SAMPLE

14/2

J1424-5720

Beta Calculation (CRPC_CAL 2.0)
By: EM BARELA, , on 12-21-1993 at 10:16:24
Det #14 2 -inch mount Beta eff. : .3076
Sample size : 1 mL Dilution : 10

149202
10

Sample # J1424 Mount # 1

$$\frac{149202}{10} - 16.0 = 2.1826E+02 \text{ uCi/L beta}$$

142521
10

Sample # J1424 Mount # 2

$$\frac{142521}{10} - 16.0 = 2.0847E+02 \text{ uCi/L beta}$$

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

1-2

Serial No	Sample Point	Date	Time Issued	Priority
J 1425.-5720	BECHTOLD	12-16-93	13:17	22

Determination	Method Standard	Result Units	Charge Code	Reruns
TB	LA-508-101	uCi/ML	E14157	0

Sample Size	Customer ID
? .100 ml	KE64A

Remarks Calculations Results

COUNT AS uCI/L
USE 13,14,15 OR 16

5 pm

WHC-SD-WM-DP-062, REV. 0

9.83×10^{1} uCi/ml

C Johnson

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst 5
	Em Bares			
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
12/20/93	1600		E.C.

54 6800-061 R-10-831

TB: LA-508-101 (D-0) LIQUIDS

Serial No.			SAMPLE	REPLICATE
J1425-5720	DETECTOR NUMBER		14	14
Batch ID	DISH SIZE 1, 2, or 5	(MS)	2	2
2412	TOTAL COUNTS	(TC)	675090	667536
AT or TB ?	COUNT TIME in MINUTES	(CT)	10	10
TB	BACKGROUND in cpm	(BKG)	16	16
Rerun No.	SAMPLE SIZE in mL	(SS)	0.100	0.100
0	DILUTION FACTOR	(DF)	1	1
Analyst	DIGEST DILUTION FACTOR	(DDF)	1	1
C JOHNSON	EFFICIENCY FACTOR	(EFF)	0.3076	0.3076
Date	Lc, Rmax, or Rs (SAMPLE RATE) as APPROPRIATE		67493.000	66737.600
12/20/93	SAMPLE CONCENTRATION in µCi/L		9.88E+02	9.77E+02
	AVG. µCi/L in SAMPLE and REPLICATE =			9.8284E+02

Rs (Sample Count Rate) = (TC / CT) - BKG

TOTAL BETA µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

TOTAL BETA µCi/mL = TOTAL BETA µCi/L / 1000mL/L

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

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

TOTAL BETA	in µCi/L (AVERAGE) =	9.83E+02	DETECTION LEVEL
TOTAL BETA	in µCi/mL (AVERAGE) =	9.83E-01	9.04E-05 µCi/mL
RELATIVE COUNTING ERROR	=	0.1%	

Data Entry by:		Date:	22-Dec-93
Approved by:		Date:	27-Dec-93

Form 1 Rev. 1.1

TOTAL BETA ANALYSIS - UNDIGESTED SAMPLE

14/2

J1425-5720

675090
10

667536
10

Beta Calculation (CRPC_CAL 2.0)
By: EM BARELA, , on 12-21-1993 at 10:18:14
Det #16 2 -inch mount Beta eff. : .3076
Sample size : 1 mL Dilution : 10

Sample # J1425 Mount # 1

675090
---------- - 16.0 = 9.8837E+02 uCi/L beta
10

Sample # J1425 Mount # 2

667536
---------- - 16.0 = 9.7731E+02 uCi/L beta
10

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

3-4

Serial No	Sample Point	Date	Time Issued	Priority
J 1425.-5720	BECHTOLD	12-16-93	13:17	22

Determination	Method-Standard	Result Units	Charge Code	Reruns
TB	LA-508-101	uCi/ML	E14157	0

Sample Size	Customer ID
?.100 ml	KE64A

Remarks Calculations Results

COUNT AS uCI/L
USE 13,14,15 OR 16

DUP

WHC-SD-WM-DP-062, REV. 0

1.01 uCi/ml

C Johnson

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	Em Barela			
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
12/20/93	1600		

54-6800-061 (R 10-83)

TB: LA-508-101 (D-0) LIQUIDS

Serial No.			SAMPLE	REPLICATE
J1425-5720	DETECTOR NUMBER		14	14
Batch ID	DISH SIZE 1, 2, or 5	(MS)	2	2
2412	TOTAL COUNTS	(TC)	680888	694364
AT or TB ?	COUNT TIME in MINUTES	(CT)	10	10
TB	BACKGROUND in cpm	(BKG)	16	16
Rerun No.	SAMPLE SIZE in mL	(SS)	0.100	0.100
0	DILUTION FACTOR	(DF)	1	1
Analyst	DIGEST DILUTION FACTOR	(DDF)	1	1
C JOHNSON	EFFICIENCY FACTOR	(EFF)	0.3076	0.3076
Date	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE		68072.800	69420.400
12/20/93	SAMPLE CONCENTRATION in µCi/L		9.97E+02	1.02E+03
	AVG. µCi/L in SAMPLE and REPLICATE =			1.0067E+03

Rs (Sample Count Rate) = (TC / CT) - BKG

TOTAL BETA µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

TOTAL BETA µCi/mL = TOTAL BETA µCi/L / 1000mL/L

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

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

TOTAL BETA	in µCi/L (AVERAGE) =	1.01E+03	DETECTION LEVEL
TOTAL BETA	in µCi/mL (AVERAGE) =	1.01E+00	9.04E-05 µCi/mL
RELATIVE COUNTING ERROR	=	0.1%	

Data Entry by:	R White	Date:	22-Dec-93
Approved by:		Date:	22-Dec-93

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TOTAL BETA ANALYSIS - UNDIGESTED SAMPLE

14/2

691/30

509/30

J1402 5620

Beta Calculation (CRPC_CAL 2.0)
By: EM BARELA, on 12-21-1993 at 10:13:56
Det #14 2 -inch mount Beta eff. : .3076
Sample size : 1 mL Dilution : 10

Sample # J1402 Mount # 1

691
---------- - 16.0 = 1.0300E-01 uCi/L beta
30

Sample # J1402 Mount # 2

509
---------- - 16.0 < 3.9485E-02 uCi/L beta
30

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

Serial No	Sample Point	Date	Time Issued	Priority
J 1425.-5720	BECHTOLD	12-16-93	13:17	22

Determination	Method Standard	Result Units	Charge Code	Reruns
TB	LA-508-101	uCi/ML	E14157	0

Sample Size	Customer ID
? .100 ml	XE64A

Remarks Calculations Results

COUNT AS uCI/L
USE 13,14,15 OR 16

TOTP

WHC-SD-WM-DP-062, REV. 0

9.69×10^{-1} uCi/ml

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	Eric Bowles			
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
12/20/93	1600	

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

TB: LA-508-101 (D-0) LIQUIDS

Serial No.			SAMPLE	REPLICATE
J1425-5720	DETECTOR NUMBER		14	14
	DISH SIZE 1, 2, or 5	(MS)	2	2
Batch ID	TOTAL COUNTS	(TC)	663585	660575
2412	COUNT TIME in MINUTES	(CT)	10	10
AT or TB ?	BACKGROUND in cpm	(BKG)	16	16
TB	SAMPLE SIZE in mL	(SS)	0.100	0.100
Rerun No.	DILUTION FACTOR	(DF)	1	1
0	DIGEST DILUTION FACTOR	(DDF)	1	1
Analyst	EFFICIENCY FACTOR	(EFF)	0.3076	0.3076
C JOHNSON	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE		66342.500	66041.500
Date	SAMPLE CONCENTRATION in µCi/L		9.72E+02	9.67E+02
12/20/93	AVG. µCi/L in SAMPLE and REPLICATE =			9.6932E+02

Rs (Sample Count Rate) = (TC / CT) - BKG

TOTAL BETA µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

TOTAL BETA µCi/mL = TOTAL BETA µCi/L / 1000mL/L

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

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

			DETECTION LEVEL
TOTAL BETA	in µCi/L (AVERAGE) =	9.69E+02	
TOTAL BETA	in µCi/mL (AVERAGE) =	9.69E-01	
			9.04E-05 µCi/mL
RELATIVE COUNTING ERROR	=	0.1%	

Data Entry by:		Date:	22-Dec-93
Approved by:		Date:	27-Dec-93

Form 1 Rev. 1.1

TOTAL BETA ANALYSIS - UNDIGESTED SAMPLE

14/2

J1425-5720

663585/10

Beta Calculation (CRPC_CAL 2.0)
By: EM BARELA, , on 12-21-1993 at 10:34:28
Det #1/6 2 -inch mount Beta eff. : .3076
Sample size : 1 mL Dilution : 10

Sample # J1425 Mount # 1

660575/10

663585
---------- - 16.0 = 9.7152E+02 uCi/L beta
10

Sample # J1425 Mount # 2

660575
---------- - 16.0 = 9.6711E+02 uCi/L beta
10

WESTINGHOUSE HANFORD COMPANY **WHC-SD-WM-DP-062, REV. 0**

222-S LABORATORY

ANALYTICAL BATCH #2413

Lab Segment Serial No. J1426, J1427, J1425	Customer ID: KE65A, KE71A, KE72A
Analysis: TB	Sample Prep: Direct Liquid

Instrument: WA 45709	Procedure/ Rev: LA508-101/Rev D Ø
Technologist: Cynthia Johnson C. Johnson	Date: 12/20/93
Starting Time: 1200	Temperature N/A
Ending Time: 1600	Chemist: S Fitzgerald

Comments:

	Description	Lab ID		Description	Lab ID
1	INITIAL LMCS CHECK STD	J1415-5520	11	sample trip	J1426-5120
2	REAGENT BLANK	J1416 5620	12		
3	sample	J1426-5120	13		
4	sample deep	J1426-5120	14		
5	sample trip	J1426-5120	15		
6	sample	J1427-5120	16		
7	sample deep	J1427-5120	17		
8	sample trip	J1427-5120	18		
9	sample	J1428-5720	19		
10	sample deep	J1428-5720	20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS check std	119B51/10ml			

A-6000-881 (03/97)

ANALYTICAL BATCH SUMMARY SHEET

METHOD: LA-508-101

DATE START: DECEMBER 20, 1993

PREPARED BY: S.L. FITZGERALD

DATE COMPLETE: DECEMBER 27, 1993

	UNITS:	uCi/mL										
SPL NAME	SPL ID	ANALYTE	RESULT #1	RESULT #2	RESULT #3	AVERAGE	2*SD	PREC	ACCU	%REC	DET LIM	% CT ER
STD 119851	J1415	BETA	2.20E-01							95.9	1.00E-06	0.8
BLANK	J1416	BETA	<9.14E-05								1.00E-04	119
KE65A	J1426	BETA	5.80E-01	5.67E-01	5.60E-01	5.69E-01	2.03E-02	3.567			1.00E-04	0.2
											1.00E-04	0.2
											1.00E-04	0.2
KE71A	J1427	BETA	1.24E+00	1.27E+00	1.26E+00	1.26E+00	3.06E-02	2.431			1.00E-04	0.1
											1.70E-04	0.2
											1.70E-04	0.2
KE72A	J1428	BETA	3.61E-01	3.47E-01	3.58E-01	3.55E-01	1.47E-02	4.149			1.00E-04	0.2
											1.00E-04	0.2
											1.00E-04	0.2

NARRATIVE: [X] NO SPECIAL PROBLEMS/METHOD VARIATIONS IN THIS BATCH

LIST SPECIFIC PROBLEMS/VARIATIONS FOR THIS BATCH:

Standard results are reported as uCi/L

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

1-2 Bath 2413

Serial No	Sample Point	Date	Time Issued	Priority
J 1415.-5520	BECHTOLD	12-15-93	11:23	22

Determination	Method Standard	Result Units	Charge Code	Reruns
TB	LA-508-101	% RECOVERY	E14157	0

Sample Size	Customer ID
? 10ml	STD

Remarks Calculations Results

S515 EV-CRB

SID# 119351 RESULT 2.20E-1

STD VAL 2.29E-1 %REC 95.93

WHC-SD-WM-DP-062, REV. 0

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
			E.C	

Date	Time Completed	Lab Unit Mgr	
12/20/93	1600		E.C

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

TB: LA-508-101 (D-0) LIQUIDS

Serial No.		STANDARD	REPLICATE
	DETECTOR NUMBER	13	13
J1415-5520	DISH SIZE 1, 2, or 5 (MS)	2	2
Batch ID	TOTAL COUNTS (TC)	15834	16183
2413	COUNT TIME in MINUTES (CT)	10	10
AT or TB ?	BACKGROUND in cpm (BKG)	22	22
TB	SAMPLE SIZE in mL (SS)	10.000	10.000
Rerun No.	DILUTION FACTOR (DF)	1	1
0	DIGEST DILUTION FACTOR (DDF)	1	1
Analyst	EFFICIENCY FACTOR (EFF)	0.3240	0.3240
C JOHNSON	Lc, Rmax, or Rs (SAMPLE RATE) as APPROPRIATE	1561.400	1596.300
Date	SAMPLE CONCENTRATION in µCi/L	2.17E-01	2.22E-01
12/20/93	AVG. µCi/L in SAMPLE and REPLICATE =		2.1950E-01

Rs (Sample Count Rate) = (TC / CT) - BKG

TOTAL BETA µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

TOTAL BETA µCi/mL = TOTAL BETA µCi/L / 1000mL/L

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

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

			DETECTION LEVEL
TOTAL BETA	in µCi/L (AVERAGE) =	2.20E-01	
TOTAL BETA	in µCi/mL (AVERAGE) =	2.20E-04	1.00E-06 µCi/mL
RELATIVE COUNTING ERROR	=	0.8%	

Data Entry by:		Date:	21-Dec-93
Approved by:		Date:	27-Dec-93

Form 1 Rev. 1.1

13/2 12-20-93 DM J1415-5520

15834 - 22
10

16183
10

Beta Calculation (CRPC_CAL 2.0)
By: MC BIERMAN, on 12-20-1993 at 21:26:28
Det #13 2 -inch mount Beta eff. : .324
Sample size : 10 mL Dilution : 1

Sample # J 1415 Mount # 1

$$\frac{15834}{10} - 22.0 = 2.1708E\text{-}01 \text{ uCi/L beta}$$

Sample # J 1415 Mount # 2

$$\frac{16183}{10} - 22.0 = 2.2193E\text{-}01 \text{ uCi/L beta}$$

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

3-4

Serial No	Sample Point	Date	Time Issued	Priority
J 1416.-5620	BECHTOLD	12-15-93	11:24	22

Determination	Method/Standard	Result Units	Charge Code	Reruns
TB	LA-508-101	uCi/ML	E14157	0

Sample Size	Customer ID
? .100ml	BLK

Remarks, Calculations, Results

COUNT AS uCI/L
USE 13,14,15 OR 16

WHC-SD-WM-DP-062, REV. 0

< 9.14E-5 uCi/ml

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	DH Melissa	[signature]		
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
12/20/93	1600	[signature]	[signature]

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

TB: LA-508-101 (D-0) LIQUIDS

			BLANK	REPLICATE
Serial No.	DETECTOR NUMBER		13	13
J1416-5620	DISH SIZE 1, 2, or 5	(MS)	2	2
Batch ID	TOTAL COUNTS	(TC)	238	250
2413	COUNT TIME in MINUTES	(CT)	10	10
AT or TB ?	BACKGROUND in cpm	(BKG)	22	22
TB	SAMPLE SIZE in mL	(SS)	0.100	0.100
Rerun No.	DILUTION FACTOR	(DF)	1	1
0	DIGEST DILUTION FACTOR	(DDF)	1	1
Analyst	EFFICIENCY FACTOR	(EFF)	0.3240	0.3240
C JOHNSON	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE		5.331	6.577
Date	SAMPLE CONCENTRATION in µCi/L		7.41E-02	9.14E-02
12/20/93	AVG. µCi/L in SAMPLE and REPLICATE =		<	8.2779E-02

Rs (Sample Count Rate) = (TC / CT) - BKG
TOTAL BETA µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)
TOTAL BETA µCi/mL = TOTAL BETA µCi/L / 1000mL/L
Relative Counting Error = (The Square Root of TC + BKG * CT) / (TC - BKG * CT)
Detection Levels and Less Than Values are determined from Procedure LA-508-002.

TOTAL BETA in µCi/L (AVERAGE) =	< 9.14E-02	DETECTION LEVEL
TOTAL BETA in µCi/mL (AVERAGE) =	< 9.14E-05	
LESS THAN Value was Determined from Rmax.		1.00E-04 µCi/mL
RELATIVE COUNTING ERROR =	118.9%	

Data Entry by:	[signature]	Date:	21-Dec-93
Approved by:	[signature]	Date:	27-Dec-93

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TOTAL BETA ANALYSIS - UNDIGESTED SAMPLE

13/2 12-20-93 DM J1416-5620

238/10 - 22

250/10

Beta Calculation (CRPC_CAL 2.0)
By: MC BIERMAN, on 12-20-1993 at 21:28:28
Det #13 2 -inch mount Beta eff. : .324
Sample size : .1 mL Dilution : 1

Sample # J 1416 Mount # 1

$$\frac{238}{10} - 22.0 < 7.4118E\text{-}02 \text{ uCi/L beta}$$

Sample # J 1416 Mount # 2

$$\frac{250}{10} - 22.0 < 9.1440E\text{-}02 \text{ uCi/L beta}$$

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

5-6

Serial No	Sample Point	Date	Time Issued	Priority
J 1426.-5720	BECHTOLD	12-16-93	13:18	22

Determination	Method Standard	Result Units	Charge Code	Reruns
TB	LA-508-101	uCi/ML	E14157	0

Sample Size	Customer ID
? .100 ml	KE65A

Remarks, Calculations, Results

COUNT AS uCI/L
USE 13,14,15 OR 16

Sam

WHC-SD-WM-DP-062, REV. 0

5.80×10^{-1} uCi/ml

~~3.58×10^{-1} uCi/ml~~ 12/21/93

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
12/20/93	1600	

54-6800-061 (R 10-83)

TB: LA-508-101 (D-0) LIQUIDS			SAMPLE	REPLICATE
Serial No.	DETECTOR NUMBER		13	13
J1426-5720	DISH SIZE 1, 2, or 5	(MS)	2	2
Batch ID	TOTAL COUNTS	(TC)	411405	422781
2413	COUNT TIME in MINUTES	(CT)	10	10
AT or TB ?	BACKGROUND in cpm	(BKG)	22	22
TB	SAMPLE SIZE in mL	(SS)	0.100	0.100
Rerun No.	DILUTION FACTOR	(DF)	1	1
0	DIGEST DILUTION FACTOR	(DDF)	1	1
Analyst	EFFICIENCY FACTOR	(EFF)	0.3240	0.3240
C JOHNSON	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE		41118.500	42256.100
Date	SAMPLE CONCENTRATION in µCi/L		5.72E+02	5.87E+02
12/20/93	AVG. µCi/L in SAMPLE and REPLICATE =			5.7957E+02

Rs (Sample Count Rate) = (TC / CT) - BKG

TOTAL BETA µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

TOTAL BETA µCi/mL = TOTAL BETA µCi/L / 1000mL/L

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

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

TOTAL BETA	in µCi/L	(AVERAGE) =	5.80E+02	DETECTION LEVEL 1.00E-04 µCi/mL
TOTAL BETA	in µCi/mL	(AVERAGE) =	5.80E-01	
RELATIVE COUNTING ERROR		=	0.2%	

Data Entry by:		Date:	21-Dec-93
Approved by:		Date:	27-Dec-93

Form 1 Rev. 1.1

TOTAL BETA ANALYSIS - UNDIGESTED SAMPLE

13/2 12-20-93 DM

J-1427-5720

898856

10

891522

10

Beta Calculation (CRPC_CAL 2.0)
By: MC BIERMAN, , on 12-20-1993 at 21:32:07
Det #13 2 -inch mount Beta eff. : .324
Sample size : .1 mL Dilution : 1

Sample # J 1427 Mount # 1

898856
---------- - 22.0 = 1.2494E+03 uCi/L beta
10

Sample # J 1427 Mount # 2

891522
---------- - 22.0 = 1.2392E+03 uCi/L beta
10

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

1-2

Serial No	Sample Point	Date	Time Issued	Priority
J 1426.-5720	BECHTOLD	12-16-93	13:18	22

Determination	Method Standard	Result Units	Charge Code	Reruns
TB	LA-508-101	uCi/ML	E14157	0

Sample Size	Customer ID
?.100 ml	KE65A

Remarks Calculations Results

COUNT AS uCI/L
USE 13,14,15 OR 16

Dup

WHC-SD-WM-DP-062, REV. 0

5.67×10^{1} uCi/ml

~~5.80×10^{1} uCi/ml~~ 12/21/93

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
12/20/93	1600		

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

TB: LA-508-101 (D-0) LIQUIDS

Serial No.		SAMPLE	REPLICATE
J1426-5720	DETECTOR NUMBER	13	13
Batch ID	DISH SIZE 1, 2, or 5 (MS)	2	2
2413	TOTAL COUNTS (TC)	406107	409341
AT or TB ?	COUNT TIME in MINUTES (CT)	10	10
TB	BACKGROUND in cpm (BKG)	22	22
Rerun No.	SAMPLE SIZE in mL (SS)	0.100	0.100
0	DILUTION FACTOR (DF)	1	1
Analyst	DIGEST DILUTION FACTOR (DDF)	1	1
C JOHNSON	EFFICIENCY FACTOR (EFF)	0.3240	0.3240
Date	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	40588.700	40912.100
12/20/93	SAMPLE CONCENTRATION in µCi/L	5.64E+02	5.69E+02
	AVG. µCi/L in SAMPLE and REPLICATE =		5.6654E+02

Rs (Sample Count Rate) = (TC / CT) - BKG

TOTAL BETA µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

TOTAL BETA µCi/mL = TOTAL BETA µCi/L / 1000mL/L

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

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

			DETECTION LEVEL
TOTAL BETA	in µCi/L (AVERAGE) =	5.67E+02	
TOTAL BETA	in µCi/mL (AVERAGE) =	5.67E-01	1.00E-04 µCi/mL
RELATIVE COUNTING ERROR	=	0.2%	

Data Entry by:	R Abeyta	Date:	21-Dec-93
Approved by:		Date:	27-Dec-93

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TOTAL BETA ANALYSIS - UNDIGESTED SAMPLE

13/2 12-20-93 DM

J1427-5728

180247
10 2

Beta Calculation (CRPC_CAL 2.0)
By: DH MILICIA, on 12-20-1993 at 23:18:15
Det #13 2 -inch mount Beta eff. : .324
Sample size : .1 mL Dilution : 1

183802
10 2

Sample # J-1427 Mount # 1

$$\frac{180247}{2} - 22.0 = 1.2527E+03 \text{ uCi/L beta}$$

Sample # J-1427 Mount # 2

$$\frac{183802}{2} - 22.0 = 1.2774E+03 \text{ uCi/L beta}$$

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

3-4

Serial No	Sample Point	Date	Time Issued	Priority
J 1426.-5720	BECHTOLD	12-16-93	13:18	22

Determination	Method Standard	Result Units	Charge Code	Reruns
TB	LA-508-101	uCi/ML	E14157	0

Sample Size	Customer ID
?,100 ml	KE65A

Remarks, Calculations, Results:
COUNT AS uCI/L
USE 13,14,15 OR 16

TR IP

WHC-SD-WM-DP-062, REV. 0

5.60×10^{2} uCi/ml

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr.	
12/20/93	1600		E.C.

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

TB: LA-508-101 (D-0) LIQUIDS

Serial No.		SAMPLE	REPLICATE
J1426-5720	DETECTOR NUMBER	13	13
Batch ID	DISH SIZE 1, 2, or 5 (MS)	2	2
2413	TOTAL COUNTS (TC)	411042	394367
AT or TB ?	COUNT TIME in MINUTES (CT)	10	10
TB	BACKGROUND in cpm (BKG)	22	22
Rerun No.	SAMPLE SIZE in mL (SS)	0.100	0.100
0	DILUTION FACTOR (DF)	1	1
Analyst	DIGEST DILUTION FACTOR (DDF)	1	1
C JOHNSON	EFFICIENCY FACTOR (EFF)	0.3240	0.3240
Date	Lc, Rmax, or Rs (SAMPLE RATE) as APPROPRIATE	41082.200	39414.700
12/20/93	SAMPLE CONCENTRATION in µCi/L	5.71E+02	5.48E+02
	AVG. µCi/L in SAMPLE and REPLICATE =		5.5957E+02

Rs (Sample Count Rate) = (TC / CT) - BKG

TOTAL BETA µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

TOTAL BETA µCi/mL = TOTAL BETA µCi/L / 1000mL/L

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

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

		DETECTION LEVEL
TOTAL BETA in µCi/L (AVERAGE) =	5.60E+02	
TOTAL BETA in µCi/mL (AVERAGE) =	5.60E-01	
		1.00E-04 µCi/mL
RELATIVE COUNTING ERROR =	0.2%	

Data Entry by:		Date:	21-Dec-93
Approved by:		Date:	27-Dec-93

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13/2 12-20-93 DH J1427-5720

175422 / 2 - 22 Beta Calculation (CRPC_CAL 2.0)
By: DH MILICIA, ., on 12-20-1993 at 23:19:03
Det #13 2 -inch mount Beta eff. : .324
Sample size : .1 mL Dilution : 1

187489 / 2

Sample # J-1427 Mount # 1

$$\frac{175422}{2} - 22.0 = 1.2191E+03 \text{ uCi/L beta}$$

Sample # J-1427 Mount # 2

$$\frac{187489}{2} - 22.0 = 1.3030E+03 \text{ uCi/L beta}$$

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

5-6

Serial No	Sample Point	Date	Time Issued	Priority
J 1427.-5720	BECHTOLD	12-16-93	13:19	22

Determination	Method/Standard	Result Units	Charge Code	Reruns
TB	LA-508-101	uCi/ML	E14157	0

Sample Size	Customer ID
? ,100 ml	KE71A

Remarks, Calculations, Results

COUNT AS uCI/L
USE 13,14,15 OR 16

Sam

WHC-SD-WM-DP-062, REV. 0

1.24 uCi/ml

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
12/20/93	1600	

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

TB: LA-508-101 (D-0) LIQUIDS

Serial No.			SAMPLE	REPLICATE
J1427-5720	DETECTOR NUMBER		13	13
Batch ID	DISH SIZE 1, 2, or 5	(MS)	2	2
2413	TOTAL COUNTS	(TC)	898856	891522
AT or TB ?	COUNT TIME in MINUTES	(CT)	10	10
TB	BACKGROUND in cpm	(BKG)	22	22
Rerun No.	SAMPLE SIZE in mL	(SS)	0.100	0.100
0	DILUTION FACTOR	(DF)	1	1
Analyst	DIGEST DILUTION FACTOR	(DDF)	1	1
C JOHNSON	EFFICIENCY FACTOR	(EFF)	0.3240	0.3240
Date	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE		89863.600	89130.200
12/20/93	SAMPLE CONCENTRATION in µCi/L		1.25E+03	1.24E+03
	AVG. µCi/L in SAMPLE and REPLICATE =			1.2443E+03

Rs (Sample Count Rate) = (TC / CT) - BKG

TOTAL BETA µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

TOTAL BETA µCi/mL = TOTAL BETA µCi/L / 1000mL/L

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

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

TOTAL BETA	in µCi/L (AVERAGE) =	1.24E+03	DETECTION LEVEL
TOTAL BETA	in µCi/mL (AVERAGE) =	1.24E+00	1.00E-04 µCi/mL
RELATIVE COUNTING ERROR	=	0.1%	

Data Entry by:		Date:	21-Dec-93
Approved by:		Date:	22-Dec-93

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TOTAL BETA ANALYSIS - UNDIGESTED SAMPLE

13/2 12-20-93 DM

J 1426-5720

Beta Calculation (CRPC_CAL 2.0)
By: MC BIERMAN, , on 12-20-1993 at 21:31:00
Det #13 2 -inch mount Beta eff. : .324
Sample size : .1 mL Dilution : 1

$\frac{411042}{10}$ - 22

$\frac{394367}{10}$

Sample # J 1426 Mount # 1

$$\frac{411042}{10} - 22.0 = 5.7116E+02 \text{ uCi/L beta}$$

Sample # J 1426 Mount # 2

$$\frac{394367}{10} - 22.0 = 5.4797E+02 \text{ uCi/L beta}$$

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

1-2

Serial No	Sample Point	Date	Time Issued	Priority
J 1427.-5720	RECHTOLD	12-16-93	13:19	22

Determination	Method Standard	Result Units	Charge Code	Reruns
TB	LA-508-101	uCi/ML	E14157	0

Sample Size	Customer ID
?.100ml	KE71A

Remarks, Calculations, Results

COUNT AS uCI/L
USE 13,14,15 OR 16

DUP

WHC-SD-WM-DP-062, REV. 0

1.27 uCi/ml

C Johnson

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	D.M. Nelson			
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
12/20/93	1600	E C D

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

TB: LA-508-101 (D-0) LIQUIDS

Serial No.			SAMPLE	REPLICATE
J1427-5720	DETECTOR NUMBER		13	13
Batch ID	DISH SIZE 1, 2, or 5	(MS)	2	2
2413	TOTAL COUNTS	(TC)	180247	183802
AT or TB ?	COUNT TIME in MINUTES	(CT)	2	2
TB	BACKGROUND in cpm	(BKG)	22	22
Rerun No.	SAMPLE SIZE in mL	(SS)	0.100	0.100
0	DILUTION FACTOR	(DF)	1	1
Analyst	DIGEST DILUTION FACTOR	(DDF)	1	1
C JOHNSON	EFFICIENCY FACTOR	(EFF)	0.3240	0.3240
Date	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE		90101.500	91879.000
12/20/93	SAMPLE CONCENTRATION in µCi/L		1.25E+03	1.28E+03
	AVG. µCi/L in SAMPLE and REPLICATE =			1.2650E+03

Rs (Sample Count Rate) = (TC / CT) - BKG

TOTAL BETA µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

TOTAL BETA µCi/mL = TOTAL BETA µCi/L / 1000mL/L

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

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

TOTAL BETA	in µCi/L	(AVERAGE) =	1.27E+03	DETECTION LEVEL
TOTAL BETA	in µCi/mL	(AVERAGE) =	1.27E+00	1.70E-04 µCi/mL
RELATIVE COUNTING ERROR		=	0.2%	

Data Entry by:	R Alcota	Date:	21-Dec-93
Approved by:		Date:	27-Dec-93

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TOTAL BETA ANALYSIS - UNDIGESTED SAMPLE

13/2 12-20-93 Dm

J1426-5720

$\frac{406107}{10} - 22$

$\frac{409341}{10}$

Beta Calculation (CRPC_CAL 2.0)
By: MC BIERMAN, on 12-20-1993 at 21:30:13
Det #13 2 -inch mount Beta eff. : .324
Sample size : .1 mL Dilution : 1

Sample # J 1426 Mount # 1

$$\frac{406107}{10} - 22.0 = 5.6430E+02 \text{ uCi/L beta}$$

Sample # J 1426 Mount # 2

$$\frac{409341}{10} - 22.0 = 5.6879E+02 \text{ uCi/L beta}$$

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

3.4

Serial No	Sample Point	Date	Time Issued	Priority
J 1427.-5720	BECHTOLD	12-16-93	13:19	22

Determination	Method Standard	Result Units	Charge Code	Reruns
TB	LA-508-101	uCi/ML	E14157	0

Sample Size	Customer ID
? .100 ml	KE71A

Remarks, Calculations, Results

COUNT AS uCI/L
USE 13,14,15 OR 16

TOTP

WHC-SD-WM-DP-062, REV. 0

1.26 uCi/ml

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
12/20/93	1600	

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

TB: LA-508-101 (D-0) LIQUIDS

			SAMPLE	REPLICATE
Serial No.	DETECTOR NUMBER		13	13
J1427-5720	DISH SIZE 1, 2, or 5	(MS)	2	2
Batch ID	TOTAL COUNTS	(TC)	175422	187489
2413	COUNT TIME in MINUTES	(CT)	2	2
AT or TB ?	BACKGROUND in cpm	(BKG)	22	22
TB	SAMPLE SIZE in mL	(SS)	0.100	0.100
Rerun No.	DILUTION FACTOR	(DF)	1	1
0	DIGEST DILUTION FACTOR	(DDF)	1	1
Analyst	EFFICIENCY FACTOR	(EFF)	0.3240	0.3240
C JOHNSON	Lc, Rmax, or Rs (SAMPLE RATE) as APPROPRIATE		87689.000	93722.500
Date	SAMPLE CONCENTRATION in µCi/L		1.22E+03	1.30E+03
12/20/93	AVG. µCi/L in SAMPLE and REPLICATE =			1.2611E+03

Rs (Sample Count Rate) = (TC / CT) - BKG
TOTAL BETA µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)
TOTAL BETA µCi/mL = TOTAL BETA µCi/L / 1000mL/L
Relative Counting Error = (The Square Root of TC + BKG * CT) / (TC - BKG * CT)
Detection Levels and Less Than Values are determined from Procedure LA-508-002.

TOTAL BETA	in µCi/L (AVERAGE) =	1.26E+03	DETECTION LEVEL
TOTAL BETA	in µCi/mL (AVERAGE) =	1.26E+00	1.70E-04 µCi/mL
RELATIVE COUNTING ERROR	=	0.2%	

Data Entry by:		Date:	21-Dec-93
Approved by:		Date:	27-Dec-93

Form 1 Rev. 1.1

TOTAL BETA ANALYSIS - UNDIGESTED SAMPLE

13/2 12-20-93 DR

J1426-5720

411405/10 - 22

422781/10

Beta Calculation (CRPC_CAL 2.0)
By: MC BIERMAN, on 12-20-1993 at 21:29:27
Det #13 2 -inch mount Beta eff. : .324
Sample size : .1 mL Dilution : 1

Sample # J 1426 Mount # 1

$$\frac{411405}{10} - 22.0 = 5.7166E+02 \text{ uCi/L beta}$$

Sample # J 1426 Mount # 2

$$\frac{422781}{10} - 22.0 = 5.8748E+02 \text{ uCi/L beta}$$

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

Serial No	Sample Point	Date	Time Issued	Priority
J 1428.-5720	BECHTOLD	12-16-93	13:20	22

Determination	Method Standard	Result Units	Charge Code	Reruns
TB	LA-508-101	uCi/ML	E14157	0

Sample Size	Customer ID
? .100 ml	KE72A

Remarks, Calculations, Results

COUNT AS uCI/L
USE 13,14,15 OR 16

TRIP

WHC-SD-WM-DP-062, REV. 0

3.58×10^{-1} uCi/ml

C JOHNSON

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	Em Barela			
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
12/20/93	1600		EC

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

TB: LA-508-101 (D-0) LIQUIDS

Serial No.			SAMPLE	REPLICATE
J1428-5720	DETECTOR NUMBER		13	13
Batch ID	DISH SIZE 1, 2, or 5	(MS)	2	2
2413	TOTAL COUNTS	(TC)	257632	258145
AT or TB ?	COUNT TIME in MINUTES	(CT)	10	10
TB	BACKGROUND in cpm	(BKG)	22	22
Rerun No.	SAMPLE SIZE in mL	(SS)	0.100	0.100
0	DILUTION FACTOR	(DF)	1	1
Analyst	DIGEST DILUTION FACTOR	(DDF)	1	1
C JOHNSON	EFFICIENCY FACTOR	(EFF)	0.3240	0.3240
Date	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE		25741.200	25792.500
12/20/93	SAMPLE CONCENTRATION in µCi/L		3.58E+02	3.59E+02
	AVG. µCi/L in SAMPLE and REPLICATE =			3.5823E+02

Rs (Sample Count Rate) = (TC / CT) - BKG

TOTAL BETA µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

TOTAL BETA µCi/mL = TOTAL BETA µCi/L / 1000mL/L

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

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

			DETECTION LEVEL
TOTAL BETA	in µCi/L (AVERAGE) =	3.58E+02	
TOTAL BETA	in µCi/mL (AVERAGE) =	3.58E-01	
RELATIVE COUNTING ERROR	=	0.2%	1.00E-04 µCi/mL

Data Entry by:		Date:	21-Dec-93
Approved by:		Date:	27-Dec-93

Form 1 Rev. 1.1

TOTAL BETA ANALYSIS - UNDIGESTED SAMPLE

13/2 12-20-93 DM

J1428-5720

246914 / 10 - 22

Beta Calculation (CRPC_CAL 2.0)
By: KM BARRLA, on 12-21-1993 at 00:29:12
Det #13 2 -inch mount Beta eff. : .324
Sample size : 1 mL Dilution : 10

252680 / 10

Sample # J1428 Mount # 1

$$\frac{246914}{10} - 22.0 = 3.4297E+02 \text{ uCi/L beta}$$

Sample # J1428 Mount # 2

$$\frac{252680}{10} - 22.0 = 3.5099E+02 \text{ uCi/L beta}$$

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

~~5-6~~ 1-3

Serial No	Sample Point	Date	Time Issued	Priority
J 1428.-5720	BECHTOLD	12-16-93	13:20	22

Determination	Method-Standard	Result Units	Charge Code	Reruns
TB	LA-508-101	uCi/ML	E14157	0

Sample Size	Customer ID
? .100 ml	KE72A

Remarks Calculations Results
COUNT AS uCI/L
USE 13,14,15 OR 16

SAM

WHC-SD-WM-DP-062, REV. 0

3.61x10⁻¹ uCi/ml

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	D H Milicia	Em Barelev		
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
12/20/93	1600	[signature]	E. C[signature]

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

TB: LA-508-101 (D-0) LIQUIDS

			SAMPLE	REPLICATE
Serial No.	DETECTOR NUMBER		13	13
J1428-5720	DISH SIZE 1, 2, or 5	(MS)	2	2
Batch ID	TOTAL COUNTS	(TC)	260409	258993
2413	COUNT TIME in MINUTES	(CT)	10	10
AT or TB ?	BACKGROUND in cpm	(BKG)	22	22
TB	SAMPLE SIZE in mL	(SS)	0.100	0.100
Rerun No.	DILUTION FACTOR	(DF)	1	1
0	DIGEST DILUTION FACTOR	(DDF)	1	1
Analyst	EFFICIENCY FACTOR	(EFF)	0.3240	0.3240
C JOHNSON	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE		26018.900	25877.300
Date	SAMPLE CONCENTRATION in µCi/L		3.62E+02	3.60E+02
12/20/93	AVG. µCi/L in SAMPLE and REPLICATE =			3.6075E+02

Rs (Sample Count Rate) = (TC / CT) - BKG
TOTAL BETA µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)
TOTAL BETA µCi/mL = TOTAL BETA µCi/L / 1000mL/L
Relative Counting Error = (The Square Root of TC + BKG * CT) / (TC - BKG * CT)
Detection Levels and Less Than Values are determined from Procedure LA-508-002.

TOTAL BETA in µCi/L (AVERAGE) =	3.61E+02	DETECTION LEVEL 1.00E-04 µCi/mL
TOTAL BETA in µCi/mL (AVERAGE) =	3.61E-01	
RELATIVE COUNTING ERROR =	0.2%	

Data Entry by:	R. Akita	Date:	21-Dec-93
Approved by:	[signature]	Date:	27-Dec-93

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TOTAL BETA ANALYSIS - UNDIGESTED SAMPLE

13/2 12-20-93 DM

J1428-G720

260409 / 10 - 22

DM

258993 / 10

Beta Calculation (CRPC_CAL 2.0)
By: EM BARELA, on 12-21-1993 at 00:28:37
Det #13 2 -inch mount Beta eff. : .324
Sample size : 1 mL Dilution : 10

Sample # J1428 Mount # 1

$$\frac{260409}{10} - 22.0 = 3.6174E+02 \text{ uCi/L beta}$$

Sample # J1428 Mount # 2

$$\frac{258993}{10} - 22.0 = 3.5977E+02 \text{ uCi/L beta}$$

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

5-7

Serial No	Sample Point	Date	Time Issued	Priority
J 1428.-5720	BECHTOLD	12-16-93	13:20	33

Determination	Method Standard	Result Units	Charge Code	Reruns
TB	LA-508-101	uCi/ML	E14157	0

Sample Size	Customer ID
? .100ml	KE72A

Remarks Calculations Results

COUNT AS uCI/L
USE 13,14,15 OR 16

Dup

WHC-SD-WM-DP-062, REV. 0

3.47×10^{1} uCi/ml

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
12/20/93	1600	

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

TB: LA-508-101 (D-0) LIQUIDS

Serial No.			SAMPLE	REPLICATE
J1428-5720	DETECTOR NUMBER		13	13
Batch ID	DISH SIZE 1, 2, or 5	(MS)	2	2
2413	TOTAL COUNTS	(TC)	246914	252680
AT or TB ?	COUNT TIME in MINUTES	(CT)	10	10
TB	BACKGROUND in cpm	(BKG)	22	22
Rerun No.	SAMPLE SIZE in mL	(SS)	0.100	0.100
0	DILUTION FACTOR	(DF)	1	1
Analyst	DIGEST DILUTION FACTOR	(DDF)	1	1
C JOHNSON	EFFICIENCY FACTOR	(EFF)	0.3240	0.3240
Date	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE		24669.400	25246.000
12/20/93	SAMPLE CONCENTRATION in µCi/L		3.43E+02	3.51E+02
	AVG. µCi/L in SAMPLE and REPLICATE =			3.4698E+02

Rs (Sample Count Rate) = (TC / CT) - BKG

TOTAL BETA µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

TOTAL BETA µCi/mL = TOTAL BETA µCi/L / 1000mL/L

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

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

			DETECTION LEVEL
TOTAL BETA	in µCi/L (AVERAGE) =	3.47E+02	
TOTAL BETA	in µCi/mL (AVERAGE) =	3.47E-01	1.00E-04 µCi/mL
RELATIVE COUNTING ERROR	=	0.2%	

Data Entry by:		Date:	21-Dec-93
Approved by:		Date:	27-Dec-93

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TOTAL BETA ANALYSIS - UNDIGESTED SAMPLE

13/2

J1428-5720

257632
10

258145
10

Beta Calculation (CRPC_CAL 2.0)
By: KM BARKLA, , on 12-21-1993 at 00:29:45
Det 13 2 -inch mount Beta eff. : .324
Sample size : 1 mL Dilution : 10

Sample # J1428 Mount # 1

$$\frac{257632}{10} - 22.0 = 3.5787E+02 \text{ uCi/L beta}$$

Sample # J1428 Mount # 2

$$\frac{258145}{10} - 22.0 = 3.5859E+02 \text{ uCi/L beta}$$

Batch 2549

WESTINGHOUSE HANFORD COMPANY

222-S LABORATORY

ANALYTICAL BATCH

WHC-SD-WM-DP-062, REV. 0

Lab Segment Serial No. J-1445, J-1446	Customer ID: KE83B, KE83D
Analysis: TB	Sample Prep: Direct

Instrument: WA 63999	Procedure/ Rev: LA-505-101 D-0
Technologist: Bill Smith William K. Smith	Date: 1-17-94
Starting Time: 0800	Temperature NA
Ending Time: 1500	Chemist: S. Fitzgerald

Comments:

	Description	Lab ID		Description	Lab ID
1	STD	J-1439-5520	11		
2	Blank	J-1440-5620	12		
3	SAM	J-1445-5720	13		
4	SAM	J-1445-5720	14		
5	SAM	J-1445-5720	15		
6	SAM	J-1446-5720	16		
7	SAM	J-1446-5720	17		
8	SAM	J-1446-5720	18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
[illegible]	119B51/10ml			

A-6000-881 (03/92)

ANALYTICAL BATCH SUMMARY SHEET

METHOD: **LA-508-101**

DATE START: **JANUARY 17, 1994**

PREPARED BY: **S.L. FITZGERALD**

DATE COMPLETE: **JANUARY 20, 1994**

	UNITS:	uCi/mL										
SPL NAME	SPL ID	ANALYTE	RESULT #1	RESULT #2	RESULT #3	AVERAGE	2*SD	PREC	ACCU	%REC	DET LIM	% CT ER
STD 119851	J1439	BETA	2.15E-01							94.7	7.35E-07	1.6
BLANK	J1440	BETA	<5.56E-04								7.42E-04	500
KE83B	J1445	BETA	1.91E+00	1.93E+00	1.99E+00	1.94E+00	7.46E-02	3.8			7.42E-04	0.5
											7.42E-04	0.5
											7.42E-04	0.5
KE83D	J1446	BETA	4.02E-01	4.14E-01	4.18E-01	4.11E-01	1.61E-02	3.9			7.42E-04	1.2
											7.42E-04	1.2
											7.42E-04	1.1

NARRATIVE: [X] NO SPECIAL PROBLEMS/METHOD VARIATIONS IN THIS BATCH

LIST SPECIFIC PROBLEMS/VARIATIONS FOR THIS BATCH:

Standard results are reported as uCi/L

This batch was run because previous batch had no replicates.
There are few diff. between the two batches.

RZ 1-24-94

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

RERUN

Batch 2549

Serial No	Sample Point	Date	Time Issued	Priority
J 1439.-5520	BECHTOLD	1-14-94	10:49	26

Determination	Method Standard	Result Units	Charge Code	Reruns
TB	LA-508-101	% RECOVERY	E14157	2

Sample Size	Customer ID
? 10ml	STD

Remarks, Calculations, Results

S515 EV-CRB

STD# 119851 RESULT 2.15E-1

STD VAL .22711 %REC 94.67%

WHC-SD-WM-DP-062, REV. 0

Will K Syth

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	Rualla M B			
Hrs	Hrs	Hrs	Hrs	Hrs
		Rubrolo		1-18-94 AK McGarland
Date	Time Completed	Lab Unit Mgr		
1-17-94	1500	[signature]		1-18-94 AK McGarland

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

TB: LA-508-101 (D-0) LIQUIDS

			STANDARD	REPLICATE
Serial No.	DETECTOR NUMBER		16	16
J1439-5520	DISH SIZE 1, 2, or 5	(MS)	2	2
Batch ID	TOTAL COUNTS	(TC)	15857	15844
2549	COUNT TIME in MINUTES	(CT)	10	10
AT or TB ?	BACKGROUND in cpm	(BKG)	12	12
TB	SAMPLE SIZE in mL	(SS)	10.000	10.000
Rerun No.	DILUTION FACTOR	(DF)	1	1
2	DIGEST DILUTION FACTOR	(DDF)	1	1
Analyst	EFFICIENCY FACTOR	(EFF)	0.3300	0.3300
W SYTH	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE		1573.700	1572.400
Date	SAMPLE CONCENTRATION in µCi/L		2.15E-01	2.15E-01
01/17/94	AVG. µCi/L in SAMPLE and REPLICATE =			2.1472E-01

Rs (Sample Count Rate) = (TC / CT) - BKG

TOTAL BETA µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

TOTAL BETA µCi/mL = TOTAL BETA µCi/L / 1000mL/L

Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100

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

TOTAL BETA in µCi/L (AVERAGE) =	2.15E-01	DETECTION LEVEL 7.35E-07 µCi/mL
TOTAL BETA in µCi/mL (AVERAGE) =	2.15E-04	
RELATIVE COUNTING ERROR =	1.6%	

Data Entry by:	[signature]	Date:	18-Jan-94
Approved by:	[signature]	Date:	20-Jan-94

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Page 1 of 1

TOTAL BETA ANALYSIS - UNDIGESTED SAMPLE

16/2 1-17-94 1-2 J1439-5520

15857
10

15844
10

Beta Calculation (CRPC_CAL 2.0)
By: MC BIERMAN, on 01-17-1994 at 19:46:54
Det #1 2 2 -inch mount Beta eff. : .33
Sample size : 10 mL Dilution : 1

Sample # J 1439-5520 Mount # 1

15857
---------- - 12.0 = 2.1481E-01 uCi/L beta
10

Sample # J 1439-5520 Mount # 2

15844
---------- - 12.0 = 2.1463E-01 uCi/L beta
10

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

RERUN

Serial No	Sample Point	Date	Time Issued	Priority
J 1440.-5620	BECHTOLD '	1-.4-94	10:52	2E

Determination	Method-Standard	Result-Units	Charge Code	Reruns
TB	LA-508-101	uCi/ML	E14157	2

Sample Size	Customer ID
1.100-10-1ml/	BLANK

Remarks, Calculations Results

COUNT AS uCI/L
USE 13,14,15 OR 16

WHC-SD-WM-DP-062, REV. 0

<5.56E-4 uCi/ml

L Hill - K Syth

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Anal Mgr	
1-17-94	1500		1-18-94 DKM Talent

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

TB: LA-508-101 (D-0) LIQUIDS

Serial No.			BLANK	REPLICATE
J1440-5620	DETECTOR NUMBER		16	16
Batch ID	DISH SIZE 1, 2, or 5	(MS)	2	2
2549	TOTAL COUNTS	(TC)	134	120
A,T or TB ?	COUNT TIME in MINUTES	(CT)	10	10
TB	BACKGROUND in cpm	(BKG)	12	12
Rerun No.	SAMPLE SIZE in mL	(SS)	1.000	1.000
2	DILUTION FACTOR	(DF)	101	101
Analyst	DIGEST DILUTION FACTOR	(DDF)	1	1
W SYTH	EFFICIENCY FACTOR	(EFF)	0.3300	0.3300
Date	Lc, Rmax or Rs, (SAMPLE RATE) as APPROPRIATE		4.030	2.556
01/17/94	SAMPLE CONCENTRATION in µCi/L		5.56E-01	3.52E-01
	AVG. µCi/L in SAMPLE and REPLICATE =		<	4.5398E-01

Rs (Sample Count Rate) = (TC / CT) - BKG

TOTAL BETA µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

TOTAL BETA µCi/mL = TOTAL BETA µCi/L / 1000mL/L

Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100

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

		DETECTION LEVEL
TOTAL BETA in µCi/L (AVERAGE) =	< 5.56E-01	
TOTAL BETA in µCi/mL (AVERAGE) =	< 5.56E-04	
LESS THAN Value was Determined from Rmax.		7.42E-04 µCi/mL
RELATIVE COUNTING ERROR =	500.0%	

Data Entry by:	L Hill	Date:	18-Jan-94
Approved by:	K Syth	Date:	20-Jan-94

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16/2 1-17-94 3-4 J1440-5620

Beta Calculation (CRPC_CAL 2.0)
By: MC BIERMAN, on 01-17-1994 at 19:48:26
Det #16 2 -inch mount Beta eff. : .33
Sample size : 1 mL Dilution : 101

134/10

Sample # J 1440-5620 Mount # 1

134
---------- - 12.0 < 5.5555E-01 uCi/L beta
10

120/10

Sample # J 1440-5620 Mount # 2

120
---------- - 12.0 < 3.5241E-01 uCi/L beta
10

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

RERUN

Serial No	Sample Point	Date	Time Issued	Priority
J 1445.-5720	BECHTOLD	1- 4-94	12: 3	26

Determination	Method Standard	Result Units	Charge Code	Reruns
TB	LA-508-101	uCi/ML	E14157	4

Sample Size	Customer ID
100-10-1ML	KE83B

Remarks Calculations Results

COUNT AS uCI/L
USE 13,14,15 OR 16
SAM

WHC-SD-WM-DP-062, REV. 0

1.91 uCi/ml

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1-17-94	1500		1-18-94

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

TB: LA-508-101 (D-0) LIQUIDS

			SAMPLE	REPLICATE
Serial No.	DETECTOR NUMBER		16	16
J1445-5720	DISH SIZE 1, 2, or 5	(MS)	2	2
Batch ID	TOTAL COUNTS	(TC)	136741	141114
2549	COUNT TIME in MINUTES	(CT)	10	10
AT or TB ?	BACKGROUND in cpm	(BKG)	12	12
TB	SAMPLE SIZE in mL	(SS)	1.000	1.000
Rerun No.	DILUTION FACTOR	(DF)	101	101
4	DIGEST DILUTION FACTOR	(DDF)	1	1
Analyst	EFFICIENCY FACTOR	(EFF)	0.3300	0.3300
W SYTH	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE		13662.100	14099.400
Date	SAMPLE CONCENTRATION in µCi/L		1.88E+03	1.94E+03
01/17/94	AVG. µCi/L in SAMPLE and REPLICATE =			1.9137E+03

Rs (Sample Count Rate) = (TC / CT) - BKG

TOTAL BETA µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

TOTAL BETA µCi/mL = TOTAL BETA µCi/L / 1000mL/L

Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100

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

TOTAL BETA in µCi/L (AVERAGE) =	1.91E+03	DETECTION LEVEL
TOTAL BETA in µCi/mL (AVERAGE) =	1.91E+00	7.42E-04 µCi/mL
RELATIVE COUNTING ERROR =	0.5%	

Data Entry by:		Date:	18-Jan-94
Approved by:		Date:	20-Jan-94

Form 1 Rev. 1.2 Page 1 of 1

TOTAL BETA ANALYSIS - UNDIGESTED SAMPLE

16/2 1-17-94 5-4 J1445-5720

136741
10

Beta Calculation (CRPC_CAL 2.0)
By: MC BIERMAN, on 01-17-1994 at 19:49:28
Det #16 2 -inch mount Beta eff. : .33
Sample Size : 1 mL Dilution : 101

Sample # J 1445-5720 Mount # 1

141114
10

$$\frac{136741}{10} - 12.0 = 1.6835E+03 \text{ uCi/L beta}$$

Sample # J 1445-5720 Mount # 2

$$\frac{141114}{10} - 12.0 = 1.9438E+03 \text{ uCi/L beta}$$

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

RERUN

Serial No	Sample Point	Date	Time Issued	Priority
J 1445.-5720	BECHTOLD	1- 4-94	12: 3	26

Determination	Method Standard	Result Units	Charge Code	Reruns
TB	LA-508-101	uCi/ML	E14157	5

Sample Size	Customer ID
100-10-1ML	KE83B

Remarks, Calculations, Results

COUNT AS uCI/L
USE 13,14,15 OR 16
DUP

WHC-SD-WM-DP-062, REV. 0

1.93 uCi/ml

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	[signature]	[signature]		
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1-17-94	1500	[signature]	1-18-94 [signature]

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

TB: LA-508-101 (D-0) LIQUIDS

			SAMPLE	REPLICATE
Serial No.	DETECTOR NUMBER		16	16
J1445-5720	DISH SIZE 1, 2, or 5	(MS)	2	2
Batch ID	TOTAL COUNTS	(TC)	139236	141202
2549	COUNT TIME in MINUTES	(CT)	10	10
AT or TB ?	BACKGROUND in cpm	(BKG)	12	12
TB	SAMPLE SIZE in mL	(SS)	1.000	1.000
Rerun No.	DILUTION FACTOR	(DF)	101	101
5	DIGEST DILUTION FACTOR	(DDF)	1	1
Analyst	EFFICIENCY FACTOR	(EFF)	0.3300	0.3300
W SYTH	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE		13911.600	14108.200
Date	SAMPLE CONCENTRATION in µCi/L		1.92E+03	1.95E+03
01/17/94	AVG. µCi/L in SAMPLE and REPLICATE =			1.9315E+03

Rs (Sample Count Rate) = (TC / CT) - BKG
TOTAL BETA µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)
TOTAL BETA µCi/mL = TOTAL BETA µCi/L / 1000mL/L
Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100
Detection Levels and Less Than Values are determined from Procedure LA-508-002.

TOTAL BETA in µCi/L (AVERAGE) =	1.93E+03	DETECTION LEVEL
TOTAL BETA in µCi/mL (AVERAGE) =	1.93E+00	7.42E-04 µCi/mL
RELATIVE COUNTING ERROR =	0.5%	

Data Entry by:	[signature]	Date:	18-Jan-94
Approved by:	[signature]	Date:	20-Jan-94

Form 1 Rev. 1.2 Page 1 of 1

TOTAL BETA ANALYSIS - UNDIGESTED SAMPLE

16/2 1-17-94 7-8 J1445-5720

139236
10

Beta Calculation (CRPC_CAL 2.0)
By: MC BIERMAN, on 01-17-1994 at 19:50:22
Det #16, 2-inch mount Beta eff. : .33
Sample ~~size~~ : 1 mL Dilution : 101

Sample # J 1445-5720 Mount # 1

141202
10

$$\frac{139236}{10} \times 12.0 = 1.9179E+03 \text{ uCi/L beta}$$

Sample # J 1445-5720 Mount # 2

$$\frac{141202}{10} \times 12.0 = 1.9450E+03 \text{ uCi/L beta}$$

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

RERUN

Serial No	Sample Point	Date	Time Issued	Priority
J 1445.-5720	BECHTOLD	1- 4-94	12: 3	26

Determination	Method Standard	Result Units	Charge Code	Reruns
TB	LA-508-101	uCi/ML	E14157	6

Sample Size	Customer ID
100-10-1ML	KE83B

Remarks, Calculations, Results

COUNT AS pCi/L
USE 13,14,15 OR 16

TRIP

WHC-SD-WM-DP-062, REV. 0

1.99 uCi/ml

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
1-17-94	1500	1-18-94

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

TB: LA-508-101 (D-0) LIQUIDS

			SAMPLE	REPLICATE
Serial No.	DETECTOR NUMBER		16	16
J1445-5720	DISH SIZE 1, 2, or 5	(MS)	2	2
Batch ID	TOTAL COUNTS	(TC)	143594	144654
2549	COUNT TIME in MINUTES	(CT)	10	10
AT or TB ?	BACKGROUND in cpm	(BKG)	12	12
TB	SAMPLE SIZE in mL	(SS)	1.000	1.000
Rerun No.	DILUTION FACTOR	(DF)	101	101
6	DIGEST DILUTION FACTOR	(DDF)	1	1
Analyst	EFFICIENCY FACTOR	(EFF)	0.3300	0.3300
W SYTH	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE		14347.400	14453.400
Date	SAMPLE CONCENTRATION in µCi/L		1.98E+03	1.99E+03
01/17/94	AVG. µCi/L in SAMPLE and REPLICATE =			1.9853E+03

Rs (Sample Count Rate) = (TC / CT) - BKG

TOTAL BETA µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

TOTAL BETA µCi/mL = TOTAL BETA µCi/L / 1000mL/L

Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100

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

TOTAL BETA	in µCi/L (AVERAGE) =	1.99E+03	DETECTION LEVEL
TOTAL BETA	in µCi/mL (AVERAGE) =	1.99E+00	7.42E-04 µCi/mL
RELATIVE COUNTING ERROR	=	0.5%	

Data Entry by:		Date:	18-Jan-94
Approved by:		Date:	20-Jan-94

Form 1 Rev. 1.2

TOTAL BETA ANALYSIS - UNDIGESTED SAMPLE

10/2 1-17-94 8-10 J1445-5720

Beta Calculation (CEPC_CAL 2.0)
By: MC BIERMAN, on 01-17-1994 at 19:51:12
Det #16 2 -inch mount Beta eff. : .33
Sample Size : 1 mL Dilution : 101

143594/10

Sample # J 1445-5720 Mount # 1

144654/10 - 143594/10 = 12.0 : 1.9780E+03 uCi/L beta

Sample # J 1445-5720 Mount # 2

144654/10 - 12.0 = 1.9926E+03 uCi/L beta

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

12 REDO

Serial No	Sample Point	Date	Time Issued	Priority
J 1446.-5720	BECHTOLD	1- 4-94	13:28	88

Determination	Method Standard	Result Units	Charge Code	Reruns
TB	LA-508-101	uCi/ML	E14157	4

Sample Size	Customer ID
? .100-10-1ml	KE&SD

Remarks Calculations Results

COUNT AS uCI/L
USE 13,14,15 OR 16
SAM

WHC-SD-WM-DP-062, REV. 0

4.02x10⁻¹ uCi/ml

W K Syth

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1-17-94	1500		1-18-94

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

TB: LA-508-101 (D-0) LIQUIDS

			SAMPLE	REPLICATE
Serial No.	DETECTOR NUMBER		16	16
J1446-5720	DISH SIZE 1, 2, or 5	(MS)	2	2
Batch ID	TOTAL COUNTS	(TC)	29146	29466
2549	COUNT TIME in MINUTES	(CT)	10	10
AT or TB ?	BACKGROUND in cpm	(BKG)	12	12
TB	SAMPLE SIZE in mL	(SS)	1.000	1.000
Rerun No.	DILUTION FACTOR	(DF)	101	101
4	DIGEST DILUTION FACTOR	(DDF)	1	1
Analyst	EFFICIENCY FACTOR	(EFF)	0.3300	0.3300
W SYTH	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE		2902.600	2934.600
Date	SAMPLE CONCENTRATION in µCi/L		4.00E+02	4.05E+02
01/17/94	AVG. µCi/L in SAMPLE and REPLICATE =			4.0237E+02

Rs (Sample Count Rate) = (TC / CT) - BKG
TOTAL BETA µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)
TOTAL BETA µCi/mL = TOTAL BETA µCi/L / 1000mL/L
Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100
Detection Levels and Less Than Values are determined from Procedure LA-508-002.

TOTAL BETA	in µCi/L (AVERAGE) =	4.02E+02	DETECTION LEVEL
TOTAL BETA	in µCi/mL (AVERAGE) =	4.02E-01	7.42E-04 µCi/mL
RELATIVE COUNTING ERROR	=	1.2%	

Data Entry by:	R Gilbert	Date:	18-Jan-94
Approved by:		Date:	20-Jan-94

Form 1 Rev. 1.2

16/2 1-17-94 mrs J1446-5720

29146 - 12
10

29466
10

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

34

Serial No	Sample Point	Date	Time Issued	Priority
J 1446.-5720	ECHTOLD	1- 4-94	12:26	26

Determination	Method Standard	Result Units	Charge Code	Reruns
TB	LA-508-101	uCi/ML	E14157	5

Sample Size	Customer ID
? ,100-10-1ml	KE88D

Remarks Calculations Results

COUNT AS uCI/L
USE 13,14,15 OR 16

WHC-SD-WM-DP-062, REV. 0

Dup

4.14×10^{-1} uCi/ml

Will R Syth

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr.	
1-17-94	1500		1-18-94

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

TB: LA-508-101 (D-0) LIQUIDS

Serial No.		SAMPLE	REPLICATE
J1446-5720	DETECTOR NUMBER	16	16
Batch ID	DISH SIZE 1, 2, or 5 (MS)	2	2
2549	TOTAL COUNTS (TC)	31061	29290
AT or TB ?	COUNT TIME in MINUTES (CT)	10	10
TB	BACKGROUND in cpm (BKG)	12	12
Rerun No.	SAMPLE SIZE in mL (SS)	1.000	1.000
5	DILUTION FACTOR (DF)	101	101
Analyst	DIGEST DILUTION FACTOR (DDF)	1	1
W SYTH	EFFICIENCY FACTOR (EFF)	0.3300	0.3300
Date	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	3094.100	2917.000
01/17/94	SAMPLE CONCENTRATION in µCi/L	4.27E+02	4.02E+02
	AVG. µCi/L in SAMPLE and REPLICATE =		4.1436E+02

Rs (Sample Count Rate) = (TC / CT) - BKG

TOTAL BETA µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

TOTAL BETA µCi/mL = TOTAL BETA µCi/L / 1000mL/L

Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100

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

		DETECTION LEVEL
TOTAL BETA in µCi/L (AVERAGE) =	4.14E+02	
TOTAL BETA in µCi/mL (AVERAGE) =	4.14E-01	7.42E-04 µCi/mL
RELATIVE COUNTING ERROR =	1.2%	

Data Entry by:		Date:	18-Jan-94
Approved by:		Date:	20-Jan-94

Form 1 Rev. 1.2

16/2 1-17-94 MS J1446-5720

31061 → -12
10

39290
10

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

56 REDU

Serial No	Sample Point	Date	Time Issued	Priority
J 1446.-5720	EECHOLD-	1- 4-94	18:26	08

Determination	Method Standard	Result Units	Charge Code	Reruns
TB	LA-508-101	uCi/ML	E14157	6

Sample Size	Customer ID
1 ,100-10-1ml	KE33D

Remarks, Calculations, Results

COUNT AS uCI/L
USE 13,14,15 OR 16

TRIP

WHC-SD-WM-DP-062, REV. 0

4.18x10² uCi/ml

Willie L Syth

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1-17-94	1500		1-18-94

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

TB: LA-508-101 (D-0) LIQUIDS

Serial No.			SAMPLE	REPLICATE
J1446-5720	DETECTOR NUMBER		16	16
Batch ID	DISH SIZE 1, 2, or 5	(MS)	2	2
2549	TOTAL COUNTS	(TC)	30556	30268
AT or TB ?	COUNT TIME in MINUTES	(CT)	10	10
TB	BACKGROUND in cpm	(BKG)	12	12
Rerun No.	SAMPLE SIZE in mL	(SS)	1.000	1.000
6	DILUTION FACTOR	(DF)	101	101
Analyst	DIGEST DILUTION FACTOR	(DDF)	1	1
W SYTH	EFFICIENCY FACTOR	(EFF)	0.3300	0.3300
Date	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE		3043.600	3014.800
01/17/94	SAMPLE CONCENTRATION in µCi/L		4.20E+02	4.16E+02
	AVG. µCi/L in SAMPLE and REPLICATE =			4.1762E+02

Rs (Sample Count Rate) = (TC / CT) - BKG

TOTAL BETA µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

TOTAL BETA µCi/mL = TOTAL BETA µCi/L / 1000mL/L

Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100

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

TOTAL BETA	in µCi/L (AVERAGE) =	4.18E+02	DETECTION LEVEL
TOTAL BETA	in µCi/mL (AVERAGE) =	4.18E-01	7.42E-04 µCi/mL
RELATIVE COUNTING ERROR	=	1.1%	

Data Entry by:		Date:	18-Jan-94
Approved by:		Date:	20-Jan-94

Form 1 Rev. 1.2

TOTAL BETA ANALYSIS - UNDIGESTED SAMPLE

16/2 1-17-94 mvs

J1446-5720

30556-12
10

30268
10

WESTINGHOUSE HANFORD COMPANY

222-S LABORATORY

ANALYTICAL BATCH 2533

Lab Segment Serial No. J-1445-1446	Customer ID: KE 83B, KE 83D
Analysis: TB	Sample Prep: Direct

Instrument: ~~NA~~ SLF 1-14-93 WA 63999	Procedure/ Rev: LA 508-101
Technologist: BILLSYTH [signature]	Date: 1-12-94
Starting Time: 0800	Temperature NA
Ending Time: 1500	Chemist: S. Fitzgerald

Comments: OUT FOR RERUN

	Description	Lab ID		Description	Lab ID
1	STD	J1439-5520	11		
2	Blank	J1440-5600	12		
3	SAM	J1445-5720	13		
4	SAM	J1445-5720	14		
5	SAM	J1446-5720	15		
6	SAM	J1446-5720	16		
7	SAM	J1446-5720	17		
8	SAM	J1445-5720	18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
[illegible]	119B51/10ml			

A-6000-881 (03/92)

ANALYTICAL BATCH SUMMARY SHEET

METHOD: **LA-508-101**

DATE START: **JANUARY 12, 1994**

PREPARED BY: **S.L. FITZGERALD**

DATE COMPLETE: **JANUARY 14, 1994**

	UNITS:	uCi/mL										
SPL NAME	SPL ID	ANALYTE	RESULT #1	RESULT #2	RESULT #3	AVERAGE	2*SD	PREC	ACCU	%REC	DET LIM	% CT ER
STD 119851	J1439	BETA	2.22E-01							97.6	7.63E-07	1.5
BLANK	J1440	BETA	<3.67E-04								7.71E-04	500
KE83B	J1445	BETA	1.85E+00	1.92E+00	1.85E+00	1.87E+00	8.08E-02	4.315			7.71E-04	0.5
											7.71E-04	0.5
											7.71E-04	0.5
KE83D	J1446	BETA	4.00E-01	4.10E-01	4.06E-01	4.05E-01	1.01E-02	2.483			1.53E-04	0.5
											1.53E-04	0.5
											1.53E-04	0.5

NARRATIVE: ☐ NO SPECIAL PROBLEMS/METHOD VARIATIONS IN THIS BATCH

LIST SPECIFIC PROBLEMS/VARIATIONS FOR THIS BATCH:

Standard results are reported as uCi/L

No replicates were run with the batch.
Batch needs to be rerun with replicates

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

1 Batch 2533

Serial No	Sample Point	Date	Time Issued	Priority
J 1439.-5520	BECHTOLD	1- 4-94	10:49	26

Determination	Method Standard	Result Units	Charge Code	Reruns
TB	LA-508-101	% RECOVERY	E14157	1

Sample Size	Customer ID
? 10ml	STD

Remarks Calculations, Results

S515 EV-CRB

STD#119B51 RESULT .222

STD VAL .227 %REC 97.60

WHC-SD-WM-DP-062, REV. 0

OUT FOR RERUN

William K. Syth

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	Raymond	Em Bareen		
Hrs	Hrs	Hrs	Hrs	Hrs
	1-12-94			D Honaker

Date	Time Completed	Lab Unit Mgr	
1-12-94	1500	[signature]	D Honaker

54-6800-061 (R-10 83)

TB: LA-508-101 (D-0) LIQUIDS

			STANDARD	REPLICATE
Serial No.	DETECTOR NUMBER		16	N/A
J1439-5520	DISH SIZE 1, 2, or 5	(MS)	2	M/A
Batch ID	TOTAL COUNTS	(TC)	16410	N/A
2533	COUNT TIME in MINUTES	(CT)	10	N/A
AT or TB ?	BACKGROUND in cpm	(BKG)	13	N/A
TB	SAMPLE SIZE in mL	(SS)	10.000	N/A
Rerun No.	DILUTION FACTOR	(DF)	1	N/A
1	DIGEST DILUTION FACTOR	(DDF)	1	N/A
Analyst	EFFICIENCY FACTOR	(EFF)	0.3300	N/A
W SYTH	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE		1628.000	N/A
Date	SAMPLE CONCENTRATION in µCi/L		2.22E-01	N/A
01/12/94	µCi/L in SAMPLE =			2.2222E-01

Rs (Sample Count Rate) = (TC / CT) - BKG

TOTAL BETA µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

TOTAL BETA µCi/mL = TOTAL BETA µCi/L / 1000mL/L

Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100

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

TOTAL BETA in µCi/L	=	2.22E-01	DETECTION LEVEL 7.63E-07 µCi/mL
TOTAL BETA in µCi/mL	=	2.22E-04	
RELATIVE COUNTING ERROR	=	1.5%	

Data Entry by:	R. Ahrts	Date:	13-Jan-94
Approved by:	[signature]	Date:	14-Jan-94

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TOTAL BETA ANALYSIS - UNDIGESTED SAMPLE

16 2" 1-12-94 R #1 J1439-5520

16410 / 10 = 13

Beta Calculation (CRPC_CAL 2.0)
By: KM BARELA, on 01-12-1994 at 16:53:43
Det #16 2 -inch mount Beta eff. : .33
Sample size : 10 mL Dilution : 1

Sample # J1439 Mount # 1

$$\frac{16410}{10} \times 13.0 = 2.2222E\text{-}01 \text{ uCi/L beta}$$

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

2

Serial No	Sample Point	Date	Time Issued	Priority
J 1440.-5620	BECHTOLD	1- 4-94	10:52	26

Determination	Method Standard	Result Units	Charge Code	Reruns
TB	LA-508-101	uCi/ML	E14157	1

Sample Size	Customer ID
? 10 ml	BLANK

Remarks Calculations, Results

COUNT AS uCI/L
USE 13,14,15 OR 16

WHC-SD-WM-DP-062, REV. 0

< 3.67×10^{-4} uCi/ml

OUT FOR RERUN

W Syth

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
	Raymond Em Bueler			
	1-12-94			

Date	Time Completed	Lab Unit Mgr
1-12-94	1500	

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

TB: LA-508-101 (D-0) LIQUIDS

Serial No.			BLANK	REPLICATE
	DETECTOR NUMBER		16	N/A
J1440-5620	DISH SIZE 1, 2, or 5	(MS)	2	N/A
Batch ID	TOTAL COUNTS	(TC)	130	N/A
2533	COUNT TIME in MINUTES	(CT)	10	N/A
AT or TB ?	BACKGROUND in cpm	(BKG)	13	N/A
TB	SAMPLE SIZE in mL	(SS)	1.000	N/A
Rerun No.	DILUTION FACTOR	(DF)	101	N/A
1	DIGEST DILUTION FACTOR	(DDF)	1	N/A
Analyst	EFFICIENCY FACTOR	(EFF)	0.3300	N/A
W SYTH	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE		2.661	N/A
Date	SAMPLE CONCENTRATION in µCi/L		3.67E-01	N/A
01/12/94	µCi/L in SAMPLE =		<	3.6680E-01

Rs (Sample Count Rate) = (TC / CT) - BKG

TOTAL BETA µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

TOTAL BETA µCi/mL = TOTAL BETA µCi/L / 1000mL/L

Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100

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

TOTAL BETA	in µCi/L	=	< 3.67E-01	DETECTION LEVEL
TOTAL BETA	in µCi/mL	=	< 3.67E-04	
LESS THAN Value was Determined from Rmax.				7.71E-04 µCi/mL
RELATIVE COUNTING ERROR		=	500.0%	

Data Entry by:		Date:	13-Jan-94
Approved by:		Date:	14-Jan-94

Form 1 Rev. 1.2

TOTAL BETA ANALYSIS - UNDIGESTED SAMPLE

16 2" 1-12-94 P #2 J1440 -5620

130/10

Beta Calculation (CRPC_CAL 2.0)
By: EM BARELA, on 01-12-1994 at 16:54:04
Det #16 2 -inch mount Beta eff. : .33
Sample size : 10 mL Dilution : 1

Sample # J1440 Mount # 1

130
---------- - 13.0 < 3.6316E-04 uCi/L beta
10

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

3

Serial No	Sample Point	Date	Time Issued	Priority
J 1445.-5720	BECHTOLD	1- 4-94	12: 3	36

Determination	Method Standard	Result Units	Charge Code	Reruns
TB	LA-508-101	uCi/ML	E14157	1

Sample Size	Customer ID
100-10-1ML	KE83B

Remarks Calculations Results

COUNT AS uCI/L
USE 13,14,15 OR 16

WHC-SD-WM-DP-062, REV. 0

1.85 uCi/ml

OUT FOR RERUN

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	Raymond			
Hrs	Hrs	Hrs	Hrs	Hrs
	1-12-94			

Date	Time Completed	Lab Unit Mgr
1-12-94	1500	

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

TB: LA-508-101 (D-0) LIQUIDS

			SAMPLE	REPLICATE
Serial No.	DETECTOR NUMBER		16	N/A
J1445-5720	DISH SIZE 1, 2, or 5	(MS)	2	N/A
Batch ID	TOTAL COUNTS	(TC)	134158	N/A
2533	COUNT TIME in MINUTES	(CT)	10	N/A
AT or TB ?	BACKGROUND in cpm	(BKG)	13	N/A
TB	SAMPLE SIZE in mL	(SS)	1.000	N/A
Rerun No.	DILUTION FACTOR	(DF)	101	N/A
1	DIGEST DILUTION FACTOR	(DDF)	1	N/A
Analyst	EFFICIENCY FACTOR	(EFF)	0.3300	N/A
W SYTH	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE		13402.800	N/A
Date	SAMPLE CONCENTRATION in µCi/L		1.85E+03	N/A
01/12/94	µCi/L in SAMPLE =			1.8478E+03

Rs (Sample Count Rate) = (TC / CT) - BKG

TOTAL BETA µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

TOTAL BETA µCi/mL = TOTAL BETA µCi/L / 1000mL/L

Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100

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

TOTAL BETA	in µCi/L	=	1.85E+03
TOTAL BETA	in µCi/mL	=	1.85E+00
RELATIVE COUNTING ERROR		=	0.5%

DETECTION LEVEL

7.71E-04 µCi/mL

Data Entry by:		Date:	13-Jan-94
Approved by:		Date:	14-Jan-94

Form 1 Rev. 1.2

TOTAL BETA ANALYSIS - UNDIGESTED SAMPLE

16 2" 1-12-94 K #3 J1445-5720

134158
10

Beta Calculation (CRPC_CAL 2.0)
By: BS BARELA, on 01-12-1994 at 16:55:11
Det #16 2 -inch mount Beta eff. : .33
Sample size : 1 mL Dilution : 101

Sample # J1445 Mount # 1

$$\frac{134158}{10} - 13.0 = 1.8478E+03 \text{ uCi/L beta}$$

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

4

Serial No	Sample Point	Date	Time Issued	Priority
J 1445.-5720	BECHTOLD	1- 4-94	12: 3	26

Determination	Method Standard	Result Units	Charge Code	Reruns
TB	LA-508-101	uCi/ML	E14157	2

Sample Size	Customer ID
100-10-1ML	KE33B

Remarks, Calculations, Results

COUNT AS uCI/L
USE 13,14,15 OR 16

WHC-SD-WM-DP-062, REV. 0

1.92 uCi/ml

OUT FOR RERUN

W Syth

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
	1-12-94			

Date	Time Completed	Lab Unit Mgr.	
1-12-94	1500		DHonaker

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

TB: LA-508-101 (D-0) LIQUIDS

Serial No.			SAMPLE	REPLICATE
J1445-5720	DETECTOR NUMBER		16	N/A
	DISH SIZE 1, 2, or 5	(MS)	2	M/A
Batch ID	TOTAL COUNTS	(TC)	139203	N/A
2533	COUNT TIME in MINUTES	(CT)	10	N/A
AT or TB ?	BACKGROUND in cpm	(BKG)	13	N/A
TB	SAMPLE SIZE in mL	(SS)	1.000	N/A
Rerun No.	DILUTION FACTOR	(DF)	101	N/A
2	DIGEST DILUTION FACTOR	(DDF)	1	N/A
Analyst	EFFICIENCY FACTOR	(EFF)	0.3300	N/A
W SYTH	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE		13907.300	N/A
Date	SAMPLE CONCENTRATION in µCi/L		1.92E+03	N/A
01/12/94	µCi/L in SAMPLE =			1.9173E+03

Rs (Sample Count Rate) = (TC / CT) - BKG

TOTAL BETA µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

TOTAL BETA µCi/mL = TOTAL BETA µCi/L / 1000mL/L

Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100

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

TOTAL BETA	in µCi/L	=	1.92E+03	DETECTION LEVEL
TOTAL BETA	in µCi/mL	=	1.92E+00	7.71E-04 µCi/mL
RELATIVE COUNTING ERROR		=	0.5%	

Data Entry by:	W Syth	Date:	13-Jan-94
Approved by:		Date:	14-Jan-94

Form 1 Rev. 1.2

TOTAL BETA ANALYSIS - UNDIGESTED SAMPLE

16 2" 1-12-94 VC #4 J1445-5720

139203 / 10

Beta Calculation (CRPC_CAL 2.0)
By: EM BARRILA, on 01-12-1994 at 16:55:31
Det #16 2 -inch mount Beta eff. : .33
Sample size : 1 mL Dilution : 101

Sample # J1445 Mount # 1

$$\frac{139203}{10} - 13.0 = 1.9173E+03 \text{ uCi/L beta}$$

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

5

Serial No	Sample Point	Date	Time Issued	Priority
J 1445.-5720	BECHTOLD	1- 4-94	12: 3	26

Determination	Method Standard	Result Units	Charge Code	Reruns
TB	LA-508-101	uCi/ML	E14157	3

Sample Size	Customer ID
100-10-1ML	KE83B

Remarks, Calculations, Results

COUNT AS uCI/L
USE 13,14,15 OR 16

WHC-SD-WM-DP-062, REV. 0

1.85 uCi/ml

OUT FOR RERUN

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	Raymond Em Barela			
Hrs	Hrs 1-12-94	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1-12-94	1501	[signature]	D Honaker

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

TB: LA-508-101 (D-0) LIQUIDS

			SAMPLE	REPLICATE
Serial No.	DETECTOR NUMBER		16	N/A
J1445-5720	DISH SIZE 1, 2, or 5	(MS)	2	M/A
Batch ID	TOTAL COUNTS	(TC)	134611	N/A
2533	COUNT TIME in MINUTES	(CT)	10	N/A
AT or TB ?	BACKGROUND in cpm	(BKG)	13	N/A
TB	SAMPLE SIZE in mL	(SS)	1.000	N/A
Rerun No.	DILUTION FACTOR	(DF)	101	N/A
3	DIGEST DILUTION FACTOR	(DDF)	1	N/A
Analyst	EFFICIENCY FACTOR	(EFF)	0.3300	N/A
W SYTH	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE		13448.100	N/A
Date	SAMPLE CONCENTRATION in µCi/L		1.85E+03	N/A
01/12/94	µCi/L in SAMPLE =			1.8540E+03

Rs (Sample Count Rate) = (TC / CT) - BKG

TOTAL BETA µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

TOTAL BETA µCi/mL = TOTAL BETA µCi/L / 1000mL/L

Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100

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

TOTAL BETA in µCi/L	=	1.85E+03	DETECTION LEVEL 7.71E-04 µCi/mL
TOTAL BETA in µCi/mL	=	1.85E+00	
RELATIVE COUNTING ERROR	=	0.5%	

Data Entry by:	[signature]	Date:	13-Jan-94
Approved by:	[signature]	Date:	14-Jan-94

Form 1 Rev. 1.2

TOTAL BETA ANALYSIS - UNDIGESTED SAMPLE

16 2" 1-12-94 R . #5 J1445-5720

134611/10

Beta Calculation (CRPC_CAL 2.0)
By: KM BARKLA, on 01-12-1994 at 16:56:24
Det #16 2-inch mount Beta eff. : .33
Sample size : 1 mL Dilution : 101

Sample # J1445 Mount # 1

$$\frac{134611}{10} - 13.0 = 1.8540E+03 \text{ uCi/L beta}$$

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

6

Serial No	Sample Point	Date	Time Issued	Priority
J 1446.-5720	BECHTOLD	1- 4-94	12:26	26

Determination	Method Standard	Result Units	Charge Code	Reruns
TB	LA-508-101	uCi/ML	E14157	1

Sample Size	Customer ID
? .050 ml	KE83D

Remarks, Calculations, Results

COUNT AS uCI/L
USE 13,14,15 OR 16

WHC-SD-WM-DP-062, REV. 0

4.00x10⁻¹ uCi/ml

OUT FOR RERUN

William K Syth

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	Raymond	Em Bacon		
Hrs	Hrs	Hrs	Hrs	Hrs
	1-12-94			

Date	Time Completed	Lab Unit Mgr	
1-12-94	1500		D Honaker

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

TB: LA-508-101 (D-0) LIQUIDS

			SAMPLE	REPLICATE
Serial No.	DETECTOR NUMBER		16	N/A
J1446-5720	DISH SIZE 1, 2, or 5	(MS)	2	M/A
Batch ID	TOTAL COUNTS	(TC)	146550	N/A
2533	COUNT TIME in MINUTES	(CT)	10	N/A
AT or TB ?	BACKGROUND in cpm	(BKG)	13	N/A
TB	SAMPLE SIZE in mL	(SS)	0.050	N/A
Rerun No.	DILUTION FACTOR	(DF)	1	N/A
1	DIGEST DILUTION FACTOR	(DDF)	1	N/A
Analyst	EFFICIENCY FACTOR	(EFF)	0.3300	N/A
W SYTH	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE		14642.000	N/A
Date	SAMPLE CONCENTRATION in µCi/L		4.00E+02	N/A
01/12/94	µCi/L in SAMPLE =			3.9973E+02

Rs (Sample Count Rate) = (TC / CT) - BKG

TOTAL BETA µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

TOTAL BETA µCi/mL = TOTAL BETA µCi/L / 1000mL/L

Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100

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

TOTAL BETA in µCi/L	=	4.00E+02	DETECTION LEVEL 1.53E-04 µCi/mL
TOTAL BETA in µCi/mL	=	4.00E-01	
RELATIVE COUNTING ERROR	=	0.5%	

Data Entry by:	R Cikita	Date:	13-Jan-94
Approved by:	[signature]	Date:	14-Jan-94

Form 1 Rev. 1.2

TOTAL BETA ANALYSIS - UNDIGESTED SAMPLE

16 2" 1-12-94 R #6 J1446-5720

146550/10

Beta Calculation (CEPC_CAL 2.0)
By: EM BAKKLA, on 01-12-1994 at 16:57:02
Det #16 2-inch mount Beta eff. : .33
Sample size : .05 mL Dilution : 1

Sample # J1446 Mount # 1

$$\frac{146550}{10} - 13.0 = 3.9973E+02 \text{ uCi/L beta}$$

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

7

Serial No	Sample Point	Date	Time Issued	Priority
J 1446.-5720	BECHTOLD	1- 4-94	12:26	26

Determination	Method Standard	Result Units	Charge Code	Reruns
TB	LA-508-101	uCi/ML	E14157	2

Sample Size	Customer ID
? .050 ml	KE83D

Remarks, Calculations, Results

COUNT AS uCI/L
USE 13,14,15 OR 16

WHC-SD-WM-DP-062, REV. 0

4.10x10⁻¹ uCi/ml

OUT FOR RERUN

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	Raymond	Em Bureau		
Hrs	Hrs 1-12-94	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1-12-94	1500	[signature]	D Honaker

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

TB: LA-508-101 (D-0) LIQUIDS

			SAMPLE	REPLICATE
Serial No.	DETECTOR NUMBER		16	N/A
J1446-5720	DISH SIZE 1, 2, or 5	(MS)	2	M/A
Batch ID	TOTAL COUNTS	(TC)	150293	N/A
2533	COUNT TIME in MINUTES	(CT)	10	N/A
AT or TB ?	BACKGROUND in cpm	(BKG)	13	N/A
TB	SAMPLE SIZE in mL	(SS)	0.050	N/A
Rerun No.	DILUTION FACTOR	(DF)	1	N/A
2	DIGEST DILUTION FACTOR	(DDF)	1	N/A
Analyst	EFFICIENCY FACTOR	(EFF)	0.3300	N/A
W SYTH	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE		15016.300	N/A
Date	SAMPLE CONCENTRATION in µCi/L		4.10E+02	N/A
01/12/94	µCi/L in SAMPLE =			4.0995E+02

Rs (Sample Count Rate) = (TC / CT) - BKG

TOTAL BETA µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

TOTAL BETA µCi/mL = TOTAL BETA µCi/L / 1000mL/L

Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100

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

TOTAL BETA in µCi/L	=	4.10E+02	DETECTION LEVEL 1.53E-04 µCi/mL
TOTAL BETA in µCi/mL	=	4.10E-01	
RELATIVE COUNTING ERROR	=	0.5%	

Data Entry by:	[signature]	Date:	13-Jan-94
Approved by:	[signature]	Date:	14-Jan-94

Form 1 Rev. 1.2

TOTAL BETA ANALYSIS - UNDIGESTED SAMPLE

16 2" 1-12-94 VR #7 J1446-5720

150293 / 10

Beta Calculation (CRPC_CAL 2.0)
By: EM BAKELA, on 01-12-1994 at 16:57:27
Det #16 2 -inch mount Beta eff. : .33
Sample size : .05 mL Dilution : 1

Sample # J1446 Mount # 1

$$\frac{150293}{10} - 13.0 = 4.0995E+02 \text{ uCi/L beta}$$

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

8

Serial No	Sample Point	Date	Time Issued	Priority
J 1446.-5720	BECHTOLD	1- 4-94	12:28	26

Determination	Method Standard	Result Units	Charge Code	Reruns
TB	LA-508-101	uCi/ML	E14157	3

Sample Size	Customer ID
? ,050 ml	KE83D

Remarks Calculations Results

COUNT AS uCi/L
USE 13,14,15 CR 15

WHC-SD-WM-DP-062, REV. 0

4.06x10^{2} uCi/ml

OUT FOR RERUN

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	Raymond			
Hrs	Hrs	Hrs	Hrs	Hrs
	1-12-94			

Date	Time Completed	Lab Unit Mgr
1-12-94	15:00	

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

TB: LA-508-101 (D-0) LIQUIDS

Serial No.			SAMPLE	REPLICATE
J1446-5720	DETECTOR NUMBER		16	N/A
	DISH SIZE 1, 2, or 5	(MS)	2	N/A
Batch ID	TOTAL COUNTS	(TC)	148776	N/A
2533	COUNT TIME in MINUTES	(CT)	10	N/A
AT or TB ?	BACKGROUND in cpm	(BKG)	13	N/A
TB	SAMPLE SIZE in mL	(SS)	0.050	N/A
Rerun No.	DILUTION FACTOR	(DF)	1	N/A
3	DIGEST DILUTION FACTOR	(DDF)	1	N/A
Analyst	EFFICIENCY FACTOR	(EFF)	0.3300	N/A
W SYTH	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE		14864.600	N/A
Date	SAMPLE CONCENTRATION in µCi/L		4.06E+02	N/A
01/12/94	µCi/L in SAMPLE =			4.0580E+02

Rs (Sample Count Rate) = (TC / CT) - BKG

TOTAL BETA µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)

TOTAL BETA µCi/mL = TOTAL BETA µCi/L / 1000mL/L

Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100

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

TOTAL BETA	in µCi/L	=	4.06E+02	DETECTION LEVEL
TOTAL BETA	in µCi/mL	=	4.06E-01	1.53E-04 µCi/mL
RELATIVE COUNTING ERROR		=	0.5%	

Data Entry by:	R. Acosta	Date:	13-Jan-94
Approved by:		Date:	14-Jan-94

Form 1 Rev. 1.2

TOTAL BETA ANALYSIS - UNDIGESTED SAMPLE

16 2" 1-12-94 IR -#8 J1446-5720

148776 / 10

Beta Calculation (CRPC_CAL 2.0)
By: M BARELA, on 01-12-1994 at 16:57:49
Det #16 2 -inch mount Beta eff. : .33
Sample size : .05 mL Dilution : 1

Sample # J1446 Mount # 1

148776
---------- - 13.0 = 4.0580E+02 uCi/L beta
10

WESTINGHOUSE HANFORD COMPANY

222-S LABORATORY

ANALYTICAL BATCH

WHC-SD-WM-DP-062, REV. 0

Lab Segment Serial No. J1445, J1446	Customer ID: KE83B, KE83D
Analysis: TO	Sample Prep: Direct Liquid

Instrument:	Procedure/ Rev: LA 508-101/Rev D Ø
Technologist: Cynthia Johnson [signature]	Date: 1/7/94
Starting Time: 1115	Temperature N/A
Ending Time: 1245	Chemist: S Fitzgerald

Comments:

OUT FOR RERUN

	Description	Lab ID		Description	Lab ID
1	Initial Lmcs check std	J1439-5520	11		
2	Blank	J1440 5620	12		
3	Sample	J1445-5720	13		
4	Sample dup	J1445-5720	14		
5	Sample trip	J1445-5720	15		
6	Sample	J1440 5720	16		
7	Sample dup	J1440 5720	17		
8	Sample trip	J1440 5720	18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
Lmcs check std	119B51/10ml			

185

A-6000-881 (03/92)

TOTAL BETA ANALYSIS - UNDIGESTED SAMPLE

Batch 2515

Serial No	Sample Point	Date	Time Issued	Priority
J 1439.-5520	BECHTOLD	1- 4-94	10:49	26

Determination	Method Standard	Result Units	Charge Code	Reruns
TB	LA-508-101	% RECOVERY	E14157	0

Sample Size	Customer ID
? 10 ml	STD

Remarks, Calculations, Results

S515 EV-CRB
STD# 119B51 RESULT
STD VAL %REC

OUT FOR RERUN

C tol

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1/7/94	1245	CA Clark	1-10-94 JK M Farrand

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

Serial No	Sample Point	Date	Time Issued	Priority
J 1440.-5620	BECHTOLD	1- 4-94	10:52	26

Determination	Method Standard	Result Units	Charge Code	Reruns
TB	LA-508-101	uCi/ML	E14157	0

Sample Size	Customer ID
?	BLANK

Remarks, Calculations, Results

COUNT AS uCi/L
USE 13,14,15 CR 16

OUT FOR RERUN

C tol

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1/7/94	1245	CA Clark	1-10-94 JK M Farrand

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

TOTAL BETA ANALYSIS - UNDIGESTED SAMPLE

Serial No.	Sample Point	Date	Time Issued	Priority
J 1445.-5720	BECHTOLD	1- 4-94	12: 3	26

Determination	Method Standard	Result Units	Charge Code	Reruns
TB	LA-508-101	uCi/ML	E14157	0

Sample Size	Customer ID
?	KE83B

Remarks, Calculations, Results

COUNT AS uCI/L
USE 13,14,15 OR 16
SAM.

OUT FOR RERUN

C Sol

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1/7/94	1245	CA Clark	1-10-94 DK McFarland

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

Serial No	Sample Point	Date	Time Issued	Priority
J 1445.-5720	BECHTOLD	1- 4-94	12: 3	26

Determination	Method Standard	Result Units	Charge Code	Reruns
TB	LA-508-101	uCi/ML	E14157	0

Sample Size	Customer ID
?	KE83B

Remarks, Calculations, Results

COUNT AS uCI/L
USE 13,14,15 OR 16
Dup.

OUT FOR RERUN

C Sol

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1/7/94	1245	CA Clark	1-10-94 DK McFarland

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

TOTAL BETA ANALYSIS - UNDIGESTED SAMPLE

Serial No.	Sample Point	Date	Time Issued	Priority
J 1445.-5720	BECHTOLD	1- 4-94	12: 3	26

Determination	Method/Standard	Result Units	Charge Code	Reruns
TB	LA-508-101	uCi/ML	E14157	0

Sample Size	Customer ID
?	KE83B

Remarks, Calculations, Results

COUNT AS uCI/L
USE 13,14,15 OR 16
Trip.

OUT FOR RERUN

C Sol

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1/7/94	1245	CA Clark	1-10-94 KM Gardner

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

Serial No	Sample Point	Date	Time Issued	Priority
J 1446.-5720	BECHTOLD	1- 4-94	12:26	26

Determination	Method Standard	Result Units	Charge Code	Reruns
TB	LA-508-101	uCi/ML	E14157	0

Sample Size	Customer ID
?	KE83D

Remarks, Calculations, Results

COUNT AS uCI/L
USE 13,14,15 OR 16
SAM.

OUT FOR RERUN

C Sol

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1/7/94	1245	CA Clark	1-10-94 KM Gardner

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

TOTAL BETA ANALYSIS - UNDIGESTED SAMPLE

Serial No	Sample Point	Date	Time Issued	Priority
J 1446.-5720	BECHTOLD	1- 4-94	12:26	26

Determination	Method Standard	Result Units	Charge Code	Reruns
TB	LA-508-101	uCi/ML	E14157	0

Sample Size	Customer ID
?	KE83D

Remarks, Calculations, Results

COUNT AS uCI/L
USE 13,14,15 OR 16
DUP.

OUT FOR RERUN

C Sol

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1/7/94	1245	CA Clark	1-10-94 AK McFarland

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

Serial No	Sample Point	Date	Time Issued	Priority
J 1446.-5720	BECHTOLD	1- 4-94	12:26	26

Determination	Method Standard	Result Units	Charge Code	Reruns
TB	LA-508-101	uCi/ML	E14157	0

Sample Size	Customer ID
?	KE83D

Remarks, Calculations, Results

COUNT AS uCI/L
USE 13,14,15 OR 16
TRIP.

OUT FOR RERUN

C Sol

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1/7/94	1245	CA Clark	1-10-94 AK McFarland

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

WESTINGHOUSE HANFORD COMPANY

222-S LABORATORY

ANALYTICAL BATCH

2408

Lab Segment Serial No. J1424 1425	Customer ID: KE65D, KE64A
Analysis: GEA	Sample Prep: Direct Liquid

Instrument: WB57237, WB57265	Procedure/ Rev: LA548-121/Rev A-0
Technologist: Cynthia Johnson C.R. Johnson	Date: 12/[illegible]/93
Starting Time: 1030	Temperature N/A
Ending Time: 1155	Chemist: Stan Catlow / Paula Fechter

Comments:

	Description	Lab ID
1	Initial Lines check std	J1401-5530
2	Reagent Blk	J1402-5630
3	Sample	J1424-5730
4	Sample drop	J1424-5730
5	Sample trip	J1424-5730
6	Sample	J1425-5730
7	Sample drop	J1425-5730
8	Sample trip	J1425-5730
9		
10		

	Description	Lab ID
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
Lines check std	521351/100ml			

A-6000-881 (03/92)

ANALYTICAL BATCH SUMMARY SHEET

METHOD: LA-548-121

DATE START: DECEMBER 20, 1993

PREPARED BY: S.L. FITZGERALD

DATE COMPLETE: DECEMBER 28, 1993

	UNITS:	ug/mL										
SPL NAME	SPL ID	ANALYTE	RESULT #1	RESULT #2	RESULT #3	AVERAGE	2*SD	PREC	ACCU	%REC	DET LIM	% CT ER
STD 32B51	J1401	CO-60	1.00E+02							99.2		2.9
		CS-137	1.33E+02							101		2.1
BLANK	J1402	AM-241	<9.38E-05								9.38E-05	
		CO-60	<9.35E-05								9.35E-05	
		CS-137	<1.22E-04								1.22E-04	
		EU-154	<2.84E-04								2.84E-04	
		EU-156	<2.20E-04								2.20E-04	
KE 65D	J1424	AM-241	9.05E-03	8.28E-03	8.26E-03	8.53E-03	9.01E-04	10.56				
		CO-60	3.44E-03	3.44E-03	3.42E-03	3.43E-03	2.31E-05	0.673				
		CS-137	1.33E-01	1.27E-01	1.26E-01	1.29E-01	7.57E-03	5.885				
		EU-154	<3.52E-04	<1.55E-03	1.87E-03	NA	NA	NA				
		EU-155	9.75E-04	8.85E-04	1.05 E-03	~~8.20E-04~~	~~1.07E-04~~	~~20.53~~				
						9.70E-04	1.35E-04	13.91	17.0	m		
KE 64A	J1425	AM-241	2.70E-02	2.74E-02	2.72E-02	2.72E-02	4.00E-04	1.471		1-21-94		
		CO-60	6.30E-03	6.62E-03	6.80E-03	6.57E-03	5.06E-04	7.705				
		CS-137	3.21E-01	3.26E-01	3.24E-01	3.24E-01	5.03E-03	1.555				
		EU-154	4.86E-03	5.41E-03	5.82E-03	5.36E-03	9.63E-04	17.96				
		EU-155	2.86E-03	3.27E-03	2.25E-03	2.79E-03	1.03E-03	36.75				

1/11/94 SSB

NARRATIVE: ☐ NO SPECIAL PROBLEMS/METHOD VARIATIONS IN THIS BATCH

LIST SPECIFIC PROBLEMS/VARIATIONS FOR THIS BATCH:

Standard results are reported in ug/L

THE PRECISION FOR EU-154 (J1424) AND EU 155 (J1425) EXCEED CONTROL LIMITS. BECAUSE OF THE LOW EU VALUES INVOLVED, HOWEVER THE HIGH PRECISION IS PROBABLY A RESULT OF COUNTING STATISTICS. THEREFORE NO RERUN IS REQUESTED.

GAMMA ENERGY ANALYSIS - UNDIGESTED SAMPLE

3062 Batch 2408

Serial No	Sample Point	Date	Time Issued	Priority
J 1401.-5530	BECHTOLD	12-15-93	9: 0	22

Determination	Method Standard	Result Units	Charge Code	Reruns
GEA	LA-548-121	% RECOVERY	E14157	0

Sample Size: ?.100ml + 23ml H_2O — Customer ID: STD

Remarks Calculations Results:
COLX STD# 32351
R901 STD VAL
RESULT 133 % REC 101.4
R901 STD VAL
RESULT 1.00 E+2 % REC 99.1

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date: 12/20/93 — Time Completed: 1155 — Lab Unit Mgr

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

3063

Serial No	Sample Point	Date	Time Issued	Priority
J 1402.-5630	BECHTOLD	12-15-93	9: 4	22

Determination	Method Standard	Result Units	Charge Code	Reruns
GEA	LA-548-121	uCi/ML	E14157	0

Sample Size: ?.500ml +23ml H_2O — Customer ID: BLK

Remarks Calculations Results:
COUNT AS uCI/L
LASER PRINTOUT
Am^{241} $<9.38 \times 10^{-5}$ uCi/ml
Co^{60} $<9.35 \times 10^{-5}$ "
Cs^{137} $<1.22 \times 10^{-4}$ "
Eu^{154} $<2.84 \times 10^{-4}$ "
Eu^{155} $<2.20 \times 10^{-4}$ "

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date: 12/20/93 — Time Completed: 1155 — Lab Unit Mgr

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

GAMMA ENERGY ANALYSIS - UNDIGESTED SAMPLE

3064

Serial No	Sample Point	Date	Time Issued	Priority
J 1424.-5730	BECHTOLD	12-16-93	13: 7	22

Determination	Method Standard	Result Units	Charge Code	Reruns
GEA	LA-548-121	uCi/ML	E14157	0

Sample Size	Customer ID
? 500 ml + 23 ml H_2O	KE65D

Remarks, Calculations, Results

SAM

COUNT AS uCI/L
LASER PRINTOUT

Am^{241} 9.05×10^{-3} uCi/ml
Co^{60} 3.44×10^{-3}
Cs^{137} 1.33×10^{-1}
Eu^{154} $<3.52 \times 10^{-4}$
Eu^{155} 9.75×10^{-4}

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	D H Milicia	M Brown		
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
12/20/93	1155	[signature] [signature]

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

3065

Serial No	Sample Point	Date	Time Issued	Priority
J 1424.-5730	BECHTOLD	12-16-93	13: 7	22

Determination	Method Standard	Result Units	Charge Code	Reruns
GEA	LA-548-121	uCi/ML	E14157	0

Sample Size	Customer ID
? 500 ml + 23 ml H_2O	KE65D

Remarks, Calculations, Results

DUP

COUNT AS uCI/L
LASER PRINTOUT

Am^{241} 8.28×10^{-3} uCi/ml
Co^{60} 3.44×10^{-3}
Cs^{137} 1.27×10^{-1}
Eu^{154}
Eu^{155} 8.85×10^{-4}

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	M Brown			
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
12/20/93	1155	[signature] [signature]

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

GAMMA ENERGY ANALYSIS - UNDIGESTED SAMPLE

3066

Serial No	Sample Point	Date	Time Issued	Priority
J 1424.-5730	BECHTOLD	12-16-93	13: 7	22

Determination	Method Standard	Result Units	Charge Code	Reruns
GEA	LA-548-121	uCi/ML	B14157	0

Sample Size	Customer ID
?,500 ml + 23 ml H_2O	KE65D

Remarks Calculations Results

TRIP

COUNT AS uCi/L
LASER PRINTOUT

Am^{241}	8.26×10^{-3} uCi/ml
Co^{60}	3.42×10^{-3}
Cs^{137}	1.26×10^{-1}
Eu^{154}	1.87×10^{-3}
Eu^{155}	1.06×10^{-3} uCi/mL 11/11/94

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	D H Williams			
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
12/20/93	1155	

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

3067

Serial No	Sample Point	Date	Time Issued	Priority
J 1425.-5730	BECHTOLD	12-16-93	13:17	22

Determination	Method Standard	Result Units	Charge Code	Reruns
GEA	LA-548-121	uCi/ML	B14157	0

Sample Size	Customer ID
?,500 ml + 23 ml H_2O	KE64A

Remarks Calculations Results

Sam

COUNT AS uCi/L
LASER PRINTOUT

Am^{241}	2.70×10^{-2} uCi/ml
Co^{60}	6.30×10^{-3}
Cs^{137}	3.21×10^{-1}
Eu^{154}	4.86×10^{-3}
Eu^{155}	2.86×10^{-3}

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	D H Williams			
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
12/20/93	1155	

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

GAMMA ENERGY ANALYSIS - UNDIGESTED SAMPLE

3068

Serial No	Sample Point	Date	Time Issued	Priority
J 1425.-5730	BECHTOLD	12-16-93	13:17	22

Determination	Method Standard	Result Units	Charge Code	Reruns
GEA	LA-548-131	uCi/ML	E14157	0

Sample Size	Customer ID
?.500 ml + 23ml H_2O	KE64A

Remarks Calculations Results

COUNT AS uCi/L
LASER PRINTOUT

DUP

Am^{241}	2.74×10^{-2} uCi/ml
Co^{60}	6.62×10^{-3}
Cs^{137}	3.26×10^{-1}
Eu^{154}	5.41×10^{-3}
Eu^{155}	3.27×10^{-3}

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	DH Milicic			
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
12/20/93	1155	

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

3069

Serial No	Sample Point	Date	Time Issued	Priority
J 1425.-5730	BECHTOLD	12-16-93	13:17	22

Determination	Method Standard	Result Units	Charge Code	Reruns
GEA	LA-548-131	uCi/ML	E14157	0

Sample Size	Customer ID
?.500 ml + 23ml H_2O	KE64A

Remarks Calculations Results

COUNT AS uCi/L
LASER PRINTOUT

TRIP

Am^{241}	2.72×10^{-2} uCi/ml
Co^{60}	6.80×10^{-3}
Cs^{137}	3.24×10^{-1}
Eu^{154}	5.82×10^{-3}
Eu^{155}	2.25×10^{-3}

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	DH Milicic			
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
12/20/93	1155	

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

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* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*                                                                       *
*              G A M M A   S P E C T R U M   A N A L Y S I S            *
*                                                                       *
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

CANBERRA SPECTRAN-F V2.06  SOFTWARE

222-S COUNTING ROOM WESTINGHOUSE HANFORD              20-DEC-93  14:11:23


                    A N A L Y S I S   P A R A M E T E R S

MCA UNIT NUMBER:    2     /     ADC UNIT NUMBER: 3.0
DETECTOR NUMBER:    3     /     GEOMETRY NUMBER:  41
SPECTRUM SIZE:  4096 CHANNELS
ORDER OF SMOOTHING FUNCTION:      5
NUMBER OF BACKGROUND CHANNELS:  4 ON EACH SIDE OF PEAK
PEAK CONFIDENCE FACTOR: 85.0%
IDENTIFICATION ENERGY WINDOW: +- 1.50 KEV
ERROR QUOTATION: 1.96 SIGMA UNCERTAINTY

ENVIRONMENTAL BACKGROUND SUBTRACTED
LLD CALCULATION PERFORMED
MEASURED ENERGY DIFFERENCES LISTED
MULTIPLET ANALYSIS PERFORMED

SPECTRAL DATA READ DIRECTLY FROM MULTICHANNEL ANALYZER AN1:
ANALYZED BY:

SAMPLE DESCRIPTION: J1401-5530
GEOMETRY DESCRIPTION:  42B47-A 22CC LIQ
SAMPLE SIZE:   1.0000E-03 LI        / CONVERSION FACTOR: 1.0000E-01
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL205

COLLECT STARTED ON 20-DEC-93 AT 13:21:03

COLLECT LIVE TIME:     3000. SECONDS
        REAL TIME:     3007. SECONDS
        DEAD TIME:      0.23 %

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

ENERGY CALIBRATION PERFORMED 20-OCT-93
EFFICIENCY CALIBRATION PERFORMED 23-OCT-92
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222-S COUNTING ROOM WESTINGHOUSE HANFORD 20-DEC-93 14:11:23

P E A K A N A L Y S I S

PK	CENTROID CHANNEL	ENERGY KEV	FWHM KEV	BACKGND COUNTS	NET AREA COUNTS	ERROR %	NUCLIDES
1C	1126.51	563.13	1.43	578.	533.	17.1	CS-134, EU-152
2C	1138.62	569.19	1.43	623.	887.	13.7	CS-134, BI-207
3C	1209.51	604.62	1.48	618.	5779.	3.4	CS-134
4C	1218.44	609.08	1.48	558.	110.	38.0	BI-214A, RU-103
5	1323.41	661.55	1.57	518.	9848.	2.1	CS-137
5B		661.41			81.	28.8	
6C	1591.77	795.70	1.70	396.	4271.	4.0	CS-134
7C	1604.12	801.87	1.70	347.	442.	14.5	CS-134
8	2346.41	1172.93	2.01	389.	5320.	2.9	CO-60
9	2665.06	1332.23	2.04	111.	4721.	2.9	CO-60
10	2730.47	1364.93	1.99	26.	125.	22.3	CS-134
11	2921.70	1460.53	2.07	26.	555.	8.9	K-40
11B		1460.58			611.	5.5	

ERROR QUOTATION AT 1.96 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

C 'ILTIPLET ANALYSIS CONVERGED NORMALLY
B .NVIRONMENTAL BACKGROUND PEAK

BACKGROUND SUBTRACTION PERFORMED USING FILE BK0013
BACKGROUND DESCRIPTION: BKG
BACKGROUND COLLECT STARTED ON 15-JAN-90 AT 11:00:00
BACKGROUND LIVE TIME: 7000. SECONDS

222-S COUNTING ROOM WESTINGHOUSE HANFORD 20-DEC-93 14:11:23

SAMPLE: J1401-5530
DATA COLLECTED ON 20-DEC-93 AT 13:21:03
DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT.

R A D I O N U C L I D E A N A L Y S I S R E P O R T

NUCLIDE	ACTIVITY CONCENTRATION IN uCi/LI MEASURED	ERROR	DECAY CORRECTED	ERROR	ENERGY COMPARISON (KEV) EXPECT	DIFF
AM-241	LLD<8.23E-01		LLD<8.23E-01		59.54	
AM-243	LLD<5.43E-01		LLD<5.43E-01		74.67	
BA-133	LLD<1.19E+00		LLD<1.19E+00		356.02	
BA-140	LLD<3.21E+00		LLD<3.21E+00		537.27	
BI-212	LLD<6.67E+00		LLD<6.67E+00		727.20	
CEPR144	LLD<6.45E+00		LLD<6.45E+00		133.51	
CO-60	1.00E+02	+-3.11E+00	1.00E+02	+-3.11E+00	1332.50	-0.27
					1173.24	-0.30
CR-51	LLD<6.32E+00		LLD<6.32E+00		320.09	
CS-134	6.71E+01	+-2.79E+00	6.71E+01	+-2.79E+00	795.84	-0.14
					604.70	-0.08
CS-137	1.33E+02	+-3.13E+00	1.33E+02	+-3.13E+00	661.65	-0.10
EU-152	LLD<2.79E+00		LLD<2.79E+00		1408.01	
EU-154	LLD<2.22E+00		LLD<2.22E+00		1274.45	
EU-154H	LLD<2.05E+00		LLD<2.05E+00		1274.80	
EU-155	LLD<1.66E+00		LLD<1.66E+00		105.31	
FE-59	LLD<2.38E+00		LLD<2.38E+00		1099.25	
I-131	LLD<9.03E-01		LLD<9.03E-01		364.48	
K-40	LLD<1.49E+01		LLD<1.49E+01		1460.75	
LA-140	LLD<5.44E-01		LLD<5.44E-01		1596.20	
MN-54	LLD<1.06E+00		LLD<1.06E+00		834.83	
NA-22	LLD<7.88E-01		LLD<7.88E-01		1274.55	
NB-94	LLD<7.53E-01		LLD<7.53E-01		702.63	
NB-95	LLD<9.16E-01		LLD<9.16E-01		765.78	
NP-237	LLD<2.57E+00		LLD<2.57E+00		86.50	
PB-212	LLD<1.15E+00		LLD<1.15E+00		239.00	
PU-239	LLD<6.20E+03		LLD<6.20E+03		129.30	
PU-241	LLD<1.97E+05		LLD<1.97E+05		148.57	
RA-224	LLD<1.24E+01		LLD<1.24E+01		240.99	
RA-226	LLD<1.22E+01		LLD<1.22E+01		186.10	
RU-103	LLD<8.58E-01		LLD<8.58E-01		497.08	
RU103	LLD<9.03E-01		LLD<9.03E-01		497.08	
RURH106	LLD<1.61E+01		LLD<1.61E+01		621.80	
SB-125	LLD<2.77E+00		LLD<2.77E+00		427.89	
SB-125A	LLD<2.77E+00		LLD<2.77E+00		427.89	
SE-75	LLD<8.50E-01		LLD<8.50E-01		264.66	
SN-113	LLD<1.23E+00		LLD<1.23E+00		391.67	
SR-85	LLD<8.56E-01		LLD<8.56E-01		513.99	
TH-228	LLD<2.75E+01		LLD<2.75E+01		84.37	
TL-208	LLD<1.08E+00		LLD<1.08E+00		583.20	
U-235	LLD<8.13E-01		LLD<8.13E-01		185.71	
Y-88	LLD<5.86E-01		LLD<5.86E-01		1836.06	
ZN-65	LLD<2.54E+00		LLD<2.54E+00		1115.55	
ZR-95	LLD<1.58E+00		LLD<1.58E+00		756.73	
TOTAL	3.00E+02	+-5.22E+00	3.00E+02	+-5.22E+00		

STANDARD DEVIATION = 0.10

EBAR = ***** MEV/DISINTEGRATION
MAXIMUM PERMISSABLE ACTIVITY = 1.42E-09 UC/LI
TOTAL MEASURED ACTIVITY = 3.00E+02 (+-5.22E+00) UC/LI
% TECH. SPEC. = ****** (+-****)

ERROR QUOTATION AT 1.96 SIGMA
LLD CONFIDENCE LEVEL AT 85.0%

PEAKS NOT USED IN ANALYSIS

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
1126.51	563.13	533.	17.1	2.01E+01
1138.62	569.19	887.	13.7	3.38E+01
1604.12	801.87	442.	14.5	2.21E+01
2730.47	1364.93	125.	22.3	1.00E+01

PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
1215.44	609.08	110.	38.0	4.43E+00
2921.70	1460.53	555.	8.9	4.73E+01

D.H Milbrath
12-20-93

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*          G A M M A   S P E C T R U M   A N A L Y S I S                *
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CANBERRA SPECTRAN-F V2.06  SOFTWARE

222-S COUNTING ROOM WESTINGHOUSE HANFORD          20-DEC-93  15:28:13


               A N A L Y S I S   P A R A M E T E R S

MCA UNIT NUMBER:    2     /     ADC UNIT NUMBER: 3.0
DETECTOR NUMBER:    3     /     GEOMETRY NUMBER:  41
SPECTRUM SIZE:  4096 CHANNELS
ORDER OF SMOOTHING FUNCTION:      5
NUMBER OF BACKGROUND CHANNELS:  4 ON EACH SIDE OF PEAK
PEAK CONFIDENCE FACTOR: 85.0%
IDENTIFICATION ENERGY WINDOW: +- 1.50 KEV
ERROR QUOTATION: 1.96 SIGMA UNCERTAINTY

ENVIRONMENTAL BACKGROUND SUBTRACTED
LLD CALCULATION PERFORMED
MEASURED ENERGY DIFFERENCES LISTED
MULTIPLET ANALYSIS PERFORMED

SPECTRAL DATA READ DIRECTLY FROM MULTICHANNEL ANALYZER AN1:
ANALYZED BY:

SAMPLE DESCRIPTION: J1402-5630
GEOMETRY DESCRIPTION:  42B47-A 22CC LIQ
SAMPLE SIZE:   1.0000E-03 LI       / CONVERSION FACTOR: 5.0000E-01
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL205

COLLECT STARTED ON 20-DEC-93 AT 14:37:58

COLLECT LIVE TIME:     3000. SECONDS
        REAL TIME:     3002. SECONDS
        DEAD TIME:      0.07 %

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

ENERGY CALIBRATION PERFORMED 20-OCT-93
EFFICIENCY CALIBRATION PERFORMED 23-OCT-92
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222-S COUNTING ROOM WESTINGHOUSE HANFORD 20-DEC-93 15:28:13

P E A K A N A L Y S I S

PK	CENTROID CHANNEL	ENERGY KEV	FWHM KEV	BACKGND COUNTS	NET AREA COUNTS	ERROR %	NUCLIDES
1	1021.60	510.69	1.67	154.	92.	44.5	RN-222,I-133,
1B		510.92			134.	19.6	TL-208,NA-22, ZN-65,RH-106
2	1218.50	609.11	1.82	89.	147.	24.8	BI-214A,
2B		609.19			122.	21.0	RU-103
3	1822.53	911.05	1.43	63.	61.	48.7	AC-228A
3B		910.98			84.	23.3	
4	2921.56	1460.46	2.12	28.	523.	9.2	K-40
4B		1460.58			611.	5.5	

ERROR QUOTATION AT 1.96 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

B - ENVIRONMENTAL BACKGROUND PEAK

BACKGROUND SUBTRACTION PERFORMED USING FILE BK0013
BACKGROUND DESCRIPTION: BKG
BACKGROUND COLLECT STARTED ON 15-JAN-90 AT 11:00:00
BACKGROUND LIVE TIME: 7000. SECONDS

222-S COUNTING ROOM WESTINGHOUSE HANFORD 20-DEC-93 15:28:13

SAMPLE: J1402-5630
DATA COLLECTED ON 20-DEC-93 AT 14:37:58
DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT.

R A D I O N U C L I D E A N A L Y S I S R E P O R T

NUCLIDE	ACTIVITY CONCENTRATION IN uCi/LI				ENERGY COMPARISON (KEV)	
	MEASURED	ERROR	DECAY CORRECTED	ERROR	EXPECT	DIFF
AM-241	LLD<9.38E-02		LLD<9.38E-02		59.54	
AM-243	LLD<7.53E-02		LLD<7.53E-02		74.67	
BA-133	LLD<1.09E-01		LLD<1.09E-01		356.02	
BA-140	LLD<2.60E-01		LLD<2.60E-01		537.27	
BI-212	LLD<6.15E-01		LLD<6.15E-01		727.20	
CEPR144	LLD<8.29E-01		LLD<8.29E-01		133.51	
CO-60	LLD<9.35E-02		LLD<9.35E-02		1332.50	
CR-51	LLD<5.89E-01		LLD<5.89E-01		320.09	
CS-134	LLD<9.49E-02		LLD<9.49E-02		795.84	
CS-137	LLD<1.22E-01		LLD<1.22E-01		661.65	
EU-152	LLD<4.83E-01		LLD<4.83E-01		1408.01	
EU-154	LLD<2.84E-01		LLD<2.84E-01		1274.45	
EU-154H	LLD<2.52E-01		LLD<2.52E-01		1274.80	
EU-155	LLD<2.20E-01		LLD<2.20E-01		105.31	
FE-59	LLD<1.54E-01		LLD<1.54E-01		1099.25	
I-131	LLD<7.72E-02		LLD<7.72E-02		364.48	
K-40	LLD<2.89E+00		LLD<2.89E+00		1460.75	
LA-140	LLD<9.14E-02		LLD<9.14E-02		1596.20	
MN-54	LLD<7.51E-02		LLD<7.51E-02		834.83	
NA-22	LLD<1.01E-01		LLD<1.01E-01		1274.55	
NB-94	LLD<7.33E-02		LLD<7.33E-02		702.63	
NB-95	LLD<8.74E-02		LLD<8.74E-02		765.78	
NP-237	LLD<3.25E-01		LLD<3.25E-01		86.50	
PB-212	LLD<1.20E-01		LLD<1.20E-01		239.00	
PU-239	LLD<7.82E+02		LLD<7.82E+02		129.30	
PU-241	LLD<2.51E+04		LLD<2.51E+04		148.57	
RA-224	LLD<1.45E+00		LLD<1.45E+00		240.99	
RA-226	LLD<1.34E+00		LLD<1.34E+00		186.10	
RU-103	LLD<6.65E-02		LLD<6.65E-02		497.08	
RU103	LLD<7.00E-02		LLD<7.00E-02		497.08	
RURH106	LLD<1.42E+00		LLD<1.42E+00		621.80	
SB-125	LLD<2.00E-01		LLD<2.00E-01		427.89	
SB-125A	LLD<2.00E-01		LLD<2.00E-01		427.89	
SE-75	LLD<8.49E-02		LLD<8.49E-02		264.66	
SN-113	LLD<9.93E-02		LLD<9.93E-02		391.67	
SR-85	LLD<9.03E-02		LLD<9.03E-02		513.99	
TH-228	LLD<3.47E+00		LLD<3.47E+00		84.37	
TL-208	LLD<1.14E-01		LLD<1.14E-01		583.20	
U-235	LLD<8.96E-02		LLD<8.96E-02		185.71	
Y-88	LLD<6.71E-02		LLD<6.71E-02		1836.06	
ZN-65	LLD<2.74E-01		LLD<2.74E-01		1115.55	
ZR-95	LLD<1.23E-01		LLD<1.23E-01		756.73	
TOTAL	0.00E-01	+-0.00E-01	0.00E-01	+-0.00E-01		

ERROR QUOTATION AT 1.96 SIGMA
LLD CONFIDENCE LEVEL AT 85.0%

ALL DETECTED PEAKS WERE USED IN THE ANALYSIS

PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
1021.60	510.69	92.	44.5	3.23E+00
1218.50	609.11	147.	24.8	5.92E+00
1822.53	911.05	61.	48.7	3.38E+00
2921.56	1460.46	523.	9.2	4.46E+01

MB..... 12/4/93

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*                                                                     *
*          G A M M A   S P E C T R U M   A N A L Y S I S              *
*                                                                     *
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CANBERRA SPECTRAN-F V2.06 SOFTWARE

WHC-SD-WM-DP-062, REV. 0

222-S COUNTING ROOM WESTINGHOUSE HANFORD 20-DEC-93 16:45:11

A N A L Y S I S P A R A M E T E R S

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MCA UNIT NUMBER:   2     /     ADC UNIT NUMBER: 3.0
DETECTOR NUMBER:    3    /     GEOMETRY NUMBER:  41
SPECTRUM SIZE:  4096 CHANNELS
ORDER OF SMOOTHING FUNCTION:      5
NUMBER OF BACKGROUND CHANNELS:  4 ON EACH SIDE OF PEAK
PEAK CONFIDENCE FACTOR: 85.0%
IDENTIFICATION ENERGY WINDOW: +- 1.50 KEV
ERROR QUOTATION: 1.96 SIGMA UNCERTAINTY

ENVIRONMENTAL BACKGROUND SUBTRACTED
LLD CALCULATION PERFORMED
MEASURED ENERGY DIFFERENCES LISTED
MULTIPLET ANALYSIS PERFORMED

SPECTRAL DATA READ DIRECTLY FROM MULTICHANNEL ANALYZER AN1:
ANALYZED BY:          DM

SAMPLE DESCRIPTION: J-1424-5730
GEOMETRY DESCRIPTION:  42B47-A 22CC LIQ
SAMPLE SIZE:   1.0000E-03 LI       / CONVERSION FACTOR: 5.0000E-01
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL205

COLLECT STARTED ON 20-DEC-93 AT 15:54:49

COLLECT LIVE TIME:     3000. SECONDS
        REAL TIME:     3009. SECONDS
        DEAD TIME:      0.30 %

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

ENERGY CALIBRATION PERFORMED 20-OCT-93
EFFICIENCY CALIBRATION PERFORMED 23-OCT-92
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P E A K A N A L Y S I S

PK	CENTROID CHANNEL	ENERGY KEV	FWHM KEV	BACKGND COUNTS	NET AREA COUNTS	ERROR %	NUCLIDES
1	97.61	48.84	1.28	2620.	276.	52.7	U-234
2	119.05	59.56	0.96	2215.	5167.	3.7	AM-241,U-237, EU-155
3	173.15	86.60	1.13	1844.	662.	19.0	CS-136, EU-155, EU-155A, PB-214X, TL-208X, CD-109
4	210.54	105.29	1.23	2127.	334.	39.7	EU-155, EU-155B, NP-239
5	246.21	123.12	1.10	1898.	1112.	12.0	EU-152,CO-57, EU-154A
6	1323.40	661.55	1.60	705.	48962.	0.9	CS-137
6B		661.41			81.	28.8	
7	1446.63	723.15	1.54	157.	137.	32.2	SB-124,I-131, AG-108, EU-154D, ZR-95
8	2346.63	1173.05	1.96	96.	966.	7.1	CO-60
9	2548.59	1274.01	2.60	68.	135.	26.4	EU-154, EU-154H, NA-22
10	2665.10	1332.25	1.88	45.	811.	7.4	CO-60
11	2921.54	1460.45	2.15	40.	571.	9.0	K-40
11B		1460.58			611.	5.5	

ERROR QUOTATION AT 1.96 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

B - ENVIRONMENTAL BACKGROUND PEAK

BACKGROUND SUBTRACTION PERFORMED USING FILE BK0013
BACKGROUND DESCRIPTION: BKG
BACKGROUND COLLECT STARTED ON 15-JAN-90 AT 11:00:00
BACKGROUND LIVE TIME: 7000. SECONDS

222-S COUNTING ROOM WESTINGHOUSE HANFORD 20-DEC-93 16:45:11

SAMPLE: J-1424-5730
DATA COLLECTED ON 20-DEC-93 AT 15:54:49
DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT.

R A D I O N U C L I D E A N A L Y S I S R E P O R T

NUCLIDE	ACTIVITY CONCENTRATION IN uCi/LI MEASURED	ERROR	DECAY CORRECTED	ERROR	ENERGY COMPARISON (KEV) EXPECT	DIFF	
AM-241	9.05E+00	+-3.41E-01	9.05E+00	+-3.41E-01	59.54	0.02	
AM-243	LLD<1.29E-01		LLD<1.29E-01		74.67		
BA-133	LLD<2.89E-01		LLD<2.89E-01		356.02		
BA-140	LLD<7.35E-01		LLD<7.35E-01		537.27		
BI-212	LLD<1.24E+00		LLD<1.24E+00		727.20		
CEPR144	LLD<1.55E+00		LLD<1.55E+00		133.51		
CO-60	3.44E+00	+-2.57E-01	3.44E+00	+-2.57E-01	1332.50	-0.25	
					1173.24	-0.19	
CR-51	LLD<1.56E+00		LLD<1.56E+00		320.09		
CS-134	LLD<1.31E-01		LLD<1.31E-01		795.84		
CS-137	1.33E+02	+-1.80E+00	1.33E+02	+-1.80E+00	661.65	-0.10	
EU-152	LLD<5.91E-01		LLD<5.91E-01		1408.01		
EU-154	LLD<3.52E-01		LLD<3.52E-01		1274.45		
~~EU-154H~~	~~1.54E+00~~	~~+-4.08E-01~~	~~1.54E+00~~	~~+-4.08E-01~~	~~1274.80~~	~~-0.79~~	BKG 12/21/93
EU-155	9.75E-01	+-3.88E-01	9.75E-01	+-3.88E-01	105.31	-0.01	
					86.54	0.06	
FE-59	LLD<2.51E-01		LLD<2.51E-01		1099.25		
I-131	LLD<2.24E-01		LLD<2.24E-01		364.48		
K-40	LLD<2.99E+00		LLD<2.99E+00		1460.75		
LA-140	LLD<8.65E-02		LLD<8.65E-02		1596.20		
MN-54	LLD<1.11E-01		LLD<1.11E-01		834.83		
~~NA-22~~	~~5.48E-01~~	~~+-1.45E-01~~	~~5.48E-01~~	~~+-1.45E-01~~	~~1274.55~~	~~-0.54~~	BKG 12/21/93
NB-94	LLD<9.74E-02		LLD<9.74E-02		702.63		
NB-95	LLD<1.06E-01		LLD<1.06E-01		765.78		
~~NP-237~~	~~3.26E+00~~	~~+-6.21E-01~~	~~3.26E+00~~	~~+-6.21E-01~~	~~86.50~~	~~0.10~~	^{155}Eu 12/21/93
PB-212	LLD<2.73E-01		LLD<2.73E-01		239.00		
PU-239	LLD<1.47E+03		LLD<1.47E+03		129.30		
PU-241	LLD<4.68E+04		LLD<4.68E+04		148.57		
RA-224	LLD<3.01E+00		LLD<3.01E+00		240.99		
RA-226	LLD<3.03E+00		LLD<3.03E+00		186.10		
RU-103	LLD<2.15E-01		LLD<2.15E-01		497.08		
RU103	LLD<2.26E-01		LLD<2.26E-01		497.08		
RUTH106	LLD<3.00E+00		LLD<3.00E+00		621.80		
SB-125	LLD<7.78E-01		LLD<7.78E-01		427.89		
SB-125A	LLD<7.78E-01		LLD<7.78E-01		427.89		
SE-75	LLD<2.06E-01		LLD<2.06E-01		264.66		
SN-113	LLD<3.12E-01		LLD<3.12E-01		391.67		
SR-85	LLD<2.05E-01		LLD<2.05E-01		513.99		
TH-228	LLD<7.53E+00		LLD<7.53E+00		84.37		
TL-208	LLD<1.94E-01		LLD<1.94E-01		583.20		
U-235	LLD<2.03E-01		LLD<2.03E-01		185.71		
Y-88	LLD<6.71E-02		LLD<6.71E-02		1836.06		
ZN-65	LLD<3.23E-01		LLD<3.23E-01		1115.55		
ZR-95	LLD<1.90E-01		LLD<1.90E-01		756.73		
TOTAL	1.52E+02	+-2.04E+00	1.52E+02	+-2.04E+00			

STANDARD DEVIATION = 0.30

EBAR = ***** MEV/DISINTEGRATION
MAXIMUM PERMISSABLE ACTIVITY = 7.77E-09 UC/LI
MEASURED ACTIVITY = 1.50E+02 (+-1.99E+00) UC/LI
% TECH. SPEC. = ****** (+-****)

ERROR QUOTATION AT 1.96 SIGMA
LLD CONFIDENCE LEVEL AT 85.0%

PEAKS NOT USED IN ANALYSIS

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
97.61	48.84	276.	52.7	3.34E+00
246.21	123.12	1112.	12.0	1.36E+01
1446.63	723.15	137.	32.2	6.31E+00

PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
2921.54	1460.45	571.	9.0	4.87E+01

MB Sicim - 12/20/93

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*                                                                     *
*          G A M M A   S P E C T R U M   A N A L Y S I S              *
*                                                                     *
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CANBERRA SPECTRAN-F V2.06 SOFTWARE

WHC-SD-WM-DP-062, REV. 0

222-S COUNTING ROOM WESTINGHOUSE HANFORD 20-DEC-93 17:47:37

A N A L Y S I S P A R A M E T E R S

MCA UNIT NUMBER: 2 / ADC UNIT NUMBER: 3.0
DETECTOR NUMBER: 3 / GEOMETRY NUMBER: 41
SPECTRUM SIZE: 4096 CHANNELS
ORDER OF SMOOTHING FUNCTION: 5
NUMBER OF BACKGROUND CHANNELS: 4 ON EACH SIDE OF PEAK
PEAK CONFIDENCE FACTOR: 85.0%
IDENTIFICATION ENERGY WINDOW: +- 1.50 KEV
ERROR QUOTATION: 1.96 SIGMA UNCERTAINTY

ENVIRONMENTAL BACKGROUND SUBTRACTED
LLD CALCULATION PERFORMED
MEASURED ENERGY DIFFERENCES LISTED
MULTIPLET ANALYSIS PERFORMED

SPECTRAL DATA READ DIRECTLY FROM MULTICHANNEL ANALYZER AN1:
ANALYZED BY: MB

SAMPLE DESCRIPTION: J 1424-5730
GEOMETRY DESCRIPTION: 42B47-A 22CC LIQ
SAMPLE SIZE: 1.0000E-03 LI / CONVERSION FACTOR: 5.0000E-01
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL205

COLLECT STARTED ON 20-DEC-93 AT 16:57:16

COLLECT LIVE TIME: 3000. SECONDS
REAL TIME: 3008. SECONDS
DEAD TIME: 0.27 %

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

ENERGY CALIBRATION PERFORMED 20-OCT-93
EFFICIENCY CALIBRATION PERFORMED 23-OCT-92

P E A K A N A L Y S I S

PK	CENTROID CHANNEL	ENERGY KEV	FWHM KEV	BACKGND COUNTS	NET AREA COUNTS	ERROR %	NUCLIDES
1C	119.06	59.56	0.99	2070.	4730.	3.8	AM-241,U-237, EU-155
2	173.27	86.66	0.98	1815.	599.	20.7	CS-136, EU-155, EU-155A, PB-214X, TL-208X, CD-109
3	210.51	105.28	1.46	2126.	303.	43.7	EU-155, EU-155B, NP-239
4	245.18	123.11	0.99	1908.	1039.	12.8	EU-152,CO-57, EU-154A
5	1323.53	661.62	1.62	697.	46548.	0.9	CS-137
5D		661.41			81.	28.8	
6	1446.68	723.18	1.70	187.	80.	56.1	SB-124,I-131, AG-108, EU-154D, ZR-95
7	2009.75	1004.64	1.95	130.	88.	46.1	EU-154G, EU-152
8	2346.77	1173.11	2.02	130.	847.	8.0	CO-60
	2548.81	1274.12	2.07	53.	136.	24.5	EU-154, EU-154H, NA-22
10	2665.36	1332.38	2.11	48.	810.	7.5	CO-60
11	2922.23	1460.80	2.10	26.	545.	9.0	K-40
11B		1460.58			611.	5.5	
12	3530.29	1764.78	2.06	14.	52.	37.8	BI-214C
12D		1764.79			47.	25.0	

ERROR QUOTATION AT 1.96 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

C - MULTIPLET ANALYSIS CONVERGED NORMALLY
B - ENVIRONMENTAL BACKGROUND PEAK

BACKGROUND SUBTRACTION PERFORMED USING FILE BK0013
BACKGROUND DESCRIPTION: BKG
BACKGROUND COLLECT STARTED ON 15-JAN-90 AT 11:00:00
BACKGROUND LIVE TIME: 7000. SECONDS

SAMPLE: J 1424-5730
DATA COLLECTED ON 20-DEC-93 AT 16:57:16
DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT.

R A D I O N U C L I D E A N A L Y S I S R E P O R T

NUCLIDE	ACTIVITY CONCENTRATION IN uCi/LI MEASURED	ERROR	DECAY CORRECTED	ERROR	ENERGY (KEV) EXPECT	COMPARISON DIFF	
AM-241	8.28E+00	+-3.27E-01	8.28E+00	+-3.27E-01	59.54	0.03	
AM-243	LLD<1.24E-01		LLD<1.24E-01		74.67		
BA-133	LLD<2.89E-01		LLD<2.89E-01		356.02		
BA-140	LLD<7.54E-01		LLD<7.54E-01		537.27		
BI-212	LLD<1.19E+00		LLD<1.19E+00		727.20		
CEPR144	LLD<1.53E+00		LLD<1.53E+00		133.51		
CO-60	3.44E+00	+-2.59E-01	3.44E+00	+-2.59E-01	1332.50	-0.12	
					1173.24	-0.12	
CR-51	LLD<1.56E+00		LLD<1.56E+00		320.09		
CS-134	LLD<1.23E-01		LLD<1.23E-01		795.84		
CS-137	1.27E+02	+-1.73E+00	1.27E+02	+-1.73E+00	661.65	-0.03	
EU-152	LLD<5.91E-01		LLD<5.91E-01		1408.01		
~~EU-154~~	~~1.55E+00~~	~~+-3.81E-01~~	~~1.55E+00~~	~~+-3.81E-01~~	~~1274.45~~	~~-0.33~~	BKG 1/21/93
					123.07	0.04	
					1004.76	-0.12	
~~EU-154M~~	~~1.56E+00~~	~~+-3.81E-01~~	~~1.56E+00~~	~~+-3.81E-01~~	~~1274.80~~	~~-0.68~~	BKG 1/21/93
EU-155	8.85E-01	+-3.86E-01	8.85E-01	+-3.86E-01	105.31	-0.03	
					86.54	0.12	
FE-59	LLD<2.68E-01		LLD<2.68E-01		1099.25		
I-131	LLD<2.19E-01		LLD<2.19E-01		364.48		
K-40	LLD<2.92E+00		LLD<2.92E+00		1460.75		
LA-140	LLD<1.00E-01		LLD<1.00E-01		1596.20		
MN-54	LLD<1.09E-01		LLD<1.09E-01		834.83		
~~NA-22~~	~~5.52E-01~~	~~+-1.35E-01~~	~~5.52E-01~~	~~+-1.35E-01~~	~~1274.55~~	~~-0.43~~	BKG 12/21/93
NB-94	LLD<9.40E-02		LLD<9.40E-02		702.63		
ND-95	LLD<1.12E-01		LLD<1.12E-01		765.78		
~~NP-239~~	~~2.95E+00~~	~~+-6.12E-01~~	~~2.95E+00~~	~~+-6.12E-01~~	~~86.50~~	~~0.16~~	^{155}Eu 12/21/93
PB-212	LLD<2.66E-01		LLD<2.66E-01		239.00		
PU-239	LLD<1.45E+03		LLD<1.45E+03		129.30		
PU-241	LLD<4.57E+04		LLD<4.57E+04		148.57		
RA-224	LLD<2.99E+00		LLD<2.99E+00		240.99		
RA-226	LLD<2.97E+00		LLD<2.97E+00		186.10		
RU-103	LLD<2.12E-01		LLD<2.12E-01		497.08		
RU103	LLD<2.23E-01		LLD<2.23E-01		497.08		
RURH106	LLD<2.96E+00		LLD<2.96E+00		621.80		
SB-125	LLD<7.45E-01		LLD<7.45E-01		427.89		
SB-125A	LLD<7.45E-01		LLD<7.45E-01		427.89		
SE-75	LLD<2.01E-01		LLD<2.01E-01		264.66		
SN-113	LLD<3.07E-01		LLD<3.07E-01		391.67		
SR-85	LLD<1.95E-01		LLD<1.95E-01		513.99		
TH-228	LLD<7.34E+00		LLD<7.34E+00		84.37		
TL-208	LLD<1.85E-01		LLD<1.85E-01		583.20		
U-235	LLD<1.99E-01		LLD<1.99E-01		185.71		
Y-88	LLD<7.65E-02		LLD<7.65E-02		1836.06		
ZN-65	LLD<3.20E-01		LLD<3.20E-01		1115.55		
ZR-95	LLD<1.76E-01		LLD<1.76E-01		756.73		

TOTAL 1.46E+02 +-2.00E+00 1.46E+02 +-2.00E+00

STANDARD DEVIATION = 0.24

EB ***** MEV/DISINTEGRATION
MAXIMUM PERMISSABLE ACTIVITY = 7.52E-09 UC/LI
TOTAL MEASURED ACTIVITY = 1.44E+02 (+-1.96E+00) UC/LI
% TECH. SPEC. = ****** (+-****)

ERROR QUOTATION AT 1.96 SIGMA
LLD CONFIDENCE LEVEL AT 85.0%

PEAKS NOT USED IN ANALYSIS

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
1446.68	723.18	80.	56.1	3.68E+00

PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
[illegible].23	1460.80	545.	9.0	4.64E+01
[illegible].29	1764.78	52.	37.8	5.15E+00

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*                                                                       *
*              G A M M A   S P E C T R U M   A N A L Y S I S            *
*                                                                       *
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CANBERRA SPECTRAN-F V2.06  SOFTWARE

222-S COUNTING ROOM WESTINGHOUSE HANFORD          20-DEC-93  19:06:10


                    A N A L Y S I S   P A R A M E T E R S

MCA UNIT NUMBER:    2      /      ADC UNIT NUMBER: 3.0
DETECTOR NUMBER:     3     /      GEOMETRY NUMBER:  41
SPECTRUM SIZE:  4096 CHANNELS
ORDER OF SMOOTHING FUNCTION:      5
NUMBER OF BACKGROUND CHANNELS:  4 ON EACH SIDE OF PEAK
PEAK CONFIDENCE FACTOR: 85.0%
IDENTIFICATION ENERGY WINDOW: +- 1.50 KEV
ERROR QUOTATION: 1.96 SIGMA UNCERTAINTY

ENVIRONMENTAL BACKGROUND SUBTRACTED
LLD CALCULATION PERFORMED
MEASURED ENERGY DIFFERENCES LISTED
MULTIPLET ANALYSIS PERFORMED

SPECTRAL DATA READ DIRECTLY FROM MULTICHANNEL ANALYZER AN1:
ANALYZED BY:         DM

SAMPLE DESCRIPTION: J-1424-5730 TRIP.
GEOMETRY DESCRIPTION:  42B47-A 22CC LIQ
SAMPLE SIZE:    1.0000E-03 LI        / CONVERSION FACTOR: 5.0000E-01
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL205

COLLECT STARTED ON 20-DEC-93 AT 18:15:49

COLLECT LIVE TIME:     3000. SECONDS
        REAL TIME:     3008. SECONDS
        DEAD TIME:      0.27 %

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

ENERGY CALIBRATION PERFORMED 20-OCT-93
EFFICIENCY CALIBRATION PERFORMED 23-OCT-92
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222-S COUNTING ROOM WESTINGHOUSE HANFORD 20-DEC-93 19:06:10

P E A K A N A L Y S I S

PK	CENTROID CHANNEL	ENERGY KEV	FWHM KEV	BACKGND COUNTS	NET AREA COUNTS	ERROR %	NUCLIDES
1	119.09	59.58	0.97	2099.	4714.	3.9	AM-241,U-237, EU-155
2	173.10	86.58	1.22	1782.	558.	21.9	CS-136, EU-155, EU-155A, PB-214X, TL-208X, CD-109
3	210.69	105.36	1.32	2060.	359.	36.5	EU-155, EU-155B, NP-239
4	246.08	123.05	1.01	1875.	1109.	12.0	EU-152,CO-57, EU-154A
5	1323.59	661.61	1.65	685.	46348.	0.9	CS-137
5B		661.41			81.	28.8	
6	1447.00	723.33	1.80	139.	120.	34.6	SB-124,I-131, AG-108, EU-154D, ZR-95
7	2009.20	1004.37	1.05	140.	48.	82.1	EU-154G, EU-152
8	2346.49	1172.98	1.99	116.	829.	8.0	CO-60
	2549.17	1274.30	1.91	49.	163.	20.7	EU-154, EU-154H, NA-22
10	2665.37	1332.34	2.08	50.	806.	7.5	CO-60
11	2920.11	1460.68	1.78	32.	553.	9.1	K-40
11B		1460.52			611.	5.5	

ERROR QUOTATION AT 1.96 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

B - ENVIRONMENTAL BACKGROUND PEAK

BACKGROUND SUBTRACTION PERFORMED USING FILE BK0013
BACKGROUND DESCRIPTION: BKG
BACKGROUND COLLECT STARTED ON 15-JAN-90 AT 11:00:00
BACKGROUND LIVE TIME: 7000. SECONDS

222-S COUNTING ROOM WESTINGHOUSE HANFORD 20-DEC-93 19:06:10

SAMPLE: J-1424-5730 TRIP.
DATA COLLECTED ON 20-DEC-93 AT 18:15:49
DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT.

WHC-SD-WM-DP-062, REV. 0

R A D I O N U C L I D E A N A L Y S I S R E P O R T

NUCLIDE	ACTIVITY CONCENTRATION IN uCi/LI MEASURED	ERROR	DECAY CORRECTED	ERROR	ENERGY COMPARISON (KEV) EXPECT	DIFF	
AM-241	8.26E+00	+-3.27E-01	8.26E+00	+-3.27E-01	59.54	0.04	
AM-243	LLD<1.25E-01		LLD<1.25E-01		74.67		
BA-133	LLD<2.86E-01		LLD<2.86E-01		356.02		
BA-140	LLD<7.17E-01		LLD<7.17E-01		537.27		
BI-212	LLD<1.19E+00		LLD<1.19E+00		727.20		
CEPR144	LLD<1.52E+00		LLD<1.52E+00		133.51		
CO-60	3.42E+00	+-2.59E-01	3.42E+00	+-2.59E-01	1332.50	-0.16	
					1173.24	-0.26	
CR-51	LLD<1.53E+00		LLD<1.53E+00		320.09		
CS-134	LLD<1.32E-01		LLD<1.32E-01		795.84		
CS-137	1.26E+02	+-1.73E+00	1.26E+02	+-1.73E+00	661.65	-0.04	
EU-152	LLD<4.69E-01		LLD<4.69E-01		1408.01		
EU-154	1.87E+00	+-3.88E-01	1.87E+00	+-3.88E-01	1274.45	-0.15	
					123.07	-0.02	
					1004.76	-0.39	
EU-154M	1.87E+00	+-3.89E-01	1.87E+00	+-3.89E-01	1274.80	-0.50	
~~EU-155~~	~~1.05E+00~~	~~+-3.83E-01~~	~~1.05E+00~~	~~+-3.83E-01~~	~~105.31~~	~~0.06~~	BKG 12/21/93
					86.54	0.03	ok to use 1/11/94
I-131	LLD<2.56E-01		LLD<2.56E-01		1099.25		
K-40	LLD<2.19E-01		LLD<2.19E-01		364.48		
MN-54	LLD<2.93E+00		LLD<2.93E+00		1460.75		
NA-22	LLD<1.09E-01		LLD<1.09E-01		1596.20		
NB-94	LLD<1.04E-01		LLD<1.04E-01		834.83		
~~NA-22~~	~~6.64E-01~~	~~+-1.38E-01~~	~~6.64E-01~~	~~+-1.38E-01~~	~~1274.55~~	~~-0.25~~	154Eu 12/21/93
NB-94	LLD<9.30E-02		LLD<9.30E-02		702.63		
NB-95	LLD<1.09E-01		LLD<1.09E-01		765.78		
~~NP-237~~	~~2.75E+00~~	~~+-6.04E-01~~	~~2.75E+00~~	~~+-6.04E-01~~	86.50	0.07	BKG 12/21/93
PB-212	LLD<2.59E-01		LLD<2.59E-01		239.00		
PU-239	LLD<1.43E+03		LLD<1.43E+03		129.30		
PU-241	LLD<4.60E+04		LLD<4.60E+04		148.57		
RA-224	LLD<2.95E+00		LLD<2.95E+00		240.99		
RA-226	LLD<2.94E+00		LLD<2.94E+00		186.10		
RU-103	LLD<2.16E-01		LLD<2.16E-01		497.08		
RU103	LLD<2.27E-01		LLD<2.27E-01		497.08		
RURH106	LLD<2.89E+00		LLD<2.89E+00		621.80		
SB-125	LLD<7.56E-01		LLD<7.56E-01		427.89		
SB-125A	LLD<7.56E-01		LLD<7.56E-01		427.89		
SE-75	LLD<2.04E-01		LLD<2.04E-01		264.66		
SN-113	LLD<3.01E-01		LLD<3.01E-01		391.67		
SR-85	LLD<1.93E-01		LLD<1.93E-01		513.99		
TH-228	LLD<7.26E+00		LLD<7.26E+00		84.37		
TL-208	LLD<1.95E-01		LLD<1.95E-01		583.20		
[illegible]	LLD<1.98E-01		LLD<1.98E-01		185.71		
[illegible]	LLD<5.59E-02		LLD<5.59E-02		1836.06		
[illegible]	LLD<3.38E-01		LLD<3.38E-01		1115.55		
YB-169	LLD<1.84E-01		LLD<1.84E-01		756.73		

TOTAL 1.46E+02 +-2.00E+00 1.46E+02 +-2.00E+00

STANDARD DEVIATION = 0.19

EB$_{AR}$ = ***** MEV/DISINTEGRATION
MAXIMUM PERMISSABLE ACTIVITY = 7.21E-09 UC/LI
TOTAL MEASURED ACTIVITY = 1.44E+02 (+-1.96E+00) UC/LI
% TECH. SPEC. = ****** (+-****)

ERROR QUOTATION AT 1.96 SIGMA
LLD CONFIDENCE LEVEL AT 85.0%

PEAKS NOT USED IN ANALYSIS

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
1447.00	723.33	120.	34.6	5.52E+00

PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
2[illegible]00	1460.68	553.	9.1	4.71E+01

D. H. Mabera
12-20-93

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*                                                                     *
*          G A M M A   S P E C T R U M   A N A L Y S I S              *
*                                                                     *
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CANBERRA SPECTRAN-F V2.06 SOFTWARE

WHC-SD-WM-DP-062, REV. 0

222-S COUNTING ROOM WESTINGHOUSE HANFORD 20-DEC-93 20:03:33

A N A L Y S I S P A R A M E T E R S

MCA UNIT NUMBER: 2 / ADC UNIT NUMBER: 3.0
DETECTOR NUMBER: 3 / GEOMETRY NUMBER: 41
SPECTRUM SIZE: 4096 CHANNELS
ORDER OF SMOOTHING FUNCTION: 5
NUMBER OF BACKGROUND CHANNELS: 4 ON EACH SIDE OF PEAK
PEAK CONFIDENCE FACTOR: 85.0%
IDENTIFICATION ENERGY WINDOW: +- 1.50 KEV
ERROR QUOTATION: 1.96 SIGMA UNCERTAINTY

ENVIRONMENTAL BACKGROUND SUBTRACTED
FLD CALCULATION PERFORMED
MEASURED ENERGY DIFFERENCES LISTED
MULTIPLET ANALYSIS PERFORMED

SPECTRAL DATA READ DIRECTLY FROM MULTICHANNEL ANALYZER AN1:
ANALYZED BY: DM

SAMPLE DESCRIPTION: J-1425-5730
GEOMETRY DESCRIPTION: 42B47-A 22CC LIQ
SAMPLE SIZE: 1.0000E-03 LI / CONVERSION FACTOR: 5.0000E-01
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL205

COLLECT STARTED ON 20-DEC-93 AT 19:13:00

COLLECT LIVE TIME: 3000. SECONDS
REAL TIME: 3019. SECONDS
DEAD TIME: 0.63 %

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

ENERGY CALIBRATION PERFORMED 20-OCT-93
EFFICIENCY CALIBRATION PERFORMED 23-OCT-92

P E A K A N A L Y S I S

PK	CENTROID CHANNEL	ENERGY KEV	FWHM KEV	BACKGND COUNTS	NET AREA COUNTS	ERROR %	NUCLIDES
1	97.69	48.88	1.70	7184.	854.	28.3	U-234
2	119.09	59.58	0.98	5542.	15421.	2.0	AM-241,U-237, EU-155
3	173.01	86.53	1.06	4197.	1734.	11.1	CS-136, EU-155, EU-155A, PB-214X, TL-208X
4	210.60	105.32	1.04	4727.	981.	20.4	EU-155, EU-155B, NP-239
5	246.14	123.08	1.03	4115.	3285.	6.3	EU-152,CO-57, EU-154A
6	1323.55	661.63	1.61	1529.	117930.	0.6	CS-137
6B		661.41			81.	28.8	
7	1447.06	723.37	1.85	271.	374.	16.7	SB-124,I-131, AG-108, EU-154D, ZR-95
8	1746.65	873.12	1.38	252.	181.	30.8	EU-154E, RH-106
9	1993.18	996.36	1.22	201.	183.	28.0	EU-154F
10	2009.57	1004.55	2.26	223.	282.	20.4	EU-154G, EU-152
11	2346.88	1173.17	2.19	128.	1772.	5.1	CO-60
12	2548.95	1274.19	2.01	75.	424.	11.7	EU-154, EU-154H, NA-22
13	2665.35	1332.38	2.05	62.	1485.	5.4	CO-60
14	2922.03	1460.70	2.48	28.	560.	8.9	K-40
14B		1460.58			611.	5.5	

ERROR QUOTATION AT 1.96 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

B - ENVIRONMENTAL BACKGROUND PEAK

BACKGROUND SUBTRACTION PERFORMED USING FILE BK0013
BACKGROUND DESCRIPTION: BKG
BACKGROUND COLLECT STARTED ON 15-JAN-90 AT 11:00:00
BACKGROUND LIVE TIME: 7000. SECONDS

222-S COUNTING ROOM WESTINGHOUSE HANFORD 20-DEC-93 20:03:33

SAMPLE: J-1425-5730
DATA COLLECTED ON 20-DEC-93 AT 19:13:00
DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT.

WHC-SD-WM-DP-062, REV. 0

R A D I O N U C L I D E A N A L Y S I S R E P O R T

NUCLIDE	ACTIVITY CONCENTRATION IN uCi/LI MEASURED	ERROR	DECAY CORRECTED	ERROR	ENERGY COMPARISON (KEV) EXPECT	DIFF
AM-241	2.70E+01	+-5.99E-01	2.70E+01	+-5.99E-01	59.54	0.05
AM-243	LLD<1.83E-01		LLD<1.83E-01		74.67	
BA-133	LLD<4.29E-01		LLD<4.29E-01		356.02	
BA-140	LLD<1.12E+00		LLD<1.12E+00		537.27	
BI-212	LLD<1.82E+00		LLD<1.82E+00		727.20	
CEPR144	LLD<2.23E+00		LLD<2.23E+00		133.51	
CO-60	6.30E+00	+-3.45E-01	6.30E+00	+-3.45E-01	1332.50	-0.12
					1173.24	-0.06
CR-51	LLD<2.32E+00		LLD<2.32E+00		320.09	
CS-134	LLD<1.65E-01		LLD<1.65E-01		795.84	
CS-137	3.21E+02	+-3.73E+00	3.21E+02	+-3.73E+00	661.65	-0.02
EU-152	LLD<3.93E-01		LLD<3.93E-01		1408.01	
EU-154	4.86E+00	+-5.70E-01	4.86E+00	+-5.70E-01	1274.45	-0.26
					123.07	0.01
					1004.76	-0.21
EU-154H	4.87E+00	+-5.71E-01	4.87E+00	+-5.71E-01	1274.80	-0.61
EU-155	2.86E+00	+-5.86E-01	2.86E+00	+-5.86E-01	105.31	0.01
					86.54	-0.01
FE-59	LLD<2.96E-01		LLD<2.96E-01		1099.25	
I-131	LLD<3.41E-01		LLD<3.41E-01		364.48	
K-40	LLD<2.94E+00		LLD<2.94E+00		1460.75	
LA-140	LLD<1.05E-01		LLD<1.05E-01		1596.20	
MN-54	LLD<1.43E-01		LLD<1.43E-01		834.83	
~~NA-22~~	~~1.73E+00~~	~~+-2.03E-01~~	~~1.73E+00~~	~~+-2.03E-01~~	~~1274.55~~	~~-0.36~~
NB-94	LLD<1.30E-01		LLD<1.30E-01		702.63	
NB-95	LLD<1.29E-01		LLD<1.29E-01		765.78	
~~NP-237~~	~~8.54E+00~~	~~+-9.51E-01~~	~~8.54E+00~~	~~+-9.51E-01~~	~~86.50~~	~~0.03~~
PB-212	LLD<3.95E-01		LLD<3.95E-01		239.00	
PU-239	LLD<2.15E+03		LLD<2.15E+03		129.30	
PU-241	LLD<6.71E+04		LLD<6.71E+04		148.57	
RA-224	LLD<4.48E+00		LLD<4.48E+00		240.99	
RA-226	LLD<4.45E+00		LLD<4.45E+00		186.10	
RU-103	LLD<3.34E-01		LLD<3.34E-01		497.08	
RU103	LLD<3.51E-01		LLD<3.51E-01		497.08	
RURH106	LLD<4.39E+00		LLD<4.39E+00		621.80	
SB-125	LLD<1.18E+00		LLD<1.18E+00		427.89	
SB-125A	LLD<1.18E+00		LLD<1.18E+00		427.89	
SE-75	LLD<3.05E-01		LLD<3.05E-01		264.66	
SN-113	LLD<4.70E-01		LLD<4.70E-01		391.67	
SR-85	LLD<2.95E-01		LLD<2.95E-01		513.99	
TH-228	LLD<1.15E+01		LLD<1.15E+01		84.37	
TL-208	LLD<2.75E-01		LLD<2.75E-01		583.20	
U-235	LLD<2.98E-01		LLD<2.98E-01		185.71	
Y-88	LLD<8.48E-02		LLD<8.48E-02		1836.06	
ZN-65	LLD<3.91E-01		LLD<3.91E-01		1115.55	
ZR-95	LLD<2.28E-01		LLD<2.28E-01		756.73	

~~^{154}Eu~~ 12/21/93

~~^{155}Eu~~ 12/21/93

TOTAL 3.77E+02 +-4.04E+00 3.77E+02 +-4.04E+00

STANDARD DEVIATION = 0.20

EB... - ***** MEV/DISINTEGRATION
MAXIMUM PERMISSABLE ACTIVITY = 7.68E-09 UC/LI
TOTAL MEASURED ACTIVITY = 3.72E+02 (+-4.00E+00) UC/LI
% TECH. SPEC. = ****** (+-****)

ERROR QUOTATION AT 1.96 SIGMA
LLD CONFIDENCE LEVEL AT 85.0%

PEAKS NOT USED IN ANALYSIS

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
97.69	48.88	854.	28.3	1.03E+01
1447.06	723.37	374.	16.7	1.72E+01
1746.65	873.12	181.	30.8	9.71E+00
1993.18	996.36	183.	28.0	1.10E+01

PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

CE... CH...	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
2922.03	1460.70	560.	8.9	4.77E+01

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*                                                                       *
*          G A M M A   S P E C T R U M   A N A L Y S I S                *
*                                                                       *
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CANBERRA SPECTRAN-F V2.06 SOFTWARE

WHC-SD-WM-DP-062, REV. 0

222-S COUNTING ROOM WESTINGHOUSE HANFORD 20-DEC-93 21:01:26

A N A L Y S I S P A R A M E T E R S

MCA UNIT NUMBER: 2 / ADC UNIT NUMBER: 3.0
DETECTOR NUMBER: 3 / GEOMETRY NUMBER: 41
SPECTRUM SIZE: 4096 CHANNELS
ORDER OF SMOOTHING FUNCTION: 5
NUMBER OF BACKGROUND CHANNELS: 4 ON EACH SIDE OF PEAK
PEAK CONFIDENCE FACTOR: 85.0%
IDENTIFICATION ENERGY WINDOW: +- 1.50 KEV
ERROR QUOTATION: 1.96 SIGMA UNCERTAINTY

ENVIRONMENTAL BACKGROUND SUBTRACTED
LD CALCULATION PERFORMED
MEASURED ENERGY DIFFERENCES LISTED
MULTIPLET ANALYSIS PERFORMED

SPECTRAL DATA READ DIRECTLY FROM MULTICHANNEL ANALYZER AN1:
ANALYZED BY: DM

SAMPLE DESCRIPTION: J-1425-5730 DUP.
GEOMETRY DESCRIPTION: 42B47-A 22CC LIQ
SAMPLE SIZE: 1.0000E-03 LI / CONVERSION FACTOR: 5.0000E-01
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL205

[illegible] STARTED ON 20-DEC-93 AT 20:10:58

COLLECT LIVE TIME: 3000. SECONDS
REAL TIME: 3019. SECONDS
DEAD TIME: 0.63 %

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

ENERGY CALIBRATION PERFORMED 20-OCT-93
EFFICIENCY CALIBRATION PERFORMED 23-OCT-92

P E A K A N A L Y S I S

PK	CENTROID CHANNEL	ENERGY KEV	FWHM KEV	BACKGND COUNTS	NET AREA COUNTS	ERROR %	NUCLIDES
1	97.75	48.92	0.99	6086.	1277.	17.3	U-234
2?	119.04	59.56	0.97	5464.	15621.	2.0	AM-241,U-237, EU-155
3	173.13	86.59	0.92	4313.	1726.	11.2	CS-136, EU-155, EU-155A, PB-214X, TL-208X, CD-109
4	210.55	105.29	1.22	4631.	1120.	17.8	EU-155, EU-155B, NP-239
5	246.13	123.08	1.12	4162.	3404.	6.1	EU-152,CO-57, EU-154A
6	369.80	184.89	1.09	5135.	297.	67.8	U-235,RA-226
7	1323.48	661.59	1.62	1466.	119643.	0.6	CS-137
7B		661.41			81.	28.8	
8	1446.78	723.22	1.61	246.	433.	14.4	SB-124,I-131, AG-108, EU-154D, ZR-95
9	1746.53	873.06	1.87	209.	188.	27.3	EU-154E, RH-106
10	1992.32	995.93	2.06	206.	172.	30.5	EU-154F
11	2009.55	1004.54	2.07	231.	288.	20.3	EU-154G, EU-152
12	2346.65	1173.06	1.82	152.	1725.	5.3	CO-60
13	2548.53	1273.98	1.89	83.	472.	11.1	EU-154, EU-154H, NA-22
14	2665.33	1332.31	1.93	60.	1560.	5.2	CO-60
15	3921.74	1460.55	1.79	26.	565.	8.8	K-40
15B		1460.58			611.	5.5	
16	3530.33	1764.80	2.14	5.	76.	24.7	BI-214C
16B		1764.79			47.	25.0	

ERROR QUOTATION AT 1.96 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

? - MULTIPLET ANALYSIS CONVERGED BUT GFIT > 4
B - ENVIRONMENTAL BACKGROUND PEAK

BACKGROUND SUBTRACTION PERFORMED USING FILE BK0013
BACKGROUND DESCRIPTION: BKG
BACKGROUND COLLECT STARTED ON 15-JAN-90 AT 11:00:00
BACKGROUND LIVE TIME: 7000. SECONDS

222-S COUNTING ROOM WESTINGHOUSE HANFORD 20-DEC-93 21:01:26

SAMPLE: J-1425-5730 DUP.
DATA COLLECTED ON 20-DEC-93 AT 20:10:58
DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT.

R A D I O N U C L I D E A N A L Y S I S R E P O R T

NUCLIDE	ACTIVITY CONCENTRATION IN uCi/LI MEASURED	ERROR	DECAY CORRECTED	ERROR	ENERGY COMPARISON (KEV) EXPECT	DIFF	
AM-241	2.74E+01	+-6.01E-01	2.74E+01	+-6.01E-01	59.54	0.02	
AM-243	LLD<1.86E-01		LLD<1.86E-01		74.67		
BA-133	LLD<4.34E-01		LLD<4.34E-01		356.02		
BA-140	LLD<1.11E+00		LLD<1.11E+00		537.27		
BI-212	LLD<1.93E+00		LLD<1.93E+00		727.20		
CEPR144	LLD<2.23E+00		LLD<2.23E+00		133.51		
CO-60	6.62E+00	+-3.52E-01	6.62E+00	+-3.52E-01	1332.50	-0.19	
					1173.24	-0.18	
CR-51	LLD<2.35E+00		LLD<2.35E+00		320.09		
CS-134	LLD<1.69E-01		LLD<1.69E-01		795.84		
CS-137	3.26E+02	+-3.77E+00	3.26E+02	+-3.77E+00	661.65	-0.06	
EU-152	LLD<5.46E-01		LLD<5.46E-01		1408.01		
EU-154	5.41E+00	+-6.01E-01	5.41E+00	+-6.01E-01	1274.45	-0.47	
					123.07	0.01	
					1004.76	-0.22	
EU-154H	5.41E+00	+-6.01E-01	5.41E+00	+-6.01E-01	1274.80	-0.82	
EU-155	3.27E+00	+-5.84E-01	3.27E+00	+-5.84E-01	105.31	-0.01	
					86.54	0.05	
FE-59	LLD<3.23E-01		LLD<3.23E-01		1099.25		
I-131	LLD<3.42E-01		LLD<3.42E-01		364.48		
K-40	LLD<2.97E+00		LLD<2.97E+00		1460.75		
LA-140	LLD<1.13E-01		LLD<1.13E-01		1596.20		
MN-54	LLD<1.31E-01		LLD<1.31E-01		834.83		
~~NA-22~~	~~1.92E+00~~	~~+-2.13E-01~~	~~1.92E+00~~	~~+-2.13E-01~~	~~1274.55~~	~~-0.57~~	154Eu RBS 12/21/93
NB-94	LLD<1.22E-01		LLD<1.22E-01		702.63		
ND-95	LLD<1.39E-01		LLD<1.39E-01		765.78		
~~NP-237~~	~~8.50E+00~~	~~+-9.61E-01~~	~~8.50E+00~~	~~+-9.61E-01~~	~~86.50~~	~~0.09~~	155Eu RBS 12/21/93
PB-212	LLD<3.98E-01		LLD<3.98E-01		239.00		
PU-239	LLD<2.15E+03		LLD<2.15E+03		129.30		
PU-241	LLD<6.80E+04		LLD<6.80E+04		148.57		
RA-224	LLD<4.45E+00		LLD<4.45E+00		240.99		
~~RA-226~~	~~6.58E+00~~	~~+-4.47E+00~~	~~6.58E+00~~	~~+-4.47E+00~~	~~186.10~~	~~-1.21~~	BKG RBS 12/21/93
RU-103	LLD<3.31E-01		LLD<3.31E-01		497.08		
RU103	LLD<3.48E-01		LLD<3.48E-01		497.08		
RUNI106	LLD<4.25E+00		LLD<4.25E+00		621.80		
SB-125	LLD<1.18E+00		LLD<1.18E+00		427.89		
SB-125A	LLD<1.18E+00		LLD<1.18E+00		427.89		
SE-75	LLD<3.06E-01		LLD<3.06E-01		264.66		
SN-113	LLD<4.66E-01		LLD<4.66E-01		391.67		
SR-85	LLD<2.93E-01		LLD<2.93E-01		513.99		
TH-228	LLD<1.16E+01		LLD<1.16E+01		84.37		
TL-208	LLD<2.72E-01		LLD<2.72E-01		583.20		
U-235	LLD<2.93E-01		LLD<2.93E-01		185.71		
Y-88	LLD<6.71E-02		LLD<6.71E-02		1836.06		
ZN-65	LLD<3.48E-01		LLD<3.48E-01		1115.55		
ZR-95	LLD<2.39E-01		LLD<2.39E-01		756.73		

TOTAL 3.91E+02 +-6.06E+00 3.91E+02 +-6.06E+00

STANDARD DEVIATION = 0.39

EB.. = ***** MEV/DISINTEGRATION
MAXIMUM PERMISSABLE ACTIVITY = 7.58E-09 UC/LI
TOTAL MEASURED ACTIVITY = 3.85E+02 (+-6.03E+00) UC/LI
% TECH. SPEC. = ****** (+-****)

ERROR QUOTATION AT 1.96 SIGMA
LLD CONFIDENCE LEVEL AT 85.0%

PEAKS NOT USED IN ANALYSIS

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
97.75	48.92	1277.	17.3	1.54E+01
1446.73	723.22	433.	14.4	1.99E+01
1746.53	873.06	188.	27.3	1.01E+01
1992.32	995.93	172.	30.5	1.03E+01
3530.33	1764.80	29.	75.5	2.93E+00

PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
2921.74	1460.55	565.	8.8	4.81E+01

S. H. Mellian
12-20-93

```
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*                                                                     *
*          G A M M A   S P E C T R U M   A N A L Y S I S              *
*                                                                     *
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
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CANBERRA SPECTRAN-F V2.06 SOFTWARE

WHC-SD-WM-DP-062, REV. 0

222-S COUNTING ROOM WESTINGHOUSE HANFORD 20-DEC-93 21:58:43

A N A L Y S I S P A R A M E T E R S

MCA UNIT NUMBER: 2 / ADC UNIT NUMBER: 3.0
DETECTOR NUMBER: 3 / GEOMETRY NUMBER: 41
SPECTRUM SIZE: 4096 CHANNELS
ORDER OF SMOOTHING FUNCTION: 5
NUMBER OF BACKGROUND CHANNELS: 4 ON EACH SIDE OF PEAK
PEAK CONFIDENCE FACTOR: 85.0%
IDENTIFICATION ENERGY WINDOW: +- 1.50 KEV
ERROR QUOTATION: 1.96 SIGMA UNCERTAINTY

ENVIRONMENTAL BACKGROUND SUBTRACTED
LLD CALCULATION PERFORMED
MEASURED ENERGY DIFFERENCES LISTED
MULTIPLET ANALYSIS PERFORMED

SPECTRAL DATA READ DIRECTLY FROM MULTICHANNEL ANALYZER AN1:
ANALYZED BY: DM

SAMPLE DESCRIPTION: J-1425-5730 TRIP.
GEOMETRY DESCRIPTION: 42B47-A 22CC LIQ
SAMPLE SIZE: 1.0000E-03 LI / CONVERSION FACTOR: 5.0000E-01
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL205

COLLECT STARTED ON 20-DEC-93 AT 21:08:15

COLLECT LIVE TIME: 3000. SECONDS
REAL TIME: 3019. SECONDS
DEAD TIME: 0.63 %

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

ENERGY CALIBRATION PERFORMED 20-OCT-93
EFFICIENCY CALIBRATION PERFORMED 23-OCT-92

P E A K A N A L Y S I S

PK	CENTROID CHANNEL	ENERGY KEV	FWHM KEV	BACKGND COUNTS	NET AREA COUNTS	ERROR %	NUCLIDES
1	97.46	48.77	0.99	6225.	882.	24.9	U-234
2	119.11	59.59	1.00	5633.	15514.	2.0	AM-241,U-237, EU-155
3	173.15	86.60	1.17	4196.	1589.	12.0	CS-136, EU-155, EU-155A, PB-214X, TL-208X, CD-109
4	210.60	105.32	1.03	4827.	771.	26.0	EU-155, EU-155B, NP-239
5	246.15	123.09	1.04	4304.	3149.	6.6	EU-152,CO-57, EU-154A
6C	369.32	184.66	1.09	4253.	301.	40.0	U-235,RA-226
7C	372.75	186.37	1.09	4506.	395.	38.8	U-235,RA-226
8	1323.52	661.61	1.64	1563.	119006.	0.6	CS-137
8B		661.41			81.	28.8	
9	1446.90	723.28	1.61	223.	412.	14.4	SB-124,I-131, AG-108, EU-154D, ZR-95
1	1746.54	873.07	1.60	201.	190.	26.6	EU-154E, RH-106
11	1992.79	996.16	1.25	232.	173.	31.8	EU-154F
12	2009.65	1004.59	1.66	252.	238.	24.7	EU-154G, EU-152
13	2346.66	1173.06	2.13	151.	1634.	5.4	CO-60
14	2548.93	1274.18	2.03	53.	508.	9.9	EU-154, EU-154H, NA-22
15	2665.31	1332.36	1.96	64.	1603.	5.2	CO-60
16	2920.58	1460.72	2.34	38.	550.	9.2	K-40
16B		1460.58			611.	5.5	

ERROR QUOTATION AT 1.96 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

C - MULTIPLET ANALYSIS CONVERGED NORMALLY
B - ENVIRONMENTAL BACKGROUND PEAK

BACKGROUND SUBTRACTION PERFORMED USING FILE BK0013
BACKGROUND DESCRIPTION: BKG
BACKGROUND COLLECT STARTED ON 15-JAN-90 AT 11:00:00
BACKGROUND LIVE TIME: 7000. SECONDS

222-S COUNTING ROOM WESTINGHOUSE HANFORD 20-DEC-93 21:58:43

SAMPLE: J-1425-5730 TRIP.
DATA COLLECTED ON 20-DEC-93 AT 21:08:15
DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT.

WHC-SD-WM-DP-062, REV. 0

R A D I O N U C L I D E A N A L Y S I S R E P O R T

NUCLIDE	ACTIVITY CONCENTRATION IN uCi/LI				ENERGY COMPARISON (KEV)	
	MEASURED	ERROR	DECAY CORRECTED	ERROR	EXPECT	DIFF
AM-241	2.72E+01	+-6.02E-01	2.72E+01	+-6.02E-01	59.54	0.05
AM-243	LLD<1.87E-01		LLD<1.87E-01		74.67	
BA-133	LLD<4.30E-01		LLD<4.30E-01		356.02	
BA-140	LLD<1.12E+00		LLD<1.12E+00		537.27	
BI-212	LLD<1.92E+00		LLD<1.92E+00		727.20	
CEPR144	LLD<2.28E+00		LLD<2.28E+00		133.51	
CO-60	6.80E+00	+-3.59E-01	6.80E+00	+-3.59E-01	1332.50	-0.15
					1173.24	-0.17
CR-51	LLD<2.34E+00		LLD<2.34E+00		320.09	
CS-134	LLD<1.55E-01		LLD<1.55E-01		795.84	
CS-137	3.24E+02	+-3.76E+00	3.24E+02	+-3.76E+00	661.65	-0.04
EU-152	LLD<5.46E-01		LLD<5.46E-01		1408.01	
EU-154	5.82E+00	+-5.79E-01	5.82E+00	+-5.79E-01	1274.45	-0.27
					123.07	0.02
					1004.76	-0.17
EU-154M	5.82E+00	+-5.80E-01	5.82E+00	+-5.80E-01	1274.80	-0.62
EU-155	2.25E+00	+-5.85E-01	2.25E+00	+-5.85E-01	105.31	0.01
					86.54	0.06
FE-59	LLD<3.00E-01		LLD<3.00E-01		1099.25	
I-131	LLD<3.33E-01		LLD<3.33E-01		364.48	
K-40	LLD<2.97E+00		LLD<2.97E+00		1460.75	
LA-140	LLD<1.05E-01		LLD<1.05E-01		1596.20	
MN-54	LLD<1.44E-01		LLD<1.44E-01		834.83	
NA-22	2.07E+00	+-2.06E-01	2.07E+00	+-2.06E-01	1274.55	-0.37
NB-94	LLD<1.28E-01		LLD<1.28E-01		702.63	
NB-95	LLD<1.33E-01		LLD<1.33E-01		765.78	
NP-237	7.83E+00	+-9.43E-01	7.83E+00	+-9.43E-01	86.50	0.10
PB-212	LLD<3.94E-01		LLD<3.94E-01		239.00	
PU-239	LLD<2.15E+03		LLD<2.15E+03		129.30	
PU-241	LLD<6.87E+04		LLD<6.87E+04		148.57	
RA-224	LLD<4.39E+00		LLD<4.39E+00		240.99	
RA-226	6.67E+00	+-2.68E+00	6.67E+00	+-2.68E+00	186.10	-1.44
RU-103	LLD<3.24E-01		LLD<3.24E-01		497.08	
RU103	LLD<3.41E-01		LLD<3.41E-01		497.08	
RUTH106	LLD<4.19E+00		LLD<4.19E+00		621.80	
SB-125	LLD<1.19E+00		LLD<1.19E+00		427.89	
SB-125A	LLD<1.19E+00		LLD<1.19E+00		427.89	
SE-75	LLD<3.08E-01		LLD<3.08E-01		264.66	
SN-113	LLD<4.72E-01		LLD<4.72E-01		391.67	
SR-85	LLD<2.98E-01		LLD<2.98E-01		513.99	
TH-232	LLD<1.13E+01		LLD<1.13E+01		84.37	
TH-208	LLD<2.63E-01		LLD<2.63E-01		583.20	
U-235	LLD<2.94E-01		LLD<2.94E-01		185.71	
U-238	LLD<7.65E-02		LLD<7.65E-02		1836.06	
YB-65	LLD<3.74E-01		LLD<3.74E-01		1115.55	
ZR-95	LLD<2.34E-01		LLD<2.34E-01		756.73	

154Eu ✗ 12/21/93

155Eu ✗ 12/21/93

BKG ✗ 12/21/93

TOTAL 3.88E+02 +-4.87E+00 3.88E+02 +-4.87E+00

STANDARD DEVIATION = 0.42

EB... = ***** MEV/DISINTEGRATION
MAXIMUM PERMISSABLE ACTIVITY = 7.44E-09 UC/LI
TOTAL MEASURED ACTIVITY = 3.83E+02 (+-4.84E+00) UC/LI
* TECH. SPEC. = ****** (+-****)

ERROR QUOTATION AT 1.96 SIGMA
LLD CONFIDENCE LEVEL AT 85.0%

PEAKS NOT USED IN ANALYSIS

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
97.46	43.77	882.	24.9	1.07E+01
372.75	186.37	395.	38.8	5.66E+00
1416.90	723.28	412.	14.4	1.89E+01
1746.54	873.07	190.	26.6	1.02E+01
1992.79	996.16	173.	31.8	1.04E+01

PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
2922.38	1460.72	550.	9.2	4.69E+01

WESTINGHOUSE HANFORD COMPANY

222-S LABORATORY

ANALYTICAL BATCH #2409

Lab Segment Serial No. J1426, J1427, J1428	Customer ID: KE 65A, KE 71A, KE 72A
Analysis: GEA	Sample Prep: Direct Liquid

Instrument: WB57237, WB57265	Procedure/ Rev: LA 548-121 / Rev D
Technologist: Cynthia Hanson C.P. Johnson	Date: 12 / 20 / 93
Starting Time: 1030	Temperature N/A
Ending Time: 1155	Chemist: S. Catlow / P. Bachley

Comments:

	Description	Lab ID		Description	Lab ID
1	Initial Lmcs check Std	J1415 5530	11	Sample trip	J1428 5130
2	Reagent BLK	J1416-5630	12		
3	sample	J1426 5130	13		
4	sample dup	J1426 5130	14		
5	sample trip	J1426 5130	15		
6	sample	J1427 5130	16		
7	sample dup	J1427-5130	17		
8	sample trip	J1427 5130	18		
9	sample	J1428 5130	19		
10	sample dup	J1428 5130	20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
Lmcs check Std	321551/.100ml			

228

ANALYTICAL BATCH SUMMARY SHEET

METHOD: LA-548-121

DATE START: DECEMBER ~~OCTOBER~~ 28, 1993 1/11/94

PREPARED BY: S.L. FITZGERALD

DATE COMPLETE: JANUARY 3, 94 ~~NOVEMBER 1, 1993~~ 1/11/94

	UNITS:	ug/mL										
SPL NAME	SPL ID	ANALYTE	RESULT #1	RESULT #2	RESULT #3	AVERAGE	2*SD	PREC	ACCU	%REC	DET LIM	% CT ER
STD 32B51	J1415	CO-60	1.00E+02							99.2		2.9
		CS-137	1.35E+02							103		2.1
BLANK	J1416	AM-241	<3.26E-04								3.26E-04	
		CO-60	<4.54E-05								4.54E-05	
		CS-137	<6.35E-05								6.35E-05	
		EU-154	<1.48E-04								1.48E-04	
		EU-156	<1.29E-04								1.29E-04	
KE 65A	J1426	AM-241	1.82E-02	1.83E-02	1.81E-02	1.82E-02	2.00E-04	1.099				
		CO-60	4.82E-03	4.77E-03	5.12E-03	4.90E-03	3.79E-04	7.721				
		CS-137	1.47E-01	1.46E-01	1.47E-01	1.47E-01	1.15E-03	0.787				
		EU-154	3.83E-03	3.59E-03	3.71E-03	3.71E-03	2.40E-04	6.469				
		EU-155	2.06E-03	1.77E-03	1.93E-03	1.92E-03	2.91E-04	15.13				
KE 71A	J1427	AM-241	4.67E-02	4.52E-02	4.57E-02	4.59E-02	1.53E-03	3.33				
		CO-60	1.01E-02	1.06E-02	1.06E-02	1.04E-02	5.77E-04	5.534				
		CS-137	4.34E-01	4.37E-01	4.39E-01	4.37E-01	5.03E-03	1.153				
		EU-154	9.57E-03	9.38E-03	1.05E-02	9.82E-03	1.20E-03	12.21				
		EU-155	5.23E-03	4.22E-03	5.28E-03	4.91E-03	1.20E-03	24.36				
KE 72A	J1428	AM-241	1.52E-02	1.39E-02	1.54E-02	1.48E-02	1.63E-03	10.98				
		CO-60	3.13E-03	3.42E-03	3.31E-03	3.29E-03	2.93E-04	8.909				
		CS-137	1.52E-01	1.54E-01	1.55E-01	1.54E-01	3.06E-03	1.988				
		EU-154	2.70E-03	2.96E-03	2.60E-03	2.75E-03	3.72E-04	13.5				
		EU-155	1.41E-03	2.05E-03	1.78E-03	1.75E-03	6.43E-04	~~36.79~~ 52.3				
								1-21-94				

NARRATIVE: [ ] NO SPECIAL PROBLEMS/METHOD VARIATIONS IN THIS BATCH
LIST SPECIFIC PROBLEMS/VARIATIONS FOR THIS BATCH:

Standard results are reported in ug/L

The precision for Eu-155 sample J1428 is out of control limits, however due to the low quantities of Eu-155 involved ~~the~~ this value is likely due to counting statistics. Therefore, no ~~n~~ SCP term is requested.

GAMMA ENERGY ANALYSIS - UNDIGESTED SAMPLE

1563 Batch 2409

Serial No	Sample Point	Date	Time Issued	Priority
J 1415.-5530	BECHTOLD	12-15-93	11:23	22

Determination	Method Standard	Result Units	Charge Code	Reruns
GEA	LA-548-121	% RECOVERY	E14157	0

Sample Size	Customer ID
?.100ml + 23ml H_2O	STD

Remarks, Calculations, Results

COLX STD# 32B51
R901 STD VAL
RESULT 1.35E2 % REC 102.99%
R905 STD VAL
RESULT 1.00E2 % REC 99.17%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	[signature]			
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
12/20/93	1155	[signature]	[signature]

54-6800-067 (R-10-83)

1564

Serial No	Sample Point	Date	Time Issued	Priority
J 1416.-5630	BECHTOLD	12-15-93	11:24	22

Determination	Method Standard	Result Units	Charge Code	Reruns
GEA	LA-548-121	uCi/ML	E14157	0

Sample Size	Customer ID
?.500ml + 23ml H_2O	BLK

Remarks, Calculations, Results

COUNT AS uCI/L
LASER PRINTOUT

Am^{241} : $< 3.26 \times 10^{-4}$ uCi/ml
Co^{60} $< 4.54 \times 10^{-5}$ "
Cs^{137} $< 6.35 \times 10^{-5}$ "
Eu^{154} $< 1.48 \times 10^{-4}$ "
Eu^{155} $< 1.29 \times 10^{-4}$ "

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	[signature]	[signature]		
Hrs	Hrs	Hrs	Hrs	Hrs
	0848			

Date	Time Completed	Lab Unit Mgr	
12/20/93	1155	[signature]	[signature]

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

GAMMA ENERGY ANALYSIS - UNDIGESTED SAMPLE

1565

Serial No	Sample Point	Date	Time Issued	Priority
J 1426.-5730	BECHTOLD	12-16-93	13:18	22

Determination	Method Standard	Result Units	Charge Code	Reruns
GEA	LA-548-121	uCi/ML	E14157	0

Sample Size	Customer ID
? 500ml + 23ml H_2O	KE65A

Remarks, Calculations, Results

COUNT AS uCI/L
LASER PRINTOUT

Am^{241} = Sample 2×10^{-2} uCi/ml
Co^{60} 4.82×10^{-3} "
Cs^{137} 1.47×10^{-1} "
Eu^{154} 3.83×10^{-3} "
Eu^{155} 2.06×10^{-3} "

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
12/20/93	0850 1155	

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

1566

Serial No	Sample Point	Date	Time Issued	Priority
J 1426.-5730	BECHTOLD	12-16-93	13:18	22

Determination	Method Standard	Result Units	Charge Code	Reruns
GEA	LA-548-121	uCi/ML	E14157	0

Sample Size	Customer ID
? 500ml + 23ml H_2O	KE65A

Remarks, Calculations, Results

COUNT AS uCI/L
LASER PRINTOUT

DUP

Am^{241} = 1.83×10^{-2} uCi/ml
Co^{60} = 4.77×10^{-3} "
Cs^{137} = 1.46×10^{-1} "
Eu^{154} = 3.59×10^{-3} "
Eu^{155} = 1.77×10^{-3} "

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
12/20/93	0855 1155	

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

GAMMA ENERGY ANALYSIS - UNDIGESTED SAMPLE

1567

Serial No	Sample Point	Date	Time Issued	Priority
J 1426.-5730	BECHTOLD	12-16-93	13:18	22

Determination	Method Standard	Result Units	Charge Code	Reruns
GEA	LA-548-121	uCi/ML	E14157	0

Sample Size	Customer ID
?.500 ml +2.3 ml H_2O	KE65A

Remarks, Calculations, Results

COUNT AS uCI/L
LASER PRINTOUT

TYP

Am^{241} = 1.81×10^{-2} uCi/ml
Co^{60} = 5.12×10^{-3} "
Cs^{137} = 1.47×10^{-1} "
Eu^{154} = 3.71×10^{-3} "
Eu^{155} = 1.93×10^{-3} "

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	D.H. McLain			
Hrs	Hrs	Hrs	Hrs	Hrs
	0950			
Date	Time Completed	Lab Unit Mgr.		
12/20/93	1155		KE Wright	

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

1568

Serial No	Sample Point	Date	Time Issued	Priority
J 1427.-5730	BECHTOLD	12-16-93	13:19	22

Determination	Method Standard	Result Units	Charge Code	Reruns
GEA	LA-548-121	uCi/ML	E14157	0

Sample Size	Customer ID
?.500 ml +2.3 ml H_2O	KE71A

Remarks, Calculations, Results

COUNT AS uCI/L
LASER PRINTOUT

Sam

Am^{241} = 4.67×10^{-2} uCi/ml
Co^{60} = 1.81×10^{-2} "
Cs^{137} = 4.34×10^{-1} "
Eu^{154} = 9.57×10^{-3} "
Eu^{155} = 5.23×10^{-3} "

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	D.H. McLain			
Hrs	Hrs	Hrs	Hrs	Hrs
	0951			
Date	Time Completed	Lab Unit Mgr.		
12/20/93	1155		KE Wright	

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

GAMMA ENERGY ANALYSIS - UNDIGESTED SAMPLE

1569

Serial No	Sample Point	Date	Time Issued	Priority
J 1427.-5730	BECHTOLD	12-16-93	13:19	22

Determination	Method Standard	Result Units	Charge Code	Reruns
GEA	LA-548-121	uCi/ML	E14157	0

Sample Size	Customer ID
?.500ml t23ml H_2O	KE71A

Remarks, Calculations, Results

COUNT AS uCi/L
LASER PRINTOUT

Am^{241} = 4.52 DMP $\times 10^{-2}$ uCi/ml
Co^{60} = 1.06×10^{-2}
Cs^{137} = 4.37×10^{-1}
Eu^{154} = 9.38×10^{-3}
Eu^{155} = 4.22×10^{-3}

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	DH Williams			
Hrs	Hrs	Hrs	Hrs	Hrs
	0958			
Date	Time Completed	Lab Unit Mgr.		
12/20/93	1155		TE Wright	

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

1570

Serial No	Sample Point	Date	Time Issued	Priority
J 1427.-5730	BECHTOLD	12-16-93	13:19	22

Determination	Method Standard	Result Units	Charge Code	Reruns
GEA	LA-548-121	uCi/ML	E14157	0

Sample Size	Customer ID
?.500ml t23ml H_2O	KE71A

Remarks, Calculations, Results

COUNT AS uCi/L
LASER PRINTOUT

TPM
Am^{241} = 4.57×10^{-2} uCi/ml
Co^{60} = 1.06×10^{-2} "
Cs^{137} = 4.39×10^{-1} "
Eu^{154} = 1.05×10^{-2}
Eu^{155} = 5.28×10^{-3}

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	DH Williams			
Hrs	Hrs	Hrs	Hrs	Hrs
	1000			
Date	Time Completed	Lab Unit Mgr.		
12/20/93	1155		TE Wright	

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

GAMMA ENERGY ANALYSIS - UNDIGESTED SAMPLE

1572

Serial No	Sample Point	Date	Time Issued	Priority
J 1428.-5730	BECHTOLD	12-16-93	13:20	22

Determination	Method Standard	Result Units	Charge Code	Reruns
GEA	LA-548-121	uCi/ML	E14157	0

Sample Size	Customer ID
? 500 ml + 23 ml H_2O	KE72A

Remarks, Calculations, Results

COUNT AS uCI/L
LASER PRINTOUT

Gamma

Am^{241} = 1.52×10^{-2} uCi/ml
Co^{60} = 3.13×10^{-3} "
Cs^{137} = 1.52×10^{-1} "
Eu^{154} = 2.70×10^{-3} "
Eu^{155} = 1.41×10^{-3} "

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	[signature]			
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
12/20/93	1004 1155	[signature]	[signature]

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

1573

Serial No	Sample Point	Date	Time Issued	Priority
J 1428.-5730	BECHTOLD	12-16-93	13:20	22

Determination	Method Standard	Result Units	Charge Code	Reruns
GEA	LA-548-121	uCi/ML	E14157	0

Sample Size	Customer ID
? 500 ml + 23 ml H_2O	KE72A

Remarks, Calculations, Results

COUNT AS uCI/L
LASER PRINTOUT

Dup

Am^{241} 1.39×10^{-2} uCi/ml
Co^{60} 3.42×10^{-3} "
Cs^{137} 1.54×10^{-1} "
Eu^{154} 2.96×10^{-3} "
Eu^{155} 2.05×10^{-3} "

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	[signature]			
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
12/20/93	1005 1155	[signature]	[signature]

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

GAMMA ENERGY ANALYSIS - UNDIGESTED SAMPLE

1574

Serial No	Sample Point	Date	Time Issued	Priority
J 1428.-5730	BECHTOLD	12-16-93	13:20	22

Determination	Method-Standard	Result Units	Charge Code	Reruns
GEA	LA-548-121	uCi/ML	E14157	0

Sample Size	Customer ID
? 200 ml + 2 3ml H_2O	KE72A

Remarks, Calculations, Results

COUNT AS uCI/L
LASER PRINTOUT

TMP

~~Am^{241} 4.58 X10^{-2} uCi/ml~~ SLF 12-28-93
~~Co^{60} 1.12 X10^{-2} " SLF 12-28-93~~
~~Cs^{137} 5.68 X10^{-1} " SLF 12-28-93~~
~~Eu^{154} 9.19 X10^{-3} " SLF 12-28-93~~
~~Eu^{155} 7.75 X10^{-3} " SLF 12-28-93~~

Am^{241} 1.54E-2 mCi/mL
Co^{60} 3.31 E-3 "
Cs^{137} 1.55 E-1 "
Eu^{154} 2.60E-3
Eu^{155} 1.78E-3

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Mgt Mgr
12/20/93	1155	

54-6800-060 (R-10-83)

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*                                                                     *
*          G A M M A   S P E C T R U M   A N A L Y S I S              *
*                                                                     *
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CANBERRA SPECTRAN-F V2.06 SOFTWARE

20-DEC-9314:09:21

R Ullellin
12-20-93

A N A L Y S I S P A R A M E T E R S

MCA UNIT NUMBER: 2 / ADC UNIT NUMBER: 1.0
DETECTOR NUMBER: 1 / GEOMETRY NUMBER: 42
SPECTRUM SIZE: 4096 CHANNELS
ORDER OF SMOOTHING FUNCTION: 5
NUMBER OF BACKGROUND CHANNELS: 4 ON EACH SIDE OF PEAK
PEAK CONFIDENCE FACTOR: 85.0%
IDENTIFICATION ENERGY WINDOW: +- 1.50 KEV
ERROR QUOTATION: 1.96 SIGMA UNCERTAINTY

ENVIRONMENTAL BACKGROUND SUBTRACTED
LLD CALCULATION PERFORMED
MEASURED ENERGY DIFFERENCES LISTED
MULTIPLET ANALYSIS PERFORMED

SPECTRAL DATA READ DIRECTLY FROM MULTICHANNEL ANALYZER AN1:
ANALYZED BY:

SAMPLE DESCRIPTION: J1415-5530
GEOMETRY DESCRIPTION: 22 ML LIQ
SAMPLE SIZE: 1.0000E-03 LI / CONVERSION FACTOR: 1.0000E-01
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL205

COLLECT STARTED ON 20-DEC-93 AT 13:19:04

COLLECT LIVE TIME: 3000. SECONDS
REAL TIME: 3006. SECONDS
DEAD TIME: 0.20 %

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

ENERGY CALIBRATION PERFORMED 8-NOV-93
EFFICIENCY CALIBRATION PERFORMED 9-NOV-93

P E A K A N A L Y S I S

PK	CENTROID CHANNEL	ENERGY KEV	FWHM KEV	BACKGND COUNTS	NET AREA COUNTS	ERROR %	NUCLIDES
1C	1127.31	563.38	1.53	565.	569.	11.9	CS-134, EU-152
2C	1139.34	569.39	1.53	543.	998.	10.6	CS-134, BI-207
3	1210.08	604.76	1.48	642.	5821.	2.9	CS-134
4	1323.84	661.64	1.56	403.	9400.	2.1	CS-137
5C	1592.09	795.77	1.63	364.	4021.	4.0	CS-134
6C	1604.33	801.89	1.63	358.	383.	11.9	CS-134
7	2346.46	1173.03	1.83	277.	5017.	3.0	CO-60
8	2664.79	1332.26	1.98	51.	4599.	2.9	CO-60
9	2730.15	1364.95	2.12	23.	98.	25.3	CS-134
10	2921.64	1460.75	1.62	11.	93.	23.6	K-40
10B		1460.83			344.	10.8	

ERROR QUOTATION AT 1.96 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

C - MULTIPLET ANALYSIS CONVERGED NORMALLY
E - ENVIRONMENTAL BACKGROUND PEAK

BACKGROUND SUBTRACTION PERFORMED USING FILE BK0011
BACKGROUND DESCRIPTION: BKG
BACKGROUND COLLECT STARTED ON 24-AUG-92 AT 13:00:00
BACKGROUND LIVE TIME: 3000. SECONDS

SAMPLE: J1415-5530
DATA COLLECTED ON 20-DEC-93 AT 13:19:04
DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT.

R A D I O N U C L I D E A N A L Y S I S R E P O R T

NUCLIDE	ACTIVITY CONCENTRATION IN uCi/LI				ENERGY COMPARISON (KEV)	
	MEASURED	ERROR	DECAY CORRECTED	ERROR	EXPECT	DIFF
AM-241	LLD<5.54E+00		LLD<5.54E+00		59.54	
AM-243	LLD<1.53E+00		LLD<1.53E+00		74.67	
BA-133	LLD<1.20E+00		LLD<1.20E+00		356.02	
BA-140	LLD<3.42E+00		LLD<3.42E+00		537.27	
BI-212	LLD<7.22E+00		LLD<7.22E+00		727.20	
CEPR144	LLD<8.70E+00		LLD<8.70E+00		133.51	
CO-60	1.00E+02	+-3.19E+00	1.00E+02	+-3.19E+00	1332.50	-0.24
					1173.24	-0.21
CR-51	LLD<7.26E+00		LLD<7.26E+00		320.09	
CS-134	6.69E+01	+-2.76E+00	6.69E+01	+-2.76E+00	795.84	-0.07
					604.70	0.06
CS-137	1.35E+02	+-3.29E+00	1.35E+02	+-3.29E+00	661.65	-0.01
EU-152	LLD<1.65E+00		LLD<1.65E+00		1408.01	
EU-154	LLD<1.23E+00		LLD<1.23E+00		1274.45	
EU-154H	LLD<1.36E+00		LLD<1.36E+00		1274.80	
EU-155	LLD<2.30E+00		LLD<2.30E+00		105.31	
FE-59	LLD<1.96E+00		LLD<1.96E+00		1099.25	
I-131	LLD<9.05E-01		LLD<9.05E-01		364.48	
K-40	LLD<1.29E+01		LLD<1.29E+01		1460.75	
LA-140	LLD<3.01E-02		LLD<3.01E-02		1596.20	
MN-54	LLD<9.44E-01		LLD<9.44E-01		834.83	
NA-22	LLD<4.38E-01		LLD<4.38E-01		1274.55	
NB-94	LLD<8.36E-01		LLD<8.36E-01		702.63	
NB-95	LLD<8.56E-01		LLD<8.56E-01		765.78	
NP-237	LLD<5.85E+00		LLD<5.85E+00		86.50	
PB-212	LLD<1.38E+00		LLD<1.38E+00		239.00	
PU-238	LLD<6.86E+03		LLD<6.86E+03		129.30	
PU-241	LLD<2.61E+05		LLD<2.61E+05		148.57	
RA-224	LLD<1.59E+01		LLD<1.59E+01		240.99	
RA-226	LLD<1.51E+01		LLD<1.51E+01		186.10	
RU-103	LLD<9.23E-01		LLD<9.23E-01		497.08	
RU103	LLD<9.71E-01		LLD<9.71E-01		497.08	
RURH106	LLD<1.70E+01		LLD<1.70E+01		621.80	
SB-125	LLD<3.01E+00		LLD<3.01E+00		427.89	
SB-125A	LLD<3.01E+00		LLD<3.01E+00		427.89	
SE-75	LLD<1.06E+00		LLD<1.06E+00		264.66	
SN-113	LLD<1.28E+00		LLD<1.28E+00		391.67	
SR-85	LLD<8.58E-01		LLD<8.58E-01		513.99	
TH-223	LLD<5.65E+01		LLD<5.65E+01		84.37	
TL-208	LLD<1.04E+00		LLD<1.04E+00		583.20	
U-235	LLD<9.18E-01		LLD<9.18E-01		185.71	
U-238	LLD<3.87E-01		LLD<3.87E-01		1836.06	
ZN-65	LLD<2.45E+00		LLD<2.45E+00		1115.55	
ZR-95	LLD<1.55E+00		LLD<1.55E+00		756.73	
TOTAL	3.02E+02	+-5.35E+00	3.02E+02	+-5.35E+00		

STANDARD DEVIATION = 0.13

EBAR = ***** MEV/DISINTEGRATION
MAXIMUM PERMISSABLE ACTIVITY = 1.43E-09 UC/LI
TOTAL MEASURED ACTIVITY = 3.02E+02 (+-5.35E+00) UC/LI
% TECH. SPEC. = ****** (+-****)

ERROR QUOTATION AT 1.96 SIGMA
LLD CONFIDENCE LEVEL AT 85.0%

PEAKS NOT USED IN ANALYSIS

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
1127.31	563.38	569.	11.9	2.23E+01
1139.34	569.39	998.	10.6	3.95E+01
1604.33	801.89	383.	11.9	2.03E+01
2798.15	1364.95	98.	25.3	8.06E+00

PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
2934	1460.75	93.	23.6	8.07E+00

D. H. Milicia
12-20-93

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*          G A M M A   S P E C T R U M   A N A L Y S I S              *
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CANBERRA SPECTRAN-F V2.06 SOFTWARE

WHC-SD-WM-DP-062, REV. 0

20-DEC-9315:25:41

A N A L Y S I S P A R A M E T E R S

MCA UNIT NUMBER: 2 / ADC UNIT NUMBER: 1.0
DETECTOR NUMBER: 1 / GEOMETRY NUMBER: 42
SPECTRUM SIZE: 4096 CHANNELS
ORDER OF SMOOTHING FUNCTION: 5
NUMBER OF BACKGROUND CHANNELS: 4 ON EACH SIDE OF PEAK
PEAK CONFIDENCE FACTOR: 85.0%
IDENTIFICATION ENERGY WINDOW: +- 1.50 KEV
ERROR QUOTATION: 1.96 SIGMA UNCERTAINTY

ENVIRONMENTAL BACKGROUND SUBTRACTED
LLD CALCULATION PERFORMED
MEASURED ENERGY DIFFERENCES LISTED
MULTIPLET ANALYSIS PERFORMED

SPECTRAL DATA READ DIRECTLY FROM MULTICHANNEL ANALYZER AN1:
ANALYZED BY:

SAMPLE DESCRIPTION: J1416-5630
GEOMETRY DESCRIPTION: 22 ML LIQ
SAMPLE SIZE: 1.0000E-03 LI / CONVERSION FACTOR: 5.0000E-01
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL205

COLLECT STARTED ON 20-DEC-93 AT 14:35:31

COLLECT LIVE TIME: 3000. SECONDS
REAL TIME: 3001. SECONDS
DEAD TIME: 0.03 %

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

ENERGY CALIBRATION PERFORMED 8-NOV-93
EFFICIENCY CALIBRATION PERFORMED 9-NOV-93

P E A K A N A L Y S I S

PK	CENTROID CHANNEL	ENERGY KEV	FWHM KEV	BACKGND COUNTS	NET AREA COUNTS	ERROR %	NUCLIDES
1	2921.26	1460.56	1.60	2.	128.	17.6	K-40
1B		1460.83			344.	10.8	

ERROR QUOTATION AT 1.96 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

B - ENVIRONMENTAL BACKGROUND PEAK

BACKGROUND SUBTRACTION PERFORMED USING FILE BK0011
BACKGROUND DESCRIPTION: BKG
BACKGROUND COLLECT STARTED ON 24-AUG-92 AT 13:00:00
BACKGROUND LIVE TIME: 3000. SECONDS

20-DEC-9315:25:41

SAMPLE: J1416-5630
DATA COLLECTED ON 20-DEC-93 AT 14:35:31
DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT.

R A D I O N U C L I D E A N A L Y S I S R E P O R T

NUCLIDE	ACTIVITY CONCENTRATION IN uCi/LI MEASURED	ERROR	DECAY CORRECTED	ERROR	ENERGY COMPARISON (KEV) EXPECT	DIFF
AM-241	LLD<3.26E-01		LLD<3.26E-01		59.54	
AM-243	LLD<9.85E-02		LLD<9.85E-02		74.67	
BA-133	LLD<7.79E-02		LLD<7.79E-02		356.02	
CA-140	LLD<1.82E-01		LLD<1.82E-01		537.27	
BI-212	LLD<4.57E-01		LLD<4.57E-01		727.20	
CEPR144	LLD<5.21E-01		LLD<5.21E-01		133.51	
CO-60	LLD<4.54E-02		LLD<4.54E-02		1332.50	
CR-51	LLD<3.77E-01		LLD<3.77E-01		320.09	
CS-134	LLD<5.85E-02		LLD<5.85E-02		795.84	
CS-137	LLD<6.35E-02		LLD<6.35E-02		661.65	
EU-152	LLD<1.26E-01		LLD<1.26E-01		1408.01	
EU-154	LLD<1.48E-01		LLD<1.48E-01		1274.45	
EU-154M	LLD<1.59E-01		LLD<1.59E-01		1274.80	
EU-155	LLD<1.29E-01		LLD<1.29E-01		105.31	
FE-59	LLD<9.84E-02		LLD<9.84E-02		1099.25	
I-131	LLD<4.44E-02		LLD<4.44E-02		364.48	
K-40	LLD<2.53E+00		LLD<2.53E+00		1460.75	
LA-140	LLD<4.32E-02		LLD<4.32E-02		1596.20	
MN-54	LLD<5.65E-02		LLD<5.65E-02		834.83	
NA-22	LLD<5.25E-02		LLD<5.25E-02		1274.55	
NB-94	LLD<4.60E-02		LLD<4.60E-02		702.63	
NB-95	LLD<4.99E-02		LLD<4.99E-02		765.78	
NP-237	LLD<3.15E-01		LLD<3.15E-01		86.50	
PB-212	LLD<7.08E-02		LLD<7.08E-02		239.00	
PU-239	LLD<3.92E+02		LLD<3.92E+02		129.30	
RA-226	LLD<1.51E+04		LLD<1.51E+04		148.57	
RA-228	LLD<8.28E-01		LLD<8.28E-01		240.99	
RA-226	LLD<9.07E-01		LLD<9.07E-01		186.10	
RU-103	LLD<4.62E-02		LLD<4.62E-02		497.08	
RU103	LLD<4.86E-02		LLD<4.86E-02		497.08	
RURH106	LLD<9.41E-01		LLD<9.41E-01		621.80	
SB-125	LLD<1.41E-01		LLD<1.41E-01		427.89	
SB-125A	LLD<1.41E-01		LLD<1.41E-01		427.89	
SE-75	LLD<5.33E-02		LLD<5.33E-02		264.66	
SN-113	LLD<5.71E-02		LLD<5.71E-02		391.67	
SR-85	LLD<6.40E-02		LLD<6.40E-02		513.99	
TH-228	LLD<3.30E+00		LLD<3.30E+00		84.37	
TH-232	LLD<5.26E-02		LLD<5.26E-02		583.20	
U-235	LLD<5.49E-02		LLD<5.49E-02		185.71	
U-238	LLD<5.67E-02		LLD<5.67E-02		1836.06	
ZN-65	LLD<1.55E-01		LLD<1.55E-01		1115.55	
ZR-95	LLD<9.05E-02		LLD<9.05E-02		756.73	
TOTAL	0.00E-01	+-0.00E-01	0.00E-01	+-0.00E-01		

ERROR QUOTATION AT 1.96 SIGMA
LLD CONFIDENCE LEVEL AT 85.0%

ALL DETECTED PEAKS WERE USED IN THE ANALYSIS

PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
2921.36	1460.56	128.	17.6	1.12E+01

M. B[illegible] 12/20/93

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*          G A M M A   S P E C T R U M   A N A L Y S I S              *
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CANBERRA SPECTRAN-F V2.06 SOFTWARE

WHC-SD-WM-DP-062, REV. 0

20-DEC-9316:42:11

A N A L Y S I S P A R A M E T E R S

MCA UNIT NUMBER: 2 / ADC UNIT NUMBER: 1.0
DETECTOR NUMBER: 1 / GEOMETRY NUMBER: 42
SPECTRUM SIZE: 4096 CHANNELS
ORDER OF SMOOTHING FUNCTION: 5
NUMBER OF BACKGROUND CHANNELS: 4 ON EACH SIDE OF PEAK
PEAK CONFIDENCE FACTOR: 85.0%
IDENTIFICATION ENERGY WINDOW: +- 1.50 KEV
ERROR QUOTATION: 1.96 SIGMA UNCERTAINTY

ENVIRONMENTAL BACKGROUND SUBTRACTED
LLD CALCULATION PERFORMED
MEASURED ENERGY DIFFERENCES LISTED
MULTIPLET ANALYSIS PERFORMED

SPECTRAL DATA READ DIRECTLY FROM MULTICHANNEL ANALYZER AN1:
ANALYZED BY: DM

SAMPLE DESCRIPTION: J-1426-5730
GEOMETRY DESCRIPTION: 22 ML LIQ
SAMPLE SIZE: 1.0000E-03 LI / CONVERSION FACTOR: 5.0000E-01
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL205

COLLECT STARTED ON 20-DEC-93 AT 15:51:55

COLLECT LIVE TIME: 3000. SECONDS
REAL TIME: 3009. SECONDS
DEAD TIME: 0.30 %

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

ENERGY CALIBRATION PERFORMED 8-NOV-93
EFFICIENCY CALIBRATION PERFORMED 9-NOV-93

P E A K A N A L Y S I S

PK	CENTROID CHANNEL	ENERGY KEV	FWHM KEV	BACKGND COUNTS	NET AREA COUNTS	ERROR %	NUCLIDES
1	119.76	59.72	1.13	2289.	1880.	8.6	AM-241,U-237, EU-155
2	173.50	86.58	1.47	2596.	665.	23.8	CS-136, EU-155, EU-155A, PB-214X, TL-208X, CD-109
3	211.25	105.44	1.03	2566.	475.	32.6	EU-155, EU-155B, NP-239
4	246.82	123.22	1.20	2322.	1860.	8.7	EU-152,CO-57, EU-154A
5	1323.78	661.61	1.56	440.	51232.	0.9	CS-137
6	1447.23	723.33	2.00	120.	273.	17.2	SB-124,I-131, AG-108, EU-154D, ZR-95
7	1746.63	873.05	1.39	135.	117.	36.3	EU-154E, RH-106
8	1992.48	996.00	1.40	111.	117.	33.9	EU-154F
9	2009.72	1004.62	1.69	109.	182.	23.3	EU-154G, EU-152
10	2346.36	1172.98	2.00	65.	1279.	5.8	CO-60
11	2548.68	1274.18	1.87	28.	325.	12.1	EU-154, EU-154H, NA-22
12	2664.75	1332.24	2.14	24.	1110.	6.1	CO-60
13	2921.15	1460.50	1.86	9.	98.	22.1	K-40
13D		1460.83			344.	10.8	

ERROR QUOTATION AT 1.96 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

D - ENVIRONMENTAL BACKGROUND PEAK

BACKGROUND SUBTRACTION PERFORMED USING FILE BK0011
BACKGROUND DESCRIPTION: BKG
BACKGROUND COLLECT STARTED ON 24-AUG-92 AT 13:00:00
BACKGROUND LIVE TIME: 3000. SECONDS

20-DEC-9316:42:11

SAMPLE: J-1426-5730
DATA COLLECTED ON 20-DEC-93 AT 15:51:55
DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT.

R A D I O N U C L I D E A N A L Y S I S R E P O R T

NUCLIDE	ACTIVITY CONCENTRATION IN uCi/LI MEASURED	ERROR	DECAY CORRECTED	ERROR	ENERGY COMPARISON (KEV) EXPECT	DIFF
AM-241	1.82E+01	+-1.79E+00	1.82E+01	+-1.79E+00	59.54	0.18
AM-243	LLD<4.37E-01		LLD<4.37E-01		74.67	
BA-133	LLD<3.19E-01		LLD<3.19E-01		356.02	
BA-140	LLD<8.10E-01		LLD<8.10E-01		537.27	
BI-212	LLD<1.60E+00		LLD<1.60E+00		727.20	
CEPR144	LLD<2.33E+00		LLD<2.33E+00		133.51	
CO-60	4.82E+00	+-2.99E-01	4.82E+00	+-2.99E-01	1332.50	-0.26
					1173.24	-0.25
CR-51	LLD<1.88E+00		LLD<1.88E+00		320.09	
CS-134	LLD<1.29E-01		LLD<1.29E-01		795.84	
CS-137	1.47E+02	+-2.19E+00	1.47E+02	+-2.19E+00	661.65	-0.04
EU-152	LLD<3.13E-01		LLD<3.13E-01		1408.01	
EU-154	3.83E+00	+-4.66E-01	3.83E+00	+-4.66E-01	1274.45	-0.27
					123.07	0.15
					1004.76	-0.14
EU-154H	3.83E+00	+-4.66E-01	3.83E+00	+-4.66E-01	1274.80	-0.62
EU-155	2.06E+00	+-6.76E-01	2.06E+00	+-6.76E-01	105.31	0.14
					86.54	0.03
FE-59	LLD<2.19E-01		LLD<2.19E-01		1099.25	
I-131	LLD<2.42E-01		LLD<2.42E-01		364.48	
K-40	LLD<2.58E+00		LLD<2.58E+00		1460.75	
LA-140	LLD<4.32E-02		LLD<4.32E-02		1596.20	
MN-54	LLD<1.07E-01		LLD<1.07E-01		834.83	
~~NA-22~~	~~1.36E+00~~	~~+-1.65E-01~~	~~1.36E+00~~	~~+-1.65E-01~~	~~1274.55~~	~~-0.37~~ ^{154}Eu 12/21/93
NB-94	LLD<9.73E-02		LLD<9.73E-02		702.63	
NB-95	LLD<1.00E-01		LLD<1.00E-01		765.78	
~~NP-237~~	~~6.77E+00~~	~~+-1.62E+00~~	~~6.77E+00~~	~~+-1.62E+00~~	~~86.50~~	~~0.07~~ ^{155}Eu 12/21/93
PB-212	LLD<3.77E-01		LLD<3.77E-01		239.00	
PU-239	LLD<1.94E+03		LLD<1.94E+03		129.30	
PU-241	LLD<6.97E+04		LLD<6.97E+04		148.57	
RA-224	LLD<4.10E+00		LLD<4.10E+00		240.99	
RA-226	LLD<4.27E+00		LLD<4.27E+00		186.10	
RU-103	LLD<2.58E-01		LLD<2.58E-01		497.08	
RU103	LLD<2.72E-01		LLD<2.72E-01		497.08	
RURH106	LLD<3.87E+00		LLD<3.87E+00		621.80	
SB-125	LLD<8.86E-01		LLD<8.86E-01		427.89	
SB-125A	LLD<8.86E-01		LLD<8.86E-01		427.89	
SE-75	LLD<2.78E-01		LLD<2.78E-01		264.66	
SN-113	LLD<3.63E-01		LLD<3.63E-01		391.67	
SR-85	LLD<2.25E-01		LLD<2.25E-01		513.99	
TH-228	LLD<1.78E+01		LLD<1.78E+01		84.37	
[illegible]-208	LLD<1.96E-01		LLD<1.96E-01		583.20	
[illegible]	LLD<2.60E-01		LLD<2.60E-01		185.71	
[illegible]	LLD<4.75E-02		LLD<4.75E-02		1836.06	
[illegible]	LLD<2.97E-01		LLD<2.97E-01		1115.55	
[illegible]	LLD<1.86E-01		LLD<1.86E-01		756.73	

TOTAL 1.88E+02 +-3.41E+00 1.88E+02 +-3.41E+00

STANDARD DEVIATION = 0.25

EBAR = ***** MEV/DISINTEGRATION
MAXIMUM PERMISSABLE ACTIVITY = 6.39E-09 UC/LI
TOTAL MEASURED ACTIVITY = 1.84E+02 (+-3.37E+00) UC/LI
% TECH. SPEC. = ****** (+-****)

ERROR QUOTATION AT 1.96 SIGMA
LLD CONFIDENCE LEVEL AT 85.0%

PEAKS NOT USED IN ANALYSIS

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
1447.23	723.33	273.	17.2	1.33E+01
1746.53	873.05	117.	36.3	6.65E+00
1992.48	996.00	117.	33.9	7.37E+00

PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
2921.15	1460.50	98.	22.1	8.55E+00

M[illegible] 11/20/93

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*                                                                     *
*          G A M M A   S P E C T R U M   A N A L Y S I S              *
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CANBERRA SPECTRAN-F V2.06 SOFTWARE

20-DEC-9317:45:57

WHC-SD-WM-DP-062, REV. 0

A N A L Y S I S P A R A M E T E R S

MCA UNIT NUMBER: 2 / ADC UNIT NUMBER: 1.0
DETECTOR NUMBER: 1 / GEOMETRY NUMBER: 42
SPECTRUM SIZE: 4096 CHANNELS
ORDER OF SMOOTHING FUNCTION: 5
NUMBER OF BACKGROUND CHANNELS: 4 ON EACH SIDE OF PEAK
PEAK CONFIDENCE FACTOR: 85.0%
IDENTIFICATION ENERGY WINDOW: +- 1.50 KEV
ERROR QUOTATION: 1.96 SIGMA UNCERTAINTY

ENVIRONMENTAL BACKGROUND SUBTRACTED
FLD CALCULATION PERFORMED
MEASURED ENERGY DIFFERENCES LISTED
MULTIPLET ANALYSIS PERFORMED

SPECTRAL DATA READ DIRECTLY FROM MULTICHANNEL ANALYZER ANI:
ANALYZED BY: MB

SAMPLE DESCRIPTION: J 1426-5730
GEOMETRY DESCRIPTION: 22 ML LIQ
SAMPLE SIZE: 1.0000E-03 LI / CONVERSION FACTOR: 5.0000E-01
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL205

COLLECT STARTED ON 20-DEC-93 AT 16:55:41

COLLECT LIVE TIME: 3000. SECONDS
REAL TIME: 3008. SECONDS
DEAD TIME: 0.27 %

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

ENERGY CALIBRATION PERFORMED 8-NOV-93
EFFICIENCY CALIBRATION PERFORMED 9-NOV-93

P E A K A N A L Y S I S

PK	CENTROID CHANNEL	ENERGY KEV	FWHM KEV	BACKGND COUNTS	NET AREA COUNTS	ERROR %	NUCLIDES
1	119.71	59.69	1.18	2393.	1886.	8.7	AM-241,U-237, EU-155
2	173.73	86.69	1.25	2392.	521.	28.1	CS-136, EU-155, EU-155A, PB-214X, TL-208X, CD-109
3	211.32	105.48	1.37	2714.	407.	38.8	EU-155, EU-155B, NP-239
4	246.84	123.23	1.14	2402.	1784.	9.1	EU-152,CO-57, EU-154A
5	1323.79	661.61	1.59	432.	51013.	0.9	CS-137
6	1446.79	723.12	1.91	140.	239.	20.2	SB-124,I-131, AG-108, EU-154D, ZR-95
7	1746.78	873.12	2.08	141.	152.	29.6	EU-154E, RH-106
8	1992.40	995.96	2.24	132.	114.	36.7	EU-154F
9	2009.55	1004.53	1.44	115.	221.	20.3	EU-154G, EU-152
10	2346.37	1172.99	2.09	63.	1244.	5.9	CO-60
11	2543.73	1274.20	1.89	21.	304.	12.3	EU-154, EU-154H, NA-22
12	2665.00	1332.36	1.93	21.	1097.	6.1	CO-60
13	2921.33	1460.59	2.17	5.	123.	18.7	K-40
13B		1460.83			344.	10.8	

ERROR QUOTATION AT 1.96 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

B - ENVIRONMENTAL BACKGROUND PEAK

BACKGROUND SUBTRACTION PERFORMED USING FILE BK0011
BACKGROUND DESCRIPTION: BKG
BACKGROUND COLLECT STARTED ON 24-AUG-92 AT 13:00:00
BACKGROUND LIVE TIME: 3000. SECONDS

SAMPLE: J 1426-5730
DATA COLLECTED ON 20-DEC-93 AT 16:55:41
DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT.

R A D I O N U C L I D E A N A L Y S I S R E P O R T

NUCLIDE	ACTIVITY CONCENTRATION IN uCi/LI MEASURED	ERROR	DECAY CORRECTED	ERROR	ENERGY COMPARISON (KEV) EXPECT	DIFF
AM-241	1.83E+01	+-1.81E+00	1.83E+01	+-1.81E+00	59.54	0.16
AM-243	LLD<4.37E-01		LLD<4.37E-01		74.67	
BA-133	LLD<3.09E-01		LLD<3.09E-01		356.02	
BA-140	LLD<8.24E-01		LLD<8.24E-01		537.27	
BI-212	LLD<1.59E+00		LLD<1.59E+00		727.20	
CEPR144	LLD<2.40E+00		LLD<2.40E+00		133.51	
CO-60	4.77E+00	+-2.96E-01	4.77E+00	+-2.96E-01	1332.50	-0.14
					1173.24	-0.25
CR-51	LLD<1.92E+00		LLD<1.92E+00		320.09	
CS-134	LLD<1.29E-01		LLD<1.29E-01		795.84	
CS-137	1.46E+02	+-2.18E+00	1.46E+02	+-2.18E+00	661.65	-0.04
EU-152	LLD<2.52E-01		LLD<2.52E-01		1408.01	
EU-154	3.59E+00	+-4.42E-01	3.59E+00	+-4.42E-01	1274.45	-0.25
					123.07	0.16
					1004.76	-0.23
EU-154H	3.59E+00	+-4.42E-01	3.59E+00	+-4.42E-01	1274.80	-0.60
EU-155	1.77E+00	+-6.89E-01	1.77E+00	+-6.89E-01	105.31	0.17
					86.54	0.15
FE-59	LLD<2.39E-01		LLD<2.39E-01		1099.25	
I-131	LLD<2.38E-01		LLD<2.38E-01		364.48	
K-40	LLD<2.53E+00		LLD<2.53E+00		1460.75	
LA-140	LLD<5.87E-02		LLD<5.87E-02		1596.20	
MN-54	LLD<1.11E-01		LLD<1.11E-01		834.83	
~~NA-22~~	~~1.27E+00~~	~~+-1.57E-01~~	~~1.27E+00~~	~~+-1.57E-01~~	~~1274.55~~	~~-0.35~~ 154 Eu [illegible] 12/21/93
NB-94	LLD<1.00E-01		LLD<1.00E-01		702.63	
NB-95	LLD<1.08E-01		LLD<1.08E-01		765.78	
~~NP-237~~	~~5.31E+00~~	~~+-1.50E+00~~	~~5.31E+00~~	~~+-1.50E+00~~	~~86.50~~	~~-0.19~~ 155 Eu [illegible] 12/21/93
[illegible]	LLD<3.82E-01		LLD<3.82E-01		239.00	
PU-239	LLD<1.93E+03		LLD<1.93E+03		129.30	
PU-241	LLD<7.07E+04		LLD<7.07E+04		148.57	
RA-224	LLD<4.16E+00		LLD<4.16E+00		240.99	
RA-226	LLD<4.22E+00		LLD<4.22E+00		186.10	
RU-103	LLD<2.62E-01		LLD<2.62E-01		497.08	
RU103	LLD<2.75E-01		LLD<2.75E-01		497.08	
RURH106	LLD<3.76E+00		LLD<3.76E+00		621.80	
SB-125	LLD<8.86E-01		LLD<8.86E-01		427.89	
SB-125A	LLD<8.86E-01		LLD<8.86E-01		427.89	
SE-75	LLD<2.84E-01		LLD<2.84E-01		264.66	
SN-113	LLD<3.63E-01		LLD<3.63E-01		391.67	
[illegible]	LLD<2.27E-01		LLD<2.27E-01		513.99	
TH-228	LLD<1.78E+01		LLD<1.78E+01		84.37	
TH-208	LLD<1.95E-01		LLD<1.95E-01		583.20	
U-235	LLD<2.57E-01		LLD<2.57E-01		185.71	
[illegible]	LLD<6.44E-02		LLD<6.44E-02		1836.06	
[illegible]	LLD<2.88E-01		LLD<2.88E-01		1115.55	
ZR-95	LLD<1.95E-01		LLD<1.95E-01		756.73	

TOTAL 1.85E+02 +-3.36E+00 1.85E+02 +-3.36E+00

STANDARD DEVIATION = 0.26

EDL = ***** MEV/DISINTEGRATION
MAXIMUM PERMISSABLE ACTIVITY = 6.50E-09 UC/LI
TOTAL MEASURED ACTIVITY = 1.81E+02 (+-3.33E+00) UC/LI
% TECH. SPEC. = ****** (+-****)

ERROR QUOTATION AT 1.96 SIGMA
ELD CONFIDENCE LEVEL AT 85.0%

PEAKS NOT USED IN ANALYSIS

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
1440.79	723.12	239.	20.2	1.16E+01
1746.78	873.12	152.	29.6	8.61E+00
1988.40	995.96	114.	36.7	7.23E+00

PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
2921.33	1460.59	123.	18.7	1.07E+01

D. H. Milicia
12-20-93

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*          G A M M A   S P E C T R U M   A N A L Y S I S              *
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CANBERRA SPECTRAN-F V2.06 SOFTWARE

WHC-SD-WM-DP-062, REV. 0

20-DEC-9319:03:27

A N A L Y S I S P A R A M E T E R S

MCA UNIT NUMBER: 2 / ADC UNIT NUMBER: 1.0
DETECTOR NUMBER: 1 / GEOMETRY NUMBER: 42
SPECTRUM SIZE: 4096 CHANNELS
ORDER OF SMOOTHING FUNCTION: 5
NUMBER OF BACKGROUND CHANNELS: 4 ON EACH SIDE OF PEAK
PEAK CONFIDENCE FACTOR: 85.0%
IDENTIFICATION ENERGY WINDOW: +- 1.50 KEV
ERROR QUOTATION: 1.96 SIGMA UNCERTAINTY

ENVIRONMENTAL BACKGROUND SUBTRACTED
LLD CALCULATION PERFORMED
MEASURED ENERGY DIFFERENCES LISTED
MULTIPLET ANALYSIS PERFORMED

SPECTRAL DATA READ DIRECTLY FROM MULTICHANNEL ANALYZER AN1:
ANALYZED BY: DM

SAMPLE DESCRIPTION: J-1426-5730 TRIP.
GEOMETRY DESCRIPTION: 22 ML LIQ
SAMPLE SIZE: 1.0000E-03 LI / CONVERSION FACTOR: 5.0000E-01
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL205

COLLECT STARTED ON 20-DEC-93 AT 18:13:11

COLLECT LIVE TIME: 3000. SECONDS
REAL TIME: 3008. SECONDS
DEAD TIME: 0.27 %

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

ENERGY CALIBRATION PERFORMED 8-NOV-93
EFFICIENCY CALIBRATION PERFORMED 9-NOV-93

P E A K A N A L Y S I S

PK	CENTROID CHANNEL	ENERGY KEV	FWHM KEV	BACKGND COUNTS	NET AREA COUNTS	ERROR %	NUCLIDES
1	119.78	59.73	1.11	2382.	1869.	8.7	AM-241,U-237, EU-155
2	173.80	86.73	1.35	2352.	632.	23.3	CS-136, EU-155, EU-155A, PB-214X, TL-208X, CD-109
3	211.27	105.45	1.06	2600.	444.	35.0	EU-155, EU-155B, NP-239
4	246.83	123.23	1.27	2387.	1773.	9.1	EU-152,CO-57, EU-154A
5	1323.76	661.60	1.60	456.	51451.	0.9	CS-137
6	1447.10	723.27	1.67	140.	284.	17.4	SB-124,I-131, AG-108, EU-154D, ZR-95
7	1746.63	873.05	1.92	145.	141.	31.6	EU-154E, RH-106
8	1992.92	996.21	1.74	141.	101.	42.3	EU-154F
9	2009.13	1004.32	2.34	120.	220.	20.6	EU-154G, EU-152
10	2346.43	1173.02	1.96	84.	1263.	6.0	CO-60
11	2548.80	1274.24	1.53	30.	314.	12.4	EU-154, EU-154H, NA-22
12	2664.65	1332.19	2.03	19.	1177.	5.8	CO-60
13	2921.62	1460.74	2.28	15.	78.	27.7	K-40
13S		1460.83			344.	10.8	

ERROR QUOTATION AT 1.96 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

B ENVIRONMENTAL BACKGROUND PEAK

BACKGROUND SUBTRACTION PERFORMED USING FILE BK0011
BACKGROUND DESCRIPTION: BKG
BACKGROUND COLLECT STARTED ON 24-AUG-92 AT 13:00:00
BACKGROUND LIVE TIME: 3000. SECONDS

20-DEC-9319:03:27

SAMPLE: J-1426-5730 TRIP.
DATA COLLECTED ON 20-DEC-93 AT 18:13:11
DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT.

R A D I O N U C L I D E A N A L Y S I S R E P O R T

NUCLIDE	ACTIVITY CONCENTRATION IN uCi/LI MEASURED	ERROR	DECAY CORRECTED	ERROR	ENERGY COMPARISON (KEV) EXPECT	DIFF
AM-241	1.81E+01	+-1.80E+00	1.81E+01	+-1.80E+00	59.54	0.19
AM-243	LLD<4.28E-01		LLD<4.28E-01		74.67	
BA-133	LLD<3.18E-01		LLD<3.18E-01		356.02	
BA-140	LLD<8.41E-01		LLD<8.41E-01		537.27	
BI-212	LLD<1.66E+00		LLD<1.66E+00		727.20	
CEPR144	LLD<2.39E+00		LLD<2.39E+00		133.51	
CO-60	5.12E+00	+-3.06E-01	5.12E+00	+-3.06E-01	1332.50	-0.31
					1173.24	-0.22
CR-51	LLD<1.90E+00		LLD<1.90E+00		320.09	
CS-134	LLD<1.37E-01		LLD<1.37E-01		795.84	
CS-137	1.47E+02	+-2.20E+00	1.47E+02	+-2.20E+00	661.65	-0.05
EU-152	LLD<2.74E-01		LLD<2.74E-01		1408.01	
EU-154	3.71E+00	+-4.62E-01	3.71E+00	+-4.62E-01	1274.45	-0.21
					123.07	0.16
					1004.76	-0.44
EU-154M	3.71E+00	+-4.62E-01	3.71E+00	+-4.62E-01	1274.80	-0.56
EU-155	1.93E+00	+-6.78E-01	1.93E+00	+-6.78E-01	105.31	0.15
					86.54	0.18
FE-59	LLD<2.36E-01		LLD<2.36E-01		1099.25	
I-131	LLD<2.47E-01		LLD<2.47E-01		364.48	
K-40	LLD<2.60E+00		LLD<2.60E+00		1460.75	
LA-140	LLD<5.87E-02		LLD<5.87E-02		1596.20	
MN-54	LLD<1.10E-01		LLD<1.10E-01		834.83	
~~NA-22~~	~~1.32E+00~~	~~+-1.64E-01~~	~~1.32E+00~~	~~+-1.64E-01~~	~~1274.55~~	~~0.31~~
NB-94	LLD<9.67E-02		LLD<9.67E-02		702.63	
NB-95	LLD<1.11E-01		LLD<1.11E-01		765.78	
~~NP-237~~	~~6.43E+00~~	~~+-1.51E+00~~	~~6.43E+00~~	~~+-1.51E+00~~	~~86.50~~	~~0.22~~
PB-212	LLD<3.72E-01		LLD<3.72E-01		239.00	
PU-239	LLD<1.93E+03		LLD<1.93E+03		129.30	
PU-241	LLD<6.93E+04		LLD<6.93E+04		148.57	
RA-224	LLD<4.14E+00		LLD<4.14E+00		240.99	
RA-226	LLD<4.26E+00		LLD<4.26E+00		186.10	
RU-103	LLD<2.57E-01		LLD<2.57E-01		497.08	
RU103	LLD<2.70E-01		LLD<2.70E-01		497.08	
RURH106	LLD<3.85E+00		LLD<3.85E+00		621.80	
SB-125	LLD<9.05E-01		LLD<9.05E-01		427.89	
SB-125A	LLD<9.05E-01		LLD<9.05E-01		427.89	
SE-75	LLD<2.82E-01		LLD<2.82E-01		264.66	
SN-113	LLD<3.55E-01		LLD<3.55E-01		391.67	
SR-85	LLD<2.33E-01		LLD<2.33E-01		513.99	
TH-228	LLD<1.78E+01		LLD<1.78E+01		84.37	
TL-208	LLD<1.99E-01		LLD<1.99E-01		583.20	
U-235	LLD<2.60E-01		LLD<2.60E-01		185.71	
Y-88	LLD<6.62E-03		LLD<6.62E-03		1836.06	
ZN-65	LLD<2.95E-01		LLD<2.95E-01		1115.55	
ZR-95	LLD<1.91E-01		LLD<1.91E-01		756.73	

154 Eu 12/21/93

155 Eu 12/21/93

TOTAL 1.88E+02 +-3.37E+00 1.88E+02 +-3.37E+00

STANDARD DEVIATION = 0.28

LBAR = ***** MEV/DISINTEGRATION
MAXIMUM PERMISSABLE ACTIVITY = 6.40E-09 UC/LI
TOTAL MEASURED ACTIVITY = 1.84E+02 (+-3.34E+00) UC/LI
% TECH. SPEC. = ****** (+-****)

ERROR QUOTATION AT 1.96 SIGMA
LLD CONFIDENCE LEVEL AT 85.0%

PEAKS NOT USED IN ANALYSIS

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
1447.10	723.27	284.	17.4	1.38E+01
1746.63	873.05	141.	31.6	8.03E+00
1992.92	996.21	101.	42.3	6.37E+00

PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
2921.66	1460.74	78.	27.7	6.79E+00

D. H. Predicio
12-20-93

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*                                                                     *
*          G A M M A   S P E C T R U M   A N A L Y S I S              *
*                                                                     *
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CANBERRA SPECTRAN-F V2.06 SOFTWARE

WHC-SD-WM-DP-062, REV. 0

20-DEC-9320:00:47

A N A L Y S I S P A R A M E T E R S

MCA UNIT NUMBER: 2 / ADC UNIT NUMBER: 1.0
DETECTOR NUMBER: 1 / GEOMETRY NUMBER: 42
SPECTRUM SIZE: 4096 CHANNELS
ORDER OF SMOOTHING FUNCTION: 5
NUMBER OF BACKGROUND CHANNELS: 4 ON EACH SIDE OF PEAK
PEAK CONFIDENCE FACTOR: 85.0%
IDENTIFICATION ENERGY WINDOW: +- 1.50 KEV
ERROR QUOTATION: 1.96 SIGMA UNCERTAINTY

ENVIRONMENTAL BACKGROUND SUBTRACTED
LLD CALCULATION PERFORMED
MEASURED ENERGY DIFFERENCES LISTED
MULTIPLET ANALYSIS PERFORMED

SPECTRAL DATA READ DIRECTLY FROM MULTICHANNEL ANALYZER AN1:
ANALYZED BY: DM

SAMPLE DESCRIPTION: J-1427-5730
GEOMETRY DESCRIPTION: 22 ML LIQ
SAMPLE SIZE: 1.0000E-03 LI / CONVERSION FACTOR: 5.0000E-01
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL205

COLLECT STARTED ON 20-DEC-93 AT 19:10:17

COLLECT LIVE TIME: 3000. SECONDS
REAL TIME: 3022. SECONDS
DEAD TIME: 0.73 %

DELAYED TO 0. DAYS. 0.0000 HOURS BEFORE THE START OF COLLECT

ENERGY CALIBRATION PERFORMED 8-NOV-93
EFFICIENCY CALIBRATION PERFORMED 9-NOV-93

P E A K A N A L Y S I S

PK	CENTROID CHANNEL	ENERGY KEV	FWHM KEV	BACKGND COUNTS	NET AREA COUNTS	ERROR %	NUCLIDES
1	119.73	59.70	1.22	6477.	4819.	5.5	AM-241,U-237, EU-155
2	173.86	86.75	1.14	6599.	1225.	19.8	CS-136, EU-155, EU-155A, PB-214X, TL-208X, CD-109
3	211.26	105.45	1.36	7138.	1203.	21.4	EU-155, EU-155B, NP-239
4	246.83	123.23	1.21	6570.	4399.	6.0	EU-152,CO-57, EU-154A
5	1184.12	591.78	1.93	1667.	151.	85.6	EU-154C
6	1323.82	661.63	1.59	1220.	151647.	0.5	CS-137
7	1447.10	723.27	1.68	266.	738.	9.9	SB-124,I-131, AG-108, EU-154D, ZR-95
8	1514.19	756.81	2.16	230.	203.	27.0	ZR-95,EU-154
9	1746.52	872.99	1.96	288.	376.	17.5	EU-154E, RH-106
10	1992.63	996.07	1.54	242.	319.	19.0	EU-154F
11	2009.37	1004.44	1.82	239.	544.	12.3	EU-154G, EU-152
12	2346.35	1173.00	2.04	110.	2659.	4.0	CO-60
13	2548.77	1274.22	1.91	58.	812.	7.6	EU-154, EU-154H, NA-22
14	2664.74	1332.23	2.09	43.	2317.	4.2	CO-60
15	2921.43	1460.64	1.39	9.	106.	21.4	K-40
15B		1460.83			344.	10.8	
16	3529.01	1764.62	0.62	4.	13.	75.4	BI-214C

ERROR QUOTATION AT 1.96 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

B - ENVIRONMENTAL BACKGROUND PEAK

BACKGROUND SUBTRACTION PERFORMED USING FILE BK0011
BACKGROUND DESCRIPTION: BKG
BACKGROUND COLLECT STARTED ON 24-AUG-92 AT 13:00:00
BACKGROUND LIVE TIME: 3000. SECONDS

SAMPLE: J-1427-5730
DATA COLLECTED ON 20-DEC-93 AT 19:10:17
DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT.

R A D I O N U C L I D E A N A L Y S I S R E P O R T

NUCLIDE	ACTIVITY CONCENTRATION IN uCi/LI MEASURED	ERROR	DECAY CORRECTED	ERROR	ENERGY COMPARISON (KEV) EXPECT	DIFF	
AM-241	4.67E+01	+-3.42E+00	4.67E+01	+-3.42E+00	59.54	0.17	
AM-243	LLD<7.21E-01		LLD<7.21E-01		74.67		
BA-133	LLD<5.28E-01		LLD<5.28E-01		356.02		
BA-140	LLD<1.34E+00		LLD<1.34E+00		537.27		
BI-212	LLD<2.64E+00		LLD<2.64E+00		727.20		
CEPR144	LLD<3.98E+00		LLD<3.98E+00		133.51		
CO-60	1.01E+01	+-4.39E-01	1.01E+01	+-4.39E-01	1332.50	-0.27	
					1173.24	-0.24	
CR-51	LLD<3.20E+00		LLD<3.20E+00		320.09		
CS-134	LLD<1.92E-01		LLD<1.92E-01		795.84		
CS-137	4.34E+02	+-5.69E+00	4.34E+02	+-5.69E+00	661.65	-0.02	
EU-152	LLD<3.47E-01		LLD<3.47E-01		1408.01		
EU-154	9.57E+00	+-7.33E-01	9.57E+00	+-7.33E-01	1274.45	-0.23	
					123.07	0.16	
					1004.76	-0.32	
EU-154H	9.58E+00	+-7.33E-01	9.58E+00	+-7.33E-01	1274.80	-0.58	
EU-155	5.23E+00	+-1.13E+00	5.23E+00	+-1.13E+00	105.31	0.15	
					86.54	0.21	
FE-59	LLD<3.39E-01		LLD<3.39E-01		1099.25		
I-131	LLD<4.16E-01		LLD<4.16E-01		364.48		
K-40	LLD<2.57E+00		LLD<2.57E+00		1460.75		
LA-140	LLD<7.05E-02		LLD<7.05E-02		1596.20		
MN-54	LLD<1.64E-01		LLD<1.64E-01		834.83		
~~NA-22~~	~~3.40E+00~~	~~+-2.60E-01~~	~~3.40E+00~~	~~+-2.60E-01~~	~~1274.55~~	~~-0.33~~	154 Eu [illegible] 12/21/93
NB-94	LLD<1.52E-01		LLD<1.52E-01		702.63		
NB-95	LLD<1.51E-01		LLD<1.51E-01		765.78		
~~NP-237~~	~~1.25E+01~~	~~+-2.49E+00~~	~~1.25E+01~~	~~+-2.49E+00~~	~~86.50~~	~~-0.25~~	155 Eu [illegible] 12/21/93
PB-212	LLD<6.27E-01		LLD<6.27E-01		239.00		
PU-239	LLD<3.20E+03		LLD<3.20E+03		129.30		
PU-241	LLD<1.16E+05		LLD<1.16E+05		148.57		
RA-224	LLD<6.90E+00		LLD<6.90E+00		240.99		
RA-226	LLD<7.14E+00		LLD<7.14E+00		186.10		
RU-103	LLD<4.37E-01		LLD<4.37E-01		497.08		
RU103	LLD<4.60E-01		LLD<4.60E-01		497.08		
RURH106	LLD<6.17E+00		LLD<6.17E+00		621.80		
SB-125	LLD<1.49E+00		LLD<1.49E+00		427.89		
SB-125A	LLD<1.49E+00		LLD<1.49E+00		427.89		
[illegible]-75	LLD<4.68E-01		LLD<4.68E-01		264.66		
[illegible]	LLD<6.07E-01		LLD<6.07E-01		391.67		
[illegible]-85	LLD<3.71E-01		LLD<3.71E-01		513.99		
[illegible]	LLD<2.91E+01		LLD<2.91E+01		84.37		
[illegible]	LLD<3.33E-01		LLD<3.33E-01		583.20		
[illegible]	LLD<4.34E-01		LLD<4.34E-01		185.71		
[illegible]	LLD<4.75E-02		LLD<4.75E-02		1836.06		
[illegible]-65	LLD<3.97E-01		LLD<3.97E-01		1115.55		
~~[illegible]~~	~~1.01E+00~~	~~+-2.74E-01~~	~~1.01E+00~~	~~+-2.74E-01~~	~~756.73~~	~~-0.08~~	154 Eu [illegible] 12/21/93
					724.20	-0.93	

TOTAL	5.33E+02 +-7.27E+00	5.33E+02 +-7.27E+00

STANDARD DEVIATION = 0.34

EBAR = ***** MEV/DISINTEGRATION
MAXIMUM PERMISSABLE ACTIVITY = 5.37E-09 UC/LI
TOTAL MEASURED ACTIVITY = 5.23E+02 (+-7.24E+00) UC/LI
% TECH. SPEC. = ****** (+-****)

ERROR QUOTATION AT 1.96 SIGMA
LLD CONFIDENCE LEVEL AT 85.0%

PEAKS NOT USED IN ANALYSIS

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
1184.12	591.78	151.	85.6	6.16E+00
1746.52	872.99	376.	17.5	2.14E+01
1992.63	996.07	319.	19.0	2.02E+01
3529.01	1764.62	13.	75.4	1.35E+00

PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

CE DID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
2901.43	1460.64	106.	21.4	9.19E+00

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*                                                                     *
*          G A M M A   S P E C T R U M   A N A L Y S I S              *
*                                                                     *
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CANBERRA SPECTRAN-F V2.06 SOFTWARE

20-DEC-9320:57:04

WHC-SD-WM-DP-062, REV. 0

A N A L Y S I S P A R A M E T E R S

MCA UNIT NUMBER: 2 / ADC UNIT NUMBER: 1.0
DETECTOR NUMBER: 1 / GEOMETRY NUMBER: 42
SPECTRUM SIZE: 4096 CHANNELS
ORDER OF SMOOTHING FUNCTION: 5
NUMBER OF BACKGROUND CHANNELS: 4 ON EACH SIDE OF PEAK
PEAK CONFIDENCE FACTOR: 85.0%
IDENTIFICATION ENERGY WINDOW: +- 1.50 KEV
ERROR QUOTATION: 1.96 SIGMA UNCERTAINTY

ENVIRONMENTAL BACKGROUND SUBTRACTED
LLD CALCULATION PERFORMED
MEASURED ENERGY DIFFERENCES LISTED
MULTIPLET ANALYSIS PERFORMED

SPECTRAL DATA READ DIRECTLY FROM MULTICHANNEL ANALYZER AN1:
ANALYZED BY: DM

SAMPLE DESCRIPTION: J-1427-5730 DUP.
GEOMETRY DESCRIPTION: 22 ML LIQ
SAMPLE SIZE: 1.0000E-03 LI / CONVERSION FACTOR: 5.0000E-01
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL205

COLLECT STARTED ON 20-DEC-93 AT 20:06:33

COLLECT LIVE TIME: 3000. SECONDS
REAL TIME: 3022. SECONDS
DEAD TIME: 0.73 %

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

ENERGY CALIBRATION PERFORMED 8-NOV-93
EFFICIENCY CALIBRATION PERFORMED 9-NOV-93

P E A K A N A L Y S I S

PK	CENTROID CHANNEL	ENERGY KEV	FWHM KEV	BACKGND COUNTS	NET AREA COUNTS	ERROR %	NUCLIDES
1	119.75	59.71	1.13	6516.	4661.	5.7	AM-241,U-237, EU-155
2	173.62	86.64	1.12	7201.	1464.	17.8	CS-136, EU-155, EU-155A, PB-214X, TL-208X, CD-109
3	211.28	105.46	1.04	7291.	971.	26.6	EU-155, EU-155B, NP-239
4	246.84	123.23	1.17	6567.	4462.	6.0	EU-152,CO-57, EU-154A
5	496.80	248.18	1.49	6608.	805.	30.5	EU-154B
6	1323.84	661.64	1.59	1264.	152528.	0.5	CS-137
7	1447.12	723.28	1.64	261.	749.	9.8	SB-124,I-131, AG-108, EU-154D, ZR-95
8	1513.74	756.59	1.22	315.	157.	39.2	ZR-95,EU-154
9	1746.49	872.98	1.60	301.	311.	20.9	EU-154E, RH-106
1	1993.01	996.26	1.57	244.	292.	20.5	EU-154F
11	2009.54	1004.53	1.96	234.	539.	12.3	EU-154G, EU-152
12	2346.42	1173.01	1.89	89.	2703.	3.9	CO-60
13	2548.99	1274.34	2.00	58.	795.	7.6	EU-154, EU-154H, NA-22
14	2664.95	1332.34	1.98	26.	2446.	4.0	CO-60
15	2921.91	1460.88	1.10	19.	109.	22.9	K-40
15B		1460.83			344.	10.8	

ERROR QUOTATION AT 1.96 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

B - ENVIRONMENTAL BACKGROUND PEAK

BACKGROUND SUBTRACTION PERFORMED USING FILE BK0011
BACKGROUND DESCRIPTION: BKG
BACKGROUND COLLECT STARTED ON 24-AUG-92 AT 13:00:00
BACKGROUND LIVE TIME: 3000. SECONDS

SAMPLE: J-1427-5730 DUP.
DATA COLLECTED ON 20-DEC-93 AT 20:06:33
DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT.

R A D I O N U C L I D E A N A L Y S I S R E P O R T

NUCLIDE	ACTIVITY CONCENTRATION IN uCi/LI				ENERGY COMPARISON (KEV)	
	MEASURED	ERROR	DECAY CORRECTED	ERROR	EXPECT	DIFF
AM-241	4.52E+01	+-3.37E+00	4.52E+01	+-3.37E+00	59.54	0.18
AM-243	LLD<7.26E-01		LLD<7.26E-01		74.67	
BA-133	LLD<5.26E-01		LLD<5.26E-01		356.02	
BA-140	LLD<1.33E+00		LLD<1.33E+00		537.27	
BI-212	LLD<2.60E+00		LLD<2.60E+00		727.20	
CEPR144	LLD<3.94E+00		LLD<3.94E+00		133.51	
CO-60	1.06E+01	+-4.48E-01	1.06E+01	+-4.48E-01	1332.50	-0.16
					1173.24	-0.23
CR-51	LLD<3.19E+00		LLD<3.19E+00		320.09	
CS-134	LLD<1.84E-01		LLD<1.84E-01		795.84	
CS-137	4.37E+02	+-5.72E+00	4.37E+02	+-5.72E+00	661.65	-0.01
EU-152	LLD<2.28E-01		LLD<2.28E-01		1408.01	
EU-154	9.38E+00	+-7.23E-01	9.38E+00	+-7.23E-01	1274.45	-0.11
					123.07	0.16
					1004.76	-0.23
EU-154M	9.38E+00	+-7.23E-01	9.38E+00	+-7.23E-01	1274.80	-0.46
EU-155	4.22E+00	+-1.13E+00	4.22E+00	+-1.13E+00	105.31	0.16
					86.54	0.10
FE-59	LLD<3.47E-01		LLD<3.47E-01		1099.25	
I-131	LLD<4.11E-01		LLD<4.11E-01		364.48	
K-40	LLD<2.62E+00		LLD<2.62E+00		1460.75	
LA-140	LLD<8.05E-02		LLD<8.05E-02		1596.20	
MN-54	LLD<1.59E-01		LLD<1.59E-01		834.83	
NA-22	3.33E+00	+-2.57E-01	3.33E+00	+-2.57E-01	1274.55	-0.21
NB-94	LLD<1.43E-01		LLD<1.43E-01		702.63	
NB-95	LLD<1.55E-01		LLD<1.55E-01		765.78	
NP-237	1.49E+01	+-2.68E+00	1.49E+01	+-2.68E+00	86.50	0.14
PB-212	LLD<6.28E-01		LLD<6.28E-01		239.00	
PU-239	LLD<3.21E+03		LLD<3.21E+03		129.30	
PU-241	LLD<1.16E+05		LLD<1.16E+05		148.57	
RA-224	LLD<6.87E+00		LLD<6.87E+00		240.99	
RA-226	LLD<7.09E+00		LLD<7.09E+00		186.10	
RU-103	LLD<4.39E-01		LLD<4.39E-01		497.08	
RU103	LLD<4.62E-01		LLD<4.62E-01		497.08	
RURH106	LLD<6.30E+00		LLD<6.30E+00		621.80	
SB-125	LLD<1.52E+00		LLD<1.52E+00		427.89	
SB-125A	LLD<1.52E+00		LLD<1.52E+00		427.89	
SE-75	LLD<4.73E-01		LLD<4.73E-01		264.66	
SN-113	LLD<6.08E-01		LLD<6.08E-01		391.67	
SR-85	LLD<3.75E-01		LLD<3.75E-01		513.99	
SR-89	LLD<2.91E+01		LLD<2.91E+01		84.37	
TL-208	LLD<3.23E-01		LLD<3.23E-01		583.20	
U-235	LLD<4.29E-01		LLD<4.29E-01		185.71	
U-238	LLD<4.75E-02		LLD<4.75E-02		1836.06	
ZN-65	LLD<4.13E-01		LLD<4.13E-01		1115.55	
ZR-95	7.85E-01	+-3.08E-01	7.85E-01	+-3.08E-01	756.73	-0.14
					724.20	-0.92

TOTAL	5.35E+02 +-7.34E+00	5.35E+02 +-7.34E+00

STANDARD DEVIATION = 0.30

EBAR = ***** MEV/DISINTEGRATION
MAXIMUM PERMISSABLE ACTIVITY = 5.70E-09 UC/LI
TOTAL MEASURED ACTIVITY = 5.25E+02 (+-7.31E+00) UC/LI
% TECh. SPEC. = ****** (+-****)

ERROR QUOTATION AT 1.96 SIGMA
ELD CONFIDENCE LEVEL AT 85.0%

PEAKS NOT USED IN ANALYSIS

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
496.20	248.18	805.	30.5	1.55E+01
1746.49	872.98	311.	20.9	1.77E+01
1993.01	996.26	292.	20.5	1.85E+01

PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
2921.91	1460.88	109.	22.9	9.51E+00

D. H. Medina
12 20 93

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*          G A M M A   S P E C T R U M   A N A L Y S I S              *
*                                                                     *
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CANBERRA SPECTRAN-F V2.06 SOFTWARE

WHC-SD-WM-DP-062, REV. 0

20-DEC-9321:54:36

A N A L Y S I S P A R A M E T E R S

MCA UNIT NUMBER: 2 / ADC UNIT NUMBER: 1.0
DETECTOR NUMBER: 1 / GEOMETRY NUMBER: 42
SPECTRUM SIZE: 4096 CHANNELS
ORDER OF SMOOTHING FUNCTION: 5
NUMBER OF BACKGROUND CHANNELS: 4 ON EACH SIDE OF PEAK
PEAK CONFIDENCE FACTOR: 85.0%
IDENTIFICATION ENERGY WINDOW: +- 1.50 KEV
ERROR QUOTATION: 1.96 SIGMA UNCERTAINTY

ENVIRONMENTAL BACKGROUND SUBTRACTED
LLD CALCULATION PERFORMED
MEASURED ENERGY DIFFERENCES LISTED
MULTIPLET ANALYSIS PERFORMED

SPECTRAL DATA READ DIRECTLY FROM MULTICHANNEL ANALYZER AN1:
ANALYZED BY: DM

SAMPLE DESCRIPTION: J-1427-5730 TRIP.
GEOMETRY DESCRIPTION: 22 ML-LIQ
SAMPLE SIZE: 1.0000E-03 LI / CONVERSION FACTOR: 5.0000E-01
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL205

COLLECT STARTED ON 20-DEC-93 AT 21:04:05

COLLECT LIVE TIME: 3000. SECONDS
REAL TIME: 3023. SECONDS
DEAD TIME: 0.76 %

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

ENERGY CALIBRATION PERFORMED 8-NOV-93
EFFICIENCY CALIBRATION PERFORMED 9-NOV-93

P E A K A N A L Y S I S

PK	CENTROID CHANNEL	ENERGY KEV	FWHM KEV	BACKGND COUNTS	NET AREA COUNTS	ERROR %	NUCLIDES
1	119.70	59.69	1.16	6541.	4716.	5.7	AM-241,U-237, EU-155
2	173.67	86.66	1.21	7187.	1525.	17.1	CS-136, EU-155, EU-155A, PB-214X, TL-208X, CD-109
3	211.26	105.45	1.11	7146.	1216.	21.2	EU-155, EU-155B, NP-239
4	246.79	123.21	1.20	6805.	4487.	6.0	EU-152,CO-57, EU-154A
5	1183.71	591.58	1.23	1540.	104.	115.6	EU-154C
6	1323.81	661.62	1.58	1253.	153329.	0.5	CS-137
7	1447.11	723.27	1.49	294.	735.	10.2	SB-124,I-131, AG-108, EU-154D, ZR-95
8	1513.95	756.70	2.10	312.	151.	39.6	ZR-95,EU-154
9	1746.88	873.17	1.85	293.	353.	18.6	EU-154E, RH-106
10	1992.56	996.03	1.44	252.	279.	21.5	EU-154F
11	2009.56	1004.54	1.87	258.	524.	13.0	EU-154G, EU-152
12	2346.44	1173.03	2.04	126.	2607.	4.1	CO-60
13	2548.73	1274.20	2.11	46.	887.	7.0	EU-154, EU-154H, NA-22
14	2664.73	1332.25	1.89	37.	2411.	4.1	CO-60
15	2921.21	1460.53	1.74	7.	94.	22.2	K-40
15B		1460.83			344.	10.8	

ERROR QUOTATION AT 1.96 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

B - ENVIRONMENTAL BACKGROUND PEAK

BACKGROUND SUBTRACTION PERFORMED USING FILE BK0011
BACKGROUND DESCRIPTION: BKG
BACKGROUND COLLECT STARTED ON 24-AUG-92 AT 13:00:00
BACKGROUND LIVE TIME: 3000. SECONDS

SAMPLE: J-1427-5730 TRIP.
DATA COLLECTED ON 20-DEC-93 AT 21:04:05
DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT.

R A D I O N U C L I D E A N A L Y S I S R E P O R T

NUCLIDE	ACTIVITY CONCENTRATION IN uCi/LI MEASURED	ERROR	DECAY CORRECTED	ERROR	ENERGY COMPARISON (KEV) EXPECT	DIFF	
AM-241	4.57E+01	+-3.39E+00	4.57E+01	+-3.39E+00	59.54	0.15	
AM-243	LLD<7.20E-01		LLD<7.20E-01		74.67		
BA-133	LLD<5.29E-01		LLD<5.29E-01		356.02		
BA-140	LLD<1.39E+00		LLD<1.39E+00		537.27		
BI-212	LLD<2.64E+00		LLD<2.64E+00		727.20		
CEPR141	LLD<3.96E+00		LLD<3.96E+00		133.51		
CO-60	1.05E+01	+-4.47E-01	1.05E+01	+-4.47E-01	1332.50	-0.25	
					1173.24	-0.21	
CR-51	LLD<3.20E+00		LLD<3.20E+00		320.09		
CS-134	LLD<1.89E-01		LLD<1.89E-01		795.84		
CS-137	4.39E+02	+-5.74E+00	4.39E+02	+-5.74E+00	661.65	-0.03	
EU-152	LLD<3.30E-01		LLD<3.30E-01		1408.01		
EU-154	1.05E+01	+-7.46E-01	1.05E+01	+-7.46E-01	1274.45	-0.25	
					123.07	0.14	
					1004.76	-0.22	
EU-154M	1.05E+01	+-7.46E-01	1.05E+01	+-7.46E-01	1274.80	-0.60	
EU-155	5.28E+00	+-1.13E+00	5.28E+00	+-1.13E+00	105.31	0.14	
					86.54	0.12	
FE-59	LLD<3.38E-01		LLD<3.38E-01		1099.25		
I-131	LLD<4.12E-01		LLD<4.12E-01		364.48		
K-40	LLD<2.57E+00		LLD<2.57E+00		1460.75		
LA-140	LLD<7.05E-02		LLD<7.05E-02		1596.20		
MN-54	LLD<1.59E-01		LLD<1.59E-01		834.83		
NA-22	3.71E+00	+-2.65E-01	3.71E+00	+-2.65E-01	1274.55	0.35	^{154}Eu 12/21/93
NB-94	LLD<1.51E-01		LLD<1.51E-01		702.63		
NB-95	LLD<1.53E-01		LLD<1.53E-01		765.78		
NP-237	1.55E+01	+-2.69E+00	1.55E+01	+-2.69E+00	86.50	0.16	^{155}Eu 12/21/93
PB-212	LLD<6.28E-01		LLD<6.28E-01		239.00		
PU-239	LLD<3.26E+03		LLD<3.26E+03		129.30		
PU-241	LLD<1.17E+05		LLD<1.17E+05		148.57		
RA-224	LLD<6.97E+00		LLD<6.97E+00		240.99		
RA-226	LLD<7.10E+00		LLD<7.10E+00		186.10		
RU-103	LLD<4.33E-01		LLD<4.33E-01		497.08		
RU103	LLD<4.56E-01		LLD<4.56E-01		497.08		
RUTH106	LLD<6.06E+00		LLD<6.06E+00		621.80		
SB-125	LLD<1.52E+00		LLD<1.52E+00		427.89		
SB-125A	LLD<1.52E+00		LLD<1.52E+00		427.89		
SE-75	LLD<4.69E-01		LLD<4.69E-01		264.66		
SN-113	LLD<6.10E-01		LLD<6.10E-01		391.67		
SR-85	LLD<3.81E-01		LLD<3.81E-01		513.99		
TH-228	LLD<2.94E+01		LLD<2.94E+01		84.37		
TL-208	LLD<3.40E-01		LLD<3.40E-01		583.20		
U-235	LLD<4.32E-01		LLD<4.32E-01		185.71		
U-238	LLD<6.44E-02		LLD<6.44E-02		1836.06		
ZN-65	LLD<3.83E-01		LLD<3.83E-01		1115.55		
ZR-95	7.56E-01	+-2.99E-01	7.56E-01	+-2.99E-01	756.73	-0.03	^{154}Eu 12/21/93
					724.20	-0.92	

TOTAL	5.42E+02 +-7.38E+00	5.42E+02 +-7.38E+00

STANDARD DEVIATION = 0.32

EBAR = ***** MEV/DISINTEGRATION
MAXIMUM PERMISSABLE ACTIVITY = 5.60E-09 UC/LI
TOTAL MEASURED ACTIVITY = 5.31E+02 (+-7.34E+00) UC/LI
% TECH. SPEC. = ****** (+-****)

ERROR QUOTATION AT 1.96 SIGMA
ELD CONFIDENCE LEVEL AT 85.0%

PEAKS NOT USED IN ANALYSIS

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
1183.71	591.58	104.	115.6	4.25E+00
1746.88	873.17	353.	18.6	2.00E+01
1992.56	996.03	279.	21.5	1.77E+01

PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
2921.21	1460.53	94.	22.2	8.18E+00

M Grossman 12/20/93

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*                                                                     *
*          G A M M A   S P E C T R U M   A N A L Y S I S              *
*                                                                     *
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CANBERRA SPECTRAN-F V2.06 SOFTWARE

WHC-SD-WM-DP-062, REV. 0

20-DEC-9323:16:16

A N A L Y S I S P A R A M E T E R S

MCA UNIT NUMBER: 2 / ADC UNIT NUMBER: 1.0
DETECTOR NUMBER: 1 / GEOMETRY NUMBER: 42
SPECTRUM SIZE: 4096 CHANNELS
ORDER OF SMOOTHING FUNCTION: 5
NUMBER OF BACKGROUND CHANNELS: 4 ON EACH SIDE OF PEAK
PEAK CONFIDENCE FACTOR: 85.0%
IDENTIFICATION ENERGY WINDOW: +- 1.50 KEV
ERROR QUOTATION: 1.96 SIGMA UNCERTAINTY

ENVIRONMENTAL BACKGROUND SUBTRACTED
FLD CALCULATION PERFORMED
MEASURED ENERGY DIFFERENCES LISTED
MULTIPLET ANALYSIS PERFORMED

SPECTRAL DATA READ DIRECTLY FROM MULTICHANNEL ANALYZER AN1:
ANALYZED BY: MB

SAMPLE DESCRIPTION: J 1428-5730
GEOMETRY DESCRIPTION: 22 ML LIQ
SAMPLE SIZE: 1.0000E-03 LI / CONVERSION FACTOR: 5.0000E-01
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL205

COLLECT STARTED ON 20-DEC-93 AT 22:26:00

COLLECT LIVE TIME: 3000. SECONDS
REAL TIME: 3008. SECONDS
DEAD TIME: 0.27 %

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

ENERGY CALIBRATION PERFORMED 8-NOV-93
EFFICIENCY CALIBRATION PERFORMED 9-NOV-93

P E A K A N A L Y S I S

PK	CENTROID CHANNEL	ENERGY KEV	FWHM KEV	BACKGND COUNTS	NET AREA COUNTS	ERROR %	NUCLIDES
1	119.73	59.70	1.12	2204.	1572.	9.9	AM-241,U-237, EU-155
2	173.87	86.76	0.81	2223.	477.	29.6	CS-136, EU-155, EU-155A, PB-214X, TL-208X, CD-109
3	211.17	105.41	1.11	2484.	325.	46.3	EU-155, EU-155B, NP-239
4	246.78	123.20	1.33	2706.	1162.	14.4	EU-152,CO-57, EU-154A
5	1323.79	661.61	1.58	421.	53062.	0.9	CS-137
6	1447.03	723.23	1.73	99.	214.	19.7	SB-124,I-131, AG-108, EU-154D, ZR-95
7	1746.63	873.05	2.16	73.	108.	31.5	EU-154E, RH-106
8	2009.79	1004.65	1.61	91.	143.	26.8	EU-154G, EU-152
9	2346.46	1173.03	1.83	53.	817.	7.4	CO-60
10	2548.60	1274.14	1.98	30.	229.	15.1	EU-154, EU-154H, NA-22
11	2664.58	1332.16	2.15	18.	721.	7.5	CO-60
12	2921.28	1460.57	2.37	5.	112.	19.7	K-40
12B		1460.83			344.	10.8	

ERROR QUOTATION AT 1.96 SIGMA
ERR CONFIDENCE LEVEL AT 95.0%

- ENVIRONMENTAL BACKGROUND PEAK

BACKGROUND SUBTRACTION PERFORMED USING FILE BK0011
BACKGROUND DESCRIPTION: BKG
BACKGROUND COLLECT STARTED ON 24-AUG-92 AT 13:00:00
BACKGROUND LIVE TIME: 3000. SECONDS

20-DEC-9323:16:16

SAMPLE: J 1428-5730
DATA COLLECTED ON 20-DEC-93 AT 22:26:00
DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT.

R A D I O N U C L I D E A N A L Y S I S R E P O R T

NUCLIDE	ACTIVITY CONCENTRATION IN uCi/LI MEASURED	ERROR	DECAY CORRECTED	ERROR	ENERGY COMPARISON (KEV) EXPECT	DIFF
AM-241	1.52E+01	+-1.67E+00	1.52E+01	+-1.67E+00	59.54	0.16
AM-243	LLD<4.26E-01		LLD<4.26E-01		74.67	
BA-133	LLD<3.22E-01		LLD<3.22E-01		356.02	
BA-140	LLD<8.04E-01		LLD<8.04E-01		537.27	
BI-212	LLD<1.50E+00		LLD<1.50E+00		727.20	
CEPR144	LLD<2.39E+00		LLD<2.39E+00		133.51	
CO-60	3.13E+00	+-2.39E-01	3.13E+00	+-2.39E-01	1332.50	-0.35
					1173.24	-0.20
CR-51	LLD<1.89E+00		LLD<1.89E+00		320.09	
CS-134	LLD<1.10E-01		LLD<1.10E-01		795.84	
CS-137	1.52E+02	+-2.25E+00	1.52E+02	+-2.25E+00	661.65	-0.04
EU-152	LLD<3.13E-01		LLD<3.13E-01		1408.01	
EU-154	2.70E+00	+-4.09E-01	2.70E+00	+-4.09E-01	1274.45	-0.31
					123.07	0.13
					1004.76	-0.11
EU-154H	2.70E+00	+-4.09E-01	2.70E+00	+-4.09E-01	1274.80	-0.66
EU-155	1.41E+00	+-6.56E-01	1.41E+00	+-6.56E-01	105.31	0.10
					86.54	0.22
FE-59	LLD<2.41E-01		LLD<2.41E-01		1099.25	
I-131	LLD<2.43E-01		LLD<2.43E-01		364.48	
K-40	LLD<2.55E+00		LLD<2.55E+00		1460.75	
LA-140	LLD<5.87E-02		LLD<5.87E-02		1596.20	
MN-54	LLD<9.94E-02		LLD<9.94E-02		834.83	
~~NA-22~~	~~9.60E-01~~	~~+-1.45E-01~~	~~9.60E-01~~	~~+-1.45E-01~~	~~1274.55~~	~~-0.41~~ 154Eu [illegible] 12/21/93
NB-94	LLD<9.17E-02		LLD<9.17E-02		702.63	
NB-95	LLD<9.40E-02		LLD<9.40E-02		765.78	
~~NP-237~~	~~4.86E+00~~	~~+-1.44E+00~~	~~4.86E+00~~	~~+-1.44E+00~~	~~86.50~~	~~0.26~~ 155Eu [illegible] 12-1/93
PU-212	LLD<3.76E-01		LLD<3.76E-01		239.00	
PU-239	LLD<1.91E+03		LLD<1.91E+03		129.30	
PU-241	LLD<7.00E+04		LLD<7.00E+04		148.57	
RA-224	LLD<4.15E+00		LLD<4.15E+00		240.99	
RA-226	LLD<4.27E+00		LLD<4.27E+00		186.10	
RU-103	LLD<2.61E-01		LLD<2.61E-01		497.08	
RU103	LLD<2.75E-01		LLD<2.75E-01		497.08	
RURH106	LLD<3.66E+00		LLD<3.66E+00		621.80	
SB-125	LLD<9.15E-01		LLD<9.15E-01		427.89	
SB-125A	LLD<9.15E-01		LLD<9.15E-01		427.89	
SE-75	LLD<2.86E-01		LLD<2.86E-01		264.66	
SN-113	LLD<3.61E-01		LLD<3.61E-01		391.67	
SR-85	LLD<2.31E-01		LLD<2.31E-01		513.99	
TH-228	LLD<1.70E+01		LLD<1.70E+01		84.37	
TL-208	LLD<1.98E-01		LLD<1.98E-01		583.20	
U-235	LLD<2.57E-01		LLD<2.57E-01		185.71	
Y-88	LLD<4.75E-02		LLD<4.75E-02		1836.06	
ZN-65	LLD<2.24E-01		LLD<2.24E-01		1115.55	
ZR-95	LLD<1.69E-01		LLD<1.69E-01		756.73	

TOTAL 1.83E+02 +-3.28E+00 1.83E+02 +-3.28E+00

STANDARD DEVIATION = 0.29

IDAL = ***** MEV/DISINTEGRATION
MAXIMUM PERMISSABLE ACTIVITY = 7.46E-09 UC/LI
TOTAL MEASURED ACTIVITY = 1.80E+02 (+-3.26E+00) UC/LI
TECH. SPEC. = ****** (+-****)

ERROR QUOTATION AT 1.96 SIGMA
LLD CONFIDENCE LEVEL AT 85.0%

PEAKS NOT USED IN ANALYSIS

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
1447.03	723.23	214.	19.7	1.04E+01
1745.63	873.05	108.	31.5	6.13E+00

PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
2[illegible]	1460.57	112.	19.7	9.72E+00

Em Barela
12-21-93

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*                                                                   *
*          G A M M A   S P E C T R U M   A N A L Y S I S            *
*                                                                   *
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CANBERRA SPECTRAN-F V2.06 SOFTWARE

WHC-SD-WM-DP-062, REV. 0

21-DEC-9300:17:19

A N A L Y S I S P A R A M E T E R S

MCA UNIT NUMBER: 2 / ADC UNIT NUMBER: 1.0
DETECTOR NUMBER: 1 / GEOMETRY NUMBER: 42
SPECTRUM SIZE: 4096 CHANNELS
ORDER OF SMOOTHING FUNCTION: 5
NUMBER OF BACKGROUND CHANNELS: 4 ON EACH SIDE OF PEAK
PEAK CONFIDENCE FACTOR: 85.0%
IDENTIFICATION ENERGY WINDOW: +- 1.50 KEV
ERROR QUOTATION: 1.96 SIGMA UNCERTAINTY

ENVIRONMENTAL BACKGROUND SUBTRACTED
LLD CALCULATION PERFORMED
MEASURED ENERGY DIFFERENCES LISTED
MULTIPLET ANALYSIS PERFORMED

SPECTRAL DATA READ DIRECTLY FROM MULTICHANNEL ANALYZER AN1:
ANALYZED BY: MB

SAMPLE DESCRIPTION: J 1428-5730
GEOMETRY DESCRIPTION: 22 ML LIQ
SAMPLE SIZE: 1.0000E-03 LI / CONVERSION FACTOR: 5.0000E-01
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL205

COLLECT STARTED ON 20-DEC-93 AT 23:27:04

COLLECT LIVE TIME: 3000. SECONDS
REAL TIME: 3008. SECONDS
DEAD TIME: 0.27 %

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

ENERGY CALIBRATION PERFORMED 8-NOV-93
EFFICIENCY CALIBRATION PERFORMED 9-NOV-93

P E A K A N A L Y S I S

PK	CENTROID CHANNEL	ENERGY KEV	FWHM KEV	BACKGND COUNTS	NET AREA COUNTS	ERROR %	NUCLIDES
1	119.70	59.69	1.26	2355.	1434.	11.0	AM-241,U-237, EU-155
2	173.86	86.76	1.21	2268.	416.	34.1	CS-136, EU-155, EU-155A, PB-214X, TL-208X, CD-109
3	211.46	105.55	1.45	2456.	472.	32.2	EU-155, EU-155B, NP-239
4	246.83	123.23	1.20	2292.	1497.	10.4	EU-152,CO-57, EU-154A
5	1323.78	661.61	1.57	474.	53688.	0.9	CS-137
6	1447.15	723.30	1.22	99.	215.	19.6	SB-124,I-131, AG-108, EU-154D, ZR-95
7	1746.69	873.08	0.99	98.	98.	37.8	EU-154E, RH-106
8	1992.06	995.78	1.63	73.	95.	35.0	EU-154F
	2009.69	1004.60	1.40	75.	172.	21.8	EU-154G, EU-152
10	2346.31	1172.96	2.02	32.	868.	7.0	CO-60
11	2548.67	1274.18	1.40	26.	251.	14.0	EU-154, EU-154H, NA-22
12	2664.73	1332.23	1.74	13.	788.	7.1	CO-60
13	2921.54	1460.69	1.84	7.	103.	21.3	K-40
13D		1460.83			344.	10.8	

ERROR QUOTATION AT 1.96 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

D ENVIRONMENTAL BACKGROUND PEAK

BACKGROUND SUBTRACTION PERFORMED USING FILE BK0011
BACKGROUND DESCRIPTION: BKG
BACKGROUND COLLECT STARTED ON 24-AUG-92 AT 13:00:00
BACKGROUND LIVE TIME: 3000. SECONDS

21-DEC-9300:17:19

SAMPLE: J 1428-5730
DATA COLLECTED ON 20-DEC-93 AT 23:27:04
DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT.

R A D I O N U C L I D E A N A L Y S I S R E P O R T

NUCLIDE	ACTIVITY CONCENTRATION IN uCi/LI MEASURED	ERROR	DECAY CORRECTED	ERROR	ENERGY COMPARISON (KEV) EXPECT	DIFF
AM-241	1.39E+01	+-1.66E+00	1.39E+01	+-1.66E+00	59.54	0.15
AM-243	LLD<4.36E-01		LLD<4.36E-01		74.67	
BA-133	LLD<3.18E-01		LLD<3.18E-01		356.02	
BA-140	LLD<8.13E-01		LLD<8.13E-01		537.27	
BI-212	LLD<1.46E+00		LLD<1.46E+00		727.20	
CEPR144	LLD<2.35E+00		LLD<2.35E+00		133.51	
CO-60	3.42E+00	+-2.49E-01	3.42E+00	+-2.49E-01	1332.50	-0.27
					1173.24	-0.28
CR-51	LLD<1.94E+00		LLD<1.94E+00		320.09	
CS-134	LLD<1.15E-01		LLD<1.15E-01		795.84	
CS-137	1.54E+02	+-2.27E+00	1.54E+02	+-2.27E+00	661.65	-0.04
EU-152	LLD<2.74E-01		LLD<2.74E-01		1408.01	
EU-154	2.96E+00	+-4.17E-01	2.96E+00	+-4.17E-01	1274.45	-0.27
					123.07	0.16
					1004.76	-0.16
EU-154H	2.96E+00	+-4.17E-01	2.96E+00	+-4.17E-01	1274.80	-0.62
EU-155	2.05E+00	+-6.62E-01	2.05E+00	+-6.62E-01	105.31	0.24
					86.54	0.21
FE-59	LLD<2.46E-01		LLD<2.46E-01		1099.25	
I-131	LLD<2.49E-01		LLD<2.49E-01		364.48	
K-40	LLD<2.56E+00		LLD<2.56E+00		1460.75	
LA-140	LLD<5.16E-02		LLD<5.16E-02		1596.20	
MN-54	LLD<1.00E-01		LLD<1.00E-01		834.83	
~~[illegible]~~	~~1.05E+00~~	~~+-1.48E-01~~	~~1.05E+00~~	~~+-1.48E-01~~	~~1274.55~~	~~-0.37~~ ^{154}Eu XBS 12/21/93
[illegible]	LLD<8.63E-02		LLD<8.63E-02		702.63	
[illegible]-95	LLD<8.81E-02		LLD<8.81E-02		765.78	
~~NP-237~~	~~4.23E+00~~	~~+-1.45E+00~~	~~4.23E+00~~	~~+-1.45E+00~~	~~86.50~~	~~0.25~~ ^{155}Eu XBS 12/21/93
PB-212	LLD<3.76E-01		LLD<3.76E-01		239.00	
PU-239	LLD<1.91E+03		LLD<1.91E+03		129.30	
PU-241	LLD<7.00E+04		LLD<7.00E+04		148.57	
RA-224	LLD<4.18E+00		LLD<4.18E+00		240.99	
RA-226	LLD<4.29E+00		LLD<4.29E+00		186.10	
RU-103	LLD<2.66E-01		LLD<2.66E-01		497.08	
RU103	LLD<2.80E-01		LLD<2.80E-01		497.08	
RUKH106	LLD<3.88E+00		LLD<3.88E+00		621.80	
[illegible]-125	LLD<8.91E-01		LLD<8.91E-01		427.89	
[illegible]-125A	LLD<8.91E-01		LLD<8.91E-01		427.89	
[illegible]-75	LLD<2.84E-01		LLD<2.84E-01		264.66	
[illegible]-113	LLD<3.55E-01		LLD<3.55E-01		391.67	
[illegible]-95	LLD<2.29E-01		LLD<2.29E-01		513.99	
[illegible]-228	LLD<1.70E+01		LLD<1.70E+01		84.37	
[illegible]-203	LLD<2.00E-01		LLD<2.00E-01		583.20	
[illegible]-235	LLD<2.60E-01		LLD<2.60E-01		185.71	
[illegible]-88	LLD<4.75E-02		LLD<4.75E-02		1836.06	
[illegible]-65	LLD<2.50E-01		LLD<2.50E-01		1115.55	
ZR-95	LLD<1.50E-01		LLD<1.50E-01		756.73	

TOTAL 1.84E+02 +-3.30E+00 1.84E+02 +-3.30E+00

STANDARD DEVIATION = 0.29

CS-137 = ***** MEV/DISINTEGRATION
MAXIMUM PERMISSABLE ACTIVITY = 7.09E-09 UC/LI
TOTAL MEASURED ACTIVITY = 1.81E+02 (+-3.28E+00) UC/LI
TECH. SPEC. = ****** (+-****)

ERROR QUOTATION AT 1.96 SIGMA
LLD CONFIDENCE LEVEL AT 85.0%

PEAKS NOT USED IN ANALYSIS

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
1347.15	723.30	215.	19.6	1.04E+01
1746.69	873.08	98.	37.8	5.54E+00
1992.06	995.78	95.	35.0	6.00E+00

PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
2921.54	1460.69	103.	21.3	8.92E+00

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* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*                                                                       *
*          G A M M A   S P E C T R U M   A N A L Y S I S                *
*                                                                       *
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

CANBERRA SPECTRAN-F V2.06  SOFTWARE
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28-DEC-9313:25:42

                A N A L Y S I S   P A R A M E T E R S

MCA UNIT NUMBER:   2     /     ADC UNIT NUMBER: 1.0
DETECTOR NUMBER:    1    /     GEOMETRY NUMBER:  42
SPECTRUM SIZE:  4096 CHANNELS
ORDER OF SMOOTHING FUNCTION:     5
NUMBER OF BACKGROUND CHANNELS:  4 ON EACH SIDE OF PEAK
PEAK CONFIDENCE FACTOR: 85.0%
IDENTIFICATION ENERGY WINDOW: +- 1.50 KEV
ERROR QUOTATION: 1.96 SIGMA UNCERTAINTY

ENVIRONMENTAL BACKGROUND SUBTRACTED
LLD CALCULATION PERFORMED
MEASURED ENERGY DIFFERENCES LISTED
MULTIPLET ANALYSIS PERFORMED

ANALYSIS OF SPECTRUM SAVED IN DISK FILE: SDI574
ANALYZED BY:

SAMPLE DESCRIPTION: J1428-5730
GEOMETRY DESCRIPTION:  22 ML LIQ
SAMPLE SIZE:   1.0000E-03 LI       / CONVERSION FACTOR: 5.0000E-01
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL205

COLLECT STARTED ON 21-DEC-93 AT 00:22:38

COLLECT LIVE TIME:    3000. SECONDS
        REAL TIME:    3008. SECONDS
        DEAD TIME:     0.27 %

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

ENERGY CALIBRATION PERFORMED  8-NOV-93
EFFICIENCY CALIBRATION PERFORMED  9-NOV-93
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P E A K A N A L Y S I S

PK	CENTROID CHANNEL	ENERGY KEV	FWHM KEV	BACKGND COUNTS	NET AREA COUNTS	ERROR %	NUCLIDES
1	119.82	59.75	1.22	2255.	1584.	9.9	AM-241,U-237, EU-155
2	173.87	86.76	1.03	2321.	416.	34.4	CS-136, EU-155, EU-155A, PB-214X, TL-208X, CD-109
3	211.17	105.41	1.04	2521.	410.	37.3	EU-155, EU-155B, NP-239
4	246.93	123.28	1.15	2378.	1469.	10.8	EU-152,CO-57, EU-154A
5	1323.82	661.63	1.56	448.	54049.	0.9	CS-137
6	1447.06	723.25	1.67	98.	229.	18.6	SB-124,I-131, AG-108, EU-154D, ZR-95
7	1746.61	873.04	1.53	124.	83.	47.9	EU-154E, RH-106
8	1992.54	996.02	1.79	88.	89.	39.3	EU-154F
9	2009.54	1004.53	1.84	85.	150.	25.3	EU-154G, EU-152
10C	2346.47	1173.04	1.87	40.	846.	7.2	CO-60
11	2548.90	1274.29	1.98	25.	221.	15.1	EU-154, EU-154H, NA-22
12	2664.92	1332.32	2.00	23.	762.	7.4	CO-60
13	2921.39	1460.62	2.48	5.	106.	20.3	K-40
13B		1460.83			344.	10.8	

ERROR QUOTATION AT 1.96 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

C - MULTIPLET ANALYSIS CONVERGED NORMALLY
B - ENVIRONMENTAL BACKGROUND PEAK

BACKGROUND SUBTRACTION PERFORMED USING FILE BK0011
BACKGROUND DESCRIPTION: BKG
BACKGROUND COLLECT STARTED ON 24-AUG-92 AT 13:00:00
BACKGROUND LIVE TIME: 3000. SECONDS

SAMPLE: J1428-5730
DATA COLLECTED ON 21-DEC-93 AT 00:22:38
DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT.

R A D I O N U C L I D E A N A L Y S I S R E P O R T

NUCLIDE	ACTIVITY CONCENTRATION IN uCi/LI				ENERGY COMPARISON (KEV)	
	MEASURED	ERROR	DECAY CORRECTED	ERROR	EXPECT	DIFF
AM-241	1.54E+01	+-1.68E+00	1.54E+01	+-1.68E+00	59.54	0.21
AM-243	LLD<4.35E-01		LLD<4.35E-01		74.67	
BA-133	LLD<3.17E-01		LLD<3.17E-01		356.02	
BA-140	LLD<8.32E-01		LLD<8.32E-01		537.27	
BI-212	LLD<1.49E+00		LLD<1.49E+00		727.20	
CEPR144	LLD<2.37E+00		LLD<2.37E+00		133.51	
CO-60	3.31E+00	+-2.48E-01	3.31E+00	+-2.48E-01	1332.50	-0.18
					1173.24	-0.20
CR-51	LLD<1.96E+00		LLD<1.96E+00		320.09	
CS-134	LLD<1.23E-01		LLD<1.23E-01		795.84	
CS-137	1.55E+02	+-2.29E+00	1.55E+02	+-2.29E+00	661.65	-0.02
EU-152	LLD<3.47E-01		LLD<3.47E-01		1408.01	
EU-154	2.60E+00	+-3.93E-01	2.60E+00	+-3.93E-01	1274.45	-0.16
					123.07	0.21
					1004.76	-0.23
EU-154H	2.60E+00	+-3.94E-01	2.60E+00	+-3.94E-01	1274.80	-0.51
EU-155	1.78E+00	+-6.66E-01	1.78E+00	+-6.66E-01	105.31	0.10
					86.54	0.22
FE-59	LLD<2.17E-01		LLD<2.17E-01		1099.25	
I-131	LLD<2.48E-01		LLD<2.48E-01		364.48	
K-40	LLD<2.54E+00		LLD<2.54E+00		1460.75	
LA-140	LLD<8.05E-02		LLD<8.05E-02		1596.20	
MN-54	LLD<1.07E-01		LLD<1.07E-01		834.83	
NA-22	9.24E-01	+-1.40E-01	9.24E-01	+-1.40E-01	1274.55	-0.26
NB-94	LLD<9.36E-02		LLD<9.36E-02		702.63	
NB-95	LLD<9.54E-02		LLD<9.54E-02		765.78	
NP-237	4.24E+00	+-1.46E+00	4.24E+00	+-1.46E+00	86.50	0.26
PB-212	LLD<3.76E-01		LLD<3.76E-01		239.00	
PU-239	LLD<1.92E+03		LLD<1.92E+03		129.30	
PU-241	LLD<6.99E+04		LLD<6.99E+04		148.57	
RA-224	LLD<4.16E+00		LLD<4.16E+00		240.99	
RA-226	LLD<4.27E+00		LLD<4.27E+00		186.10	
RU-103	LLD<2.69E-01		LLD<2.69E-01		497.08	
RU103	LLD<2.83E-01		LLD<2.83E-01		497.08	
RURH106	LLD<3.64E+00		LLD<3.64E+00		621.80	
SB-125	LLD<9.02E-01		LLD<9.02E-01		427.89	
SB-125A	LLD<9.02E-01		LLD<9.02E-01		427.89	
SE-75	LLD<2.84E-01		LLD<2.84E-01		264.66	
SN-113	LLD<3.68E-01		LLD<3.68E-01		391.67	
SR-85	LLD<2.26E-01		LLD<2.26E-01		513.99	
TH-228	LLD<1.70E+01		LLD<1.70E+01		84.37	
TL-208	LLD<1.93E-01		LLD<1.93E-01		583.20	
U-235	LLD<2.61E-01		LLD<2.61E-01		185.71	
Y-88	LLD<4.75E-02		LLD<4.75E-02		1836.06	
ZN-65	LLD<2.42E-01		LLD<2.42E-01		1115.55	
ZR-95	LLD<1.75E-01		LLD<1.75E-01		756.73	

TOTAL 1.86E+02 +-3.32E+00 1.86E+02 +-3.32E+00

STANDARD DEVIATION = 0.25

EBAR = ***** MEV/DISINTEGRATION
MAXIMUM PERMISSABLE ACTIVITY = 7.46E-09 UC/LI
TOTAL MEASURED ACTIVITY = 1.83E+02 (+-3.30E+00) UC/LI
% TECH. SPEC. = ****** (+-****)

ERROR QUOTATION AT 1.96 SIGMA
LLD CONFIDENCE LEVEL AT 85.0%

PEAKS NOT USED IN ANALYSIS

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
1447.06	723.25	229.	18.6	1.11E+01
1746.61	873.04	83.	47.9	4.69E+00
1992.54	996.02	89.	39.3	5.65E+00

PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
2921.39	1460.62	106.	20.3	9.20E+00

WESTINGHOUSE HANFORD COMPANY

222-S LABORATORY WHC-SD-WM-DP-062, REV. 0

ANALYTICAL BATCH

Lab Segment Serial No.	Customer ID:
J1445, J1446	KE 83B, KE 83D
Analysis:	Sample Prep:
	Direct Liquid

Instrument: WB57237/WB57265	Procedure/ Rev: LA 548 121 /Rev 0
Technologist: Cynthia Johnson	Date: 1/7/94
Starting Time: 1035	Temperature N/A
Ending Time: 1045	Chemist: S Cathum P Bachelor

Comments: _____

	Description	Lab ID
1	Initial Units Check Std	J1429-S53C
2	Reagent Blk	J1446-S68C
3	Sample	J1445-S73C
4	Sample dup	J1445-S73C
5	Sample trip	J1445-S73C
6	Sample	J1446-S73C
7	Sample dup	J1446-S73C
8	Sample trip	J1446-S73C
9		
10		

	Description	Lab ID
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
WHC Check Std	C2B351/.1CCm			

ANALYTICAL BATCH SUMMARY SHEET

METHOD: LA-548-121

DATE START: 14 JANUARY 1994

PREPARED BY: P. P. Bachelor

DATE COMPLETE: 14 JANUARY 1994

	UNITS:	uCi/mL								
SPL NAME	SPL ID	ANALYT	RESULT #1	RESULT #2	RESULT #3	AVERAGE	PREC	%RE	DET LIM	% CT ER
STD 32B51	J1439-5530	CO-60	1.02E+02					102		2.9
		CS-137	1.36E+02					104		2.1
BLANK	J1440-5630	AM-241	<3.16E-04						3.16E-04	
		CO-60	<6.93E-05						6.93E-05	
		CS-137	<7.88E-05						7.88E-05	
		EU-154	<2.33E-04						2.33E-04	
		EU-155	<1.34E-04						1.34E-04	
SAMPLE	J1445-5730	AM-241	1.89E-01	1.84E-01	1.90E-01	1.88E-01	2.8	3.4		2.1,2.2,2.2
		CO-60	1.62E-02	1.60E-02	1.68E-02	1.63E-02	4.2	1.9		3.2,3.3,3.2
		CS-137	7.34E-01	7.27E-01	7.44E-01	7.35E-01	1.9	1.2		0.4,0.4,0.4
		EU-154	3.98E-02	3.83E-02	3.94E-02	3.92E-02	3.2	4.0		3.5,3.6,3.5
		EU-155	2.19E-02	2.10E-02	2.02E-02	2.10E-02	6.6	8.1		6.0,6.7,5.9
SAMPLE	J1446-5730	AM-241	3.30E-02	3.09E-02	3.22E-02	3.20E-02	5.4	6.7		5.3,5.6,5.3
		CO-60	7.16E-03	7.14E-03	7.10E-03	7.13E-03	0.7	0.9		4.8,4.9,*
		CS-137	1.32E-01	1.31E-01	1.30E-01	1.31E-01	1.2	1.4		0.9 (3)
		EU-154	6.37E-03	6.44E-03	6.03E-03	6.28E-03	5.7	7.0		9.2,9.1,9.5
		EU-155	3.24E-03	3.53E-03	3.23E-03	3.33E-03	8.3	10.2		16.3,*,18.8
							1-20-94			

NARRATIVE: [X] NO SPECIAL PROBLEMS/METHOD VARIATIONS IN THIS BATCH

LIST SPECIFIC PROBLEMS/VARIATIONS FOR THIS BATCH:

The results for the standard are in uCi/L.

174 Batch 2516

Serial No	Sample Point	Date	Time Issued	Priority
1439.-5530	BECHTOLD	1- 4-94	10:49	26

Determination	Method Standard	Result Units	Charge Code	Reruns
GEA	LA-548-121	% RECOVERY	E14157	0

Sample Size	Customer ID
100 ml	STD

Remarks, Calculations, Results

[illegible] STD# 32B51
[illegible] STD VAL 130.95
RESULT 136. % REC 103.8%
[illegible] STD VAL 100.26
RESULT 102. % REC 101.7%

C Johnson

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	[signature]			
Hrs	Hrs	Hrs	Hrs	1-13-94 [signature]
Date 1-7-94	Time Completed	Lab Unit Mgr [signature]		1-13-94 [signature]

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

1712

Serial No	Sample Point	Date	Time Issued	Priority
1440.-5630	BECHTOLD	1- 4-94	10:52	26

Determination	Method Standard	Result Units	Charge Code	Reruns
GEA	LA-548-121	uCi/ML	E14157	0

Sample Size	Customer ID
500 ml	BLANK

Remarks, Calculations, Results

[illegible]
LASER PRINTOUT

$Eu_{154} < 2.33E-4$
$Eu_{155} < 1.34E-4$
$Am_{241} < 3.16E-4$ uCi/ml
$Co_{60} < 6.93E-5$
$Cs_{137} < 7.88E-5$

C Johnson

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	[signature]			
Hrs	Hrs	Hrs	Hrs	Hrs
Date 1-7-94	Time Completed	Lab Unit Mgr [signature]		1-13-94 [signature]

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

1713

Serial No	Sample Point	Date	Time Issued	Priority
J 1446.-6736	BECHTOLD	1- 4-94	12: 3	26

Determination	Method Standard	Result Units	Charge Code	Reruns
GEA	LA-548-101	UCI/ML	E14157	0

Sample Size	Customer ID
? .500 me	KE88B

Remarks, Calculations, Results

COUNT AS METAL
LASER PRINTOUT

SAM
Am_{241} 1.89 E-1 uci/me
Co_{60} 1.62 E-2
Cs_{137} 7.34 E-1
Eu_{154} 3.98E-2
Eu_{155} 2.15E-2

C Johnson

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	Em Bauer			
Hrs	Hrs	Hrs	Hrs	Hrs
		Jakob		
Date	Time Completed	Lab Unit Mgr		
1-7-94		D Bachelor	1-13-94 JK McLaren	

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

1714

Serial No	Sample Point	Date	Time Issued	Priority
J 1446.-6738	BECHTOLD	1- 4-94	12: 3	26

Determination	Method Standard	Result Units	Charge Code	Reruns
GEA	LA-548-101	UCI/ML	E14157	0

Sample Size	Customer ID
? .500 me	KE88B

Remarks, Calculations, Results

COUNT AS METAL
LASER PRINTOUT

Dup
Am_{241} 1.84 E-1 uci/me
Co_{60} 1.60E-2
Cs_{137} 7.27E-1
Eu_{154} 3.83E-2
Eu_{155} 2.10 E-2

C Johnson

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	Em Bauer			
Hrs	Hrs	Hrs	Hrs	Hrs
		Jakob		
Date	Time Completed	Lab Unit Mgr		
1-7-94		D Bachelor	1-13-94 JK McLaren	

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

1715

Serial No	Sample Point	Date	Time Issued	Priority
J 1445.-5730	BECHTOLD	1- 4-94	12: 3	26

Determination	Method Standard	Result Units	Charge Code	Reruns
GEA	LA-548-121	uCi/ML	E14157	0

Sample Size	Customer ID
? .500 ml	KE83B

Remarks Calculations Results

COUNT AS uCi/L
LASER PRINTOUT

Cs137 7.44E-1
Eu154 3.94E-2
Eu155 2.02E-2

Trip
Am241 1.90E-1 uci/ml
Co60 1.68E-2

C Johns

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	Em Barela			
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1-7-94		Rahul RB Bachelor	1-13-94 KM Garcia

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

1716

Serial No	Sample Point	Date	Time Issued	Priority
J 1446.-5730	BECHTOLD	1- 4-94	12:26	26

Determination	Method Standard	Result Units	Charge Code	Reruns
GEA	LA-548-121	uCi/ML	E14157	0

Sample Size	Customer ID
? .500 ml	KE83D

Remarks Calculations Results

COUNT AS uCi/L
LASER PRINTOUT

Cs137 1.32E-1
Eu154 6.37E-3
Eu155 3.24E-3

SAM
Am241 3.30E-2 uci/ml
Co60 7.16 E-3

C Joh

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	Em Barela			
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1-7-94		Rahul RB Bachelor	1-13-94 KM Garcia

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

1718

Serial No	Sample Point	Date	Time Issued	Priority
J 1446.-5730	BECHTOLD	1- 4-94	12:26	26

Determination	Method Standard	Result Units	Charge Code	Reruns
GEA	LA-548-121	uCi/ML	E14157	0

Sample Size	Customer ID
? .500 ml	KE83D

Remarks, Calculations, Results

COUNT AS uCi/L
LASER PRINTOUT

Cs137 1.31E-1
Eu154 6.44E-3
Eu155 3.53E-3

Dup 3.09 ~~3.03~~ 1/14/94
Am241 ~~3.04~~ E-2 uCi/ml
Co60 7.14E-3

C Toh

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	Em Barela			
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1-7-94		Bachelor	1-13-94 OK M Garland

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

1719

Serial No	Sample Point	Date	Time Issued	Priority
J 1446.-5730	BECHTOLD	1- 4-94	12:26	26

Determination	Method Standard	Result Units	Charge Code	Reruns
GEA	LA-548-121	uCi/ML	E14157	0

Sample Size	Customer ID
? .500 ml	KE83D

Remarks, Calculations, Results

COUNT AS uCi/L
LASER PRINTOUT

Cs137 1.30E-1
Eu154 6.03E-3
Eu155 3.23E-3

Trip
Am241 3.22E-2 uCi/ml
Co60 7.10 E-3

C Toh

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	Em Barela	A Johanson		
Hrs	Hrs	Hrs 1-13-94	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1-7-94		Bachelor	1-13-94 OK M Garland

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

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* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*                                                                     *
*          G A M M A   S P E C T R U M   A N A L Y S I S              *
*                                                                     *
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

CANBERRA SPECTRAN-F V2.06  SOFTWARE
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12-JAN-9414:36:17

1-12-94

A N A L Y S I S P A R A M E T E R S

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MCA UNIT NUMBER:   2     /     ADC UNIT NUMBER: 1.0
DETECTOR NUMBER:    1    /     GEOMETRY NUMBER:  42
SPECTRUM SIZE:  4096 CHANNELS
ORDER OF SMOOTHING FUNCTION:      5
NUMBER OF BACKGROUND CHANNELS:  4 ON EACH SIDE OF PEAK
PEAK CONFIDENCE FACTOR: 85.0%
IDENTIFICATION ENERGY WINDOW: +- 1.50 KEV
ERROR QUOTATION: 1.96 SIGMA UNCERTAINTY

ENVIRONMENTAL BACKGROUND SUBTRACTED
LLD CALCULATION PERFORMED
MEASURED ENERGY DIFFERENCES LISTED
MULTIPLET ANALYSIS PERFORMED

SPECTRAL DATA READ DIRECTLY FROM MULTICHANNEL ANALYZER AN1:
ANALYZED BY:

SAMPLE DESCRIPTION: J1439-5530
GEOMETRY DESCRIPTION:  22 ML LIQ
SAMPLE SIZE:  1.0000E-03 LI        / CONVERSION FACTOR: 1.0000E-01
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL205

COLLECT STARTED ON 12-JAN-94 AT 13:46:03

COLLECT LIVE TIME:     3000. SECONDS
        REAL TIME:     3006. SECONDS
        DEAD TIME:      0.20 %

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

ENERGY CALIBRATION PERFORMED  8-NOV-93
EFFICIENCY CALIBRATION PERFORMED  9-NOV-93
```

P E A K A N A L Y S I S

PK	CENTROID CHANNEL	ENERGY KEV	FWHM KEV	BACKGND COUNTS	NET AREA COUNTS	ERROR %	NUCLIDES
1C	1127.23	563.34	1.42	547.	514.	13.0	CS-134, EU-152
2C	1139.56	569.50	1.42	533.	898.	11.9	CS-134, BI-207
3	1210.21	604.83	1.61	606.	5664.	2.9	CS-134
4	1324.10	661.77	1.59	434.	9547.	2.1	CS-137
4B		661.65			65.	11.5	
5C	1592.30	795.87	1.57	357.	4029.	4.0	CS-134
6C	1604.70	802.07	1.57	304.	339.	14.3	CS-134
7	2346.66	1173.14	1.97	236.	5070.	2.9	CO-60
8	2665.14	1332.43	1.95	58.	4699.	2.9	CO-60
8B		1332.48			20.	21.6	
9	2730.63	1365.19	1.86	13.	108.	21.9	CS-134
10	2800.18	1399.99	1.73	23.	37.	52.6	I-132
11	2921.83	1460.84	1.79	17.	101.	23.7	K-40
11B		1460.79			99.	6.9	

ERROR QUOTATION AT 1.96 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

C MULTIPLET ANALYSIS CONVERGED NORMALLY
B ENVIRONMENTAL BACKGROUND PEAK

BACKGROUND SUBTRACTION PERFORMED USING FILE BK0011
BACKGROUND DESCRIPTION: BKG DET #1
BACKGROUND COLLECT STARTED ON 7-JAN-94 AT 14:46:01
BACKGROUND LIVE TIME: 30000. SECONDS

SAMPLE: J1439-5530
DATA COLLECTED ON 12-JAN-94 AT 13:46:03
DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT.

R A D I O N U C L I D E A N A L Y S I S R E P O R T

NUCLIDE	ACTIVITY CONCENTRATION IN uCi/LI				ENERGY COMPARISON (KEV)	
	MEASURED	ERROR	DECAY CORRECTED	ERROR	EXPECT	DIFF
AM-241	LLD<5.44E+00		LLD<5.44E+00		59.54	
AM-243	LLD<1.54E+00		LLD<1.54E+00		74.67	
BA-133	LLD<1.20E+00		LLD<1.20E+00		356.02	
BA-140	LLD<3.47E+00		LLD<3.47E+00		537.27	
BI-212	LLD<7.17E+00		LLD<7.17E+00		727.20	
CEPR144	LLD<8.74E+00		LLD<8.74E+00		133.51	
CO-60	1.02E+02	+-3.23E+00	1.02E+02	+-3.23E+00	1332.50	-0.07
					1173.24	-0.10
CR-51	LLD<7.14E+00		LLD<7.14E+00		320.09	
CS-134	6.71E+01	+-2.78E+00	6.71E+01	+-2.78E+00	795.84	0.03
					604.70	0.13
CS-137	1.36E+02	+-3.33E+00	1.36E+02	+-3.33E+00	661.65	0.12
EU-152	LLD<1.89E+00		LLD<1.89E+00		1408.01	
EU-154	LLD<1.62E+00		LLD<1.62E+00		1274.45	
EU-154H	LLD<1.74E+00		LLD<1.74E+00		1274.80	
EU-155	LLD<2.36E+00		LLD<2.36E+00		105.31	
FE-59	LLD<2.10E+00		LLD<2.10E+00		1099.25	
I-131	LLD<8.72E-01		LLD<8.72E-01		364.48	
K-40	LLD<6.15E+00		LLD<6.15E+00		1460.75	
LA-140	LLD<3.24E-01		LLD<3.24E-01		1596.20	
MN-54	LLD<9.42E-01		LLD<9.42E-01		834.83	
NA-22	LLD<5.76E-01		LLD<5.76E-01		1274.55	
NB-94	LLD<8.74E-01		LLD<8.74E-01		702.63	
NB-95	LLD<8.58E-01		LLD<8.58E-01		765.78	
NP-237	LLD<5.83E+00		LLD<5.83E+00		86.50	
PB-212	LLD<1.41E+00		LLD<1.41E+00		239.00	
PU-239	LLD<6.91E+03		LLD<6.91E+03		129.30	
PU-241	LLD<2.55E+05		LLD<2.55E+05		148.57	
RA-224	LLD<1.56E+01		LLD<1.56E+01		240.99	
RA-226	LLD<1.56E+01		LLD<1.56E+01		186.10	
RU-103	LLD<9.29E-01		LLD<9.29E-01		497.08	
RU103	LLD<9.78E-01		LLD<9.78E-01		497.08	
RURH106	LLD<1.80E+01		LLD<1.80E+01		621.80	
SB-125	LLD<3.08E+00		LLD<3.08E+00		427.89	
SB-125A	LLD<3.08E+00		LLD<3.08E+00		427.89	
SE-75	LLD<1.04E+00		LLD<1.04E+00		264.66	
SN-113	LLD<1.32E+00		LLD<1.32E+00		391.67	
SR-85	LLD<9.02E-01		LLD<9.02E-01		513.99	
TH-228	LLD<5.73E+01		LLD<5.73E+01		84.37	
TL-208	LLD<1.03E+00		LLD<1.03E+00		583.20	
U-235	LLD<9.44E-01		LLD<9.44E-01		185.71	
Y-88	LLD<3.22E-01		LLD<3.22E-01		1836.06	
ZN-65	LLD<2.38E+00		LLD<2.38E+00		1115.55	
ZR-95	LLD<1.54E+00		LLD<1.54E+00		756.73	
TOTAL	3.05E+02	+-5.41E+00	3.05E+02	+-5.41E+00		

STANDARD DEVIATION = 0.11

EBAR = ***** MEV/DISINTEGRATION
MAXIMUM PERMISSABLE ACTIVITY = 1.43E-09 UC/LI
TOTAL MEASURED ACTIVITY = 3.05E+02 (+-5.41E+00) UC/LI
% TECH. SPEC. = ****** (+-****)

ERROR QUOTATION AT 1.96 SIGMA
LLD CONFIDENCE LEVEL AT 85.0%

PEAKS NOT USED IN ANALYSIS

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
1127.23	563.34	514.	13.0	2.01E+01
1139.56	569.50	898.	11.9	3.55E+01
1604.70	802.07	339.	14.3	1.80E+01
2730.63	1365.19	108.	21.9	8.85E+00
2800.18	1399.99	37.	52.6	3.12E+00

PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
2921.83	1460.84	101.	23.7	8.80E+00

Eric Barclay
1-12-94

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*          G A M M A   S P E C T R U M   A N A L Y S I S            *
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CANBERRA SPECTRAN-F V2.06 SOFTWARE

WHC-SD-WM-DP-062, REV. 0

12-JAN-9417:07:41

A N A L Y S I S P A R A M E T E R S

MCA UNIT NUMBER: 2 / ADC UNIT NUMBER: 1.0
DETECTOR NUMBER: 1 / GEOMETRY NUMBER: 42
SPECTRUM SIZE: 4096 CHANNELS
ORDER OF SMOOTHING FUNCTION: 5
NUMBER OF BACKGROUND CHANNELS: 4 ON EACH SIDE OF PEAK
PEAK CONFIDENCE FACTOR: 85.0%
IDENTIFICATION ENERGY WINDOW: +- 1.50 KEV
ERROR QUOTATION: 1.96 SIGMA UNCERTAINTY

ENVIRONMENTAL BACKGROUND SUBTRACTED
LLD CALCULATION PERFORMED
MEASURED ENERGY DIFFERENCES LISTED
MULTIPLET ANALYSIS PERFORMED

SPECTRAL DATA READ DIRECTLY FROM MULTICHANNEL ANALYZER AN1:
ANALYZED BY:

SAMPLE DESCRIPTION: J1440-5630
GEOMETRY DESCRIPTION: 22 ML LIQ
SAMPLE SIZE: 1.0000E-03 LI / CONVERSION FACTOR: 5.0000E-01
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL205

COLLECT STARTED ON 12-JAN-94 AT 16:17:32

COLLECT LIVE TIME: 3000. SECONDS
REAL TIME: 3001. SECONDS
DEAD TIME: 0.03 %

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

ENERGY CALIBRATION PERFORMED 8-NOV-93
EFFICIENCY CALIBRATION PERFORMED 9-NOV-93

P E A K A N A L Y S I S

PK	CENTROID CHANNEL	ENERGY KEV	FWHM KEV	BACKGND COUNTS	NET AREA COUNTS	ERROR %	NUCLIDES
1	1324.07	661.76	1.81	36.	65.	37.5	CS-137
1B		661.65			65.	11.5	
2	2921.94	1460.90	2.00	7.	129.	18.7	K-40
2B		1460.79			99.	6.9	

ERROR QUOTATION AT 1.96 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

B - ENVIRONMENTAL BACKGROUND PEAK

BACKGROUND SUBTRACTION PERFORMED USING FILE BK0011
BACKGROUND DESCRIPTION: BKG DET #1
BACKGROUND COLLECT STARTED ON 7-JAN-94 AT 14:46:01
BACKGROUND LIVE TIME: 30000. SECONDS

SAMPLE: J1440-5630
DATA COLLECTED ON 12-JAN-94 AT 16:17:32
DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT.

R A D I O N U C L I D E A N A L Y S I S R E P O R T

NUCLIDE	ACTIVITY CONCENTRATION IN uCi/LI MEASURED	ERROR	DECAY CORRECTED	ERROR	ENERGY COMPARISON (KEV) EXPECT	DIFF
AM-241	LLD<3.16E-01		LLD<3.16E-01		59.54	
AM-243	LLD<9.66E-02		LLD<9.66E-02		74.67	
BA-133	LLD<6.87E-02		LLD<6.87E-02		356.02	
BA-140	LLD<1.59E-01		LLD<1.59E-01		537.27	
BI-212	LLD<4.15E-01		LLD<4.15E-01		727.20	
CEPR144	LLD<5.26E-01		LLD<5.26E-01		133.51	
CO-60	LLD<6.93E-02		LLD<6.93E-02		1332.50	
CR-51	LLD<3.49E-01		LLD<3.49E-01		320.09	
CS-134	LLD<5.12E-02		LLD<5.12E-02		795.84	
CS-137	LLD<7.88E-02		LLD<7.88E-02		661.65	
EU-152	LLD<2.52E-01		LLD<2.52E-01		1408.01	
EU-154	LLD<2.33E-01		LLD<2.33E-01		1274.45	
EU-154H	LLD<2.40E-01		LLD<2.40E-01		1274.80	
EU-155	LLD<1.34E-01		LLD<1.34E-01		105.31	
FE-59	LLD<1.07E-01		LLD<1.07E-01		1099.25	
I 131	LLD<4.44E-02		LLD<4.44E-02		364.48	
~~K-40~~	~~1.29E+00 +-1.10E+00~~		~~1.29E+00 +-1.10E+00~~		~~1460.75~~	~~0.15~~
LA-140	LLD<5.16E-02		LLD<5.16E-02		1596.20	
MN-54	LLD<4.00E-02		LLD<4.00E-02		834.83	
NA-22	LLD<8.28E-02		LLD<8.28E-02		1274.55	
NB-94	LLD<5.56E-02		LLD<5.56E-02		702.63	
NB-95	LLD<5.39E-02		LLD<5.39E-02		765.78	
NP-237	LLD<3.59E-01		LLD<3.59E-01		86.50	
PB-212	LLD<7.88E-02		LLD<7.88E-02		239.00	
PU-239	LLD<4.01E+02		LLD<4.01E+02		129.30	
PU-241	LLD<1.56E+04		LLD<1.56E+04		148.57	
RA-224	LLD<7.15E-01		LLD<7.15E-01		240.99	
RA-226	LLD<8.89E-01		LLD<8.89E-01		186.10	
RU-103	LLD<4.91E-02		LLD<4.91E-02		497.08	
RU103	LLD<5.16E-02		LLD<5.16E-02		497.08	
RURH106	LLD<9.83E-01		LLD<9.83E-01		621.80	
SB-125	LLD<1.36E-01		LLD<1.36E-01		427.89	
SB-125A	LLD<1.36E-01		LLD<1.36E-01		427.89	
SE-75	LLD<6.05E-02		LLD<6.05E-02		264.66	
SN-113	LLD<6.57E-02		LLD<6.57E-02		391.67	
SR-85	LLD<5.95E-02		LLD<5.95E-02		513.99	
TH-228	LLD<3.34E+00		LLD<3.34E+00		84.37	
TI-208	LLD<5.79E-02		LLD<5.79E-02		583.20	
U-235	LLD<5.57E-02		LLD<5.57E-02		185.71	
Y-88	LLD<5.67E-02		LLD<5.67E-02		1836.06	
ZN-65	LLD<1.37E-01		LLD<1.37E-01		1115.55	
ZR-95	LLD<8.54E-02		LLD<8.54E-02		756.73	
TOTAL	1.29E+00 +-1.10E+00		1.29E+00 +-1.10E+00			

BRG 382 1/13/94

EPAR = 7.01 MEV/DISINTEGRATION
MAXIMUM PERMISSABLE ACTIVITY = 1.43E-01 UC/LI

TOTAL MEASURED ACTIVITY = 1.29E+00 (+-1.10E+00) UC/LI
% TECH. SPEC. = 901.35 (+-****)

ERR QUOTATION AT 1.96 SIGMA
LLD CONFIDENCE LEVEL AT 85.0%

ALL DETECTED PEAKS WERE USED IN THE ANALYSIS

PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
1324.07	661.76	65.	37.5	2.93E+00

Em Bailey
1-12-94

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*          G A M M A   S P E C T R U M   A N A L Y S I S              *
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CANBERRA SPECTRAN-F V2.06 SOFTWARE

12-JAN-9418:05:55

WHC-SD-WM-DP-062, REV. 0

A N A L Y S I S P A R A M E T E R S

MCA UNIT NUMBER: 2 / ADC UNIT NUMBER: 1.0
DETECTOR NUMBER: 1 / GEOMETRY NUMBER: 42
SPECTRUM SIZE: 4096 CHANNELS
ORDER OF SMOOTHING FUNCTION: 5
NUMBER OF BACKGROUND CHANNELS: 4 ON EACH SIDE OF PEAK
PEAK CONFIDENCE FACTOR: 85.0%
IDENTIFICATION ENERGY WINDOW: +- 1.50 KEV
ERROR QUOTATION: 1.96 SIGMA UNCERTAINTY

ENVIRONMENTAL BACKGROUND SUBTRACTED
LLD CALCULATION PERFORMED
MEASURED ENERGY DIFFERENCES LISTED
MULTIPLET ANALYSIS PERFORMED

SPECTRAL DATA READ DIRECTLY FROM MULTICHANNEL ANALYZER AN1:
ANALYZED BY:

SAMPLE DESCRIPTION: J1445-5730
GEOMETRY DESCRIPTION: 22 ML LIQ
SAMPLE SIZE: 1.0000E-03 LI / CONVERSION FACTOR: 5.0000E-01
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL205

COLLECT STARTED ON 12-JAN-94 AT 17:15:08

COLLECT LIVE TIME: 3000. SECONDS
REAL TIME: 3039. SECONDS
DEAD TIME: 1.28 %

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

ENERGY CALIBRATION PERFORMED 8-NOV-93
EFFICIENCY CALIBRATION PERFORMED 9-NOV-93

P E A K A N A L Y S I S

PK	CENTROID CHANNEL	ENERGY KEV	FWHM KEV	BACKGND COUNTS	NET AREA COUNTS	ERROR %	NUCLIDES
1	119.93	59.80	1.17	12137.	19462.	2.1	AM-241,U-237, EU-155
2	173.95	86.80	1.14	11827.	5745.	6.0	CS-136, EU-155, EU-155A, PB-214X, TL-208X, CD-109
3	211.52	105.58	1.30	12608.	5040.	7.1	EU-155, EU-155B, NP-239
4	247.12	123.37	1.19	13081.	17733.	2.4	CO-57, EU-154A
5	496.92	248.23	1.27	12867.	2329.	15.3	EU-154B
6	856.35	427.91	1.69	11523.	494.	66.3	SB-125, SB-125B
7	1184.30	591.87	1.54	2957.	722.	24.5	EU-154C
8	1324.17	661.80	1.58	2561.	256398.	0.4	CS-137
8B		661.65			65.	11.5	
9	1385.82	692.63	1.55	642.	348.	24.9	EU-154
10	1447.36	723.40	1.68	669.	2934.	4.5	SB-124,I-131, AG-108, EU-154D, ZR-95
11	1514.39	756.91	1.61	624.	658.	14.0	ZR-95,EU-154
12	1591.75	795.60	2.12	640.	207.	41.2	CS-134
13	1746.97	873.22	1.61	580.	1392.	7.6	EU-154E, RH-106
14	1993.15	996.33	1.87	470.	1268.	7.7	EU-154F
15	2010.13	1004.82	1.69	484.	2051.	5.5	EU-154G, EU-152
16	2346.91	1173.26	1.82	208.	4157.	3.2	CO-60
17	2549.14	1274.41	1.85	96.	3372.	3.5	EU-154, EU-154H, NA-22
18	2665.27	1332.50	1.94	72.	3756.	3.3	CO-60
18B		1332.48			20.	21.6	
19	2921.28	1460.57	1.79	35.	62.	39.8	K-40
19B		1460.79			99.	6.9	
20	3193.07	1596.54	2.09	19.	144.	19.1	LA-140, EU-154I

ERROR QUOTATION AT 1.96 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

B - ENVIRONMENTAL BACKGROUND PEAK

BACKGROUND SUBTRACTION PERFORMED USING FILE BK0011
BACKGROUND DESCRIPTION: BKG DET #1
BACKGROUND COLLECT STARTED ON 7-JAN-94 AT 14:46:01

BACKGROUND LIVE TIME: 30000. SECONDS

SA E: J1445-5730
DA COLLECTED ON 12-JAN-94 AT 17:15:08
DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT.

R A D I O N U C L I D E A N A L Y S I S R E P O R T

NUCLIDE	ACTIVITY CONCENTRATION IN uCi/LI				ENERGY COMPARISON (KEV)	
	MEASURED	ERROR	DECAY CORRECTED	ERROR	EXPECT	DIFF
AM-241	1.89E+02	+-9.84E+00	1.89E+02	+-9.84E+00	59.54	0.27
AM-243	LLD<9.59E-01		LLD<9.59E-01		74.67	
BA-133	LLD<6.86E-01		LLD<6.86E-01		356.02	
BA-140	LLD<1.80E+00		LLD<1.80E+00		537.27	
BI-212	LLD<4.87E+00		LLD<4.87E+00		727.20	
CEPR144	LLD<5.20E+00		LLD<5.20E+00		133.51	
CO-60	1.62E+01	+-5.73E-01	1.62E+01	+-5.73E-01	1332.50	-0.00
					1173.24	0.02
CR-51	LLD<4.21E+00		LLD<4.21E+00		320.09	
CS-134	LLD<2.74E-01		LLD<2.74E-01		795.84	
CS-137	7.34E+02	+-9.31E+00	7.34E+02	+-9.31E+00	661.65	0.15
EU-152	LLD<3.77E-01		LLD<3.77E-01		1408.01	
EU-154	3.98E+01	+-1.48E+00	3.98E+01	+-1.48E+00	1274.45	-0.04
					123.07	0.30
					1004.76	0.06
EU-154H	3.98E+01	+-1.48E+00	3.98E+01	+-1.48E+00	1274.80	-0.39
EU-155	2.19E+01	+-1.67E+00	2.19E+01	+-1.67E+00	105.31	0.27
					86.54	0.26
FE-59	LLD<4.60E-01		LLD<4.60E-01		1099.25	
I-131	LLD<5.34E-01		LLD<5.34E-01		364.48	
K-40	LLD<1.42E+00		LLD<1.42E+00		1460.75	
LA-140	LLD<8.92E-02		LLD<8.92E-02		1596.20	
MN-54	LLD<2.30E-01		LLD<2.30E-01		834.83	
NA-22	1.41E+01	+-5.25E-01	1.41E+01	+-5.25E-01	1274.55	-0.14
NB-94	LLD<2.22E-01		LLD<2.22E-01		702.63	
NB-95	LLD<2.29E-01		LLD<2.29E-01		765.78	
NP-237	5.85E+01	+-3.85E+00	5.85E+01	+-3.85E+00	86.50	0.30
PB-212	LLD<8.16E-01		LLD<8.16E-01		239.00	
PU-239	LLD<4.22E+03		LLD<4.22E+03		129.30	
PU-241	LLD<1.52E+05		LLD<1.52E+05		148.57	
RA-224	LLD<9.10E+00		LLD<9.10E+00		240.99	
RA-226	LLD<9.28E+00		LLD<9.28E+00		186.10	
RU-103	LLD<5.74E-01		LLD<5.74E-01		497.08	
RU103	LLD<6.04E-01		LLD<6.04E-01		497.08	
RURH106	LLD<8.43E+00		LLD<8.43E+00		621.80	
SB-125	LLD<1.99E+00		LLD<1.99E+00		427.89	
SB-125A	2.78E+00	+-1.84E+00	2.78E+00	+-1.84E+00	427.89	0.02
SE-75	LLD<6.16E-01		LLD<6.16E-01		264.66	
SN-113	LLD<7.99E-01		LLD<7.99E-01		391.67	
SR-85	LLD<5.12E-01		LLD<5.12E-01		513.99	
TH-228	LLD<4.37E+01		LLD<4.37E+01		84.37	
TL-208	LLD<4.46E-01		LLD<4.46E-01		583.20	
U-235	LLD<5.63E-01		LLD<5.63E-01		185.71	
[illegible]	LLD<4.75E-02		LLD<4.75E-02		1836.06	
ZN-65	LLD<5.30E-01		LLD<5.30E-01		1115.55	
ZR-95	3.29E+00	+-4.63E-01	3.29E+00	+-4.63E-01	756.73	0.19
					724.20	-0.80

TOTAL	1.12E+03 +-1.45E+01	1.12E+03 +-1.45E+01

STANDARD DEVIATION = 0.30

EBAR = ***** MEV/DISINTEGRATION
MAXIMUM PERMISSABLE ACTIVITY = 4.10E-09 UC/LI
TOTAL MEASURED ACTIVITY = 1.08E+03 (+-1.43E+01) UC/LI
% TECH. SPEC. = ****** (+-****)

ERROR QUOTATION AT 1.96 SIGMA
LLD CONFIDENCE LEVEL AT 85.0%

PEAKS NOT USED IN ANALYSIS

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
496.92	248.23	2329.	15.3	4.50E+01
1184.30	591.87	722.	24.5	2.95E+01
1385.82	692.63	348.	24.9	1.63E+01
1591.75	795.60	207.	41.2	1.09E+01
1746.97	873.22	1392.	7.6	7.91E+01
1993.15	996.33	1268.	7.7	8.03E+01
3193.07	1596.54	144.	19.1	1.36E+01

PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
2921.23	1460.57	62.	39.8	5.39E+00

Em Barela
1-12-94

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*                                                                   *
*          G A M M A   S P E C T R U M   A N A L Y S I S            *
*                                                                   *
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CANBERRA SPECTRAN-F V2.06 SOFTWARE

12-JAN-9419:01:59

WHC-SD-WM-DP-062, REV. 0

A N A L Y S I S P A R A M E T E R S

MCA UNIT NUMBER: 2 / ADC UNIT NUMBER: 1.0
DETECTOR NUMBER: 1 / GEOMETRY NUMBER: 42
SPECTRUM SIZE: 4096 CHANNELS
ORDER OF SMOOTHING FUNCTION: 5
NUMBER OF BACKGROUND CHANNELS: 4 ON EACH SIDE OF PEAK
PEAK CONFIDENCE FACTOR: 85.0%
IDENTIFICATION ENERGY WINDOW: +- 1.50 KEV
ERROR QUOTATION: 1.96 SIGMA UNCERTAINTY

ENVIRONMENTAL BACKGROUND SUBTRACTED
LLD CALCULATION PERFORMED
MEASURED ENERGY DIFFERENCES LISTED
MULTIPLET ANALYSIS PERFORMED

SPECTRAL DATA READ DIRECTLY FROM MULTICHANNEL ANALYZER AN1:
ANALYZED BY:

SAMPLE DESCRIPTION: J1445-5730
GEOMETRY DESCRIPTION: 22 ML LIQ
SAMPLE SIZE: 1.0000E-03 LI / CONVERSION FACTOR: 5.0000E-01
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL205

COLLECT STARTED ON 12-JAN-94 AT 18:11:11

COLLECT LIVE TIME: 3000. SECONDS
REAL TIME: 3039. SECONDS
DEAD TIME: 1.28 %

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

ENERGY CALIBRATION PERFORMED 8-NOV-93
EFFICIENCY CALIBRATION PERFORMED 9-NOV-93

P E A K A N A L Y S I S

PK	CENTROID CHANNEL	ENERGY KEV	FWHM KEV	BACKGND COUNTS	NET AREA COUNTS	ERROR %	NUCLIDES
1	119.96	59.81	1.13	12022.	18997.	2.2	AM-241,U-237, EU-155
2	173.95	86.80	1.18	12130.	5174.	6.7	CS-136, EU-155, EU-155A, PB-214X, TL-208X, CD-109
3	211.52	105.58	1.29	12688.	4830.	7.4	EU-155, EU-155B, NP-239
4	247.10	123.36	1.19	11477.	17589.	2.3	CO-57, EU-154A
5	497.02	248.28	1.27	11593.	2477.	13.4	EU-154B
6	856.84	428.15	1.09	11441.	684.	47.9	SB-125, SB-125B
7	1184.37	591.91	1.47	2790.	885.	19.6	EU-154C
8	1324.20	661.82	1.58	2427.	253727.	0.4	CS-137
8B		661.65			65.	11.5	
9	1385.69	692.57	1.50	734.	198.	44.7	EU-154
10	1447.48	723.46	1.70	648.	2921.	4.5	SB-124,I-131, AG-108, EU-154D, ZR-95
11	1514.54	756.99	1.81	600.	628.	14.4	ZR-95,EU-154
12	1747.10	873.28	1.86	562.	1527.	7.0	EU-154E, RH-106
13	1993.06	996.28	1.75	535.	1163.	8.5	EU-154F
14	2010.03	1004.77	1.87	517.	2098.	5.5	EU-154G, EU-152
15	2346.85	1173.23	1.89	197.	4076.	3.3	CO-60
16	2549.24	1274.46	1.77	89.	3246.	3.6	EU-154, EU-154H, NA-22
17	2665.31	1332.52	1.97	61.	3694.	3.3	CO-60
17B		1332.48			20.	21.6	
18	2921.28	1460.56	1.72	23.	97.	25.5	K-40
18B		1460.79			99.	6.9	
19	2988.22	1494.06	0.83	5.	59.	28.5	EU-154
20	3193.53	1596.76	2.24	17.	161.	17.6	LA-140, EU-154I

ERROR QUOTATION AT 1.96 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

B ENVIRONMENTAL BACKGROUND PEAK

300

BACKGROUND SUBTRACTION PERFORMED USING FILE BK0011
BACKGROUND DESCRIPTION: BKG DET #1
BACKGROUND COLLECT STARTED ON 7-JAN-94 AT 14:46:01

BACKGROUND LIVE TIME: 30000. SECONDS

SAMPLE: J1445-5730
DATA COLLECTED ON 12-JAN-94 AT 18:11:11
DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT.

R A D I O N U C L I D E A N A L Y S I S R E P O R T

NUCLIDE	ACTIVITY CONCENTRATION IN uCi/LI				ENERGY COMPARISON (KEV)	
	MEASURED	ERROR	DECAY CORRECTED	ERROR	EXPECT	DIFF
AM-241	1.84E+02	+-9.63E+00	1.84E+02	+-9.63E+00	59.54	0.28
AM-243	LLD<9.53E-01		LLD<9.53E-01		74.67	
BA-133	LLD<6.94E-01		LLD<6.94E-01		356.02	
BA-140	LLD<1.77E+00		LLD<1.77E+00		537.27	
BI-212	LLD<4.74E+00		LLD<4.74E+00		727.20	
CEPR144	LLD<5.21E+00		LLD<5.21E+00		133.51	
CO-60	1.60E+01	+-5.66E-01	1.60E+01	+-5.66E-01	1332.50	0.02
					1173.24	-0.01
CR-51	LLD<4.20E+00		LLD<4.20E+00		320.09	
CS-134	LLD<2.81E-01		LLD<2.81E-01		795.84	
CS-137	7.27E+02	+-9.22E+00	7.27E+02	+-9.22E+00	661.65	0.17
EU-152	LLD<4.06E-01		LLD<4.06E-01		1408.01	
EU-154	3.83E+01	+-1.44E+00	3.83E+01	+-1.44E+00	1274.45	0.01
					123.07	0.29
					1004.76	0.01
EU-154H	3.83E+01	+-1.44E+00	3.83E+01	+-1.44E+00	1274.80	-0.34
EU-155	2.10E+01	+-1.66E+00	2.10E+01	+-1.66E+00	105.31	0.27
					86.54	0.26
FE-59	LLD<4.71E-01		LLD<4.71E-01		1099.25	
I 131	LLD<5.36E-01		LLD<5.36E-01		364.48	
K 40	LLD<1.36E+00		LLD<1.36E+00		1460.75	
LA-140	LLD<8.05E-02		LLD<8.05E-02		1596.20	
MN-54	LLD<2.24E-01		LLD<2.24E-01		834.83	
NA-22	1.36E+01	+-5.13E-01	1.36E+01	+-5.13E-01	1274.55	-0.09
NB-94	LLD<2.31E-01		LLD<2.31E-01		702.63	
NB-95	LLD<2.29E-01		LLD<2.29E-01		765.78	
NP-237	5.27E+01	+-3.79E+00	5.27E+01	+-3.79E+00	86.50	0.30
PB-212	LLD<8.13E-01		LLD<8.13E-01		239.00	
PU-239	LLD<4.16E+03		LLD<4.16E+03		129.30	
PU-241	LLD<1.50E+05		LLD<1.50E+05		148.57	
RA-224	LLD<9.05E+00		LLD<9.05E+00		240.99	
RA-226	LLD<9.26E+00		LLD<9.26E+00		186.10	
RU-103	LLD<5.76E-01		LLD<5.76E-01		497.08	
RU103	LLD<6.06E-01		LLD<6.06E-01		497.08	
RURH106	LLD<8.30E+00		LLD<8.30E+00		621.80	
SB-125	LLD<1.98E+00		LLD<1.98E+00		427.89	
SB-125A	3.85E+00	+-1.84E+00	3.85E+00	+-1.84E+00	427.89	0.27
SE-75	LLD<6.16E-01		LLD<6.16E-01		264.66	
SN-113	LLD<7.97E-01		LLD<7.97E-01		391.67	
SR-85	LLD<4.95E-01		LLD<4.95E-01		513.99	
TH-228	LLD<4.36E+01		LLD<4.36E+01		84.37	
TL-208	LLD<4.43E-01		LLD<4.43E-01		583.20	
U 235	LLD<5.63E-01		LLD<5.63E-01		185.71	
U-238	LLD<5.67E-02		LLD<5.67E-02		1836.06	
ZN-65	LLD<5.28E-01		LLD<5.28E-01		1115.55	
ZR-95	3.14E+00	+-4.54E-01	3.14E+00	+-4.54E-01	756.73	0.26
					724.20	-0.74

TOTAL	1.10E+03 +-1.43E+01	1.10E+03 +-1.43E+01

STANDARD DEVIATION = 0.29

EBAR = ***** MEV/DISINTEGRATION
MAXIMUM PERMISSABLE ACTIVITY = 4.15E-09 UC/LI
TOTAL MEASURED ACTIVITY = 1.06E+03 (+-1.41E+01) UC/LI
% TECH. SPEC. = ****** (+-****)

ERROR QUOTATION AT 1.96 SIGMA
LLD CONFIDENCE LEVEL AT 85.0%

PEAKS NOT USED IN ANALYSIS

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
497.02	248.28	2477.	13.4	4.78E+01
1184.37	591.91	885.	19.6	3.62E+01
1385.69	692.57	198.	44.7	9.25E+00
1747.10	873.28	1527.	7.0	8.67E+01
1993.06	996.28	1163.	8.5	7.36E+01
2988.22	1494.06	59.	28.5	5.21E+00
3103.53	1596.76	161.	17.6	1.52E+01

PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
2921.28	1460.56	97.	25.5	8.46E+00

Em Barela
1-12-94

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*          G A M M A   S P E C T R U M   A N A L Y S I S            *
*                                                                   *
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CANBERRA SPECTRAN-F V2.06 SOFTWARE

12-JAN-9419:58:23

WHC-SD-WM-DP-062, REV. 0

A N A L Y S I S P A R A M E T E R S

MCA UNIT NUMBER: 2 / ADC UNIT NUMBER: 1.0
DETECTOR NUMBER: 1 / GEOMETRY NUMBER: 42
SPECTRUM SIZE: 4096 CHANNELS
ORDER OF SMOOTHING FUNCTION: 5
NUMBER OF BACKGROUND CHANNELS: 4 ON EACH SIDE OF PEAK
PEAK CONFIDENCE FACTOR: 85.0%
IDENTIFICATION ENERGY WINDOW: +- 1.50 KEV
ERROR QUOTATION: 1.96 SIGMA UNCERTAINTY

ENVIRONMENTAL BACKGROUND SUBTRACTED
LLD CALCULATION PERFORMED
MEASURED ENERGY DIFFERENCES LISTED
MULTIPLET ANALYSIS PERFORMED

SPECTRAL DATA READ DIRECTLY FROM MULTICHANNEL ANALYZER AN1:
ANALYZED BY:

SAMPLE DESCRIPTION: J1445-5730
GEOMETRY DESCRIPTION: 22 ML LIQ
SAMPLE SIZE: 1.0000E-03 LI / CONVERSION FACTOR: 5.0000E-01
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL205

COLLECT STARTED ON 12-JAN-94 AT 19:07:35

COLLECT LIVE TIME: 3000. SECONDS
REAL TIME: 3039. SECONDS
DEAD TIME: 1.28 %

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

ENERGY CALIBRATION PERFORMED 8-NOV-93
EFFICIENCY CALIBRATION PERFORMED 9-NOV-93

P E A K A N A L Y S I S

PK	CENTROID CHANNEL	ENERGY KEV	FWHM KEV	BACKGND COUNTS	NET AREA COUNTS	ERROR %	NUCLIDES
1	119.93	59.80	1.17	12161.	19550.	2.1	AM-241,U-237, EU-155
2	173.94	86.79	1.16	11807.	5853.	5.9	CS-136, EU-155, EU-155A, PB-214X, TL-208X, CD-109
3	211.52	105.58	1.23	13068.	4644.	7.8	EU-155, EU-155B, NP-239
4	247.11	123.37	1.24	13184.	18236.	2.4	CO-57, EU-154A
5	496.95	248.25	1.28	12998.	2495.	14.3	EU-154B
6	856.66	428.07	1.46	11561.	853.	38.7	SB-125, SB-125B
7	1184.33	591.89	1.60	3045.	752.	23.8	EU-154C
8?	1315.82	657.63	1.52	2249.	514.	101.8	AG-110M, NB-97
9?	1324.17	661.80	1.52	1651.	259918.	0.4	CS-137
9B		661.65			65.	11.5	
1	1385.72	692.58	1.72	636.	341.	25.3	EU-154
1	1447.46	723.45	1.65	710.	2912.	4.6	SB-124,I-131, AG-108, EU-154D, ZR-95
12	1514.36	756.90	1.47	584.	641.	14.0	ZR-95,EU-154
13	1592.09	795.77	2.08	540.	229.	34.0	CS-134
14	1747.14	873.30	1.44	543.	1542.	6.9	EU-154E, RH-106
15	1993.10	996.30	1.86	544.	1156.	8.6	EU-154F
16	2010.12	1004.81	2.00	509.	2124.	5.4	EU-154G, EU-152
17	2346.86	1173.23	1.94	187.	4249.	3.2	CO-60
18	2492.44	1246.05	1.40	116.	81.	48.6	EU-154
19	2549.22	1274.45	2.05	102.	3345.	3.5	EU-154, EU-154H, NA-22
20	2665.31	1332.52	2.11	63.	3893.	3.2	CO-60
20B		1332.48			20.	21.6	
21	2922.33	1461.09	1.64	14.	108.	22.0	K-40
21B		1460.79			99.	6.9	
22	2987.24	1493.56	0.99	23.	60.	36.1	EU-154
23	3193.00	1596.50	2.41	19.	146.	19.0	LA-140, EU-154I

EP[illegible] QUOTATION AT 1.96 SIGMA
PL CONFIDENCE LEVEL AT 85.0%

[illegible] - MULTIPLET ANALYSIS CONVERGED BUT GFIT > 4
[illegible] - ENVIRONMENTAL BACKGROUND PEAK

BACKGROUND SUBTRACTION PERFORMED USING FILE BK0011
BACKGROUND DESCRIPTION: BKG DET #1
BACKGROUND COLLECT STARTED ON 7-JAN-94 AT 14:46:01
BACKGROUND LIVE TIME: 30000. SECONDS

SA E: J1445-5730
DA.. COLLECTED ON 12-JAN-94 AT 19:07:35
DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT.

R A D I O N U C L I D E A N A L Y S I S R E P O R T

NUCLIDE	ACTIVITY CONCENTRATION IN uCi/LI MEASURED	ERROR	DECAY CORRECTED	ERROR	ENERGY COMPARISON (KEV) EXPECT	DIFF
AM-241	1.90E+02	+-9.88E+00	1.90E+02	+-9.88E+00	59.54	0.27
AM-243	LLD<9.68E-01		LLD<9.68E-01		74.67	
BA-133	LLD<6.91E-01		LLD<6.91E-01		356.02	
BA-140	LLD<1.84E+00		LLD<1.84E+00		537.27	
BI-212	LLD<4.82E+00		LLD<4.82E+00		727.20	
CEPR144	LLD<5.21E+00		LLD<5.21E+00		133.51	
CO-60	1.68E+01	+-5.83E-01	1.68E+01	+-5.83E-01	1332.50	0.02
					1173.24	-0.01
CR-51	LLD<4.19E+00		LLD<4.19E+00		320.09	
CS-134	LLD<2.64E-01		LLD<2.64E-01		795.84	
CS-137	7.44E+02	+-9.56E+00	7.44E+02	+-9.56E+00	661.65	0.15
EU-152	LLD<4.06E-01		LLD<4.06E-01		1408.01	
EU-154	3.94E+01	+-1.47E+00	3.94E+01	+-1.47E+00	1274.45	0.00
					123.07	0.30
					1004.76	0.05
EU-154H	3.95E+01	+-1.47E+00	3.95E+01	+-1.47E+00	1274.80	-0.35
FU 5	2.02E+01	+-1.66E+00	2.02E+01	+-1.66E+00	105.31	0.27
					86.54	0.25
FE-59	LLD<4.53E-01		LLD<4.53E-01		1099.25	
I 131	LLD<5.42E-01		LLD<5.42E-01		364.48	
K-40	LLD<1.25E+00		LLD<1.25E+00		1460.75	
LA-140	LLD<8.92E-02		LLD<8.92E-02		1596.20	
MN-54	LLD<2.45E-01		LLD<2.45E-01		834.83	
NA-22	1.40E+01	+-5.23E-01	1.40E+01	+-5.23E-01	1274.55	-0.10
NB-94	LLD<2.25E-01		LLD<2.25E-01		702.63	
NB-95	LLD<2.36E-01		LLD<2.36E-01		765.78	
NP-237	5.96E+01	+-3.86E+00	5.96E+01	+-3.86E+00	86.50	0.29
PB 212	LLD<8.30E-01		LLD<8.30E-01		239.00	
PU-239	LLD<4.22E+03		LLD<4.22E+03		129.30	
PU-241	LLD<1.53E+05		LLD<1.53E+05		148.57	
RA-224	LLD<9.15E+00		LLD<9.15E+00		240.99	
RA-226	LLD<9.38E+00		LLD<9.38E+00		186.10	
RU-103	LLD<5.74E-01		LLD<5.74E-01		497.08	
RU103	LLD<6.04E-01		LLD<6.04E-01		497.08	
RURH106	LLD<8.46E+00		LLD<8.46E+00		621.80	
SB-125	LLD<1.98E+00		LLD<1.98E+00		427.89	
SB-125A	4.81E+00	+-1.86E+00	4.81E+00	+-1.86E+00	427.89	-0.18
SE-75	LLD<6.22E-01		LLD<6.22E-01		264.66	
SN-113	LLD<8.04E-01		LLD<8.04E-01		391.67	
SR-85	LLD<5.02E-01		LLD<5.02E-01		513.99	
TH-228	LLD<4.40E+01		LLD<4.40E+01		84.37	
TL-208	LLD<4.42E-01		LLD<4.42E-01		583.20	
[illegible]	LLD<5.69E-01		LLD<5.69E-01		185.71	
[illegible]	LLD<5.67E-02		LLD<5.67E-02		1836.06	
ZN-65	LLD<5.49E-01		LLD<5.49E-01		1115.55	
ZR-95	3.21E+00	+-4.51E-01	3.21E+00	+-4.51E-01	756.73	-0.17
					724.20	-0.75

TOTAL	1.13E+03 +-1.47E+01	1.13E+03 +-1.47E+01

STANDARD DEVIATION = 0.28

EBAR = ***** MEV/DISINTEGRATION
MAXIMUM PERMISSABLE ACTIVITY = 4.17E-09 UC/LI
TOTAL MEASURED ACTIVITY = 1.09E+03 (+-1.45E+01) UC/LI
% TECH. SPEC. = ****** (+-****)

ERROR QUOTATION AT 1.96 SIGMA
LLD CONFIDENCE LEVEL AT 85.0%

PEAKS NOT USED IN ANALYSIS

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
496.95	248.25	2495.	14.3	4.82E+01
1184.33	591.89	752.	23.8	3.08E+01
1315.82	657.63	514.	101.8	2.30E+01
1385.72	692.58	341.	25.3	1.60E+01
1592.09	795.77	229.	34.0	1.21E+01
1747.14	873.30	1542.	6.9	8.76E+01
1993.10	996.30	1156.	8.6	7.31E+01
2492.44	1246.05	81.	48.6	6.12E+00
2987.24	1493.56	60.	36.1	5.35E+00
3193.00	1596.50	146.	19.0	1.38E+01

PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
2922.33	1461.09	108.	22.0	9.40E+00

Em Davila
1-12-94

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*                                                                   *
*          G A M M A   S P E C T R U M   A N A L Y S I S            *
*                                                                   *
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CANBERRA SPECTRAN-F V2.06 SOFTWARE

WHC-SD-WM-DP-062, REV. 0

12-JAN-9420:54:16

A N A L Y S I S P A R A M E T E R S

MCA UNIT NUMBER: 2 / ADC UNIT NUMBER: 1.0
DETECTOR NUMBER: 1 / GEOMETRY NUMBER: 42
SPECTRUM SIZE: 4096 CHANNELS
ORDER OF SMOOTHING FUNCTION: 5
NUMBER OF BACKGROUND CHANNELS: 4 ON EACH SIDE OF PEAK
PEAK CONFIDENCE FACTOR: 85.0%
IDENTIFICATION ENERGY WINDOW: +- 1.50 KEV
ERROR QUOTATION: 1.96 SIGMA UNCERTAINTY

ENVIRONMENTAL BACKGROUND SUBTRACTED
LLD CALCULATION PERFORMED
MEASURED ENERGY DIFFERENCES LISTED
MULTIPLET ANALYSIS PERFORMED

SPECTRAL DATA READ DIRECTLY FROM MULTICHANNEL ANALYZER AN1:
ANALYZED BY:

SAMPLE DESCRIPTION: J1446-5730
GEOMETRY DESCRIPTION: 22 ML LIQ
SAMPLE SIZE: 1.0000E-03 LI. / CONVERSION FACTOR: 5.0000E-01
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL205

COLLECT STARTED ON 12-JAN-94 AT 20:03:59

COLLECT LIVE TIME: 3000. SECONDS
REAL TIME: 3008. SECONDS
DEAD TIME: 0.27 %

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

ENERGY CALIBRATION PERFORMED 8-NOV-93
EFFICIENCY CALIBRATION PERFORMED 9-NOV-93

P E A K A N A L Y S I S

PK	CENTROID CHANNEL	ENERGY KEV	FWHM KEV	BACKGND COUNTS	NET AREA COUNTS	ERROR %	NUCLIDES
1	119.87	59.77	1.20	2373.	3399.	5.3	AM-241,U-237, EU-155
2	173.94	86.80	1.23	2265.	912.	16.3	CS-136, EU-155, EU-155A, PB-214X, TL-208X, CD-109
3	211.53	105.58	1.23	2546.	746.	21.1	EU-155, EU-155B, NP-239
4	247.06	123.34	1.17	2243.	2890.	5.9	CO-57, EU-154A
5	496.92	248.23	1.17	2519.	386.	40.5	EU-154B
6	1324.16	661.80	1.58	488.	46091.	0.9	CS-137
6B		661.65			65.	11.5	
7	1447.33	723.38	1.46	183.	369.	15.3	SB-124,I-131, AG-108, EU-154D, ZR-95
8	1747.12	873.29	1.90	198.	216.	24.6	EU-154E, RH-106
9	1993.11	996.31	1.56	151.	214.	22.6	EU-154F
10	2010.02	1004.76	1.98	138.	372.	14.3	EU-154G, EU-152
11	2346.84	1173.22	1.94	83.	1818.	4.9	CO-60
12	2549.14	1274.41	2.10	35.	540.	9.2	EU-154, EU-154H, NA-22
13	2665.31	1332.52	1.96	7.	1666.	4.8	CO-60
13B		1332.48			20.	21.6	
14	2922.42	1461.13	2.51	6.	113.	19.7	K-40
14B		1460.79			99.	6.9	

ERROR QUOTATION AT 1.96 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

B - ENVIRONMENTAL BACKGROUND PEAK

BACKGROUND SUBTRACTION PERFORMED USING FILE BK0011
BACKGROUND DESCRIPTION: BKG DET #1
BACKGROUND COLLECT STARTED ON 7-JAN-94 AT 14:46:01
BACKGROUND LIVE TIME: 30000. SECONDS

SA E: J1446-5730
DATA COLLECTED ON 12-JAN-94 AT 20:03:59
DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT.

R A D I O N U C L I D E A N A L Y S I S R E P O R T

NUCLIDE	ACTIVITY CONCENTRATION IN uCi/LI MEASURED	ERROR	DECAY CORRECTED	ERROR	ENERGY COMPARISON (KEV) EXPECT	DIFF	
AM-241	3.30E+01	+-2.35E+00	3.30E+01	+-2.35E+00	59.54	0.24	
AM-243	LLD<4.29E-01		LLD<4.29E-01		74.67		
BA-133	LLD<3.06E-01		LLD<3.06E-01		356.02		
BA-140	LLD<7.99E-01		LLD<7.99E-01		537.27		
BI-212	LLD<1.95E+00		LLD<1.95E+00		727.20		
CEPR144	LLD<2.27E+00		LLD<2.27E+00		133.51		
CO-60	7.16E+00	+-3.62E-01	7.16E+00	+-3.62E-01	1332.50	0.02	
					1173.24	-0.01	
CR-51	LLD<1.87E+00		LLD<1.87E+00		320.09		
CS-134	LLD<1.57E-01		LLD<1.57E-01		795.84		
CS-137	1.32E+02	+-2.01E+00	1.32E+02	+-2.01E+00	661.65	0.15	
EU-152	LLD<2.01E-01		LLD<2.01E-01		1408.01		
EU-154	6.37E+00	+-5.88E-01	6.37E+00	+-5.88E-01	1274.45	-0.04	
					123.07	0.27	
					1004.76	0.00	
EU-154H	6.37E+00	+-5.88E-01	6.37E+00	+-5.88E-01	1274.80	-0.39	
EU 155	3.24E+00	+-6.91E-01	3.24E+00	+-6.91E-01	105.31	0.28	OK to report
					86.54	0.25	RJS 1/13/94
FE-59	LLD<2.77E-01		LLD<2.77E-01		1099.25		
I 131	LLD<2.37E-01		LLD<2.37E-01		364.48		
K 40	LLD<1.13E+00		LLD<1.13E+00		1460.75		
LA-140	LLD<6.49E-02		LLD<6.49E-02		1596.20		
MN-54	LLD<1.31E-01		LLD<1.31E-01		834.83		
~~NA-22~~	~~2.26E+00~~	~~+-2.09E-01~~	~~2.26E+00~~	~~+-2.09E-01~~	~~1274.55~~	~~-0.14~~	154Eu
NB-94	LLD<1.24E-01		LLD<1.24E-01		702.63		
NB-95	LLD<1.29E-01		LLD<1.29E-01		765.78		
~~NP-237~~	~~9.29E+00~~	~~+-1.53E+00~~	~~9.29E+00~~	~~+-1.53E+00~~	~~86.50~~	~~0.29~~	155Eu
PB-212	LLD<3.63E-01		LLD<3.63E-01		239.00		
PU-239	LLD<1.91E+03		LLD<1.91E+03		129.30		
PU-241	LLD<6.68E+04		LLD<6.68E+04		148.57		
RA-224	LLD<4.02E+00		LLD<4.02E+00		240.99		
RA-226	LLD<4.01E+00		LLD<4.01E+00		186.10		
RU-103	LLD<2.42E-01		LLD<2.42E-01		497.08		
RU103	LLD<2.54E-01		LLD<2.54E-01		497.08		
RURH106	LLD<3.81E+00		LLD<3.81E+00		621.80		
SB-125	LLD<8.54E-01		LLD<8.54E-01		427.89		
SB-125A	LLD<8.54E-01		LLD<8.54E-01		427.89		
SE-75	LLD<2.72E-01		LLD<2.72E-01		264.66		
SN-113	LLD<3.47E-01		LLD<3.47E-01		391.67		
SR-85	LLD<2.28E-01		LLD<2.28E-01		513.99		
TH-228	LLD<1.86E+01		LLD<1.86E+01		84.37		
TL-208	LLD<2.01E-01		LLD<2.01E-01		583.20		
[illegible]	LLD<2.43E-01		LLD<2.43E-01		185.71		
[illegible]	LLD<6.44E-02		LLD<6.44E-02		1836.06		
ZN-65	LLD<3.32E-01		LLD<3.32E-01		1115.55		
ZR-95	LLD<2.17E-01		LLD<2.17E-01		756.73		

TOTAL 2.00E+02 +-3.64E+00 2.00E+02 +-3.64E+00

STANDARD DEVIATION = 0.21

EBAR = ***** MEV/DISINTEGRATION
MAXIMUM PERMISSABLE ACTIVITY = 5.21E-09 UC/LI
TOTAL MEASURED ACTIVITY = 1.93E+02 (+-3.59E+00) UC/LI
% TECH. SPEC. = ****** (+-****)

ERROR QUOTATION AT 1.96 SIGMA
LLD CONFIDENCE LEVEL AT 85.0%

PEAKS NOT USED IN ANALYSIS

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
496.92	248.23	386.	40.5	7.45E+00
1447.33	723.38	369.	15.3	1.79E+01
1747.12	873.29	216.	24.6	1.23E+01
1993.11	996.31	214.	22.6	1.35E+01

PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
2922.42	1461.13	113.	19.7	9.87E+00

Eric Barela
1-12-97

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*                                                                   *
*          G A M M A   S P E C T R U M   A N A L Y S I S            *
*                                                                   *
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CANBERRA SPECTRAN-F V2.06 SOFTWARE

WHC-SD-WM-DP-062, REV. 0

12-JAN-9422:09:22

A N A L Y S I S P A R A M E T E R S

MCA UNIT NUMBER: 2 / ADC UNIT NUMBER: 1.0
DETECTOR NUMBER: 1 / GEOMETRY NUMBER: 42
SPECTRUM SIZE: 4096 CHANNELS
ORDER OF SMOOTHING FUNCTION: 5
NUMBER OF BACKGROUND CHANNELS: 4 ON EACH SIDE OF PEAK
PEAK CONFIDENCE FACTOR: 85.0%
IDENTIFICATION ENERGY WINDOW: +- 1.50 KEV
ERROR QUOTATION: 1.96 SIGMA UNCERTAINTY

ENVIRONMENTAL BACKGROUND SUBTRACTED
LLD CALCULATION PERFORMED
MEASURED ENERGY DIFFERENCES LISTED
MULTIPLET ANALYSIS PERFORMED

SPECTRAL DATA READ DIRECTLY FROM MULTICHANNEL ANALYZER AN1:
AN ZED BY:

SAMPLE DESCRIPTION: J1446-5730
GEOMETRY DESCRIPTION: 22 ML LIQ
SAMPLE SIZE: 1.0000E-03 LI / CONVERSION FACTOR: 5.0000E-01
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL205

COLLECT STARTED ON 12-JAN-94 AT 21:19:06

COLLECT LIVE TIME: 3000. SECONDS
REAL TIME: 3008. SECONDS
DEAD TIME: 0.27 %

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

ENERGY CALIBRATION PERFORMED 8-NOV-93
EFFICIENCY CALIBRATION PERFORMED 9-NOV-93

P E A K A N A L Y S I S

PK	CENTROID CHANNEL	ENERGY KEV	FWHM KEV	BACKGND COUNTS	NET AREA COUNTS	ERROR %	NUCLIDES
1	83.63	41.66	1.07	1498.	398.	30.3	CE-144,U-233,
1B		41.48			13.	46.6	EU/GD-X,
1B		43.08			13.	46.8	AM-243B
2	119.94	59.81	1.09	2373.	3181.	5.6	AM-241,U-237, EU-155
3	173.90	86.77	1.24	2320.	920.	16.3	CS-136, EU-155, EU-155A, PB-214X, TL-208X, CD-109
4	211.41	105.52	1.29	2408.	812.	19.1	EU-155, EU-155B, NP-239
5	247.07	123.35	1.28	2223.	2878.	5.9	CO-57, EU-154A
6	496.74	248.14	0.89	2369.	224.	65.1	EU-154B
7	1324.17	661.80	1.59	534.	45713.	0.9	CS-137
7B		661.65			65.	11.5	
8	1447.40	723.42	1.73	182.	492.	12.3	SB-124,I-131, AG-108, EU-154D, ZR-95
9	1746.93	873.20	1.81	190.	246.	21.8	EU-154E, RH-106
10	1993.54	996.52	1.47	180.	145.	33.7	EU-154F
11	2009.82	1004.66	1.91	167.	280.	18.8	EU-154G, EU-152
12	2346.75	1173.18	1.93	91.	1809.	4.9	CO-60
13	2549.08	1274.38	1.89	35.	546.	9.1	EU-154, EU-154H, NA-22
14	2665.26	1332.49	1.83	26.	1662.	4.9	CO-60
14B		1332.48			20.	21.6	
15	2921.30	1460.58	2.38	11.	115.	20.5	K-40
15B		1460.79			99.	6.9	

ERROR QUOTATION AT 1.96 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

B - ENVIRONMENTAL BACKGROUND PEAK

BACKGROUND SUBTRACTION PERFORMED USING FILE BK0011
BACKGROUND DESCRIPTION: BKG DET #1
BACKGROUND COLLECT STARTED ON 7-JAN-94 AT 14:46:01
BACKGROUND LIVE TIME: 30000. SECONDS

SA : J1446-5730
DATA COLLECTED ON 12-JAN-94 AT 21:19:06
DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT.

R A D I O N U C L I D E A N A L Y S I S R E P O R T

NUCLIDE	ACTIVITY CONCENTRATION IN uCi/LI MEASURED	ERROR	DECAY CORRECTED	ERROR	ENERGY COMPARISON (KEV) EXPECT	DIFF
AM-241	3.09E+01	+-2.26E+00	3.09E+01	+-2.26E+00	59.54	0.27
AM-243	LLD<4.29E-01		LLD<4.29E-01		74.67	
BA-133	LLD<3.01E-01		LLD<3.01E-01		356.02	
BA-140	LLD<7.79E-01		LLD<7.79E-01		537.27	
BI-212	LLD<2.07E+00		LLD<2.07E+00		727.20	
CEPR144	LLD<2.30E+00		LLD<2.30E+00		133.51	
CO-60	7.14E+00	+-3.66E-01	7.14E+00	+-3.66E-01	1332.50	-0.01
					1173.24	-0.06
CR-51	LLD<1.84E+00		LLD<1.84E+00		320.09	
CS-134	LLD<1.43E-01		LLD<1.43E-01		795.84	
CS-137	1.31E+02	+-1.99E+00	1.31E+02	+-1.99E+00	661.65	0.15
EU-152	LLD<2.94E-01		LLD<2.94E-01		1408.01	
EU-154	6.44E+00	+-5.91E-01	6.44E+00	+-5.91E-01	1274.45	-0.07
					123.07	0.28
					1004.76	-0.10
EU-154H	6.44E+00	+-5.91E-01	6.44E+00	+-5.91E-01	1274.80	-0.42
EU [illegible]	3.53E+00	+-6.79E-01	3.53E+00	+-6.79E-01	105.31	0.22
					86.54	0.23
FE-59	LLD<2.70E-01		LLD<2.70E-01		1099.25	
I-131	LLD<2.35E-01		LLD<2.35E-01		364.48	
K-40	LLD<1.17E+00		LLD<1.17E+00		1460.75	
LA-140	LLD<5.16E-02		LLD<5.16E-02		1596.20	
MN-54	LLD<1.31E-01		LLD<1.31E-01		834.83	
NA-22	2.29E+00	+-2.10E-01	2.29E+00	+-2.10E-01	1274.55	0.17
NB-94	LLD<1.19E-01		LLD<1.19E-01		702.63	
NB-95	LLD<1.24E-01		LLD<1.24E-01		765.78	
NP-237	9.37E+00	+-1.55E+00	9.37E+00	+-1.55E+00	86.50	0.27
PB-212	LLD<3.56E-01		LLD<3.56E-01		239.00	
PU-239	LLD<1.84E+03		LLD<1.84E+03		129.30	
PU-241	LLD<6.80E+04		LLD<6.80E+04		148.57	
RA-224	LLD<4.07E+00		LLD<4.07E+00		240.99	
RA-226	LLD<4.07E+00		LLD<4.07E+00		186.10	
RU-103	LLD<2.48E-01		LLD<2.48E-01		497.08	
RU103	LLD<2.61E-01		LLD<2.61E-01		497.08	
RURH106	LLD<3.91E+00		LLD<3.91E+00		621.80	
SB-125	LLD<8.34E-01		LLD<8.34E-01		427.89	
SB-125A	LLD<8.34E-01		LLD<8.34E-01		427.89	
SE-75	LLD<2.70E-01		LLD<2.70E-01		264.66	
SN-113	LLD<3.49E-01		LLD<3.49E-01		391.67	
SR-85	LLD<2.21E-01		LLD<2.21E-01		513.99	
TH-228	LLD<1.88E+01		LLD<1.88E+01		84.37	
TL-208	LLD<1.99E-01		LLD<1.99E-01		583.20	
U- [illegible]	LLD<2.48E-01		LLD<2.48E-01		185.71	
[illegible]	LLD<5.67E-02		LLD<5.67E-02		1836.06	
ZN-65	LLD<3.76E-01		LLD<3.76E-01		1115.55	
ZR-95	LLD<2.14E-01		LLD<2.14E-01		756.73	

TOTAL 1.97E+02 +-3.58E+00 1.97E+02 +-3.58E+00

STANDARD DEVIATION = 0.22

EBAR = ***** MEV/DISINTEGRATION
MAXIMUM PERMISSABLE ACTIVITY = 5.11E-09 UC/LI
TOTAL MEASURED ACTIVITY = 1.90E+02 (+-3.53E+00) UC/LI
% TECH. SPEC. = ****** (+-****)

ERROR QUOTATION AT 1.96 SIGMA
LLD CONFIDENCE LEVEL AT 85.0%

PEAKS NOT USED IN ANALYSIS

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
83.63	41.66	372.	32.4	1.05E+02
496.74	248.14	224.	65.1	4.33E+00
1447.40	723.42	492.	12.3	2.39E+01
1746.93	873.20	246.	21.8	1.40E+01
1993.54	996.52	145.	33.7	9.15E+00

PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
2921.30	1460.58	115.	20.5	9.96E+00

A J Johansen 1-13-94

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*          G A M M A   S P E C T R U M   A N A L Y S I S              *
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CANBERRA SPECTRAN-F V2.06 SOFTWARE

WHC-SD-WM-DP-062, REV. 0

12-JAN-9423:05:44

A N A L Y S I S P A R A M E T E R S

MCA UNIT NUMBER: 2 / ADC UNIT NUMBER: 1.0
DETECTOR NUMBER: 1 / GEOMETRY NUMBER: 42
SPECTRUM SIZE: 4096 CHANNELS
ORDER OF SMOOTHING FUNCTION: 5
NUMBER OF BACKGROUND CHANNELS: 4 ON EACH SIDE OF PEAK
PEAK CONFIDENCE FACTOR: 85.0%
IDENTIFICATION ENERGY WINDOW: +- 1.50 KEV
ERROR QUOTATION: 1.96 SIGMA UNCERTAINTY

ENVIRONMENTAL BACKGROUND SUBTRACTED
LLD CALCULATION PERFORMED
MEASURED ENERGY DIFFERENCES LISTED
MULTIPLET ANALYSIS PERFORMED

SPECTRAL DATA READ DIRECTLY FROM MULTICHANNEL ANALYZER AN1:
AN[illegible]ZED BY:

SAMPLE DESCRIPTION: J1446-5730
GEOMETRY DESCRIPTION: 22 ML LIQ
SAMPLE SIZE: 1.0000E-03 LI / CONVERSION FACTOR: 5.0000E-01
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL205

COLLECT STARTED ON 12-JAN-94 AT 22:15:29

COLLECT LIVE TIME: 3000. SECONDS
REAL TIME: 3009. SECONDS
DEAD TIME: 0.30 %

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

ENERGY CALIBRATION PERFORMED 8-NOV-93
EFFICIENCY CALIBRATION PERFORMED 9-NOV-93

P E A K A N A L Y S I S

PK	CENTROID CHANNEL	ENERGY KEV	FWHM KEV	BACKGND COUNTS	NET AREA COUNTS	ERROR %	NUCLIDES
1	119.89	59.78	1.23	2251.	3319.	5.3	AM-241,U-237, EU-155
2	174.14	86.90	1.10	2314.	788.	18.8	CS-136, EU-155, EU-155A, PB-214X, TL-208X, CD-109
3	211.46	105.55	1.24	2480.	744.	20.9	EU-155, EU-155B, NP-239
4	247.12	123.38	1.19	2523.	2784.	6.5	CO-57, EU-154A
5	496.87	248.21	0.88	2449.	359.	42.9	EU-154B
6	1324.13	661.78	1.56	461.	45416.	0.9	CS-137
6B		661.65			65.	11.5	
7	1447.28	723.36	1.78	183.	472.	12.7	SB-124,I-131, AG-108, EU-154D, ZR-95
8	1747.01	873.24	1.55	179.	232.	22.4	EU-154E, RH-106
9	1993.22	996.36	1.59	153.	170.	27.5	EU-154F
10	2009.99	1004.75	1.57	158.	325.	16.4	EU-154G, EU-152
11	2346.80	1173.20	1.80	63.	1742.	4.9	CO-60
12	2549.03	1274.35	2.03	35.	511.	9.5	EU-154, EU-154H, NA-22
13	2665.31	1332.52	1.84	30.	1653.	4.9	CO-60
13B		1332.48			20.	21.6	
14	2921.79	1460.82	1.68	6.	100.	21.1	K-40
14B		1460.79			99.	6.9	

ERROR QUOTATION AT 1.96 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

B - ENVIRONMENTAL BACKGROUND PEAK

BACKGROUND SUBTRACTION PERFORMED USING FILE BK0011
BACKGROUND DESCRIPTION: BKG DET #1
BACKGROUND COLLECT STARTED ON 7-JAN-94 AT 14:46:01
BACKGROUND LIVE TIME: 30000. SECONDS

S/ E: J1446-5730
DATA COLLECTED ON 12-JAN-94 AT 22:15:29
DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT.

R A D I O N U C L I D E A N A L Y S I S R E P O R T

NUCLIDE	ACTIVITY CONCENTRATION IN uCi/LI MEASURED	ERROR	DECAY CORRECTED	ERROR	ENERGY COMPARISON (KEV) EXPECT	DIFF
AM-241	3.22E+01	+-2.30E+00	3.22E+01	+-2.30E+00	59.54	0.25
AM-243	LLD<4.24E-01		LLD<4.24E-01		74.67	
BA-133	LLD<3.07E-01		LLD<3.07E-01		356.02	
BA-140	LLD<7.66E-01		LLD<7.66E-01		537.27	
BI-212	LLD<2.03E+00		LLD<2.03E+00		727.20	
CEPR144	LLD<2.31E+00		LLD<2.31E+00		133.51	
CO-60	7.10E+00	+-3.66E-01	7.10E+00	+-3.66E-01	1332.50	0.02
					1173.24	-0.04
CR-51	LLD<1.82E+00		LLD<1.82E+00		320.09	
CS-134	LLD<1.59E-01		LLD<1.59E-01		795.84	
CS-137	1.30E+02	+-1.98E+00	1.30E+02	+-1.98E+00	661.65	0.13
EU-152	LLD<2.52E-01		LLD<2.52E-01		1408.01	
EU-154	6.03E+00	+-5.74E-01	6.03E+00	+-5.74E-01	1274.45	-0.10
					123.07	0.31
					1004.76	-0.01
EU-154H	6.03E+00	+-5.75E-01	6.03E+00	+-5.75E-01	1274.80	-0.45
EU 5	3.23E+00	+-6.83E-01	3.23E+00	+-6.83E-01	105.31	0.24 ok to report
					86.54	0.35 RSB 1/13/94
FE-59	LLD<2.57E-01		LLD<2.57E-01		1099.25	
I-131	LLD<2.40E-01		LLD<2.40E-01		364.48	
K-40	LLD<1.10E+00		LLD<1.10E+00		1460.75	
LA-140	LLD<5.16E-02		LLD<5.16E-02		1596.20	
MN-54	LLD<1.32E-01		LLD<1.32E-01		834.83	
~~NA-22~~	~~2.14E+00~~	~~+-2.04E-01~~	~~2.14E+00~~	~~+-2.04E-01~~	~~1274.55~~	~~0.20~~ 154Eu RSB 1/13/94
NB-94	LLD<1.18E-01		LLD<1.18E-01		702.63	
NB-95	LLD<1.17E-01		LLD<1.17E-01		765.78	
~~NP-237~~	~~8.02E+00~~	~~+-1.52E+00~~	~~8.02E+00~~	~~+-1.52E+00~~	~~86.50~~	~~0.39~~ 155Eu RSB 1/13/94
PB-212	LLD<3.58E-01		LLD<3.58E-01		239.00	
PU-239	LLD<1.89E+03		LLD<1.89E+03		129.30	
PU-241	LLD<6.66E+04		LLD<6.66E+04		148.57	
RA-224	LLD<4.03E+00		LLD<4.03E+00		240.99	
RA-226	LLD<4.07E+00		LLD<4.07E+00		186.10	
RU-103	LLD<2.46E-01		LLD<2.46E-01		497.08	
RU103	LLD<2.58E-01		LLD<2.58E-01		497.08	
RURH106	LLD<3.79E+00		LLD<3.79E+00		621.80	
SB-125	LLD<8.68E-01		LLD<8.68E-01		427.89	
SB-125A	LLD<8.68E-01		LLD<8.68E-01		427.89	
SE-75	LLD<2.63E-01		LLD<2.63E-01		264.66	
SN-113	LLD<3.43E-01		LLD<3.43E-01		391.67	
SR-85	LLD<2.20E-01		LLD<2.20E-01		513.99	
TH-228	LLD<1.84E+01		LLD<1.84E+01		84.37	
TL-208	LLD<1.99E-01		LLD<1.99E-01		583.20	
U-	LLD<2.46E-01		LLD<2.46E-01		185.71	
[illegible]	LLD<3.55E-02		LLD<3.55E-02		1836.06	
ZN-65	LLD<3.63E-01		LLD<3.63E-01		1115.55	
ZR-95	LLD<2.20E-01		LLD<2.20E-01		756.73	

TOTAL 1.95E+02 +-3.58E+00 1.95E+02 +-3.58E+00

STANDARD DEVIATION = 0.25

EBAR = ***** MEV/DISINTEGRATION
MAXIMUM PERMISSABLE ACTIVITY = 5.25E-09 UC/LI
TOTAL MEASURED ACTIVITY = 1.89E+02 (+-3.53E+00) UC/LI
% TECH. SPEC. = ****** (+-****)

ERROR QUOTATION AT 1.96 SIGMA
LLD CONFIDENCE LEVEL AT 85.0%

PEAKS NOT USED IN ANALYSIS

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
496.37	248.21	359.	42.9	6.93E+00
1447.28	723.36	472.	12.7	2.29E+01
1747.01	873.24	232.	22.4	1.32E+01
1993.22	996.36	170.	27.5	1.08E+01

PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
2921.79	1460.82	100.	21.1	8.73E+00

WESTINGHOUSE HANFORD COMPANY

222-S LABORATORY

ANALYTICAL BATCH

LHD 1-10-94 ~~2400~~ 2400

Lab Segment Serial No.	Customer ID:
J1415-J1416 J1424	KE65D
Analysis: Pu 239/40	**Sample Prep:** DIRECT

Instrument: WB 537237	Procedure/ Rev: LA 503-156 D-0
Technologist: Joel M VanSant	Date: 12-28-93
Starting Time: 1630	Temperature 25 °C
Ending Time:	Chemist: L Fritts

Comments: Count "AEA" to 24HRS

	Description	Lab ID
1	LMCS LHD 1-10-94	J1415 5681
2	BLANK	J1416-5681
3	SAMPLE	J1424-5781
4	SAMPLE DUPLICATE	J1424-5791
5	SAMPLE TRIPLICATE	J1424-5791
6	SPIKE	J1424-5981
7	SPIKE DUPLICATE	J1424-5991
8		
9		
10		

	Description	Lab ID
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS	63843 .100mL	10mL-.100mL		
Spike	77843 .050mL			

ANALYTICAL BATCH SUMMARY SHEET

METHOD: **LA-503-156**

DATE START: **December 28, 1993**

PREPARED BY: **L.L. Fritts** L.L. Fritts 1-3-94

DATE COMPLETE: **January 3, 1994**

	UNITS:	uCi/mL									
SPL NAME	SPL ID	ANALYTE	RESULT #1	RESULT #2	RESULT #3	AVERAGE	2*SD	PREC	%REC	DET LIM	% CT ER
STD 63B43	J1415	Pu-239/40	1.37E+2						105.0	1.10E-2	0.7
BLANK	J1416	Pu-239/40	<3.75E-6						34.3	3.75E-6	4.0
KE65D	J1424	Pu-239/40	9.16E-3	1.08E-2	9.86E-3	9.94E-3	1.65E-3	16.6	64.4	9.25E-4	1.0
									34.7	1.15E-3	1.0
									43.0	9.80E-4	0.9
KE65D	J1424	239 Spike	96.0	96.4						1.65E-3	0.7
										1.69E-3	0.8
STD 63B43	J1415	Pu-238	<1.36E-2						N/A	1.36E-2	100.0
BLANK	J1416	Pu-238	<2.62E-5						34.3	2.62E-5	100.0
KE65D	J1424	Pu-238	<1.54E-3	<2.86E-3	<2.30E-3	N/A	N/A	N/A	64.4	1.54E-3	1.8
									34.7	2.86E-3	1.5
									43.0	2.30E-3	1.5

NARRATIVE: [X] NO SPECIAL PROBLEMS/METHOD VARIATIONS IN THIS BATCH

LIST SPECIFIC PROBLEMS/VARIATIONS FOR THIS BATCH:

The results for the standard are in uCi/L.

The results for the spike are in percent recovery.

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

#2 2495 Batch 2400

Serial No	Sample Point	Date	Time Issued	Priority
J 1415.-5581	BECHTOLD	12-15-93	11:23	22

Determination	Method Standard	Result Units	Charge Code	Reruns
Pu239/40	LA-503-156	% RECOVERY	E14157	0

Sample Size	Customer ID
? .100mL - 10 - .100mL + .05mL Spike	STD

Remarks Calculations, Results

EDP R211 AR001 77B43 24HRS

STD# 63B43 RESULT 1.37E+2 "AEA" ~~[illegible]~~ 1-10-94

STD VAL. 1.305 E+2 %REC 105.0% ATTACH PRINTOUT

WHC-SD-WM-DP-062, REV. 0

Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
VAN SANT	[signature]	[signature]	
Hrs	Hrs	Hrs	Hrs
		[signature]	[signature]

Date	Time Completed	Lab Unit Mgr	
12-28-93		[signature]	[signature]

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

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

				STANDARD
Serial No.	Date Counted	12/29/93	Pu 236 AEA Frac. (C236)	0.317
J1415-5581	Sample Volume in mL (SS)	0.1	Pu 238 AEA Frac. (C238)	0
Batch ID	Sample D.F. (DF)	101	Pu 239 AEA Frac. (C239)	0.622
2400	Tracer Volume in mL (SPKV)	0.05	Total AT Counts	10163
Rerun No.	Digest D.F. (DDF)	1	Time Counted in min (TC)	60
0	Tracer Book No.	77B43	Background in cpm (Bkg)	8
Analyst	Tracer Preparation Date	10/12/93	Pu 236 Counts	21.73
J. VAN SANT	Pu-236 Preparation Value	3226	Pu 238 Counts	0
Date	Pu-236 Decay Corr'd Value	3062.72	Pu 239 Counts	42.58
12/28/93	Pu-238 Tracer Value	133	AEA Count Time in min	1440

Decay Time = Date Counted - Tracer Preparation Date

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

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SS

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

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

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

Pu-239/240 µCi/L	=	1.37E+02

NOTE: Tracer values are in dpm/mL.

Pu-239/240 µCi/mL	=	1.37E-01
Relative Counting Error	=	0.7%
Pu-238 µCi/mL	=	< 1.36E-02
Relative Counting Error	=	100.0%
Pu 236 Tracer Recovery	=	66.8%

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

DETECTION LEVELS in µCi/mL					
Pu 239/240	=	1.10E-02	Pu 238	=	1.36E-02

Data Entry by:	[signature]	Date:	30-Dec-93
Approved by:	[signature]	Date:	3 Jan '94

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PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#1 12-29-93 DM
10163
30/60 DM - 8

J1415-5581

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

WHC-SD-WM-DP-062, REV. 0

#3 3557

Serial No	Sample Point	Date	Time Issued	Priority
J 1416.-5681	BECHTOLD	12-15-93	11:24	22

Determination	Method Standard	Result Units	Charge Code	Reruns
Pu239/40	LA-503-156	uCi/ML	E14157	0

Sample Size	Customer ID
? 1mL	BLK

Remarks, Calculations, Results

REAGENT BLANK

COUNT AS uCI/L

.05mL 77B43 Spike

24HRS

"AEA" - ~~[illegible]~~ LAD [illegible]

ATTACH PRINTOUT

$< 3.75 \times 10^{-6}$ uCi/ml $Pu^{239/40}$

~~$< 2.75 \times 10$~~ RA 1/5/94

$< 2.62 \times 10^{-5}$ uCi/ml Pu^{238}

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
[signature]	D.H. Milliner	[signature]		
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
12-29-93		[signature]	1-4-94 [signature]

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

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

				BLANK
Serial No.	Date Counted	12/29/93	Pu 236 AEA Frac. (C236)	0.919
J1416-5681	Sample Volume in mL (SS)	1	Pu 238 AEA Frac. (C238)	0
Batch ID	Sample D.F. (DF)	1	Pu 239 AEA Frac. (C239)	0.034
2400	Tracer Volume in mL (SPKV)	0.05	Total AT Counts	1837
Rerun No.	Digest D.F. (DDF)	1	Time Counted in min (TC)	60
0	Tracer Book No.	77B43	Background in cpm (Bkg)	2
Analyst	Tracer Preparation Date	10/12/93	Pu 236 Counts	12.37
J VAN SANT	Pu-236 Preparation Value	3226	Pu 238 Counts	0
Date	Pu-236 Decay Corr'd Value	3062.72	Pu 239 Counts	0.46
12/28/93	Pu-238 Tracer Value	133	AEA Count Time in min	1440

Decay Time = Date Counted - Tracer Preparation Date

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

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SS

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

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

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

Pu-239/240 µCi/L	=	< 3.75E-03

NOTE: Tracer values are in dpm/mL.

Pu-239/240 µCi/mL	=	< 3.75E-06
Relative Counting Error	=	4.0%
Pu-238 µCi/mL	=	< 2.62E-05
Relative Counting Error	=	100.0%
Pu 236 Tracer Recovery	=	34.3%

NOTE: Pu 239/240 Reported result is a LESS THAN value using 0.05 for the Pu-239/240 peak height.

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

DETECTION LEVELS in µCi/mL					
Pu 239/240	=	3.75E-06	Pu 238	=	2.62E-05

Data Entry by:	[signature]	Date:	30-Dec-93
Approved by:	[signature]	Date:	4 Jan '94

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[initials] 1.3.94

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#2 12-29-95 9m

1837 - 2

30/60 9m

J1416-5681

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

#4 4067

Serial No	Sample Point	Date	Time Issued	Priority
J 1424.-5781	BECHTOLD	12-16-93	13: 7	22

Determination	Method Standard	Result Units	Charge Code	Reruns
Pu239/40	LA-503-156	uCi/ML	E14157	0

Sample Size	Customer ID
1mL-10-.100mL +.05 spike	KE65D

Remarks, Calculations, Results

COUNT AS uCI/L SAM 77B43

24HRS

"AEA" - ~~[illegible]~~ ATTACH PRINTOUT LAD 1-10-94

239/40 Pu 9.16×10^{-3} uCi/ml

238 Pu $< 1.54 \times 10^{-3}$ "

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
[signature]	D.H. Milicia	[signature]		
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Mgr	
12-28-93		[signature]	1-4-94 [signature]

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

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

				SAMPLE
Serial No.	Date Counted	12/29/93	Pu 236 AEA Frac. (C236)	0.41
J1424-5781	Sample Volume in mL (SS)	0.1	Pu 238 AEA Frac. (C238)	0.083
Batch ID	Sample D.F. (DF)	11	Pu 239 AEA Frac. (C239)	0.495
2400	Tracer Volume in mL (SPKV)	0.05	Total AT Counts	7395
Rerun No.	Digest D.F. (DDF)	1	Time Counted in min (TC)	60
0	Tracer Book No.	77B43	Background in cpm (Bkg)	3
Analyst	Tracer Preparation Date	10/12/93	Pu 236 Counts	13.05
J VAN SANT	Pu-236 Preparation Value	3226	Pu 238 Counts	2.65
Date	Pu-236 Decay Corr'd Value	3062.72	Pu 239 Counts	15.77
12/28/93	Pu-238 Tracer Value	133	AEA Count Time in min	1440

Decay Time = Date Counted - Tracer Preparation Date

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

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SS

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

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

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

Pu-239/240 µCi/L	=	9.16E+00

NOTE: Tracer values are in dpm/mL.

Pu-239/240 µCi/mL	=	9.16E-03
Relative Counting Error	=	1.0%
Pu-238 µCi/mL	=	< 1.54E-03
Relative Counting Error	=	1.8%
Pu 236 Tracer Recovery	=	64.4%

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

DETECTION LEVELS in µCi/mL					
Pu 239/240	=	9.25E-04	Pu 238	=	1.54E-03

Data Entry by:	[signature]	Date:	30-Dec-93
Approved by:	[signature]	Date:	4 Jan '94

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PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#3 12-29-93 DM

7395 3
30/60 DM

J1404-5781
#4

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

#5 5989

Serial No	Sample Point	Date	Time Issued	Priority
J 1424.-5781	BECHTOLD	12-16-93	13: 7	22

Determination	Method Standard	Result Units	Charge Code	Reruns
Pu239/40	LA-503-156	uCi/ML	E14157	0

Sample Size	Customer ID
7mL-10-.100mL + .05 spike 77B43	KE65D

Remarks, Calculations, Results

COUNT AS uCI/L DUP 24HRS

"AEA" - ~~[illegible]~~ ATTACH PRINTOUT LAD 1-10-94

$Pu^{239/40}$ 1.08×10^{-2} uCi/ml

Pu^{238} $< 2.86 \times 10^{-3}$ " "

WHC-SD-WM-DP-062, REV. 0

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
[signature]	[signature]	[signature]		
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit	
12-29-93		[signature]	1-4-94 [signature]

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

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

				SAMPLE
Serial No.	Date Counted	12/29/93	Pu 236 AEA Frac. (C236)	0.331
J1424-5781	Sample Volume in mL (SS)	0.1	Pu 238 AEA Frac. (C238)	0.118
Batch ID	Sample D.F. (DF)	11	Pu 239 AEA Frac. (C239)	0.469
2400	Tracer Volume in mL (SPKV)	0.05	Total AT Counts	5294
Rerun No.	Digest D.F. (DDF)	1	Time Counted in min (TC)	60
0	Tracer Book No.	77B43	Background in cpm (Bkg)	8
Analyst	Tracer Preparation Date	10/12/93	Pu 236 Counts	11.52
J VAN SANT	Pu-236 Preparation Value	3226	Pu 238 Counts	4.09
Date	Pu-236 Decay Corr'd Value	3062.72	Pu 239 Counts	16.3
12/28/93	Pu-238 Tracer Value	133	AEA Count Time in min	1440

Decay Time = Date Counted - Tracer Preparation Date

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

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SS

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

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

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

Pu-239/240 µCi/L	=	1.08E+01

NOTE: Tracer values are in dpm/mL.

Pu-239/240 µCi/mL	=	1.08E-02
Relative Counting Error	=	1.0%
Pu-238 µCi/mL	=	< 2.86E-03
Relative Counting Error	=	1.5%
Pu 236 Tracer Recovery	=	34.7%

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

DETECTION LEVELS in µCi/mL					
Pu 239/240	=	1.15E-03	Pu 238	=	2.86E-03

Data Entry by:	[signature]	Date:	30-Dec-93
Approved by:	[signature]	Date:	4 Jan '94

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[signature] 1.3.94

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#1 12-29-93 Dm
5294 -8
Co

J1424-5781
#5

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

#6 6898

Serial No	Sample Point	Date	Time Issued	Priority
J 1424.-5781	BECHTOLD	12-16-93	13: 7	22

Determination	Method Standard	Result Units	Charge Code	Reruns
Pu239/40	LA-503-156	uCi/ML	E14157	0

Sample Size	Customer ID
?1ml-10-100mL + .05 spike 77B43	KE65D

Remarks, Calculations, Results

COUNT AS uCI/L TRIP 24HRS

"AEA" - ATTACH PRINTOUT. LAD 1-4-94

~~111 1.394~~ ~~9.86×10^{-6} uCi/ml~~

$Pu^{239/40}$ 9.86×10^{-3} uCi/ml

Pu^{238} $<2.30 \times 10^{-3}$ "

Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
12-28-93			1-4-94

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

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

Serial No.				SAMPLE
J1424-5781	Date Counted	12/29/93	Pu 236 AEA Frac. (C236)	0.387
Batch ID	Sample Volume in mL (SS)	0.1	Pu 238 AEA Frac. (C238)	0.095
2400	Sample D.F. (DF)	11	Pu 239 AEA Frac. (C239)	0.503
Rerun No.	Tracer Volume in mL (SPKV)	0.05	Total AT Counts	5225
0	Digest D.F. (DDF)	1	Time Counted in min (TC)	60
Analyst	Tracer Book No.	77B43	Background in cpm (Bkg)	2
J VAN SANT	Tracer Preparation Date	10/12/93	Pu 236 Counts	14.87
Date	Pu-236 Preparation Value	3226	Pu 238 Counts	3.63
12/28/93	Pu-236 Decay Corr'd Value	3062.72	Pu 239 Counts	19.29
	Pu-238 Tracer Value	133	AEA Count Time in min	1440

Decay Time = Date Counted - Tracer Preparation Date

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

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SS

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

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * (C238) - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

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

Pu-239/240 µCi/L	=	9.86E+00

NOTE: Tracer values are in dpm/mL.

Pu-239/240 µCi/mL	=	9.86E-03
Relative Counting Error	=	0.9%
Pu-238 µCi/mL	=	< 2.30E-03
Relative Counting Error	=	1.5%
Pu 236 Tracer Recovery	=	43.0%

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

DETECTION LEVELS in µCi/mL					
Pu 239/240	=	9.80E-04	Pu 238	=	2.30E-03

Data Entry by:	Date:	30-Dec-93
Approved by:	Date:	3 Jan '94

Form 1 Rev. 1.4

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#2 12-29-93 Dm

5225
60 - 2

J1424-5781
#6

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

#7 7426

Serial No	Sample Point	Date	Time Issued	Priority
J 1424.-5981	BECHTOLD	12-16-93	13: 7	22

Determination	Method Standard	Result Units	Charge Code	Reruns
Pu239/24	LA-503-156	% RECOVERY	E14157	0

Sample Size: ?1mL-10-.1mL + .100mL STD + .05mL Spike — 63843 — Customer ID: KE65D

Remarks Calculations, Results:
SAMPLE SPIKED ID 63843 SPIKED 77843
SPIKE ID ~~63843~~ 12-28-93 77843
SPIKE VOLUME .05mL
COUNT AS µCi/L
"AEA" ~~[illegible]~~ 24HRS
ATTACH PRINTOUT
96.40%
WHC-SD-WM-DP-062, REV. 0

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
Date	Time Completed	Lab Supervisor		
12-28-93			1-4-94	

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

LMD 1-10-94

1993 2.8.94

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

CHK EXT NO.

Serial No.				
J1424-5981	Date Counted	12/29/93	Pu 236 AEA Frac. (C236)	0.225
Batch ID	Sample Volume in mL (SS)	0.1	Pu 238 AEA Frac. (C238)	0.05
2400	Sample D.F. (DF)	11	Pu 239 AEA Frac. (C239)	0.727
Rerun No.	Tracer Volume in mL (SPKV)	0.05	Total AT Counts	11120
0	Digest D.F. (DDF)	1	Time Counted in min (TC)	60
Analyst	Tracer Book No.	77B43	Background in cpm (Bkg)	3
J VAN SANT	Tracer Preparation Date	10/12/93	Pu 236 Counts	14.94
Date	Pu-236 Preparation Value	3226	Pu 238 Counts	3.33
12/28/93	Pu-236 Decay Corr'd Value	3062.72	Pu 239 Counts	48.33
	Pu-238 Tracer Value	133	AEA Count Time in min	1440

Decay Time = Date Counted - Tracer Preparation Date

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

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SS

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

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

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

Pu-239/240 µCi/L	=	2.45E+01

NOTE: Tracer values are in dpm/mL.

Pu-239/240 µCi/mL	=	2.45E-02
Relative Counting Error	=	0.8%
Pu-238 µCi/mL	=	< 1.85E-03
Relative Counting Error	=	1.6%
Pu 236 Tracer Recovery	=	53.6%

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

DETECTION LEVELS in µCi/mL					
Pu 239/240	=	1.69E-03	Pu 238	=	1.85E-03

Data Entry by:	Date:	03-Jan-94
Approved by:	Date:	3 Jan 1994

Form 1 Rev. 1.4

$$\frac{(24.5-10.8)\left(\frac{10}{1}/\frac{11}{1}\right)(100)}{130.5} = 96.40\%$$

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#3 12-29-95 Dm

11120/60 - 5

J1424-5981

#7

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

#8 8641

WHC-SD-WM-DP-062, REV. 0

Serial No	Sample Point	Date	Time Issued	Priority
J 1424.-5981	BECHTOLD	12-16-93	13: 7	22

Determination	Method Standard	Result Units	Charge Code	Reruns
Pu239/24	LA-503-156	% RECOVERY	E14157	0

Sample Size	Customer ID
?1mL-10-.1mL + .100-10-.100mL Std 63843	KE65D

Remarks Calculations Results

SAMPLE SPIKED ID 63843 SPIKE DUP + .05mL Spike 77843

SPIKE ID 77843

SPIKE VOLUME
COUNT AS uCI/L .05mL

24 HRS

"AEA" - ~~400MIN~~
ATTACH PRINTOUT LAD 1-10-94

96.0%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	D.H. Milicia	M Brown		
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
12-28-93		Pakeda K Fitts	1-4-94 K M Garlue

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

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

Serial No.	Date Counted	12/29/93	Pu 236 AEA Frac. (C236)	CHK EXT NO.
J1424-5981	Sample Volume in mL (SS)	0.1	Pu 238 AEA Frac. (C238)	0.23
Batch ID	Sample D.F. (DF)	11	Pu 239 AEA Frac. (C239)	0.051
2400	Tracer Volume in mL (SPKV)	0.05	Total AT Counts	0.692
Rerun No.	Digest D.F. (DDF)	1	Time Counted in min (TC)	12079
0	Tracer Book No.	77B43	Background in cpm (Bkg)	60
Analyst	Tracer Preparation Date	10/12/93	Pu 236 Counts	3
J VAN SANT	Pu-236 Preparation Value	3226	Pu 238 Counts	18.92
Date	Pu-236 Decay Corr'd Value	3062.72	Pu 239 Counts	4.18
12/28/93	Pu-238 Tracer Value	133	AEA Count Time in min	56.99
				1440

Decay Time = Date Counted - Tracer Preparation Date

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

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SS

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

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

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

Pu-239/240 µCi/L	=	2.28E+01

NOTE: Tracer values are in dpm/mL.

Pu-239/240 µCi/mL	=	2.28E-02
Relative Counting Error	=	0.7%
Pu-238 µCi/mL	=	< 1.66E-03
Relative Counting Error	=	1.4%
Pu 236 Tracer Recovery	=	59.6%

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

DETECTION LEVELS in µCi/mL					
Pu 239/240	=	1.65E-03	Pu 238	=	1.66E-03

Data Entry by:	K Fitts	Date:	03-Jan-94
Approved by:	K Fitts	Date:	3 Jan 94

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335

Page 1 of 1

$$\frac{(22.8-9.16)\left(\frac{101}{11}\right)(100)}{130.5} = 96.0\%$$

2.8.94

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#3 12-29-93 DM

12079/60 -3

J1424-5981

#8

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT WHC-SD-WM-DP-062, REV. 0

SAMPLE
J-1415-5581
File ID: 2a2495.CNF

Counted on: 12/29/93 @ 2:10
Detector: AEA2
Geometry number: 1
Count time: 86403. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	1036.8	1036.8	355.036	355.036	20.000	19.386	10.000	3.959
2	30.0	30.0	267.938	267.564	78.000	1.000	39.000	0.100
3	2008.0	2008.0	224.249	224.236	24.000	19.646	12.000	3.949
4?	12.5	12.5	41.326	41.319	278.000	95.062	139.000	145.410

PEAK RESULTS
Peak Error Limit: 25%

ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Cm243	0.317	5.786	5.751	0.035	0.09	21.73	1.1	254.5	0.115E-03
	Pu236		5.756	5.751	0.005				189.6	0.854E-04
2		0.012		5.340	0.00		0.81	6.3	6.9	0.310E-05
3	Pu239	0.622	5.143	5.137	0.006	0.09	42.58	0.8	363.9	0.164E-03
	Pu240		5.144	5.137	0.007				363.9	0.164E-03
4		????		4.277			0.40	8.5		
Totals:		0.951	<--valid peaks only-->				65.12			

DETECTOR CALIBRATION
Energy(MEV) = 4.083 + (0.0047)*Channel
Energy range (MeV): 4.083 TO 6.489
Efficiency = 0.1170 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	98595.0	100.000
Smoothed	98594.9	100.000
Composite fit	94349.2	95.694
Residuals	4245.8	4.306

Analyzed by: _____
DM

Spectrum 2a2495.CNF
Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.: 14819.7

Raw Data Dump for AEA Spectrum: 2a2495.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	2.	5.	2.	6.
21	9.	7.	9.	6.	9.	7.	7.	8.	5.	8.
	14.	9.	8.	6.	12.	12.	17.	13.	6.	11.
	14.	15.	14.	6.	6.	15.	9.	19.	6.	7.
51	10.	20.	10.	8.	14.	14.	12.	10.	17.	10.
61	7.	15.	6.	12.	13.	13.	11.	20.	13.	12.
71	16.	23.	24.	19.	11.	17.	23.	15.	19.	27.
81	17.	9.	12.	16.	22.	17.	18.	23.	19.	15.
91	24.	20.	26.	16.	28.	19.	19.	18.	19.	21.
101	19.	29.	16.	20.	29.	25.	31.	34.	30.	43.
111	28.	32.	30.	30.	37.	25.	32.	29.	30.	37.
121	37.	44.	35.	39.	47.	47.	43.	38.	54.	40.
131	47.	38.	44.	46.	47.	62.	55.	55.	64.	53.
141	76.	75.	66.	64.	67.	61.	62.	73.	86.	60.
151	83.	88.	79.	77.	94.	92.	92.	97.	105.	93.
161	123.	128.	94.	105.	134.	115.	124.	114.	150.	132.
171	149.	163.	162.	158.	187.	185.	180.	199.	192.	186.
181	233.	212.	236.	230.	240.	279.	262.	279.	310.	321.
191	299.	371.	390.	359.	426.	449.	445.	529.	534.	614.
201	620.	641.	732.	761.	865.	883.	887.	974.	1055.	1135.
211	1268.	1271.	1319.	1488.	1471.	1634.	1708.	1803.	1893.	1885.
221	1983.	2057.	2051.	2119.	2035.	2032.	1944.	1802.	1763.	1587.
231	1391.	1308.	1064.	878.	748.	563.	470.	336.	268.	189.
241	151.	85.	61.	72.	26.	31.	32.	37.	33.	24.
251	22.	29.	31.	28.	33.	38.	27.	26.	34.	29.
261	31.	22.	36.	32.	33.	34.	41.	44.	42.	32.
271	32.	33.	37.	34.	27.	30.	45.	47.	37.	34.
281	46.	48.	56.	66.	39.	62.	53.	63.	65.	61.
291	72.	70.	68.	66.	77.	63.	73.	85.	89.	77.
301	78.	84.	74.	101.	95.	85.	77.	108.	91.	73.
311	117.	106.	126.	91.	120.	116.	121.	154.	151.	157.
321	155.	187.	175.	186.	187.	208.	229.	232.	230.	253.
331	286.	304.	359.	335.	366.	407.	435.	458.	482.	466.
341	574.	636.	679.	775.	791.	849.	851.	888.	939.	868.
351	1033.	1041.	1040.	1059.	1017.	1090.	1071.	927.	846.	783.
361	810.	691.	600.	524.	441.	358.	270.	197.	182.	132.
371	82.	77.	40.	29.	17.	13.	5.	4.	1.	1.
381	1.	0.	0.	0.	2.	0.	0.	0.	0.	0.
391	0.	0.	2.	0.	2.	0.	0.	0.	0.	1.
401	0.	1.	0.	1.	0.	1.	0.	1.	1.	0.
411	1.	1.	0.	1.	1.	0.	1.	1.	1.	2.
421	0.	4.	3.	0.	3.	4.	1.	0.	1.	2.
431	1.	2.	1.	0.	0.	0.	1.	0.	1.	2.
441	1.	0.	0.	0.	0.	1.	0.	0.	1.	1.
451	0.	0.	2.	1.	0.	0.	0.	1.	1.	0.
461	1.	0.	1.	1.	2.	3.	1.	0.	2.	5.
471	1.	1.	1.	4.	4.	3.	3.	2.	1.	1.
481	1.	2.	2.	1.	0.	2.	2.	1.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
501	1.	0.								

M [illegible] 12/30/93

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT

WHC-SD-WM-DP-062, REV. 0

SAMPLE
J-1416-5681
File ID: 3a3557.CNF

Counted on: 12/29/93 @ 2:11
Detector: AEA3
Geometry number: 1
Count time: 86403. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	763.6	763.6	363.248	363.248	16.000	7.777	8.000	1.783
2	18.4	18.4	277.544	277.544	16.000	16.995	8.000	8.709
2?	13.4	13.4	267.125	267.125	28.000	0.851	14.000	5.216
1	19.0	19.0	232.161	232.115	20.000	32.952	10.000	6.809

PEAK RESULTS
Peak Error Limit: 25%

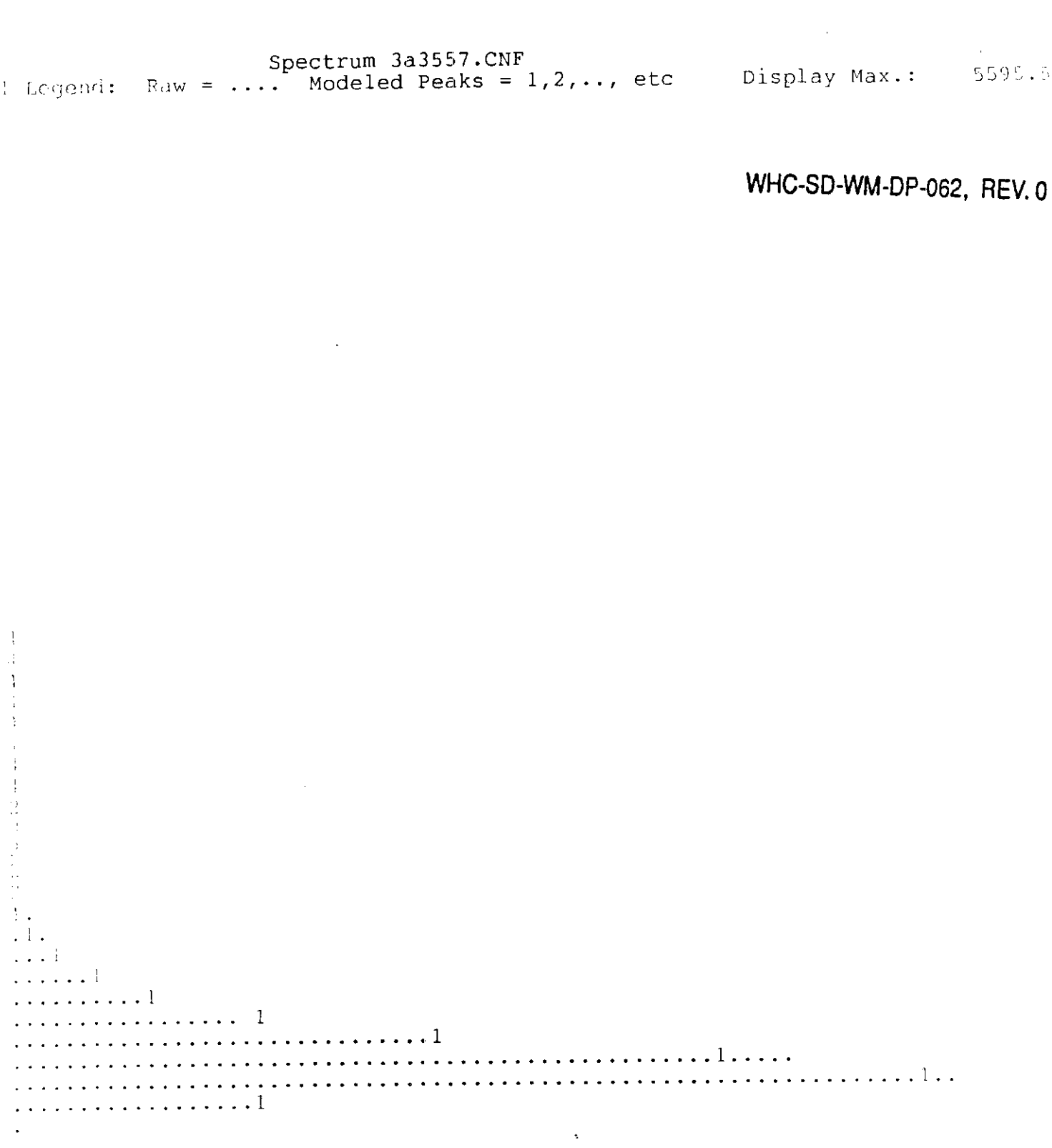
Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err 095	d/m	Activity [illegible]
1	Pu236	0.919	5.756	5.752	0.004	0.04	12.37	1.5	98.9	[illegible]
	Cm243		5.786	5.752	0.034				132.7	[illegible]
2	Th228	0.020	5.430	5.358	0.072	0.08	0.27	13.1	2.9	[illegible]
	Am243		5.276	5.358	-.082				2.1	[illegible]
3		????		5.310			0.04	50.8		
1	Pu239	0.034	5.143	5.149	-.006	0.15	0.46	8.2	3.6	0.161E-05
	Pu240		5.144	5.149	-.005				3.6	[illegible]
		---					---			
Totals:		0.973	<--valid peaks only-->				13.10			

DETECTOR CALIBRATION
Energy(MEV) = 4.081 + (0.0046)*Channel
Energy range (MeV): 4.081 TO 6.436
Efficiency = 0.1277 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	19392.0	100.000
Smoothed	19392.0	100.000
Composite fit	18920.6	97.569
Residuals	471.4	2.431

Analyzed by: _____
DM


Spectrum 3a3557.CNF
Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.: 5595.5

Raw Data Dump for AEA Spectrum: 3a3557.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
21	1.	0.	1.	0.	0.	0.	0.	0.	0.	0.
31	0.	2.	0.	0.	0.	1.	0.	2.	0.	0.
41	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
51	0.	0.	0.	0.	0.	1.	0.	1.	0.	1.
61	0.	0.	0.	2.	0.	0.	0.	0.	0.	0.
71	1.	0.	0.	0.	2.	1.	0.	0.	0.	1.
81	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
91	1.	1.	0.	0.	2.	0.	1.	0.	0.	0.
101	1.	0.	0.	0.	1.	0.	2.	0.	0.	[illegible]
111	1.	1.	0.	1.	1.	1.	0.	0.	1.	[illegible]
121	0.	1.	0.	1.	1.	1.	0.	2.	0.	0.
131	1.	0.	1.	1.	0.	0.	0.	4.	1.	0.
141	1.	4.	1.	1.	1.	1.	0.	3.	2.	0.
151	1.	4.	2.	3.	2.	0.	1.	3.	1.	0.
161	2.	1.	0.	1.	0.	4.	1.	2.	1.	0.
171	1.	2.	2.	1.	1.	0.	2.	1.	1.	2.
181	0.	6.	3.	3.	5.	4.	4.	1.	3.	6.
191	4.	2.	4.	3.	4.	4.	4.	4.	3.	[illegible]
201	7.	6.	1.	6.	3.	7.	7.	10.	7.	[illegible]
211	6.	4.	7.	10.	5.	12.	8.	10.	7.	[illegible]
221	10.	10.	13.	12.	17.	10.	13.	15.	16.	[illegible]
231	21.	26.	14.	19.	20.	15.	10.	13.	[illegible]	[illegible]
241	4.	5.	9.	7.	7.	5.	10.	10.	[illegible]	[illegible]
251	12.	14.	17.	10.	12.	20.	18.	20.	10.	[illegible]
261	21.	19.	18.	21.	14.	28.	18.	21.	22.	[illegible]
271	14.	15.	16.	8.	8.	13.	9.	13.	16.	10.
281	8.	10.	13.	11.	12.	20.	13.	14.	23.	17.
291	11.	17.	21.	17.	21.	25.	26.	21.	25.	26.
301	25.	36.	24.	24.	26.	23.	34.	48.	45.	[illegible]
311	33.	37.	33.	35.	41.	39.	41.	52.	54.	[illegible]
321	67.	51.	66.	59.	78.	82.	76.	104.	[illegible]	[illegible]
331	[illegible]	95.	114.	111.	104.	131.	148.	157.	[illegible]	[illegible]
341	[illegible]	169.	243.	216.	254.	275.	267.	311.	[illegible]	[illegible]
351	110.	471.	483.	528.	617.	615.	639.	638.	[illegible]	[illegible]
361	811.	772.	825.	763.	786.	740.	639.	458.	517.	[illegible]
371	121.	59.	36.	21.	6.	2.	1.	1.	0.	1.
[illegible]	0.	0.	0.	0.	0.	0.	0.	0.	0.	[illegible]
[illegible]	0.	0.	0.	1.	0.	0.	0.	1.	0.	[illegible]
401	0.	0.	1.	0.	0.	1.	0.	0.	2.	1.
411	0.	0.	0.	0.	1.	0.	0.	0.	0.	[illegible]
421	0.	0.	0.	2.	0.	0.	0.	0.	0.	[illegible]
[illegible]	0.	0.	0.	0.	0.	0.	0.	0.	0.	[illegible]
441	0.	0.	0.	0.	0.	0.	0.	1.	[illegible]	[illegible]
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	[illegible]
461	0.	0.	0.	0.	0.	0.	0.	0.	[illegible]	[illegible]
471	0.	0.	2.	0.	0.	0.	1.	0.	0.	[illegible]
481	0.	0.	1.	0.	0.	0.	0.	0.	0.	[illegible]
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

M Beaver 12/30/93

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT

WHC-SD-WM-DP-062, REV. 0

SAMPLE
J-1424-5781
File ID: 4a4067.CNF

Counted on: 12/29/93 @ 2:12
Detector: AEA4
Geometry number: 1
Count time: 86400. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Final	Peak center Initial	Final	FWHM Initial	Final	Tau Initial	Final
1	1432.6	1432.6	363.479	363.479	10.000	3.818	[illegible]	[illegible]
2	289.9	289.9	305.885	305.879	12.000	3.855	[illegible]	[illegible]
3	1834.7	1834.7	232.527	232.527	14.000	4.852	[illegible]	[illegible]

PEAK RESULTS
Peak Error Limit: 25%

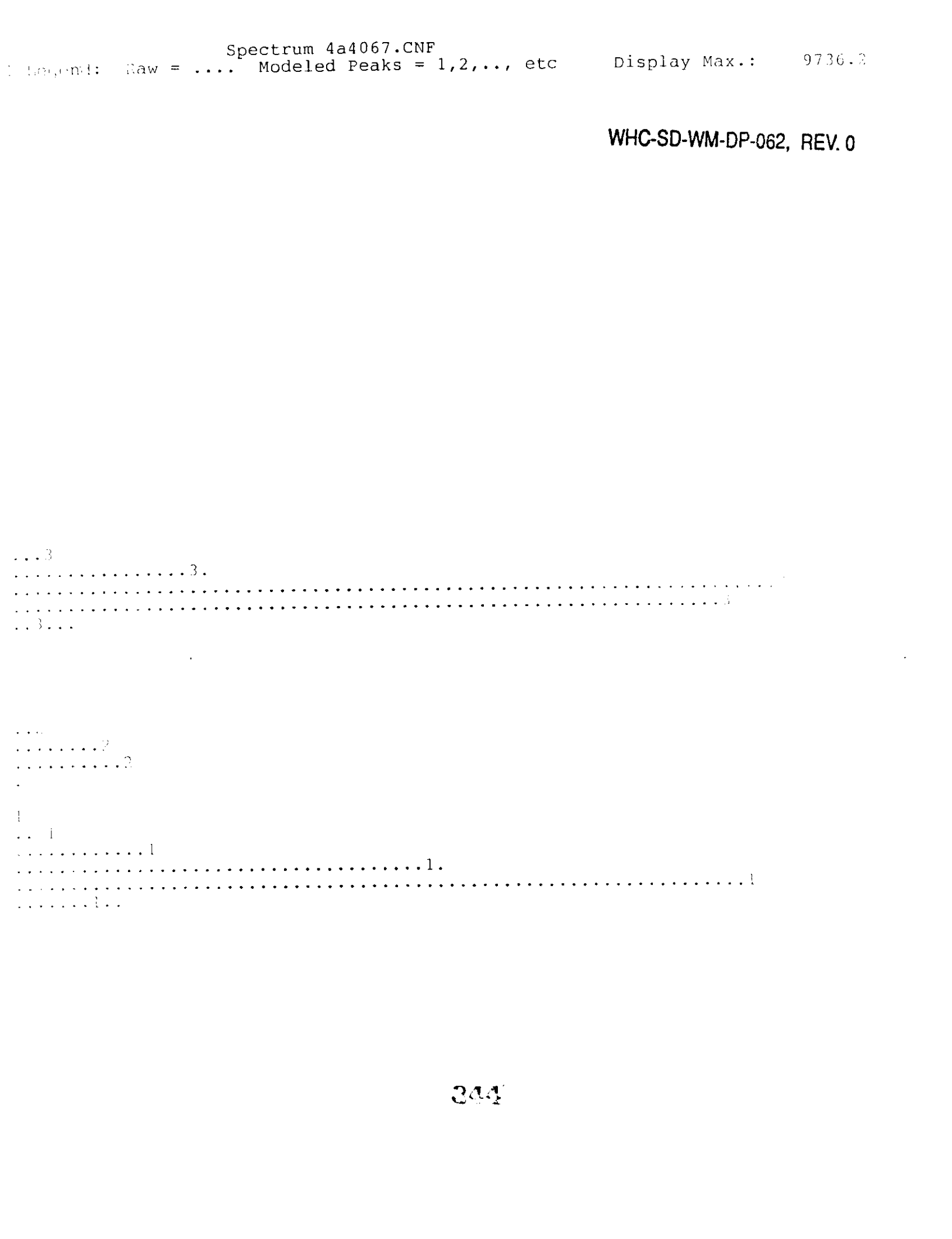
Lo #	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ml
1	Cm244	0.410	5.796	5.790	0.006	0.02	13.05	1.4	152.9	0.[illegible]
	Cm243		5.786	5.790	-.004				249.1	[illegible]
2	Pu238	0.083	5.499	5.519	-.020	0.02	2.65	3.2	31.1	[illegible]
	Am241		5.480	5.519	-.039				33.1	[illegible]
3	Pu239	0.495	5.143	5.175	-.032	0.02	15.77	1.3	184.6	0.8[illegible]
	Pu240		5.144	5.175	-.031				184.6	0.8[illegible]
Totals:		0.989	<--valid peaks only-->				31.47			

DETECTOR CALIBRATION
Energy(MEV) = 4.082 + (0.0047)*Channel
Energy range (MeV): 4.082 TO 6.488
Efficiency = 0.0854 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	45835.0	100.000
Smoothed	45834.9	100.000
Composite fit	45317.0	98.870
Residuals	518.0	1.130

Analyzed by: _____
DM


Spectrum 4a4067.CNF
Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.: 9736.3

Save Data Dump for AEA Spectrum: 4a4067.CNF

	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
21	0.	1.	1.	1.	0.	0.	0.	1.	0.	0.
	1.	0.	0.	0.	0.	1.	0.	0.	1.	0.
	1.	0.	1.	1.	0.	1.	0.	0.	1.	1.
51	0.	0.	0.	0.	1.	1.	0.	2.	0.	1.
61	0.	1.	1.	0.	0.	3.	1.	2.	0.	0.
71	1.	0.	0.	0.	0.	0.	0.	1.	1.	1.
81	1.	1.	1.	2.	1.	1.	0.	1.	1.	1.
91	0.	0.	0.	2.	0.	0.	1.	0.	0.	3.
101	2.	0.	2.	0.	0.	2.	1.	0.	1.	3.
111	0.	2.	0.	0.	2.	1.	0.	2.	2.	0.
121	0.	3.	2.	0.	0.	2.	2.	0.	0.	1.
131	2.	1.	0.	0.	0.	1.	2.	5.	3.	3.
141	3.	2.	3.	2.	1.	0.	2.	4.	1.	1.
151	3.	2.	3.	1.	0.	4.	0.	2.	1.	2.
161	0.	0.	0.	1.	4.	4.	5.	3.	4.	3.
171	5.	2.	1.	3.	6.	5.	5.	3.	6.	4.
181	6.	6.	7.	7.	7.	6.	11.	6.	9.	8.
191	9.	4.	14.	8.	13.	17.	15.	22.	18.	16.
201	22.	19.	23.	30.	30.	38.	31.	36.	28.	45.
211	62.	43.	74.	68.	87.	102.	155.	208.	234.	290.
221	366.	440.	511.	608.	709.	755.	955.	1171.	1389.	1586.
231	2019.	2186.	2101.	1948.	1575.	1136.	763.	157.	2[illegible].	[illegible].
241	37.	14.	2.	2.	0.	2.	0.	[illegible].	[illegible].	[illegible].
251	3.	3.	2.	2.	4.	4.	5.	7.	[illegible].	[illegible].
261	6.	5.	3.	8.	8.	9.	2.	11.	[illegible].	[illegible].
271	6.	7.	14.	8.	7.	4.	9.	4.	4.	[illegible].
281	12.	8.	11.	15.	10.	9.	16.	23.	19.	25.
291	38.	41.	65.	91.	122.	127.	139.	134.	152.	156.
301	168.	196.	252.	259.	354.	344.	313.	278.	187.	101.
	18.	16.	11.	3.	6.	8.	5.	2.	7.	[illegible].
321	8.	6.	4.	3.	13.	16.	11.	11.	14.	[illegible].
331	19.	15.	17.	18.	23.	21.	21.	23.	27.	[illegible].
341	42.	48.	56.	53.	63.	105.	120.	160.	210.	[illegible].
351	112.	514.	623.	713.	654.	657.	658.	662.	[illegible].	[illegible].
361	1[illegible].	1505.	1710.	1690.	1563.	1136.	701.	391.	1[illegible].	[illegible].
371	[illegible].	5.	1.	0.	1.	0.	0.	0.	[illegible].	[illegible].
381	3.	0.	1.	0.	0.	0.	0.	0.	[illegible].	[illegible].
391	0.	0.	0.	0.	1.	0.	0.	0.	[illegible].	[illegible].
401	0.	0.	0.	0.	2.	0.	1.	1.	1.	1.
411	1.	1.	1.	0.	2.	0.	0.	0.	0.	2.
421	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
431	0.	0.	0.	1.	0.	0.	0.	0.	1.	1.
441	1.	1.	0.	0.	0.	0.	0.	0.	0.	[illegible].
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
461	0.	0.	0.	0.	0.	0.	0.	0.	[illegible].	[illegible].
471	1.	1.	0.	1.	0.	0.	0.	2.	[illegible].	[illegible].
481	1.	1.	1.	1.	1.	2.	0.	0.	[illegible].	[illegible].
491	0.	0.	0.	0.	0.	0.	0.	0.	[illegible].	[illegible].
501	0.	0.								

M Graham 12/30/93

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT

WHC-SD-WM-DP-062, REV. 0

SAMPLE
J-1424-5781 DUP
File ID: 5a5989.CNF

Counted on: 12/29/93 @ 3:11
Detector: AEA5
Geometry number: 1
Count time: 86403. Sec

PEAK ANALYSIS

Peak	Peak height		Peak center		FWHM		Tau	
ID	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	520.7	520.7	358.440	359.046	22.000	17.348	11.000	3.079
2	145.3	145.3	300.632	300.013	28.000	17.188	14.000	2.101
3	773.6	773.6	227.433	226.534	22.000	17.840	11.000	3.484
4?	11.9	11.9	28.260	28.643	334.000	41.926	167.000	176.598

PEAK RESULTS
Peak Error Limit: 25%

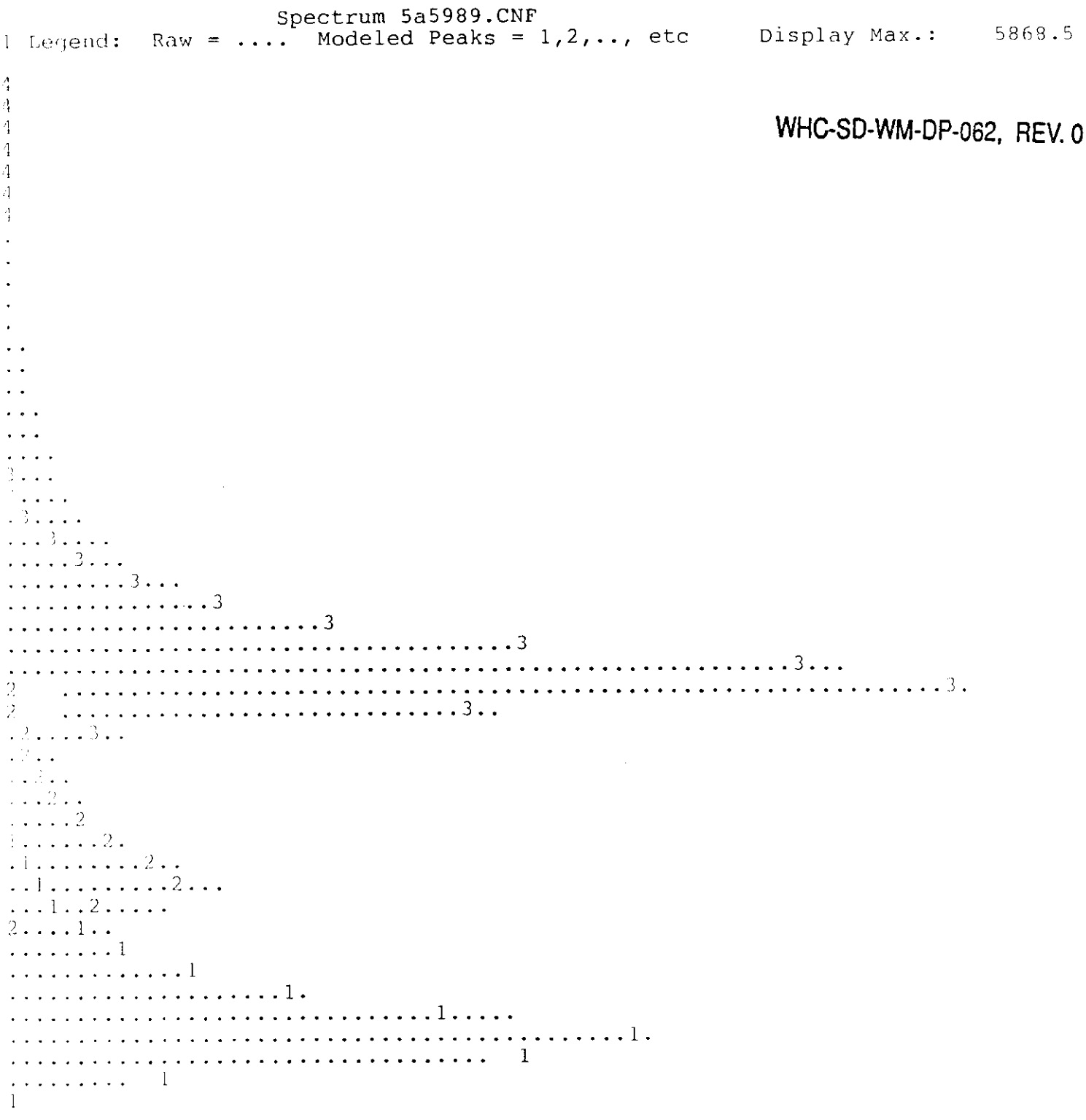
Peak		AEA	Peak Centroid				Count	%err		Activity
ID	Isotope	Frac	Exp.	Obs.	Diff.	FWHM	Rate c/m	@95	d/m	uCi/ea
1	Cm243	0.331	5.786	5.772	0.014	0.08	11.52	1.5	115.5	0.520E-04
	Pu236		5.756	5.772	-.016				86.0	0.387E-04
2	Am241	0.118	5.480	5.494	-.014	0.08	4.09	3.0	31.9	0.144E-04
	Pu238		5.499	5.494	0.005				41.6	0.187E-04
3	Pu239	0.469	5.143	5.149	-.006	0.08	16.30	1.3	119.2	0.537E-04
	Pu240		5.144	5.149	-.005				119.2	0.537E-04
4		????		4.219			0.25	10.4		
Totals:		0.918	<--valid peaks only-->				31.92			

DETECTOR CALIBRATION
Energy(MEV) = 4.084 + (0.0047)*Channel
Energy range (MeV): 4.084 TO 6.491
Efficiency = 0.1367 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	50093.0	100.000
Smoothed	50092.7	99.999
Composite fit	46327.6	92.483
Residuals	3765.4	7.517

Analyzed by: DM


Spectrum 5a5989.CNF
Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.: 5868.5

Raw Data Dump for AEA Spectrum: 5a5989.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	3.	17.	14.	10.
21	13.	8.	9.	10.	12.	8.	3.	19.	11.	9.
31	11.	7.	6.	5.	8.	12.	12.	11.	10.	9.
41	10.	10.	19.	9.	2.	9.	16.	9.	9.	10.
51	16.	7.	14.	12.	12.	12.	15.	13.	13.	15.
61	17.	7.	13.	11.	8.	19.	17.	17.	15.	13.
71	10.	14.	19.	15.	19.	13.	17.	10.	17.	16.
81	21.	19.	12.	22.	11.	12.	21.	17.	17.	20.
91	17.	24.	15.	22.	20.	19.	19.	32.	21.	2 .
101	18.	21.	22.	18.	23.	19.	28.	24.	25.	33.
111	20.	23.	40.	27.	38.	26.	32.	33.	27.	27.
121	28.	30.	30.	49.	26.	26.	34.	38.	34.	29.
131	35.	37.	36.	39.	38.	41.	44.	33.	47.	44.
141	44.	48.	45.	46.	54.	47.	39.	55.	60.	59.
151	52.	44.	52.	52.	68.	58.	52.	66.	58.	78.
161	60.	62.	59.	82.	76.	68.	82.	71.	95.	73.
171	97.	106.	81.	83.	70.	123.	104.	99.	98.	112.
181	121.	99.	114.	104.	104.	134.	147.	142.	138.	146.
191	168.	158.	165.	154.	152.	170.	183.	181.	207.	223.
201	215.	240.	225.	274.	292.	304.	304.	316.	330.	334.
211	366.	346.	409.	454.	491.	517.	549.	603.	621.	668.
221	702.	745.	758.	764.	781.	838.	824.	811.	725.	717.
231	643.	582.	585.	477.	435.	326.	286.	244.	169.	153.
241	135.	96.	67.	63.	60.	47.	38.	37.	53.	43.
251	45.	52.	48.	34.	42.	53.	53.	54.	52.	46.
261	58.	51.	55.	67.	55.	53.	74.	63.	61.	65.
271	76.	79.	60.	82.	61.	69.	74.	75.	76.	94.
281	72.	83.	98.	86.	122.	121.	113.	120.	126.	133.
291	156.	138.	152.	150.	178.	192.	181.	165.	164.	181.
301	181.	182.	173.	145.	151.	127.	149.	106.	114.	104.
311	95.	98.	102.	93.	100.	76.	98.	78.	89.	89.
321	91.	97.	96.	106.	122.	109.	120.	129.	121.	138.
331	159.	138.	169.	176.	153.	191.	187.	210.	227.	2 .
341	230.	272.	292.	303.	314.	321.	370.	431.	423.	4 .
351	467.	494.	479.	558.	496.	479.	537.	527.	536.	510.
361	484.	474.	433.	359.	335.	273.	257.	200.	136.	130.
371	83.	63.	35.	37.	16.	15.	7.	3.	3.	1.
381	2.	1.	0.	2.	0.	0.	0.	4.	2.	1.
391	0.	0.	0.	0.	0.	0.	1.	3.	0.	1.
401	1.	0.	1.	1.	1.	4.	1.	1.	0.	0.
411	3.	2.	2.	2.	3.	1.	4.	3.	2.	2.
421	3.	3.	5.	0.	0.	0.	2.	1.	1.	0.
431	0.	1.	3.	0.	1.	1.	3.	0.	0.	0.
441	3.	0.	0.	1.	1.	1.	0.	0.	0.	1.
451	0.	0.	0.	1.	2.	0.	0.	0.	2.	2.
461	3.	1.	0.	2.	1.	2.	0.	1.	3.	0.
471	2.	2.	1.	3.	2.	2.	3.	0.	4.	3.
481	2.	1.	2.	1.	5.	3.	3.	0.	0.	0.
491	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
501	0.	0.								

McSherman 12/30/93

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT **WHC-SD-WM-DP-062, REV. 0**

SAMPLE
J-1424-5781 TRIP
File ID: 6a6898.CNF

Counted on: 12/29/93 @ 3:11
Detector: AEA6
Geometry number: 1
Count time: 86402. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Final	Peak center Initial	Final	FWHM Initial	Final	Tau Initial	Final
1?	14.7	14.7	496.224	496.224	8.000	1.027	4.000	2.[illegible]
4	698.5	698.5	358.434	358.434	32.000	32.722	16.000	[illegible]
3	168.6	168.6	299.916	299.666	22.000	23.339	11.000	[illegible]
1	1013.8	1013.8	226.370	226.355	24.000	23.341	12.000	[illegible]

PEAK RESULTS
Peak Error Limit: 25%

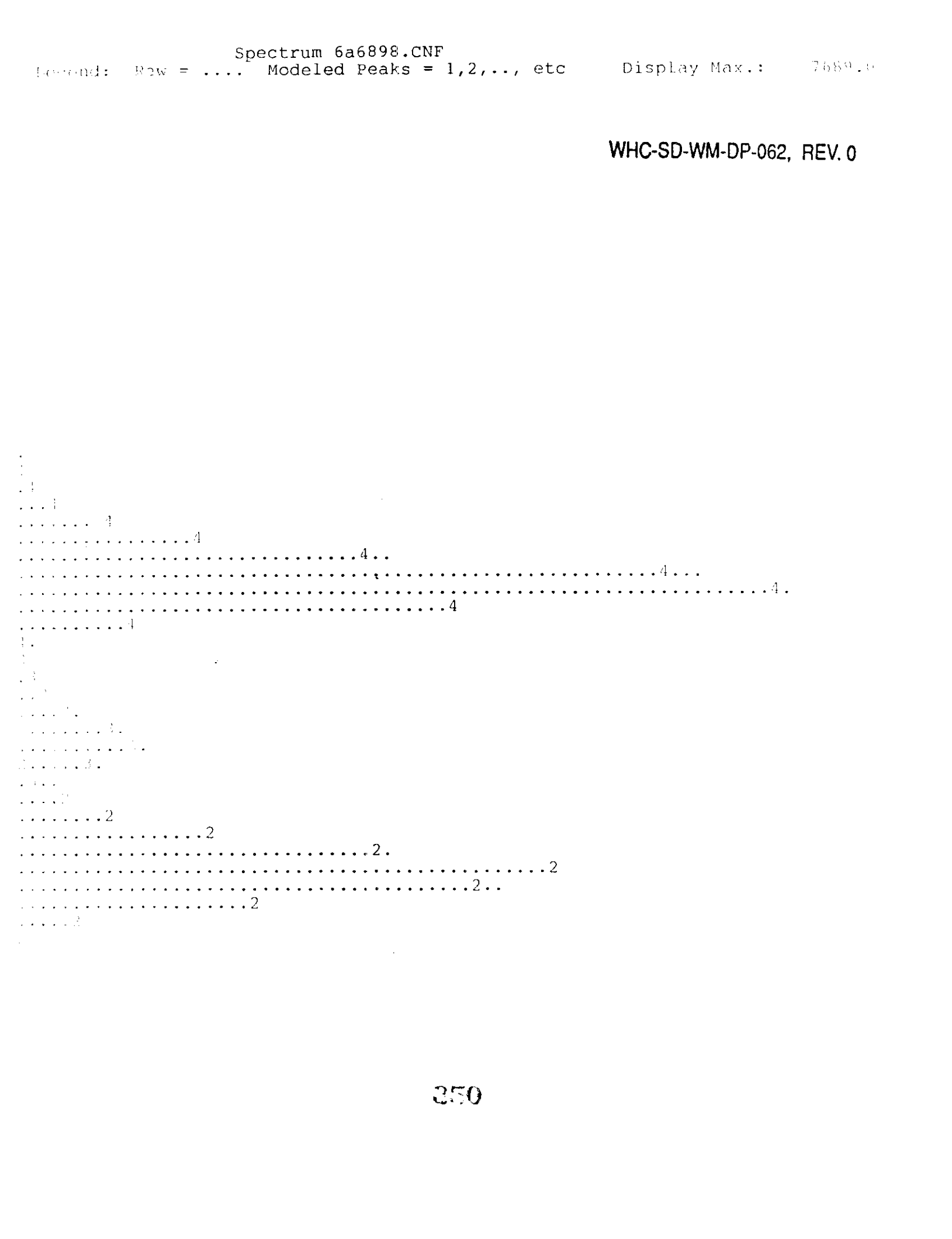
ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	3σerr 095	d/m	Activity [illegible]
		????		6.371			0.05	22.5		
2	Cm242	0.387	5.786	5.737	0.0490	0.15	14.87	1.3	195.6	[illegible]
	Pu236		5.756	5.737	0.019				115.9	[illegible]
4	Am241	0.095	5.480	5.467	0.0130	0.11	3.63	3.0	29.5	0.1338-01
	Cm238		5.499	5.467	0.032				38.5	0.1718-01
3	Pu239	0.503	5.143	5.130	0.0130	0.11	19.29	1.2	147.4	[illegible]
	Pu240		5.144	5.130	0.014				147.4	[illegible]
Totals:		0.985	<--valid peaks only-->				37.79			

DETECTOR CALIBRATION
Energy(MEV) = 4.089 + (0.0046)*Channel
Energy range (MeV): 4.089 TO 6.444
Efficiency = 0.1309 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	55263.0	100.000
Smoothed	55268.2	100.009
Composite fit	54497.8	98.613
Residuals	765.2	1.385

Analyzed by: _____
DM


Spectrum 6a6898.CNF
Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.: 7689.0

Raw Data Dump for AEA Spectrum: 6a6898.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	[illegible]	[illegible]
11	0.	0.	0.	0.	0.	0.	1.	0.	1.	.
21	2.	1.	1.	1.	4.	2.	1.	0.	0.	4.
[illegible]	1.	6.	2.	3.	1.	1.	3.	1.	4.	1.
	3.	1.	2.	1.	2.	2.	1.	2.	1.	0.
51	1.	0.	2.	1.	2.	0.	1.	4.	0.	3.
61	3.	4.	5.	3.	1.	2.	0.	6.	2.	3.
71	2.	3.	1.	3.	6.	3.	3.	4.	1.	1.
81	4.	3.	3.	1.	3.	2.	3.	7.	2.	[illegible]
91	5.	3.	1.	2.	0.	5.	3.	1.	1.	1.
101	2.	5.	4.	3.	3.	5.	2.	4.	4.	[illegible]
111	5.	5.	9.	7.	4.	9.	4.	3.	[illegible]	[illegible]
121	2.	5.	8.	7.	5.	5.	4.	7.	[illegible]	[illegible]
131	5.	1.	8.	5.	6.	11.	15.	3.	10.	[illegible]
141	10.	9.	7.	10.	9.	7.	8.	9.	10.	[illegible]
151	9.	14.	9.	14.	7.	15.	13.	22.	18.	18.
161	16.	16.	22.	19.	31.	24.	16.	17.	29.	22.
171	24.	26.	32.	18.	19.	26.	30.	44.	35.	53.
181	35.	40.	57.	43.	54.	55.	56.	71.	61.	81.
191	56.	86.	77.	84.	114.	111.	111.	136.	122.	162.
201	179.	199.	206.	234.	239.	254.	312.	339.	347.	[illegible]
211	460.	463.	530.	549.	660.	681.	743.	782.	837.	[illegible]
221	999.	999.	1029.	1033.	1055.	1012.	1060.	1020.	980.	[illegible]
231	884.	843.	717.	659.	612.	555.	439.	356.	295.	[illegible]
241	201.	193.	138.	78.	85.	41.	49.	35.	[illegible]	[illegible]
251	22.	19.	13.	16.	17.	16.	21.	16.	20.	[illegible]
261	22.	19.	30.	19.	21.	31.	28.	28.	26.	[illegible]
271	29.	29.	37.	41.	44.	57.	48.	63.	58.	65.
281	66.	75.	73.	102.	99.	101.	112.	114.	126.	147.
291	159.	147.	168.	177.	162.	196.	161.	178.	169.	176.
301	266.	164.	158.	143.	151.	137.	122.	117.	96.	123.
[illegible]	102.	94.	67.	71.	62.	60.	58.	62.	43.	[illegible]
321	52.	56.	50.	71.	71.	65.	80.	101.	108.	[illegible]
331	106.	126.	121.	145.	148.	191.	176.	197.	249.	[illegible]
341	303.	313.	357.	352.	408.	433.	439.	462.	503.	[illegible]
351	603.	627.	636.	703.	669.	704.	760.	695.	722.	[illegible]
361	691.	681.	684.	619.	573.	579.	499.	458.	413.	[illegible]
371	252.	290.	212.	185.	173.	131.	111.	90.	76.	[illegible]
381	37.	31.	18.	16.	10.	9.	10.	1.	[illegible]	[illegible]
391	0.	1.	0.	0.	0.	0.	1.	2.	[illegible]	[illegible]
401	1.	1.	0.	5.	0.	2.	0.	2.	[illegible]	[illegible]
411	1.	2.	1.	1.	1.	0.	1.	1.	1.	[illegible]
421	0.	1.	2.	1.	2.	2.	4.	1.	0.	[illegible]
431	1.	0.	1.	1.	1.	0.	0.	0.	1.	[illegible]
441	0.	0.	3.	0.	2.	0.	1.	1.	0.	[illegible]
451	0.	0.	1.	0.	0.	1.	0.	0.	1.	[illegible]
461	2.	2.	2.	1.	1.	1.	3.	1.	[illegible]	[illegible]
471	3.	3.	1.	5.	7.	8.	6.	2.	[illegible]	[illegible]
481	0.	0.	0.	2.	0.	0.	0.	2.	0.	[illegible]
491	0.	1.	5.	5.	11.	24.	26.	6.	0.	[illegible]
501	0.	0.								

MB Lee 12-9-93

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT

WHC-SD-WM-DP-062, REV. 0

SAMPLE
J-1424-5981 SPIK
File ID: 8a8641.CNF

Counted on: 12/29/93 @ 4: 9
Detector: AEA8
Geometry number: 1
Count time: 86401. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	1660.5	1660.5	360.995	360.995	14.000	6.810	7.000	2.799
2	366.8	366.8	302.921	302.894	14.000	6.757	7.000	2.757
3	5504.0	5504.0	228.917	228.916	14.000	7.126	7.000	3.852
4?	16.3	16.3	144.228	144.224	110.000	1.000	55.000	0.100

PEAK RESULTS
Peak Error Limit: 25%

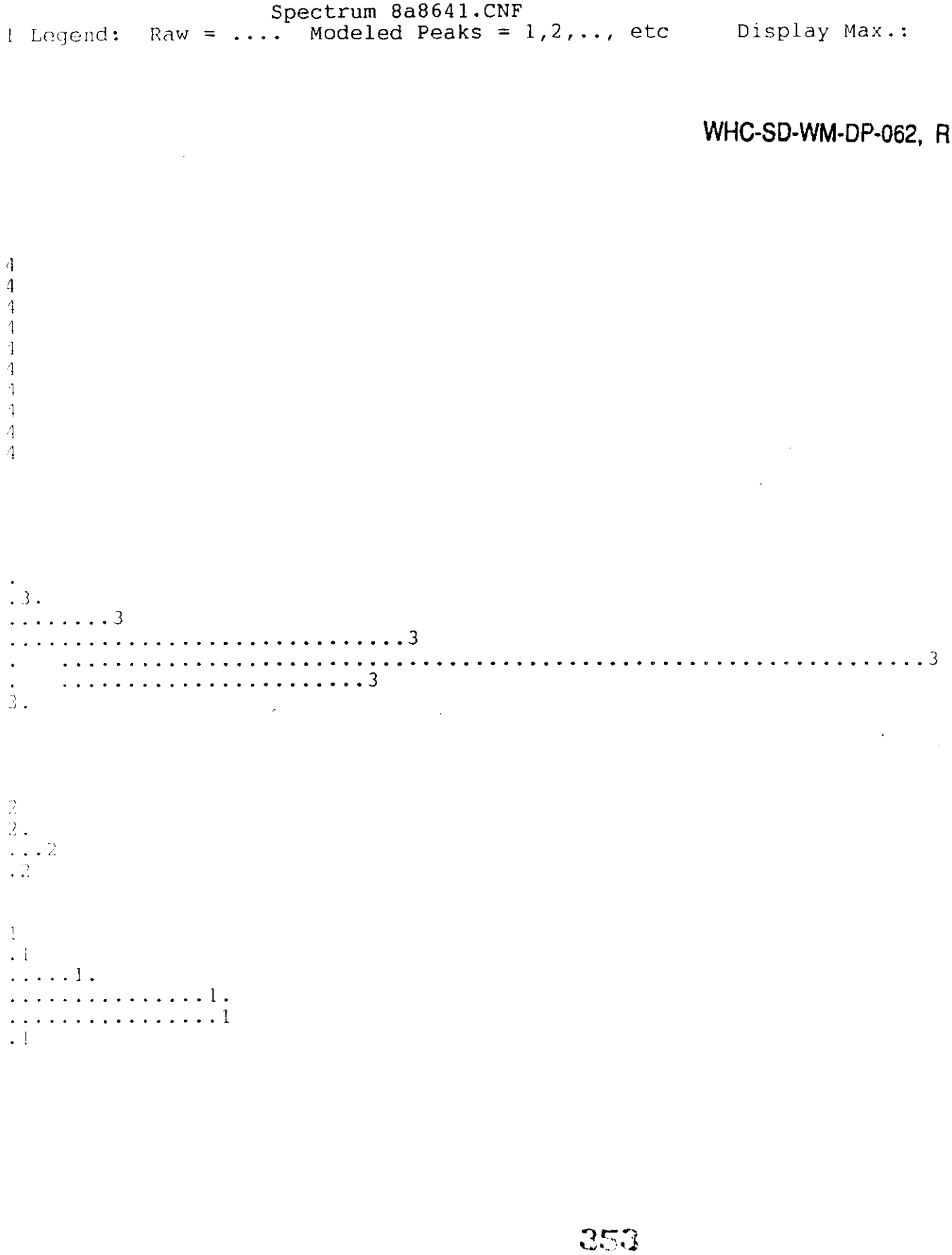
Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Cm244	0.230	5.796	5.788	0.008	0.03	18.92	1.2	147.5	0.665E-04
	Cm243		5.786	5.788	-.002				202.1	0.910E-04
2	Pu238	0.051	5.499	5.515	-.016	0.03	4.18	2.6	45.3	0.204E-04
	Am241		5.480	5.515	-.035				34.7	0.156E-04
3	Pu239	0.692	5.143	5.167	-.024	0.03	56.99	0.7	444.5	0.200E-03
	Pu240		5.144	5.167	-.023				444.5	0.200E-03
4		????		4.769			0.43	7.9		
Totals:		0.973	<--valid peaks only-->				80.09			

DETECTOR CALIBRATION
Energy(MEV) = 4.091 + (0.0047)*Channel
Energy range (MeV): 4.091 TO 6.497
Efficiency = 0.1282 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	118567.0	100.000
Smoothed	118567.0	100.000
Composite fit	115942.2	97.786
Residuals	2624.8	2.214

Analyzed by: _____
DM


Spectrum 8a8641.CNF
Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.: 39799.4

Raw Data Dump for AEA Spectrum: 8a8641.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	1.	5.	8.	6.
21	2.	4.	5.	4.	4.	2.	9.	4.	4.	1.
31	3.	7.	2.	4.	1.	2.	6.	3.	3.	6.
41	5.	5.	4.	3.	2.	5.	6.	1.	3.	4.
51	5.	0.	2.	6.	2.	1.	2.	4.	0.	5.
61	2.	4.	2.	4.	4.	6.	5.	3.	5.	4.
71	6.	3.	5.	4.	3.	6.	2.	3.	4.	6.
81	4.	10.	6.	6.	2.	5.	8.	3.	9.	4.
91	3.	4.	3.	4.	9.	7.	5.	1.	4.	3.
101	3.	7.	10.	8.	6.	5.	7.	3.	3.	4.
111	6.	0.	3.	5.	6.	2.	8.	5.	8.	4.
121	5.	5.	3.	5.	4.	6.	7.	5.	10.	11.
131	10.	8.	10.	6.	7.	12.	11.	11.	11.	8.
141	15.	9.	16.	15.	17.	14.	7.	11.	13.	13.
151	16.	16.	14.	17.	18.	22.	15.	14.	15.	16.
161	20.	16.	20.	18.	24.	24.	18.	26.	19.	30.
171	17.	34.	36.	29.	39.	35.	41.	42.	42.	33.
181	10.	45.	50.	57.	47.	66.	68.	73.	71.	70.
191	81.	101.	92.	112.	117.	104.	120.	147.	148.	114.
201	166.	179.	203.	215.	267.	261.	317.	347.	366.	341.
211	531.	602.	642.	840.	969.	1187.	1280.	1503.	1808.	2131.
221	2183.	2861.	3461.	4031.	4598.	5138.	5788.	6149.	6122.	5361.
231	5287.	4445.	3661.	2730.	1900.	1273.	793.	485.	230.	133.
241	52.	29.	12.	11.	6.	9.	9.	11.	11.	12.
251	9.	17.	8.	14.	17.	13.	12.	24.	21.	19.
261	17.	31.	26.	24.	21.	24.	22.	21.	23.	20.
271	18.	20.	13.	19.	20.	21.	17.	24.	20.	23.
281	23.	29.	43.	30.	40.	55.	57.	95.	95.	103.
291	119.	145.	183.	185.	225.	233.	255.	294.	340.	339.
301	387.	398.	396.	395.	376.	294.	234.	177.	119.	73.
311	40.	23.	26.	21.	19.	11.	21.	22.	19.	28.
321	19.	27.	21.	29.	40.	22.	38.	35.	43.	47.
331	41.	53.	44.	70.	64.	74.	99.	100.	139.	133.
341	126.	162.	193.	238.	284.	349.	380.	490.	617.	667.
351	859.	893.	956.	1028.	1168.	1264.	1359.	1581.	1747.	1771.
361	1804.	1785.	1647.	1391.	1093.	768.	552.	303.	190.	111.
371	18.	19.	5.	4.	0.	0.	0.	1.	0.	0.
381	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
391	1.	0.	0.	0.	0.	0.	2.	0.	0.	1.
401	0.	0.	0.	1.	1.	2.	2.	0.	2.	1.
411	2.	0.	3.	2.	1.	1.	2.	2.	3.	1.
421	2.	0.	1.	0.	0.	1.	0.	0.	1.	0.
431	2.	0.	0.	0.	0.	0.	1.	0.	1.	1.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	1.	0.	0.	0.	0.	0.	0.	0.	1.	0.
471	0.	1.	0.	0.	0.	0.	1.	1.	1.	2.
481	0.	0.	1.	1.	2.	1.	1.	2.	0.	1.
491	2.	0.	0.	0.	0.	0.	0.	0.	0.	0.
501	0.	0.								

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT

WHC-SD-WM-DP-062, REV. 0

SAMPLE
J-1424-5981 SPIK
File ID: 7a7426.CNF

Counted on: 12/29/93 @ 3:12
Detector: AEA7
Geometry number: 1
Count time: 86404. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	1220.7	1220.7	362.834	362.834	16.000	10.274	8.000	4.[illegible]
2	278.9	278.9	305.157	305.145	14.000	8.999	7.[illegible]	[illegible]
3	4187.6	4187.6	231.273	231.273	18.000	10.369	9.000	[illegible]

PEAK RESULTS
Peak Error Limit: 25%

	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err 095	d/m	Activity pCi/[illegible]
1	Am241	0.225	5.796	5.792	0.004	0.05	14.94	1.3	135.6	[illegible]
	Cm243		5.786	5.792	-.006				199.2	[illegible]
2	Pu238	0.050	5.499	5.521	-.022	0.04	3.33	2.9	35.1	[illegible]
	Am241		5.480	5.521	-.041				34.6	[illegible]
3	Pu239	0.727	5.143	5.174	-.031	0.05	48.33	0.7	471.1	[illegible]
	Pu240		5.144	5.174	-.030				471.1	[illegible]
Totals:		1.002	<--valid peaks only-->				66.60			

DETECTOR CALIBRATION
Energy(MEV) = 4.087 + (0.0047)*Channel
Energy range (MeV): 4.087 TO 6.193
Efficiency = 0.1026 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	95722.0	100.000
Smoothed	95722.0	100.000
Composite fit	95911.9	100.198
Residuals	-189.9	-0.198

Analyzed by: [illegible]
DM

Spectrum 7a7426.CNF
Second: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.:

Raw Data Dump for AEA Spectrum: 7a7426.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	0.	0.
21	0.	0.	0.	0.	2.	0.	1.	1.	1.
	2.	2.	0.	1.	0.	1.	1.	0.	1.
	0.	1.	1.	1.	0.	2.	0.	0.	0.
51	0.	0.	0.	0.	1.	1.	0.	0.	1.
61	0.	1.	1.	0.	1.	0.	1.	3.	0.
71	0.	0.	5.	1.	0.	5.	3.	0.	0.
	1.	1.	1.	0.	0.	0.	0.	2.	1.
91	1.	1.	0.	2.	1.	1.	2.	0.	1.
101	1.	2.	0.	1.	0.	1.	1.	1.	0.
111	2.	2.	2.	0.	1.	4.	2.	2.	2.
121	3.	1.	1.	2.	1.	3.	3.	3.	0.
131	2.	2.	5.	1.	5.	3.	0.	3.	1.
141	7.	2.	5.	5.	3.	1.	5.	4.	3.
151	0.	2.	2.	2.	2.	7.	5.	3.	3.
161	3.	2.	6.	2.	1.	3.	4.	5.	7.
171	4.	2.	5.	8.	6.	4.	5.	4.	6.
181	11.	6.	6.	6.	14.	7.	8.	15.	12.
191	15.	20.	18.	17.	16.	23.	27.	27.	38.
201	37.	63.	55.	52.	69.	88.	88.	98.	137.
211	192.	244.	292.	430.	492.	577.	745.	877.	1031.
221	1511.	1759.	2000.	2459.	2830.	3185.	3715.	3993.	4259.
231	3512.	1538.	4093.	3807.	3413.	2951.	2262.	1828.	1371.
241	671.	489.	304.	161.	119.	64.	22.	18.	14.
251	2.	6.	0.	6.	6.	3.	2.	5.	3.
261	3.	6.	4.	5.	5.	6.	7.	6.	10.
271	8.	11.	3.	6.	5.	8.	9.	8.	9.
281	12.	17.	12.	17.	21.	22.	30.	48.	41.
291	69.	79.	105.	92.	108.	151.	148.	188.	221.
301	255.	288.	251.	311.	291.	310.	281.	236.	203.
	115.	106.	69.	46.	39.	31.	20.	10.	7.
	3.	1.	4.	8.	6.	13.	15.	9.	17.
	12.	12.	13.	19.	13.	27.	20.	31.	32.
	56.	63.	76.	104.	134.	177.	230.	288.	3[illegible].
	132.	510.	570.	633.	757.	823.	929.	1003.	1021.
	1216.	1234.	1392.	1241.	1120.	1053.	905.	790.	6[illegible].
	232.	213.	157.	95.	74.	26.	35.	12.	8.
	1.	0.	0.	0.	0.	0.	0.	0.	
	0.	0.	0.	1.	0.	0.	0.	0.	0.
401	0.	0.	1.	0.	1.	1.	0.	0.	0.
411	0.	1.	0.	2.	1.	1.	0.	3.	1.
421	1.	0.	1.	0.	1.	0.	2.	0.	0.
431	0.	0.	0.	1.	1.	0.	0.	1.	0.
441	0.	1.	0.	0.	0.	0.	0.	0.	1.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	1.	0.	1.	0.	1.
481	1.	0.	0.	1.	0.	1.	1.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.
501	12.	0.							

WESTINGHOUSE HANFORD COMPANY

222-S LABORATORY

ANALYTICAL BATCH 2399

Lab Segment Serial No.	Customer ID:
J1425	KE64A
Analysis: Pu 239/240	**Sample Prep:** DIRECT

Instrument: LuB 537 237	**Procedure/ Rev:** LA 503 - 156 - DO
Technologist: Joel mVANSANT	**Date:** ~~1-4-93~~ 1-4-94 1.24.94
Starting Time: 1800	**Temperature** 25°C
Ending Time: 2300	**Chemist:** L Fritts

Comments: AEA 24 HRS

	Description	Lab ID
1	LMCS	J1401-5581
2	BLANK	J1402-5681
3	SAMPLE	J1425-5781
4	SAMPLE DUP	J1425-5781
5	SAMPLE TRIP	J1425-5781
6	Spike	J1425-5981
7	Spike Dup	J1425-5981
8		
9		
10		

	Description	Lab ID
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS	63843	.100mL-10-.100mL		
Spike	77843	.05mL		
		258		

ANALYTICAL BATCH SUMMARY SHEET

METHOD: **LA-503-156**

DATE START: **January 4, 1993**

PREPARED BY: **L.L. Fritts** L.L. Fritts 1-13-94

DATE COMPLETE: **January 13, 1994**

	UNITS:	uCi/mL									
SPL NAME	SPL ID	ANALYTE	RESULT #1	RESULT #2	RESULT #3	AVERAGE	2*SD	PREC	%REC	DET LIM	% CT ER
STD 63B43	J1401	Pu-239/40	1.36E+2						104.2	1.11E-2	0.8
BLANK	J1402	Pu-239/40	<1.28E-3						51.1	1.28E-3	5.8
KE64A	J1425	Pu-239/40	3.17E-2	3.08E-2	2.85E-2	3.03E-2	3.30E-3	10.9	57.7	3.14E-3	0.8
									74.5	2.97E-3	0.7
									54.0	2.75E-3	1.1
KE64A	J1425	239 Spike	101.6	106.2						5.40E-3	0.8
										5.40E-3	0.8
STD 63B43	J1401	Pu-238	<1.49E+1						N/A	1.49E-2	100.0
BLANK	J1402	Pu-238	<5.93E-3						51.1	5.93E-3	100.0
KE64A	J1425	Pu-238	<5.26E-3	<4.07E-3	<5.61E-3	N/A	N/A	N/A	57.7	5.26E-3	1.4
									74.5	4.07E-3	1.2
									54.0	5.61E-3	2.1

NARRATIVE: [X] NO SPECIAL PROBLEMS/METHOD VARIATIONS IN THIS BATCH

LIST SPECIFIC PROBLEMS/VARIATIONS FOR THIS BATCH:

The results for the standard are in uCi/L.

The results for the spike are in percent recovery.

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

#1 7440 Batch 2399

Serial No	Sample Point	Date	Time Issued	Priority
J 1401.-5581	BECHTOLD	12-15-93	9:.0	22

Determination	Method-Standard	Result Units	Charge Code	Reruns
Pu239/40	LA-503-156	% RECOVERY	E14157	0

Sample Size	Customer ID
? .100-10-.1mL	STD

Remarks Calculations Results

EDP R211 AR001

STD# 68B43 RESULT 136

STD VAL. 130.5 %REC 104.2%

.05mL 77B43

"AEA" - 24 HRS

ATTACH PRINTOUT

WHC-SD-WM-DP-062, REV. 0

Analyst	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	Raymond	[signature]		
Hrs	Hrs 1-5-94	Hrs 1-6-94	Hrs Rabits	Hrs [signature]
Date 1-4-94	Time Completed	Lab Mgr [signature]	[signature]	

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

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

				STANDARD
Serial No.	Date Counted	01/05/94	Pu 236 AEA Frac. (C236)	0.312
J1401-5581	Sample Volume in mL (SS)	0.1	Pu 238 AEA Frac. (C238)	0
Batch ID	Sample D.F. (DF)	101	Pu 239 AEA Frac. (C239)	0.614
2399	Tracer Volume in mL (SPKV)	0.05	Total AT Counts	9220
Rerun No.	Digest D.F. (DDF)	1	Time Counted in min (TC)	60
0	Tracer Book No.	77B43	Background in cpm (Bkg)	4
Analyst	Tracer Preparation Date	10/12/93	Pu 236 Counts	17.83
J VAN SANT	Pu-236 Preparation Value	3226	Pu 238 Counts	0
Date	Pu-236 Decay Corr'd Value	3048.48	Pu 239 Counts	35.07
01/04/94	Pu-238 Tracer Value	133	AEA Count Time in min	1440.05

Decay Time = Date Counted - Tracer Preparation Date

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

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SS

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

Pu 238 dpm = (Total AT Counts / TC) - Bkg * 2 * C238 - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

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

Pu-239/240 µCi/L	=	1.36E+02

NOTE: Tracer values are in dpm/mL.

Pu-239/240 µCi/mL	=	1.36E-01
Relative Counting Error	=	0.8%
Pu-238 µCi/mL	=	< 1.49E-02
Relative Counting Error	=	100.0%
Pu 236 Tracer Recovery	=	61.3%

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

DETECTION LEVELS in µCi/mL					
Pu 239/240	=	1.11E-02	Pu 238	=	1.49E-02

Data Entry by:	CA Clark	Date:	11-Jan-94
Approved by:	[signature]	Date:	12 Jan 1994

Form 1 Rev. 1.4

Page 1 of 1

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#3 VR 1-5-94
9220/60 - 4

J 1401-5581

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

#5 5002

Serial No	Sample Point	Date	Time Issued	Priority
J 1402.-5681	BECHTOLD	12-15-93	9: 4	22

Determination	Method Standard	Result Units	Charge Code	Reruns
Pu239/40	LA-503-156	uCi/ML	E14157	0

Sample Size	Customer ID
? -1mL - 10 - .300mL	BLK

Remarks Calculations, Results

REAGENT BLANK

COUNT AS uCI/L

24HR3

"AEA" - ATTACH PRINTOUT

.05mL 77B43

< 1.28E-3 µCi/mL

WHC-SD-WM-DP-062, REV. 0

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	Raymond			
Hrs	Hrs	Hrs	Hrs	Hrs
	1-5-94	1-6-94		
Date	Time Completed	Lab Unit Mgr		
1-4-94				

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

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

Serial No.				BLANK
J1402-5681	Date Counted	01/05/94	Pu 236 AEA Frac. (C236)	0.901
Batch ID	Sample Volume in mL (SS)	0.3	Pu 238 AEA Frac. (C238)	0
2399	Sample D.F. (DF)	101	Pu 239 AEA Frac. (C239)	0.011
Rerun No.	Tracer Volume in mL (SPKV)	0.05	Total AT Counts	2655
0	Digest D.F. (DDF)	1	Time Counted in min (TC)	60
Analyst	Tracer Book No.	77B43	Background in cpm (Bkg)	1
J VAN SANT	Tracer Preparation Date	10/12/93	Pu 236 Counts	16.98
Date	Pu-236 Preparation Value	3226	Pu 238 Counts	0
01/04/94	Pu-236 Decay Corr'd Value	3048.48	Pu 239 Counts	0.21
	Pu-238 Tracer Value	133	AEA Count Time in min	1440.02

Decay Time = Date Counted - Tracer Preparation Date

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

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SS

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

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

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

Pu-239/240 µCi/L	=	< 1.28E+00

NOTE: Tracer values are in dpm/mL.

Pu-239/240 µCi/mL	=	< 1.28E-03
Relative Counting Error	=	5.8%
Pu-238 µCi/mL	=	< 5.93E-03
Relative Counting Error	=	100.0%
Pu 236 Tracer Recovery	=	51.1%

NOTE: Pu 239/240 Reported result is a LESS THAN value using 0.05 for the Pu-239/240 peak height.

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

DETECTION LEVELS in µCi/mL					
Pu 239/240	=	1.28E-03	Pu 238	=	5.93E-03

Data Entry by:	C A Clark	Date:	11-Jan-94
Approved by:	L L Smith	Date:	12 Jan 1994

Form 1 Rev. 1.4

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#2 vr 1-5-94
2655 - 1
60

J1402-5681

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

#2 2510

Serial No	Sample Point	Date	Time Issued	Priority
J 1425.-5781	BECHTOLD	12-16-93	13:17	22

Determination	Method-Standard	Result Units	Charge Code	Reruns
Pu239/40	LA-503-156	uCi/ML	E14157	0

Sample Size	Customer ID
?,1mL-10 - .300mL	KE64A

Remarks, Calculations, Results

COUNT AS uCI/L SAMPLE 24HRS

"AEA" - ~~AGGMAN~~ ATTACH PRINTOUT

.05mL 77843 3.17×10^{-8} uCi/ml

WHC-SD-WM-DP-062, REV. 0

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
	1-5-94			
Date	Time Completed	Lab Unit Mgr		
1-4-94				

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

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

Serial No.				SAMPLE
J1425-5781	Date Counted	01/05/94	Pu 236 AEA Frac. (C236)	0.368
Batch ID	Sample Volume in mL (SS)	0.3	Pu 238 AEA Frac. (C238)	0.097
2399	Sample D.F. (DF)	101	Pu 239 AEA Frac. (C239)	0.505
Rerun No.	Tracer Volume in mL (SPKV)	0.05	Total AT Counts	7526
0	Digest D.F. (DDF)	1	Time Counted in min (TC)	60
Analyst	Tracer Book No.	77B43	Background in cpm (Bkg)	6
J VAN SANT	Tracer Preparation Date	10/12/93	Pu 236 Counts	18.17
Date	Pu-236 Preparation Value	3226	Pu 238 Counts	4.77
01/04/94	Pu-236 Decay Corr'd Value	3048.48	Pu 239 Counts	24.93
	Pu-238 Tracer Value	133	AEA Count Time in min	1440.03

Decay Time = Date Counted - Tracer Preparation Date

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

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * (C236 * 100 / Pu-236 Decay Corr'd Value * SS

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

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * (238) - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / (Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS

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

Pu-239/240 µCi/L	=	3.17E+01

NOTE: Tracer values are in dpm/mL.

Pu-239/240 µCi/mL	=	3.17E-02
Relative Counting Error	=	0.8%
Pu-238 µCi/mL	=	< 5.26E-03
Relative Counting Error	=	1.4%
Pu 236 Tracer Recovery	=	57.7%

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

DETECTION LEVELS in µCi/mL					
Pu 239/240	=	3.14E-03	Pu 238	=	5.26E-03

Data Entry by:	PA Clark	Date:	11-Jan-94
Approved by:	LA Fitts	Date:	12 Jan 1994

Form 1 Rev. 1.4

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#1 VR 1-5-94

7526 6
60

J1425-5781
#2

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

#3 3572

Serial No	Sample Point	Date	Time Issued	Priority
J 1425.-5781	BECHTOLD	12-16-93	13:17	22

Determination	Method-Standard	Result Units	Charge Code	Reruns
Pu239/40	LA-503-156	uCi/ML	E14157	0

Sample Size	Customer ID
? .100mL-10-.300mL	KE64A

Remarks Calculations Results

COUNT AS uCI/L DUP 24HRS

"AEA" - [illegible]

ATTACH PRINTOUT

.05mL 77843 3.08×10^{-2} uCi/ml

WHC-SD-WM-DP-062, REV. 0

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Van Sant	Raymond	D. H. Milicia		
Hrs	Hrs	Hrs	Hrs	Hrs
	1-5-94			

Date	Time Completed	Lab Log	
1-4-94		[signature]	[signature]

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

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

				SAMPLE
Serial No.	Date Counted	01/05/94	Pu 236 AEA Frac. (C236)	0.389
J1425-5781	Sample Volume in mL (SS)	0.3	Pu 238 AEA Frac. (C238)	0.083
Batch ID	Sample D.F. (DF)	101	Pu 239 AEA Frac. (C239)	0.519
2399	Tracer Volume in mL (SPKV)	0.05	Total AT Counts	9000
Rerun No.	Digest D.F. (DDF)	1	Time Counted in min (TC)	60
0	Tracer Book No.	77B43	Background in cpm (Bkg)	4
Analyst	Tracer Preparation Date	10/12/93	Pu 236 Counts	26.49
J VAN SANT	Pu-236 Preparation Value	3226	Pu 238 Counts	5.64
Date	Pu-236 Decay Corr'd Value	3048.48	Pu 239 Counts	35.36
01/04/94	Pu-238 Tracer Value	133	AEA Count Time in min	1440.02

Decay Time = Date Counted - Tracer Preparation Date

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

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SS

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

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

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

Pu-239/240 µCi/L	=	3.08E+01

NOTE: Tracer values are in dpm/mL.

Pu-239/240 µCi/mL	=	3.08E-02
Relative Counting Error	=	0.7%
Pu-238 µCi/mL	=	< 4.07E-03
Relative Counting Error	=	1.2%
Pu 236 Tracer Recovery	=	74.5%

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

DETECTION LEVELS in µCi/mL					
Pu 239/240	=	2.97E-03	Pu 238	=	4.07E-03

Data Entry by:	CA Clark	Date:	11-Jan-94
Approved by:	[signature]	Date:	12 Jan 1994

Form 1 Rev. 1.4

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Page 1 of 1

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#3 VR 1-5-94

$\frac{9000}{60} - 4$

J1425-5781

#3

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

#4 4082

Serial No	Sample Point	Date	Time Issued	Priority
J 1425.-5781	BECHTOLD	12-16-93	13:17	22

Determination	Method/Standard	Result Units	Charge Code	Reruns
Pu239/40	LA-503-156	uCi/ML	E14157	0

Sample Size	Customer ID
?.100mL-10-.300mL	KE64A

Remarks, Calculations, Results

COUNT AS uCI/L TRIP 2498 "AEA" ATTACH PRINTOUT

.05mL 77843 2.85×10^{-2} uCi/ml

WHC-SD-WM-DP-062, REV. 0

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
	1-5-94			
Date	Time Completed	Lab Unit Mgr.		
1-4-94				

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

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

Serial No.	Date Counted	01/05/94	Pu 236 AEA Frac. (C236)	SAMPLE 0.421
J1425-5781	Sample Volume in mL (SS)	0.3	Pu 238 AEA Frac. (C238)	0.073
Batch ID	Sample D.F. (DF)	101	Pu 239 AEA Frac. (C239)	0.519
2399	Tracer Volume in mL (SPKV)	0.05	Total AT Counts	5929
Rerun No.	Digest D.F. (DDF)	1	Time Counted in min (TC)	60
0	Tracer Book No.	77843	Background in cpm (Bkg)	1
Analyst	Tracer Preparation Date	10/12/93	Pu 236 Counts	11.11
J VAN SANT	Pu-236 Preparation Value	3226	Pu 238 Counts	1.93
Date	Pu-236 Decay Corr'd Value	3048.48	Pu 239 Counts	13.7
01/04/94	Pu-238 Tracer Value	133	AEA Count Time in min	1440.03

Decay Time = Date Counted - Tracer Preparation Date

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

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SS

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

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

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

Pu-239/240 µCi/L	=	2.85E+01

NOTE: Tracer values are in dpm/mL.

Pu-239/240 µCi/mL	=	2.85E-02
Relative Counting Error	=	1.1%
Pu-238 µCi/mL	=	< 5.61E-03
Relative Counting Error	=	2.1%
Pu 236 Tracer Recovery	=	54.0%

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

DETECTION LEVELS in µCi/mL					
Pu 239/240	=	2.75E-03	Pu 238	=	5.61E-03

Data Entry by:	CA Van Sant	Date:	11-Jan-94
Approved by:		Date:	12 Jan 1994

Form 1 Rev. 1.4

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#2 1-5-94
5929 - 1
60

J1425-5781

#4

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

#6 6912

Serial No	Sample Point	Date	Time Issued	Priority
J 1425.-5981	BECHTOLD	12-16-93	13:17	22

Determination	Method Standard	Result Units	Charge Code	Reruns
Pu239/24	LA-503-156	% RECOVERY	E14157	0

Sample Size	Customer ID
?.100mL-10-.300mL	KE64A

Remarks, Calculations, Results

SAMPLE SPIKED ID 63843 PRICE .100mL-.100mL

SPIKE ID 77843

SPIKE VOLUME COUNT AS µCi/L .05mL

"AEA" - 24 HRS ATTACH PRINTOUT

101.6 % Rec.

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
	1-5-94			
Date	Time Completed	Lab Supervisor		
1-4-94				

54-5800-061 (R-10-83)

FGF 2.10.94

(75.9 - 31.7) (101/101) (100) = 101.6 %

130.5

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

CHK EXT NO.

Serial No.	Date Counted	01/05/94	Pu 236 AEA Frac. (C236)	0.214
J1425-5981	Sample Volume in mL (SS)	0.3	Pu 238 AEA Frac. (C238)	0.058
Batch ID	Sample D.F. (DF)	101	Pu 239 AEA Frac. (C239)	0.703
2399	Tracer Volume in mL (SPKV)	0.05	Total AT Counts	9555
Rerun No.	Digest D.F. (DDF)	1	Time Counted in min (TC)	60
0	Tracer Book No.	77843	Background in cpm (Bkg)	6
Analyst	Tracer Preparation Date	10/12/93	Pu 236 Counts	15.1
J VAN SANT	Pu-236 Preparation Value	3226	Pu 238 Counts	4.11
Date	Pu-236 Decay Corr'd Value	3048.48	Pu 239 Counts	49.53
01/04/94	Pu-238 Tracer Value	133	AEA Count Time in min	1440.05

Decay Time = Date Counted - Tracer Preparation Date

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

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SS

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

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

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

Pu-239/240 µCi/L	=	7.59E+01

NOTE: Tracer values are in dpm/mL.

Pu-239/240 µCi/mL	=	7.59E-02
Relative Counting Error	=	0.8%
Pu-238 µCi/mL	=	< 7.05E-03
Relative Counting Error	=	1.5%
Pu 236 Tracer Recovery	=	43.0%

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

DETECTION LEVELS in µCi/mL					
Pu 239/240	=	5.40E-03	Pu 238	=	7.05E-03

Data Entry by:	C A Clark	Date:	11-Jan-94
Approved by:		Date:	12 Jan 1994

Form 1 Rev. 1.4

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#1 R 1-5-94
9555/60 -6

J1425-5981
#6

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

#8 8654

Serial No	Sample Point	Date	Time Issued	Priority
J 1425.-5981	BECHTOLD	12-16-93	13:17	22

Determination	Method/Standard	Result Units	Charge Code	Reruns
Pu239/24	LA-503-156	% RECOVERY	E14157	0

Sample Size	Customer ID
?.100mL-10-.300mL	KE64A

Remarks, Calculations, Results

SAMPLE SPIKED ID 63848K DUP .100mL10-.100mL

SPIKE ID 77843

SPIKE VOLUME COUNT AS uCI/L .05mL

24HRS

ATTACH PRINTOUT

106.2 % Rec.

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	Raymond	D.H. Milligan		
Hrs	Hrs	Hrs	Hrs	Hrs
	1-5-94			
Date	Time Completed	Lab Unit Mgr		
1-4-94				

54-5800-061 (R-10-83)

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

CHK EXT NO.

Serial No.	Date Counted	01/05/94	Pu 236 AEA Frac. (C236)	0.214
J1425-5981	Sample Volume in mL (SS)	0.3	Pu 238 AEA Frac. (C238)	0.055
Batch ID	Sample D.F. (DF)	101	Pu 239 AEA Frac. (C239)	0.713
2399	Tracer Volume in mL (SPKV)	0.05	Total AT Counts	9345
Rerun No.	Digest D.F. (DDF)	1	Time Counted in min (TC)	60
0	Tracer Book No.	77843	Background in cpm (Bkg)	4
Analyst	Tracer Preparation Date	10/12/93	Pu 236 Counts	13.41
J VAN SANT	Pu-236 Preparation Value	3226	Pu 238 Counts	3.44
Date	Pu-236 Decay Corr'd Value	3048.48	Pu 239 Counts	44.66
01/04/94	Pu-238 Tracer Value	133	AEA Count Time in min	1440.05

Decay Time = Date Counted - Tracer Preparation Date

Pu-236 Decay Corr'd Value = Pu-236 Preparation Value * 'e to the power of ((-ln2 * Decay Time) / 1040.05)

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SS

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

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

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

Pu-239/240 µCi/L	=	7.70E+01

NOTE: Tracer values are in dpm/mL.

Pu-239/240 µCi/mL	=	7.70E-02
Relative Counting Error	=	0.8%
Pu-238 µCi/mL	=	< 7.12E-03
Relative Counting Error	=	1.6%
Pu 236 Tracer Recovery	=	42.6%

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

DETECTION LEVELS in µCi/mL					
Pu 239/240	=	5.40E-03	Pu 238	=	7.12E-03

Data Entry by:	C A Clark	Date:	11-Jan-94
Approved by:		Date:	12 Jan 1994

Form 1 Rev. 1.4

(77.0 - 30.5) (101 / 1) (101 / 3) (100) = 106.2 %

101 1324.64

130.5

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#3 vr 1-5-94

9345/60 - 4

J1425-5981

#8

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT

WHC-SD-WM-DP-062, REV. 0

SAMPLE
J1401-5581
File ID: 7a7440.CNF

Counted on: 1/ 5/94 @ 5:12
Detector: AEA7
Geometry number: 1
Count time: 86403. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	1046.8	1046.8	361.312	361.312	20.000	15.005	10.000	4.089
2	2199.2	2199.2	230.291	230.291	20.000	12.862	10.000	3.697
3	21.5	21.5	113.605	113.582	154.000	1.000	77.000	0.100
4?	0.8	0.1	93.663	90.000	4.000	0.100	2.000	0.100

PEAK RESULTS
Peak Error Limit: 25%

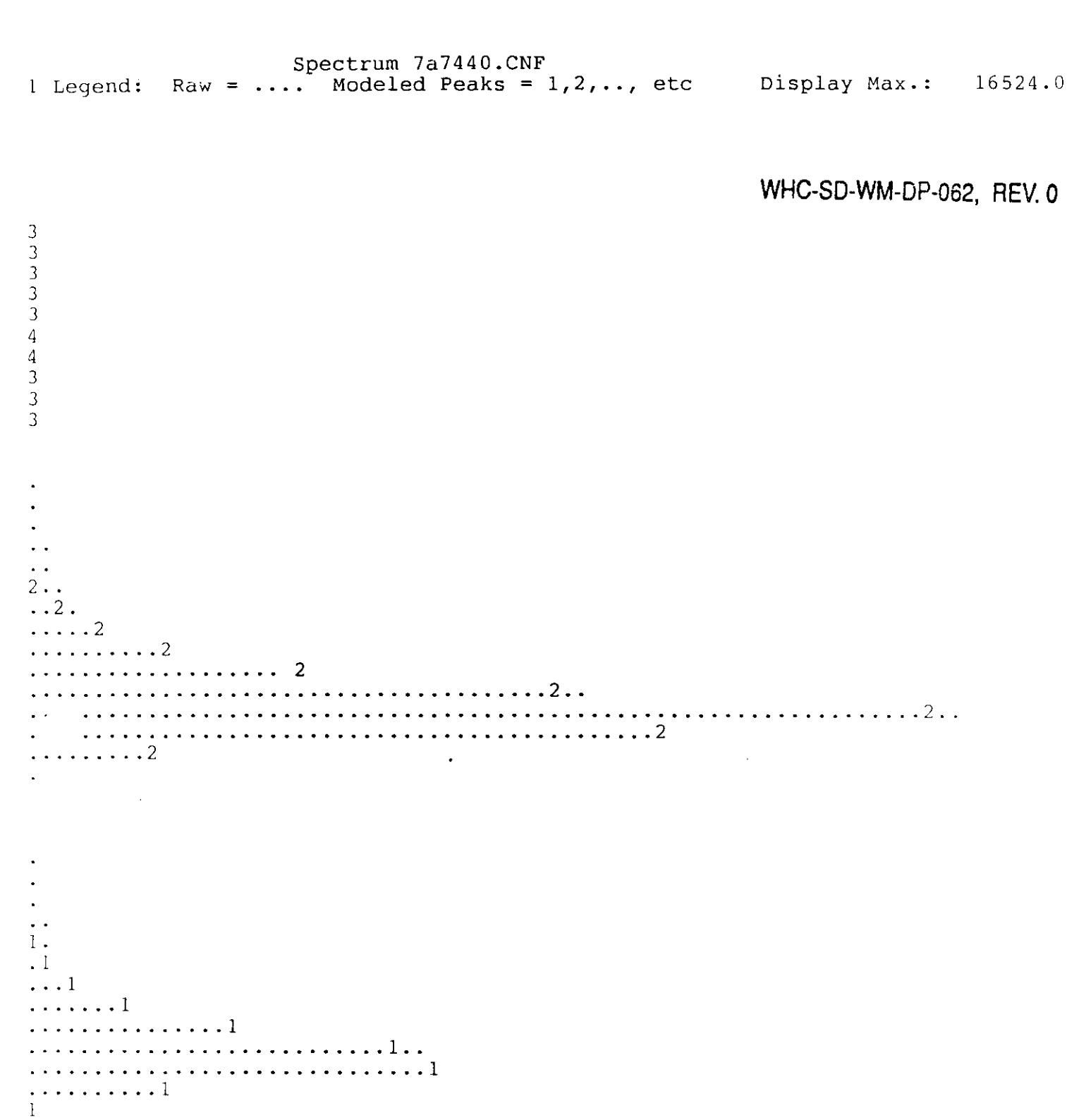
Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Cm243	0.312	5.786	5.778	0.008	0.07	17.83	1.2	200.9	0.905E-04
	Cm244		5.796	5.778	0.018				146.6	0.661E-04
2	Pu239	0.614	5.143	5.162	-.019	0.06	35.07	0.9	288.4	0.130E-03
	Pu240		5.144	5.162	-.018				288.4	0.130E-03
3		????		4.613			0.55	7.0		
4		????		4.502			0.00	8827.		
Totals:		0.926	<--valid peaks only-->				52.91			

DETECTOR CALIBRATION
Energy(MEV) = 4.079 + (0.0047)*Channel
Energy range (MeV): 4.079 TO 6.486
Efficiency = 0.1216 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	82300.0	100.000
Smoothed	82300.3	100.000
Composite fit	76982.9	93.539
Residuals	5317.1	6.461

Analyzed by: _____
VR


Spectrum 7a7440.CNF
Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.: 16524.0

Raw Data Dump for AEA Spectrum: 7a7440.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	4.	7.	3.
21	4.	1.	2.	2.	2.	3.	1.	2.	3.	2.
31	3.	2.	0.	4.	3.	5.	5.	7.	4.	6.
41	5.	3.	3.	6.	4.	3.	3.	6.	1.	2.
51	2.	4.	8.	6.	6.	8.	5.	8.	4.	9.
61	7.	4.	4.	5.	5.	9.	5.	4.	3.	8.
71	4.	6.	6.	12.	10.	5.	7.	6.	6.	9.
81	10.	14.	8.	11.	13.	7.	9.	9.	9.	14.
91	13.	10.	9.	18.	9.	11.	9.	14.	5.	14.
101	8.	18.	10.	15.	19.	21.	12.	15.	15.	17.
111	15.	19.	13.	28.	19.	13.	14.	11.	13.	24.
121	19.	23.	28.	18.	24.	19.	28.	20.	28.	22.
131	23.	24.	40.	26.	25.	32.	26.	36.	37.	28.
141	36.	30.	32.	21.	28.	44.	37.	47.	47.	42.
151	38.	48.	49.	47.	47.	43.	51.	47.	54.	50.
161	63.	62.	52.	49.	62.	69.	72.	72.	72.	73.
171	65.	77.	82.	98.	72.	89.	91.	90.	99.	108.
181	104.	106.	130.	110.	107.	127.	144.	131.	143.	156.
191	169.	170.	197.	184.	192.	206.	232.	211.	239.	211.
201	268.	268.	296.	306.	323.	368.	393.	384.	433.	479.
211	547.	547.	670.	714.	742.	840.	959.	1015.	1091.	1262.
221	1423.	1517.	1646.	1760.	1979.	2066.	2230.	2190.	2217.	2349.
231	2282.	2204.	2060.	1855.	1666.	1321.	1137.	1003.	717.	525.
241	413.	304.	203.	138.	98.	79.	51.	48.	20.	24.
251	16.	19.	11.	10.	15.	15.	11.	19.	15.	21.
261	22.	21.	24.	25.	24.	30.	26.	34.	21.	25.
271	20.	23.	23.	25.	21.	19.	27.	24.	19.	22.
281	25.	22.	31.	35.	32.	35.	39.	40.	43.	36.
291	30.	38.	40.	50.	46.	57.	53.	54.	68.	51.
301	49.	57.	69.	64.	51.	74.	68.	64.	76.	64.
311	60.	54.	54.	74.	79.	72.	60.	68.	75.	81.
321	92.	75.	75.	73.	95.	87.	91.	102.	118.	127.
331	136.	127.	129.	130.	184.	182.	167.	191.	197.	195.
341	253.	286.	296.	330.	370.	442.	456.	501.	506.	628.
351	645.	661.	797.	804.	935.	908.	980.	1066.	1070.	1112.
361	1085.	1064.	1070.	1019.	942.	851.	700.	649.	574.	395.
371	336.	220.	173.	118.	98.	57.	47.	23.	13.	7.
381	3.	3.	3.	2.	1.	1.	0.	0.	1.	0.
391	0.	0.	0.	0.	0.	0.	1.	1.	0.	0.
401	0.	0.	0.	0.	0.	1.	0.	2.	0.	1.
411	1.	0.	1.	0.	0.	0.	0.	2.	0.	0.
421	0.	2.	0.	0.	0.	0.	1.	0.	0.	1.
431	1.	0.	1.	1.	0.	1.	0.	0.	1.	1.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	2.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	0.	0.	2.	0.	0.	2.
481	2.	1.	2.	0.	0.	0.	0.	0.	1.	0.
491	1.	0.	1.	1.	0.	0.	0.	0.	0.	0.
511	12.	0.								

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT

WHC-SD-WM-DP-062, REV. 0

SAMPLE
J1402-5681
File ID: 5a5002.CNF

Counted on: 1/ 5/94 @ 5:12
Detector: AEA5
Geometry number: 1
Count time: 86401. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	907.7	907.7	358.170	358.170	22.000	17.120	11.000	4.122
2	26.2	26.2	276.835	275.880	98.000	1.000	49.000	0.100
3?	8.6	8.6	264.290	263.029	10.000	2.485	5.000	0.482
4	5.4	5.4	222.660	222.103	12.000	7.209	6.000	0.539

PEAK RESULTS
Peak Error Limit: 25%

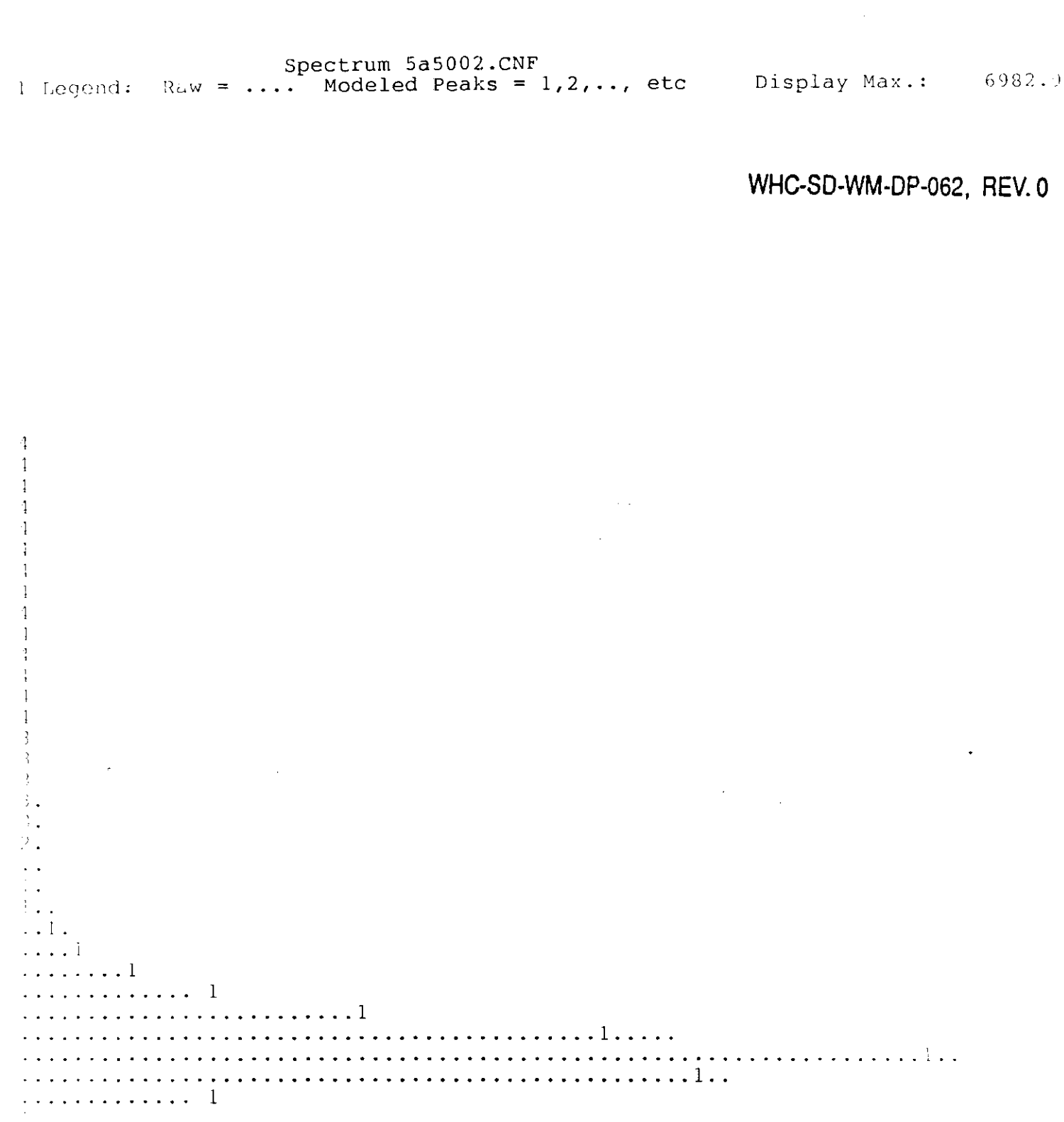
P ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/gm
1	Cm243	0.901	5.786	5.777	0.009	0.08	16.98	1.3	201.4	0.907E-03
	Cm244		5.796	5.777	0.019				147.0	0.662E-03
2		0.037		5.390	0.00		0.70	6.5	6.1	0.274E-04
3		????		5.330			0.14	33.9		
4	Pu239	0.011	5.143	5.138	0.005	0.03	0.21	17.1	1.8	8.013E-06
	Pu240		5.144	5.138	0.006				1.[illegible]	[illegible]
Totals:		0.949	<--valid peaks only-->				17.89			

DETECTOR CALIBRATION
Energy(MEV) = 4.094 + (0.0047)*Channel
Energy range (MeV): 4.094 TO 6.500
Efficiency = 0.1155 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	27147.0	100.000
Smoothed	27146.7	99.999
Composite fit	25956.7	95.615
Residuals	1190.3	4.385

Analyzed by: _____
VR


Spectrum 5a5002.CNF
Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.: 6982.0

Raw Data Dump for AEA Spectrum: 5a5002.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	1.	2.	3.	1.
21	1.	1.	2.	1.	1.	2.	2.	1.	1.	1.
[illegible]	0.	3.	4.	2.	1.	2.	1.	2.	1.	0.
	1.	1.	0.	1.	1.	2.	3.	1.	3.	2.
51	4.	7.	1.	4.	3.	1.	4.	1.	1.	0.
61	2.	4.	1.	6.	2.	3.	3.	3.	1.	1.
71	3.	0.	3.	3.	1.	3.	3.	0.	1.	5.
81	1.	0.	1.	3.	1.	1.	1.	1.	2.	4.
91	2.	2.	6.	3.	5.	0.	2.	2.	0.	3.
101	2.	2.	1.	5.	6.	3.	3.	1.	0.	2.
111	3.	1.	4.	4.	3.	3.	3.	1.	2.	4.
121	5.	0.	1.	4.	2.	2.	3.	3.	3.	1.
131	2.	1.	4.	1.	0.	2.	2.	1.	1.	4.
141	3.	2.	1.	3.	6.	2.	3.	6.	1.	5.
151	1.	6.	4.	1.	1.	6.	5.	5.	8.	1.
161	5.	5.	6.	2.	3.	4.	5.	2.	6.	6.
171	3.	6.	3.	4.	5.	4.	8.	4.	5.	4.
181	9.	6.	8.	7.	6.	4.	7.	7.	9.	1.
191	6.	6.	9.	2.	11.	5.	5.	11.	6.	6.
201	7.	6.	5.	8.	6.	11.	14.	7.	8.	11.
211	13.	10.	6.	11.	12.	12.	11.	11.	8.	12.
221	10.	13.	16.	13.	7.	12.	16.	6.	10.	8.
231	17.	9.	10.	12.	12.	14.	12.	12.	6.	15.
241	13.	13.	12.	9.	16.	21.	16.	31.	17.	13.
251	17.	18.	19.	26.	23.	21.	19.	25.	32.	19.
261	20.	26.	36.	33.	20.	32.	30.	22.	23.	30.
271	24.	21.	27.	24.	31.	19.	34.	26.	25.	28.
281	18.	21.	25.	30.	25.	25.	31.	34.	42.	37.
291	27.	40.	30.	43.	43.	37.	42.	46.	39.	46.
301	42.	42.	58.	49.	41.	59.	46.	48.	55.	56.
3	63.	78.	71.	64.	62.	81.	68.	83.	77.	102.
32.	96.	104.	88.	109.	112.	116.	123.	116.	129.	145.
331	133.	191.	181.	213.	219.	220.	208.	253.	297.	310.
341	368.	364.	380.	464.	484.	531.	581.	637.	648.	738.
351	770.	843.	874.	840.	903.	912.	949.	935.	934.	910.
361	857.	837.	777.	679.	603.	486.	411.	325.	240.	195.
371	144.	88.	69.	45.	16.	15.	14.	4.	3.	0.
381	0.	0.	0.	1.	0.	0.	0.	0.	0.	1.
391	0.	2.	1.	0.	1.	0.	1.	0.	0.	.
101	0.	0.	2.	1.	0.	0.	1.	2.	0.	.
411	2.	2.	4.	3.	0.	2.	0.	3.	1.	1.
421	3.	2.	3.	2.	1.	0.	0.	1.	0.	1.
431	1.	1.	0.	2.	0.	0.	0.	0.	2.	1.
441	2.	0.	0.	2.	0.	0.	1.	0.	0.	0.
451	0.	0.	1.	1.	0.	0.	0.	1.	0.	0.
461	0.	1.	0.	2.	1.	1.	1.	0.	1.	1.
471	1.	1.	1.	1.	1.	0.	2.	1.	3.	4.
481	5.	0.	3.	0.	2.	0.	2.	1.	1.	0.
491	0.	0.	0.	0.	1.	0.	0.	0.	1.	0.
511	0.	0.								

Bill Mulcia
1-6-94

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT

WHC-SD-WM-DP-062, REV. 0

SAMPLE
J-1425-5781
File ID: 2a2510.CNF

Counted on: 1/ 5/94 @11:58
Detector: AEA2
Geometry number: 1
Count time: 86402. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	915.0	915.0	358.696	358.696	24.000	24.721	12.000	6.603
2	214.0	214.0	300.539	299.896	28.000	29.974	14.000	6.903
3	1278.6	1278.6	228.744	228.731	24.000	23.276	12.000	6.215

PEAK RESULTS
Peak Error Limit: 25%

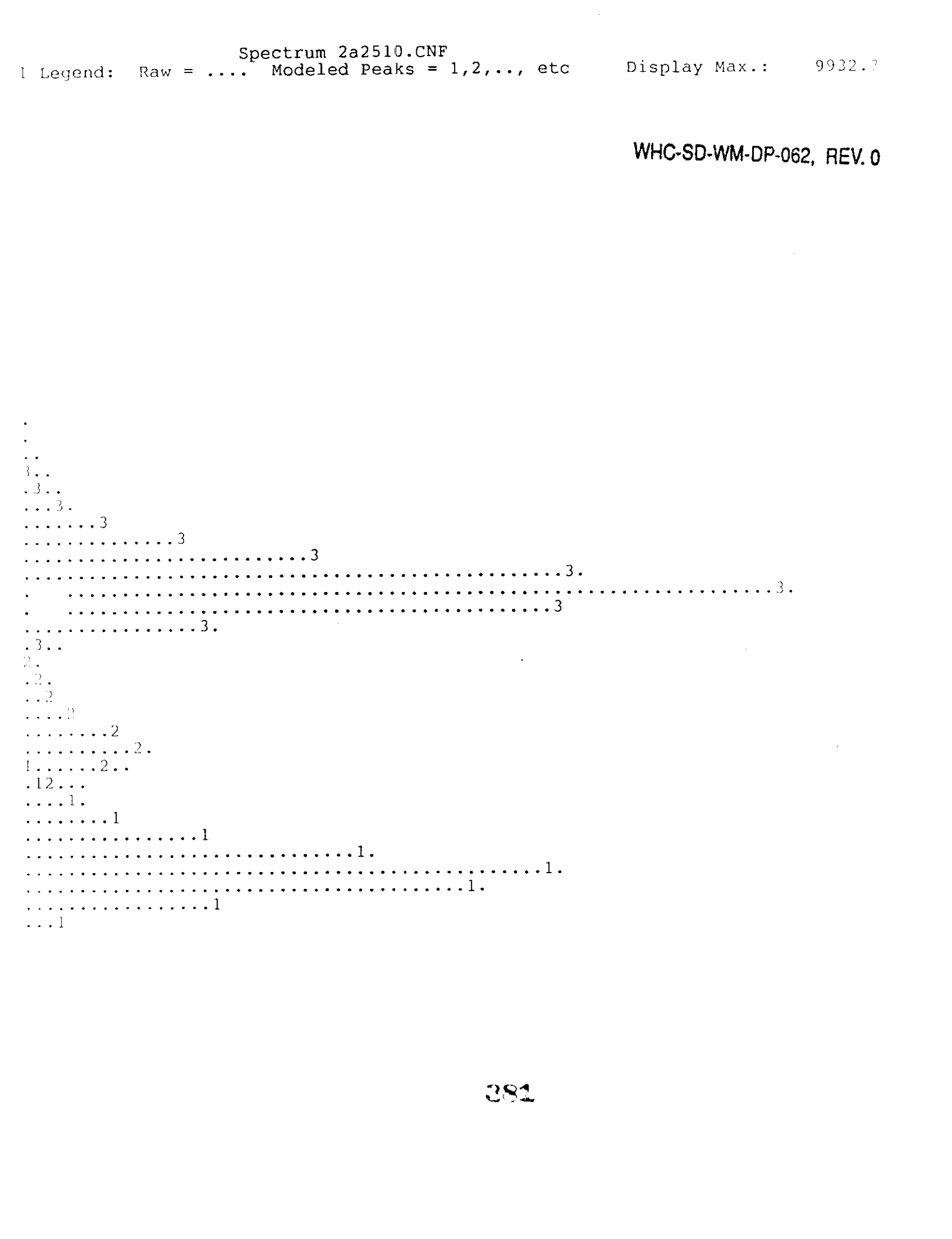
Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Peak Centroid Obs.	Peak Centroid Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Cm243	0.368	5.786	5.788	-.002	0.12	18.17	1.2	192.8	0.868E-04
	Cm244		5.796	5.788	0.008				140.7	0.634E-04
2	Am241	0.097	5.480	5.512	-.032	0.14	4.77	2.7	39.3	0.177E-04
	Pu238		5.499	5.512	-.013				51.4	0.231E-04
3	Pu239	0.505	5.143	5.177	-.034	0.11	24.93	1.0	193.1	0.870E-04
	Pu240		5.144	5.177	-.033				193.1	0.870E-04
Totals:		0.970	<--valid peaks only-->				47.87			

DETECTOR CALIBRATION
Energy(MEV) = 4.102 + (0.0047)*Channel
Energy range (MeV): 4.102 TO 6.509
Efficiency = 0.1291 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	71044.0	100.000
Smoothed	71044.0	100.000
Composite fit	68931.7	97.027
Residuals	2112.3	2.973

Analyzed by: _____
DM


Spectrum 2a2510.CNF
Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.: 9932.7

Raw Data Dump for AEA Spectrum: 2a2510.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	4.	4.	9.
21	4.	6.	4.	4.	1.	2.	6.	2.	2.	4.
31	4.	4.	4.	1.	2.	1.	4.	3.	2.	5.
41	4.	3.	2.	3.	4.	3.	0.	2.	4.	4.
51	5.	4.	4.	4.	4.	2.	4.	1.	2.	1.
61	5.	3.	4.	3.	3.	1.	3.	2.	4.	4.
71	1.	6.	5.	9.	3.	3.	6.	8.	3.	9.
81	6.	3.	5.	4.	4.	5.	7.	4.	2.	3.
91	3.	6.	7.	5.	6.	1.	5.	6.	5.	7.
101	4.	14.	2.	6.	5.	10.	4.	6.	8.	10.
111	6.	8.	4.	10.	9.	5.	12.	7.	9.	7.
121	5.	16.	11.	12.	12.	10.	13.	13.	13.	15.
131	14.	7.	15.	19.	12.	22.	16.	22.	12.	15.
141	20.	14.	19.	18.	20.	29.	25.	15.	22.	23.
151	24.	31.	20.	24.	32.	26.	29.	35.	35.	37.
161	43.	29.	35.	42.	45.	41.	45.	41.	47.	54.
171	50.	73.	69.	61.	52.	65.	63.	69.	77.	69.
181	75.	66.	95.	84.	93.	83.	109.	101.	116.	105.
191	106.	121.	114.	145.	152.	166.	182.	167.	202.	211.
201	207.	219.	236.	276.	271.	296.	309.	344.	346.	417.
211	435.	472.	546.	600.	595.	655.	741.	809.	880.	957.
221	974.	1050.	1168.	1189.	1265.	1307.	1287.	1343.	1342.	1[illegible].
231	1260.	1182.	1166.	1030.	959.	818.	728.	670.	562.	[illegible].
241	466.	363.	301.	242.	210.	171.	146.	120.	97.	[illegible].
251	76.	44.	45.	44.	51.	48.	40.	53.	37.	46.
261	48.	46.	53.	40.	43.	52.	60.	57.	51.	54.
271	67.	46.	66.	60.	64.	46.	57.	72.	77.	70.
281	88.	79.	80.	101.	107.	103.	97.	128.	114.	137.
291	148.	159.	160.	215.	214.	218.	217.	248.	225.	237.
301	251.	211.	235.	210.	193.	235.	180.	189.	166.	175.
311	143.	144.	134.	124.	105.	107.	107.	108.	137.	88.
321	101.	85.	109.	100.	106.	117.	104.	137.	130.	111.
331	154.	193.	167.	189.	217.	196.	227.	250.	292.	[illegible].
341	322.	399.	356.	418.	418.	506.	541.	568.	650.	[illegible].
351	754.	813.	795.	916.	906.	919.	937.	937.	959.	[illegible]
361	873.	911.	841.	734.	741.	629.	590.	465.	419.	[illegible].
371	336.	262.	253.	177.	156.	116.	96.	73.	46.	[illegible].
381	28.	22.	14.	15.	7.	6.	3.	2.	1.	1.
391	0.	2.	0.	0.	0.	1.	0.	1.	0.	0.
401	0.	1.	0.	0.	1.	0.	0.	1.	0.	1.
411	2.	0.	3.	2.	3.	2.	2.	0.	0.	2.
421	0.	0.	2.	1.	0.	2.	3.	0.	3.	0.
431	1.	2.	0.	0.	3.	0.	2.	2.	2.	0.
441	0.	0.	1.	0.	0.	1.	1.	0.	1.	1.
451	0.	0.	0.	0.	1.	0.	0.	0.	1.	1.
461	1.	1.	2.	1.	2.	1.	3.	1.	1.	1.
471	1.	2.	1.	5.	3.	1.	2.	3.	1.	1.
481	1.	3.	1.	2.	0.	1.	2.	2.	2.	3.
491	0.	0.	0.	0.	0.	2.	0.	0.	0.	0.
501	0.	0.								

O.H. Milicia
1-6-94

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT

WHC-SD-WM-DP-062, REV. 0

SAMPLE
J-1425-5781 DUP
File ID: 3a3572.CNF

Counted on: 1/ 5/94 @11:59
Detector: AEA3
Geometry number: 1
Count time: 86401. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	1664.5	1664.5	363.693	363.693	20.000	14.385	10.000	[illegible]
2	343.9	343.9	306.678	306.380	20.000	11.013	10.000	[illegible]
3?	36.3	36.3	264.221	264.221	28.000	1.232	14.000	[illegible]
4	2280.6	2280.6	232.694	232.689	18.000	13.390	9.000	[illegible]

PEAK RESULTS
Peak Error Limit: 25%

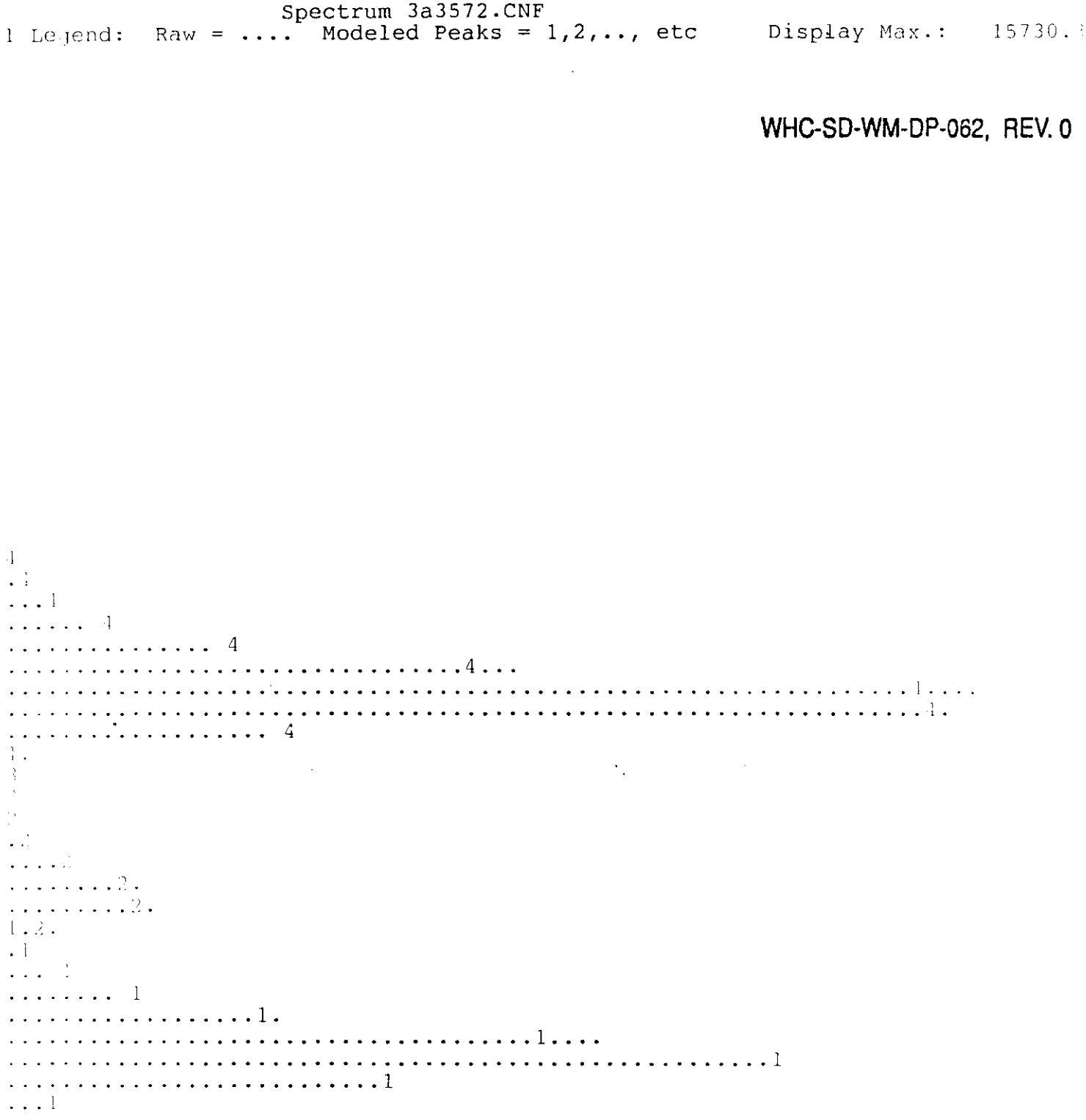
P ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Cm243	0.389	5.786	5.752	0.034	0.07	26.49	1.0	245.4	[illegible]
	Pu236		5.756	5.752	0.004				182.[illegible]	[illegible]
2	Am241	0.083	5.480	5.488	-.008	0.05	5.64	2.3	40.5	[illegible]
	Pu238		5.499	5.488	0.011				52.9	[illegible]
3		????		5.294			0.13	26.3		
4	Pu239	0.519	5.143	5.149	-.006	0.06	35.36	0.9	239.1	[illegible]
	Pu240		5.144	5.149	-.005				239.1	[illegible]
Totals:		0.991	<--valid peaks only-->				67.49			

DETECTOR CALIBRATION
Energy(MEV) = 4.079 + (0.0046)*Channel
Energy range (MeV): 4.079 TO 6.434
Efficiency = 0.1479 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	98084.0	100.000
Smoothed	98084.0	100.000
Composite fit	97374.8	99.277
Residuals	709.2	0.723

Analyzed by: _____
DM


Spectrum 3a3572.CNF
Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.: 15730.

Raw Data Dump for AEA Spectrum: 3a3572.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	5.	7.	3.
21	4.	7.	4.	1.	5.	2.	1.	3.	4.	1.
31	0.	1.	3.	0.	3.	1.	0.	2.	1.	0.
	1.	0.	3.	0.	0.	0.	1.	3.	4.	1.
51	0.	1.	0.	0.	1.	1.	2.	2.	0.	2.
61	0.	0.	1.	0.	2.	1.	0.	3.	2.	0.
71	1.	1.	3.	4.	3.	0.	2.	1.	3.	1.
81	2.	2.	1.	1.	1.	1.	2.	1.	2.	1.
91	4.	1.	1.	3.	5.	2.	2.	0.	2.	1.
101	0.	4.	6.	1.	1.	3.	2.	2.	4.	1.
111	3.	2.	5.	1.	3.	5.	5.	0.	3.	5.
121	5.	7.	4.	8.	7.	4.	8.	6.	5.	9.
131	8.	2.	10.	8.	3.	11.	11.	8.	9.	15.
141	12.	8.	6.	7.	10.	17.	12.	12.	9.	17.
151	4.	17.	8.	9.	9.	14.	10.	10.	8.	6.
161	15.	12.	10.	12.	9.	13.	16.	16.	10.	25.
171	17.	15.	23.	18.	20.	30.	24.	23.	21.	21.
181	33.	32.	26.	34.	34.	47.	47.	46.	43.	55.
191	71.	79.	61.	76.	88.	71.	115.	119.	111.	129.
201	138.	144.	197.	189.	202.	207.	259.	280.	305.	342.
211	372.	416.	507.	547.	620.	689.	715.	825.	922.	1022.
221	1145.	1355.	1445.	1595.	1713.	1831.	1999.	2014.	2099.	2346.
231	2359.	2383.	2428.	2278.	2236.	2064.	1924.	1660.	1447.	1178.
241	853.	648.	433.	313.	202.	123.	57.	55.	26.	24.
251	25.	40.	33.	24.	41.	34.	41.	36.	34.	14.
261	42.	40.	53.	41.	50.	47.	45.	31.	28.	34.
271	28.	43.	26.	42.	32.	43.	33.	38.	56.	34.
281	45.	66.	50.	66.	82.	78.	97.	106.	113.	137.
291	121.	178.	174.	183.	195.	256.	246.	284.	302.	321.
301	342.	341.	353.	357.	368.	377.	358.	368.	380.	306.
311	279.	245.	187.	174.	149.	96.	62.	54.	53.	44.
321	36.	40.	56.	45.	70.	69.	55.	61.	82.	80.
331	95.	80.	104.	126.	139.	157.	180.	174.	214.	232.
341	247.	321.	314.	367.	423.	455.	470.	558.	690.	680.
351	767.	908.	1033.	1027.	1159.	1282.	1414.	1501.	1586.	1688.
361	1707.	1683.	1715.	1735.	1716.	1578.	1546.	1460.	1301.	1118.
371	956.	716.	530.	357.	220.	144.	90.	35.	17.	7.
381	2.	0.	2.	0.	2.	0.	0.	1.	0.	2.
391	0.	3.	0.	0.	0.	0.	5.	2.	2.	1.
401	1.	3.	2.	5.	7.	1.	1.	1.	1.	3.
411	4.	2.	4.	2.	4.	2.	5.	4.	6.	4.
421	3.	1.	5.	1.	4.	0.	5.	1.	0.	3.
431	1.	0.	0.	0.	0.	0.	1.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	1.	0.	0.	0.	0.	0.	1.	0.	1.	0.
461	1.	1.	0.	0.	1.	0.	1.	0.	0.	2.
471	2.	0.	2.	0.	0.	0.	3.	0.	0.	0.
481	0.	0.	0.	0.	2.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
501	0.	0.								

Q.A. [illegible]
1-6-94

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT

WHC-SD-WM-DP-062, REV. 0

SAMPLE
J-1425-5781 TRIP
File ID: 4a4082.CNF

Counted on: 1/ 5/94 @11:59
Detector: AEA4
Geometry number: 1
Count time: 86402. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Final	Peak center Initial	Final	FWHM Initial	Final	Tau Initial	Final
1	704.4	704.4	362.157	362.157	14.000	5.714	7.[illegible]	1.2[illegible]
2	132.4	132.4	304.210	303.791	14.000	4.818	7.[illegible]	1.[illegible]
3	959.6	959.6	231.091	231.088	14.000	6.942	7.[illegible]	1.[illegible]

PEAK RESULTS
Peak Error Limit: 25%

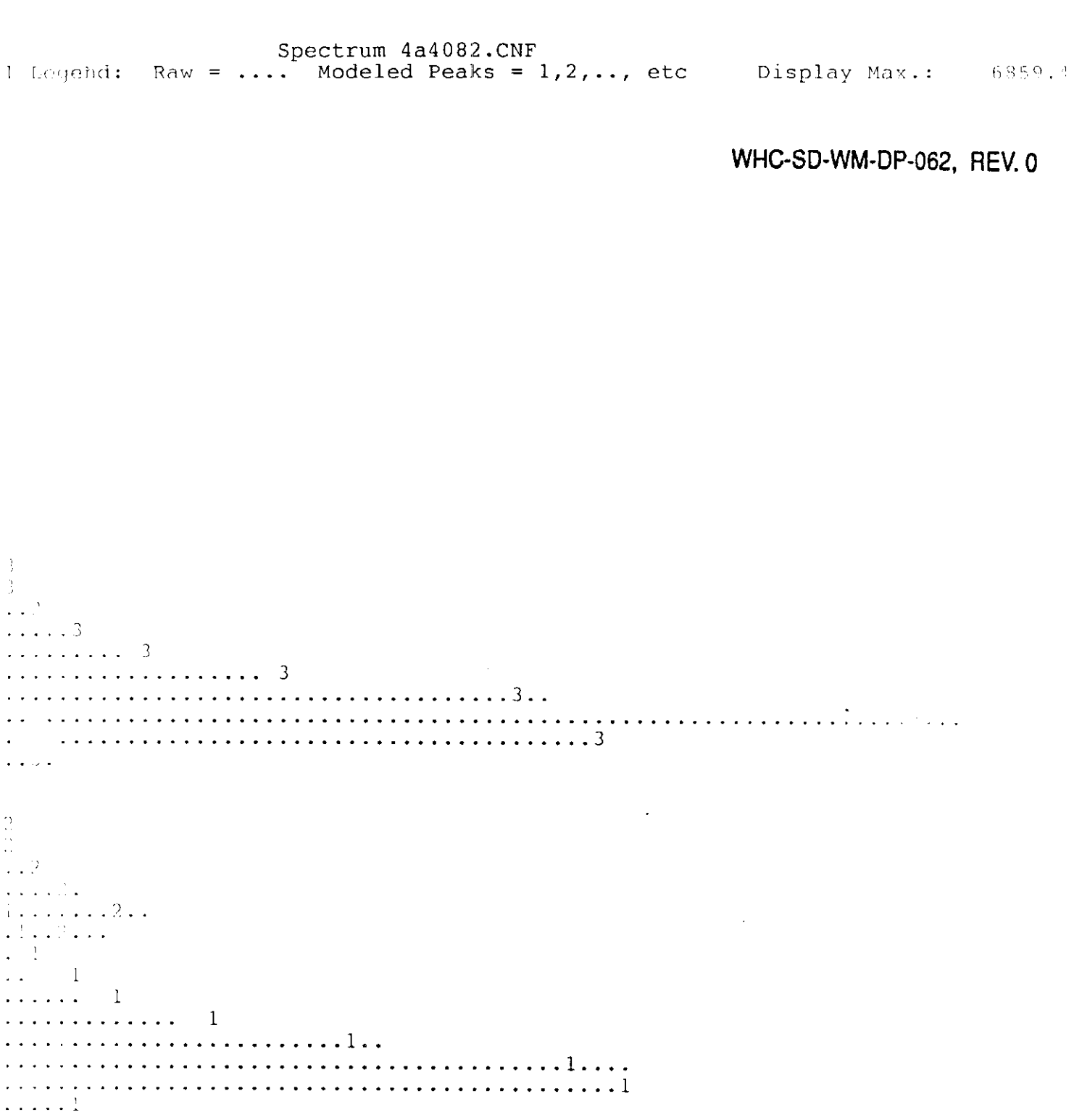
Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity [illegible]
1	Cm244	0.421	5.796	5.785	0.011	0.03	11.11	1.5	143.1	[illegible]
	Cm243		5.786	5.785	0.001				196.1	[illegible]
2	Pu238	0.073	5.499	5.511	-.012	0.02	1.93	4.2	24.[illegible]	[illegible]
	Am241		5.480	5.511	-.031				26.4	[illegible]
3	Pu239	0.519	5.143	5.169	-.026	0.03	13.70	1.4	176.3	[illegible]
	Pu240		5.144	5.169	-.025				176.3	[illegible]
Totals:		1.013	<--valid peaks only-->				26.74			

DETECTOR CALIBRATION
Energy(MEV) = 4.083 + (0.0047)*Channel
Energy range (MeV): 4.083 TO 6.489
Efficiency = 0.0775 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	38011.0	100.000
Smoothed	38011.0	100.000
Composite fit	38505.4	101.301
Residuals	-494.4	-1.301

Analyzed by: _____
DM


Spectrum 4a4082.CNF
Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.: 6859.

Raw Data Dump for AEA Spectrum: 4a4082.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
21	1.	1.	0.	1.	0.	0.	0.	2.	0.	1.
31	0.	0.	0.	0.	0.	1.	0.	0.	0.	1.
41	1.	0.	1.	3.	2.	1.	0.	0.	0.	0.
51	0.	0.	1.	2.	0.	1.	0.	0.	0.	2.
61	0.	0.	0.	0.	1.	0.	0.	0.	0.	1.
71	1.	1.	1.	0.	0.	0.	2.	1.	1.	0.
81	0.	0.	0.	1.	1.	1.	0.	0.	0.	0.
91	0.	1.	1.	1.	0.	0.	0.	0.	0.	1.
101	1.	0.	1.	0.	1.	0.	0.	0.	0.	0.
111	1.	1.	0.	1.	1.	1.	2.	0.	1.	1.
121	3.	1.	2.	2.	1.	0.	1.	2.	2.	1.
131	1.	0.	1.	4.	0.	1.	0.	0.	1.	[illegible]
141	3.	4.	3.	2.	5.	2.	3.	2.	2.	[illegible]
151	0.	1.	4.	7.	2.	2.	5.	2.	3.	[illegible]
161	6.	6.	2.	3.	5.	6.	4.	6.	7.	[illegible]
171	4.	5.	5.	14.	11.	12.	14.	11.	15.	20.
181	13.	18.	15.	24.	24.	32.	25.	37.	36.	37.
191	40.	44.	56.	66.	75.	72.	66.	88.	88.	82.
201	86.	105.	113.	126.	127.	144.	164.	162.	172.	224.
211	232.	245.	261.	309.	290.	337.	394.	402.	446.	517.
221	563.	561.	677.	691.	765.	806.	810.	888.	962.	[illegible]
231	1021.	1032.	963.	867.	641.	566.	337.	197.	[illegible]	[illegible]
241	30.	11.	5.	3.	3.	3.	4.	5.	[illegible]	[illegible]
251	3.	5.	6.	5.	5.	6.	8.	12.	10.	[illegible]
261	8.	14.	16.	14.	15.	14.	20.	15.	15.	21.
271	11.	21.	28.	22.	18.	23.	25.	17.	32.	30.
281	29.	26.	36.	33.	36.	54.	60.	50.	61.	67.
291	67.	100.	91.	93.	100.	126.	130.	135.	141.	[illegible]
301	145.	144.	178.	139.	168.	151.	163.	103.	70.	[illegible]
311	17.	23.	20.	20.	19.	14.	11.	15.	21.	[illegible]
321	22.	23.	32.	36.	41.	45.	40.	66.	54.	[illegible]
331	77.	97.	87.	80.	94.	119.	107.	137.	163.	[illegible]
341	174.	187.	187.	228.	275.	267.	315.	351.	362.	[illegible]
351	149.	524.	563.	561.	585.	579.	596.	608.	[illegible]	[illegible]
361	693.	768.	764.	707.	625.	432.	313.	185.	[illegible]	[illegible]
371	11.	5.	0.	0.	0.	0.	0.	0.	0.	[illegible]
381	1.	0.	0.	1.	1.	0.	0.	0.	1.	[illegible]
391	0.	0.	0.	2.	1.	0.	0.	0.	1.	[illegible]
401	0.	1.	0.	0.	2.	1.	1.	1.	1.	1.
411	1.	0.	1.	0.	1.	1.	1.	0.	1.	[illegible]
421	1.	0.	0.	2.	1.	0.	0.	0.	0.	[illegible]
431	0.	0.	0.	0.	1.	1.	0.	0.	1.	0.
441	0.	0.	0.	0.	1.	0.	1.	0.	0.	1.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	[illegible]
461	0.	2.	1.	0.	0.	0.	1.	1.	0.	[illegible]
471	0.	0.	1.	1.	0.	0.	2.	0.	[illegible]	[illegible]
481	1.	1.	3.	3.	1.	0.	2.	0.	[illegible]	[illegible]
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	[illegible]
511	0.	0.								

D.A. Nikolaev
1-6-94

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT **WHC-SD-WM-DP-062, REV. 0**

SAMPLE
J-1425-5981 SPIK
File ID: 6a6912.CNF

Counted on: 1/ 5/94 @12: 6
Detector: AEA6
Geometry number: 1
Count time: 86403. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	758.7	758.7	361.451	360.904	26.000	28.119	13.000	8.495
2	195.5	195.5	302.082	300.101	28.000	24.290	14.000	5.366
3	2779.2	2779.2	228.260	227.066	24.000	21.020	12.000	6.571
4?	6.6	6.6	35.389	32.925	30.000	58.042	15.000	22.163

PEAK RESULTS
Peak Error Limit: 25%

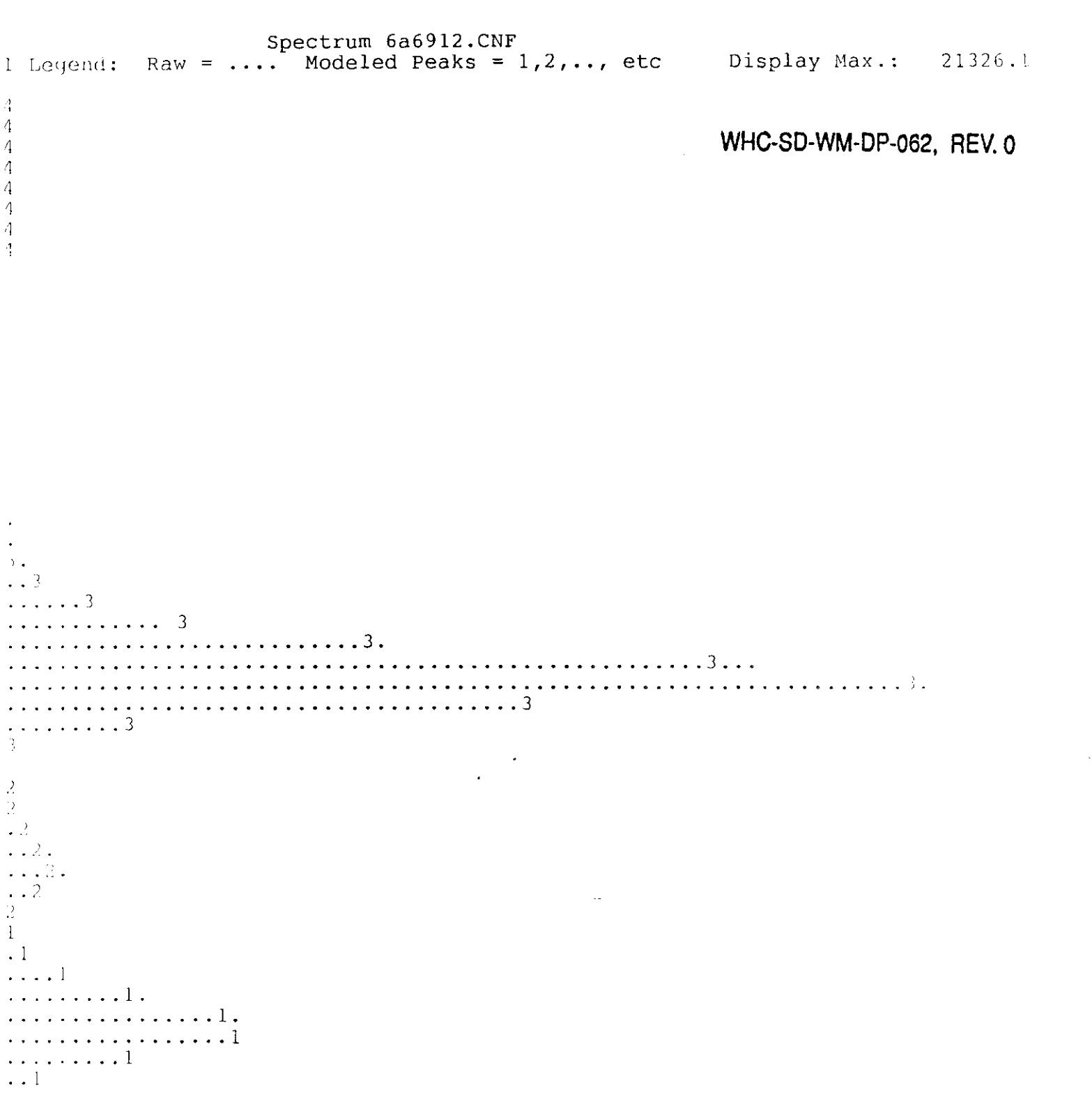
P ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Cm243	0.214	5.786	5.760	0.026	0.13	15.10	1.3	145.2	0.654E-03
	Pu236		5.756	5.760	-.004				108.2	0.487E-03
2	Am241	0.058	5.480	5.480	0.0000	0.11	4.11	2.7	30.7	0.138E-03
	Pu238		5.499	5.480	0.019				40.1	0.181E-03
3	Pu239	0.703	5.143	5.144	-.001	0.10	49.53	0.7	347.9	0.157E-02
	Pu240		5.144	5.144	0.000				347.9	0.157E-02
4		????		4.251			0.16	12.8		
Totals:		0.976	<--valid peaks only-->				68.74			

DETECTOR CALIBRATION
Energy(MEV) = 4.100 + (0.0046)*Channel
Energy range (MeV): 4.100 TO 6.455
Efficiency = 0.1424 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	101421.0	100.000
Smoothed	101430.7	100.010
Composite fit	99225.0	97.835
Residuals	2196.0	2.165

Analyzed by: _____
DM


Spectrum 6a6912.CNF
Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.: 21326.1

Raw Data Dump for AEA Spectrum: 6a6912.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	1.	3.	3.	5.
21	7.	3.	3.	4.	1.	5.	3.	6.	5.	5.
	6.	7.	10.	3.	7.	6.	5.	2.	3.	8.
	3.	2.	2.	5.	5.	3.	2.	4.	2.	4.
51	0.	4.	6.	5.	1.	3.	4.	5.	2.	8.
61	7.	5.	4.	4.	7.	5.	6.	2.	5.	3.
71	7.	6.	4.	4.	8.	4.	3.	6.	6.	9.
81	8.	7.	6.	5.	6.	8.	7.	4.	5.	6.
91	9.	7.	7.	8.	4.	6.	3.	7.	6.	8.
101	8.	11.	11.	9.	4.	8.	3.	5.	6.	9.
111	6.	7.	16.	11.	5.	11.	10.	12.	14.	10.
121	16.	15.	12.	17.	14.	7.	14.	8.	17.	10.
131	19.	22.	15.	19.	20.	15.	14.	24.	17.	18.
141	23.	23.	28.	23.	18.	30.	37.	32.	21.	28.
151	24.	38.	31.	33.	30.	29.	42.	31.	40.	34.
161	48.	61.	43.	46.	48.	43.	67.	46.	54.	45.
171	62.	81.	63.	93.	78.	80.	80.	98.	92.	90.
181	98.	108.	100.	106.	127.	136.	146.	155.	158.	169.
191	158.	182.	195.	189.	229.	232.	244.	276.	330.	352.
201	357.	386.	460.	465.	503.	600.	611.	709.	818.	934.
211	982.	1097.	1232.	1379.	1461.	1683.	1845.	2010.	2084.	2275.
221	2350.	2638.	2750.	2758.	2819.	2892.	2926.	2783.	2774.	2664.
231	2480.	2397.	2160.	1941.	1652.	1397.	1204.	995.	823.	676.
241	531.	453.	331.	226.	189.	136.	104.	73.	63.	45.
251	34.	31.	24.	22.	27.	36.	21.	20.	34.	38.
261	25.	32.	39.	32.	36.	38.	28.	34.	40.	46.
271	41.	31.	37.	47.	37.	44.	46.	39.	53.	[illegible]
281	76.	76.	66.	86.	84.	119.	115.	130.	139.	[illegible]
291	128.	152.	152.	174.	198.	209.	232.	197.	211.	205.
301	187.	216.	189.	211.	206.	187.	155.	134.	142.	129.
3	110.	88.	82.	59.	68.	51.	68.	43.	55.	48.
321	38.	43.	41.	54.	54.	68.	73.	63.	86.	76.
331	95.	114.	117.	138.	137.	139.	139.	161.	186.	232.
341	239.	264.	306.	335.	332.	383.	472.	424.	496.	559.
351	535.	556.	652.	673.	676.	738.	786.	784.	758.	785.
361	733.	730.	719.	702.	672.	622.	607.	528.	454.	[illegible]
371	293.	320.	282.	227.	200.	153.	130.	100.	79.	[illegible]
381	11.	25.	25.	9.	10.	11.	6.	5.	6.	[illegible]
391	3.	1.	0.	1.	2.	0.	0.	1.	[illegible]	[illegible]
401	2.	1.	1.	0.	0.	0.	0.	0.	2.	[illegible]
411	1.	1.	1.	0.	1.	1.	2.	3.	[illegible]	[illegible]
421	0.	2.	1.	2.	4.	3.	0.	1.	2.	2.
431	0.	1.	1.	1.	0.	1.	0.	1.	2.	2.
441	1.	4.	3.	1.	1.	2.	2.	1.	1.	2.
451	0.	0.	1.	0.	0.	1.	1.	0.	0.	1.
461	0.	1.	2.	3.	3.	6.	2.	1.	2.	5.
471	2.	3.	9.	1.	8.	5.	7.	2.	1.	2.
481	1.	0.	0.	1.	0.	0.	0.	2.	3.	1.
491	0.	0.	2.	5.	10.	24.	32.	10.	1.	0.
501	0.	0.								

S. H Nielsen
1-6-94

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT **WHC-SD-WM-DP-062, REV. 0**

SAMPLE
J-1425-5981 SPIK
File ID: 8a8654.CNF

Counted on: 1/ 5/94 @12: 0
Detector: AEA8
Geometry number: 1
Count time: 86403. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	784.2	784.2	354.433	354.433	20.000	15.157	10.000	4.11[illegible]
2	197.0	197.0	296.056	295.620	22.000	14.456	11.0[illegible]	3.[illegible]
3?	33.6	33.6	258.411	257.510	12.000	5.104	6.00[illegible]	3.[illegible]
4	2697.0	2697.0	222.809	222.806	20.000	13.991	10.0[illegible]	3.[illegible]
5?	14.9	14.9	144.611	142.892	34.000	31.034	17.000	2.91[illegible]

PEAK RESULTS
Peak Error Limit: 25%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	[illegible] pCi
1	Cm243	0.214	5.786	5.757	0.029	0.07	13.41	1.4	158.6	0.[illegible]
	Pu236		5.756	5.757	-.001				118.1	0.[illegible]
2	Am241	0.055	5.480	5.480	0.000	0.07	3.44	3.0	31.[illegible]	0.[illegible]
	Pu238		5.499	5.480	0.019				41.2	0.[illegible]
3		????		5.301			0.28	15.5		
4	Pu239	0.713	5.143	5.138	0.005	0.07	44.66	0.8	385.3	0.174[illegible]
	Pu240		5.144	5.138	0.006				385.3	0.174[illegible]
5		????		4.762			0.54	11.1		
Totals:		0.982	<--valid peaks only-->				61.51			

DETECTOR CALIBRATION
Energy(MEV) = 4.091 + (0.0047)*Channel
Energy range (MeV): 4.091 TO 6.497
Efficiency = 0.1159 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	90224.0	100.000
Smoothed	90224.0	100.000
Composite fit	89759.7	99.485
Residuals	464.3	0.515

Analyzed by: _____
DM

Spectrum 8a8654.CNF
Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.: 20140.5

Raw Data Dump for AEA Spectrum: 8a8654.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	4.	7.	5.	9.
21	7.	7.	13.	12.	7.	7.	7.	2.	0.	1.
31	3.	6.	3.	1.	1.	3.	3.	3.	3.	6.
	2.	4.	2.	1.	6.	5.	2.	5.	5.	2.
	3.	6.	5.	6.	4.	5.	2.	4.	6.	4.
61	2.	4.	2.	4.	7.	3.	4.	4.	5.	2.
71	2.	9.	2.	6.	6.	6.	4.	3.	0.	2.
81	12.	3.	4.	3.	6.	6.	4.	6.	3.	[illegible]
91	6.	4.	3.	4.	6.	4.	4.	2.	[illegible]	[illegible]
101	9.	8.	9.	7.	5.	8.	7.	6.	[illegible]	[illegible]
111	9.	9.	7.	6.	5.	9.	8.	13.	[illegible]	[illegible]
121	9.	12.	9.	6.	8.	8.	15.	14.	16.	[illegible]
131	13.	16.	10.	18.	22.	16.	26.	14.	21.	15.
141	15.	28.	16.	23.	21.	26.	15.	17.	22.	21.
151	18.	23.	20.	24.	34.	26.	29.	29.	31.	39.
161	27.	27.	45.	43.	35.	37.	32.	59.	53.	59.
171	55.	62.	50.	57.	73.	89.	72.	102.	85.	109.
181	103.	119.	135.	148.	149.	173.	168.	182.	201.	234.
191	284.	246.	257.	287.	316.	361.	400.	472.	487.	526.
201	536.	619.	687.	760.	794.	937.	1006.	1098.	1191.	[illegible]
211	1459.	1520.	1763.	1904.	2035.	2125.	2348.	2421.	2602.	[illegible]
221	2882.	2741.	2846.	2710.	2658.	2538.	2365.	2038.	1717.	[illegible]
231	1116.	864.	631.	457.	282.	176.	114.	57.	41.	[illegible]
241	30.	33.	22.	16.	28.	23.	24.	28.	42.	[illegible]
251	46.	33.	42.	49.	41.	51.	42.	58.	53.	53.
261	41.	35.	42.	35.	29.	35.	32.	21.	37.	41.
271	36.	42.	38.	49.	63.	49.	63.	73.	81.	72.
281	74.	89.	90.	125.	138.	165.	147.	155.	153.	109.
291	193.	212.	213.	200.	225.	207.	210.	212.	185.	206.
301	159.	180.	122.	106.	98.	81.	56.	40.	42.	[illegible]
311	25.	31.	35.	39.	35.	41.	52.	44.	46.	[illegible]
321	48.	50.	64.	74.	76.	96.	79.	101.	129.	[illegible]
331	148.	168.	163.	197.	230.	258.	257.	268.	322.	[illegible]
341	436.	448.	468.	523.	504.	601.	649.	679.	[illegible]	
351	790.	831.	836.	790.	784.	832.	739.	748.	[illegible]	
361	430.	404.	343.	245.	191.	108.	67.	44.	19.	[illegible]
371	2.	2.	4.	2.	0.	0.	0.	0.	0.	[illegible]
381	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
391	0.	0.	1.	0.	0.	1.	0.	0.	1.	0.
401	3.	3.	4.	0.	2.	0.	2.	1.	1.	[illegible]
411	1.	2.	1.	1.	0.	1.	2.	2.	0.	0.
421	0.	0.	0.	3.	0.	0.	0.	0.	0.	0.
431	1.	0.	0.	0.	0.	0.	0.	1.	1.	1.
441	0.	0.	1.	0.	0.	0.	0.	0.	0.	[illegible]
451	1.	0.	0.	0.	0.	0.	0.	0.	[illegible]	[illegible]
461	0.	0.	0.	0.	1.	0.	0.	0.	0.	[illegible]
471	3.	1.	0.	0.	3.	1.	0.	0.	1.	1.
481	0.	0.	1.	2.	1.	0.	0.	2.	0.	[illegible]
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
501	0.	0.								

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Batch 2583

WESTINGHOUSE HANFORD COMPANY

222-S LABORATORY

ANALYTICAL BATCH

WHC-SD-WM-DP-062, REV. 0

Lab Segment Serial No.	Customer ID:
JA26	KE65A
Analysis: Pu 238, 239/240	**Sample Prep:** DIRECT

Instrument: WB537237	Procedure/ Rev: LA 503-156 D0
Technologist: Joel M. VanSant	Date: 1-27-94
Starting Time: 0900	Temperature 25°C
Ending Time: 1400	Chemist: L Fritz

Comments: 24 HR AEA

	Description	Lab ID
1	LMCS	JA18-5581
2	BLK	J1421-5681
3	Sample	J1426-5781
4	Sample Dup	J1426-5781
5	Sample Trip	J1426-5781
6	Spike	J1426-5981
7	Spike Dup	J1426-5981
8		
9		
10		

	Description	Lab ID
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS	AR501/68843	100mL - 10 -	.100mL	
Spike	77843	.05mL		

ANALYTICAL BATCH SUMMARY SHEET

METHOD: **LA-503-156**

DATE START: **January 27, 1994**

PREPARED BY: **L.L. Fritts** LL Fritts 2-1-94

DATE COMPLETE: **February 1, 1994**

	UNITS:	uCi/mL									
SPL NAME	SPL ID	ANALYTE	RESULT #1	RESULT #2	RESULT #3	AVERAGE	2*SD	PREC	%REC	DET LIM	% CT ER
STD 63B43	J1418	Pu-239/40	1.24E+2						95.0	8.94E-3	1.4
BLANK	J1421	Pu-239/40	<6.91E-4						67.6	6.91E-4	100.0
KE65A	J1426	Pu-239/40	2.15E-2	2.13E-2	2.24E-2	2.17E-2	1.17E-3	5.4	65.6	2.10E-3	1.8
									73.7	1.58E-3	1.4
									50.0	2.56E-3	1.6
KE65A	J1426	239 Spike	101.2	115.5							
STD 63B43	J1418	Pu-238	<1.20E-2						N/A	1.20E-2	3.6
BLANK	J1421	Pu-238	<1.35E-3						67.6	1.35E-3	100.0
KE65A	J1426	Pu-238	4.21E-3	<2.24E-3	3.39E-3	N/A	N/A	N/A	65.6	2.76E-3	2.8
									73.7	2.24E-3	2.8
									50.0	3.22E-3	2.7

NARRATIVE: ☐ NO SPECIAL PROBLEMS/METHOD VARIATIONS IN THIS BATCH

LIST SPECIFIC PROBLEMS/VARIATIONS FOR THIS BATCH:

The results for the standard are in uCi/L.

The results for the spike are in percent recovery.

Pu-238 results are outside of control limits. Results are somewhat close to detection levels, so rerun unnecessary.

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

#2 2566 Batch 2583

Serial No	Sample Point	Date	Time Issued	Priority

Determination	Method Standard	Result Units	Charge Code	Reruns

Sample Size	Customer ID
.100mL - 10 - .100mL	

Remarks, Calculations, Results

63843 1,24 E+2 "AEA" 24 HR

1,305 E+2 95,0% ATTACH PRINTOUT

.05mL 77843

WHC-SD-WM-DP-062, REV. 0

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
VanSant			D.H. Williams	
Hrs	Hrs	Hrs 1-27-94	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr.
1-27-94		

5A 6800-061 (R 10-83)

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

						STANDARD
Serial No.	Date Counted		01/28/94	Pu 236 AEA Frac.	(C236)	0.325
J1418-5581	Sample Volume in mL	(SS)	0.100	Pu 238 AEA Frac.	(C238)	0.033
Batch ID	Sample D.F.	(DF)	101	Pu 239 AEA Frac.	(C239)	0.59
2583	Tracer Volume in mL	(SPKV)	0.050	Total AT Counts		10314
Rerun No.	Digest D.F.	(DDF)	1	AT Count Time (min)	(TC)	60
1	Tracer Book No.		77B43	Background in cpm	(Bkg)	9
Analyst	Tracer Preparation Date		10/12/93	Pu 236 cpm		22.29
VAN SANT	Pu-236 Preparation Value	(dpm/mL)	3226	Pu 238 cpm		2.27
Date	Pu-236 Decay Corr'd value	(dpm/mL)	3002.15	Pu 239 cpm		40.44
01/27/94	Pu-238 Tracer Value	(dpm/mL)	133	AEA Count Time	(min)	1440
Sample Type						
LIQUID	<<<<<<<<< Enter a Sample Type <<<<<<<<<			Pu 239/240 µCi/L		1.2398E+02

Decay Time = Date Counted - Tracer Preparation Date

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

Pu 236 Tracer Recovery = ((Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SPKV

Pu-239/240 µCi/L = (C239 * Pu-236 Decay Corr'd Value * SPKV * DF * DDF * (1000mL/1)) / (C236 * SS * (2220000dpm/µCi))

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS

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

				DETECTION LEVELS in µCi/mL
Pu 239/240	µCi/mL	=	1.24E-01	
Relative Counting Error		=	1.4%	
NOTE: Pu 238 Result is a LESS THAN Value.				Pu 239/240 8.94E-03
Pu 238	µCi/mL	=	< 1.20E-02	
Relative Counting Error		=	3.6%	Pu 238 1.20E-02
Pu 236 Tracer Recovery		=	70.5%	

Data Entry by:	Date:	31-Jan-94
Approved by:	Date:	1 Feb 94

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#1 1-27-94 J1418-5581

5233 1-27-94
30 -9

10314
60 -9

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

#3 3625

Serial No	Sample Point	Date	Time Issued	Priority

Determination	Method Standard	Result Units	Charge Code	Reruns

Sample Size	Customer ID
~~1mL~~ 1ml - 10ml - .05ml 2.1.94	

Remarks Calculations Results

24 Hr

"AEA" - ~~ABOMIN~~

ATTACH PRINTOUT

.05mL 77B43 <6.91 X 10^{-4} µCi/ml

WHC-SD-WM-DP-062, REV. 0

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
VanSant	[signature]	[signature]	D H Milicia	
Hrs	Hrs	Hrs 1-27-94	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1-27-94		[signature]	[signature]

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

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

					BLANK
Serial No.	Date Counted	01/28/94	Pu 236 AEA Frac.	(C236)	0.956
J1421-5681	Sample Volume in mL (SS)	0.050	Pu 238 AEA Frac.	(C238)	0
Batch ID	Sample D.F. (DF)	11	Pu 239 AEA Frac.	(C239)	0
2583	Tracer Volume in mL (SPKV)	0.050	Total AT Counts		3304
Rerun No.	Digest D.F. (DDF)	1	AT Count Time (min)	(TC)	60
1	Tracer Book No.	77B43	Background in cpm	(Bkg)	2
Analyst	Tracer Preparation Date	10/12/93	Pu 236 cpm		24.49
VAN SANT	Pu-236 Preparation Value (dpm/mL)	3226	Pu 238 cpm		0
Date	Pu-236 Decay Corr'd value (dpm/mL)	3002.15	Pu 239 cpm		0
01/27/94	Pu-238 Tracer Value (dpm/mL)	133	AEA Count Time	(min)	1440
Sample Type					
LIQUID	<<<<<<<<< Enter a Sample Type <<<<<<<<<		Pu 239/240 µCi/L =	<	6.9060E-01

Decay Time = Date Counted - Tracer Preparation Date

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

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SPKV

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

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

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

NOTE: Pu 239\240 Result is a LESS THAN Value.

				DETECTION LEVELS in µCi/mL
Pu 239/240	µCi/mL	=	< 6.91E-04	
Relative Counting Error		=	100.0%	
NOTE: Pu 238 Result is a LESS THAN Value.				Pu 239/240 6.91E-04
Pu 238	µCi/mL	=	< 1.35E-03	
Relative Counting Error		=	100.0%	Pu 238 1.35E-03
Pu 236 Tracer Recovery		=	67.6%	

Data Entry by:	[signature]	Date:	01-Feb-94
Approved by:	[signature]	Date:	1 Feb 94

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#2 1-27-94 J1421-5681

1652 1-27-94
30 -2

3304
60 -2

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

#4 4132

Serial No	Sample Point	Date	Time Issued	Priority
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Determination	Method Standard	Result Units	Charge Code	Reruns
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Sample Size	Customer ID
1mL - 10 - .05mL	[illegible]

Remarks Calculations Results

SAM

.05mL 77B43 2.15×10^{-2} µCi/ml

24 HR

"AEA" - ~~[illegible]~~ IN

ATTACH PRINTOUT

WHC-SD-WM-DP-062, REV. 0

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Van Sant	[illegible]	[illegible]	D.A. Milicia	
Hrs	Hrs	Hrs 1-27-94	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1-27-94		[illegible]	[illegible]

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

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

					SAMPLE
Serial No.	Date Counted	01/28/94	Pu 236 AEA Frac.	(C236)	0.324
J1426-5781	Sample Volume in mL (SS)	0.050	Pu 238 AEA Frac.	(C238)	0.106
Batch ID	Sample D.F. (DF)	11	Pu 239 AEA Frac.	(C239)	0.468
2583	Tracer Volume in mL (SPKV)	0.050	Total AT Counts		9362
Rerun No.	Digest D.F. (DDF)	1	AT Count Time (min)	(TC)	60
1	Tracer Book No.	77B43	Background in cpm	(Bkg)	4
Analyst	Tracer Preparation Date	10/12/93	Pu 236 cpm		14.2
VAN SANT	Pu-236 Preparation Value (dpm/mL)	3226	Pu 238 cpm		4.66
Date	Pu-236 Decay Corr'd value (dpm/mL)	3002.15	Pu 239 cpm		20.53
01/27/94	Pu-238 Tracer Value (dpm/mL)	133	AEA Count Time	(min)	1440
Sample Type					
LIQUID	<<<<<<<<< Enter a Sample Type <<<<<<<<<		Pu 239/240 µCi/L		2.1487E+01

Decay Time = Date Counted - Tracer Preparation Date

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

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SPKV

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

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

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

				DETECTION LEVELS in µCi/mL
Pu 239/240	µCi/mL	=	2.15E-02	
Relative Counting Error		=	1.8%	
				Pu 239/240
Pu 238	µCi/mL	=	4.21E-03	2.10E-03
Relative Counting Error		=	2.8%	Pu 238
Pu 236 Tracer Recovery		=	65.6%	2.76E-03

Data Entry by:	[illegible]	Date:	31-Jan-94
Approved by:	[illegible]	Date:	1 Feb 94

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#3 1-27-94

J1426-5781
#4

~~4823~~ 1-27-94
30 -4

9362
60 -4

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

#5 5053

Serial No	Sample Point	Date	Time Issued	Priority

Determination	Method Standard	Result Units	Charge Code	Reruns

Sample Size: 1mL - 10 - .05mL

Customer ID:

Remarks, Calculations, Results

24 HR

"AEA"

ATTACH PRINTOUT

Dup

.05mL 77B43

2.13×10^{-2} µCi/ml

WHC-SD-WM-DP-062, REV. 0

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
VAN SANT		D HAMILTON		
Hrs	Hrs 1-27-94	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
1-27-94		

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

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

Serial No.	Date Counted		01/28/94	Pu 236 AEA Frac.	(C236)	SAMPLE 0.383
J1426-5781	Sample Volume in mL	(SS)	0.050	Pu 238 AEA Frac.	(C238)	0.067
Batch ID	Sample D.F.	(DF)	11	Pu 239 AEA Frac.	(C239)	0.548
2583	Tracer Volume in mL	(SPKV)	0.050	Total AT Counts		9211
Rerun No	Digest D.F.	(DDF)	1	AT Count Time (min)	(TC)	60
2	Tracer Book No.		77B43	Background in cpm	(Bkg)	9
Analyst	Tracer Preparation Date		10/12/93	Pu 236 cpm		22.92
VAN SANT	Pu-236 Preparation Value	(dpm/mL)	3226	Pu 238 cpm		4.02
Date	Pu-236 Decay Corr'd value	(dpm/mL)	3002.15	Pu 239 cpm		32.84
01/27/94	Pu-238 Tracer Value	(dpm/mL)	133	AEA Count Time	(min)	1440
Sample Type						
LIQUID	<<<<<<<<< Enter a Sample Type <<<<<<<<<			Pu 239/240 µCi/L		2.1284E+01

Decay Time = Date Counted - Tracer Preparation Date

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

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C238 * 100 / Pu-236 Decay Corr'd Value * SPKV

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

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-236 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

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

				DETECTION LEVELS in µCi/mL
Pu 239/240	µCi/mL	=	2.13E-02	
Relative Counting Error		=	1.4%	
NOTE: Pu 238 Result is a LESS THAN Value.				Pu 239/240 1.58E-03
Pu 238	µCi/mL	=	< 2.24E-03	
Relative Counting Error		=	2.8%	Pu 238 2.24E-03
Pu 236 Tracer Recovery		=	73.7%	

Data Entry by:	Date:	31-Jan-94
Approved by:	Date:	1 Feb 94

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#1 1-27-94 KJ

J1426-5781

9211/60 - 9

#6

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

#6 6964

Serial No	Sample Point	Date	Time Issued	Priority

Determination	Method Standard	Result Units	Charge Code	Reruns

Sample Size: 1mL - 10 - .05 mL

Customer ID:

Remarks Calculations Results

TRIP

.05mL 77B43

24HR

ATTACH PRINTOUT

2.24×10^{-2} µCi/ml

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
VanSant		D.H. McVain		
Hrs	Hrs 1-27-94	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr.	
1-27-94			

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

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

Serial No.	Date Counted		01/28/94	Pu 236 AEA Frac.	(C236)	SAMPLE 0.349
J1426-5781	Sample Volume in mL	(SS)	0.050	Pu 238 AEA Frac.	(C238)	0.095
Batch ID	Sample D.F.	(DF)	11	Pu 239 AEA Frac.	(C239)	0.526
2583	Tracer Volume in mL	(SPKV)	0.050	Total AT Counts		6567
Rerun No.	Digest D.F.	(DDF)	1	AT Count Time (min)	(TC)	60
3	Tracer Book No.		77B43	Background in cpm	(Bkg)	2
Analyst	Tracer Preparation Date		10/12/93	Pu 236 cpm		17.29
VAN SANT	Pu-236 Preparation Value	(dpm/mL)	3226	Pu 238 cpm		4.71
Date	Pu-236 Decay Corr'd value	(dpm/mL)	3002.15	Pu 239 cpm		26.1
01/27/94	Pu-238 Tracer Value	(dpm/mL)	133	AEA Count Time	(min)	1440
Sample Type						
LIQUID	<<<<<<<<< Enter a Sample Type <<<<<<<<<			Pu 239/240 µCi/L		2.2420E+01

Decay Time = Date Counted - Tracer Preparation Date

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

Pu 238 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C238 * 100 / Pu-236 Decay Corr'd Value * SPKV

Pu-239/240 µCi/L = (C239 * Pu-236 Decay Corr'd Value * SPKV * DF * DDF * (1000mL/L)) / (C238 * SS * (2220000dpm/µCi))

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-236 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS

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

				DETECTION LEVELS in µCi/mL
Pu 239/240	µCi/mL	=	2.24E-02	
Relative Counting Error		=	1.6%	
				Pu 239/240
Pu 238	µCi/mL	=	3.39E-03	2.56E-03
Relative Counting Error		=	2.7%	Pu 238
Pu 236 Tracer Recovery		=	50.0%	3.22E-03

Data Entry by:	Date:	31-Jan-94
Approved by:	Date:	1 Feb 94

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#2 1-27-94 AJ

J1426-5781

#6

$\frac{6567}{60}$-2

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

HT 7489

Serial No	Sample Point	Date	Time Issued	Priority
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Determination	Method Standard	Result Units	Charge Code	Reruns
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Sample Size	Customer ID
1mL-10-.05mL	[illegible]

Remarks Calculations Results

63B43 .100mL-10-.100mL 24HR

77B43

.85mL 101.2%

ATTACH PRINTOUT

WHC-SD-WM-DP-062, REV. 0

Analyst	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
VanSant	[signature]	D.H. Milicia		
Hrs	Hrs 1-27-94	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1-27-94		[signature]	[signature]

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

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

Serial No.	Date Counted		01/28/94	Pu 236 AEA Frac. (C236)	0.211
J1426-5981	Sample Volume in mL	(SS)	0.050	Pu 238 AEA Frac. (C238)	0.058
Batch ID	Sample D.F.	(DF)	11	Pu 239 AEA Frac. (C239)	0.713
2583	Tracer Volume in mL	(SPKV)	0.050	Total AT Counts	11361
Rerun No.	Digest D.F.	(DDF)	1	AT Count Time (min) (TC)	60
1	Tracer Book No.		77B43	Background in cpm (Bkg)	4
Analyst	Tracer Preparation Date		10/12/93	Pu 236 cpm	15.04
VAN SANT	Pu-236 Preparation Value	(dpm/mL)	3226	Pu 238 cpm	4.14
Date	Pu-236 Decay Corr'd value	(dpm/mL)	3002.15	Pu 239 cpm	50.76
01/27/94	Pu-238 Tracer Value	(dpm/mL)	133	AEA Count Time (min)	1440
Sample Type					
LIQUID	<<<<<<<<< Enter a Sample Type <<<<<<<<<			Pu 239/240 µCi/L	5.0267E+01

Decay Time = Date Counted - Tracer Preparation Date

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

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SPKV

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

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

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

				DETECTION LEVELS in µCi/mL
Pu 239/240	µCi/mL	=	5.03E-02	
Relative Counting Error		=	1.5%	
NOTE: Pu 238 Result is a LESS THAN Value.				Pu 239/240 4.06E-03
Pu 238	µCi/mL	=	< 4.72E-03	
Relative Counting Error		=	2.9%	Pu 238 4.72E-03
Pu 236 Tracer Recovery		=	52.1%	

Data Entry by:	[signature]	Date:	31-Jan-94
Approved by:	[signature]	Date:	1 Feb 94

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Form 5 Rev. 1

Page 1 of 1

50,267 - 21,487 (101/.1) / (11/.05) (100) = 101.2%

130.5

[signature] 2.10.94

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#3 1-27-94 KJ

J1426-5981

#7

11361
60 -4

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

#8 8702

Serial No	Sample Point	Date	Time Issued	Priority
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Determination	Method Standard	Result Units	Charge Code	Reruns
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Sample Size	Customer ID
1mL - 10 - .05mL	[illegible]

Remarks Calculations Results

63843 .100mL-10-.100mL

77843

.05mL 115.5%

Dup Spike

ATTACH PRINTOUT

24HR

WHC-SD-WM-DP-062, REV. 0

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
VanSant	[signature]	D.H. Milicia		
Hrs	Hrs 1-27-94	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1-27-94		[signature]	[signature]

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

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

Serial No.	Date Counted		01/28/94	Pu 236 AEA Frac. (C236)	CHK EXT NO.
J1426-5981	Sample Volume in mL	(SS)	0.050	Pu 238 AEA Frac. (C238)	0.16
Batch ID	Sample D.F.	(DF)	11	Pu 239 AEA Frac. (C239)	0.081
2583	Tracer Volume in mL	(SPKV)	0.050	Total AT Counts	0.582
Rerun No.	Digest D.F.	(DDF)	1	AT Count Time (min) (TC)	7639
2	Tracer Book No.		77B43	Background in cpm (Bkg)	60
Analyst	Tracer Preparation Date		10/12/93	Pu 236 cpm	9
VAN SANT	Pu-236 Preparation Value	(dpm/mL)	3226	Pu 238 cpm	7.06
Date	Pu-236 Decay Corr'd value	(dpm/mL)	3002.15	Pu 239 cpm	3.57
01/27/94	Pu-238 Tracer Value	(dpm/mL)	133	AEA Count Time (min)	25.61
Sample Type					1440
LIQUID	<<<<<<<<< Enter a Sample Type <<<<<<<<<			Pu 239/240 µCi/L	5.4110E+01

Decay Time = Date Counted - Tracer Preparation Date

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

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SPKV

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

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

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

				DETECTION LEVELS in µCi/mL
Pu 239/240	µCi/mL	=	5.41E-02	
Relative Counting Error		=	2.2%	
NOTE: Pu 238 Result is a LESS THAN Value.				Pu 239/240 1.11E-02
Pu 238	µCi/mL	=	< 1.17E-02	
Relative Counting Error		=	3.4%	Pu 238 1.17E-02
Pu 236 Tracer Recovery		=	25.2%	

Data Entry by:	[signature]	Date:	31-Jan-94
Approved by:	[signature]	Date:	1 Feb 94

(54.11 - 21.284)(101/.1)(1/.05)(100) = 115.5%

130.5

2.10.94

Form 5 Rev. 1

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PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#1 1-27-94 AG

J1426-5981

7639/60 -9

#8

WHC-SD-WM-DP-062, REV. 0

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT WHC-SD-WM-DP-062, REV. 0

SAMPLE
J-1418-5581
File ID: 2a2566.CNF

Counted on: 1/28/94 @ 0: 9
Detector: AEA2
Geometry number: 1
Count time: 86402. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	1382.6	1382.6	361.081	361.081	20.000	15.008	10.000	4.636
2	80.9	80.9	304.351	302.631	36.000	37.524	18.000	5.951
3?	18.7	18.7	268.056	268.056	16.000	0.120	8.000	5.294
4	2623.6	2623.6	230.060	230.057	20.000	13.804	10.000	4.480
5?	15.0	15.0	95.671	95.665	204.000	1.000	102.000	0.100
6?	9.3	9.3	89.174	88.455	208.000	1.000	104.000	0.100

PEAK RESULTS
Peak Error Limit: 25%

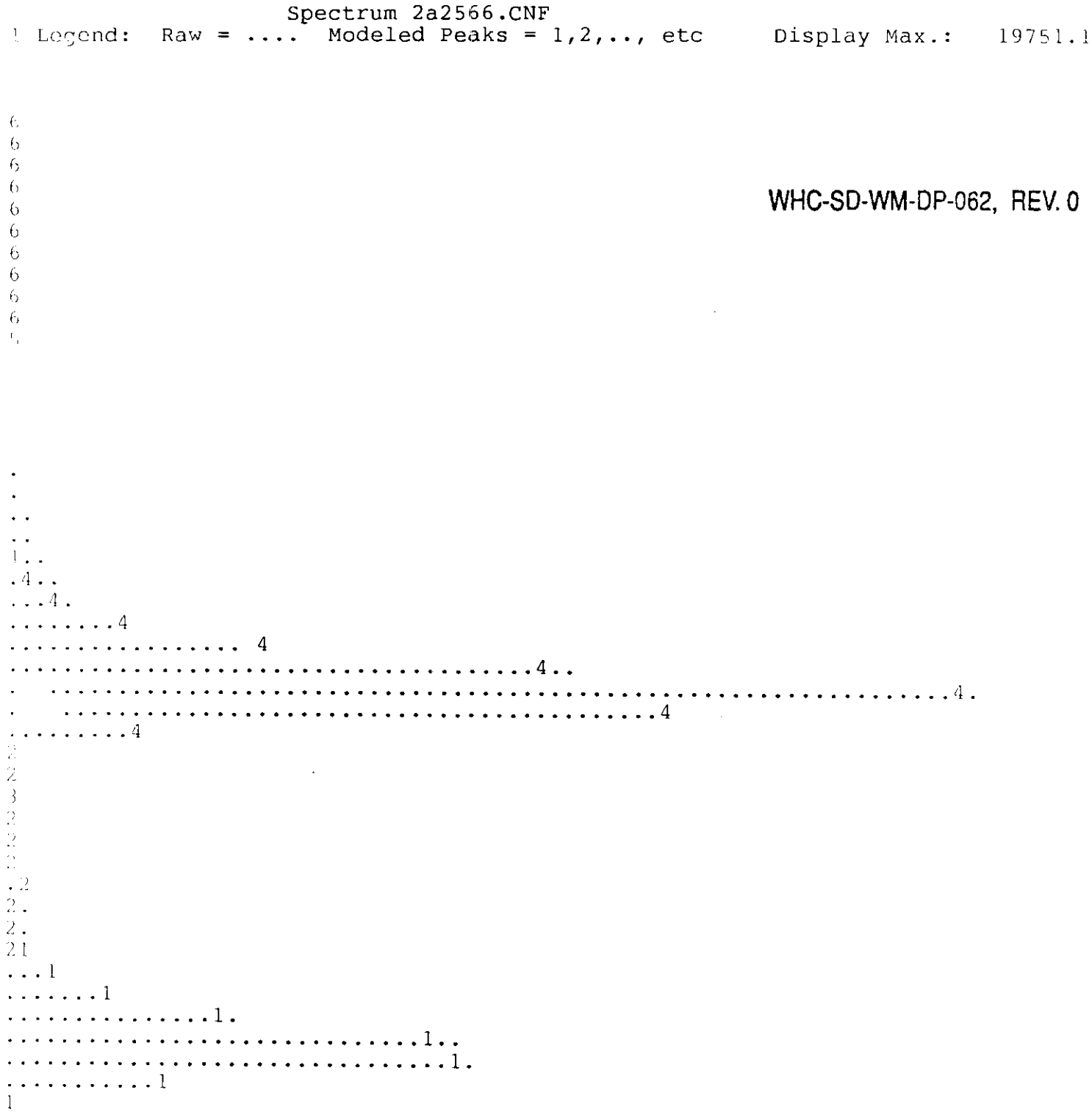
Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Cm243	0.325	5.786	5.778	0.008	0.07	22.29	1.1	236.1	0.106E-03
	Cm244		5.796	5.778	0.018				172.4	0.777E-04
2	Am241	0.033	5.480	5.504	-.024	0.18	2.27	4.8	18.7	0.841E-05
	Pu238		5.499	5.504	-.005				24.4	0.110E-04
3		????		5.341			0.02	153.		
4	Pu239	0.590	5.143	5.162	-.019	0.06	40.44	0.8	312.7	0.141E-03
	Pu240		5.144	5.162	-.018				312.7	0.141E-03
5		????		4.531			0.37	8.5		
6		????		4.497			0.23	17.2		
Totals:		0.948	<--valid peaks only-->				64.99			

DETECTOR CALIBRATION
Energy(MEV) = 4.081 + (0.0047)*Channel
Energy range (MeV): 4.081 TO 6.488
Efficiency = 0.1293 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	98707.0	100.000
Smoothed	98707.0	100.000
Composite fit	94491.7	95.729
Residuals	4215.3	4.271

Analyzed by: _____
DM


Spectrum 2a2566.CNF
Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.: 19751.1

Raw Data Dump for AEA Spectrum: 2a2566.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	7.	3.	4.
21	5.	2.	4.	4.	2.	4.	2.	8.	0.	1.
31	10.	2.	3.	2.	4.	1.	8.	6.	7.	8.
41	6.	9.	9.	2.	5.	6.	4.	7.	13.	5.
51	2.	3.	12.	7.	6.	8.	6.	9.	2.	3.
61	4.	6.	9.	10.	9.	8.	3.	8.	8.	10.
71	5.	7.	8.	5.	14.	2.	12.	9.	12.	12.
81	9.	11.	9.	7.	15.	9.	13.	13.	18.	13.
91	14.	9.	13.	10.	17.	15.	14.	12.	11.	10.
101	21.	12.	16.	14.	14.	17.	14.	19.	22.	16.
111	19.	15.	17.	16.	27.	24.	20.	22.	20.	14.
121	22.	22.	31.	20.	21.	31.	28.	30.	18.	31.
131	19.	26.	27.	26.	38.	24.	25.	27.	32.	42.
141	32.	53.	35.	38.	34.	36.	49.	43.	49.	44.
151	51.	44.	40.	60.	53.	58.	67.	55.	60.	73.
161	77.	69.	83.	75.	79.	55.	78.	86.	86.	86.
171	96.	82.	84.	107.	81.	99.	97.	96.	117.	124.
181	109.	131.	139.	149.	141.	123.	150.	161.	141.	159.
191	168.	156.	181.	203.	209.	203.	180.	234.	238.	244.
201	255.	255.	315.	293.	308.	328.	361.	430.	432.	493.
211	531.	624.	689.	717.	898.	957.	1052.	1237.	1376.	1453.
221	1615.	1788.	1992.	2115.	2342.	2456.	2552.	2717.	2782.	2771.
231	2701.	2666.	2356.	2218.	1975.	1690.	1414.	1155.	966.	672.
241	520.	377.	271.	160.	118.	75.	56.	31.	20.	35.
251	28.	39.	25.	26.	24.	27.	33.	32.	30.	29.
261	29.	32.	25.	28.	20.	29.	27.	30.	28.	27.
271	31.	20.	25.	23.	40.	39.	33.	41.	31.	33.
281	40.	30.	44.	41.	42.	49.	54.	53.	58.	74.
291	59.	47.	65.	78.	69.	81.	72.	82.	116.	80.
301	90.	87.	96.	92.	94.	84.	95.	98.	61.	81.
311	73.	84.	75.	77.	76.	67.	65.	92.	87.	84.
321	69.	101.	86.	91.	102.	96.	115.	103.	123.	127.
331	142.	147.	137.	147.	163.	162.	192.	205.	232.	241.
341	275.	310.	340.	385.	435.	454.	565.	619.	676.	775.
351	889.	915.	988.	1131.	1176.	1199.	1304.	1391.	1382.	1167.
361	1461.	1410.	1387.	1253.	1214.	1102.	950.	767.	698.	537.
371	431.	301.	206.	152.	76.	57.	34.	30.	16.	13.
381	3.	2.	2.	1.	0.	0.	1.	0.	0.	0.
391	0.	0.	0.	1.	0.	0.	0.	1.	0.	1.
401	1.	0.	0.	0.	0.	0.	0.	1.	0.	0.
411	0.	0.	1.	2.	2.	1.	0.	2.	0.	0.
421	1.	0.	0.	3.	1.	0.	1.	2.	0.	1.
431	1.	0.	0.	0.	1.	0.	1.	0.	0.	2.
441	0.	1.	0.	2.	2.	0.	0.	0.	0.	0.
451	2.	0.	0.	1.	0.	1.	0.	1.	0.	1.
461	1.	0.	0.	1.	1.	0.	2.	2.	0.	5.
471	1.	2.	3.	3.	1.	5.	4.	4.	3.	5.
481	0.	0.	3.	1.	2.	2.	2.	1.	0.	0.
491	0.	0.	0.	0.	0.	0.	1.	0.	0.	1.
511	0.	0.								

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT

WHC-SD-WM-DP-062, REV. 0

SAMPLE
J-1421-5681
File ID: 3a3625.CNF

Counted on: 1/28/94 @ 0:10
Detector: AEA3
Geometry number: 1
Count time: 86404. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	1565.3	1565.3	354.120	354.120	20.000	13.892	10.000	[illegible]
2	47.2	47.2	298.197	294.787	20.000	11.929	10.000	2.5[illegible]
3	11.1	11.1	262.324	261.292	20.000	2.214	10.000	0.213
4?	15.1	15.1	222.135	222.135	22.000	5.411	11.000	1.577

PEAK RESULTS
Peak Error Limit: 25%

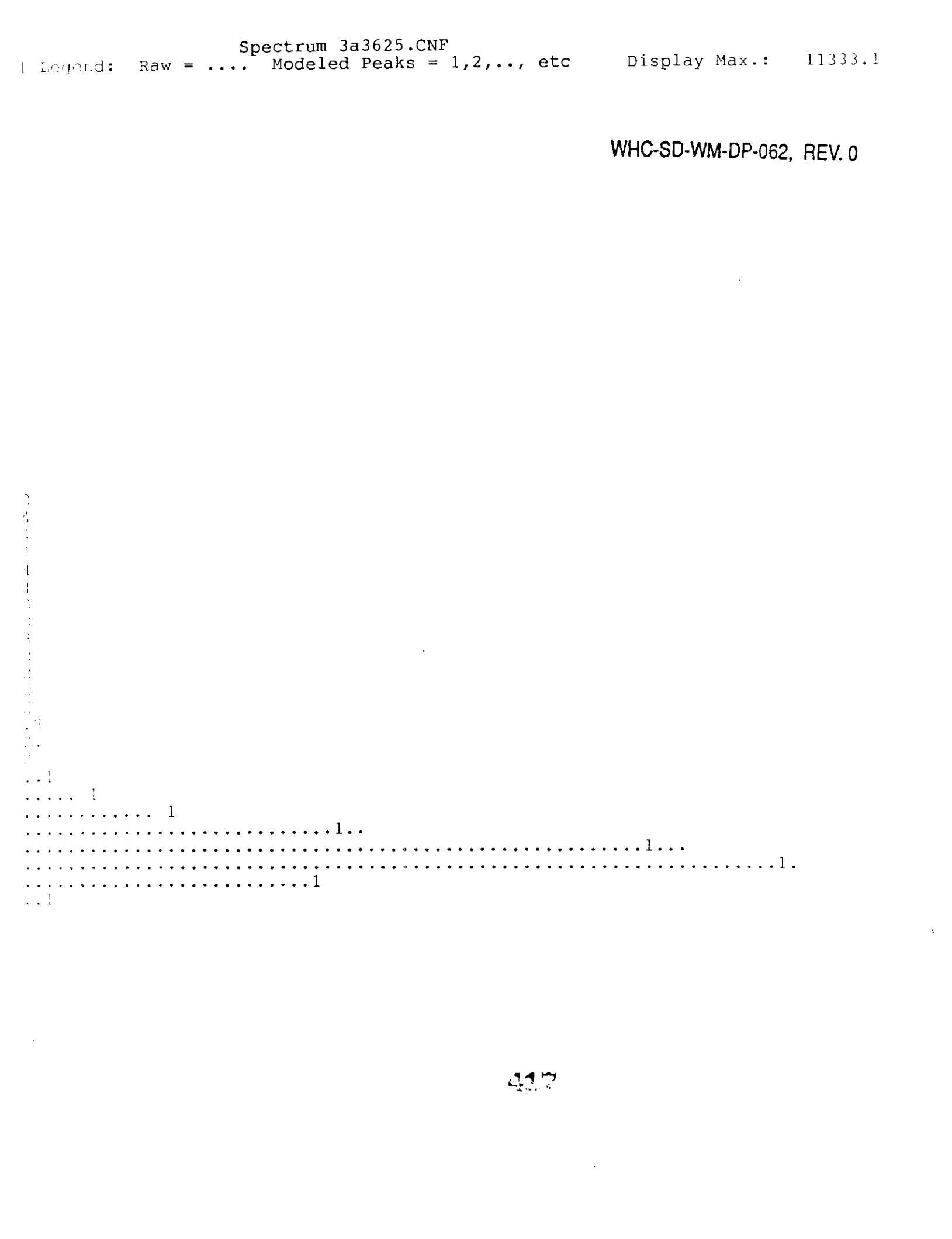
ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/cc
1	Ra224	0.956	5.680	5.722	-.042	0.06	24.49	1.0	174.3	[illegible]
	Pu236		5.756	5.722	0.034				167.2	[illegible]
2	Th228	0.034	5.430	5.449	-.019	0.05	0.87	7.0	8.2	[illegible]
	Am241		5.480	5.449	0.031				6.2	[illegible]
3	Am243	0.012	5.276	5.295	-.019	0.01	0.32	11.1	2.2	[illegible]
4		????		5.115			0.20	15.9		
Totals:		1.002	<--valid peaks only-->				25.68			

DETECTOR CALIBRATION
Energy(MEV) = 4.093 + (0.0046)*Channel
Energy range (MeV): 4.093 TO 6.448
Efficiency = 0.1495 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	36895.0	100.000
Smoothed	36895.0	100.000
Composite fit	37262.8	100.997
Residuals	-367.8	-0.997

Analyzed by: _____
DM


Spectrum 3a3625.CNF
Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.: 11333.1

Raw Data Dump for AEA Spectrum: 3a3625.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
21	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
51	0.	0.	0.	1.	0.	0.	0.	2.	0.	0.
61	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
71	0.	1.	1.	0.	0.	0.	0.	0.	1.	0.
81	1.	0.	0.	0.	0.	0.	0.	1.	2.	0.
91	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
101	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
111	3.	1.	0.	0.	2.	1.	0.	0.	0.	1.
121	0.	1.	1.	0.	0.	0.	0.	0.	1.	0.
131	1.	2.	0.	1.	0.	0.	0.	1.	1.	2.
141	0.	0.	0.	0.	2.	0.	0.	1.	0.	0.
151	0.	0.	0.	1.	0.	0.	1.	0.	1.	0.
161	1.	0.	1.	0.	1.	0.	0.	3.	1.	2.
171	0.	0.	1.	0.	2.	0.	1.	0.	2.	3.
181	2.	0.	0.	0.	2.	3.	1.	1.	1.	4.
191	3.	3.	7.	1.	4.	3.	4.	4.	3.	3.
201	13.	2.	4.	6.	7.	10.	11.	6.	6.	10.
211	10.	11.	16.	19.	17.	9.	14.	25.	22.	22.
221	18.	14.	18.	23.	18.	11.	13.	14.	8.	7.
231	4.	6.	4.	5.	2.	4.	10.	5.	8.	12.
241	16.	6.	9.	12.	7.	11.	13.	7.	14.	14.
251	10.	15.	12.	14.	14.	19.	21.	16.	14.	15.
261	14.	19.	20.	18.	13.	12.	9.	9.	14.	17.
271	14.	13.	19.	29.	22.	19.	23.	24.	20.	23.
281	26.	29.	30.	26.	35.	39.	30.	39.	38.	44.
291	43.	47.	65.	61.	66.	60.	58.	57.	57.	64.
301	55.	50.	46.	38.	36.	26.	37.	37.	35.	34.
	45.	36.	39.	44.	45.	41.	58.	66.	50.	55.
321	68.	86.	95.	96.	118.	123.	148.	157.	179.	188.
331	247.	255.	272.	320.	344.	393.	479.	525.	574.	655.
341	746.	765.	866.	912.	1072.	1057.	1234.	1312.	1380.	1480.
351	1448.	1516.	1640.	1698.	1631.	1507.	1406.	1365.	1194.	1089.
361	899.	734.	568.	413.	330.	194.	88.	42.	18.	11.
371	2.	0.	0.	0.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
461	0.	0.	0.	0.	1.	0.	0.	0.	2.	1.
471	1.	0.	1.	1.	0.	0.	0.	0.	1.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT

WHC-SD-WM-DP-062, REV. 0

SAMPLE
J-1426-5781
File ID: 4a4132.CNF

Counted on: 1/28/94 @ 0:10
Detector: AEA4
Geometry number: 1
Count time: 86403. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	986.4	986.4	362.844	362.844	14.000	5.753	7.000	1.459
2	283.3	283.3	304.813	304.673	16.000	9.691	8.000	2.327
3	1554.9	1554.9	231.876	231.872	14.000	6.869	7.000	2.12[illegible]

PEAK RESULTS
Peak Error Limit: 25%

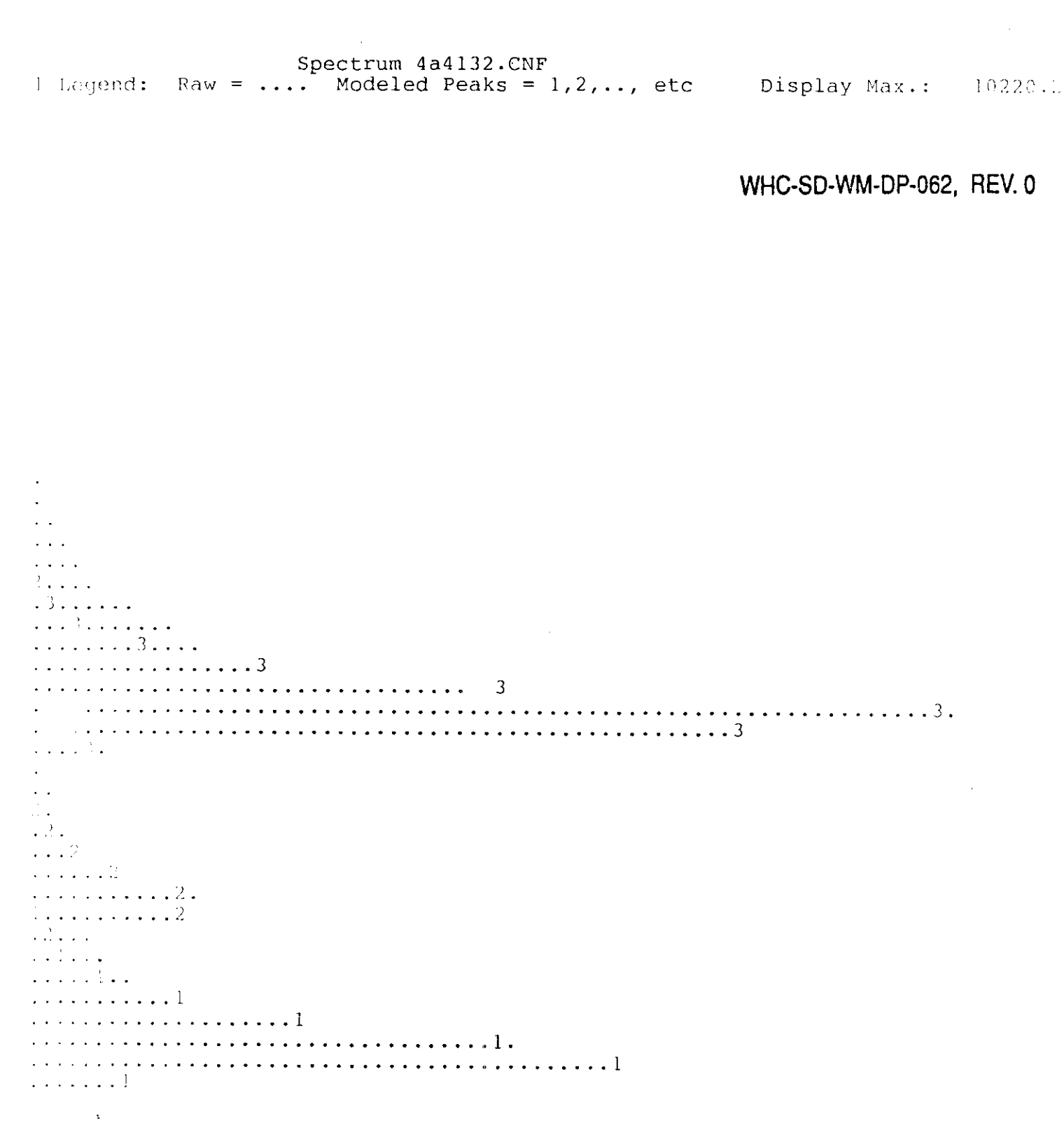
Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/[illegible]
1	Cm244	0.324	5.796	5.781	0.0150.03		14.20	1.4	183.9	0.8[illegible]
	Cm243		5.786	5.781	0.005				252.0	0.1[illegible]
2	Am241	0.106	5.480	5.507	-.0270.05		4.66	2.6	64.2	0.289E-0[illegible]
	Pu238		5.499	5.507	-.008				83.8	0.377E-[illegible]
3	Pu239	0.468	5.143	5.165	-.0220.03		20.53	1.1	265.9	0.120E-[illegible]
	Pu240		5.144	5.165	-.021				265.9	0.120E-
		-----					---------			
Totals:		0.898	<--valid peaks only-->				39.38			

DETECTOR CALIBRATION
Energy(MEV) = 4.075 + (0.0047)*Channel
Energy range (MeV): 4.075 TO 6.482
Efficiency = 0.0772 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	63173.0	100.000
Smoothed	63173.0	100.000
Composite fit	56712.1	89.773
Residuals	6460.9	10.227

Analyzed by: _____
DM


Spectrum 4a4132.CNF
Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.:

Raw Data Dump for AEA Spectrum: 4a4132.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	1.	0.	3.	3.
21	1.	2.	4.	2.	1.	1.	4.	3.	4.	2.
31	0.	1.	0.	0.	1.	1.	3.	0.	2.	2.
41	2.	0.	1.	2.	4.	1.	3.	3.	4.	2.
51	1.	2.	1.	0.	0.	0.	5.	7.	2.	3.
61	1.	0.	3.	3.	1.	4.	4.	2.	2.	0.
71	5.	3.	3.	2.	4.	1.	7.	1.	3.	3.
81	1.	2.	2.	6.	0.	3.	4.	3.	4.	7.
91	5.	8.	5.	6.	4.	5.	3.	6.	6.	9.
101	5.	4.	8.	9.	9.	8.	8.	6.	9.	8.
111	11.	3.	9.	7.	2.	9.	14.	6.	15.	9.
121	9.	12.	15.	11.	15.	17.	11.	16.	21.	14.
131	14.	18.	20.	10.	21.	21.	20.	21.	15.	27.
141	20.	22.	27.	30.	26.	32.	22.	35.	34.	28.
151	40.	34.	36.	46.	45.	46.	40.	39.	36.	54.
161	29.	55.	51.	56.	61.	84.	55.	63.	83.	68.
171	74.	67.	66.	99.	90.	92.	94.	95.	104.	122.
181	122.	119.	124.	119.	129.	116.	142.	148.	168.	185.
191	164.	161.	176.	204.	195.	192.	212.	210.	242.	236.
201	252.	218.	235.	235.	256.	272.	274.	258.	287.	329.
211	329.	313.	352.	382.	393.	421.	431.	505.	599.	615.
221	651.	715.	811.	942.	971.	998.	1243.	1375.	1438.	1657.
231	1632.	1698.	1640.	1517.	1333.	994.	755.	515.	325.	197.
241	97.	46.	34.	21.	17.	28.	16.	23.	28.	15.
251	27.	21.	34.	33.	31.	30.	34.	38.	43.	35.
261	35.	42.	36.	41.	41.	41.	47.	49.	48.	56.
271	54.	47.	59.	64.	40.	71.	71.	65.	66.	69.
281	76.	64.	70.	82.	94.	93.	92.	104.	101.	99.
291	122.	139.	173.	160.	163.	190.	223.	253.	241.	252.
301	350.	278.	280.	343.	327.	311.	276.	265.	213.	156.
311	130.	108.	88.	94.	82.	77.	83.	104.	100.	79.
321	92.	123.	115.	128.	117.	128.	132.	141.	162.	141.
331	168.	163.	169.	151.	160.	216.	211.	169.	195.	213.
341	189.	229.	234.	268.	285.	310.	302.	357.	375.	423.
351	527.	560.	624.	611.	682.	705.	737.	720.	825.	946.
361	963.	1059.	1084.	1071.	952.	736.	560.	389.	242.	123.
371	53.	22.	13.	3.	4.	0.	1.	0.	0.	0.
381	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	2.	0.	0.	0.	0.	1.	0.
431	1.	1.	0.	0.	0.	0.	0.	2.	0.	0.
441	1.	0.	0.	1.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
471	1.	0.	0.	0.	1.	2.	2.	1.	1.	1.
481	1.	1.	3.	2.	0.	0.	2.	0.	1.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
501	0.	0.								

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT

WHC-SD-WM-DP-062, REV. 0

SAMPLE
J-1426-5781 DUP
File ID: 5a5053.CNF

Counted on: 1/28/94 @ 0:11
Detector: AEA5
Geometry number: 1
Count time: 86403. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	797.8	797.8	357.153	358.352	22.000	19.574	11.000	2.393
2	169.8	169.8	301.997	299.150	18.000	13.298	9.000	1.97[illegible]
3	1214.5	1214.5	226.940	226.599	22.000	19.074	11.000	2.321

PEAK RESULTS
Peak Error Limit: 25%

	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Cm243	0.383	5.786	5.756	0.030	0.09	22.92	1.1	230.4	0.104E-0[illegible]
	Pu236		5.756	5.756	0.000				171.6	0.77[illegible]
2	Am241	0.067	5.480	5.478	0.002	0.06	4.02	3.8	31.3	0.[illegible]
	Pu238		5.499	5.478	0.021				40.9	0.18[illegible]
3	Pu239	0.548	5.143	5.137	0.006	0.09	32.84	0.9	240.9	0.10[illegible]
	Pu240		5.144	5.137	0.007				240.9	0.[illegible]
Totals:		0.998	<--valid peaks only-->				59.78			

DETECTOR CALIBRATION
Energy(MEV) = 4.072 + (0.0047)*Channel
Energy range (MeV): 4.072 TO 6.478
Efficiency = 0.1363 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	86264.0	100.000
Smoothed	86264.0	100.000
Composite fit	86083.8	99.791
Residuals	180.2	0.209

Analyzed by: _____
DM

Spectrum 5a5053.CNF

Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 9298.9

Raw Data Dump for AEA Spectrum: 5a5053.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	2.	5.	5.	8.
21	5.	6.	3.	5.	3.	6.	5.	3.	7.	10.
	9.	3.	4.	6.	12.	4.	6.	7.	5.	6.
	7.	8.	4.	6.	8.	4.	5.	8.	4.	5.
51	11.	6.	8.	9.	6.	3.	7.	11.	7.	11.
61	8.	5.	10.	10.	11.	7.	14.	11.	15.	9.
71	5.	4.	8.	12.	12.	9.	14.	11.	11.	17.
81	11.	13.	14.	13.	8.	17.	12.	23.	14.	13.
91	16.	19.	17.	12.	12.	12.	13.	20.	21.	24.
101	14.	16.	18.	19.	17.	16.	21.	22.	22.	15.
111	33.	10.	22.	25.	26.	19.	30.	25.	21.	36.
121	32.	23.	34.	28.	30.	24.	24.	21.	38.	49.
131	34.	42.	39.	43.	47.	51.	37.	41.	41.	38.
141	49.	44.	47.	56.	70.	61.	74.	57.	69.	78.
151	76.	71.	67.	84.	89.	77.	79.	97.	85.	89.
161	75.	105.	116.	123.	124.	123.	115.	113.	129.	129.
171	170.	157.	171.	148.	162.	178.	214.	177.	207.	224.
181	233.	258.	257.	267.	259.	269.	237.	267.	316.	321.
191	337.	371.	369.	376.	424.	428.	421.	467.	427.	496.
201	537.	545.	571.	624.	632.	667.	643.	676.	709.	834.
211	709.	814.	848.	920.	868.	916.	1064.	997.	1084.	1164.
221	1112.	1206.	1233.	1209.	1209.	1287.	1238.	1320.	1177.	1113.
231	1029.	971.	874.	853.	694.	590.	492.	387.	320.	276.
241	188.	174.	99.	99.	82.	57.	46.	59.	47.	58.
251	49.	51.	59.	59.	53.	65.	69.	62.	65.	82.
261	77.	77.	88.	83.	86.	97.	109.	96.	78.	94.
271	120.	93.	116.	106.	109.	108.	143.	136.	116.	111.
281	128.	151.	162.	186.	179.	198.	169.	183.	214.	202.
291	231.	238.	263.	261.	276.	236.	264.	288.	260.	325.
	294.	249.	269.	265.	261.	251.	259.	227.	208.	221.
	179.	173.	177.	166.	207.	222.	194.	188.	206.	257.
321	206.	237.	256.	237.	279.	271.	268.	295.	281.	276.
331	335.	344.	352.	384.	372.	441.	454.	468.	483.	535.
341	530.	589.	552.	599.	622.	655.	698.	661.	739.	757.
351	731.	799.	847.	784.	842.	787.	786.	787.	801.	782.
361	744.	691.	656.	555.	525.	434.	354.	308.	238.	179.
371	140.	85.	67.	48.	27.	15.	14.	14.	5.	7.
381	1.	0.	1.	0.	0.	0.	0.	1.	0.	3.
391	1.	0.	0.	0.	0.	1.	0.	0.	0.	0.
401	1.	0.	1.	1.	0.	1.	0.	0.	1.	1.
411	0.	0.	0.	0.	0.	1.	0.	0.	1.	0.
421	1.	0.	1.	1.	0.	4.	1.	0.	0.	2.
431	4.	0.	2.	0.	0.	0.	1.	0.	1.	0.
441	0.	0.	0.	0.	1.	0.	1.	1.	0.	0.
451	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
461	0.	0.	0.	0.	1.	0.	1.	2.	0.	1.
471	0.	2.	1.	4.	0.	1.	3.	1.	5.	1.
481	3.	1.	1.	2.	4.	2.	0.	0.	1.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
501	0.	0.								

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT

WHC-SD-WM-DP-062, REV. 0

SAMPLE
J-1426-5781 TRIP
File ID: 6a6964.CNF

Counted on: 1/28/94 @ 0:12
Detector: AEA6
Geometry number: 1
Count time: 86403. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1?	13.4	13.4	496.354	496.354	8.000	0.961	4.000	3.430
2	754.5	754.5	358.306	358.306	28.000	30.178	14.000	6.536
3	210.1	210.1	298.088	297.752	24.000	22.608	12.000	4.3[illegible]
4	1286.2	1286.2	224.996	224.979	28.000	24.275	14.000	6.0[illegible]
5?	13.1	13.1	103.383	103.335	168.000	1.000	84.000	0.1[illegible]

PEAK RESULTS
Peak Error Limit: 25%

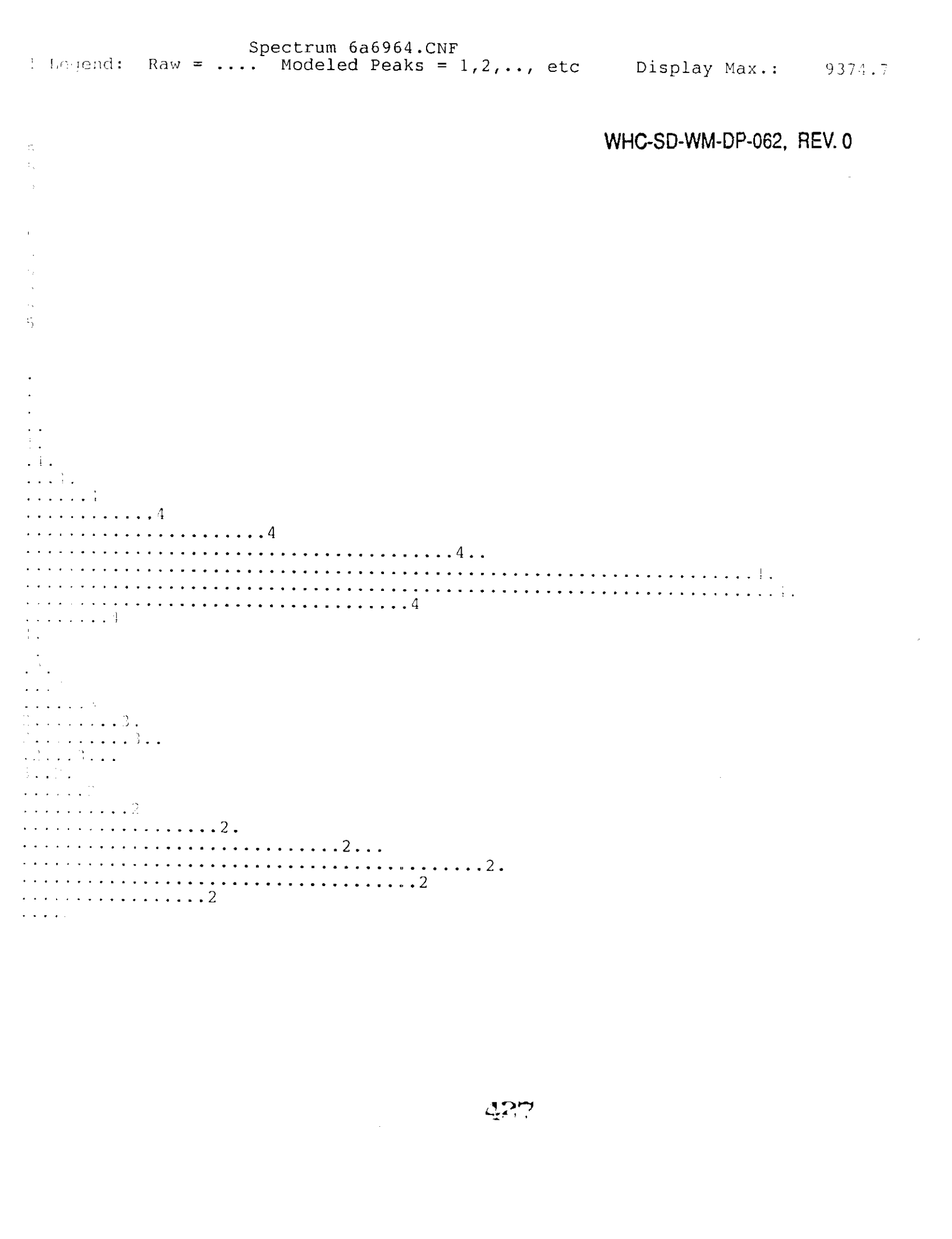
Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1		????		6.415			0.04	24.6		
2	Cm243	0.349	5.786	5.766	0.020	0.14	17.29	1.2	185.3	0.835E-0[illegible]
	Pu236		5.756	5.766	-.010				138.0	0.622E-04
3	Am241	0.095	5.480	5.481	-.001	0.11	4.71	2.8	39.2	[illegible]
	Pu238		5.499	5.481	0.018				51.2	0.23[illegible]
4	Pu239	0.526	5.143	5.139	0.004	0.11	26.10	1.0	204.2	[illegible]
	Pu240		5.144	5.139	0.005				204.2	0.92[illegible]
5		????		4.567			0.33	9.1		
Totals:		0.970	<--valid peaks only-->				48.09			

DETECTOR CALIBRATION
Energy(MEV) = 4.082 + (0.0047)*Channel
Energy range (MeV): 4.082 TO 6.488
Efficiency = 0.1278 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	71387.0	100.000
Smoothed	71393.5	100.009
Composite fit	69798.4	97.775
Residuals	1588.6	2.225

Analyzed by: _____
DM


Spectrum 6a6964.CNF
Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.: 9374.7

Raw Data Dump for AEA Spectrum: 6a6964.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	4.	4.	4.
21	4.	6.	5.	5.	5.	6.	1.	6.	8.	10.
	5.	4.	13.	2.	5.	6.	9.	10.	8.	5.
	7.	6.	6.	5.	11.	7.	3.	10.	3.	11.
51	4.	4.	1.	3.	6.	8.	2.	8.	11.	7.
61	4.	11.	5.	8.	4.	3.	4.	10.	8.	6.
71	10.	5.	1.	5.	8.	7.	9.	6.	9.	12.
81	6.	11.	8.	4.	6.	12.	12.	7.	12.	6.
91	7.	3.	7.	9.	6.	14.	10.	9.	13.	10.
101	8.	8.	20.	15.	8.	8.	17.	5.	15.	8.
111	6.	8.	12.	9.	12.	10.	12.	12.	16.	10.
121	11.	11.	21.	15.	18.	22.	22.	16.	24.	17.
131	15.	11.	16.	22.	17.	19.	24.	24.	26.	20.
141	19.	29.	22.	26.	39.	27.	28.	29.	29.	29.
151	27.	31.	31.	42.	23.	50.	33.	36.	37.	1[illegible].
161	44.	35.	48.	45.	46.	48.	55.	47.	58.	51.
171	63.	58.	48.	59.	71.	65.	85.	91.	87.	88.
181	98.	101.	104.	105.	114.	124.	114.	127.	155.	110.
191	150.	155.	170.	184.	214.	174.	213.	252.	240.	278.
201	302.	337.	369.	356.	398.	419.	482.	520.	567.	648.
211	668.	768.	773.	854.	894.	937.	998.	1103.	1170.	1227.
221	1288.	1211.	1298.	1396.	1313.	1308.	1288.	1230.	1193.	1060.
231	983.	925.	836.	757.	672.	561.	511.	423.	308.	237.
241	211.	171.	128.	125.	85.	80.	65.	49.	50.	[illegible].
251	37.	43.	28.	36.	36.	38.	46.	38.	35.	[illegible].
261	54.	57.	43.	58.	59.	55.	56.	67.	61.	[illegible].
271	49.	63.	73.	61.	62.	83.	73.	72.	78.	[illegible].
281	105.	100.	154.	133.	136.	154.	170.	190.	185.	[illegible].
291	219.	191.	243.	205.	204.	231.	250.	247.	250.	223.
301	218.	210.	210.	191.	158.	171.	166.	145.	143.	137.
[illegible]	115.	105.	102.	99.	100.	101.	90.	80.	93.	84.
321	86.	90.	96.	111.	115.	123.	110.	153.	146.	150.
331	156.	206.	191.	190.	221.	227.	288.	299.	310.	345.
341	380.	401.	421.	447.	454.	481.	527.	547.	643.	685.
351	696.	709.	721.	774.	771.	773.	714.	782.	770.	733.
361	746.	717.	683.	652.	579.	559.	512.	451.	402.	301.
371	303.	247.	219.	185.	146.	113.	78.	78.	61.	[illegible].
381	29.	22.	12.	13.	7.	11.	1.	2.	0.	[illegible].
391	1.	0.	0.	0.	1.	1.	1.	1.	1.	[illegible].
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
411	0.	0.	0.	0.	1.	1.	0.	0.	2.	0.
421	1.	0.	1.	0.	1.	0.	0.	2.	0.	0.
431	0.	0.	2.	2.	1.	0.	1.	0.	2.	1.
441	0.	1.	0.	1.	1.	0.	2.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
461	1.	1.	1.	0.	2.	2.	4.	5.	4.	4.
471	2.	4.	5.	5.	8.	6.	1.	5.	2.	3.
481	0.	3.	0.	1.	0.	0.	1.	0.	0.	0.
491	1.	0.	0.	3.	11.	21.	27.	6.	0.	0.
501	0.	0.								

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT

SAMPLE
J-1426-5981 SPIK
File ID: 7a7489.CNF

Counted on: 1/28/94 @ 0:12
Detector: AEA7
Geometry number: 1
Count time: 86401. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Final	Peak center Initial	Final	FWHM Initial	Final	Tau Initial	Final
1	794.1	794.1	358.655	358.655	20.000	15.219	10.000	2.382
	214.9	214.9	301.640	301.158	20.000	12.594	10.000	2.533
	2752.8	2752.8	228.559	228.552	18.000	11.297	9.000	2.356
12	13.9	13.9	107.421	107.007	82.000	1.000	41.000	0.100

PEAK RESULTS
Peak Error Limit: 25%

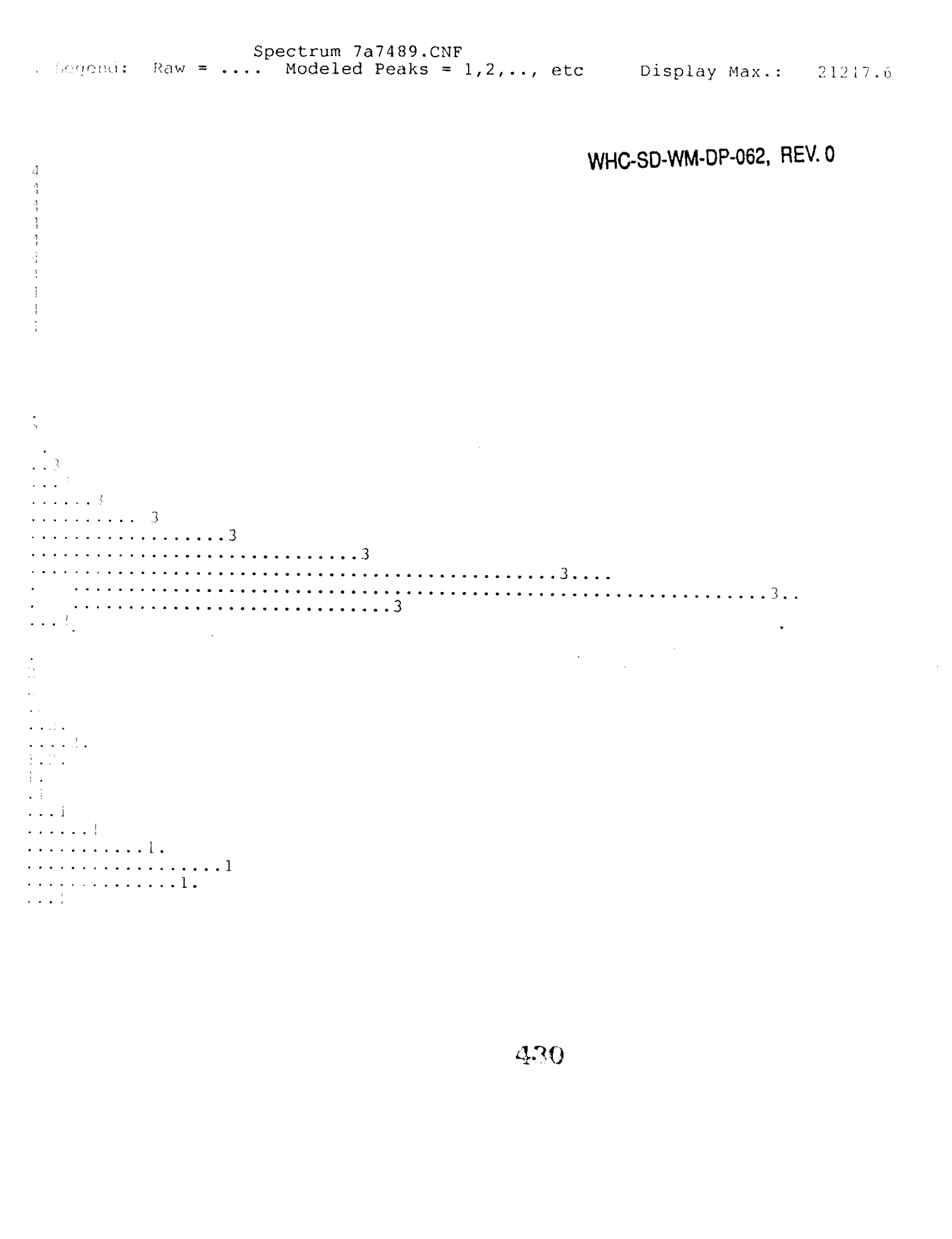
Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ml
1	Pu224	0.211	5.680	5.732	-.0520.07		15.04	1.3	136.1	0.6138-0
	Pu226		5.756	5.732	0.024				130.5	0.5888-0
2	Am241	0.058	5.480	5.468	0.0120.06		4.14	2.9	37.4	0.1694-0
	Cm238		5.499	5.468	0.031				48.8	0.2208-0
3	Pu239	0.713	5.143	5.134	0.0090.05		50.76	0.7	431.6	0.1948-0
	Pu240		5.144	5.134	0.010				431.6	0.1948-
4		????		4.575			0.35	9.3		
Totals:		0.982	<--valid peaks only-->				69.94			

DETECTOR CALIBRATION
Energy(MEV) = 4.082 + (0.0046)*Channel
Energy range (MeV): 4.082 TO 6.438
Efficiency = 0.1176 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	102567.0	100.000
Smoothed	102566.7	100.000
Composite fit	101216.7	98.684
Residuals	1350.3	1.316

Analyzed by: _____
DM


Spectrum 7a7489.CNF
Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.: 21217.6

Raw Data Dump for AEA Spectrum: 7a7489.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	2.	6.	2.	8.
21	2.	5.	3.	1.	2.	3.	6.	6.	9.	10.
31	4.	5.	4.	5.	2.	7.	1.	3.	1.	5.
41	7.	3.	2.	6.	7.	10.	4.	4.	5.	7.
51	2.	3.	4.	7.	2.	7.	4.	8.	4.	8.
61	4.	7.	6.	10.	2.	3.	9.	6.	6.	6.
71	8.	8.	8.	6.	4.	5.	11.	10.	10.	8.
81	5.	13.	5.	9.	4.	6.	6.	9.	10.	10.
91	5.	7.	7.	12.	12.	7.	12.	9.	12.	13.
101	11.	4.	18.	9.	10.	22.	12.	9.	19.	15.
111	10.	9.	12.	19.	21.	14.	20.	22.	21.	23.
121	22.	23.	11.	26.	16.	24.	29.	27.	23.	25.
131	18.	30.	27.	22.	28.	23.	36.	26.	37.	34.
141	36.	37.	41.	43.	47.	53.	48.	35.	44.	34.
151	53.	60.	52.	61.	63.	52.	47.	58.	63.	58.
161	81.	75.	82.	97.	76.	82.	70.	95.	95.	93.
171	119.	102.	99.	128.	158.	148.	141.	155.	182.	187.
181	155.	175.	196.	202.	219.	223.	264.	226.	241.	289.
191	286.	342.	304.	357.	378.	384.	462.	414.	475.	489.
201	586.	638.	659.	692.	703.	775.	852.	958.	968.	999.
211	1159.	1191.	1310.	1364.	1475.	1671.	1741.	1911.	1957.	2011.
221	2231.	2335.	2468.	2588.	2623.	2808.	2810.	2865.	2862.	2798.
231	2717.	2469.	2216.	1825.	1521.	1088.	858.	505.	316.	204.
241	120.	85.	49.	27.	23.	19.	22.	21.	23.	30.
251	27.	24.	21.	31.	34.	33.	34.	44.	37.	46.
261	25.	31.	49.	58.	48.	46.	30.	35.	56.	46.
271	46.	58.	49.	48.	59.	65.	65.	70.	75.	59.
281	85.	72.	101.	89.	117.	119.	132.	126.	135.	152.
291	140.	178.	157.	194.	225.	199.	261.	265.	217.	237.
301	269.	236.	245.	235.	222.	211.	191.	180.	134.	121.
311	97.	85.	58.	78.	57.	51.	65.	76.	66.	71.
321	76.	85.	91.	97.	111.	109.	104.	125.	113.	139.
331	127.	146.	206.	174.	181.	262.	248.	243.	280.	274.
341	319.	324.	335.	392.	422.	473.	503.	543.	556.	595.
351	636.	721.	712.	741.	757.	821.	834.	812.	816.	810.
361	755.	787.	733.	708.	556.	521.	347.	275.	165.	99.
371	68.	45.	26.	9.	3.	1.	0.	0.	1.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	1.	0.	0.	1.
431	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	1.	1.	0.	0.	0.	0.	0.	1.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	1.	1.	0.
471	2.	0.	2.	0.	1.	0.	0.	0.	1.	1.
481	1.	0.	0.	1.	1.	0.	2.	0.	2.	0.
491	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
501	17.	0.								

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT **WHC-SD-WM-DP-062, REV. 0**

SAMPLE
J-1426-5981 SPIK
File ID: 8a8702.CNF

Counted on: 1/28/94 @ 0:13
Detector: AEA8
Geometry number: 1
Count time: 86404. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	255.1	255.1	352.870	352.870	26.000	22.103	13.000	2.953
2	91.0	91.0	295.807	295.288	24.000	21.293	12.000	1.727
??	16.7	16.7	258.861	257.541	24.000	7.426	12.000	2.340
4	833.7	833.7	221.928	221.838	24.000	20.731	12.000	2.329
5	80.0	80.0	141.402	137.924	58.000	115.425	29.000	2.337

PEAK RESULTS
Peak Error Limit: 25%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/cc
1	Cm243	0.160	5.786	5.743	0.043	0.10	7.05	1.9	84.5	0.381E-[illegible]
	Pu236		5.756	5.743	0.013				62.9	0.283E-0[illegible]
2	Am241	0.081	5.480	5.473	0.007	0.10	3.57	3.3	33.2	0.150E-0[illegible]
	Pu238		5.499	5.473	0.026				43.4	0.195E-0[illegible]
[illegible]		????		5.295			0.22	35.3		
[illegible]	[illegible]239	0.582	5.143	5.128	0.015	0.10	25.61	1.0	224.0	0.101E-[illegible]
	Pu240		5.144	5.128	0.016				224.0	0.101E-[illegible]
[illegible]	Np237	0.153	4.640	4.733	-.093	0.54	6.73	3.2	981.7	[illegible]
	Np237		4.781	4.733	0.048				67.7	0.305E-[illegible]
Totals:		0.977	<--valid peaks only-->				42.96			

DETECTOR CALIBRATION
Energy(MEV) = 4.085 + (0.0047)*Channel
Energy range (MeV): 4.085 TO 6.491
Efficiency = 0.1143 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	63335.0	100.000
Smoothed	63335.0	100.000
Composite fit	62183.2	98.181
Residuals	1151.8	1.819

Analyzed by: _____
DM

Spectrum 8a8702.CNF
Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.:

Raw Data Dump for AEA Spectrum: 8a8702.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	31.	53.	75.	63.
21	70.	62.	72.	67.	56.	77.	58.	61.	62.	56.
31	74.	71.	77.	64.	61.	80.	72.	71.	66.	63.
41	79.	65.	81.	66.	66.	63.	69.	76.	67.	56.
51	63.	71.	80.	74.	68.	67.	70.	83.	86.	76.
61	86.	81.	74.	83.	74.	87.	67.	92.	98.	73.
71	91.	87.	78.	89.	93.	103.	96.	111.	86.	88.
81	81.	87.	84.	84.	90.	93.	95.	99.	97.	90.
91	91.	107.	95.	81.	119.	113.	110.	98.	86.	123.
101	116.	107.	105.	99.	104.	104.	126.	95.	112.	102.
111	124.	111.	125.	122.	130.	114.	121.	123.	147.	125.
121	127.	126.	131.	132.	130.	117.	128.	135.	138.	131.
131	121.	125.	134.	161.	129.	131.	132.	168.	140.	151.
141	152.	143.	151.	151.	130.	131.	129.	166.	159.	151.
151	158.	161.	174.	163.	178.	165.	163.	167.	175.	183.
161	215.	199.	203.	185.	212.	203.	177.	170.	216.	205.
171	230.	199.	227.	225.	252.	217.	212.	249.	251.	244.
181	271.	264.	292.	284.	306.	295.	302.	310.	348.	347.
191	332.	350.	387.	371.	401.	379.	427.	393.	468.	470.
201	464.	494.	462.	506.	508.	564.	551.	578.	629.	640.
211	705.	651.	698.	706.	794.	775.	789.	877.	819.	900.
221	916.	894.	845.	840.	849.	813.	802.	683.	632.	576.
231	488.	436.	320.	239.	180.	128.	112.	96.	74.	62.
241	63.	50.	49.	55.	49.	59.	54.	52.	43.	60.
251	56.	60.	58.	57.	58.	54.	52.	69.	65.	52.
261	51.	55.	67.	55.	64.	76.	66.	74.	73.	71.
271	63.	65.	77.	74.	72.	71.	90.	77.	82.	101.
281	79.	88.	112.	101.	97.	87.	106.	102.	105.	98.
291	97.	119.	119.	125.	120.	140.	128.	98.	132.	107.
301	116.	112.	92.	119.	89.	102.	76.	66.	80.	68.
311	66.	83.	69.	70.	76.	71.	59.	80.	81.	77.
321	75.	96.	98.	75.	89.	110.	110.	103.	113.	127.
331	123.	136.	135.	118.	140.	158.	146.	189.	147.	178.
341	173.	188.	217.	199.	235.	200.	247.	251.	252.	249.
351	228.	254.	275.	262.	226.	249.	240.	220.	197.	165.
361	159.	153.	143.	130.	84.	63.	55.	27.	13.	14.
371	5.	0.	2.	0.	0.	0.	0.	0.	0.	1.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	1.	1.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
461	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	1.	0.	0.	0.	0.	0.	0.	1.	0.
481	1.	1.	0.	2.	0.	1.	0.	1.	1.	0.
491	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
501	0.	0.								

2402

WESTINGHOUSE HANFORD COMPANY

222-S LABORATORY

WHC-SD-WM-DP-062, REV. 0

ANALYTICAL BATCH

Lab Segment Serial No.	Customer ID:
J1427	KE71A
Analysis: Pu239/240	**Sample Prep:** DIRECT

Instrument: WB537237	Procedure/ Rev: LA503-156 / D-0
Technologist: Joel M Uhrlaub	Date: 1-13-94
Starting Time: 0900	Temperature 25°C
Ending Time: 1800	Chemist: L Fitts

Comments: 24 HR AZA

	Description	Lab ID
1	LMCS	J1419-5591
2	BLK	J1422-5691
3	Sample	J1427-5791
4	Sample Dup	J1427-5791
5	Sample Trip	J1427-5791
6	Spike	J1427-5991
7	Spike Dup	J1427-5991
8		
9		
10		

	Description	Lab ID
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS	03843	.100-10-.100		
Spike	77843	.05mL		

ANALYTICAL BATCH SUMMARY SHEET

METHOD: LA-503-156

DATE START: January 13, 1994

PREPARED BY: L.L. Fritts 1-19-94

DATE COMPLETE: January 19, 1994

	UNITS:	uCi/mL									
SPL NAME	SPL ID	ANALYTE	RESULT #1	RESULT #2	RESULT #3	AVERAGE	2*SD	PREC	%REC	DET LIM	% CT ER
STD 63B43	J1419	Pu-239/40	1.43E+2						109.6	1.15E-2	0.6
BLANK	J1422	Pu-239/40	<1.81E-3						32.8	1.81E-3	100.0
KE71A	J1427	Pu-239/40	5.97E-2	6.10E-2	5.56E-2	5.88E-2	5.64E-3	9.6	72.3	5.49E-3	0.9
									71.8	5.76E-3	0.7
									79.0	4.75E-3	0.6
KE71A	J1427	239 Spike	112.3	110.3							
STD 63B43	J1419	Pu-238	<1.03E+1						N/A	1.03E-2	1.9
BLANK	J1422	Pu-238	<1.39E-2						32.8	1.39E-2	4.5
KE71A	J1427	Pu-238	9.13E-3	1.09E-2	<5.76E-3	N/A	N/A	N/A	72.3	6.30E-3	1.4
									71.8	6.34E-3	1.1
									79.0	5.76E-3	1.3

NARRATIVE: [X] NO SPECIAL PROBLEMS/METHOD VARIATIONS IN THIS BATCH

LIST SPECIFIC PROBLEMS/VARIATIONS FOR THIS BATCH:

The results for the standard are in uCi/L.

The results for the spike are in percent recovery.

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

#5 2532 Batch 2402

Serial No	Sample Point	Date	Time Issued	Priority
J 1419.-5581	BECHTOLD	12-16-93	9:12	22

Determination	Method Standard	Result Units	Charge Code	Reruns
Pu239/40	LA-503-156	% RECOVERY	E14157	0

Sample Size	Customer ID
? .100-10-.100mL	STD

Remarks, Calculations, Results

EDP R211 AR001 "AEA" - ~~ASCII~~ ATTACH PRINTOUT

STD#63843 RESULT 143

STD VAL. 1.3050E+2 %REC 109.6%

.05mL 77B43 WHC-SD-WM-DP-062, REV. 0

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs 1-14-94	Hrs	1-17-94
Date 1-13-94	Time Completed 1800	Lab Unit Mgr	1-17-94	

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

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

Serial No.				STANDARD
J1419-5581	Date Counted	01/14/94	Pu 236 AEA Frac. (C236)	0.301
Batch ID	Sample Volume in mL (SS)	0.1	Pu 238 AEA Frac. (C238)	0.022
2402	Sample D.F. (DF)	101	Pu 239 AEA Frac. (C239)	0.625
Rerun No.	Tracer Volume in mL (SPKV)	0.05	Total AT Counts	13880
0	Digest D.F. (DDF)	1	Time Counted in min (TC)	60
Analyst	Tracer Book No.	77B43	Background in cpm (Bkg)	8
J VANSANT	Tracer Preparation Date	10/12/93	Pu 236 Counts	28.27
Date	Pu-236 Preparation Value	3226	Pu 238 Counts	2.09
01/13/94	Pu-236 Decay Corr'd Value	3030.27	Pu 239 Counts	58.65
	Pu-238 Tracer Value	133	AEA Count Time in min	1440

Decay Time = Date Counted - Tracer Preparation Date

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

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SS

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

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

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

Pu-239/240 µCi/L	=	1.43E+02

NOTE: Tracer values are in dpm/mL.

Pu-239/240 µCi/mL	=	1.43E-01
Relative Counting Error	=	0.6%
Pu-238 µCi/mL	=	< 1.03E-02
Relative Counting Error	=	1.9%
Pu 236 Tracer Recovery	=	88.7%

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

DETECTION LEVELS in µCi/mL					
Pu 239/240	=	1.15E-02	Pu 238	=	1.03E-02

Data Entry by:		Date:	17-Jan-94
Approved by:		Date:	19 Jan 1994

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#1 1-13-94 DM

13880/60 -8

J 1419-5581

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

#3 3592

Serial No	Sample Point	Date	Time Issued	Priority
J 1422.-5681	BECHTOLD	12-16-93	9:14	22

Determination	Method-Standard	Result Units	Charge Code	Reruns
Pu239/40	LA-503-156	uCi/ML	E14157	0

Sample Size: ? .1mL - 10. mL - .2 mL

Customer ID: BLK

Remarks, Calculations, Results: REAGENT BLANK

COUNT AS uCI/L

.05mL 77843

"AEA" 24HR ATTACH PRINTOUT

$< 1.81 \times 10^{-3}$ uCi/mL

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs 1-14-94	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1-13-94	1800	Roberts	1-17-94

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

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

Serial No.				BLANK
J1422-5681	Date Counted	01/14/94	Pu 236 AEA Frac. (C236)	0.954
Batch ID	Sample Volume in mL (SS)	0.2	Pu 238 AEA Frac. (C238)	0.03
2402	Sample D.F. (DF)	101	Pu 239 AEA Frac. (C239)	0
Rerun No.	Tracer Volume in mL (SPKV)	0.05	Total AT Counts	1622
0	Digest D.F. (DDF)	1	Time Counted in min (TC)	60
Analyst	Tracer Book No.	77B43	Background in cpm (Bkg)	1
J VANSANT	Tracer Preparation Date	10/12/93	Pu 236 Counts	10.92
Date	Pu-236 Preparation Value	3226	Pu 238 Counts	0.35
01/13/94	Pu-236 Decay Corr'd Value	3030.27	Pu 239 Counts	0
	Pu-238 Tracer Value	133	AEA Count Time in min	1440

Decay Time = Date Counted - Tracer Preparation Date

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

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SS

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

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

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

Pu-239/240 µCi/L	=	< 1.81E+00

NOTE: Tracer values are in dpm/mL.

Pu-239/240 µCi/mL	=	< 1.81E-03
Relative Counting Error	=	100.0%
Pu-238 µCi/mL	=	< 1.39E-02
Relative Counting Error	=	4.5%
Pu 236 Tracer Recovery	=	32.8%

NOTE: Pu 239/240 Reported result is a LESS THAN value using 0.05 for the Pu-239/240 peak height.

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

DETECTION LEVELS in µCi/mL					
Pu 239/240	=	1.81E-03	Pu 238	=	1.39E-02

Data Entry by:		Date:	17-Jan-94
Approved by:		Date:	19 Jan 1994

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#2 1-13-94 DK1

1622 / 60 — 1

J1422-5681

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

#4 4101

Serial No	Sample Point	Date	Time Issued	Priority
J 1427.-5781	BECHTOLD	12-16-93	13:19	22

Determination	Method Standard	Result Units	Charge Code	Reruns
Pu239/40	LA-503-156	uCi/ML	E14157	0

Sample Size	Customer ID
? .1mL - 10 - .2mL	KE71A

Remarks Calculations Results

COUNT AS uCI/L

SAM

"AEA" - 24HR

ATTACH PRINTOUT

.05mL 77B43

5.97×10^{-2} uCi/ml

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	D H Milicia	[signature]		
Hrs	Hrs	Hrs 1-14-94	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1-13-94	1800	[signature] Rakita	1-17-94 [signature]

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

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

				SAMPLE
Serial No.	Date Counted	01/14/94	Pu 236 AEA Frac. (C236)	0.314
J1427-5781	Sample Volume in mL (SS)	0.2	Pu 238 AEA Frac. (C238)	0.097
Batch ID	Sample D.F. (DF)	101	Pu 239 AEA Frac. (C239)	0.544
2402	Tracer Volume in mL (SPKV)	0.05	Total AT Counts	10759
Rerun No.	Digest D.F. (DDF)	1	Time Counted in min (TC)	60
0	Tracer Book No.	7.7B43	Background in cpm (Bkg)	5
Analyst	Tracer Preparation Date	10/12/93	Pu 236 Counts	15.03
J VANSANT	Pu-236 Preparation Value	3226	Pu 238 Counts	4.67
Date	Pu-236 Decay Corr'd Value	3030.27	Pu 239 Counts	26.07
01/13/94	Pu-238 Tracer Value	133	AEA Count Time in min	1440

Decay Time = Date Counted - Tracer Preparation Date

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

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SS

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

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

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

Pu-239/240 µCi/L	=	5.97E+01

NOTE: Tracer values are in dpm/mL.

Pu-239/240 µCi/mL	=	5.97E-02
Relative Counting Error	=	0.9%
Pu-238 µCi/mL	=	9.13E-03
Relative Counting Error	=	1.4%
Pu 236 Tracer Recovery	=	72.3%

DETECTION LEVELS in µCi/mL					
Pu 239/240	=	5.49E-03	Pu 238	=	6.30E-03

Data Entry by:	R Rakita	Date:	17-Jan-94
Approved by:	[signature]	Date:	19 Jan 1994

Form 1 Rev. 1.4

Page 1 of 1

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#3 1-13-94 DM

10759/60 -5

J1427-5781

#4

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

#5 5022

Serial No	Sample Point	Date	Time Issued	Priority
J 1427.-5781	BECHTOLD	12-16-93	13:19	22

Determination	Method-Standard	Result Units	Charge Code	Reruns
Pu239/40	LA-503-156	uCi/ML	E14157	0

Sample Size	Customer ID
? .1mL -10 - .2mL	KE71A

Remarks, Calculations, Results

COUNT AS uCI/L Dup "AEA" - 24HR ATTACH PRINTOUT

.05mL 77843

6.10×10^{-2} uCi/mL

VanSant

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
		1-14-94		
Date	Time Completed	Lab Unit Mgr		
1-13-94	1800	Roberts	1-17-94	

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

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

Serial No.				SAMPLE
J1427-5781	Date Counted	01/14/94	Pu 236 AEA Frac. (C236)	0.299
Batch ID	Sample Volume in mL (SS)	0.2	Pu 238 AEA Frac. (C238)	0.108
2402	Sample D.F. (DF)	101	Pu 239 AEA Frac. (C239)	0.529
Rerun No.	Tracer Volume in mL (SPKV)	0.05	Total AT Counts	11397
0	Digest D.F. (DDF)	1	Time Counted in min (TC)	60
Analyst	Tracer Book No.	77843	Background in cpm (Bkg)	8
J VANSANT	Tracer Preparation Date	10/12/93	Pu 236 Counts	23.06
Date	Pu-236 Preparation Value	3226	Pu 238 Counts	8.34
01/13/94	Pu-236 Decay Corr'd Value	3030.27	Pu 239 Counts	40.83
	Pu-238 Tracer Value	133	AEA Count Time in min	1440

Decay Time = Date Counted − Tracer Preparation Date

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

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SS

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

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-236 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

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

Pu-239/240 µCi/L	=	6.10E+01

NOTE: Tracer values are in dpm/mL.

Pu-239/240 µCi/mL	=	6.10E-02
Relative Counting Error	=	0.7%
Pu-238 µCi/mL	=	1.09E-02
Relative Counting Error	=	1.1%
Pu 236 Tracer Recovery	=	71.8%

DETECTION LEVELS in µCi/mL					
Pu 239/240	=	5.76E-03	Pu 238	=	6.34E-03

Data Entry by:		Date: 17-Jan-94
Approved by:		Date: 19 Jan 1994

Form 1 Rev. 1.4

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#1 1-13-94 DM

11397 / 60 - 8

J1427-5781

#5

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

#6 6932

WHC-SD-WM-DP-062, REV. 0

Serial No	Sample Point	Date	Time Issued	Priority
J 1427.-5781	BECHTOLD	12-16-93	13:19	22

Determination	Method-Standard	Result Units	Charge Code	Reruns
Pu239/40	LA-503-156	uCi/ML	E14157	0

Sample Size	Customer ID
? .1mL -10 - .2mL	KE71A

Remarks, Calculations, Results

COUNT AS uCI/L

TMP

"AEA" - ~~480min~~ 24HR

ATTACH PRINTOUT

.05mL 77843

5.56×10^{-2} uCi/ml

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	DH Maticia	[signature]		
Hrs	Hrs	Hrs 1-14-94	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1-13-94	1800	[signature]	1-17-94 [signature]

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

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

Serial No.	Date Counted	01/14/94	Pu 236 AEA Frac. (C236)	SAMPLE 0.363
J1427-5781	Sample Volume in mL (SS)	0.2	Pu 238 AEA Frac. (C238)	0.066
Batch ID	Sample D.F. (DF)	101	Pu 239 AEA Frac. (C239)	0.586
2402	Tracer Volume in mL (SPKV)	0.05	Total AT Counts	9952
Rerun No.	Digest D.F. (DDF)	1	Time Counted in min (TC)	60
0	Tracer Book No.	77843	Background in cpm (Bkg)	1
Analyst	Tracer Preparation Date	10/12/93	Pu 236 Counts	28.17
J VANSANT	Pu-236 Preparation Value	3226	Pu 238 Counts	5.11
Date	Pu-236 Decay Corr'd Value	3030.27	Pu 239 Counts	45.46
01/13/94	Pu-238 Tracer Value	133	AEA Count Time in min	1440

Decay Time = Date Counted - Tracer Preparation Date

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

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SS

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

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

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

Pu-239/240 µCi/L	=	5.56E+01

NOTE: Tracer values are in dpm/mL.

Pu-239/240 µCi/mL	=	5.56E-02
Relative Counting Error	=	0.6%
Pu-238 µCi/mL	=	< 5.76E-03
Relative Counting Error	=	1.3%
Pu 236 Tracer Recovery	=	79.0%

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

DETECTION LEVELS in µCi/mL					
Pu 239/240	=	4.75E-03	Pu 238	=	5.76E-03

Data Entry by:	[signature]	Date:	17-Jan-94
Approved by:	[signature]	Date:	19 Jan 1994

Form 1 Rev. 1.4

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#2 1-13-94 DM

9952/60 - 1

J1427-5781

#6

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

#7 · 7459

Serial No	Sample Point	Date	Time Issued	Priority
J 1427.-5981	BECHTOLD	12-16-93	13:19	22

Determination	Method Standard	Result Units	Charge Code	Reruns
Pu239/24	LA-503-156	% RECOVERY	E14157	0

Sample Size	Customer ID
? .100 - 10 - .200ml	KE71A

Remarks Calculations Results

SAMPLE SPIKED ID 63843 SK .100 - 10 - .100

24 HR

SPIKE ID 77843

"AEA" - ~~48 HR~~

ATTACH PRINTOUT

SPIKE VOLUME
COUNT AS uCI/L .05ml

112.3%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
		1-14-94 Date		

Date	Time Completed	Lab Unit Mgr.	
1-13-94 (1-13-94)	1800		1-17-94

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

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

CHK EXT NO.

Serial No.	Date Counted	01/14/94	Pu 236 AEA Frac. (C236)	0.184
J1427-5981	Sample Volume in mL (SS)	0.2	Pu 238 AEA Frac. (C238)	0.061
Batch ID	Sample D.F. (DF)	101	Pu 239 AEA Frac. (C239)	0.712
2402	Tracer Volume in mL (SPKV)	0.05	Total AT Counts	22488
Rerun No.	Digest D.F. (DDF)	1	Time Counted in min (TC)	60
0	Tracer Book No.	77843	Background in cpm (Bkg)	5
Analyst	Tracer Preparation Date	10/12/93	Pu 236 Counts	25.54
J VANSANT	Pu-236 Preparation Value	3226	Pu 238 Counts	8.47
Date	Pu-236 Decay Corr'd Value	3030.27	Pu 239 Counts	98.95
01/13/94	Pu-238 Tracer Value	133	AEA Count Time in min	1440

1-13-94 2.8.94 112.3%

133 - 5.7 (101 / 1.2) = 130.5

Decay Time = Date Counted - Tracer Preparation Date

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

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SS

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

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

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

Pu-239/240 µCi/L	=	1.33E+02

NOTE: Tracer values are in dpm/mL.

Pu-239/240 µCi/mL	=	1.33E-01
Relative Counting Error	=	0.6%
Pu-238 µCi/mL	=	9.91E-03
Relative Counting Error	=	1.0%
Pu 236 Tracer Recovery	=	89.8%

DETECTION LEVELS in µCi/mL			
Pu 239/240	= 9.37E-03	Pu 238	= 5.07E-03

Data Entry by:		Date:	17-Jan-94
Approved by:		Date:	19 Jan 1994

Form 1 Rev. 1.4

Page 1 of 1

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#3 1-13-94 DM

$\frac{22488}{60}$ -5

J1427-5981

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

#6 8672

Serial No	Sample Point	Date	Time Issued	Priority
J 1427.-5981	BECHTOLD	12-16-93	13:19	22

Determination	Method Standard	Result Units	Charge Code	Reruns
Pu239/24	LA-503-156	% RECOVERY	E14157	0

Sample Size	Customer ID
? .100 - 10 - .200mL	XE71A

Remarks, Calculations, Results

SAMPLE SPIKED ID 63843 SKDUP .100 - 100 - .100

SPIKE ID 77843

24 HR "AEA" - ~~420MIN~~ ATTACH PRINTOUT

SPIKE VOLUME COUNT AS uCI/L .05mL

110.3%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs 1-14-94	Hrs	Hrs
Date 1-13-94	Time Completed 1800	Lab Lead Initials	1-17-94	

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

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

CHK EXT NO.

Serial No.	Date Counted	01/14/94	Pu 236 AEA Frac. (C236)	0.179
J1427-5981	Sample Volume in mL (SS)	0.2	Pu 238 AEA Frac. (C238)	0.066
Batch ID	Sample D.F. (DF)	101	Pu 239 AEA Frac. (C239)	0.689
2402	Tracer Volume in mL (SPKV)	0.05	Total AT Counts	21649
Rerun No.	Digest D.F. (DDF)	1	Time Counted in min. (TC)	60
0	Tracer Book No.	77843	Background in cpm (Bkg)	5
Analyst	Tracer Preparation Date	10/12/93	Pu 236 Counts	26.89
J VANSANT	Pu-236 Preparation Value	3226	Pu 238 Counts	9.85
Date	Pu-236 Decay Corr'd Value	3030.27	Pu 239 Counts	103.26
01/13/94	Pu-238 Tracer Value	133	AEA Count Time in min	1440

Decay Time = Date Counted - Tracer Preparation Date

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

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SS

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

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

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

Pu-239/240 µCi/L	=	1.33E+02

NOTE: Tracer values are in dpm/mL.

Pu-239/240 µCi/mL	=	1.33E-01
Relative Counting Error	=	0.6%
Pu-238 µCi/mL	=	1.12E-02
Relative Counting Error	=	1.0%
Pu 236 Tracer Recovery	=	84.1%

DETECTION LEVELS in µCi/mL					
Pu 239/240	=	9.63E-03	Pu 238	=	5.41E-03

Data Entry by:		Date: 17-Jan-94
Approved by:		Date: 19 Jan 1994

Form 1 Rev. 1.4

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#3 1-13-93 DM

21649
60 -5

J1427-5981

D.H. Hilton
1-15-94

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT

WHC-SD-WM-DP-062, REV. 0

SAMPLE
J1419-5581
File ID: 2a2532.CNF

Counted on: 1/14/94 @ 1:34
Detector: AEA2
Geometry number: 1
Count time: 86405. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	1830.3	1830.3	358.729	358.729	18.000	14.264	9.000	4.717
2	72.4	72.4	299.797	299.314	28.000	24.526	14.000	3.139
3?	9.9	9.9	270.721	269.540	14.000	0.601	7.000	3.928
4	4011.5	4011.5	227.253	227.250	20.000	14.666	10.000	5.798
5	86.8	86.8	164.007	163.104	42.000	141.273	21.000	14.244
6?	2.9	2.9	134.875	133.000	8.000	0.001	4.000	0.000
7?	13.6	13.6	100.236	99.539	22.000	8.765	11.000	1.149
8?	10.0	10.0	85.353	85.353	14.000	0.000	7.000	6.451
9?	10.0	10.0	75.451	74.434	14.000	10.407	7.000	3.021
10?	13.2	13.2	55.249	54.761	12.000	4.703	6.000	0.346

PEAK RESULTS
Peak Error Limit: 25%

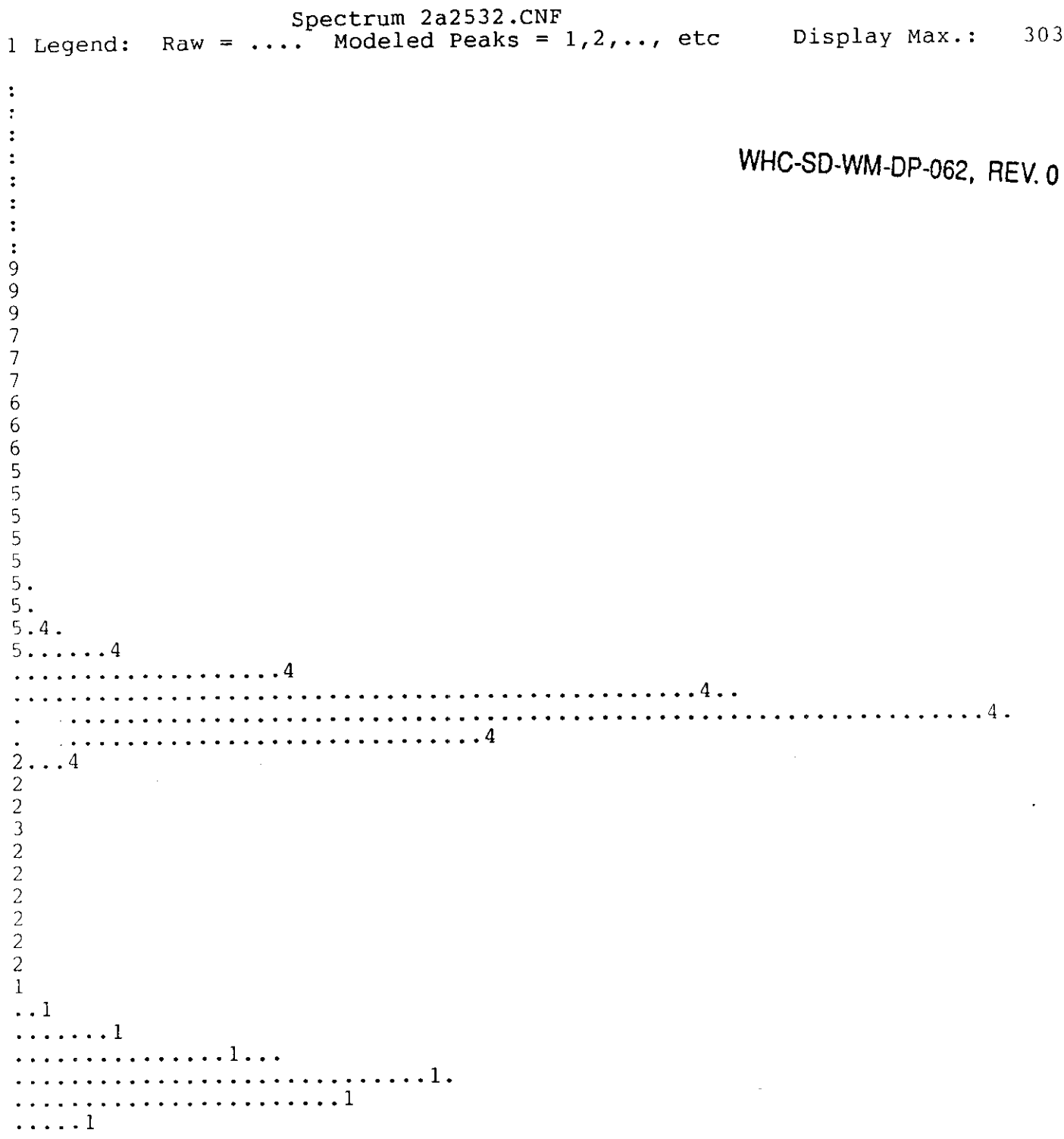
Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Cm243	0.301	5.786	5.772	0.014	0.07	28.27	1.0	304.5	0.137E-03
	Pu236		5.756	5.772	-.016				226.8	0.102E-03
2	Am241	0.022	5.480	5.493	-.013	0.12	2.09	4.4	17.5	0.789E-05
	Pu238		5.499	5.493	0.006				22.9	0.103E-04
3		????		5.353			0.03	168.		
4	Pu239	0.625	5.143	5.154	-.011	0.07	58.65	0.7	461.1	0.208E-03
	Pu240		5.144	5.154	-.010				461.1	0.208E-03
5	Np237	0.045	4.781	4.853	-.072	0.66	4.26	8.7	38.5	0.173E-04
6		????		4.711			0.07	83.0		
7		????		4.554			0.33	16.5		
8		????		4.487			0.00	1000.		
9		????		4.436			0.15	29.7		
10		????		4.343			0.34	12.2		
Totals:		0.994	<--valid peaks only-->				93.28			

DETECTOR CALIBRATION
Energy(MEV) = 4.086 + (0.0047)*Channel
Energy range (MeV): 4.086 TO 6.492
Efficiency = 0.1272 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	135140.0	100.000
Smoothed	135140.0	100.000
Composite fit	135649.9	100.377
Residuals	-509.9	-0.377

Analyzed by: _____
ALJ


Spectrum 2a2532.CNF
1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.: 30338.0

Raw Data Dump for AEA Spectrum: 2a2532.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	3.	16.	14.	9.
21	9.	17.	11.	15.	12.	15.	11.	10.	16.	22.
31	12.	10.	16.	12.	20.	21.	15.	21.	5.	22.
41	19.	12.	11.	14.	17.	21.	16.	12.	18.	21.
51	20.	14.	24.	17.	28.	34.	12.	22.	21.	12.
61	24.	14.	20.	18.	14.	18.	15.	25.	18.	18.
71	25.	24.	26.	28.	22.	28.	31.	17.	24.	20.
81	27.	28.	17.	22.	28.	28.	29.	14.	18.	28.
91	29.	24.	43.	19.	28.	32.	31.	26.	26.	35.
101	39.	27.	23.	27.	30.	29.	26.	38.	33.	23.
111	29.	35.	25.	34.	28.	20.	42.	37.	33.	29.
121	47.	38.	32.	42.	34.	38.	48.	41.	47.	47.
131	38.	34.	53.	48.	49.	54.	41.	44.	46.	48.
141	45.	40.	58.	64.	58.	53.	55.	56.	54.	59.
151	51.	72.	59.	63.	65.	59.	81.	77.	72.	83.
161	86.	81.	72.	83.	90.	75.	74.	67.	73.	87.
171	98.	115.	109.	111.	107.	102.	119.	110.	122.	100.
181	133.	124.	151.	124.	133.	134.	157.	176.	160.	164.
191	169.	179.	179.	195.	191.	204.	232.	248.	288.	263.
201	304.	319.	345.	418.	427.	467.	566.	611.	773.	826.
211	934.	1103.	1214.	1435.	1703.	1800.	2076.	2357.	2616.	2906.
221	3138.	3379.	3647.	3930.	4065.	4333.	4301.	4135.	4008.	3730.
231	3598.	3187.	2791.	2345.	1944.	1598.	1150.	963.	667.	487.
241	370.	241.	166.	103.	78.	53.	38.	24.	27.	27.
251	21.	24.	23.	22.	30.	27.	17.	26.	22.	24.
261	34.	35.	29.	32.	29.	31.	28.	28.	32.	39.
271	41.	30.	33.	31.	30.	24.	48.	47.	38.	40.
281	37.	46.	46.	53.	44.	54.	56.	73.	50.	56.
291	71.	64.	62.	70.	74.	65.	73.	83.	96.	79.
301	90.	70.	79.	80.	76.	81.	73.	70.	61.	53.
311	68.	72.	63.	59.	57.	53.	53.	57.	80.	77.
321	76.	92.	62.	107.	110.	107.	88.	118.	95.	146.
331	154.	138.	155.	193.	188.	214.	263.	311.	340.	396.
341	413.	478.	614.	664.	745.	802.	922.	1093.	1125.	1287.
351	1440.	1533.	1622.	1754.	1767.	1837.	1806.	1840.	1952.	1896.
361	1718.	1644.	1470.	1270.	1101.	932.	722.	611.	412.	334.
371	242.	155.	100.	77.	45.	26.	4.	8.	6.	2.
381	4.	0.	0.	0.	2.	2.	2.	2.	2.	1.
391	2.	0.	0.	2.	1.	1.	1.	3.	5.	3.
401	6.	3.	0.	2.	4.	1.	6.	4.	3.	5.
411	3.	2.	4.	1.	4.	2.	7.	1.	3.	1.
421	3.	1.	0.	1.	5.	0.	2.	2.	2.	1.
431	1.	1.	1.	2.	1.	1.	1.	1.	0.	0.
441	0.	0.	0.	0.	1.	0.	1.	0.	0.	0.
451	2.	0.	1.	0.	2.	0.	0.	0.	1.	1.
461	0.	2.	1.	2.	1.	2.	1.	7.	1.	8.
471	3.	4.	4.	3.	7.	6.	3.	1.	1.	1.
481	2.	2.	2.	5.	2.	3.	1.	1.	1.	1.
491	1.	0.	0.	1.	0.	0.	0.	0.	0.	0.
511	1.	0.								

D. H. N. Felicia
1-15-94

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT

WHC-SD-WM-DP-062, REV. 0

SAMPLE
J1422-5681 BLK
File ID: 3a3592.CNF

Counted on: 1/14/94 @ 1:35
Detector: AEA3
Geometry number: 1
Count time: 86402. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	703.4	703.4	363.342	363.342	22.000	15.333	11.000	5.310
2	10.1	10.1	309.241	309.241	16.000	1.563	8.000	0.123

PEAK RESULTS
Peak Error Limit: 25%

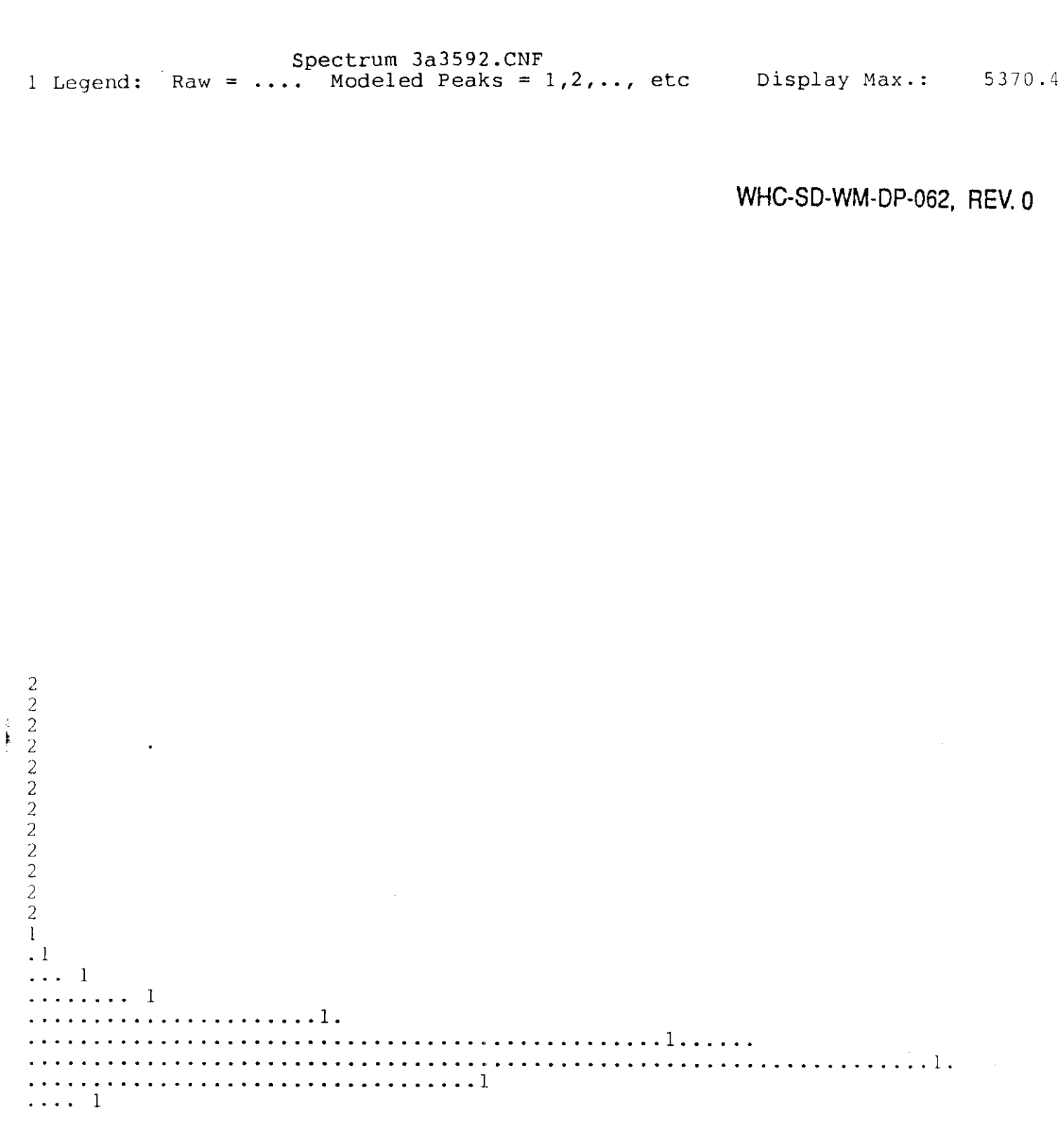
Peak	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
	Cm243	0.954	5.786	5.747	0.039	0.07	10.92	1.6	99.0	0.446E-04
	Pu236		5.756	5.747	0.009				73.8	0.332E-04
2	Pu238	0.030	5.499	5.499	0.000	0.01	0.35	9.8	3.2	0.143E-05
	Am241		5.480	5.499	-.019				2.4	0.110E-05
Totals:		0.984	<--valid peaks only-->				11.26			

DETECTOR CALIBRATION
Energy(MEV) = 4.076 + (0.0046)*Channel
Energy range (MeV): 4.076 TO 6.431
Efficiency = 0.1510 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	16481.0	100.000
Smoothed	16481.0	100.000
Composite fit	16219.8	98.415
Residuals	261.2	1.585

Analyzed by: _____
ALJ


Spectrum 3a3592.CNF
1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 5370.4

Raw Data Dump for AEA Spectrum: 3a3592.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
21	1.	0.	0.	0.	0.	0.	0.	0.	1.	0.
	0.	0.	0.	0.	0.	0.	1.	1.	0.	0.
[illegible]	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
51	2.	0.	0.	0.	1.	0.	1.	0.	0.	0.
61	0.	0.	0.	0.	0.	0.	2.	1.	0.	1.
71	1.	0.	0.	0.	1.	0.	0.	0.	1.	1.
81	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
91	0.	0.	1.	1.	0.	0.	0.	0.	2.	0.
101	1.	0.	2.	0.	0.	2.	0.	0.	0.	2.
111	1.	0.	0.	0.	0.	1.	0.	2.	2.	2.
121	0.	0.	2.	0.	0.	1.	1.	0.	3.	2.
131	0.	0.	0.	1.	2.	0.	1.	0.	0.	1.
141	1.	1.	0.	1.	1.	1.	0.	1.	2.	2.
151	1.	1.	0.	1.	0.	0.	0.	0.	0.	0.
161	0.	2.	0.	0.	0.	2.	1.	1.	2.	1.
171	0.	3.	1.	2.	0.	0.	0.	0.	0.	2.
181	1.	2.	1.	0.	1.	1.	0.	1.	1.	2.
191	2.	1.	0.	1.	3.	3.	2.	3.	1.	0.
201	1.	3.	3.	1.	3.	3.	3.	3.	2.	3.
211	4.	7.	1.	3.	1.	4.	4.	3.	4.	8.
221	5.	3.	6.	5.	8.	7.	7.	7.	8.	7.
231	15.	7.	9.	9.	4.	6.	8.	3.	5.	7.
241	2.	3.	4.	5.	3.	3.	6.	5.	5.	5.
251	6.	5.	8.	6.	9.	2.	6.	9.	7.	9.
261	11.	10.	7.	5.	6.	4.	8.	3.	4.	6.
271	9.	5.	9.	5.	6.	3.	4.	8.	3.	1.
281	3.	7.	8.	6.	5.	10.	7.	8.	6.	11.
291	8.	10.	8.	12.	5.	9.	12.	13.	14.	10.
[illegible]	10.	13.	6.	13.	18.	14.	11.	11.	13.	13.
[illegible]	13.	14.	5.	8.	11.	15.	15.	14.	19.	9.
321	22.	18.	20.	23.	19.	15.	16.	23.	33.	23.
331	24.	29.	34.	35.	31.	51.	50.	51.	68.	72.
341	95.	90.	131.	133.	150.	179.	206.	230.	275.	307.
351	373.	360.	417.	468.	488.	579.	588.	654.	722.	656.
361	669.	797.	701.	712.	740.	644.	668.	560.	529.	437.
371	364.	295.	199.	170.	103.	55.	50.	24.	17.	7.
381	2.	1.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	1.	0.	0.	1.	1.	0.	1.	0.	1.
401	0.	0.	0.	0.	0.	1.	0.	0.	1.	0.
411	0.	1.	2.	2.	2.	1.	0.	0.	1.	1.
421	1.	0.	0.	1.	1.	0.	0.	1.	0.	1.
431	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	1.	1.	1.	0.	1.	0.	0.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

S. H. Widdop
1-15-94

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT

WHC-SD-WM-DP-062, REV. 0

SAMPLE
J1427-5781 SAM
File ID: 4a4101.CNF

Counted on: 1/14/94 @ 1:36
Detector: AEA4
Geometry number: 1
Count time: 86405. Sec

PEAK ANALYSIS

Peak	Peak height		Peak center		FWHM		Tau	
ID	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	899.5	899.5	357.825	357.825	20.000	12.571	10.000	3.252
2	265.8	265.8	301.531	300.939	18.000	10.351	9.000	2.279
3	1634.9	1634.9	227.455	227.447	20.000	11.798	10.000	3.243
4?	11.2	11.2	91.091	91.082	198.000	1.000	99.000	0.100
5?	9.7	9.7	87.398	86.507	186.000	1.000	93.000	0.100

PEAK RESULTS
Peak Error Limit: 25%

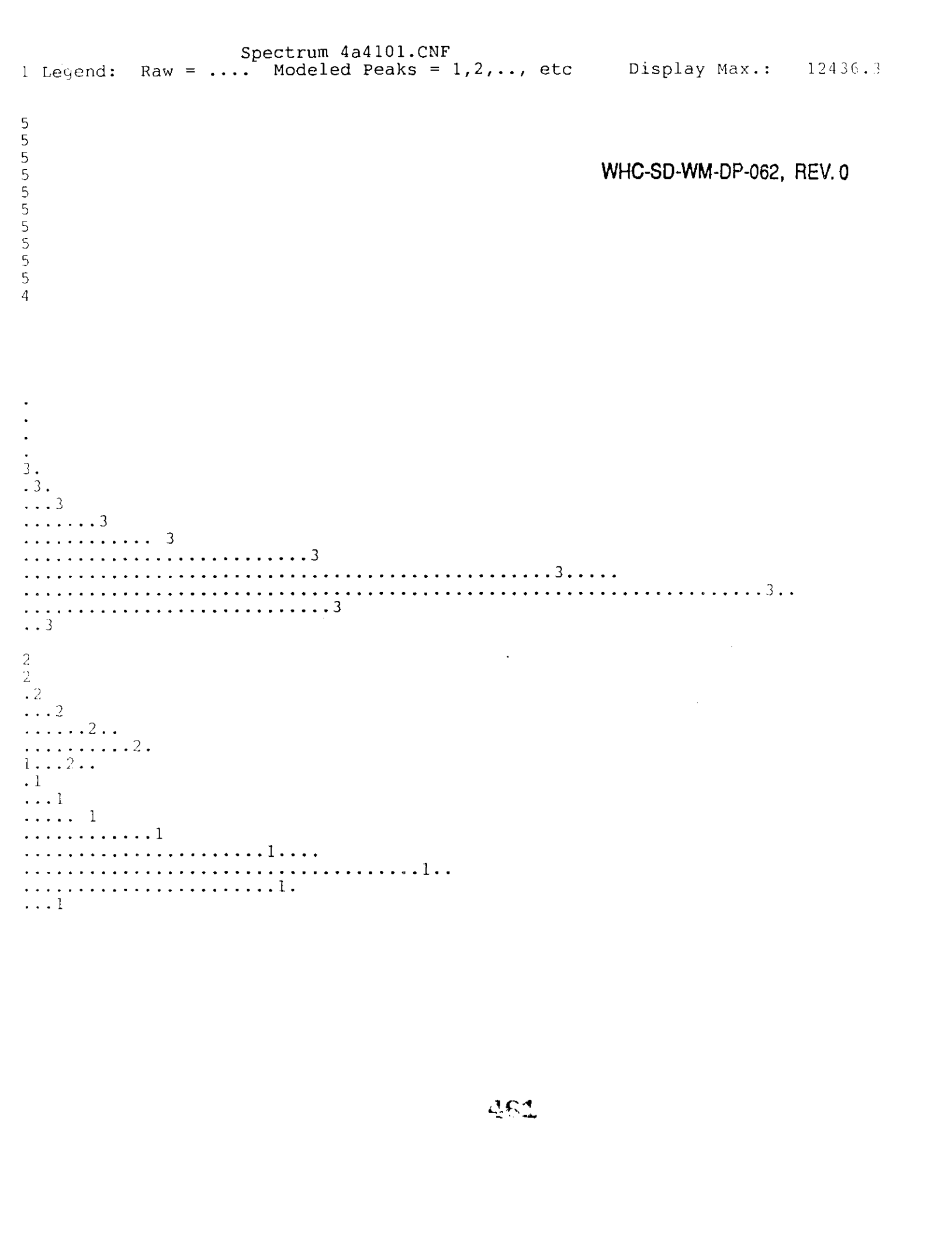
Peak		AEA	Peak Centroid				Count	%err		Activity
ID	Isotope	Frac	Exp.	Obs.	Diff.	FWHM	Rate c/m	@95	d/m	uCi/ea
1	Cm243	0.314	5.786	5.758	0.028	0.06	15.03	1.3	270.9	0.122E-03
	Pu236		5.756	5.758	-.002				201.8	0.909E-04
2	Am241	0.097	5.480	5.491	-.011	0.05	4.67	2.6	65.4	0.295E-03
	Pu238		5.499	5.491	0.008				85.4	0.385E-04
3	Pu239	0.544	5.143	5.145	-.002	0.06	26.07	1.0	343.0	0.155E-03
	Pu240		5.144	5.145	-.001				343.0	0.155E-03
4		????		4.504			0.28	9.9		
5		????		4.483			0.24	15.6		
Totals:		0.955	<--valid peaks only-->				45.77			

DETECTOR CALIBRATION
Energy(MEV) = 4.076 + (0.0047)*Channel
Energy range (MeV): 4.076 TO 6.483
Efficiency = 0.0760 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	69030.0	100.000
Smoothed	69029.5	99.999
Composite fit	66654.4	96.559
Residuals	2375.6	3.441

Analyzed by: _____
ALJ


Spectrum 4a4101.CNF
Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.: 12436.3

Raw Data Dump for AEA Spectrum: 4a4101.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	7.	5.	2.
21	1.	7.	0.	4.	1.	5.	6.	2.	4.	5.
	8.	1.	5.	2.	4.	7.	3.	2.	8.	0.
	6.	5.	7.	5.	3.	7.	2.	8.	7.	6.
51	9.	9.	4.	7.	3.	10.	8.	8.	5.	3.
61	6.	6.	9.	9.	10.	5.	10.	3.	6.	8.
71	7.	7.	8.	14.	5.	11.	7.	9.	8.	10.
81	10.	10.	6.	8.	10.	13.	11.	14.	7.	11.
91	13.	10.	13.	6.	10.	6.	11.	8.	16.	8.
101	13.	6.	15.	15.	14.	10.	14.	10.	15.	13.
111	19.	12.	12.	9.	14.	15.	17.	11.	10.	18.
121	17.	21.	15.	20.	14.	20.	19.	13.	16.	27.
131	23.	22.	15.	22.	25.	34.	23.	32.	34.	27.
141	24.	35.	33.	19.	29.	38.	27.	34.	27.	43.
151	34.	37.	29.	36.	42.	31.	41.	37.	38.	34.
161	37.	40.	38.	44.	49.	44.	61.	59.	42.	60.
171	51.	80.	57.	60.	57.	82.	57.	74.	73.	71.
181	84.	94.	85.	95.	94.	96.	103.	103.	101.	115.
191	110.	134.	142.	137.	141.	157.	189.	196.	199.	206.
201	243.	229.	261.	297.	291.	323.	372.	390.	429.	486.
211	547.	623.	675.	753.	794.	941.	925.	1068.	1191.	1234.
221	1358.	1347.	1530.	1578.	1687.	1688.	1741.	1696.	1653.	1561.
231	1496.	1351.	1088.	911.	664.	522.	321.	197.	111.	75.
241	36.	25.	24.	19.	12.	27.	16.	16.	14.	15.
251	18.	13.	23.	26.	16.	22.	15.	21.	28.	31.
261	19.	35.	36.	33.	28.	35.	43.	47.	32.	45.
271	35.	49.	58.	40.	56.	55.	59.	67.	59.	66.
281	91.	93.	103.	107.	120.	126.	134.	151.	159.	178.
291	216.	224.	225.	274.	261.	258.	286.	285.	293.	279.
3	298.	274.	292.	291.	267.	200.	195.	140.	86.	77.
3	65.	43.	55.	53.	45.	50.	47.	61.	67.	61.
321	65.	61.	50.	81.	87.	70.	74.	95.	91.	111.
331	133.	124.	131.	162.	173.	173.	192.	229.	265.	281.
341	337.	344.	394.	431.	469.	499.	611.	619.	672.	709.
351	783.	856.	895.	885.	918.	899.	940.	925.	903.	889.
361	880.	792.	708.	604.	480.	323.	195.	128.	51.	23.
371	9.	3.	4.	0.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	1.	0.	0.	1.
391	0.	2.	1.	1.	0.	1.	2.	0.	1.	0.
401	1.	1.	0.	0.	1.	0.	0.	1.	1.	0.
411	1.	2.	0.	1.	1.	0.	1.	0.	0.	0.
421	0.	1.	0.	0.	0.	1.	1.	0.	2.	0.
431	0.	0.	1.	1.	0.	0.	1.	1.	2.	0.
441	0.	0.	1.	0.	0.	2.	0.	0.	0.	0.
451	1.	0.	0.	0.	0.	0.	0.	1.	0.	0.
461	0.	2.	0.	0.	2.	0.	0.	0.	0.	1.
471	1.	0.	1.	0.	0.	2.	0.	2.	0.	0.
481	2.	0.	1.	0.	0.	2.	0.	0.	1.	0.
491	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
511	1.	0.								

C. H. [illegible]
1-15-94

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT

WHC-SD-WM-DP-062, REV. 0

SAMPLE
J1427-5781 DUP
File ID: 5a5022.CNF

Counted on: 1/14/94 @ 1:38
Detector: AEA5
Geometry number: 1
Count time: 86405. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	829.0	829.0	353.756	353.756	28.000	26.624	14.000	3.725
2	266.9	266.9	295.682	294.683	30.000	29.213	15.000	3.481
3	1445.8	1445.8	223.960	223.854	22.000	22.316	11.000	2.890
4	55.1	55.1	104.248	103.632	118.000	1.000	59.000	0.100

PEAK RESULTS
Peak Error Limit: 25%

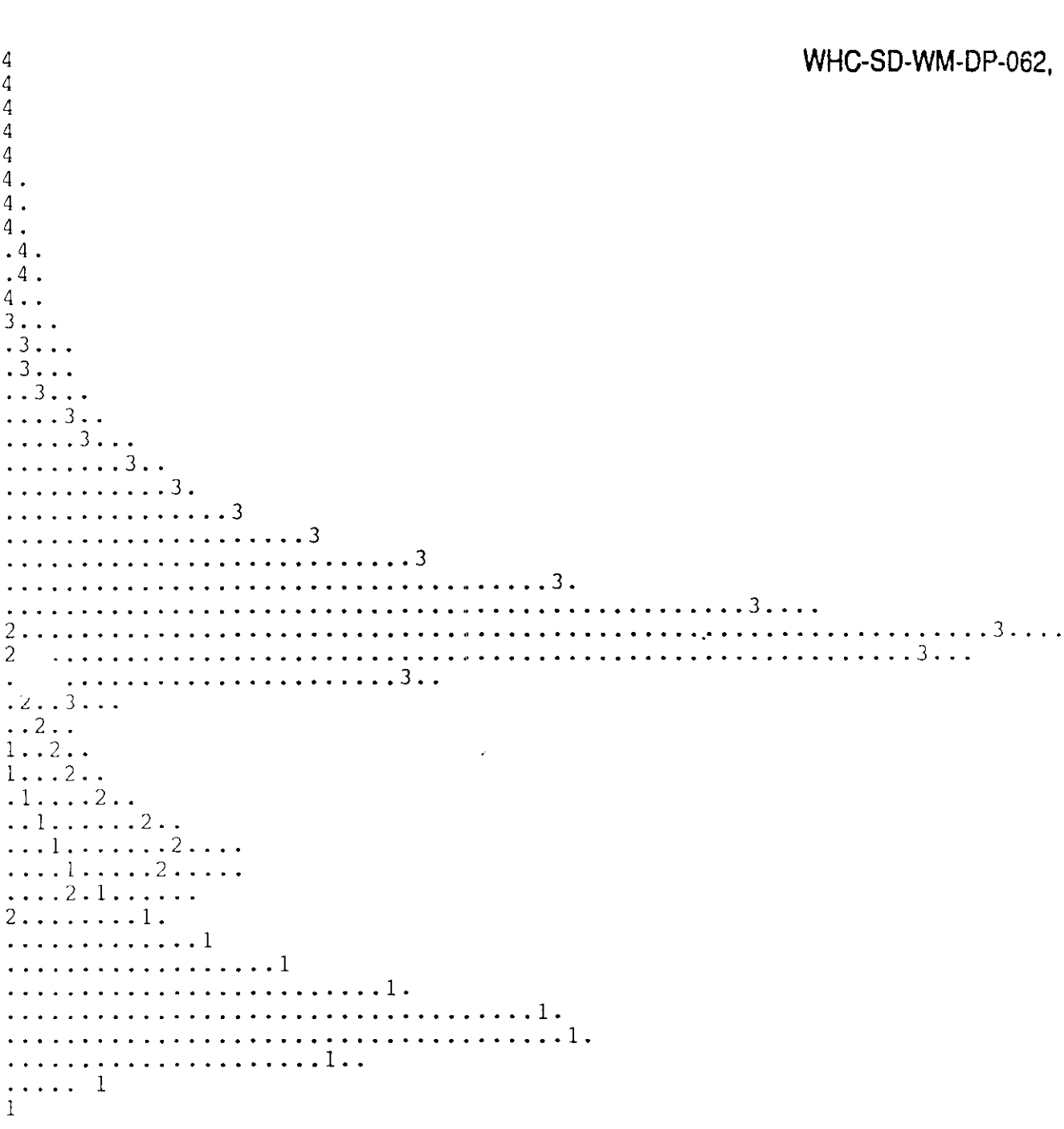
Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Cm243	0.299	5.786	5.736	0.050	0.12	23.06	1.1	278.0	0.125E-03
	Pu236		5.756	5.736	0.020				207.1	0.933E-04
2	Th228	0.108	5.430	5.464	-.034	0.13	8.34	2.3	103.4	0.466E-04
	Am241		5.480	5.464	0.016				78.1	0.352E-04
3	Pu239	0.529	5.143	5.138	0.005	0.10	40.83	0.8	359.4	0.162E-03
	Pu240		5.144	5.138	0.006				359.4	0.162E-03
4		0.018		4.585		0.00	1.39	5.1	12.3	0.553E-05
		---					---			
Totals:		0.953	<--valid peaks only-->				73.62			

DETECTOR CALIBRATION
Energy(MEV) = 4.109 + (0.0046)*Channel
Energy range (MeV): 4.109 TO 6.464
Efficiency = 0.1136 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	111208.0	100.000
Smoothed	111208.0	100.000
Composite fit	106014.9	95.330
Residuals	5193.1	4.670

Analyzed by: _____
ALJ


Spectrum 5a5022.CNF
1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.: 11295.1

Raw Data Dump for AEA Spectrum: 5a5022.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	8.	15.	28.	28.
21	22.	20.	22.	26.	18.	22.	26.	32.	29.	19.
31	23.	23.	31.	44.	25.	35.	29.	28.	30.	35.
41	32.	25.	32.	36.	33.	28.	38.	29.	28.	31.
51	35.	35.	34.	29.	33.	43.	43.	23.	52.	43.
61	37.	30.	46.	35.	43.	36.	50.	45.	41.	52.
71	39.	39.	38.	45.	44.	37.	45.	44.	56.	58.
81	50.	55.	47.	50.	52.	49.	54.	68.	50.	76.
91	63.	58.	71.	49.	74.	81.	52.	79.	66.	74.
101	61.	77.	73.	80.	79.	78.	63.	67.	76.	69.
111	71.	95.	85.	91.	94.	79.	75.	99.	100.	94.
121	110.	94.	104.	105.	113.	106.	111.	108.	117.	116.
131	115.	99.	129.	117.	119.	139.	126.	128.	140.	148.
141	156.	136.	134.	137.	128.	167.	172.	160.	166.	159.
151	177.	163.	180.	195.	203.	184.	193.	202.	232.	213.
161	213.	215.	229.	202.	231.	251.	237.	286.	266.	256.
171	271.	268.	288.	287.	309.	318.	313.	314.	347.	355.
181	328.	377.	380.	376.	373.	365.	422.	459.	462.	465.
191	459.	495.	505.	559.	536.	537.	655.	616.	639.	675.
201	667.	691.	749.	752.	828.	884.	877.	905.	982.	991.
211	1065.	1083.	1161.	1275.	1207.	1363.	1354.	1380.	1461.	1451.
221	1476.	1503.	1478.	1475.	1555.	1454.	1417.	1320.	1299.	1201.
231	1050.	951.	892.	677.	597.	543.	421.	347.	282.	223.
241	181.	161.	126.	119.	94.	93.	88.	95.	91.	103.
251	102.	101.	127.	96.	104.	109.	116.	108.	138.	119.
261	128.	123.	121.	148.	150.	137.	159.	145.	162.	175.
271	165.	194.	169.	170.	200.	170.	208.	210.	204.	210.
281	224.	247.	264.	242.	265.	289.	273.	319.	338.	365.
291	328.	367.	326.	373.	370.	373.	360.	339.	345.	373.
301	339.	331.	322.	309.	302.	309.	310.	243.	252.	237.
311	231.	222.	217.	197.	230.	212.	229.	253.	234.	248.
321	274.	252.	239.	276.	250.	306.	310.	331.	336.	342.
331	392.	403.	416.	426.	403.	450.	488.	493.	534.	572.
341	532.	632.	656.	650.	703.	735.	762.	727.	776.	816.
351	827.	847.	864.	839.	853.	806.	783.	802.	772.	709.
361	695.	599.	543.	452.	393.	352.	257.	226.	156.	103.
371	73.	65.	51.	31.	15.	13.	5.	5.	5.	0.
381	2.	0.	0.	0.	2.	1.	1.	1.	0.	1.
391	1.	1.	1.	1.	0.	2.	0.	4.	0.	2.
401	3.	2.	1.	1.	2.	2.	1.	1.	1.	2.
411	2.	0.	0.	0.	1.	2.	3.	3.	0.	2.
421	1.	2.	1.	2.	1.	0.	0.	3.	0.	1.
431	0.	2.	2.	0.	1.	2.	0.	1.	0.	1.
441	0.	0.	2.	1.	1.	1.	0.	0.	0.	0.
451	2.	1.	2.	1.	2.	2.	0.	0.	1.	0.
461	1.	1.	2.	0.	1.	2.	1.	1.	4.	2.
471	3.	2.	1.	2.	1.	3.	1.	4.	3.	2.
481	3.	1.	1.	1.	2.	1.	4.	1.	2.	0.
491	0.	0.	1.	2.	0.	0.	0.	0.	0.	0.
511	0.	0.								

S. M. McKeen
1-15-94

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT

WHC-SD-WM-DP-062, REV. 0

SAMPLE
J1427-5781 TRIP
File ID: 6a6932.CNF

Counted on: 1/14/94 @ 1:39
Detector: AEA6
Geometry number: 1
Count time: 86403. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1?	11.7	11.7	497.467	496.961	8.000	1.007	4.000	2.712
2	626.8	626.8	352.698	352.308	34.000	41.939	17.000	3.185
3	147.0	147.0	297.148	297.148	30.000	9.894	15.000	0.849
4	1211.4	1211.4	220.590	220.634	26.000	29.332	13.000	2.658
5?	10.0	10.0	34.311	35.095	16.000	28.016	8.000	5.685

PEAK RESULTS
Peak Error Limit: 25%

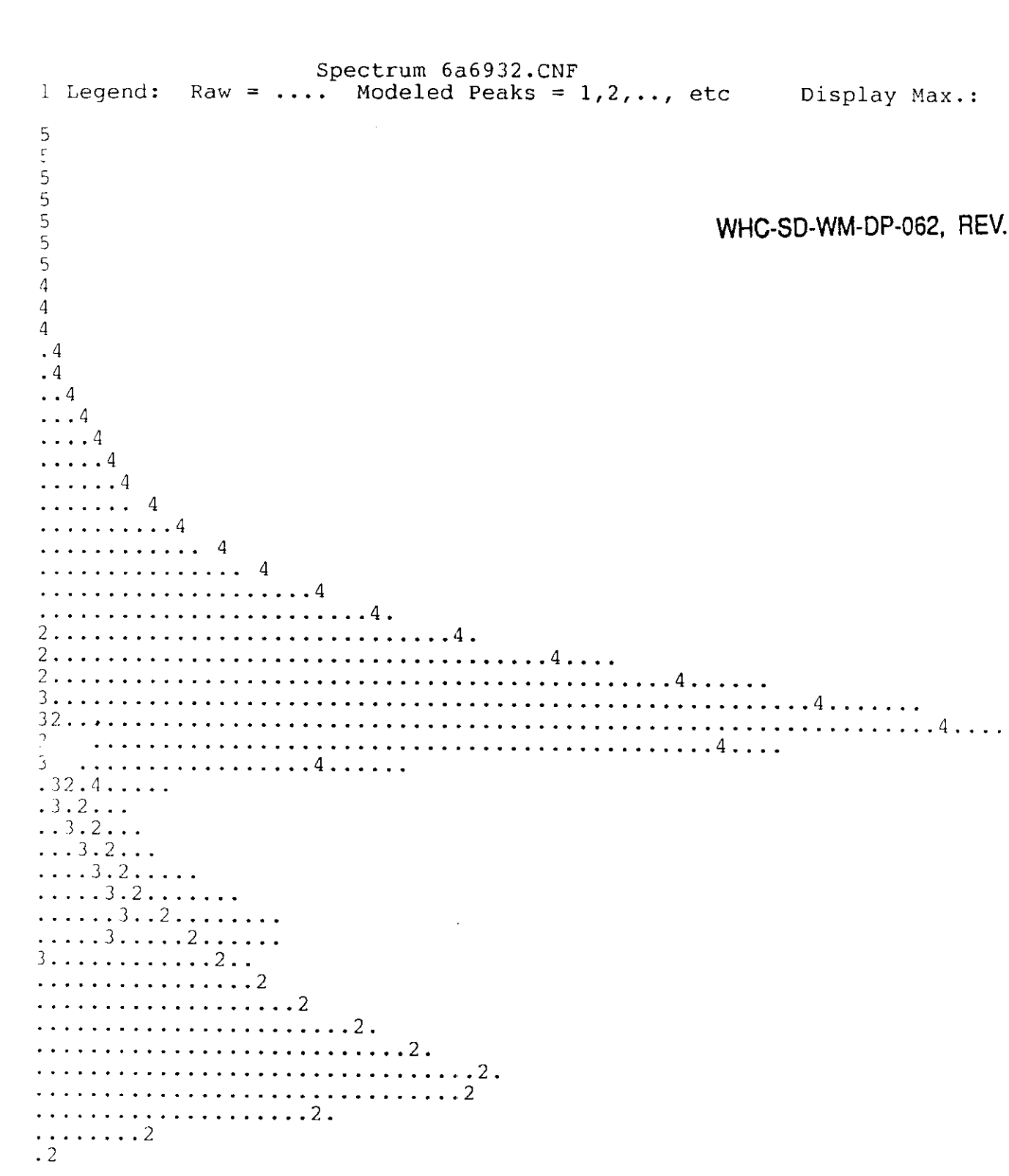
Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/gc
1		????		6.414			0.04	25.9		
2	Cm243	0.363	5.786	5.734	0.052	0.20	28.17	1.0	276.0	0.124E-03
	Pu236		5.756	5.734	0.022				205.6	0.926E-04
3	Am241	0.066	5.480	5.475	0.005	0.05	5.11	3.9	38.9	0.175E-04
	Pu238		5.499	5.475	0.024				50.8	0.229E-04
4	Pu239	0.586	5.143	5.116	0.027	0.14	45.46	0.8	325.2	0.146E-03
	Pu240		5.144	5.116	0.028				325.2	0.146E-03
5		????		4.244			0.21	22.9		
Totals:		1.015	<--valid peaks only-->				78.74			

DETECTOR CALIBRATION
Energy(MEV) = 4.079 + (0.0047)*Channel
Energy range (MeV): 4.079 TO 6.485
Efficiency = 0.1398 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	111669.0	100.000
Smoothed	111677.5	100.008
Composite fit	113752.1	101.865
Residuals	-2083.1	-1.865

Analyzed by: _____
ALJ


Spectrum 6a6932.CNF
1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.: 9942.2

Raw Data Dump for AEA Spectrum: 6a6932.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	5.	17.	23.	21.
21	18.	18.	12.	22.	14.	20.	17.	25.	16.	19.
31	26.	25.	19.	12.	20.	25.	21.	18.	16.	20.
41	20.	19.	19.	18.	13.	23.	36.	22.	27.	29.
51	20.	32.	24.	25.	28.	24.	31.	25.	19.	28.
61	18.	26.	19.	27.	25.	30.	34.	33.	28.	24.
71	37.	28.	34.	40.	37.	34.	41.	34.	29.	44.
81	28.	27.	45.	37.	42.	44.	43.	36.	44.	40.
91	49.	48.	57.	47.	63.	53.	38.	49.	51.	68.
101	68.	71.	51.	73.	65.	77.	70.	66.	68.	86.
111	78.	76.	74.	83.	75.	70.	76.	72.	68.	86.
121	92.	93.	82.	116.	81.	99.	96.	122.	120.	130.
131	94.	116.	120.	102.	133.	113.	124.	110.	130.	142.
141	152.	157.	173.	155.	166.	164.	199.	176.	165.	196.
151	229.	186.	230.	186.	208.	202.	234.	228.	234.	252.
161	244.	266.	275.	283.	291.	316.	305.	301.	348.	338.
171	389.	357.	326.	364.	410.	402.	459.	444.	438.	474.
181	509.	480.	529.	532.	516.	571.	596.	569.	609.	575.
191	639.	640.	742.	693.	709.	749.	799.	810.	833.	875.
201	846.	905.	931.	998.	997.	968.	1010.	1067.	1059.	1120.
211	1156.	1162.	1228.	1228.	1216.	1196.	1278.	1247.	1257.	1252.
221	1314.	1330.	1232.	1177.	1134.	988.	1025.	959.	903.	881.
231	765.	692.	626.	520.	503.	442.	402.	309.	282.	240.
241	191.	176.	151.	153.	134.	117.	120.	126.	123.	125.
251	143.	125.	132.	132.	130.	142.	133.	147.	154.	161.
261	164.	151.	158.	157.	173.	154.	200.	177.	170.	191.
271	185.	192.	205.	228.	252.	218.	241.	249.	256.	262.
281	244.	273.	283.	268.	286.	314.	289.	285.	342.	336.
291	343.	327.	333.	344.	325.	318.	344.	339.	351.	286.
301	320.	318.	312.	301.	315.	307.	290.	280.	271.	306.
311	271.	256.	310.	278.	293.	248.	260.	273.	329.	321.
321	341.	326.	348.	358.	391.	391.	403.	390.	365.	443.
331	462.	463.	473.	476.	460.	506.	511.	477.	471.	518.
341	558.	568.	599.	547.	621.	659.	607.	604.	630.	591.
351	617.	651.	644.	591.	618.	631.	555.	565.	529.	528.
361	464.	445.	471.	406.	337.	326.	277.	251.	232.	183.
371	172.	132.	102.	91.	74.	55.	55.	36.	19.	18.
381	12.	13.	2.	4.	3.	6.	2.	0.	0.	1.
391	1.	1.	1.	0.	1.	2.	0.	0.	2.	1.
401	1.	2.	1.	1.	3.	1.	0.	0.	0.	0.
411	0.	1.	1.	0.	1.	1.	1.	0.	1.	2.
421	0.	2.	0.	1.	0.	0.	2.	1.	0.	1.
431	0.	1.	0.	0.	2.	1.	3.	1.	3.	1.
441	1.	0.	0.	0.	1.	0.	2.	0.	0.	3.
451	1.	0.	0.	2.	1.	0.	1.	0.	1.	1.
461	1.	0.	0.	1.	2.	3.	1.	2.	6.	2.
471	5.	8.	5.	5.	7.	1.	3.	5.	1.	0.
481	0.	0.	1.	1.	1.	1.	1.	0.	0.	2.
491	2.	1.	3.	3.	5.	21.	20.	6.	0.	0.
511	0.	0.								

D. H. McLaren
1-15-94

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT WHC-SD-WM-DP-062, REV. 0

SAMPLE
J1427-5981 SPK
File ID: 7a7459.CNF

Counted on: 1/14/94 @ 1:40
Detector: AEA7
Geometry number: 1
Count time: 86402. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	1358.5	1358.5	357.405	357.405	22.000	16.787	11.000	3.959
2	429.1	429.1	299.155	298.715	22.000	17.468	11.000	3.816
3	5388.2	5388.2	225.968	225.962	22.000	16.919	11.000	4.205
4?	30.7	30.7	53.042	53.038	258.000	1.000	129.000	0.100
5?	4.8	4.8	42.939	42.143	4.000	0.440	2.000	0.309
6?	6.7	6.7	29.568	28.601	10.000	2.410	5.000	1.235

PEAK RESULTS
Peak Error Limit: 25%

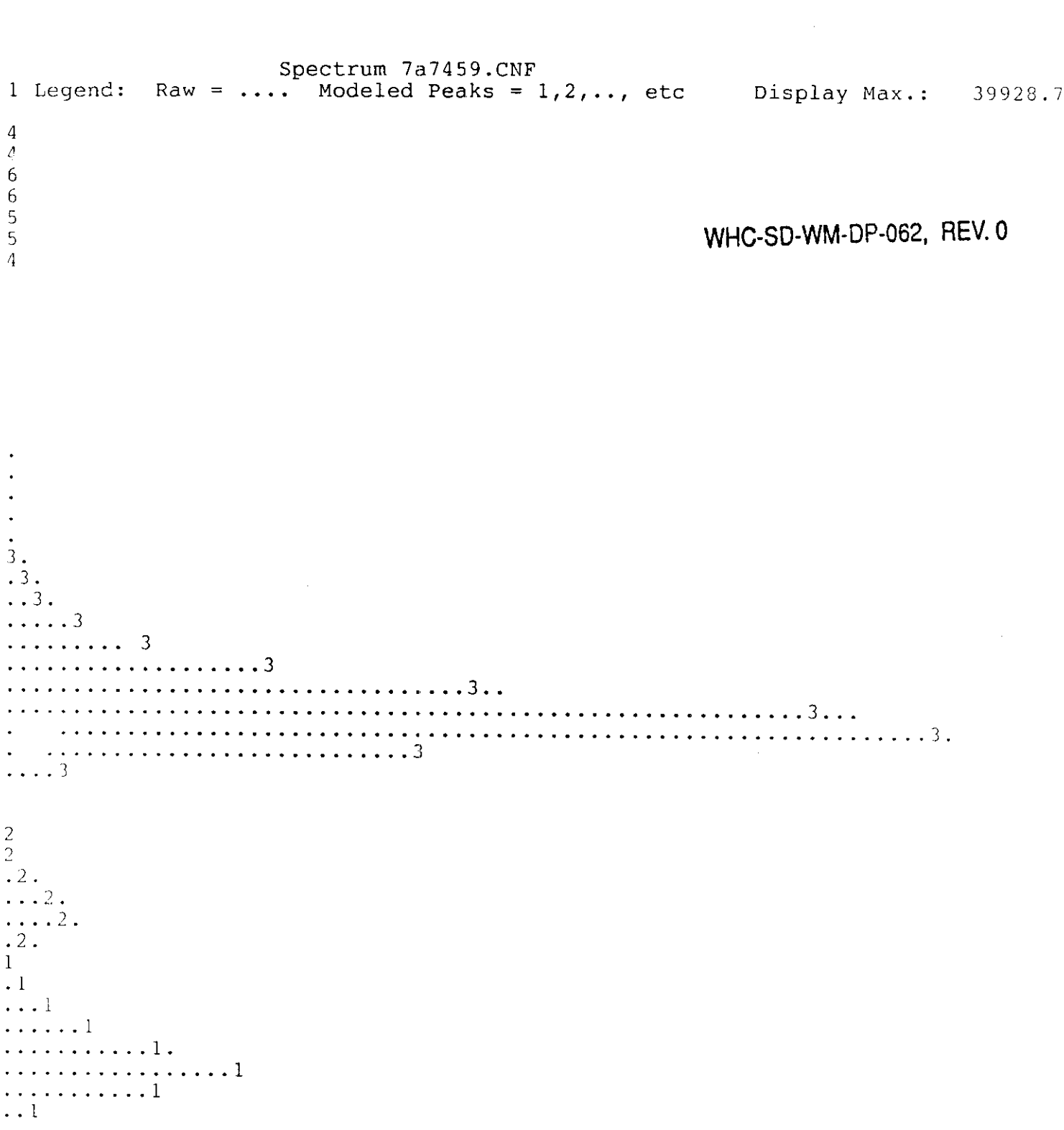
Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Ra224	0.184	5.680	5.724	-.044	0.08	25.54	1.0	230.5	0.104E-03
	Pu236		5.756	5.724	0.032				221.1	0.996E-04
2	Th228	0.061	5.430	5.454	-.024	0.08	8.47	2.0	101.2	0.456E-04
	Am241		5.480	5.454	0.026				76.4	0.344E-04
3	Pu239	0.712	5.143	5.119	0.024	0.08	98.95	0.5	839.3	0.378E-03
	Pu240		5.144	5.119	0.025				839.3	0.378E-03
4		????		4.324			0.63	6.5		
5		????		4.274			0.02	154.		
6		????		4.211			0.05	61.4		
Totals:		0.957	<--valid peaks only-->				132.96			

DETECTOR CALIBRATION
Energy(MEV) = 4.080 + (0.0046)*Channel
Energy range (MeV): 4.080 TO 6.435
Efficiency = 0.1179 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	200133.0	100.000
Smoothed	200133.5	100.000
Composite fit	192491.9	96.182
Residuals	7641.1	3.818

Analyzed by: ALJ


Spectrum 7a7459.CNF
1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.: 39928.7

Raw Data Dump for AEA Spectrum: 7a7459.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	4.	24.	12.	26.
21	19.	19.	17.	18.	19.	23.	17.	29.	18.	28.
31	22.	21.	19.	18.	22.	23.	20.	25.	21.	25.
41	25.	22.	38.	27.	21.	22.	28.	25.	19.	34.
51	32.	31.	32.	33.	33.	18.	34.	33.	17.	32.
61	30.	25.	33.	27.	33.	21.	27.	36.	28.	30.
71	31.	26.	38.	39.	34.	33.	38.	37.	30.	41.
81	42.	26.	53.	33.	38.	43.	49.	33.	41.	47.
91	52.	51.	48.	39.	46.	47.	64.	40.	50.	38.
101	42.	58.	45.	40.	57.	55.	50.	51.	51.	51.
111	59.	65.	52.	62.	67.	69.	74.	72.	65.	70.
121	61.	74.	73.	85.	68.	78.	75.	73.	86.	74.
131	70.	94.	84.	80.	82.	88.	97.	100.	91.	82.
141	100.	107.	113.	100.	112.	119.	100.	117.	130.	127.
151	127.	124.	121.	121.	130.	138.	163.	173.	145.	152.
161	171.	161.	168.	174.	165.	192.	183.	198.	187.	240.
171	186.	218.	239.	205.	265.	243.	271.	316.	258.	289.
181	314.	275.	338.	325.	366.	411.	393.	429.	440.	465.
191	496.	494.	570.	582.	657.	689.	734.	848.	900.	969.
201	1076.	1164.	1213.	1275.	1518.	1545.	1837.	1987.	2069.	2272.
211	2404.	2735.	2914.	3264.	3380.	3724.	3925.	4275.	4521.	4853.
221	4980.	5066.	5378.	5555.	5491.	5597.	5634.	5190.	5116.	4855.
231	4390.	3978.	3378.	2821.	2333.	1833.	1359.	1039.	721.	536.
241	399.	258.	169.	92.	81.	56.	49.	40.	30.	36.
251	51.	43.	35.	32.	35.	43.	50.	50.	48.	43.
261	53.	67.	55.	64.	72.	56.	76.	70.	87.	81.
271	81.	97.	96.	112.	114.	132.	142.	157.	148.	170.
281	181.	205.	212.	235.	234.	254.	299.	313.	327.	334.
291	361.	429.	394.	418.	459.	446.	490.	462.	478.	485.
301	454.	454.	403.	404.	391.	332.	287.	265.	225.	188.
311	154.	140.	141.	116.	111.	105.	114.	91.	93.	105.
321	115.	109.	108.	150.	145.	181.	164.	195.	205.	203.
331	237.	245.	301.	300.	342.	376.	405.	428.	484.	522.
341	619.	657.	743.	716.	837.	847.	1033.	1023.	1085.	1153.
351	1130.	1240.	1368.	1358.	1356.	1375.	1421.	1347.	1475.	1227.
361	1256.	1077.	1044.	874.	743.	652.	521.	404.	303.	216.
371	150.	97.	58.	30.	30.	14.	6.	5.	0.	2.
381	3.	2.	1.	2.	1.	1.	2.	0.	2.	2.
391	1.	2.	3.	0.	4.	1.	4.	1.	2.	2.
401	5.	0.	1.	6.	5.	4.	4.	2.	3.	2.
411	4.	3.	4.	1.	2.	3.	3.	3.	1.	4.
421	2.	4.	2.	0.	1.	0.	1.	0.	1.	2.
431	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	1.	0.	0.	0.	0.	0.	0.	1.
451	0.	2.	0.	2.	0.	1.	1.	1.	0.	0.
461	1.	2.	1.	0.	1.	1.	0.	1.	1.	0.
471	2.	3.	1.	1.	2.	1.	2.	2.	1.	1.
481	1.	1.	0.	0.	0.	2.	1.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	30.	0.								

D. H. McTiboa
1-15-94

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT

WHC-SD-WM-DP-062, REV. 0

SAMPLE
J1427-5981 SPK D
File ID: 8a8672.CNF

Counted on: 1/14/94 @ 1:41
Detector: AEA8
Geometry number: 1
Count time: 86400. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	1200.2	1200.2	355.228	355.228	20.000	14.590	10.000	2.407
2	412.2	412.2	298.693	298.120	18.000	11.425	9.000	1.622
3	4790.0	4790.0	224.165	224.149	20.000	13.011	10.000	2.209
4?	30.6	30.6	47.044	43.672	264.000	1.000	132.000	0.100
5?	4.3	4.3	34.262	34.262	6.000	0.044	3.000	0.010

PEAK RESULTS
Peak Error Limit: 25%

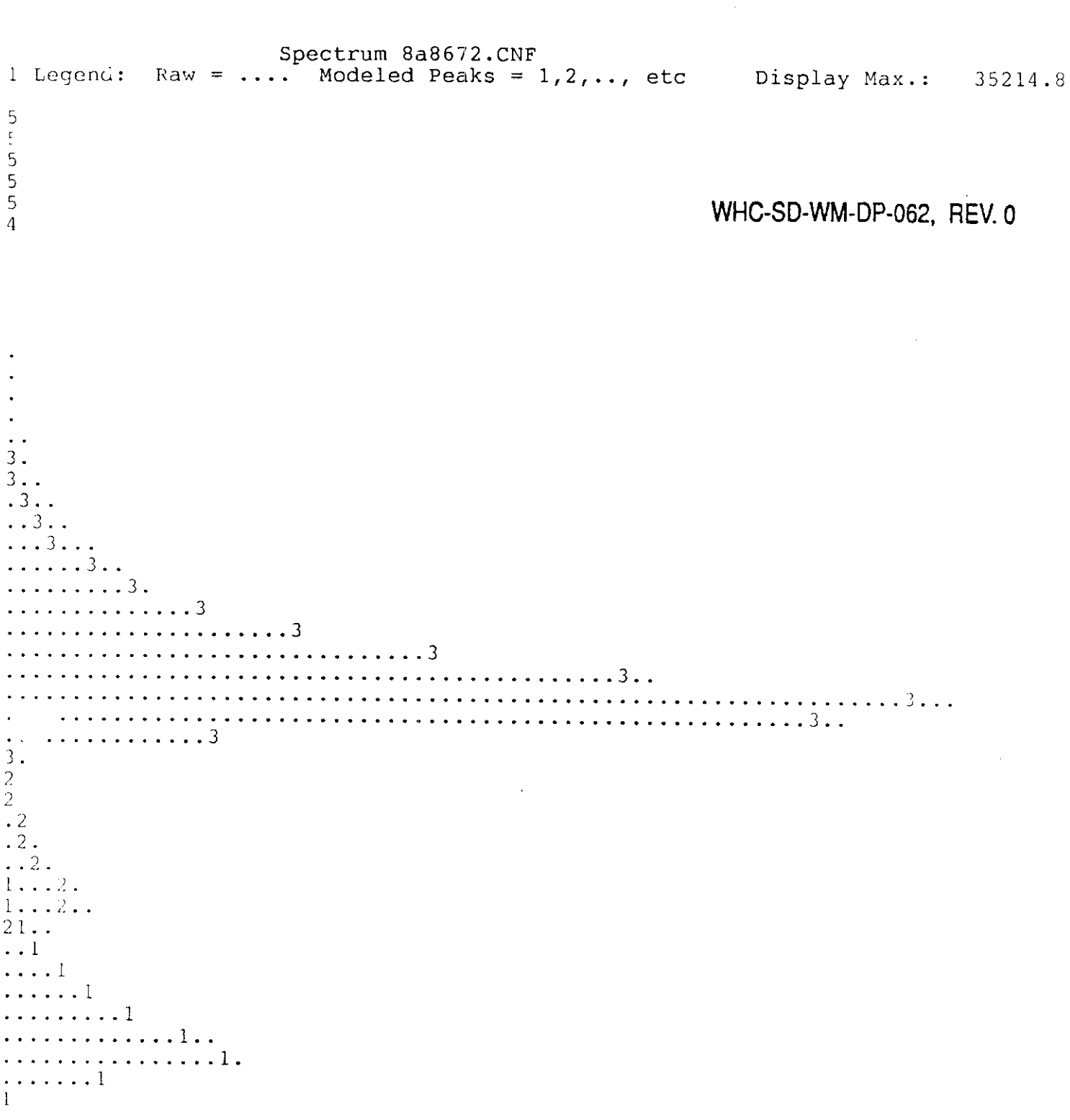
Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Ra224	0.179	5.680	5.731	-.051	0.07	26.89	1.0	247.1	0.111E-03
	Pu236		5.756	5.731	0.025				237.0	0.107E-03
2	Am241	0.066	5.480	5.469	0.011	0.05	9.85	1.9	90.4	0.407E-04
	Pu238		5.499	5.469	0.030				118.1	0.532E-04
3	Pu239	0.689	5.143	5.128	0.015	0.06	103.26	0.5	891.7	0.402E-03
	Pu240		5.144	5.128	0.016				891.7	0.402E-03
4		????		4.298			0.58	6.9		
5		????		4.255			0.04	81.6		
Totals:		0.934	<--valid peaks only-->				140.00			

DETECTOR CALIBRATION
Energy(MEV) = 4.097 + (0.0046)*Channel
Energy range (MeV): 4.097 TO 6.453
Efficiency = 0.1158 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	215796.0	100.000
Smoothed	215795.9	100.000
Composite fit	202490.9	93.834
Residuals	13305.1	6.166

Analyzed by: _____
ALJ


Spectrum 8a8672.CNF
Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.: 35214.8

Raw Data Dump for AEA Spectrum: 8a8672.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	5.	26.	17.	23.
21	28.	21.	20.	18.	27.	25.	16.	24.	25.	31.
31	28.	19.	28.	18.	32.	22.	24.	19.	30.	15.
41	28.	19.	29.	40.	25.	24.	31.	30.	24.	28.
51	25.	25.	28.	28.	27.	33.	29.	40.	49.	43.
61	39.	37.	47.	42.	29.	39.	40.	33.	46.	50.
71	38.	36.	52.	60.	47.	45.	56.	56.	42.	50.
81	47.	62.	66.	57.	64.	70.	59.	52.	55.	65.
91	76.	72.	68.	61.	83.	60.	75.	86.	97.	82.
101	86.	80.	89.	72.	97.	102.	91.	105.	105.	118.
111	101.	106.	94.	131.	118.	123.	97.	133.	131.	125.
121	156.	145.	156.	145.	165.	185.	159.	145.	179.	188.
131	197.	172.	210.	188.	223.	185.	216.	228.	213.	242.
141	224.	224.	239.	269.	302.	268.	287.	304.	308.	335.
151	301.	337.	332.	338.	349.	373.	321.	369.	391.	414.
161	439.	422.	438.	443.	426.	494.	518.	502.	542.	557.
171	597.	598.	624.	603.	681.	671.	680.	736.	712.	718.
181	737.	876.	853.	892.	915.	894.	978.	910.	1032.	1056.
191	1045.	1120.	1214.	1246.	1293.	1384.	1327.	1468.	1616.	1610.
201	1675.	1757.	1879.	1977.	2080.	2113.	2391.	2468.	2622.	2688.
211	2988.	3054.	3243.	3485.	3731.	3793.	4010.	4157.	4423.	4519.
221	4740.	4935.	4940.	5021.	4907.	4878.	4518.	4403.	3744.	3290.
231	2780.	2040.	1654.	1172.	816.	527.	320.	212.	143.	111.
241	75.	70.	78.	79.	77.	81.	86.	79.	79.	89.
251	102.	74.	92.	100.	98.	101.	112.	96.	120.	116.
261	124.	140.	117.	126.	156.	144.	149.	158.	154.	178.
271	190.	194.	180.	194.	204.	199.	186.	244.	228.	248.
281	271.	278.	299.	302.	332.	372.	329.	399.	378.	397.
291	450.	485.	474.	462.	503.	497.	473.	531.	536.	513.
301	489.	453.	409.	376.	309.	291.	285.	254.	219.	192.
311	188.	191.	202.	207.	199.	222.	216.	203.	232.	242.
321	256.	293.	264.	309.	334.	304.	366.	370.	382.	356.
331	377.	451.	432.	510.	538.	545.	555.	612.	571.	673.
341	703.	782.	818.	821.	907.	936.	1006.	1107.	1110.	1111.
351	1153.	1187.	1171.	1230.	1257.	1221.	1180.	1146.	1152.	1074.
361	855.	789.	618.	477.	347.	236.	157.	98.	51.	31.
371	7.	9.	2.	1.	0.	0.	2.	1.	0.	0.
381	2.	4.	0.	0.	0.	0.	0.	2.	0.	1.
391	2.	1.	2.	2.	0.	0.	1.	1.	1.	0.
401	1.	3.	2.	3.	2.	2.	3.	1.	3.	3.
411	0.	0.	1.	0.	2.	0.	1.	0.	2.	0.
421	0.	3.	0.	0.	0.	1.	0.	0.	0.	0.
431	1.	1.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	1.	0.	0.	1.	1.	2.	2.	0.	0.
471	1.	0.	0.	0.	0.	0.	0.	1.	0.	2.
481	2.	1.	2.	0.	0.	0.	2.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

WESTINGHOUSE HANFORD COMPANY

222-S LABORATORY

ANALYTICAL BATCH 2403

Lab Segment Serial No.	Customer ID:
J1428	KE72A
Analysis: Pu 239/40	**Sample Prep:** DIRECT

Instrument: LUB 5872237	Procedure/ Rev: LA 503-156 D0
Technologist: Jerlm VanSant	Date: 1-6-94
Starting Time: 1800	Temperature 25°C
Ending Time: 2200	Chemist: L Hills

Comments: AEA 24HRS

	Description	Lab ID
1	Lmcs	J1420-5591
2	BLANK	J1423-5691
3	Sample	J1428-5781
4	Sample Dup	J1428-5791
5	Sample Top	J1429-5791
6	Spike	J1428-5981
7	Spike Dup	J1429-5981
8		
9		
10		

	Description	Lab ID
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
Lmcs	63843	100-10-100mL		
Spike	77843	.05mL		

ANALYTICAL BATCH SUMMARY SHEET

METHOD: **LA-503-156**

DATE START: **January 6, 1994**

PREPARED BY: **L.L. Fritts** L.L. Fritts 1/13/94

DATE COMPLETE: **January 13, 1994**

	UNITS:	uCi/mL									
SPL NAME	SPL ID	ANALYTE	RESULT #1	RESULT #2	RESULT #3	AVERAGE	2*SD	PREC	%REC	DET LIM	% CT ER
STD 63843	J1420	Pu-239/40	1.57E+2						120.3	1.50E-2	1.0
BLANK	J1423	Pu-239/40	<8.01E-4						67.8	8.01E-4	100.0
KE72A	J1428	Pu-239/40	2.25E-2	2.15E-2	2.32E-2	2.24E-2	1.71E-3	7.6	42.7	2.11E-3	0.9
									75.2	1.99E-3	0.7
									73.1	2.14E-3	0.7
KE72A	J1428	239 Spike	116.1	128.4						4.17E-3	0.8
										3.68E-3	0.8
STD 63843	J1420	Pu-238	<1.78E+1						N/A	1.78E-2	2.1
BLANK	J1423	Pu-238	<2.92E-3						67.8	2.92E-3	100.0
KE72A	J1428	Pu-238	<4.64E-3	<2.64E-3	3.14E-3	N/A	N/A	N/A	42.7	4.64E-3	1.5
									75.2	2.64E-3	1.2
									73.1	2.71E-3	1.2

NARRATIVE: ☐ NO SPECIAL PROBLEMS/METHOD VARIATIONS IN THIS BATCH

LIST SPECIFIC PROBLEMS/VARIATIONS FOR THIS BATCH:

The results for the standard are in uCi/L.

The results for the spike are in percent recovery.

Spike duplicate is slightly outside of control limits. This batch is a candidate for rerun depending on availability of tracer.

Standard mount was recounted and results were poor. Visual inspection of the mount showed it to be inadequate for a good count. Mount was uneven and appeared to be covered with a residue. Standard result was calculated assuming the peaks had been shifted.

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

4 4087 Rev 1 (2) 4344 Batch 2403

Serial No	Sample Point	Date	Time Issued	Priority
J 1420.-5581	BECHTOLD	12-16-93	9:12	22

Determination	Method Standard	Result Units	Charge Code	Reruns
Pu239/40	LA-503-156	% RECOVERY	E14157	0

Sample Size	Customer ID
?.100mL-10-.100mL	STD

Remarks Calculations, Results

EDP RZ11 AR001

STD# 63843 RESULT 157

STD VAL. 130.5 %REC 120.3%

.05mL 77843

~~24 hrs~~ ~~8 hr.~~ 24 hrs 1-13-94

WHC-SD-WM-DP-062, REV. 0

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs 1-12-94

Date	Time Completed	Lab Unit Mgr	
1-6-94			1-13-94

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

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

Serial No.				STANDARD
J1420-5581	Date Counted	01/07/94	Pu 236 AEA Frac. (C236)	0.231
Batch ID	Sample Volume in mL (SS)	0.1	Pu 238 AEA Frac. (C238)	0.04
2403	Sample D.F. (DF)	101	Pu 239 AEA Frac. (C239)	0.523
Rerun No.	Tracer Volume in mL (SPKV)	0.05	Total AT Counts	5181
0	Digest D.F. (DDF)	1	Time Counted in min (TC)	30
Analyst	Tracer Rook No.	77843	Background in cpm (Bkg)	4
J VAN SANT	Tracer Preparation Date	10/12/93	Pu 236 Counts	10.5
Date	Pu-236 Decay Corr'd Value	3044.42	Pu 238 Counts	1.8
01/06/94	Pu-238 Tracer Value	133	Pu 239 Counts	23.74
			AEA Count Time in min	1440

Decay Time = Date Counted - Tracer Preparation Date

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

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SS

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

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

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

Pu-239/240 µCi/L	=	1.57E+02

NOTE: Tracer values are in dpm/mL.

Pu-239/240 µCi/mL	=	1.57E-01
Relative Counting Error	=	1.0%
Pu-238 µCi/mL	=	< 1.78E-02
Relative Counting Error	=	2.1%
Pu 236 Tracer Recovery	=	51.2%

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

DETECTION LEVELS in µCi/mL					
Pu 239/240	=	1.50E-02	Pu 238	=	1.78E-02

Data Entry by:		Date:	12-Jan-94
Approved by:		Date:	13 Jan 1994

Form 1 Rev. 1.4

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

II 3 1-7-94 J1420-5581

5181/30 - 4

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

7 7445

Serial No	Sample Point	Date	Time Issued	Priority
J 1423.-5681	BECHTOLD	12-16-93	9:14	22

Determination	Method Standard	Result Units	Charge Code	Reruns
Pu239/40	LA-503-156	uCi/ML	E14157	0

Sample Size	Customer ID
? ~~1mL~~ 1ml-10ml -.05ml 1-12-94	BLK

Remarks Calculations Results

REAGENT BLANK

COUNT AS uCI/L

24 HRS

"AEA" - ~~[illegible]~~

ATTACH PRINTOUT

.05mL 77B43 <8.01 x 10^-4 uCi/ml

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
[signature]	[signature]	[signature]	[signature]	
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1-6-94		[signature]	1-13-94 [signature]

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

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

Serial No.	Date Counted	01/07/94	Pu 236 AEA Frac. (C236)	BLANK
J1423-5681	Sample Volume in mL (SS)	0.05	Pu 238 AEA Frac. (C238)	0
Batch ID	Sample D.F. (DF)	11	Pu 239 AEA Frac. (C239)	0
2403	Tracer Volume in mL (SPKV)	0.05	Total AT Counts	1674
Rerun No.	Digest D.F. (DDF)	1	Time Counted in min (TC)	30
0	Tracer Book No.	77B43	Background in cpm (Bkg)	1
Analyst	Tracer Preparation Date	10/12/93	Pu 236 Counts	20.06
J VAN SANT	Pu-236 Preparation Value	3226	Pu 238 Counts	0
Date	Pu-236 Decay Corr'd Value	3044.42	Pu 239 Counts	0
01/06/94	Pu-238 Tracer Value	133	AEA Count Time in min	1440

Decay Time = Date Counted - Tracer Preparation Date

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

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SS

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

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

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

Pu-239/240 µCi/L	=	< 8.01E-01

NOTE: Tracer values are in dpm/mL.

Pu-239/240 µCi/mL	=	< 8.01E-04
Relative Counting Error	=	100.0%
Pu-238 µCi/mL	=	< 2.92E-03
Relative Counting Error	=	100.0%
Pu 236 Tracer Recovery	=	67.8%

NOTE: Pu 239/240 Reported result is a LESS THAN value using 0.05 for the Pu-239/240 peak height.

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

DETECTION LEVELS in µCi/mL					
Pu 239/240	=	8.01E-04	Pu 238	=	2.92E-03

Data Entry by:	[signature]	Date:	12-Jan-94
Approved by:	[signature]	Date:	13 Jan 1994

Form 1 Rev. 1.4

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#2 1-7-94

J1427-5681

#1

1674/30 -1

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

WHC-SD-WM-DP-062, REV. 0

6 ~~7115~~ 6917

Serial No	Sample Point	Date	Time Issued	Priority
J 1428.-5781	BECHTOLD	12-16-93	13:20	22

Determination	Method Standard	Result Units	Charge Code	Reruns
Pu239/40	LA-503-156	uCi/ML	E14157	0

Sample Size	Customer ID
? 1mL - 10 - .05mL	KE72A

Remarks Calculations Results

COUNT AS uCI/L

Sam

.05mL 77B43

24 HRS

"AEA" - ~~[illegible]~~

ATTACH PRINTOUT

2.25×10^{-2} uCi/ml

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
[signature]	[signature]	[signature]	[signature]	
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1-6-94		[signature]	1-13-94 [signature]

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

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

Serial No.	Date Counted	01/07/94	Pu 236 AEA Frac. (C236)	SAMPLE 0.357
J1428-5781	Sample Volume in mL (SS)	0.05	Pu 238 AEA Frac. (C238)	0.09
Batch ID	Sample D.F. (DF)	11	Pu 239 AEA Frac. (C239)	0.532
2403	Tracer Volume in mL (SPKV)	0.05	Total AT Counts	2973
Rerun No.	Digest D.F. (DDF)	1	Time Counted in min (TC)	30
0	Tracer Book No.	77B43	Background in cpm (Bkg)	8
Analyst	Tracer Preparation Date	10/12/93	Pu 236 Counts	15.64
J VAN SANT	Pu-236 Preparation Value	3226	Pu 238 Counts	3.94
Date	Pu-236 Decay Corr'd Value	3044.42	Pu 239 Counts	23.29
01/06/94	Pu-238 Tracer Value	133	AEA Count Time in min	1440

Decay Time = Date Counted - Tracer Preparation Date

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

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SS

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

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

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

Pu-239/240 µCi/L	=	2.25E+01

NOTE: Tracer values are in dpm/mL.

Pu-239/240 µCi/mL	=	2.25E-02
Relative Counting Error	=	0.9%
Pu-238 µCi/mL	=	< 4.64E-03
Relative Counting Error	=	1.5%
Pu 236 Tracer Recovery	=	42.7%

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

DETECTION LEVELS in µCi/mL					
Pu 239/240	=	2.11E-03	Pu 238	=	4.64E-03

Data Entry by:	[signature]	Date:	12-Jan-94
Approved by:	[signature]	Date:	13 Jan 1994

Form 1 Rev. 1.4

Page 1 of 1

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#1 1-7-94

J1428-5781

#6

2973
30 -8

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

3 3577 . .

Serial No	Sample Point	Date	Time Issued	Priority
J 1428.-5781	BECHTOLD	12-16-93	13:20	22

Determination	Method Standard	Result Units	Charge Code	Reruns
Pu239/40	LA-503-156	uCi/ML	E14157	0

Sample Size	Customer ID
?1mL - 10 - .05mL	KE72A

Remarks, Calculations, Results

COUNT AS uCI/L DUP 24 HRS

"AEA" - ASSIGN

ATTACH PRINTOUT

.05mL 77B43 2.15×10^{-2} uCi/ml

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	Em Bauer	[signature]	D.H. Milicia	
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1-6-94		[signature]	1-13-94 [signature]

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

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

				SAMPLE
Serial No.	Date Counted	01/07/94	Pu 236 AEA Frac. (C236)	0.379
J1428-5781	Sample Volume in mL (SS)	0.05	Pu 238 AEA Frac. (C238)	0.082
Batch ID	Sample D.F. (DF)	11	Pu 239 AEA Frac. (C239)	0.539
2403	Tracer Volume in mL (SPKV)	0.05	Total AT Counts	4559
Rerun No.	Digest D.F. (DDF)	1	Time Counted in min (TC)	30
0	Tracer Book No.	77B43	Background in cpm (Bkg)	1
Analyst	Tracer Preparation Date	10/12/93	Pu 236 Counts	27.24
J VAN SANT	Pu-236 Preparation Value	3226	Pu 238 Counts	5.88
Date	Pu-236 Decay Corr'd Value	3044.42	Pu 239 Counts	38.74
01/06/94	Pu-238 Tracer Value	133	AEA Count Time in min	1440

Decay Time = Date Counted - Tracer Preparation Date

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

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SS

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

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

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

Pu-239/240 µCi/L	=	2.15E+01

NOTE: Tracer values are in dpm/mL.

Pu-239/240 µCi/mL	=	2.15E-02
Relative Counting Error	=	0.7%
Pu-238 µCi/mL	=	< 2.64E-03
Relative Counting Error	=	1.2%
Pu 236 Tracer Recovery	=	75.2%

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

DETECTION LEVELS in µCi/mL					
Pu 239/240	=	1.99E-03	Pu 238	=	2.64E-03

Data Entry by:	[signature]	Date:	12-Jan-94
Approved by:	[signature]	Date:	13 Jan 1994

Form 1 Rev. 1.4

Page 1 of 1

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#2 1-7-94 J1428-5781

#3

4559/30 -1

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

2 2515

Serial No	Sample Point	Date	Time Issued	Priority
J 1428.-5781	BECHTOLD	12-16-93	13:20	22

Determination	Method Standard	Result Units	Charge Code	Reruns
Pu239/40	LA-503-156	uCi/ML	E14157	0

Sample Size	Customer ID
? 1mL - 10 - .05mL	KE72A

Remarks, Calculations, Results

COUNT AS uCI/L TRIP 24 HRS

ATTACH PRINTOUT

.05mL 77843 2.32×10^{-2} uCi/ml

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr.	
1-6-94			1-13-94

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

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

		SAMPLE		
Serial No.	Date Counted	01/07/94	Pu 236 AEA Frac. (C236)	0.353
J1428-5781	Sample Volume in mL (SS)	0.05	Pu 238 AEA Frac. (C238)	0.089
Batch ID	Sample D.F. (DF)	11	Pu 239 AEA Frac. (C239)	0.544
2403	Tracer Volume in mL (SPKV)	0.05	Total AT Counts	4966
Rerun No.	Digest D.F. (DDF)	1	Time Counted in min (TC)	30
0	Tracer Book No.	77B43	Background in cpm (Bkg)	8
Analyst	Tracer Preparation Date	10/12/93	Pu 236 Counts	23.46
J VAN SANT	Pu-236 Preparation Value	3226	Pu 238 Counts	5.94
Date	Pu-236 Decay Corr'd Value	3044.42	Pu 239 Counts	36.16
01/06/94	Pu-238 Tracer Value	133	AEA Count Time in min	1440

Decay Time = Date Counted - Tracer Preparation Date

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

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SS

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

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

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

Pu-239/240 µCi/L	=	2.32E+01

NOTE: Tracer values are in dpm/mL.

Pu-239/240 µCi/mL	=	2.32E-02
Relative Counting Error	=	0.7%
Pu-238 µCi/mL	=	3.14E-03
Relative Counting Error	=	1.2%
Pu 236 Tracer Recovery	=	73.1%

DETECTION LEVELS in µCi/mL			
Pu 239/240	= 2.14E-03	Pu 238	= 2.71E-03

Data Entry by:	Date:	12-Jan-94
Approved by:	Date:	13 Jan 1994

Form 1 Rev. 1.4

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#1 1-7-94 J1428-5781

#2

4966
30 -8

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

WHC-SD-WM-DP-062, REV. 0

5 ~~[illegible]~~ 5007

Serial No	Sample Point	Date	Time Issued	Priority
J 1428.-5981	BECHTOLD	12-16-93	13:20	22

Determination	Method Standard	Result Units	Charge Code	Reruns
Pu239/24	LA-503-156	% RECOVERY	E14157	0

Sample Size	Customer ID
? 1mL - 10 - .05mL	KE72A

Remarks Calculations Results

SAMPLE SPIKED ID 63843 SK .100-10 - .100ml

SPIKE ID 77B43

SPIKE VOLUME
COUNT AS uCI/L .05mL

24 HRS
"AEA" - ~~[illegible]~~
ATTACH PRINTOUT

116.1%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
J Van Sant	Em Barclay	[illegible]	D.H. Mitchell	
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1-6-94		K.K. Fitts	1-13-94 AK McGarland

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

2.10.94

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

Serial No.	Date Counted	01/07/94	Pu 236 AEA Frac. (C236)	CHK EXT NO.
J1428-5981	Sample Volume in mL (SS)	0.05	Pu 238 AEA Frac. (C238)	0.181
Batch ID	Sample D.F. (DF)	11	Pu 239 AEA Frac. (C239)	0.067
2403	Tracer Volume in mL (SPKV)	0.05	Total AT Counts	0.666
Rerun No.	Digest D.F. (DDF)	1	Time Counted in min (TC)	5442
0	Tracer Book No.	77B43	Background in cpm (Bkg)	30
Analyst	Tracer Preparation Date	10/12/93	Pu 236 Counts	1
J VAN SANT	Pu-236 Preparation Value	3226	Pu 238 Counts	14.23
Date	Pu-236 Decay Corr'd Value	3044.42	Pu 239 Counts	5.24
01/06/94	Pu-238 Tracer Value	133	AEA Count Time in min	52.53
				1440

Decay Time = Date Counted - Tracer Preparation Date

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

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SS

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

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

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

Pu-239/240 µCi/L	=	5.55E+01

NOTE: Tracer values are in dpm/mL.

Pu-239/240 µCi/mL	=	5.55E-02
Relative Counting Error	=	0.8%
Pu-238 µCi/mL	=	4.92E-03
Relative Counting Error	=	1.3%
Pu 236 Tracer Recovery	=	42.9%

DETECTION LEVELS in µCi/mL					
Pu 239/240	=	4.17E-03	Pu 238	=	4.62E-03

$$\frac{(55.5-22.5)\left(\frac{101}{.1}\Big/\frac{11}{.05}\right)(100)}{130.5} = 116.1\%$$

Data Entry by:	K.K. Fitts	Date:	12-Jan-94
Approved by:	K.K. Fitts	Date:	13 Jan 1994

Form 1 Rev. 1.4

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#2 1-7-94 . J1428-5981
#5

5442
30 -1

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

8 8659

WHC-SD-WM-DP-062, REV. 0

Serial No	Sample Point	Date	Time Issued	Priority
J 1428.-5981	BECHTOLD	12-16-93	13:20	22

Determination	Method Standard	Result Units	Charge Code	Reruns
Pu239/24	LA-503-156	% RECOVERY	E14157	0

Sample Size	Customer ID
?1mL-10-.05mL	KE72A

Remarks Calculations Results

SAMPLE SPIKED ID 63843 SKOVP .100mL10 -.100mL

SPIKE ID 77B43

SPIKE VOLUME
COUNT AS uCI/L .05mL

24HRS

128.4%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Van Sant	Em Barella	[illegible]	D.H. [illegible]	
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1-6-94		[illegible]	1-13-94 [illegible]

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

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

Serial No.	Date Counted	01/07/94	Pu 236 AEA Frac. (C236)	CHK EXT NO. 0.205
J1428-5981	Sample Volume in mL (SS)	0.05	Pu 238 AEA Frac. (C238)	0.04
Batch ID	Sample D.F. (DF)	11	Pu 239 AEA Frac. (C239)	0.788
2403	Tracer Volume in mL (SPKV)	0.05	Total AT Counts	5287
Rerun No.	Digest D.F. (DDF)	1	Time Counted in min (TC)	30
0	Tracer Book No.	77B43	Background in cpm (Bkg)	8
Analyst	Tracer Preparation Date	10/12/93	Pu 236 Counts	14.65
J VAN SANT	Pu-236 Preparation Value	3226	Pu 238 Counts	2.84
Date	Pu-236 Decay Corr'd Value	3044.42	Pu 239 Counts	56.41
01/06/94	Pu-238 Tracer Value	133	AEA Count Time in min	1440

Decay Time = Date Counted - Tracer Preparation Date

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

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SS

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

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

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

Pu-239/240 µCi/L	=	5.80E+01

NOTE: Tracer values are in dpm/mL.

Pu-239/240 µCi/mL	=	5.80E-02
Relative Counting Error	=	0.8%
Pu-238 µCi/mL	=	< 4.37E-03
Relative Counting Error	=	1.7%
Pu 236 Tracer Recovery	=	45.3%

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

DETECTION LEVELS in µCi/mL					
Pu 239/240	=	3.68E-03	Pu 238	=	4.37E-03

Data Entry by:	[illegible]	Date:	12-Jan-94
Approved by:	[illegible]	Date:	13 Jan 1994

Form 1 Rev. 1.4

492

Page 1 of 1

$$\frac{(58.0 - 21.5)\left(\frac{101}{.1}\Big/\frac{11}{.05}\right)(100)}{130.5} = 128.4\%$$

[illegible] 2.10.94

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#1 1-7-94

J1428-5981

$\frac{S-287}{30}$ -8

#8

S.H Wilcox
1-5-94

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT

WHC-SD-WM-DP-062, REV. 0

SAMPLE
J1420-5581
File ID: 4a4087.CNF

Counted on: 1/ 7/94 @ 8:45
Detector: AEA4
Geometry number: 1
Count time: 86405. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Final	Peak center Initial	Final	FWHM Initial	Final	Initial	Final
1	239.6	239.6	318.620	320.080	36.000	44.324	18.000	[illegible]
2	68.5	68.5	268.786	264.990	38.000	23.801	19.000	[illegible]
3	545.3	545.3	185.377	184.972	34.000	56.521	17.000	4.257
4	142.6	142.6	135.498	135.498	40.000	12.417	20.000	0.202

PEAK RESULTS
Peak Error Limit: 25%

ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity
1	Ra224	0.231	5.680	5.585	0.095	0.21	10.50	1.6	127.9	[illegible]
	Pu238		5.499	5.585	-.086				167.0	[illegible]
2	Am243	0.040	5.276	5.326	-.050	0.11	1.80	7.2	20.8	[illegible]
	Pu240		5.144	5.326	-.182				20.6	[illegible]
3	Np237	0.523	4.781	4.950	-.169	0.27	23.74	1.1	312.5	[illegible]
4	Np237	0.237	4.640	4.717	-.077	0.06	10.76	2.1	2053.3	[illegible]
Totals:		1.031	<--valid peaks only-->				46.79			

DETECTOR CALIBRATION
Energy(MEV) = 4.080 + (0.0047)*Channel
Energy range (MeV): 4.080 TO 6.487
Efficiency = 0.0873 CPM/DPM

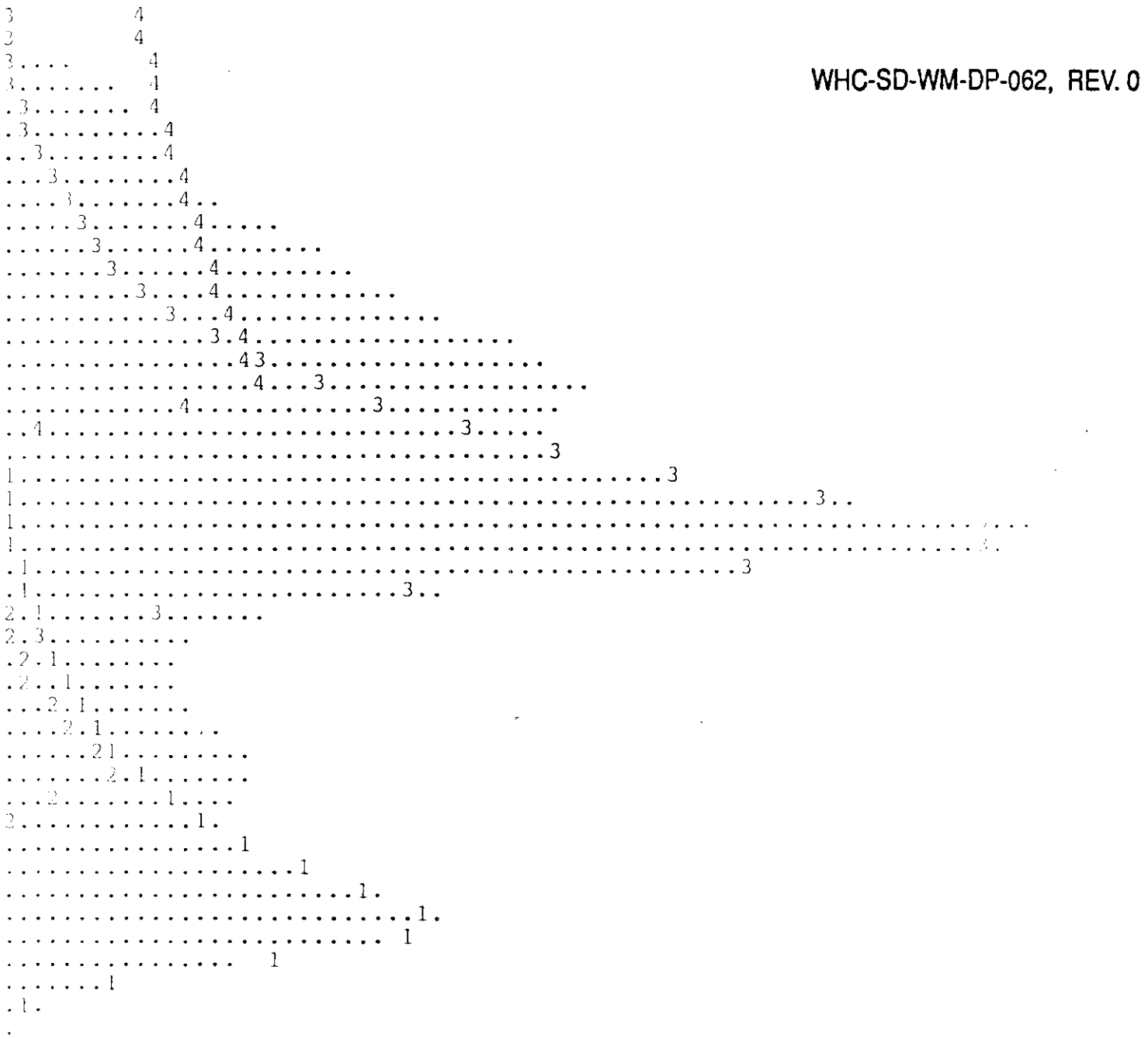
TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	65322.0	100.000
Smoothed	65321.4	99.999
Composite fit	67374.6	103.142
Residuals	-2052.6	-3.142

Analyzed by: _____
RW

Spectrum 4a4087.CNF

Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 4305.6



Raw Data Dump for AEA Spectrum: 4a4087.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	17.	42.	55.	66.
21	63.	62.	59.	66.	58.	74.	64.	54.	63.	87.
	69.	71.	81.	65.	64.	81.	54.	80.	63.	92.
	96.	95.	78.	88.	82.	88.	88.	92.	87.	87.
51	78.	103.	98.	83.	100.	111.	110.	112.	97.	107.
61	102.	101.	119.	117.	128.	113.	122.	119.	122.	131.
71	139.	126.	147.	124.	149.	157.	154.	165.	184.	164.
81	174.	151.	144.	168.	182.	190.	186.	201.	198.	199.
91	170.	182.	202.	198.	226.	194.	209.	224.	233.	173.
101	227.	229.	216.	224.	223.	241.	244.	217.	224.	224.
111	254.	257.	260.	263.	271.	285.	278.	286.	287.	299.
121	267.	303.	278.	287.	296.	286.	298.	282.	305.	316.
131	319.	309.	306.	320.	321.	312.	309.	290.	290.	338.
141	263.	290.	312.	291.	295.	262.	296.	278.	261.	313.
151	287.	300.	264.	291.	312.	300.	316.	325.	271.	288.
161	319.	344.	324.	363.	380.	369.	376.	399.	456.	395.
171	444.	475.	460.	461.	513.	522.	549.	512.	560.	539.
181	558.	572.	550.	537.	589.	554.	551.	557.	502.	527.
191	496.	465.	431.	410.	419.	381.	336.	353.	294.	300.
201	249.	246.	245.	221.	215.	180.	168.	191.	156.	156.
211	155.	124.	123.	128.	106.	117.	100.	90.	113.	96.
221	91.	94.	113.	84.	97.	91.	97.	93.	103.	85.
231	105.	93.	95.	94.	92.	81.	83.	87.	108.	82.
241	105.	103.	118.	122.	101.	123.	97.	104.	116.	96.
251	107.	132.	122.	121.	120.	118.	140.	141.	135.	135.
261	125.	124.	134.	124.	158.	133.	147.	133.	137.	134.
271	135.	132.	139.	119.	140.	128.	113.	137.	134.	120.
281	114.	126.	106.	119.	115.	136.	126.	130.	122.	133.
291	147.	148.	110.	147.	131.	157.	145.	130.	145.	183.
301	176.	173.	182.	200.	197.	200.	211.	200.	211.	183.
311	226.	209.	245.	235.	242.	234.	256.	239.	211.	217.
321	233.	223.	209.	217.	211.	170.	176.	188.	149.	143.
331	145.	127.	91.	93.	85.	89.	78.	72.	69.	57.
341	44.	42.	49.	35.	36.	16.	23.	22.	23.	15.
351	17.	15.	8.	12.	13.	14.	11.	8.	7.	6.
361	5.	3.	11.	8.	2.	4.	7.	1.	3.	1.
371	1.	2.	0.	0.	1.	0.	2.	0.	0.	0.
381	0.	1.	0.	0.	1.	0.	0.	1.	1.	0.
391	1.	1.	1.	1.	0.	0.	0.	0.	1.	0.
401	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	1.	1.	2.	0.	0.	0.	0.	0.	0.
421	1.	0.	0.	0.	2.	1.	0.	0.	0.	1.
431	1.	1.	1.	3.	0.	0.	1.	0.	0.	2.
441	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	1.	0.	0.	1.	0.	1.	1.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
471	0.	0.	0.	0.	0.	0.	1.	0.	2.	1.
481	2.	2.	3.	1.	1.	1.	1.	1.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
511	0.	0.								

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT

WHC-SD-WM-DP-062, REV. 0

SAMPLE
J1423-5681
File ID: 7a7445.CNF

Counted on: 1/ 7/94 @ 8:46
Detector: AEA7
Geometry number: 1
Count time: 86402. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	929.1	929.1	355.916	355.916	26.000	21.542	13.000	10.771
[illegible]	12.7	12.7	240.170	240.027	136.000	1.000	68.000	0.500
[illegible]	9.6	9.6	224.362	224.124	8.000	1.786	4.000	0.893
[illegible]	5.6	5.6	208.257	207.898	8.000	1.334	4.000	0.667

PEAK RESULTS
Peak Error Limit: 25%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/[illegible]
1	Cm243	0.942	5.786	5.762	0.024	0.10	20.06	1.2	269.7	0.1[illegible]E-[illegible]
	Pu236		5.756	5.762	-.006				200.[illegible]	[illegible]
2		0.016		5.217		0.00	0.34	9.2	3.[illegible]	[illegible]
3		????		5.142			0.05	54.3		
4		????		5.066			0.05	50.9		
Totals:		0.958	<--valid peaks only-->				20.40			

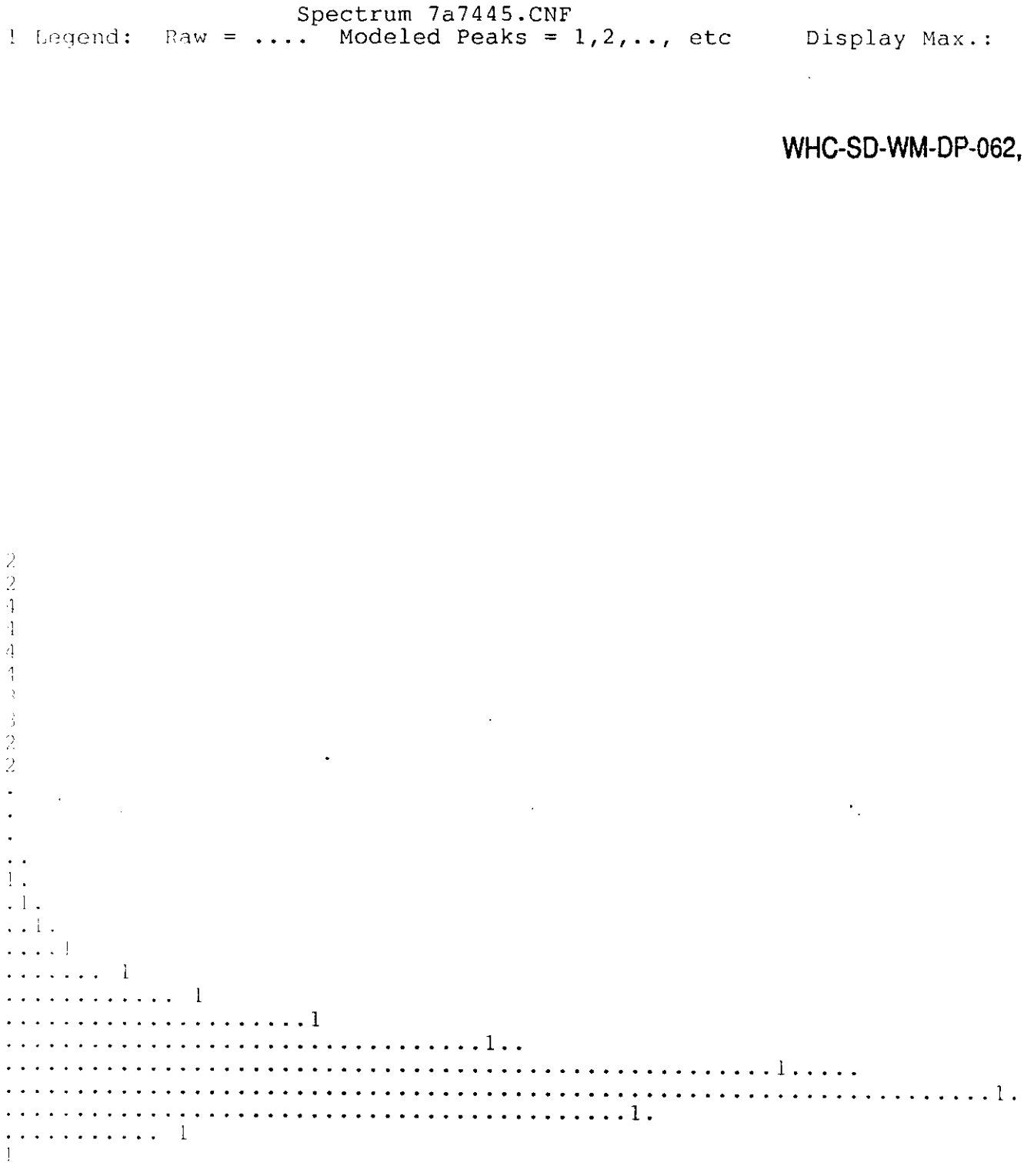
DETECTOR CALIBRATION
Energy(MEV) = 4.089 + (0.0047)*Channel
Energy range (MeV): 4.089 TO 6.495
Efficiency = 0.1019 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	30661.0	100.000
Smoothed	30660.6	99.999
Composite fit	29528.9	96.308
Residuals	1132.1	3.692

Analyzed by: _____
RW

[illegible]


Spectrum 7a7445.CNF
! Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 7213.1

Raw Data Dump for AEA Spectrum: 7a7445.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
21	2.	2.	0.	0.	0.	0.	1.	0.	2.	1.
31	2.	0.	0.	1.	1.	2.	1.	0.	0.	1.
41	0.	1.	1.	0.	1.	0.	1.	0.	1.	0.
51	0.	2.	1.	0.	0.	2.	1.	0.	2.	0.
61	1.	2.	0.	1.	0.	0.	1.	0.	1.	1.
71	0.	1.	0.	0.	1.	1.	2.	1.	1.	0.
81	0.	1.	0.	0.	1.	2.	0.	2.	1.	0.
91	1.	1.	2.	2.	0.	0.	2.	1.	2.	2.
101	4.	2.	1.	2.	1.	4.	2.	4.	5.	1.
111	4.	4.	0.	3.	2.	1.	1.	1.	2.	1.
121	1.	4.	3.	0.	5.	1.	4.	0.	3.	3.
131	2.	2.	2.	1.	4.	1.	2.	2.	4.	2.
141	2.	4.	3.	5.	1.	3.	2.	3.	1.	1.
151	6.	0.	3.	2.	3.	3.	1.	1.	1.	1.
161	2.	2.	3.	2.	3.	5.	3.	3.	3.	1.
171	7.	1.	2.	3.	2.	3.	7.	4.	1.	1.
181	3.	1.	7.	7.	4.	4.	6.	3.	3.	1.
191	5.	7.	9.	4.	5.	4.	7.	12.	7.	6.
201	5.	3.	7.	9.	9.	10.	11.	14.	13.	11.
211	7.	9.	3.	4.	9.	5.	16.	12.	14.	10.
221	15.	12.	9.	29.	20.	13.	11.	9.	18.	13.
231	12.	12.	13.	14.	8.	9.	7.	13.	16.	19.
241	11.	17.	10.	9.	11.	12.	12.	12.	15.	19.
251	11.	12.	17.	15.	19.	20.	19.	19.	19.	17.
261	13.	22.	21.	14.	17.	20.	15.	24.	23.	17.
271	16.	24.	28.	31.	32.	31.	24.	34.	25.	22.
281	31.	26.	30.	31.	31.	40.	40.	41.	34.	31.
291	41.	42.	49.	41.	55.	53.	55.	56.	53.	43.
301	54.	58.	63.	79.	65.	84.	74.	54.	80.	67.
311	59.	78.	81.	87.	97.	87.	106.	128.	114.	128.
321	174.	144.	148.	168.	157.	189.	185.	202.	233.	232.
331	272.	292.	289.	303.	325.	349.	379.	404.	441.	492.
341	498.	569.	559.	623.	679.	699.	761.	807.	820.	874.
351	866.	921.	998.	874.	970.	968.	904.	935.	883.	832.
361	708.	708.	652.	635.	461.	476.	333.	283.	201.	154.
371	120.	81.	50.	40.	22.	19.	13.	5.	6.	3.
381	5.	0.	0.	1.	0.	1.	0.	1.	1.	0.
391	3.	1.	0.	0.	1.	0.	1.	0.	0.	0.
401	0.	0.	2.	2.	1.	0.	1.	4.	0.	0.
411	1.	3.	0.	2.	1.	1.	1.	1.	0.	0.
421	0.	1.	1.	0.	0.	0.	0.	0.	1.	0.
431	1.	0.	1.	0.	0.	0.	0.	1.	0.	1.
441	0.	0.	0.	0.	1.	1.	0.	1.	0.	1.
451	0.	1.	0.	0.	0.	1.	0.	1.	0.	0.
461	0.	0.	0.	0.	0.	0.	1.	3.	1.	0.
471	1.	0.	1.	0.	0.	0.	0.	0.	2.	1.
481	0.	0.	0.	0.	0.	0.	0.	0.	2.	1.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
501	17.	0.								

Dill Mikkia
1-8-94

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT

WHC-SD-WM-DP-062, REV. 0

SAMPLE
J1428-5781
File ID: 6a6917.CNF

Counted on: 1/ 7/94 @ 8:46
Detector: AEA6
Geometry number: 1
Count time: 86405. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	[illegible] Initial	[illegible]
1?	12.7	12.7	496.425	496.425	8.000	0.991	[illegible]	[illegible]
2	790.5	790.5	359.063	359.063	24.000	26.913	12.000	[illegible]
3	194.6	194.6	297.576	297.343	30.000	28.003	15.000	7.975
4	1272.3	1272.3	225.739	225.734	26.000	23.882	13.000	7.379
5?	11.9	11.9	134.925	134.847	122.000	1.000	61.000	0.190
6?	2.0	2.0	127.952	127.840	4.000	0.000	2.000	3.758

PEAK RESULTS
Peak Error Limit: 25%

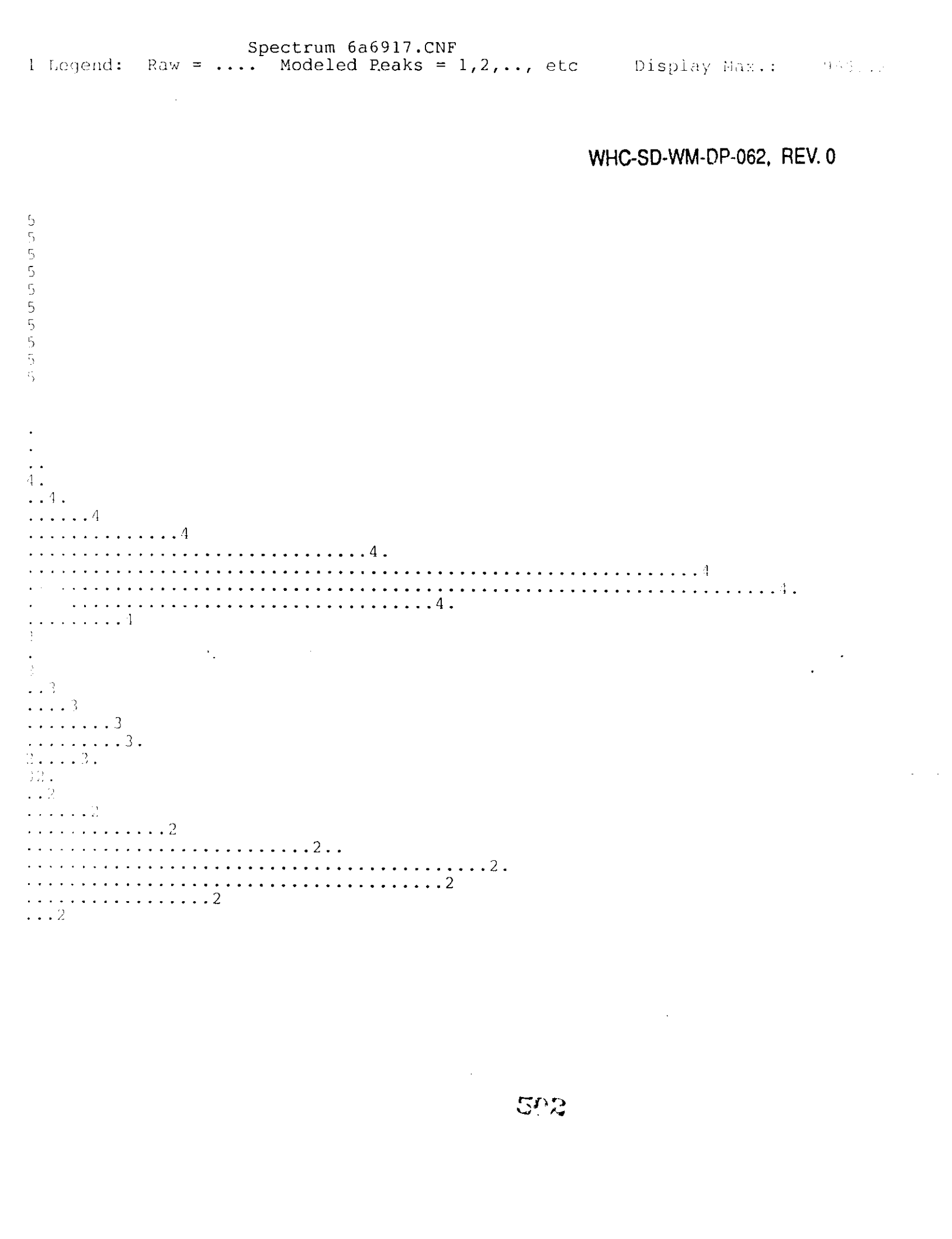
Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Peak Centroid Obs.	Peak Centroid Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity [illegible]
1		????		6.414			0.04	25.0		
2	Cm243	0.357	5.786	5.768	0.018	0.13	15.64	1.3	167.6	[illegible]
	Pu236		5.756	5.768	-.012				124.9	[illegible]
3	Am241	0.090	5.480	5.478	0.002	0.13	3.94	2.9	32.8	[illegible]
	Pu238		5.499	5.478	0.021				42.8	[illegible]
4	Pu239	0.532	5.143	5.142	0.001	0.11	23.29	1.1	182.2	[illegible]
	Pu240		5.144	5.142	0.002				182.2	[illegible]
5		????		4.715			0.31	9.3		
6		????		4.682			0.00	1000.		
Totals:		0.978	<--valid peaks only-->				42.87			

DETECTOR CALIBRATION
Energy(MEV) = 4.081 + (0.0047)*Channel
Energy range (MeV): 4.081 TO 6.487
Efficiency = 0.1278 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	63095.0	100.000
Smoothed	63102.3	100.012
Composite fit	62242.6	98.649
Residuals	852.4	1.351

Analyzed by: _____
RW


Spectrum 6a6917.CNF
Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.:

Raw Data Dump for AEA Spectrum: 6a6917.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	1.	1.	4.	3.
21	3.	4.	6.	3.	0.	2.	3.	0.	1.	4.
31	4.	6.	2.	5.	3.	3.	1.	4.	1.	1.
41	6.	4.	1.	1.	4.	5.	1.	1.	3.	5.
51	5.	2.	3.	5.	1.	3.	2.	5.	2.	5.
61	7.	0.	3.	4.	4.	6.	2.	3.	2.	2.
71	5.	3.	5.	3.	6.	5.	9.	6.	5.	4.
81	6.	6.	3.	3.	3.	4.	1.	4.	3.	5.
91	5.	2.	2.	8.	4.	6.	7.	9.	4.	3.
101	3.	3.	7.	7.	5.	8.	7.	6.	2.	3.
111	7.	4.	10.	8.	3.	10.	5.	7.	4.	6.
121	4.	4.	6.	11.	10.	7.	9.	18.	15.	6.
131	5.	6.	8.	10.	12.	13.	6.	9.	6.	8.
141	12.	8.	17.	13.	10.	13.	15.	13.	12.	[illegible]
151	22.	27.	15.	19.	22.	22.	28.	20.	24.	[illegible]
161	26.	22.	23.	24.	19.	21.	32.	26.	41.	[illegible]
171	23.	26.	37.	40.	45.	46.	49.	50.	54.	[illegible]
181	45.	56.	53.	51.	61.	70.	81.	51.	60.	79.
191	81.	94.	90.	111.	102.	105.	120.	157.	142.	169.
201	199.	208.	208.	251.	292.	329.	335.	364.	447.	483.
211	556.	525.	630.	687.	766.	843.	889.	956.	1032.	1115.
221	1169.	1196.	1257.	1359.	1359.	1315.	1276.	1250.	1216.	1155.
231	1040.	1026.	882.	844.	711.	666.	524.	433.	370.	303.
241	218.	174.	157.	107.	84.	64.	40.	31.	36.	[illegible]
251	31.	21.	16.	9.	30.	13.	14.	18.	22.	[illegible]
261	20.	27.	19.	20.	35.	34.	32.	32.	34.	[illegible]
271	35.	34.	40.	41.	50.	60.	51.	69.	67.	[illegible]
281	68.	88.	83.	88.	89.	118.	146.	127.	[illegible]	[illegible]
291	159.	165.	197.	207.	194.	210.	216.	208.	[illegible]	[illegible]
301	184.	192.	180.	167.	164.	146.	137.	149.	122.	[illegible]
311	94.	83.	65.	74.	64.	43.	52.	56.	49.	50.
321	68.	41.	62.	57.	67.	76.	75.	79.	88.	85.
331	109.	97.	119.	150.	152.	193.	188.	190.	217.	[illegible]
341	295.	284.	300.	388.	406.	416.	496.	515.	550.	[illegible]
351	637.	650.	707.	795.	818.	769.	798.	795.	786.	[illegible]
361	751.	760.	726.	655.	666.	575.	522.	444.	[illegible]	[illegible]
371	338.	284.	239.	206.	147.	121.	96.	83.	[illegible]	[illegible]
381	34.	22.	9.	15.	6.	5.	3.	2.	[illegible]	[illegible]
391	0.	1.	0.	0.	0.	0.	0.	1.	[illegible]	[illegible]
401	1.	0.	0.	1.	0.	0.	2.	0.	[illegible]	[illegible]
411	1.	3.	0.	0.	1.	0.	1.	0.	[illegible]	[illegible]
421	1.	1.	0.	0.	1.	0.	2.	1.	3.	[illegible]
431	1.	1.	1.	1.	1.	0.	1.	2.	0.	[illegible]
441	1.	1.	0.	0.	0.	0.	2.	1.	2.	2.
451	0.	0.	0.	0.	0.	3.	1.	2.	0.	1.
461	2.	1.	0.	1.	0.	2.	3.	2.	3.	1.
471	7.	4.	6.	4.	3.	5.	2.	3.	2.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	1.	1.
491	0.	1.	1.	3.	8.	21.	24.	7.	1.	[illegible]
511	0.	0.								

D. H. Wilson
1-8-94

Westinghouse Hanford Co.

GENERAL ALPHA ENERGY ANALYSIS
Rev. 2.01

DATA REDUCTION REPORT **WHC-SD-WM-DP-062, REV. 0**

SAMPLE
J1428-5781
File ID: 3a3577.CNF

Counted on: 1/ 7/94 @ 8:44
Detector: AEA3
Geometry number: 1
Count time: 86401. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	1534.2	1534.2	359.654	359.654	20.000	15.281	10.000	3.857
2	321.4	321.4	302.097	301.630	18.000	12.271	9.000	2.665
3	2150.8	2150.8	228.306	228.293	20.000	15.128	10.000	3.691

PEAK RESULTS
Peak Error Limit: 25%

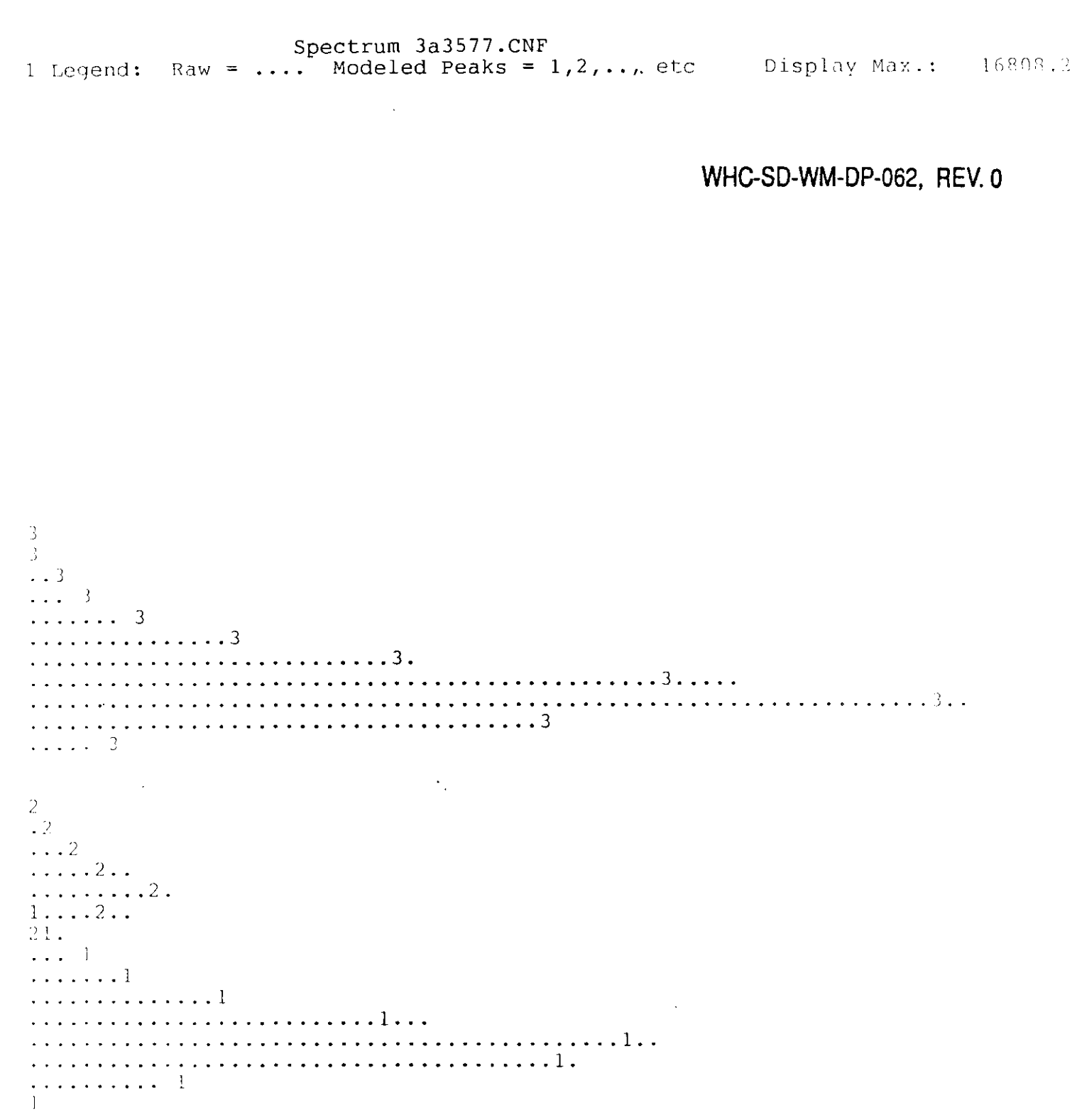
Peak	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Cm243	0.379	5.786	5.736	0.050	0.07	27.24	1.0	303.1	0.137E-03
	Pu236		5.756	5.736	0.020				225.8	0.102E-03
2	Am241	0.082	5.480	5.469	0.011	0.06	5.88	2.4	50.8	0.229E-04
	Pu238		5.499	5.469	0.030				66.4	0.299E-04
3	Pu239	0.539	5.143	5.132	0.011	0.07	38.74	0.8	314.7	0.142E-03
	Pu240		5.144	5.132	0.012				314.7	0.142E-03
Totals:		1.000	<--valid peaks only-->				71.86			

DETECTOR CALIBRATION
Energy(MEV) = 4.082 + (0.0046)*Channel
Energy range (MeV): 4.082 TO 6.437
Efficiency = 0.1231 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	103530.0	100.000
Smoothed	103530.0	100.000
Composite fit	103481.2	99.953
Residuals	48.8	0.047

Analyzed by: _____
RW


Spectrum 3a3577.CNF
1 Legend: Raw = ... Modeled Peaks = 1,2,..,. etc
Display Max.: 16808.2

Raw Data Dump for AEA Spectrum: 3a3577.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	1.	2.	0.	3.
21	1.	1.	1.	3.	3.	2.	1.	1.	2.	0.
[illegible]	0.	0.	4.	0.	1.	3.	2.	1.	3.	1.
	3.	1.	0.	2.	1.	0.	1.	2.	3.	2.
51	2.	1.	2.	0.	0.	1.	2.	3.	3.	2.
61	0.	4.	2.	0.	2.	2.	3.	0.	3.	2.
71	3.	2.	1.	6.	3.	1.	1.	3.	1.	[illegible]
81	1.	0.	1.	2.	3.	0.	4.	4.	2.	2.
91	1.	3.	2.	3.	4.	1.	1.	0.	1.	2.
101	3.	3.	4.	1.	6.	4.	5.	6.	5.	2.
111	7.	1.	4.	7.	4.	4.	1.	4.	7.	4.
121	2.	3.	6.	5.	5.	11.	4.	4.	5.	10.
131	7.	6.	8.	9.	6.	7.	7.	12.	6.	10.
141	10.	12.	13.	8.	8.	14.	14.	6.	11.	13.
151	21.	14.	15.	17.	20.	22.	29.	20.	23.	27.
161	21.	17.	33.	27.	22.	34.	30.	35.	30.	43.
171	39.	47.	37.	36.	43.	48.	46.	66.	77.	70.
181	72.	71.	75.	87.	115.	100.	115.	127.	132.	117.
191	136.	158.	204.	194.	212.	219.	239.	270.	283.	337.
201	334.	369.	468.	458.	511.	510.	586.	603.	668.	[illegible]
211	810.	905.	985.	1024.	1109.	1254.	1368.	1484.	1550.	[illegible]
221	1707.	1895.	2026.	2091.	2088.	2235.	2283.	2206.	2187.	[illegible]
231	2110.	2000.	1868.	1543.	1377.	1124.	888.	699.	493.	335.
241	195.	131.	76.	34.	34.	15.	14.	12.	13.	16.
251	15.	12.	16.	17.	12.	17.	28.	27.	16.	26.
261	29.	32.	26.	19.	24.	30.	37.	38.	50.	37.
271	47.	46.	44.	61.	87.	80.	53.	87.	93.	113.
281	111.	105.	120.	143.	131.	166.	177.	205.	211.	213.
291	231.	258.	258.	282.	313.	338.	341.	372.	347.	327.
[illegible]	363.	364.	370.	350.	323.	301.	278.	261.	225.	[illegible]
[illegible]	150.	114.	104.	84.	72.	77.	48.	67.	71.	[illegible]
321	62.	87.	94.	100.	104.	134.	139.	156.	190.	[illegible]
331	182.	227.	252.	264.	285.	345.	366.	336.	389.	[illegible]
341	452.	527.	605.	674.	795.	771.	868.	876.	1029.	1093.
351	1100.	1278.	1314.	1473.	1460.	1505.	1546.	1525.	1589.	1602.
361	1553.	1475.	1429.	1350.	1162.	1052.	884.	714.	551.	417.
371	263.	153.	89.	49.	20.	17.	6.	2.	1.	2.
381	0.	1.	1.	0.	1.	0.	0.	1.	0.	1.
391	0.	1.	1.	2.	0.	0.	0.	2.	2.	2.
401	3.	2.	0.	2.	2.	1.	3.	3.	0.	2.
411	2.	3.	3.	2.	4.	0.	3.	4.	3.	1.
421	0.	2.	2.	3.	1.	2.	0.	0.	0.	1.
431	1.	0.	1.	1.	1.	0.	0.	0.	0.	[illegible]
441	1.	0.	0.	1.	0.	0.	0.	0.	0.	[illegible]
451	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
461	0.	4.	0.	0.	0.	1.	2.	0.	0.	2.
471	1.	2.	1.	0.	3.	1.	2.	1.	0.	2.
481	2.	0.	0.	1.	0.	0.	1.	0.	0.	0.
491	0.	0.	2.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

D.H. Williams
1-5-94

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT

WHC-SD-WM-DP-062, REV. 0

SAMPLE
J1428-5781
File ID: 2a2515.CNF

Counted on: 1/ 7/94 @ 8:44
Detector: AEA2
Geometry number: 1
Count time: 86403. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	1334.6	1334.6	355.874	355.874	22.000	19.147	11.000	5.721
2	321.4	321.4	297.768	297.439	24.000	19.253	12.000	5.097
3	2068.9	2068.9	225.636	225.630	22.000	18.625	11.000	5.526
4?	11.9	11.9	117.789	117.649	136.000	1.000	68.000	0.100

PEAK RESULTS
Peak Error Limit: 25%

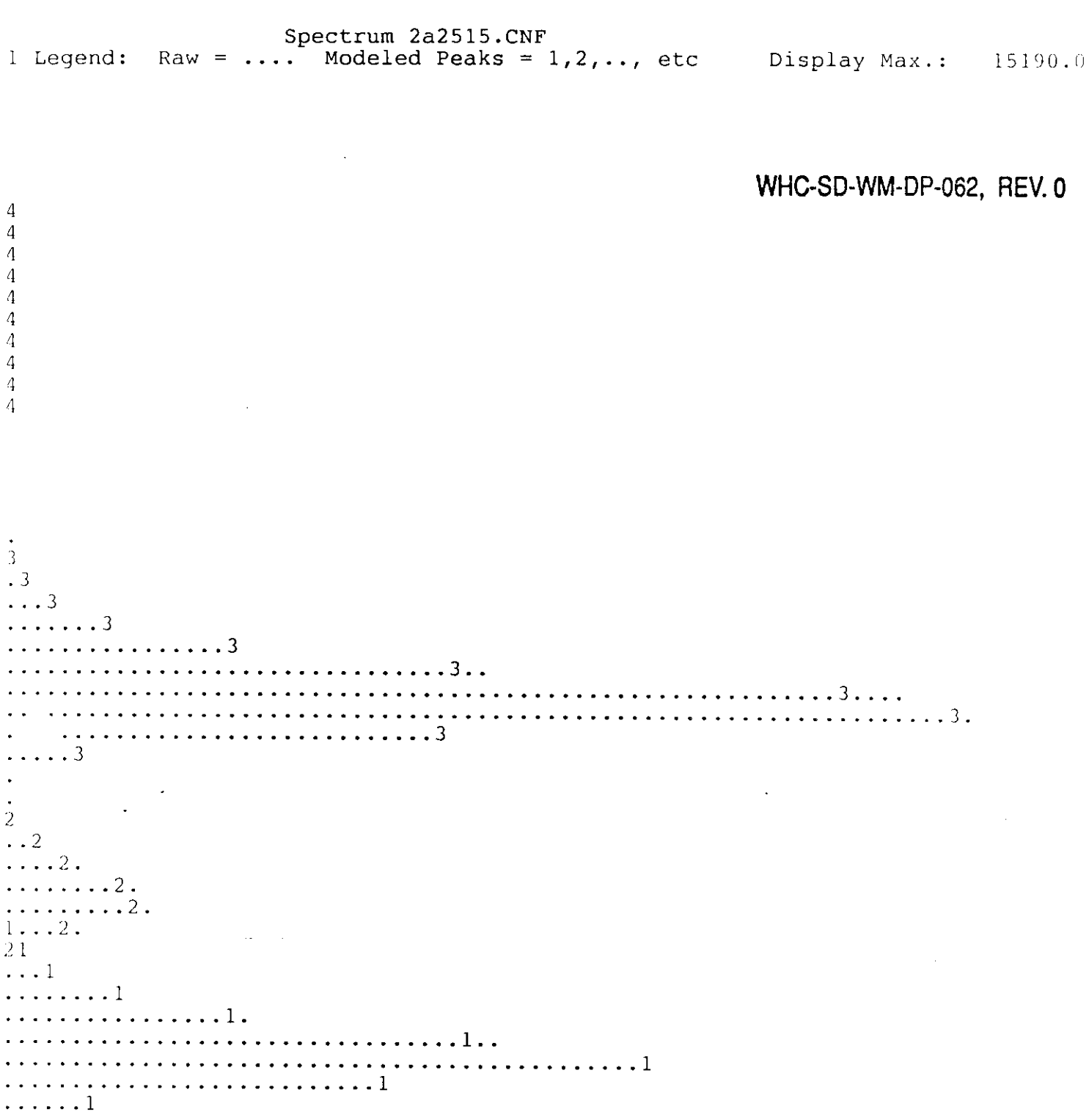
Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Cm243	0.353	5.786	5.750	0.036	0.09	23.46	1.1	285.0	0.128E-03
	Pu236		5.756	5.750	0.006				212.3	0.956E-04
2	Am241	0.089	5.480	5.475	0.005	0.09	5.94	2.3	56.0	0.252E-03
	Pu238		5.499	5.475	0.024				73.2	0.330E-04
3	Pu239	0.544	5.143	5.138	0.005	0.09	36.16	0.9	320.6	0.144E-03
	Pu240		5.144	5.138	0.006				320.6	0.144E-03
4		????		4.630			0.31	9.4		
Totals:		0.986	<--valid peaks only-->				65.57			

DETECTOR CALIBRATION
Energy(MEV) = 4.077 + (0.0047)*Channel
Energy range (MeV): 4.077 TO 6.484
Efficiency = 0.1128 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	95745.0	100.000
Smoothed	95744.7	100.000
Composite fit	94865.8	99.082
Residuals	879.2	0.918

Analyzed by: RW


Spectrum 2a2515.CNF
1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.: 15190.0

Raw Data Dump for AEA Spectrum: 2a2515.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	6.	1.	6.
21	3.	1.	2.	5.	2.	5.	4.	6.	6.	3.
31	1.	2.	4.	4.	5.	4.	11.	7.	5.	3.
41	7.	5.	7.	2.	4.	6.	4.	7.	7.	4.
51	4.	4.	5.	3.	5.	6.	10.	2.	7.	6.
61	5.	6.	8.	0.	5.	5.	4.	9.	4.	4.
71	9.	9.	6.	7.	4.	7.	7.	5.	1.	5.
81	7.	8.	11.	10.	7.	7.	5.	6.	6.	8.
91	8.	10.	5.	7.	8.	7.	13.	11.	10.	6.
101	6.	6.	6.	9.	11.	9.	11.	13.	17.	6.
111	14.	11.	16.	10.	7.	10.	9.	14.	10.	10.
121	10.	9.	8.	11.	6.	14.	8.	17.	17.	10.
131	12.	19.	11.	14.	12.	12.	20.	9.	18.	21.
141	15.	15.	16.	9.	22.	21.	17.	14.	16.	21.
151	23.	13.	25.	15.	19.	26.	24.	24.	23.	28.
161	26.	31.	30.	46.	35.	34.	31.	36.	41.	55.
171	30.	47.	44.	62.	55.	60.	57.	62.	51.	60.
181	48.	54.	89.	70.	100.	79.	89.	99.	100.	117.
191	122.	120.	125.	159.	168.	196.	216.	275.	236.	294.
201	322.	336.	380.	439.	492.	545.	598.	666.	691.	756.
211	943.	977.	1110.	1181.	1334.	1384.	1455.	1744.	1723.	1881.
221	1950.	1975.	2104.	2169.	2138.	2130.	2124.	2012.	1936.	1780.
231	1655.	1469.	1249.	1023.	929.	712.	584.	496.	307.	277.
241	198.	114.	89.	53.	46.	27.	27.	19.	24.	21.
251	24.	15.	16.	18.	27.	24.	21.	22.	33.	29.
261	28.	33.	36.	34.	41.	42.	39.	47.	42.	39.
271	60.	59.	60.	76.	71.	65.	96.	90.	100.	127.
281	123.	130.	147.	184.	189.	182.	238.	243.	246.	254.
291	279.	290.	318.	319.	357.	312.	356.	356.	331.	311.
301	329.	296.	272.	255.	240.	193.	200.	146.	136.	104.
311	121.	92.	66.	74.	78.	57.	65.	51.	60.	68.
321	67.	96.	87.	98.	94.	98.	115.	153.	166.	179.
331	199.	205.	249.	266.	278.	352.	352.	421.	459.	532.
341	552.	626.	723.	776.	785.	892.	1006.	1008.	1098.	1165.
351	1184.	1320.	1359.	1317.	1396.	1396.	1381.	1267.	1261.	1153.
361	1092.	939.	861.	764.	623.	528.	398.	355.	259.	175.
371	136.	103.	65.	43.	19.	21.	6.	4.	2.	3.
381	1.	0.	1.	4.	1.	0.	0.	1.	0.	1.
391	0.	2.	0.	0.	0.	1.	1.	0.	0.	1.
401	1.	4.	0.	3.	3.	3.	3.	3.	3.	2.
411	2.	2.	0.	1.	2.	2.	2.	3.	0.	2.
421	2.	2.	0.	3.	2.	1.	2.	0.	1.	2.
431	1.	3.	0.	1.	1.	1.	0.	3.	0.	0.
441	0.	1.	1.	0.	0.	1.	2.	0.	0.	3.
451	0.	0.	1.	1.	1.	1.	3.	1.	3.	1.
461	2.	2.	1.	3.	3.	2.	1.	1.	1.	3.
471	2.	5.	1.	4.	3.	4.	4.	4.	3.	3.
481	1.	1.	0.	1.	1.	2.	1.	2.	1.	0.
491	0.	1.	0.	0.	0.	0.	0.	2.	1.	0.
501	0.	0.								

S.H Tallman
1-5-94

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT

WHC-SD-WM-DP-062, REV. 0

SAMPLE
J1428-5981
File ID: 5a5007.CNF

Counted on: 1/ 7/94 @ 8:45
Detector: AEA5
Geometry number: 1
Count time: 86402. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	608.7	608.7	357.526	357.619	22.000	18.141	11.000	2.983
2	168.3	168.3	301.345	301.345	26.000	12.629	13.000	1.279
3	2222.6	2222.6	226.433	225.477	22.000	17.839	11.000	2.3[illegible]

PEAK RESULTS
Peak Error Limit: 25%

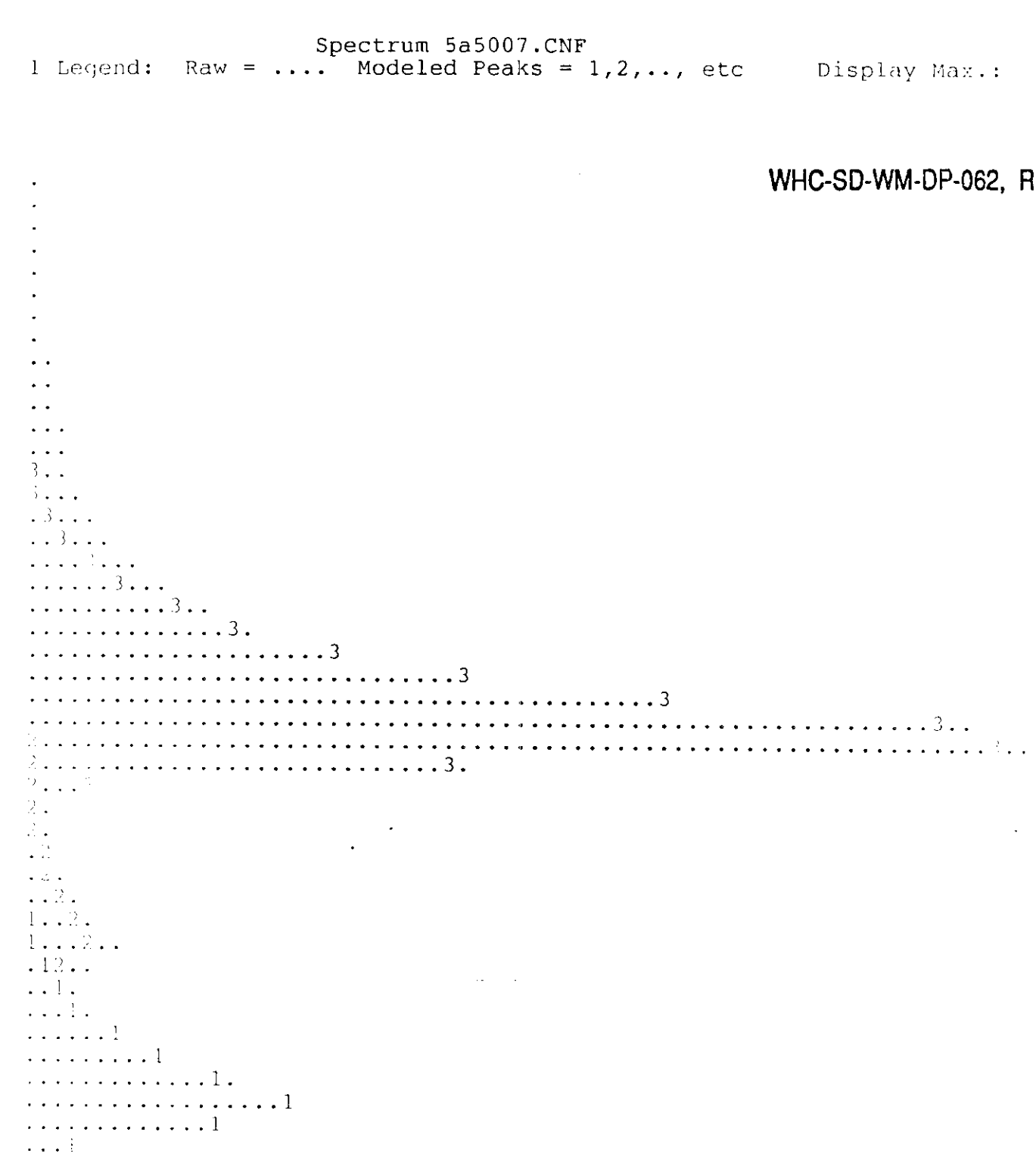
Peak	Isotope	AEA Frac	Peak Centroid Exp.	Peak Centroid Obs.	Peak Centroid Diff.	FWHM	Count Rate c/m	Perr 695	d/m	[illegible]
1	Cm243	0.181	5.786	5.738	0.0480.08		14.23	1.4	141.7	[illegible]
	Pu236		5.756	5.738	0.018				105.6	[illegible]
2	Am241	0.067	5.480	5.479	0.0010.06		5.24	2.7	40.5	[illegible]
	Pu238		5.499	5.479	0.020				52.9	[illegible]
3	Pu239	0.666	5.143	5.130	0.0130.08		52.53	0.7	381.8	[illegible]
	Pu240		5.144	5.130	0.014				381.8	[illegible]
Totals:		0.913	<--valid peaks only-->				72.01			

DETECTOR CALIBRATION
Energy(MEV) = 4.093 + (0.0046)*Channel
Energy range (MeV): 4.093 TO 6.448
Efficiency = 0.1376 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	113556.0	100.000
Smoothed	113556.0	100.000
Composite fit	103692.8	91.314
Residuals	9863.2	8.686

Analyzed by: _____
RW


Spectrum 5a5007.CNF
Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.: 16459.3

Raw Data Dump for AEA Spectrum: 5a5007.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	9.	31.	30.	24.
21	16.	31.	37.	29.	39.	32.	35.	31.	32.	26.
31	33.	32.	35.	35.	30.	33.	23.	32.	31.	31.
	32.	28.	40.	35.	32.	34.	50.	41.	39.	31.
	32.	35.	36.	53.	35.	30.	41.	32.	43.	33.
61	35.	49.	28.	43.	40.	38.	43.	37.	50.	47.
71	60.	37.	41.	44.	40.	52.	46.	54.	45.	[illegible]
81	50.	44.	71.	56.	62.	72.	60.	54.	[illegible]	[illegible]
91	53.	54.	53.	69.	64.	87.	60.	82.	[illegible]	[illegible]
101	66.	56.	47.	74.	85.	70.	81.	72.	93.	[illegible]
111	95.	89.	90.	102.	74.	79.	100.	99.	89.	98.
121	88.	90.	126.	95.	92.	132.	112.	125.	123.	125.
131	102.	96.	109.	130.	122.	135.	141.	139.	113.	143.
141	163.	147.	180.	150.	168.	161.	165.	168.	170.	178.
151	183.	201.	190.	176.	211.	194.	206.	220.	218.	236.
161	227.	234.	239.	237.	247.	286.	290.	306.	292.	295.
171	302.	320.	339.	339.	336.	347.	374.	382.	402.	[illegible]
181	380.	426.	457.	436.	450.	477.	486.	467.	502.	[illegible]
191	538.	581.	589.	622.	625.	703.	678.	700.	742.	[illegible]
201	824.	828.	904.	969.	935.	1021.	1140.	1069.	1029.	[illegible]
211	1292.	1354.	1434.	1508.	1567.	1670.	1715.	1812.	1976.	[illegible]
221	2078.	2178.	2178.	2376.	2318.	2324.	2280.	2160.	2043.	[illegible]
231	1756.	1591.	1444.	1115.	982.	777.	631.	467.	356.	[illegible]
241	195.	136.	82.	78.	76.	54.	63.	55.	57.	51.
251	46.	58.	51.	40.	63.	59.	63.	40.	55.	78.
261	78.	82.	66.	86.	79.	74.	79.	90.	74.	76.
271	84.	87.	78.	96.	110.	96.	94.	103.	116.	119.
281	120.	109.	127.	131.	146.	161.	159.	147.	138.	167.
291	175.	157.	161.	191.	201.	193.	239.	224.	206.	[illegible]
301	214.	214.	213.	193.	202.	170.	169.	148.	133.	[illegible]
[illegible]	132.	132.	117.	119.	110.	130.	118.	113.	122.	[illegible]
[illegible]	135.	138.	145.	147.	159.	194.	169.	179.	220.	[illegible]
331	210.	186.	209.	226.	241.	254.	290.	294.	297.	[illegible]
341	328.	341.	378.	391.	392.	412.	444.	448.	506.	[illegible]
351	539.	544.	586.	581.	601.	625.	616.	630.	590.	[illegible]
361	499.	500.	426.	439.	353.	264.	199.	173.	132.	[illegible]
371	73.	57.	28.	18.	15.	10.	5.	4.	3.	2.
381	0.	1.	0.	0.	0.	0.	1.	0.	0.	[illegible]
391	0.	1.	0.	0.	0.	0.	0.	0.	0.	[illegible]
401	0.	0.	0.	1.	0.	0.	0.	0.	0.	1.
411	0.	0.	0.	0.	0.	0.	1.	1.	1.	[illegible]
421	0.	1.	0.	1.	0.	0.	1.	1.	2.	[illegible]
431	0.	2.	2.	0.	0.	1.	0.	3.	1.	[illegible]
441	1.	1.	1.	1.	2.	0.	1.	1.	[illegible]	[illegible]
451	1.	0.	0.	0.	1.	0.	1.	0.	[illegible]	[illegible]
461	0.	1.	0.	1.	0.	1.	1.	1.	2.	[illegible]
471	1.	0.	2.	4.	2.	3.	1.	1.	2.	[illegible]
481	1.	0.	2.	3.	4.	1.	1.	0.	1.	0.
491	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

R.H Millican
1-5-94

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT

WHC-SD-WM-DP-062, REV. 0

SAMPLE
J1428-5981
File ID: 8a8659.CNF

Counted on: 1/ 7/94 @ 8:47
Detector: AEA8
Geometry number: 1
Count time: 86404. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Final	Peak center Initial	Final	FWHM Initial	Final	Tau Initial	Final
1	443.3	443.3	351.128	351.140	28.000	27.540	14.000	2.979
2	97.2	97.2	295.737	291.706	24.000	19.124	12.000	2.277
3	1614.1	1614.1	220.459	219.796	24.000	24.296	12.000	2.334

PEAK RESULTS
Peak Error Limit: 25%

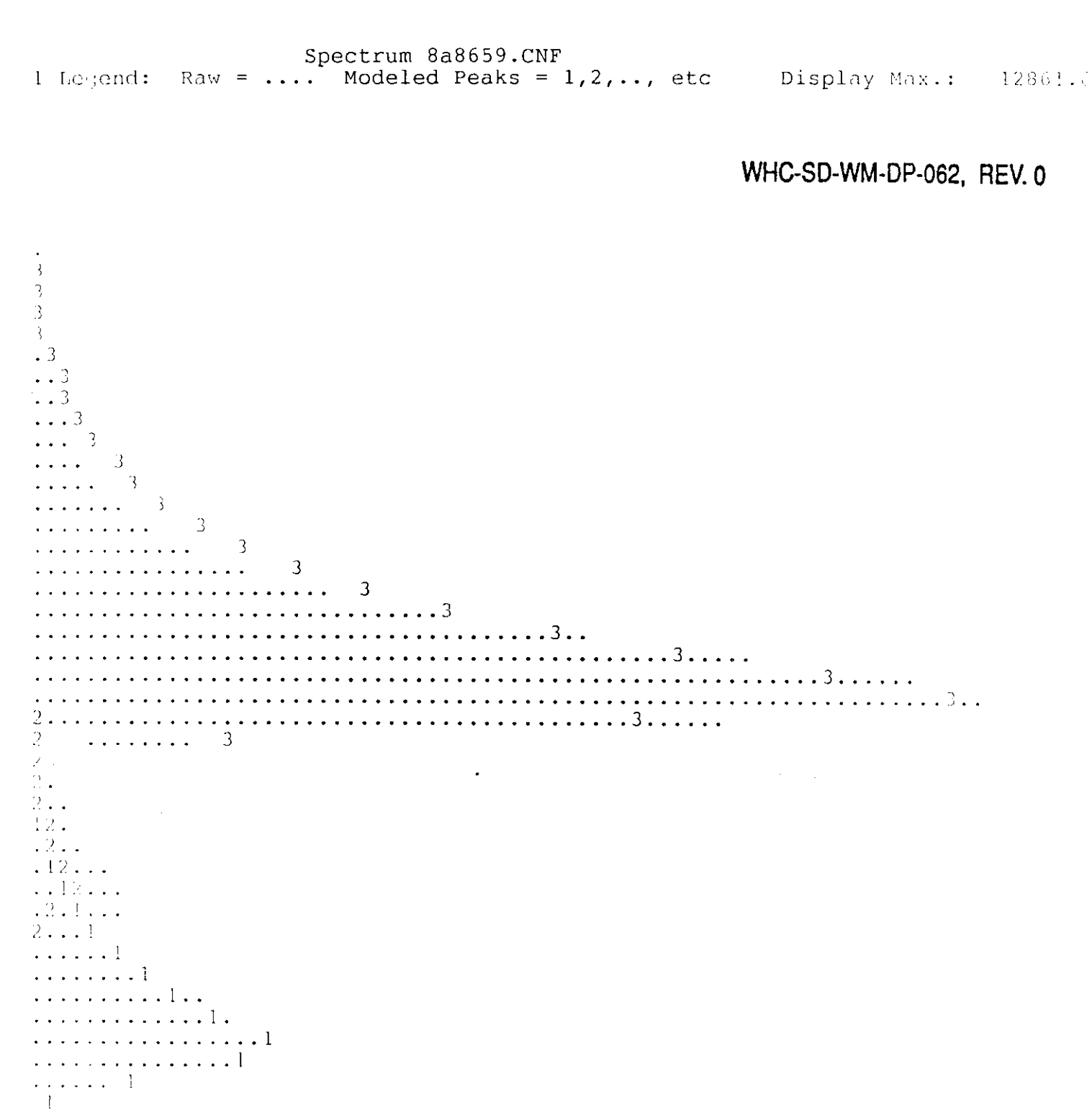
Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity
1	Am243	0.205	5.786	5.744	0.042	0.13	14.65	1.3	139.4	0.719E-1
	Pu236		5.756	5.744	0.012				116.7	0.602E-1
2	Am241	0.040	5.480	5.465	0.015	0.09	2.84	4.8	24.0	0.124E-1
	Pu238		5.499	5.465	0.034				31.3	0.161E-1
3	Pu239	0.788	5.143	5.127	0.016	0.11	56.41	0.7	418.0	0.216E+0
	Pu240		5.144	5.127	0.017				118.4	0.611E-1
Totals:		1.032	<--valid peaks only-->				73.89			

DETECTOR CALIBRATION
Energy(MEV) = 4.094 + (0.0047)*Channel
Energy range (MeV): 4.094 TO 6.500
Efficiency = 0.1259 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	103095.0	100.000
Smoothed	103095.9	100.001
Composite fit	106412.0	103.217
Residuals	-3317.0	-3.217

Analyzed by: _____
RW


Spectrum 8a8659.CNF
Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.:

Raw Data Dump for AEA Spectrum: 8a8659.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	5.	16.	25.	20.
21	18.	13.	14.	16.	25.	23.	22.	21.	15.	15.
31	19.	23.	28.	25.	26.	20.	19.	15.	15.	20.
41	22.	24.	24.	24.	27.	23.	24.	13.	24.	22.
51	21.	26.	28.	30.	20.	27.	21.	31.	27.	17.
61	30.	29.	30.	27.	31.	27.	24.	25.	22.	24.
71	29.	33.	41.	28.	39.	23.	35.	38.	32.	1.
81	37.	38.	38.	55.	41.	52.	44.	40.	1.	1.
91	27.	46.	32.	48.	51.	51.	47.	55.	56.	0.
101	59.	54.	58.	57.	51.	61.	56.	65.	60.	71.
111	57.	62.	69.	75.	77.	67.	78.	89.	69.	82.
121	96.	70.	71.	81.	89.	107.	104.	89.	103.	117.
131	116.	93.	103.	132.	134.	132.	152.	147.	120.	127.
141	166.	138.	131.	139.	149.	172.	166.	191.	172.	186.
151	202.	193.	214.	186.	244.	219.	228.	245.	261.	282.
161	270.	270.	280.	273.	282.	307.	350.	320.	341.	386.
171	372.	414.	394.	422.	428.	463.	430.	500.	513.	5[illegible].
181	548.	594.	588.	544.	595.	664.	725.	720.	741.	[illegible].
191	800.	789.	868.	924.	972.	991.	1038.	1046.	1074.	[illegible]
201	1136.	1182.	1166.	1261.	1268.	1289.	1338.	1457.	1431.	13[illegible].
211	1561.	1558.	1604.	1603.	1615.	1550.	1620.	1628.	1661.	16[illegible].
221	1711.	1581.	1566.	1584.	1549.	1390.	1351.	1237.	1072.	8[illegible].
231	781.	623.	399.	329.	236.	164.	105.	77.	48.	17.
241	41.	56.	43.	38.	35.	36.	53.	47.	43.	49.
251	39.	55.	70.	63.	55.	67.	60.	54.	73.	[illegible].
261	77.	70.	83.	79.	80.	92.	97.	92.	98.	89.
271	80.	78.	91.	119.	104.	107.	107.	146.	109.	11[illegible].
281	112.	143.	138.	153.	179.	158.	151.	144.	18[illegible].	[illegible].
291	182.	185.	189.	183.	154.	167.	170.	183.	164.	[illegible]
301	168.	161.	156.	158.	139.	125.	139.	117.	13[illegible].	[illegible].
311	194.	130.	136.	148.	158.	158.	161.	194.	[illegible].	[illegible].
321	155.	213.	226.	218.	229.	214.	237.	261.	27[illegible].	[illegible].
331	296.	307.	334.	357.	293.	329.	334.	338.	31[illegible].	[illegible].
341	360.	402.	432.	396.	437.	462.	397.	428.	440.	11[illegible].
351	474.	419.	424.	409.	407.	385.	378.	373.	337.	29[illegible].
361	262.	214.	171.	136.	94.	63.	39.	23.	12.	7.
371	1.	2.	0.	1.	0.	0.	0.	0.	0.	[illegible].
381	1.	1.	0.	0.	0.	0.	0.	1.	[illegible].	[illegible].
391	0.	0.	1.	0.	0.	0.	0.	0.	[illegible].	[illegible].
401	0.	0.	0.	0.	0.	0.	0.	0.	[illegible].	[illegible].
411	0.	0.	1.	1.	0.	0.	1.	0.	[illegible].	[illegible].
421	0.	0.	1.	0.	0.	0.	1.	0.	[illegible].	[illegible].
431	0.	0.	0.	1.	0.	1.	1.	0.	0.	[illegible].
441	0.	0.	0.	1.	0.	0.	1.	0.	0.	[illegible].
451	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	1.	0.	1.	1.
471	0.	0.	0.	1.	0.	1.	0.	1.	1.	1.
481	1.	3.	3.	0.	2.	2.	0.	1.	0.	[illegible].
491	0.	0.	1.	0.	0.	0.	0.	0.	0.	[illegible].
501	0.	0.								

WESTINGHOUSE HANFORD COMPANY

222-S LABORATORY

WHC-SD-WM-DP-062, REV. 0

ANALYTICAL BATCH

2511

Lab Segment Serial No. J1445	Customer ID: KE 83B
Analysis:	Sample Prep: DIRECT

Instrument: WB537237	Procedure/ Rev: LA 503-156 D-0
Technologist: Joel M VanSant	Date: 1-19-94
Starting Time: 0900	Temperature 25°C
Ending Time: 1400	Chemist: L FRITTS

Comments: 24HR AEA

	Description	Lab ID		Description	Lab ID
1	STANDARD	J1439-55S1	11		
2	STANDARD	J1439-55S1	12		
3	Blank	J1440-56S1	13		
4	Sample	J1445-57S1	14		
5	Sample Dup	J1445-57S1	15		
6	Sample Dup	J1445-57S1	16		
7	Spike	J1445-57S1	17		
8	Spike Dup	J1445-57S1	18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS	ARCO 63343	.100 - 10 -	.100 mL	
Spike	77343	05 mL		

A-6000-881 (03/92)

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ANALYTICAL BATCH SUMMARY SHEET

METHOD: **LA-503-156**

DATE START: **January 19, 1994**

PREPARED BY: **L.L. Fritts** LL Fritts 1-24-94

DATE COMPLETE: **January 24, 1994**

	UNITS:	uCi/mL									
SPL NAME	SPL ID	ANALYTE	RESULT #1	RESULT #2	RESULT #3	AVERAGE	2*SD	PREC	%REC	DET LIM	% CT ER
STD 63B43	J1439	Pu-239/40	1.27E+2						97.5	1.74E-2	1.9
STD 63B43	J1439	Pu-239/40	1.15E+2						88.8	1.01E-2	1.4
BLANK	J1440	Pu-239/40	<8.40E-3						55.2	8.40E-3	8.6
KE83B	J1445	Pu-239/40	2.05E-1	1.98E-1	2.23E-1	2.09E-1	2.58E-2	12.4	55.9	2.04E-2	1.5
									71.9	1.53E-2	1.3
									50.7	2.45E-2	1.7
KE83B	J1445	239 Spike	99.9	97.3							
STD 63B43	J1439	Pu-238	<2.04E-2						N/A	2.04E-2	100.0
STD 63B43	J1439	Pu-238	<1.31E-2						N/A	1.31E-2	100.0
BLANK	J1440	Pu-238	<1.45E-2						55.2	1.45E-2	100.0
KE86B	J1445	Pu-238	<2.65E-2	2.48E-2	3.16E-2	N/A	N/A	N/A	55.9	2.65E-2	2.7
									71.9	2.14E-2	2.4
									50.7	3.05E-2	2.8

NARRATIVE: [X] NO SPECIAL PROBLEMS/METHOD VARIATIONS IN THIS BATCH

LIST SPECIFIC PROBLEMS/VARIATIONS FOR THIS BATCH:

The results for the standard are in uCi/L.

The results for the spike are in percent recovery.

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

#2 2545 Batch 2511

Serial No	Sample Point	Date	Time Issued	Priority
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Determination	Method Standard	Result Units	Charge Code	Reruns
[illegible]	[illegible]	[illegible]	[illegible]	

Sample Size	Customer ID
.100 - 10 - .100 mL	[illegible]

Remarks Calculations Results

63843 127.3

130.5 97.5%

.05mL 77843

24HR

"AEA" - ~~[illegible]~~

ATTACH PRINTOUT

WHC-SD-WM-DP-062, REV. 0

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
[signature]	D.H. [signature]	[signature]		
Hrs	Hrs	Hrs 1-20-94	Hrs	Hrs
Date 1-19-94	Time Completed	Lab Unit Mgr [signature]	[signature]	

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

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

Serial No.	Date Counted		01/20/94	Pu 236 AEA Frac. (C236)	STANDARD
J1439-5581	Sample Volume in mL	(SS)	0.100	Pu 238 AEA Frac. (C238)	0
Batch ID	Sample D.F.	(DF)	101	Pu 239 AEA Frac. (C239)	0.586
2511	Tracer Volume in mL	(SPKV)	0.050	Total AT Counts	5852
Rerun No.	Digest D.F.	(DDF)	1	AT Count Time (min) (TC)	60
0	Tracer Book No.		77B43	Background in cpm (Bkg)	8
Analyst	Tracer Preparation Date		10/12/93	Pu 236 cpm	11.97
J VAN SANT	Pu-236 Preparation Value	(dpm/mL)	3226	Pu 238 cpm	0
Date	Pu-236 Decay Corr'd value	(dpm/mL)	3018.18	Pu 239 cpm	22.21
01/19/94	Pu-238 Tracer Value	(dpm/mL)	133	AEA Count Time (min)	1440
Sample Type					
LIQUID	<<<<<<<<< Enter a Sample Type <<<<<<<<<			Pu 239/240 µCi/L	1.2732E+02

Decay Time = Date Counted - Tracer Preparation Date

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

Pu 238 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SPKV

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

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-238 Tracer Value * SPKV * Pu 238 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

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

				DETECTION LEVELS in µCi/mL
Pu 239/240	µCi/mL	=	1.27E-01	
Relative Counting Error		=	1.9%	
NOTE: Pu 238 Result is a LESS THAN Value.				Pu 239/240
Pu 238	µCi/mL	=	< 2.04E-02	1.74E-02
Relative Counting Error		=	100.0%	Pu 238
Pu 236 Tracer Recovery		=	37.5%	2.04E-02

Data Entry by: [signature]		Date:	21-Jan-94
Approved by: [signature]		Date:	21 Jan 94

Form 5 Rev. 1

518

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#1 1-19-94 Dm

5852/60 - 8

J1439-5581 #2

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

#3 3605

Serial No	Sample Point	Date	Time Issued	Priority
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Determination	Method Standard	Result Units	Charge Code	Reruns
[illegible]	[illegible]	[illegible]	[illegible]	

Sample Size	Customer ID
.100 - 10 - .100 mL	[illegible]

Remarks Calculations Results

63B43 115.3

130.5 88.4%

.05mL 77B43

"AEA" - ~~[illegible]~~ 24H02

ATTACH PRINTOUT

WHC-SD-WM-DP-062, REV. 0

	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
[signature]	[signature]	[signature]		
Hrs	Hrs	Hrs 1-20-94	Hrs	Hrs
Date 1-19-94	Time Completed	Lab Unit Mgr [signature]	[signature]	

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

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

Serial No.	Date Counted		01/20/94	Pu 236 AEA Frac. (C236)	STANDARD
J1439-5581	Sample Volume in mL	(SS)	0.100	Pu 238 AEA Frac. (C238)	0.333
Batch ID	Sample D.F.	(DF)	101	Pu 239 AEA Frac. (C239)	0
2511	Tracer Volume in mL	(SPKV)	0.050	Total AT Counts	0.559
Rerun No.	Digest D.F.	(DDF)	1	AT Count Time (min) (TC)	8649
0	Tracer Book No.		77B43	Background in cpm (Bkg)	60
Analyst	Tracer Preparation Date		10/12/93	Pu 236 cpm	5
J VAN SANT	Pu-236 Preparation Value	(dpm/mL)	3226	Pu 238 cpm	22.66
Date	Pu-236 Decay Corr'd value	(dpm/mL)	3018.18	Pu 239 cpm	0
01/19/94	Pu-238 Tracer Value	(dpm/mL)	133	AEA Count Time (min)	38.01
Sample Type					1440
LIQUID	<<<<<<<<< Enter a Sample Type <<<<<<<<<			Pu 239/240 µCi/L	1.1525E+02

Decay Time = Date Counted – Tracer Preparation Date

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

Pu 238 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-238 Decay Corr'd Value * SPKV

Pu-239/240 µCi/L = (C239 * Pu-238 Decay Corr'd Value * SPKV * DF * DDF * (1000mL/L)) / (C236 * SS * (2220000dpm/µCi))

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 238 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

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

				DETECTION LEVELS in µCi/mL
Pu 239/240	µCi/mL	=	1.15E-01	
Relative Counting Error		=	1.4%	
NOTE: Pu 238 Result is a LESS THAN Value.				Pu 239/240 1.01E-02
Pu 238	µCi/mL	=	< 1.31E-02	
Relative Counting Error		=	100.0%	Pu 238 1.31E-02
Pu 236 Tracer Recovery		=	61.4%	

Data Entry by: [signature]		Date:	21-Jan-94
Approved by: [signature]		Date:	21 Jan 94

520

Form 5 Rev. 1

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#3 1-19-94 DM

8649
60 -5

J1439-5581
#3

WHC-SD-WM-DP-062, REV. 0

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

#4 4113

WHC-SD-WM-DP-062, REV 0

Serial No	Sample Point	Date	Time Issued	Priority

Determination	Method Standard	Result Units	Charge Code	Reruns

Sample Size 1-21-94 .100ml-10ml-.05ml

Customer ID

Remarks Calculations Results

24hr

ATTACH PRINTOUT

.05mL 77843 $Pu^{239/240}$ < 8.40×10^{-3} uCi/ml

Pu^{238} < 1.45×10^{-2} uCi/mL

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
		1-20-94		
Date	Time Completed	Lab Unit Mgr.		
1-19-94				

54-6800-061 (R-10 83)

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

Serial No.	Date Counted		01/20/94	Pu 236 AEA Frac.	(C236)	BLANK
J1440-5681	Sample Volume in mL	(SS)	0.050	Pu 238 AEA Frac.	(C238)	0
Batch ID	Sample D.F.	(DF)	101	Pu 239 AEA Frac.	(C239)	0.028
2511	Tracer Volume in mL	(SPKV)	0.050	Total AT Counts		2934
Rerun No.	Digest D.F.	(DDF)	1	AT Count Time (min)	(TC)	60
0	Tracer Book No.		77843	Background in cpm	(Bkg)	2
Analyst	Tracer Preparation Date		10/12/93	Pu 236 cpm		11.58
J VAN SANT	Pu-236 Preparation Value	(dpm/mL)	3226	Pu 238 cpm		0
Date	Pu-236 Decay Corr'd value	(dpm/mL)	3018.18	Pu 239 cpm		0.37
01/19/94	Pu-238 Tracer Value	(dpm/mL)	133	AEA Count Time	(min)	1440
Sample Type						
LIQUID	<<<<<<<<< Enter a Sample Type <<<<<<<<<			Pu 239/240 µCi/L =	<	8.4047E+00

Decay Time = Date Counted - Tracer Preparation Date

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

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * (C236 * 100 / Pu-236 Decay Corr'd Value * SPKV

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

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * (2381 - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS

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

NOTE: Pu 239\240 Result is a LESS THAN Value.

Pu 239/240	µCi/mL	=	< 8.40E-03	DETECTION LEVELS in µCi/mL
Relative Counting Error		=	8.6%	
NOTE: Pu 238 Result is a LESS THAN Value.				Pu 239/240 8.40E-03
Pu 238	µCi/mL	=	< 1.45E-02	Pu 238 1.45E-02
Relative Counting Error		=	100.0%	
Pu 236 Tracer Recovery		=	55.2%	

Data Entry by: Date: 21-Jan-94

Approved by: Date: 21 Jan 94

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PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#2 1-19-94 DMS

$\frac{2934}{60}$ -2

J1440-5681

#4

WHC-SD-WM-DP-062, REV. 0

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

3 5034

Serial No	Sample Point	Date	Time Issued	Priority
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Determination	Method Standard	Result Units	Charge Code	Reruns
[illegible]	[illegible]	[illegible]	[illegible]	

Sample Size	Customer ID
.100 - 10 - .05ml	[illegible]

Remarks, Calculations, Results

[illegible]

SAM

24 HR

WHC-SD-WM-DP-062, REV. 0

ATTACH PRINTOUT

.05ml 77843

Pu239/240 2.05 X 10⁻¹ µCi/ml

Pu238 < 2.65 X 10⁻² µCi/ml

SKM 1-25-94

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
[signature]	D.H. Milicia	[signature]		
Hrs	Hrs	Hrs 1-20-94	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1-19-94		[signature]	[signature]

54 6800-061 (R-10-83)

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

					SAMPLE
Serial No.	Date Counted	01/20/94	Pu 236 AEA Frac.	(C236)	0.361
J1445-5781	Sample Volume in mL (SS)	0.050	Pu 238 AEA Frac.	(C238)	0.085
Batch ID	Sample D.F. (DF)	101	Pu 239 AEA Frac.	(C239)	0.54
2511	Tracer Volume in mL (SPKV)	0.050	Total AT Counts		7487
Rerun No.	Digest D.F. (DDF)	1	AT Count Time (min)	(TC)	60
0	Tracer Book No.	77843	Background in cpm	(Bkg)	8
Analyst	Tracer Preparation Date	10/12/93	Pu 236 cpm		18.9
J VAN SANT	Pu-236 Preparation Value (dpm/mL)	3226	Pu 238 cpm		4.43
Date	Pu-236 Decay Corr'd value (dpm/mL)	3018.18	Pu 239 cpm		28.24
01/19/94	Pu-238 Tracer Value (dpm/mL)	133	AEA Count Time	(min)	1440
Sample Type					
LIQUID	<<<<<<<<< Enter a Sample Type <<<<<<<<<		Pu 239/240 µCi/L		2.0540E+02

Decay Time = Date Counted - Tracer Preparation Date

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

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SPKV

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

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

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

				DETECTION LEVELS in µCi/mL
Pu 239/240	µCi/mL	=	2.05E-01	
Relative Counting Error		=	1.5%	
NOTE: Pu 238 Result is a LESS THAN Value.				Pu 239/240 2.04E-02
Pu 238	µCi/mL	=	< 2.65E-02	
Relative Counting Error		=	2.7%	Pu 238 2.65E-02
Pu 236 Tracer Recovery		=	55.9%	

Data Entry by:	[signature]	Date:	21-Jan-94
Approved by:	[signature]	Date:	21 Jan 94

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PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#1 1-19-94 Dm

7487 / 60 - 8

J1445-5781
#5

WHC-SD-WM-DP-062, REV. 0

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

#6 6944

WHC-SD-WM-DP-062, REV. 0

Serial No	Sample Point	Date	Time Issued	Priority
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Determination	Method Standard	Result Units	Charge Code	Reruns
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Sample Size	Customer ID
.100 - 10 - .05mL	[illegible]

Remarks Calculations Results

[illegible] 24HR

DUP

ATTACH PRINTOUT

.05mL 77B43 Pu 239/240 1.98 X 10⁻¹ uCi/ml

Pu238 2.48 X 10⁻² uCi/ml

SKM 1-25-94

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
VanSant	D.H. Milicia	[signature]		
Hrs	Hrs	Hrs 1-20-94	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1-19-94		[signature]	[signature]

54-6800-061 (R 10-83)

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

Serial No.	Date Counted		01/20/94	Pu 236 AEA Frac. (C236)	SAMPLE
J1445-5781	Sample Volume in mL	(SS)	0.050	Pu 238 AEA Frac. (C238)	0.374
Batch ID	Sample D.F.	(DF)	101	Pu 239 AEA Frac. (C239)	0.084
2511	Tracer Volume in mL	(SPKV)	0.050	Total AT Counts	0.538
Rerun No.	Digest D.F.	(DDF)	1	AT Count Time (min) (TC)	8818
0	Tracer Book No.		77B43	Background in cpm (Bkg)	60
Analyst	Tracer Preparation Date		10/12/93	Pu 236 cpm	2
J VANSANT	Pu-236 Preparation Value	(dpm/mL)	3226	Pu 238 cpm	25.11
Date	Pu-236 Decay Corr'd value	(dpm/mL)	3018.18	Pu 239 cpm	5.66
01/19/94	Pu-238 Tracer Value	(dpm/mL)	133	AEA Count Time (min)	36.1
Sample Type					1440
LIQUID	<<<<<<<<< Enter a Sample Type <<<<<<<<<			Pu 239/240 µCi/L	1.9753E+02

Decay Time = Date Counted - Tracer Preparation Date

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

Pu 238 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SPKV

Pu-239/240 µCi/L = (C239 * Pu-238 Decay Corr'd Value * SPKV * DF * DDF * (1000mL/L)) / (C236 * SS * (2220000dpm/µCi))

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

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

				DETECTION LEVELS in µCi/mL
Pu 239/240	µCi/mL	=	1.98E-01	
Relative Counting Error		=	1.3%	
				Pu 239/240
Pu 238	µCi/mL	=	2.48E-02	1.53E-02
Relative Counting Error		=	2.4%	Pu 238
Pu 236 Tracer Recovery		=	71.9%	2.14E-02

Data Entry by:	[signature]	Date:	21-Jan-94
Approved by:	[signature]	Date:	21 Jan 94

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PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-062, REV. 0

#2 1-19-94 DM

8818
60 -2

J1445-3781
#6

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

#1 7471

Serial No	Sample Point	Date	Time Issued	Priority
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Determination	Method Standard	Result Units	Charge Code	Reruns
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Sample Size	Customer ID
.100 - 10 - .05mL	[illegible]

Remarks Calculations Results

24HR

TRIP

ATTACH PRINTOUT

.05mL 77B43 Pu239/240 2.23×10^{-1} uCi/mL

Pu238 3.16 E-2 uCi/mL

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs 1-20-94	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
1-19-94		

54-6800-061 (R 10-83)

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

Serial No.	Date Counted		01/20/94	Pu 236 AEA Frac.	(C236)	SAMPLE 0.332
J1445-5781	Sample Volume in mL	(SS)	0.050	Pu 238 AEA Frac.	(C238)	0.091
Batch ID	Sample D.F.	(DF)	101	Pu 239 AEA Frac.	(C239)	0.539
2511	Tracer Volume in mL	(SPKV)	0.050	Total AT Counts		7213
Rerun No.	Digest D.F.	(DDF)	1	AT Count Time (min)	(TC)	60
0	Tracer Book No.		77B43	Background in cpm	(Bkg)	5
Analyst	Tracer Preparation Date		10/12/93	Pu 236 cpm		15.69
J VAN SANT	Pu-236 Preparation Value	(dpm/mL)	3226	Pu 238 cpm		4.32
Date	Pu-236 Decay Corr'd value	(dpm/mL)	3018.18	Pu 239 cpm		25.44
01/19/94	Pu-238 Tracer Value	(dpm/mL)	133	AEA Count Time	(min)	1440
Sample Type						
LIQUID	<<<<<<<<< Enter a Sample Type <<<<<<<<<			Pu 239/240 µCi/L		2.2293E+02

Decay Time = Date Counted - Tracer Preparation Date

Pu-238 Decay Corr'd Value = Pu-236 Preparation Value * 2 to the power of ((-ln2 * Decay Time) / 1040.95)

Pu 238 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C238 * 100 / Pu-238 Decay Corr'd Value * SPKV

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

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 238 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

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

Pu 239/240	µCi/mL	=	2.23E-01	DETECTION LEVELS in µCi/mL
Relative Counting Error		=	1.7%	
				Pu 239/240 2.45E-02
Pu 238	µCi/mL	=	3.16E-02	
Relative Counting Error		=	2.8%	Pu 238 3.05E-02
Pu 236 Tracer Recovery		=	50.7%	

Data Entry by: [signature] Date: 21-Jan-94

Approved by: [signature] Date: 21 Jan 1994

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PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#3 1-19-94 Dm

2213/60 - 5

J1445-5781

#7

WHC-SD-WM-DP-062, REV. 0

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

WHC-SD-WM-DP-062, REV. 0

#4 8684 ~~[illegible]~~ #8 8686

Serial No	Sample Point	Date	Time Issued	Priority
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Determination	Method Standard	Result Units	Charge Code	Reruns
[illegible]	[illegible]	[illegible]	[illegible]	0

Sample Size	Customer ID
.100-10-.05mL	[illegible]

Remarks Calculations Results DP

[illegible] 63B43 .100-10-.100mL

[illegible] 77B43 24HR

[illegible] .05mL ATTACH PRINTOUT

Re-Count 8 hrs

99.9% sp. rec.

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
[signature]	[signature]	[signature]	[signature]	
Hrs	Hrs	Hrs 1-20-94	Hrs 1-21-94	Hrs
Date 1-19-94	Time Completed	Lab Unit Mgr [signature]	[signature]	

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

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

Serial No.					ERR
	Date Counted	01/21/94	Pu 236 AEA Frac.	(C236)	0.166
J1445-5081	Sample Volume in mL (SS)	0.050	Pu 238 AEA Frac.	(C238)	0.149
Batch ID	Sample D.F. (DF)	101	Pu 239 AEA Frac.	(C239)	0.564
2511	Tracer Volume in mL (SPKV)	0.050	Total AT Counts		14146
Rerun No.	Digest D.F. (DDF)	1	AT Count Time (min)	(TC)	60
0	Tracer Book No.	77B43	Background in cpm	(Bkg)	8
Analyst	Tracer Preparation Date	10/12/93	Pu 236 cpm		5.79
J VAN SANT	Pu-236 Preparation Value (dpm/mL)	3226	Pu 238 cpm		5.19
Date	Pu-236 Decay Corr'd value (dpm/mL)	3016.17	Pu 239 cpm		19.62
01/19/94	Pu-238 Tracer Value (dpm/mL)	133	AEA Count Time	(min)	480
Sample Type					
LIQUID	<<<<<<<<< Enter a Sample Type <<<<<<<<<		Pu 239/240 µCi/L		4.6623E+02

Decay Time = Date Counted - Tracer Preparation Date

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

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C238 * 100 / Pu-238 Decay Corr'd Value * SPKV

Pu-239/240 µCi/L = (C239 * Pu-236 Decay Corr'd Value * SPKV * DF * DDF * (1000mL/L)) / (C238 * SS * (2220000dpm/µCi))

Pu 238 dpm = (Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / (Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS

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

				DETECTION LEVELS in µCi/mL
Pu 239/240	µCi/mL	=	4.66E-01	
Relative Counting Error		=	4.2%	
				Pu 239/240 4.95E-02
Pu 238	µCi/mL	=	1.17E-01	
Relative Counting Error		=	5.4%	Pu 238 5.55E-02
Pu 236 Tracer Recovery		=	50.1%	

Data Entry by: [signature]		Date:	24-Jan-94
Approved by: [signature]		Date:	24 Jan 1994

(466.23 - 205.40)(~~[illegible]~~ (101/101)(100) = 99.9%

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PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#1 1-19-94 [illegible]

$\frac{14146}{60}$-8

J1445-5081
#8

WHC-SD-WM-DP-062, REV. 0

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

#9 1.496

Serial No	Sample Point	Date	Time Issued	Priority
J 1445.-5981	BECHTOLD	1- 4-94	12: 3	26

Determination	Method/Standard	Result Units	Charge Code	Reruns
Pu239/24	LA-503-156	% RECOVERY	E14157	0

Sample Size	Customer ID
?.100 - 10 - .05mL	KE83B

Remarks, Calculations, Results

SAMPLE SPIKED ID 69843 . 100-10-.100mL

SPIKE ID 77843

SPIKE VOLUME COUNT AS uCI/L .05mL

97.3% ATTACH PRINTOUT

24HR "AEA" - ~~ASSAY~~

WHC-SD-WM-DP-062, REV. 0

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs 1-20-94 1-21-94	Hrs	Hrs
Date 1-19-94	Time Completed	Lab Unit Mgr		

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

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

Serial No.						CHK EXT NO.
J1445-5981	Date Counted		01/20/94	Pu 236 AEA Frac.	(C236)	0.184
Batch ID	Sample Volume in mL	(SS)	0.050	Pu 238 AEA Frac.	(C238)	0.073
2511	Sample D.F.	(DF)	101	Pu 239 AEA Frac.	(C239)	0.605
Rerun No.	Tracer Volume in mL	(SPKV)	0.050	Total AT Counts		4037
0	Digest D.F.	(DDF)	1	AT Count Time (min)	(TC)	60
Analyst	Tracer Book No.		77843	Background in cpm	(Bkg)	2
J VAN SANT	Tracer Preparation Date		10/12/93	Pu 236 cpm		19.24
Date	Pu-236 Preparation Value	(dpm/mL)	3226	Pu 238 cpm		7.68
01/19/94	Pu-236 Decay Corr'd value	(dpm/mL)	3018.18	Pu 239 cpm		63.32
Sample Type	Pu-238 Tracer Value	(dpm/mL)	133	AEA Count Time	(min)	1440
LIQUID	<<<<<<<<< Enter a Sample Type <<<<<<<<<			Pu 239/240 µCi/L		4.5149E+02

Decay Time = Date Counted - Tracer Preparation Date

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

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SPKV

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

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-236 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS

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

				DETECTION LEVELS in µCi/mL
Pu 239/240	µCi/mL	=	4.51E-01	
Relative Counting Error		=	1.3%	
NOTE: Pu 238 Result is a LESS THAN Value.				Pu 239/240 1.41E-01
Pu 238	µCi/mL	=	< 1.47E-01	
Relative Counting Error		=	2.2%	Pu 238 1.47E-01
Pu 236 Tracer Recovery		=	15.9%	

Data Entry by:	Date:	21-Jan-94
Approved by:	Date:	21 Jan 94

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457.5 - 197.5 (101/1) (.25) (.02) = 97.3%

130.5

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#2 1-19-94 mbs

4032-2
60

J1445-5981
45

WHC-SD-WM-DP-062, REV. 0

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT

WHC-SD-WM-DP-062, REV. 0

SAMPLE
J1445-5781 SAM
File ID: 5a5034.CNF

Counted on: 1/20/94 @11:32
Detector: AEA5
Geometry number: 1
Count time: 86403. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	888.8	888.8	354.992	355.860	22.000	18.795	11.000	3.687
2	201.5	201.5	298.147	296.610	22.000	15.898	11.000	2.77[illegible]
3	1309.3	1309.3	224.215	223.445	24.000	20.609	12.000	1.[illegible]
4?	8.9	8.9	99.584	99.075	48.000	1.000	24.000	0.1[illegible]
5?	2.9	2.9	89.984	87.056	8.000	0.709	1.000	1.[illegible]
6?	4.1	4.1	72.754	72.098	14.000	1.072	7.000	0.[illegible]
7?	5.2	5.2	62.678	60.371	16.000	5.743	8.000	0.5[illegible]

PEAK RESULTS
Peak Error Limit: 25%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity [illegible]
1	Cm243	0.361	5.786	5.762	0.024	0.09	18.90	1.2	138.9	0.[illegible]
	Pu236		5.756	5.762	-.006				138.[illegible]	[illegible]
2	Am241	0.085	5.480	5.483	-.003	0.07	4.43	2.9	1.[illegible]	[illegible]
	Pu238		5.499	5.483	0.016				1[illegible]	[illegible]
3	Pu239	0.540	5.143	5.139	0.004	0.10	28.24	1.0	206.0	0.9288E-[illegible]
	Pu240		5.144	5.139	0.005				206.0	0.9288E-[illegible]
4		????		4.555			0.22	11.6		
5		????		4.498			0.01	187.		
6		????		4.428			0.01	137.		
7		????		4.373			0.13	19.7		
Totals:		0.986	<--valid peaks only-->				51.58			

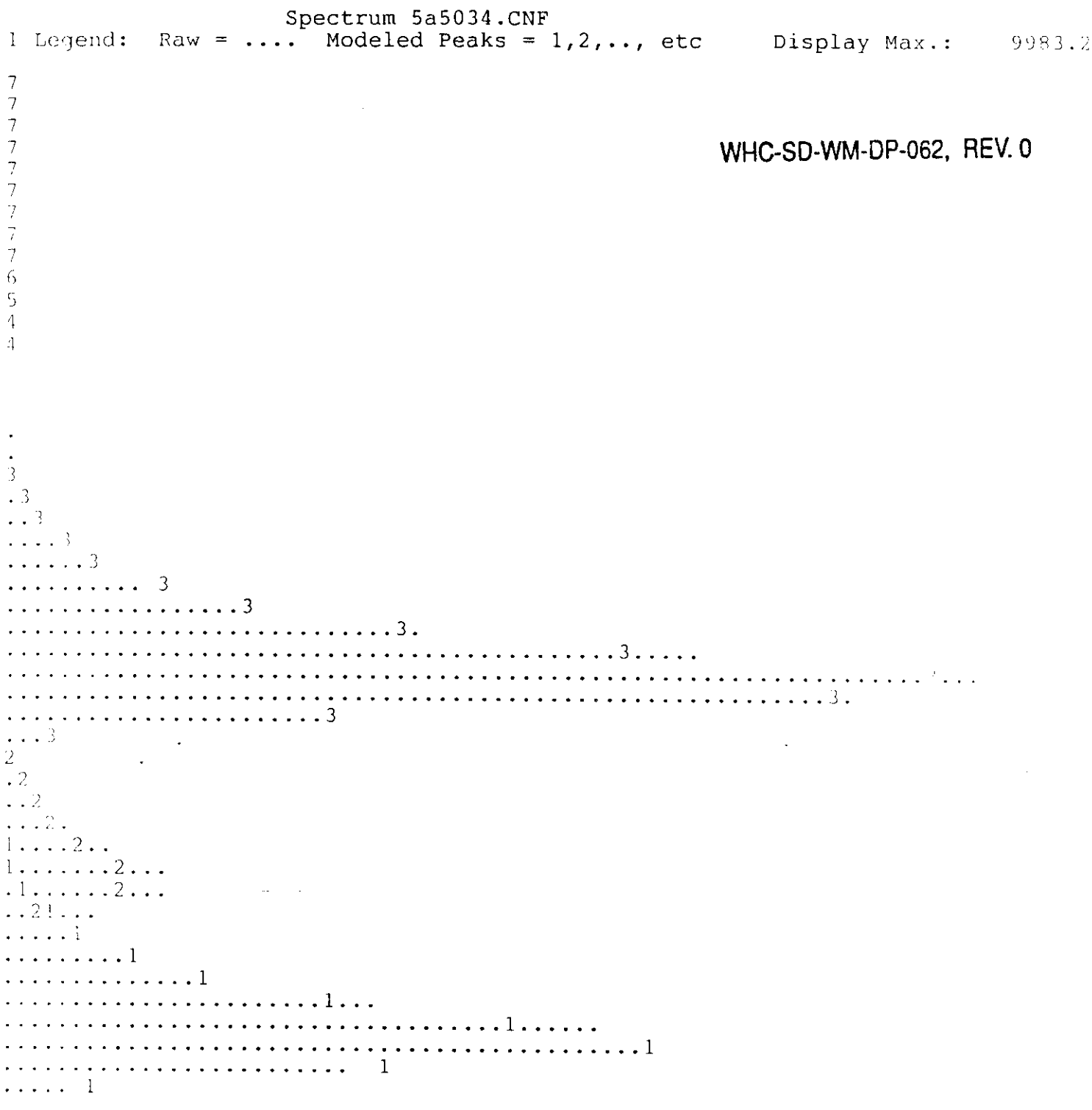
DETECTOR CALIBRATION
Energy(MEV) = 4.089 + (0.0047)*Channel
Energy range (MeV): 4.089 TO 6.496
Efficiency = 0.1371 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	75340.0	100.000
Smoothed	75339.9	100.000

Composite fit	74821.4	99.312
Residuals	518.6	0.688

Analyzed by: _____
ALJ


Spectrum 5a5034.CNF
Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.: 9983.2

Raw Data Dump for AEA Spectrum: 5a5034.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	3.	4.	3.
21	9.	6.	4.	3.	6.	3.	7.	5.	4.	2.
	3.	4.	3.	6.	5.	6.	3.	7.	2.	11.
41	11.	5.	1.	5.	8.	2.	6.	6.	5.	4.
51	4.	7.	8.	9.	5.	7.	8.	2.	8.	12.
61	8.	8.	5.	9.	6.	9.	6.	5.	4.	5.
71	7.	8.	13.	5.	6.	4.	7.	5.	5.	8.
81	9.	6.	5.	11.	4.	15.	7.	14.	9.	8.
91	7.	6.	7.	8.	13.	12.	8.	11.	11.	10.
101	13.	6.	11.	6.	9.	9.	8.	12.	7.	7.
111	12.	15.	16.	8.	9.	9.	10.	3.	11.	18.
121	11.	14.	10.	14.	16.	15.	18.	19.	13.	13.
131	19.	25.	24.	20.	15.	27.	23.	21.	31.	17.
141	26.	20.	32.	22.	26.	24.	22.	22.	35.	34.
151	43.	34.	38.	38.	37.	39.	36.	44.	55.	43.
161	45.	57.	55.	55.	53.	66.	77.	74.	64.	79.
171	75.	91.	78.	76.	101.	100.	97.	105.	102.	110.
181	100.	133.	159.	160.	141.	157.	178.	170.	193.	208.
191	224.	264.	273.	295.	255.	326.	295.	341.	378.	401.
201	416.	471.	530.	555.	571.	636.	688.	742.	757.	805.
211	855.	915.	989.	1009.	1090.	1182.	1150.	1292.	1206.	1309.
221	1372.	1294.	1385.	1309.	1339.	1293.	1241.	1094.	1076.	991.
231	856.	722.	615.	529.	436.	369.	244.	215.	166.	105.
241	79.	59.	45.	24.	36.	30.	32.	16.	26.	19.
251	31.	33.	26.	33.	29.	32.	44.	49.	39.	46.
261	44.	40.	54.	41.	68.	43.	79.	60.	81.	69.
271	61.	87.	82.	88.	79.	101.	88.	91.	109.	126.
281	113.	141.	111.	165.	153.	175.	173.	200.	181.	229.
291	245.	217.	228.	220.	241.	237.	262.	239.	256.	212.
3	199.	209.	209.	192.	172.	154.	147.	115.	118.	110.
3.	103.	101.	74.	92.	72.	100.	113.	102.	110.	120.
321	114.	140.	152.	169.	167.	169.	217.	224.	202.	220.
331	254.	287.	310.	311.	349.	391.	405.	427.	445.	513.
341	551.	602.	608.	645.	775.	742.	691.	777.	847.	893.
351	880.	903.	889.	869.	893.	904.	877.	804.	759.	693.
361	618.	560.	486.	461.	334.	303.	204.	175.	111.	91.
371	90.	40.	37.	18.	12.	5.	5.	2.	0.	1.
381	0.	1.	0.	1.	0.	1.	0.	1.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	2.	0.	0.	0.	0.	0.	1.
411	0.	0.	0.	0.	1.	0.	1.	0.	0.	0.
421	0.	1.	0.	0.	1.	2.	0.	1.	2.	3.
431	2.	4.	0.	0.	0.	0.	3.	0.	0.	0.
441	2.	1.	0.	1.	1.	0.	2.	0.	0.	1.
451	0.	1.	0.	2.	0.	0.	0.	1.	0.	1.
461	1.	0.	0.	0.	0.	0.	2.	2.	1.	2.
471	1.	3.	1.	2.	2.	2.	2.	2.	4.	1.
481	4.	2.	7.	4.	3.	1.	3.	1.	0.	0.
491	0.	0.	0.	0.	1.	0.	0.	0.	1.	0.
511	0.	0.								

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT WHC-SD-WM-DP-062, REV. 0

SAMPLE
J1439-5581 STD
File ID: 2a2545.CNF

Counted on: 1/20/94 @11:29
Detector: AEA2
Geometry number: 1
Count time: 86401. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	346.0	346.0	351.823	352.329	28.000	28.397	14.000	2.884
2	618.1	618.1	220.267	218.787	32.000	38.467	16.000	3.975
3	38.4	38.4	58.910	58.395	188.000	1.000	94.000	0.100

PEAK RESULTS
Peak Error Limit: 25%

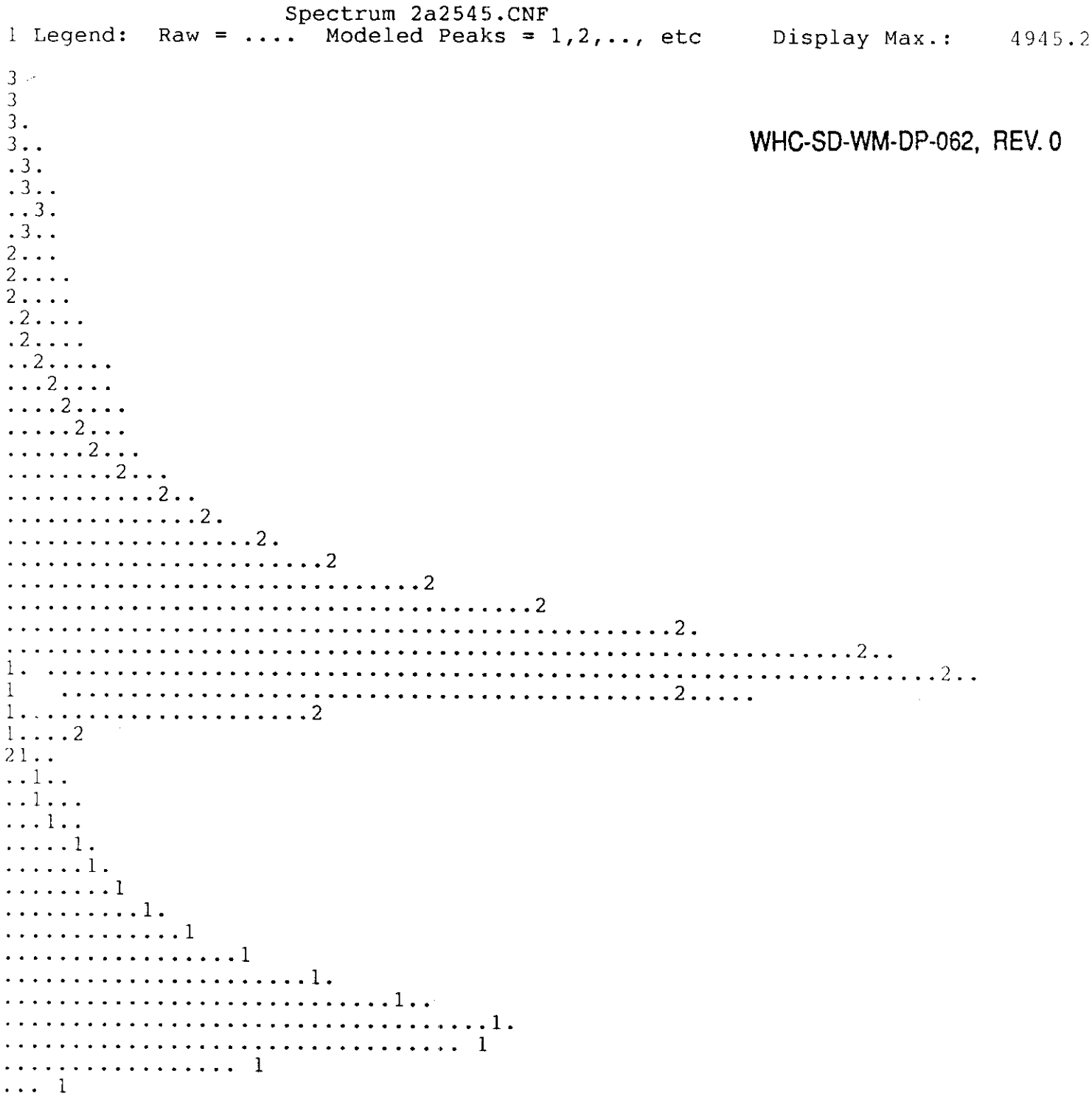
Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Cm243	0.316	5.786	5.738	0.048	0.13	11.97	1.5	140.8	0.634E-04
	Pu236		5.756	5.738	0.018				104.8	0.472E-04
2	Pu239	0.586	5.143	5.111	0.032	0.18	22.21	1.1	190.7	0.859E-04
	Pu240		5.144	5.111	0.033				190.7	0.859E-04
3		0.022		4.357	0.00		0.83	6.2	7.1	0.319E-05
Totals:		0.924	<--valid peaks only-->				35.01			

DETECTOR CALIBRATION
Energy(MEV) = 4.082 + (0.0047)*Channel
Energy range (MeV): 4.082 TO 6.489
Efficiency = 0.1165 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	54553.0	100.000
Smoothed	54553.0	100.000
Composite fit	50411.0	92.407
Residuals	4142.0	7.593

Analyzed by: _____
ALJ


Spectrum 2a2545.CNF
Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.: 4945.2

Raw Data Dump for AEA Spectrum: 2a2545.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	7.	28.	28.	31.
21	24.	31.	22.	30.	24.	29.	29.	42.	36.	35.
31	36.	31.	46.	40.	29.	36.	30.	28.	27.	23.
41	44.	36.	29.	38.	46.	36.	43.	40.	43.	37.
51	35.	34.	37.	51.	48.	33.	42.	51.	43.	55.
61	34.	31.	41.	43.	35.	38.	54.	31.	46.	40.
71	51.	49.	31.	40.	58.	33.	56.	51.	43.	42.
81	51.	55.	51.	57.	53.	58.	51.	62.	46.	61.
91	55.	43.	55.	57.	58.	62.	54.	51.	65.	60.
101	57.	62.	63.	73.	65.	70.	63.	75.	88.	69.
111	85.	71.	66.	68.	77.	72.	64.	77.	77.	73.
121	81.	68.	71.	86.	84.	84.	83.	95.	87.	90.
131	73.	87.	78.	72.	83.	92.	95.	93.	93.	90.
141	98.	105.	104.	92.	117.	107.	109.	106.	106.	133.
151	101.	115.	128.	130.	140.	138.	117.	136.	144.	120.
161	134.	142.	149.	137.	149.	154.	165.	165.	168.	161.
171	180.	189.	189.	200.	208.	197.	216.	206.	210.	229.
181	222.	212.	247.	241.	249.	256.	264.	271.	287.	274.
191	310.	299.	333.	310.	308.	348.	349.	373.	386.	409.
201	407.	421.	455.	445.	494.	457.	500.	523.	522.	518.
211	586.	594.	621.	609.	636.	643.	633.	616.	645.	619.
221	623.	606.	654.	579.	582.	515.	528.	521.	450.	403.
231	368.	349.	305.	232.	221.	150.	136.	121.	86.	71.
241	62.	58.	44.	37.	41.	49.	34.	39.	40.	34.
251	41.	59.	36.	53.	43.	36.	46.	59.	55.	42.
261	47.	51.	50.	53.	46.	52.	58.	64.	61.	41.
271	47.	74.	64.	53.	63.	62.	56.	72.	63.	55.
281	55.	54.	69.	60.	64.	66.	63.	78.	82.	73.
291	74.	82.	74.	73.	77.	91.	79.	75.	98.	89.
301	93.	94.	88.	97.	84.	94.	122.	88.	134.	116.
311	112.	128.	114.	131.	138.	112.	138.	140.	131.	138.
321	153.	167.	193.	157.	181.	191.	183.	152.	189.	217.
331	210.	229.	220.	232.	219.	254.	260.	269.	294.	297.
341	298.	306.	293.	321.	309.	320.	347.	336.	347.	348.
351	358.	353.	337.	333.	341.	299.	269.	281.	249.	219.
361	242.	161.	161.	155.	134.	110.	74.	69.	46.	42.
371	29.	12.	12.	7.	9.	0.	3.	0.	0.	0.
381	1.	0.	0.	0.	0.	0.	0.	0.	1.	0.
391	0.	0.	1.	0.	0.	0.	0.	0.	0.	1.
401	1.	0.	0.	0.	0.	0.	1.	0.	0.	0.
411	0.	1.	0.	0.	0.	1.	1.	0.	0.	1.
421	0.	1.	0.	1.	1.	2.	0.	1.	2.	1.
431	1.	1.	0.	0.	1.	0.	0.	0.	0.	2.
441	0.	0.	5.	0.	2.	0.	1.	0.	0.	0.
451	0.	0.	2.	0.	0.	0.	1.	0.	0.	0.
461	0.	3.	0.	1.	0.	3.	1.	2.	2.	3.
471	0.	0.	4.	4.	4.	1.	3.	4.	2.	1.
481	2.	0.	2.	1.	2.	1.	0.	0.	0.	1.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT WHC-SD-WM-DP-062, REV. 0

SAMPLE
J1439-5581 STD
File ID: 3a3605.CNF

Counted on: 1/20/94 @11:30
Detector: AEA3
Geometry number: 1
Count time: 86406. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	1112.2	1112.2	363.297	363.297	14.000	7.781	7.000	1.[illegible]
2	2092.8	2092.8	231.191	231.188	16.000	7.897	8.000	1.[illegible]
3	45.7	45.7	109.598	109.185	176.000	1.000	88.000	[illegible]
4?	6.2	6.2	86.556	85.296	8.000	1.851	4.000	0.[illegible]
5?	9.3	9.3	52.658	52.250	22.000	32.506	11.000	1.[illegible]

PEAK RESULTS
Peak Error Limit: 25%

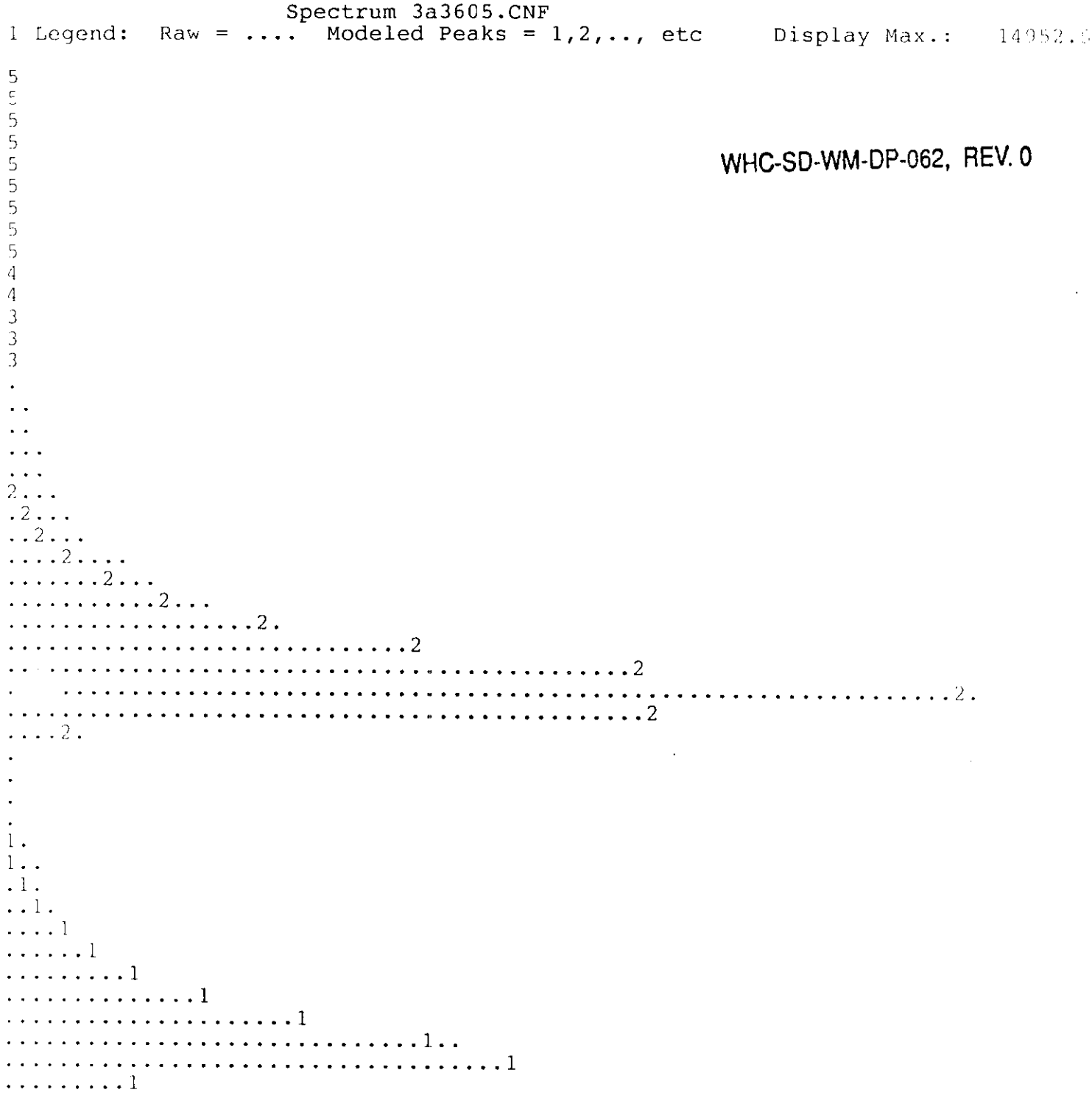
Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	Activity d/m	Activity [illegible]
1	Pu236	0.333	5.756	5.752	0.004	0.04	22.66	1.1	180.7	0.8[illegible]
	Cm243		5.786	5.752	0.034				242.5	0.[illegible]
2	Pu239	0.559	5.143	5.145	-.002	0.04	38.01	0.8	297.[illegible]	[illegible]
	Pu240		5.144	5.145	-.001				297.[illegible]	0.[illegible]
3		0.017		4.584		0.00	1.17	4.9	9.1	0.[illegible]
4		????		4.474			0.18	28.0		
5		????		4.322			0.32	16.6		
Totals:		0.910	<--valid peaks only-->				61.84			

DETECTOR CALIBRATION
Energy(MEV) = 4.081 + (0.0046)*Channel
Energy range (MeV): 4.081 TO 6.437
Efficiency = 0.1280 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	97905.0	100.000
Smoothed	97905.0	100.000
Composite fit	89774.4	91.695
Residuals	8130.6	8.305

Analyzed by: _____


Spectrum 3a3605.CNF
Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.: 14052.6

Raw Data Dump for AEA Spectrum: 3a3605.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	3.	20.	17.	13.
21	15.	9.	18.	13.	10.	13.	16.	11.	14.	20.
31	15.	8.	26.	11.	16.	17.	13.	12.	23.	14.
41	16.	14.	17.	17.	24.	18.	19.	13.	12.	19.
51	20.	29.	19.	25.	18.	16.	17.	22.	20.	23.
61	24.	21.	19.	17.	25.	22.	29.	34.	28.	20.
71	13.	33.	19.	20.	29.	18.	16.	24.	31.	27.
81	23.	28.	26.	34.	29.	34.	33.	33.	26.	30.
91	26.	25.	38.	36.	40.	25.	33.	36.	38.	39.
101	41.	35.	41.	45.	43.	53.	48.	44.	48.	52.
111	47.	39.	54.	44.	41.	47.	44.	61.	51.	38.
121	62.	52.	60.	51.	62.	54.	65.	57.	71.	62.
131	66.	57.	69.	69.	90.	73.	69.	71.	95.	84.
141	78.	85.	74.	93.	93.	95.	93.	93.	86.	111.
151	94.	108.	108.	131.	97.	121.	121.	141.	131.	124.
161	126.	135.	139.	134.	126.	133.	170.	164.	176.	150.
171	168.	201.	202.	215.	204.	209.	215.	255.	257.	265.
181	238.	244.	261.	263.	262.	269.	321.	371.	336.	302.
191	351.	339.	355.	400.	390.	407.	404.	464.	446.	471.
201	504.	513.	530.	590.	574.	554.	592.	677.	685.	718.
211	793.	748.	800.	869.	961.	1013.	1078.	1096.	1192.	1224.
221	1317.	1360.	1479.	1582.	1541.	1729.	1850.	1891.	2083.	2181.
231	2261.	2243.	2104.	1847.	1615.	1277.	970.	644.	411.	245.
241	114.	78.	47.	37.	33.	27.	30.	19.	23.	21.
251	33.	31.	32.	21.	28.	28.	30.	23.	22.	34.
261	26.	24.	39.	33.	39.	35.	32.	50.	43.	49.
271	36.	44.	32.	46.	39.	55.	47.	42.	64.	5 .
281	61.	68.	62.	68.	61.	73.	65.	89.	76.	78.
291	84.	73.	106.	76.	89.	92.	96.	111.	104.	97.
301	117.	105.	132.	120.	120.	128.	122.	138.	108.	119.
311	139.	128.	125.	138.	158.	143.	156.	161.	162.	169.
321	146.	185.	180.	215.	218.	221.	187.	217.	225.	238.
331	245.	242.	282.	312.	311.	328.	363.	353.	401.	391.
341	393.	391.	441.	467.	464.	539.	577.	587.	644.	666.
351	721.	745.	815.	838.	921.	939.	936.	986.	1023.	1073.
361	1042.	1131.	1127.	1221.	1097.	1038.	880.	723.	530.	359.
371	188.	106.	45.	34.	6.	5.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	1.	0.	0.	0.	0.	0.	1.	1.	0.
411	1.	0.	0.	0.	1.	0.	1.	0.	1.	0.
421	0.	0.	0.	0.	1.	0.	1.	0.	0.	0.
431	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
461	0.	2.	0.	0.	0.	0.	0.	0.	0.	0.
471	1.	0.	1.	1.	0.	0.	0.	0.	1.	0.
481	0.	1.	1.	0.	1.	0.	0.	1.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT

WHC-SD-WM-DP-062, REV. 0

SAMPLE
J1440-5681 BLK
File ID: 4a4113.CNF

Counted on: 1/20/94 @11:31
Detector: AEA4
Geometry number: 1
Count time: 86402. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Chn Initial	Chn Final
1	677.0	677.0	362.245	362.245	14.000	5.861	7.000	1.162
2	13.3	13.3	229.778	229.715	22.000	55.923	11.000	12.373

PEAK RESULTS
Peak Error Limit: 25%

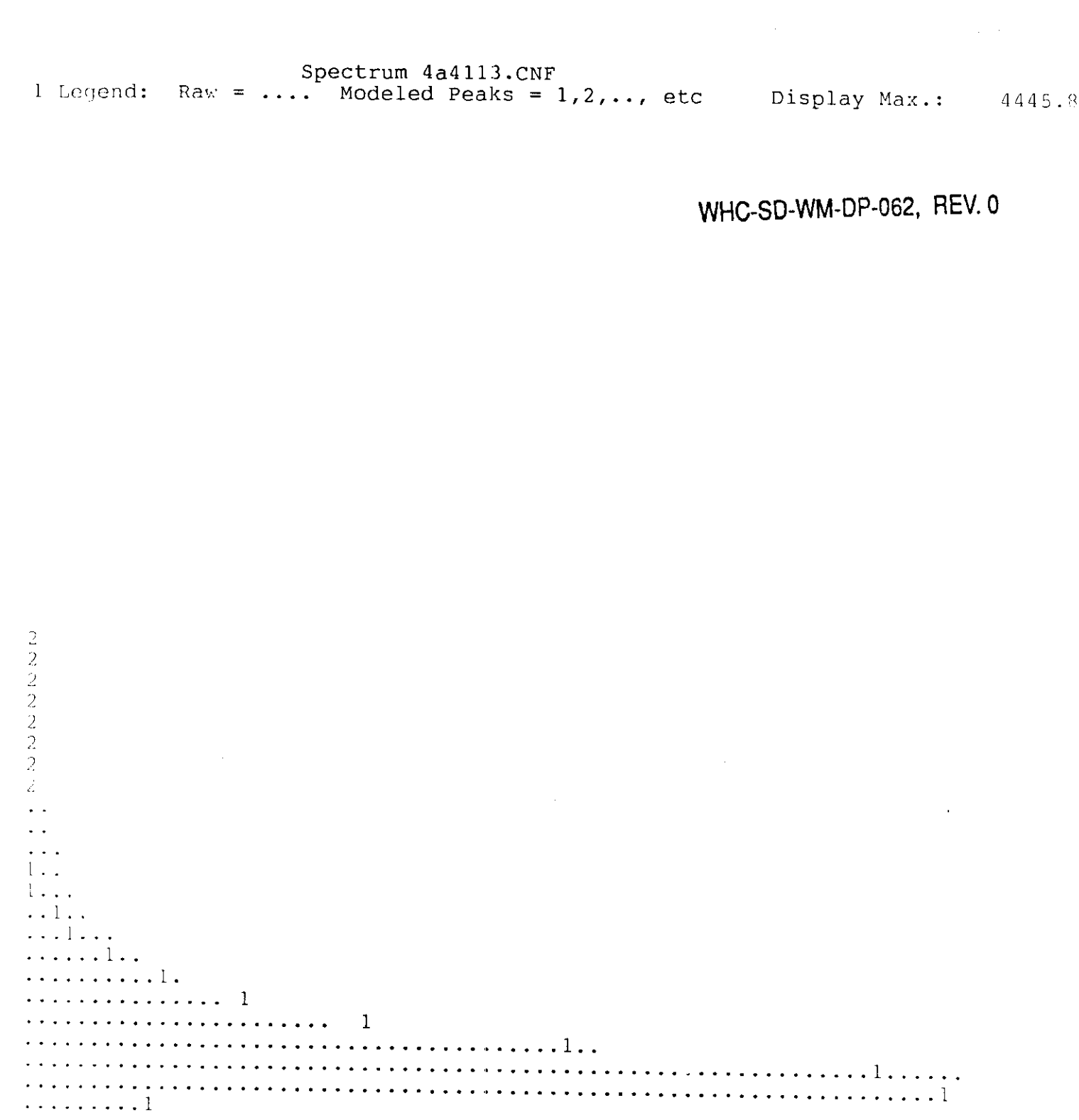
Peak	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Act [illegible]
	Cm244	0.888	5.796	5.785	0.011	0.03	11.58	1.5	133.[illegible]	[illegible]
	Cm243		5.786	5.785	0.001				182.[illegible]	[illegible]
2	Pu239	0.028	5.143	5.162	-.019	0.26	0.37	9.2	4.2	[illegible]
	Pu240		5.144	5.162	-.018				4.2	[illegible]
Totals:		0.916	<--valid peaks only-->				11.95			

DETECTOR CALIBRATION
Energy(MEV) = 4.082 + (0.0047)*Channel
Energy range (MeV): 4.082 TO 6.488
Efficiency = 0.0867 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	18776.0	100.000
Smoothed	18776.0	100.000
Composite fit	17202.5	91.619
Residuals	1573.5	8.381

Analyzed by: _____
ALJ


Spectrum 4a4113.CNF
Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.: 4445.8

Raw Data Dump for AEA Spectrum: 4a4113.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	2.	2.	0.
21	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
	2.	0.	0.	0.	1.	0.	0.	0.	0.	0.
	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
51	0.	0.	0.	1.	1.	0.	0.	0.	1.	0.
61	0.	0.	0.	0.	2.	2.	0.	0.	1.	1.
71	0.	0.	0.	0.	2.	0.	2.	0.	0.	0.
81	0.	1.	0.	1.	0.	1.	0.	0.	0.	2.
91	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
101	0.	0.	0.	0.	4.	1.	0.	1.	0.	0.
111	0.	3.	2.	0.	1.	1.	0.	0.	4.	1.
121	1.	0.	2.	1.	0.	0.	0.	0.	0.	1.
131	0.	1.	1.	2.	1.	1.	0.	1.	2.	0.
141	0.	1.	0.	1.	4.	0.	0.	0.	2.	1.
151	2.	3.	0.	2.	1.	0.	2.	0.	3.	1.
161	0.	0.	1.	2.	1.	1.	0.	2.	2.	0.
171	2.	0.	0.	2.	0.	2.	2.	2.	1.	1.
181	2.	1.	1.	6.	1.	0.	2.	4.	3.	0.
191	2.	7.	4.	6.	5.	4.	2.	2.	3.	[illegible]
201	4.	0.	4.	4.	5.	2.	3.	5.	3.	[illegible]
211	4.	4.	5.	8.	7.	10.	7.	11.	8.	[illegible]
221	13.	6.	9.	16.	10.	13.	10.	9.	17.	[illegible]
231	9.	13.	12.	11.	7.	12.	7.	9.	3.	[illegible]
241	7.	3.	13.	3.	9.	5.	10.	3.	11.	[illegible]
251	16.	12.	15.	13.	15.	20.	20.	22.	21.	[illegible]
261	16.	16.	23.	24.	17.	19.	24.	21.	24.	17.
271	23.	28.	24.	24.	19.	32.	30.	20.	30.	28.
281	23.	24.	35.	31.	30.	33.	26.	41.	40.	38.
291	38.	35.	50.	45.	32.	39.	42.	46.	52.	57.
3	41.	51.	50.	53.	52.	51.	60.	64.	55.	[illegible]
3	64.	67.	63.	71.	72.	55.	68.	90.	75.	[illegible]
321	113.	87.	100.	95.	99.	102.	123.	108.	110.	[illegible]
331	110.	122.	127.	120.	143.	138.	163.	176.	167.	[illegible]
341	172.	209.	225.	264.	241.	305.	296.	352.	381.	[illegible]
351	447.	522.	555.	549.	605.	582.	558.	544.	579.	[illegible]
361	719.	735.	716.	697.	631.	453.	304.	190.	105.	[illegible]
371	15.	10.	1.	4.	1.	0.	0.	0.	0.	[illegible]
381	1.	0.	0.	0.	0.	1.	0.	0.	0.	[illegible]
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	[illegible]
401	1.	0.	0.	0.	0.	1.	1.	0.	0.	[illegible]
411	0.	0.	1.	0.	0.	0.	0.	0.	0.	[illegible]
421	1.	0.	0.	0.	0.	0.	0.	1.	1.	[illegible]
431	0.	1.	0.	0.	1.	0.	0.	0.	0.	[illegible]
441	3.	0.	1.	0.	0.	0.	0.	0.	0.	[illegible]
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	[illegible]
461	0.	1.	0.	0.	0.	0.	1.	0.	0.	[illegible]
471	0.	0.	0.	2.	0.	1.	1.	0.	2.	[illegible]
481	0.	1.	0.	0.	1.	1.	0.	0.	1.	0.
491	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT

WHC-SD-WM-DP-062, REV. 0

SAMPLE
J1445-5781 DUP
File ID: 6a6944.CNF

Counted on: 1/20/94 @11:33
Detector: AEA6
Geometry number: 1
Count time: 86402. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1?	11.2	11.2	497.333	496.763	10.000	1.032	5.000	6.45[illegible]
2	826.5	826.5	355.037	354.164	30.000	40.122	15.000	[illegible]
3	176.2	176.2	297.900	297.900	30.000	11.562	15.000	[illegible]
4	1319.4	1319.4	222.581	220.937	30.000	36.379	15.000	[illegible]
5?	10.4	10.4	90.701	88.529	16.000	77.409	8.000	[illegible]

PEAK RESULTS
Peak Error Limit: 25%

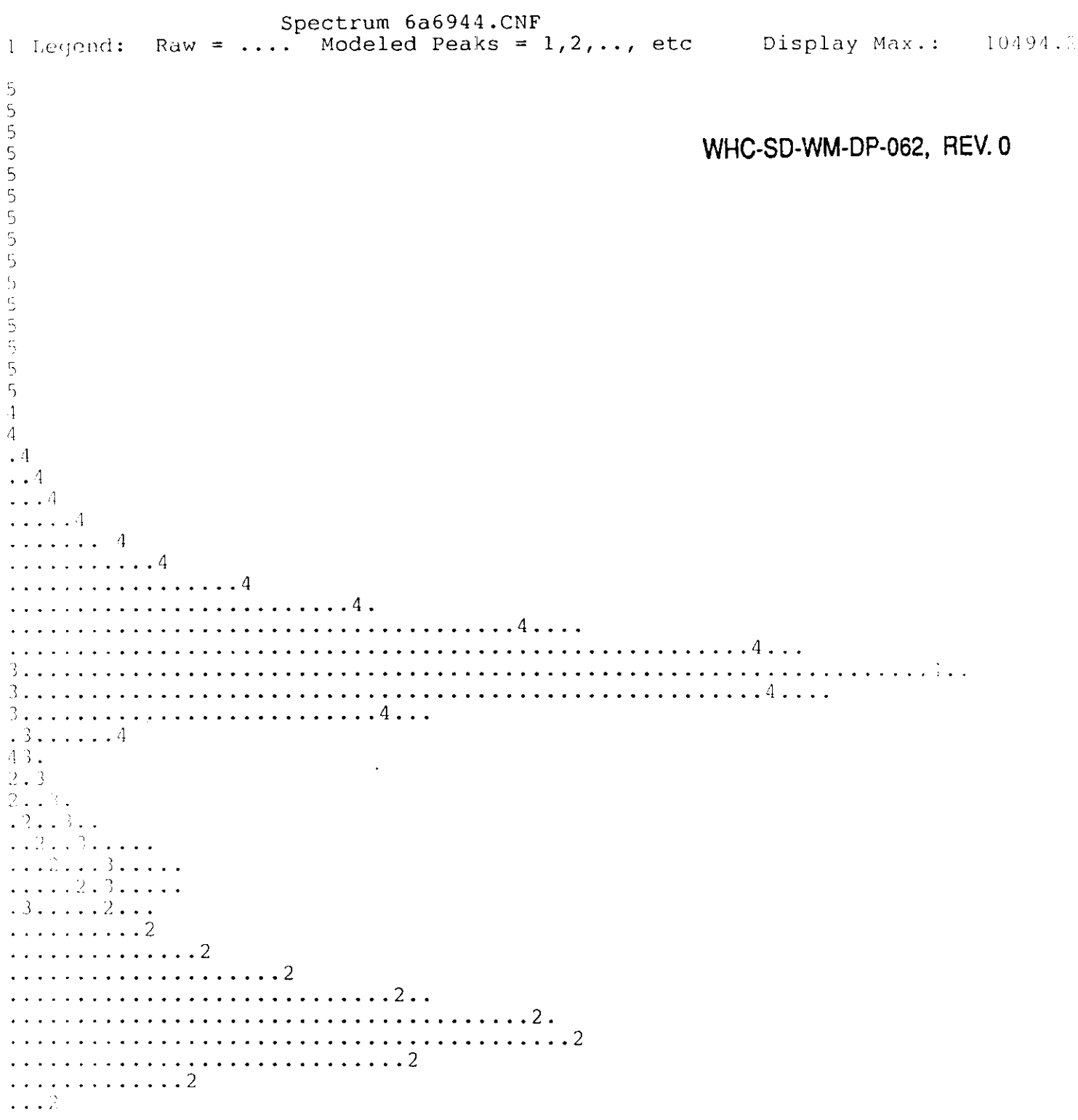
Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi
1		????		6.423			0.04	26.6		
2	Cm243	0.374	5.786	5.753	0.033	0.19	25.11	1.0	266.2	0.1[illegible]
	Pu236		5.756	5.753	0.003				198.2	[illegible]
3	Am241	0.084	5.480	5.489	-.009	0.05	5.66	2.9	46.6	[illegible]
	Pu238		5.499	5.489	0.010				60.9	[illegible]
4	Pu239	0.538	5.143	5.127	0.016	0.17	36.10	0.9	279.4	0.12[illegible]
	Pu240		5.144	5.127	0.017				279.4	0.12[illegible]
5		????		4.505			0.45	12.1		
Totals:		0.996	<--valid peaks only-->				66.87			

DETECTOR CALIBRATION
Energy(MEV) = 4.089 + (0.0047)*Channel
Energy range (MeV): 4.089 TO 6.495
Efficiency = 0.1292 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	96653.0	100.000
Smoothed	96663.0	100.010
Composite fit	96995.8	100.355
Residuals	-342.8	-0.355

Analyzed by: J144


Spectrum 6a6944.CNF
Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.: 10494.3

Raw Data Dump for AEA Spectrum: 6a6944.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	1.	4.	2.	7.
21	2.	6.	6.	4.	2.	5.	10.	4.	3.	11.
	4.	8.	5.	10.	9.	6.	12.	6.	3.	10.
41	6.	9.	9.	1.	5.	10.	9.	11.	4.	10.
51	7.	10.	6.	10.	8.	6.	8.	7.	9.	7.
61	4.	10.	11.	9.	10.	6.	7.	12.	10.	7.
71	10.	7.	13.	10.	8.	11.	13.	10.	17.	15.
81	8.	12.	11.	15.	17.	9.	14.	11.	19.	17.
91	9.	11.	19.	15.	10.	9.	9.	11.	14.	14.
101	13.	16.	18.	18.	19.	17.	17.	21.	17.	16.
111	13.	21.	19.	9.	16.	22.	22.	21.	19.	25.
121	18.	21.	27.	28.	22.	25.	22.	26.	28.	26.
131	25.	23.	27.	34.	28.	39.	41.	34.	36.	38.
141	42.	43.	40.	36.	37.	61.	40.	47.	59.	51.
151	61.	58.	51.	72.	77.	70.	72.	71.	81.	92.
161	88.	106.	84.	106.	110.	101.	113.	132.	132.	148.
171	124.	159.	164.	169.	162.	171.	204.	203.	220.	231.
181	234.	270.	284.	279.	297.	318.	324.	360.	367.	395.
191	379.	422.	453.	424.	491.	565.	564.	587.	640.	652.
201	707.	763.	790.	814.	799.	911.	914.	981.	1057.	1077.
211	1054.	1117.	1186.	1189.	1245.	1223.	1288.	1344.	1381.	1337.
221	1401.	1384.	1320.	1248.	1277.	1300.	1174.	1137.	1116.	1057.
231	945.	832.	795.	695.	626.	532.	439.	383.	321.	251.
241	208.	184.	164.	131.	101.	81.	79.	62.	54.	52.
251	56.	54.	62.	60.	56.	61.	69.	75.	69.	74.
261	79.	70.	83.	92.	99.	83.	107.	126.	107.	142.
271	130.	118.	122.	148.	150.	145.	160.	158.	181.	154.
281	204.	192.	201.	223.	222.	230.	249.	239.	236.	243.
291	266.	279.	259.	274.	255.	253.	249.	285.	253.	262.
3	256.	248.	242.	221.	230.	230.	218.	223.	185.	199.
31	210.	174.	187.	196.	204.	196.	209.	170.	212.	25[illegible].
321	246.	227.	249.	279.	279.	307.	297.	324.	38[illegible].	[illegible].
331	372.	392.	440.	462.	457.	494.	547.	571.	579.	[illegible].
341	660.	649.	620.	705.	708.	758.	767.	757.	781.	[illegible].
351	816.	855.	858.	789.	849.	833.	817.	766.	753.	21[illegible].
361	690.	623.	597.	603.	544.	509.	439.	392.	348.	3[illegible].
371	270.	193.	189.	171.	119.	95.	90.	61.	47.	4[illegible].
381	26.	25.	10.	14.	6.	10.	6.	4.	2.	1.
391	1.	2.	0.	0.	0.	1.	0.	0.	0.	0.
401	1.	0.	1.	0.	0.	1.	1.	0.	0.	2.
411	0.	0.	3.	1.	0.	1.	1.	0.	3.	1.
421	0.	0.	0.	1.	1.	2.	0.	1.	1.	0.
431	0.	2.	1.	0.	0.	2.	1.	0.	1.	1.
441	1.	0.	0.	0.	1.	0.	0.	1.	1.	1.
451	0.	2.	2.	0.	1.	0.	0.	1.	0.	1.
461	0.	0.	2.	0.	1.	2.	3.	1.	0.	0.
471	2.	1.	5.	7.	5.	8.	5.	1.	1.	0.
481	0.	0.	0.	1.	0.	0.	0.	0.	1.	0.
491	2.	0.	3.	4.	8.	21.	17.	4.	0.	0.
501	0.	0.								

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT WHC-SD-WM-DP-062, REV. 0

SAMPLE
J1445-5781 TRIP
File ID: 7a7471.CNF

Counted on: 1/20/94 @11:36
Detector: AEA7
Geometry number: 1
Count time: 86404. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	1174.5	1174.5	362.765	362.765	14.000	8.068	7.000	2.61[illegible]
2	311.3	311.3	304.334	304.220	18.000	10.084	9.000	3.39[illegible]
3	2032.9	2032.9	231.227	231.226	16.000	8.625	8.000	3.[illegible]
4?	14.9	14.9	141.582	141.549	114.000	1.000	57.000	0.[illegible]

PEAK RESULTS
Peak Error Limit: 25%

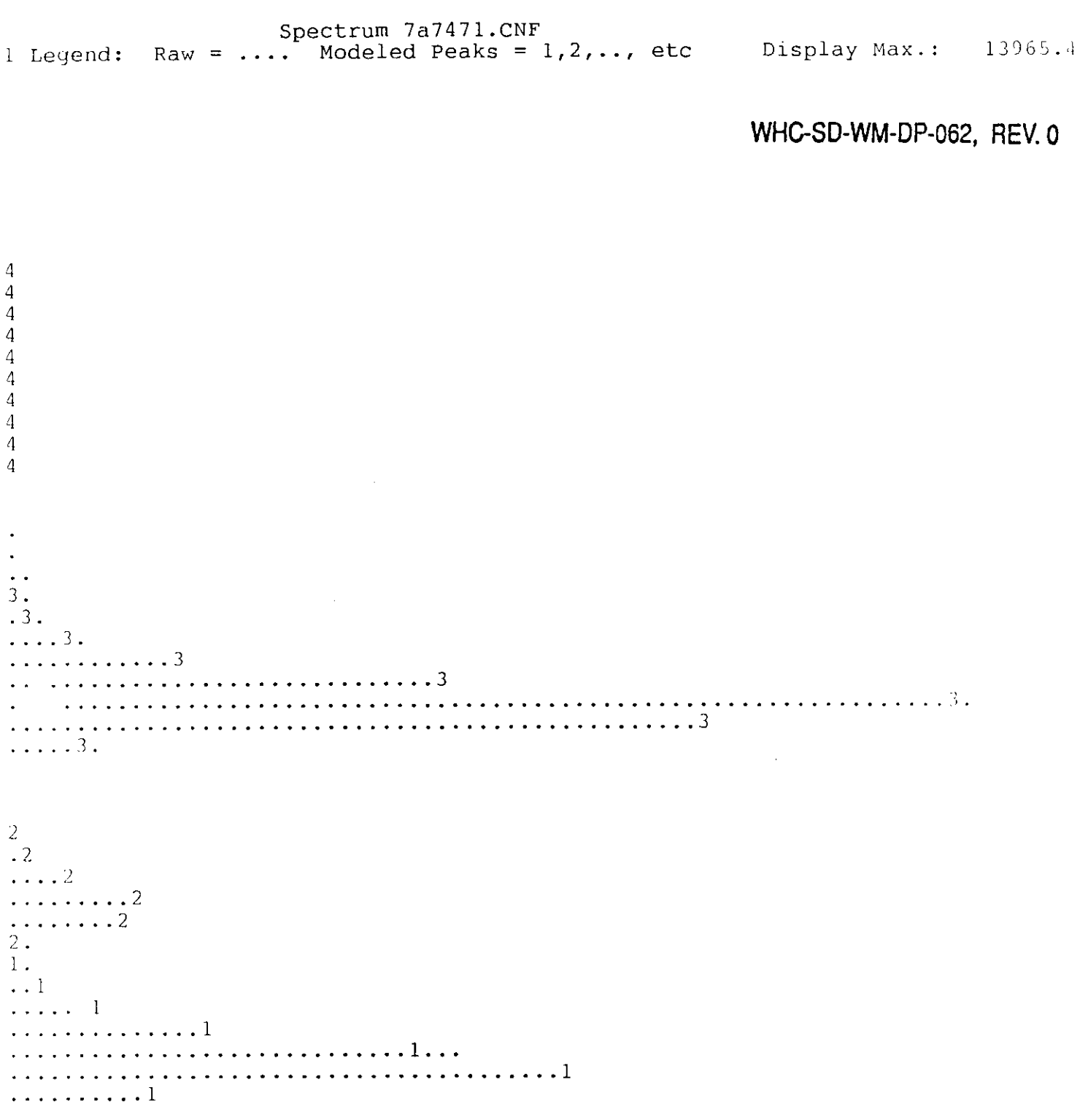
Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Cm244	0.332	5.796	5.793	0.003	0.04	15.69	1.3	159.4	0.718E-04
	Cm243		5.786	5.793	-.007				218.4	0.[illegible]E-[illegible]
2	Am241	0.091	5.480	5.518	-.038	0.05	4.32	2.6	46.7	0.[illegible]
	Pu238		5.499	5.518	-.019				61.0	0.[illegible]
3	Pu239	0.539	5.143	5.175	-.032	0.04	25.44	1.0	258.3	0.[illegible]
	Pu240		5.144	5.175	-.031				258.5	0.[illegible]
4		????		4.753			0.39	8.3		
Totals:		0.962	<--valid peaks only-->				45.45			

DETECTOR CALIBRATION
Energy(MEV) = 4.088 + (0.0047)*Channel
Energy range (MeV): 4.088 TO 6.494
Efficiency = 0.0984 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	68002.0	100.000
Smoothed	68002.0	100.000
Composite fit	66011.9	97.074
Residuals	1990.1	2.926

Analyzed by: _____
ALJ


Spectrum 7a7471.CNF
1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.: 13965.4

Raw Data Dump for AEA Spectrum: 7a7471.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
21	2.	1.	0.	1.	0.	2.	1.	0.	2.	1.
31	2.	0.	0.	3.	0.	0.	1.	1.	0.	1.
41	2.	2.	2.	0.	1.	1.	0.	1.	1.	1.
51	0.	1.	1.	1.	1.	1.	0.	2.	1.	1.
61	0.	0.	3.	2.	3.	3.	1.	3.	3.	0.
71	2.	1.	1.	2.	1.	2.	2.	1.	2.	3.
81	1.	4.	1.	3.	2.	2.	3.	2.	3.	1.
91	2.	2.	1.	0.	3.	3.	4.	1.	3.	3.
101	4.	1.	1.	4.	0.	3.	2.	2.	2.	5.
111	4.	10.	3.	9.	7.	3.	3.	7.	3.	8.
121	5.	8.	10.	9.	9.	7.	7.	8.	4.	7.
131	12.	6.	5.	6.	15.	6.	16.	11.	8.	11.
141	16.	18.	9.	11.	13.	7.	11.	18.	11.	16.
151	15.	20.	16.	16.	15.	20.	26.	23.	22.	21.
161	16.	23.	27.	24.	20.	32.	47.	37.	38.	25.
171	22.	34.	39.	43.	39.	48.	45.	37.	46.	46.
181	57.	61.	60.	66.	56.	60.	54.	68.	80.	76.
191	87.	86.	76.	80.	102.	87.	107.	130.	124.	125.
201	116.	141.	139.	170.	166.	188.	200.	200.	222.	262.
211	262.	325.	342.	372.	490.	435.	538.	632.	647.	796.
221	889.	1052.	1102.	1258.	1456.	1550.	1740.	1851.	2039.	2155.
231	2251.	2204.	1950.	1831.	1615.	1181.	901.	740.	526.	341.
241	269.	119.	80.	48.	22.	15.	16.	12.	6.	9.
251	11.	9.	14.	10.	12.	18.	11.	11.	7.	15.
261	15.	17.	13.	11.	22.	13.	22.	22.	25.	22.
271	22.	25.	37.	29.	28.	38.	31.	29.	43.	[illegible]
281	34.	36.	41.	58.	63.	63.	66.	81.	72.	[illegible]
291	113.	137.	145.	159.	168.	209.	198.	263.	266.	223.
301	311.	346.	314.	339.	346.	301.	326.	241.	228.	171.
311	152.	104.	81.	58.	50.	46.	40.	33.	32.	31.
321	37.	39.	44.	54.	61.	64.	65.	69.	62.	61.
331	94.	66.	85.	73.	100.	102.	93.	127.	146.	117.
341	164.	183.	185.	192.	224.	311.	315.	359.	382.	370.
351	567.	616.	665.	767.	778.	847.	899.	985.	1020.	1179.
361	1220.	1231.	1263.	1223.	1150.	984.	789.	609.	423.	223.
371	182.	123.	77.	25.	25.	7.	3.	1.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	1.	0.	0.	0.	0.	0.	1.	0.
421	0.	1.	0.	0.	0.	0.	0.	1.	0.	0.
431	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
471	0.	0.	0.	0.	0.	0.	1.	3.	1.	1.
481	0.	1.	1.	1.	0.	0.	0.	1.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	9.	0.								

MS 1-21-94

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT WHC-SD-WM-DP-062, REV. 0

SAMPLE
J1445-5081 SPK D
File ID: 8a8686.CNF

Counted on: 1/21/94 @14:32
Detector: AEA8
Geometry number: 1
Count time: 28801. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	88.5	88.5	356.782	355.235	26.000	19.543	13.000	3.724
2	52.2	52.2	300.381	299.508	22.000	30.879	11.000	3.405
3	312.2	312.2	226.355	225.521	18.000	13.301	9.000	2.374

PEAK RESULTS
Peak Error Limit: 25%

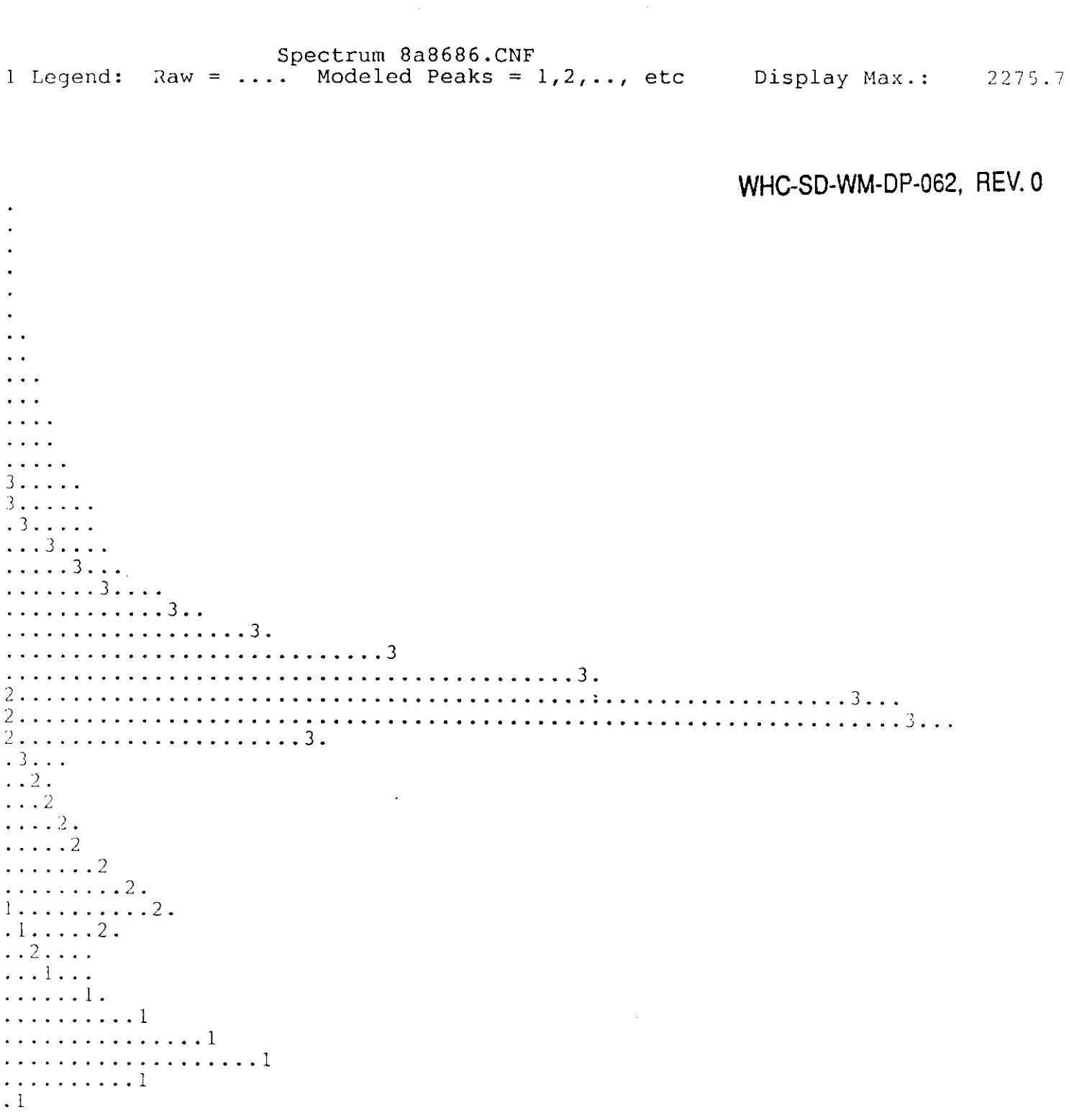
P	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/cc
1	Cm243	0.166	5.786	5.766	0.020	0.09	5.79	3.7	62.3	0.284E-04
	Pu236		5.756	5.766	-.010				46.4	0.209E-04
2	Am241	0.149	5.480	5.504	-.024	0.15	5.19	4.3	43.4	0.196E-04
	Pu238		5.499	5.504	-.005				56.7	0.256E-04
3	Pu239	0.564	5.143	5.156	-.013	0.06	19.62	2.1	154.3	0.695E-04
	Pu240		5.144	5.156	-.012				154.3	0.695E-04
Totals:		0.879	<--valid peaks only-->				30.61			

DETECTOR CALIBRATION
Energy(MEV) = 4.096 + (0.0047)*Channel
Energy range (MeV): 4.096 TO 6.503
Efficiency = 0.1272 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	16712.0	100.000
Smoothed	16710.9	99.993
Composite fit	14692.1	87.914
Residuals	2019.9	12.086

Analyzed by: _____
ALJ


Spectrum 8a8686.CNF
1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.: 2275.7

Raw Data Dump for AEA Spectrum: 8a8686.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	2.	9.	2.	5.
21	3.	4.	5.	4.	0.	2.	5.	2.	7.	2.
	2.	6.	5.	9.	1.	8.	4.	3.	7.	3.
41	5.	5.	5.	6.	8.	4.	3.	2.	2.	5.
51	6.	10.	9.	9.	7.	5.	8.	10.	5.	5.
61	4.	10.	3.	9.	6.	10.	5.	5.	9.	4.
71	4.	6.	7.	3.	8.	6.	7.	14.	11.	7.
81	5.	8.	8.	4.	10.	12.	13.	8.	12.	9.
91	13.	11.	11.	16.	13.	16.	9.	16.	10.	12.
101	11.	14.	11.	13.	15.	10.	13.	14.	22.	15.
111	20.	24.	16.	20.	21.	14.	14.	12.	13.	15.
121	19.	18.	18.	18.	17.	15.	20.	21.	27.	24.
131	26.	29.	18.	28.	29.	19.	31.	20.	31.	23.
141	29.	24.	22.	19.	30.	25.	26.	34.	31.	30.
151	37.	33.	34.	32.	29.	26.	26.	30.	32.	47.
161	39.	34.	41.	40.	35.	27.	42.	38.	33.	38.
171	42.	39.	39.	39.	42.	46.	58.	43.	47.	56.
181	60.	43.	49.	55.	61.	65.	54.	79.	66.	72.
191	64.	64.	83.	78.	80.	83.	91.	87.	81.	83.
201	110.	112.	96.	108.	125.	151.	136.	125.	160.	183.
211	177.	159.	193.	196.	224.	238.	243.	256.	249.	289.
221	294.	305.	305.	313.	335.	350.	307.	295.	295.	2[illegible].
231	239.	210.	169.	120.	91.	70.	41.	32.	31.	18.
241	18.	11.	15.	12.	21.	23.	18.	21.	15.	20.
251	12.	23.	16.	24.	21.	19.	16.	16.	19.	26.
261	24.	22.	10.	19.	19.	22.	34.	19.	43.	30.
271	27.	30.	32.	29.	31.	20.	33.	28.	22.	29.
281	26.	33.	36.	27.	41.	35.	38.	43.	38.	47.
291	33.	48.	46.	46.	59.	56.	60.	64.	51.	54.
3[illegible]	62.	64.	45.	48.	36.	53.	40.	39.	35.	31.
3[illegible]	34.	36.	24.	20.	29.	28.	36.	25.	29.	29.
321	30.	25.	40.	29.	36.	34.	31:	27.	24.	29.
331	25.	46.	53.	36.	35.	34.	46.	36.	52.	[illegible].
341	38.	49.	53.	56.	55.	63.	64.	45.	67.	[illegible].
351	67.	75.	97.	82.	110.	80.	71.	71.	70.	[illegible].
361	73.	58.	67.	39.	50.	35.	16.	8.	4.	[illegible].
371	2.	0.	0.	0.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	1.	0.	0.	0.	0.	0.	0.	0.	0.	[illegible].
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	[illegible].
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	[illegible].
471	0.	1.	0.	0.	1.	0.	0.	0.	0.	1.
481	0.	0.	0.	0.	0.	0.	0.	0.	1.	1.
491	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.
511	1.	0.								

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT

WHC-SD-WM-DP-062, REV. 0

SAMPLE
J1445-5981 SPK
File ID: 9a1496.CNF

Counted on: 1/20/94 @11:39
Detector: AEA9
Geometry number: 1
Count time: 86401. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	765.8	765.8	356.928	356.928	20.000	14.649	10.000	2.[illegible]
2	234.9	234.9	302.104	301.189	16.000	10.039	8.000	[illegible]
3	2634.1	2634.1	226.016	225.980	18.000	10.949	9.000	[illegible]
4	89.6	89.6	66.780	65.940	246.000	1.000	123.000	[illegible]
5?	34.1	34.1	28.194	26.782	34.000	42.670	17.000	20.993
6?	14.9	14.9	15.729	14.392	8.000	1.303	4.000	7.542

PEAK RESULTS
Peak Error Limit: 25%

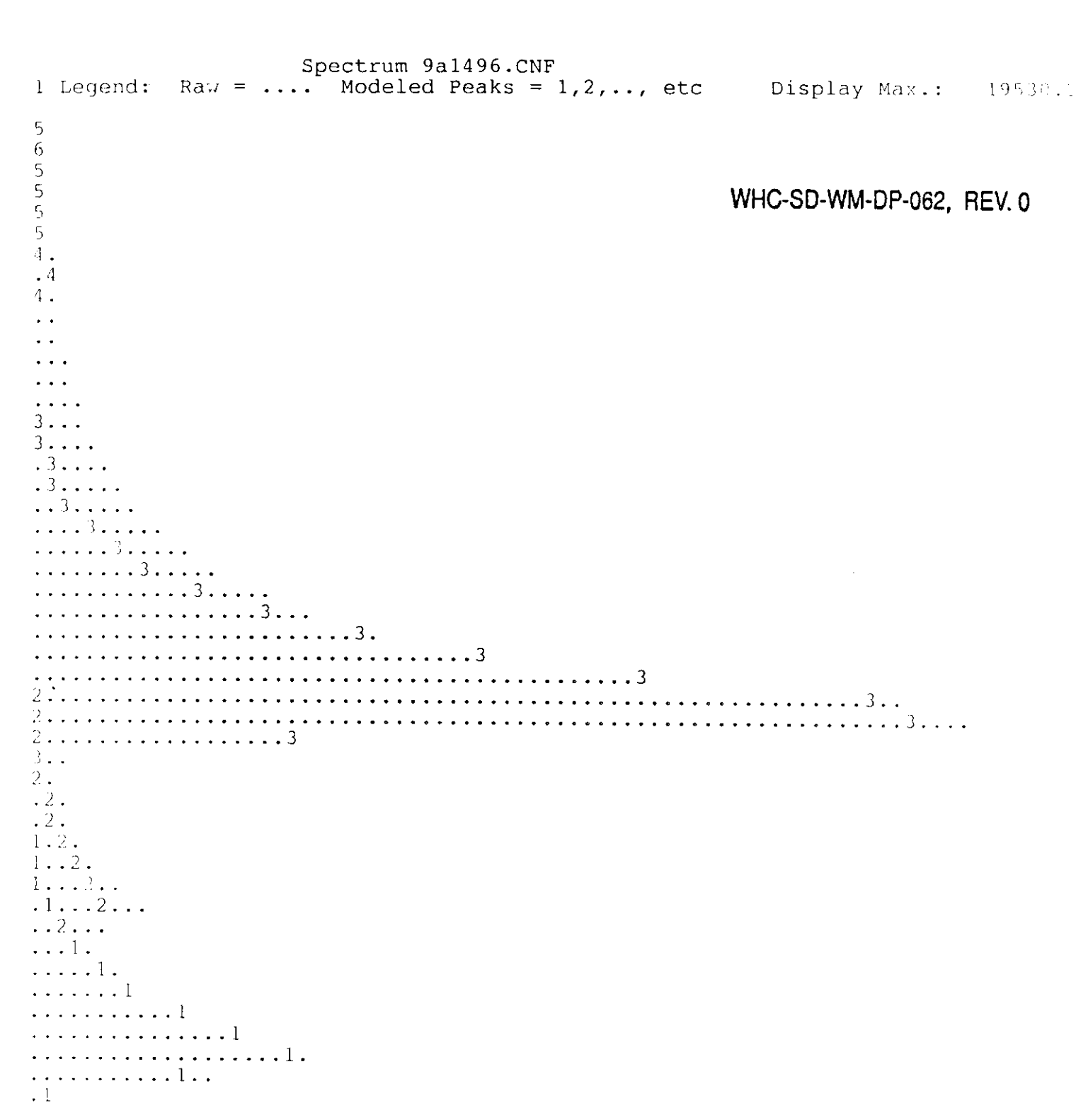
Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/[illegible]
1	Ra224	0.184	5.680	5.732	-.0520.07		19.24	1.2	142.9	[illegible]
	Pu236		5.756	5.732	0.024				137.1	[illegible]
2	Am241	0.073	5.480	5.475	0.0050.05		7.68	2.3	57.0	[illegible]
	Pu238		5.499	5.475	0.024				74.4	[illegible]
3	Pu239	0.605	5.143	5.129	0.0140.05		63.32	0.7	442.2	[illegible]
	Pu240		5.144	5.129	0.015				442.2	[illegible]
4	U 235	0.019	4.396	4.393	0.0030.00		2.01	3.8	24.7	[illegible]
5		????		4.213			0.72	11.7		
6		????		4.156			0.06	69.1		
Totals:		0.881	<--valid peaks only-->				92.25			

DETECTOR CALIBRATION
Energy(MEV) = 4.090 + (0.0046)*Channel
Energy range (MeV): 4.090 TO 6.445
Efficiency = 0.1432 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	150834.0	100.000
Smoothed	150833.8	100.000
Composite fit	133958.7	88.812
Residuals	16875.3	11.188

Analyzed by: ALJ


Spectrum 9a1496.CNF
Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.:

Raw Data Dump for AEA Spectrum: 9a1496.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	50.	43.
11	56.	56.	55.	61.	75.	58.	59.	56.	54.	42.
21	50.	57.	70.	53.	78.	57.	58.	78.	67.	62.
	63.	45.	54.	66.	58.	75.	68.	67.	79.	65.
	64.	66.	74.	73.	49.	75.	65.	70.	84.	80.
51	67.	73.	76.	76.	76.	80.	62.	84.	93.	81.
61	78.	100.	70.	87.	97.	97.	90.	87.	81.	106.
71	101.	98.	107.	90.	85.	86.	96.	109.	103.	[illegible]
81	104.	108.	86.	90.	94.	113.	132.	107.	113.	[illegible]
91	118.	104.	117.	115.	128.	140.	132.	136.	136.	[illegible]
101	150.	148.	149.	149.	140.	152.	136.	167.	145.	169.
111	156.	161.	166.	150.	144.	189.	194.	166.	172.	183.
121	197.	191.	209.	190.	208.	214.	192.	208.	204.	243.
131	211.	244.	251.	237.	256.	246.	222.	281.	244.	246.
141	280.	277.	297.	257.	299.	289.	301.	347.	308.	330.
151	288.	301.	341.	354.	369.	352.	340.	431.	387.	397.
161	404.	432.	414.	457.	413.	489.	501.	478.	498.	470.
171	494.	548.	529.	565.	538.	594.	605.	615.	630.	625.
181	604.	664.	709.	699.	704.	703.	764.	790.	806.	[illegible]
191	818.	844.	858.	861.	863.	928.	950.	998.	974.	[illegible]
201	1093.	1115.	1127.	1188.	1199.	1265.	1396.	1330.	1456.	[illegible]
211	1503.	1643.	1668.	1734.	1806.	1895.	2062.	2208.	2245.	[illegible]
221	2133.	2533.	2624.	2709.	2801.	2770.	2763.	2554.	2670.	[illegible]
231	2106.	1662.	1358.	838.	587.	322.	200.	118.	97.	[illegible]
241	90.	75.	80.	83.	75.	90.	95.	88.	88.	81.
251	95.	95.	91.	107.	114.	100.	115.	96.	115.	113.
261	97.	127.	130.	114.	108.	111.	133.	141.	136.	130.
271	142.	145.	149.	170.	151.	147.	167.	177.	172.	180.
281	183.	160.	222.	199.	214.	225.	248.	222.	225.	265.
291	286.	251.	276.	293.	295.	332.	296.	332.	319.	[illegible]
301	344.	334.	342.	341.	298.	279.	219.	227.	175.	[illegible]
311	177.	167.	181.	208.	207.	187.	180.	189.	215.	[illegible]
321	228.	237.	233.	246.	255.	249.	272.	291.	277.	[illegible]
331	332.	312.	293.	345.	323.	321.	375.	373.	420.	[illegible]
341	416.	433.	449.	465.	496.	545.	559.	608.	612.	[illegible]
351	679.	701.	683.	743.	833.	800.	785.	778.	776.	[illegible]
361	770.	675.	615.	524.	445.	305.	161.	81.	34.	[illegible]
371	6.	2.	2.	2.	1.	0.	1.	0.	1.	[illegible]
381	0.	1.	0.	0.	1.	0.	0.	1.	0.	[illegible]
391	0.	0.	0.	0.	0.	0.	0.	1.	1.	[illegible]
401	0.	0.	1.	0.	2.	1.	0.	0.	0.	[illegible]
411	0.	0.	1.	0.	0.	0.	1.	0.	0.	[illegible]
421	0.	1.	1.	1.	0.	0.	0.	0.	0.	[illegible]
431	0.	0.	1.	0.	1.	0.	0.	0.	0.	[illegible]
441	0.	0.	0.	0.	0.	0.	0.	1.	0.	[illegible]
451	1.	0.	0.	0.	0.	0.	0.	0.	0.	[illegible]
461	1.	0.	0.	1.	0.	1.	0.	0.	3.	0.
471	0.	1.	1.	1.	1.	0.	0.	1.	0.	0.
481	0.	1.	0.	0.	0.	0.	1.	0.	0.	0.
491	0.	1.	0.	0.	0.	1.	1.	0.	0.	0.
511	0.	0.								

2561

WESTINGHOUSE HANFORD COMPANY

222-S LABORATORY

ANALYTICAL BATCH

WHC-SD-WM-DP-062, REV. 0

Lab Segment Serial No. J1446	Customer ID: KEESD
Analysis: Pu 239/40	Sample Prep: Direct

Instrument: LUB 537237	Procedure/ Rev: LA 552-3- [illegible] D-C
Technologist: [illegible]	Date: 1-21-94
Starting Time: 0900	Temperature 25°C
Ending Time: 1400	Chemist: L Fe Hs

Comments: _____

	Description	Lab ID
1	INITIAL LMCS CHECK STD	J1447-550
2	REAGENT BLANK	J144E-568
3	Sample	J1446-57E
4	Sample Dup	J1446 57E1
5	Sample Dup	J1446 57E
6	Spike	J1446-5CE1
7	Spike Dup	J1446-5CE1
8		
9		
10		

	Description	Lab ID
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS	163843	.100-10-	.100	
Spike	177843	.05mL		

A-6000-[illegible] (03/93)

ANALYTICAL BATCH SUMMARY SHEET

METHOD: **LA-503-156**

DATE START: **January 21, 1994**

PREPARED BY: **L.L. Fritts** L.L. Fritts 1.25.94

DATE COMPLETE: **January 25, 1994**

	UNITS:	uCi/mL									
SPL NAME	SPL ID	ANALYTE	RESULT #1	RESULT #2	RESULT #3	AVERAGE	2*SD	PREC	%REC	DET LIM	% CT ER
STD 63B43	J1447	Pu-239/40	1.22E+2						93.5	1.44E-2	1.7
BLANK	J1448	Pu-239/40	<1.76E-3						50.0	1.76E-3	100.0
KE83D	J1446	Pu-239/40	3.86E-2	4.15E-2	3.91E-2	3.97E-2	3.10E-3	7.8	78.4	2.73E-3	1.6
									37.5	6.37E-3	1.8
									53.5	4.01E-3	1.5
KE83D	J1446	239 Spike	99.0	107.8							
STD 63B43	J1447	Pu-238	<1.75E-2						N/A	1.75E-2	100.0
BLANK	J1448	Pu-238	<2.77E-3						50.0	2.77E-3	100.0
KE83D	J1446	Pu-238	5.49E-3	8.23E-3	5.56E-3	6.43E-3	3.12E-3	48.6	78.4	3.74E-3	2.7
									37.5	7.38E-3	2.7
									53.5	5.02E-3	2.5

NARRATIVE: ☐ NO SPECIAL PROBLEMS/METHOD VARIATIONS IN THIS BATCH

LIST SPECIFIC PROBLEMS/VARIATIONS FOR THIS BATCH:

The results for the standard are in uCi/L.

The results for the spike are in percent recovery.

The Pu-238 results are outside control limits. However results are close to detection limits--no rerun requested!

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

#2 2550 Batch 2561

Serial No	Sample Point	Date	Time Issued	Priority
J 1447.-5581	BECHTOLD	1- 4-94	13:50	26

Determination	Method Standard	Result Units	Charge Code	Reruns
Pu239/40	LA-503-156	% RECOVERY	E14157	1

Sample Size	Customer ID
? ,100-10-.100mL	STD

Remarks, Calculations, Results

EDP R211 AR001 RERUN

STD# 63B43 RESULT 1.22 E+2

STD VAL. 1.305 E+2 %REC 93.5%

24HR2

"AEA" -

ATTACH PRINTOUT

105mL 77B43

WHC-SD-WM-DP-062, REV. 0

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs 1-22-94 + 1-23-94	Hrs	Hrs
Date 1-21-94	Time Completed	Lab Unit Mgr		

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

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

Serial No.	Date Counted		01/22/94	Pu 236 AEA Frac. (C236)	STANDARD
J1447-5581	Sample Volume in mL	(SS)	0.100	Pu 238 AEA Frac. (C238)	0
Batch ID	Sample D.F.	(DF)	101	Pu 239 AEA Frac. (C239)	0.543
2561	Tracer Volume in mL	(SPKV)	0.050	Total AT Counts	6988
Rerun No.	Digest D.F.	(DDF)	1	AT Count Time (min) (TC)	60
1	Tracer Book No.		77B43	Background in cpm (Bkg)	1
Analyst	Tracer Preparation Date		10/12/93	Pu 236 cpm	15.12
J VAN SANT	Pu-236 Preparation Value	(dpm/mL)	3226	Pu 238 cpm	0
Date	Pu-236 Decay Corr'd value	(dpm/mL)	3014.17	Pu 239 cpm	26.93
01/21/94	Pu-238 Tracer Value	(dpm/mL)	133	AEA Count Time (min)	1440
Sample Type					
LIQUID	<<<<<<<<< Enter a Sample Type <<<<<<<<<			Pu 239/240 µCi/L	1.2207E+02

Decay Time = Date Counted - Tracer Preparation Date

Pu-238 Decay Corr'd Value = Pu-238 Preparation Value * 'e to the power of [(-ln2 * Decay Time) / 1040.95)]

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SPKV

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

Pu 238 dpm = [(Total AT Counts / TC) - Bkg * 2 * C238] - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / [Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS]

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

Pu 239/240	µCi/mL	=	1.22E-01	DETECTION LEVELS in µCi/mL
Relative Counting Error		=	1.7%	
NOTE: Pu 238 Result is a LESS THAN Value.				Pu 239/240 1.44E-02
Pu 238	µCi/mL	=	< 1.75E-02	
Relative Counting Error		=	100.0%	Pu 238 1.75E-02
Pu 236 Tracer Recovery		=	46.7%	

Data Entry by: Date: 24-Jan-94

Approved by: Date: 25 Jan 1994

Form 5 Rev. 1

584

Page 1 of 1

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

P2 1-21-94 mb

6988 - 1
60

J1447-5581
#2

WHC-SD-WM-DP-062, REV. 0

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

#3 3610

Serial No	Sample Point	Date	Time Issued	Priority
J 1448.-5681	BECHTOLD	1- 4-94	13:52	26

Determination	Method Standard	Result Units	Charge Code	Reruns
Pu239/40	LA-503-156	uCi/ML	E14157	1

Sample Size	Customer ID
? ~~1mL~~ .1ml-10ml-.3ml 1-25-94	BLANK

Remarks Calculations Results

REAGENT BLANK

COUNT AS uCI/L

.05mL 77B43

RERUN 24HR "AEA" - ~~430~~MIN ATTACH PRINTOUT

$< 1.76 \times 10^{-3}$ uCi/ml

WHC-SD-WM-DP-062, REV. 0

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
VanSant	[signature]	[signature]		
Hrs	Hrs	Hrs 1-22-94 + 1-23-94	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1-21-94		[signature]	[signature]

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

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

					BLANK
Serial No.	Date Counted	01/22/94	Pu 236 AEA Frac.	(C236)	0.779
J1448-5681	Sample Volume in mL (SS)	0.300	Pu 238 AEA Frac.	(C238)	0
Batch ID	Sample D.F. (DF)	101	Pu 239 AEA Frac.	(C239)	0
2561	Tracer Volume in mL (SPKV)	0.050	Total AT Counts		3144
Rerun No.	Digest D.F. (DDF)	1	AT Count Time (min)	(TC)	60
1	Tracer Book No.	77B43	Background in cpm	(Bkg)	4
Analyst	Tracer Preparation Date	10/12/93	Pu 236 cpm		18.45
J VAN SANT	Pu-236 Preparation Value (dpm/mL)	3226	Pu 238 cpm		0
Date	Pu-236 Decay Corr'd value (dpm/mL)	3014.17	Pu 239 cpm		0
01/21/94	Pu-238 Tracer Value (dpm/mL)	133	AEA Count Time	(min)	1440
Sample Type					
LIQUID	<<<<<<<<< Enter a Sample Type <<<<<<<<<		Pu 239/240 µCi/L =	<	1.7591E+00

Decay Time = Date Counted - Tracer Preparation Date

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

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SPKV

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

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-238 Tracer Value * SPKV * Pu 238 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

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

NOTE: Pu 239\240 Result is a LESS THAN Value.

Pu 239/240	µCi/mL	=	< 1.76E-03	DETECTION LEVELS in µCi/mL
Relative Counting Error		=	100.0%	
NOTE: Pu 238 Result is a LESS THAN Value.				Pu 239/240 1.76E-03
Pu 238	µCi/mL	=	< 2.77E-03	
Relative Counting Error		=	100.0%	Pu 238 2.77E-03
Pu 236 Tracer Recovery		=	50.0%	

Data Entry by:	[signature]	Date:	25-Jan-94
Approved by:	[signature]	Date:	25 Jan 1994

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#3 1-21-94 MD

J1448-5681
#3

3144/60 -4

WHC-SD-WM-DP-062, REV. 0

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

WHC-SD-WM-DP-062, REV. 0

#4 4118

Serial No	Sample Point	Date	Time Issued	Priority
J 1446.-5781	BECHTOLD	1- 4-94	12:26	26

Determination	Method Standard	Result Units	Charge Code	Reruns
Pu239/40	LA-503-156	uCi/ML	E14157	1

Sample Size	Customer ID
? .1mL-10-.300mL	KE83D

Remarks, Calculations, Results SAMPLE

COUNT AS uCI/L

RERUN

.05mL 77B43

3.86×10^{-2} uCi/ml

24 HR

"AEA" [illegible]

ATTACH PRINTOUT

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
[signature]	[signature]	[signature]		
Hrs	Hrs	Hrs 1-22-94 + 1-23-94	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1-21-94		[signature]	[signature]

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

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

					SAMPLE
Serial No.	Date Counted	01/22/94	Pu 236 AEA Frac.	(C236)	0.32
J1446-5781	Sample Volume in mL (SS)	0.300	Pu 238 AEA Frac.	(C238)	0.091
Batch ID	Sample D.F. (DF)	101	Pu 239 AEA Frac.	(C239)	0.541
2561	Tracer Volume in mL (SPKV)	0.050	Total AT Counts		11317
Rerun No.	Digest D.F. (DDF)	1	AT Count Time (min)	(TC)	60
1	Tracer Book No.	77B43	Background in cpm	(Bkg)	4
Analyst	Tracer Preparation Date	10/12/93	Pu 236 cpm		16.81
VAN SANT	Pu-236 Preparation Value (dpm/mL)	3226	Pu 238 cpm		4.76
Date	Pu-236 Decay Corr'd value (dpm/mL)	3014.17	Pu 239 cpm		28.35
01/21/94	Pu-238 Tracer Value (dpm/mL)	133	AEA Count Time	(min)	1440
Sample Type					
LIQUID	<<<<<<<<< Enter a Sample Type <<<<<<<<<		Pu 239/240 µCi/L		3.8640E+01

Decay Time = Date Counted - Tracer Preparation Date

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

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SPKV

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

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

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

				DETECTION LEVELS in µCi/mL
Pu 239/240	µCI/mL	=	3.86E-02	
Relative Counting Error		=	1.6%	
				Pu 239/240
Pu 238	µCI/mL	=	5.49E-03	2.73E-03
Relative Counting Error		=	2.7%	Pu 238
Pu 236 Tracer Recovery		=	78.4%	3.74E-03

Data Entry by:	[signature]	Date:	24-Jan-94
Approved by:	[signature]	Date:	25 Jan 1994

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Form 5 Rev. 1

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#3 1-21-94 MB

11317-4/
60

J1446-5781
#4

WHC-SD-WM-DP-062, REV. 0

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

#5 5039

Serial No	Sample Point	Date	Time Issued	Priority
J 1446.-5781	BECHTOLD	1- 4-94	12:26	26

Determination	Method Standard	Result Units	Charge Code	Reruns
Pu239/40	LA-503-156	uCi/ML	E14157	2

Sample Size	Customer ID
? .100mL - 10 - .300mL	KE83D

Remarks Calculations Results DUP

RERUN

COUNT AS uCI/L

.05mL 77B43 4.15×10^{-2} uCi/ml "AEA" 24HR ~~48 MIN~~ PRINTOUT

WHC-SD-WM-DP-062, REV. 0

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs 1-22-94 + 1-23-94	Hrs	Hrs
Date 1-21-94	Time Completed	Lab Unit Mgr		

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

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

Serial No.	Date Counted		01/22/94	Pu 236 AEA Frac.	(C236)	SAMPLE 0.287
J1446-5781	Sample Volume in mL	(SS)	0.300	Pu 238 AEA Frac.	(C238)	0.116
Batch ID	Sample D.F.	(DF)	101	Pu 239 AEA Frac.	(C239)	0.521
2561	Tracer Volume in mL	(SPKV)	0.050	Total AT Counts		6445
Rerun No.	Digest D.F.	(DDF)	1	AT Count Time (min)	(TC)	60
1	Tracer Book No.		77B43	Background in cpm	(Bkg)	9
Analyst	Tracer Preparation Date		10/12/93	Pu 236 cpm		13.04
VAN SANT	Pu-236 Preparation Value	(dpm/mL)	3226	Pu 238 cpm		5.29
Date	Pu-236 Decay Corr'd value	(dpm/mL)	3014.17	Pu 239 cpm		23.72
01/21/94	Pu-238 Tracer Value	(dpm/mL)	133	AEA Count Time	(min)	1440
Sample Type						
LIQUID	<<<<<<<<< Enter a Sample Type <<<<<<<<<			Pu 239/240 µCi/L		4.1490E+01

Decay Time = Date Counted - Tracer Preparation Date

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

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SPKV

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

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

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

				DETECTION LEVELS in µCi/mL
Pu 239/240	µCi/mL	=	4.15E-02	
Relative Counting Error		=	1.8%	
				Pu 239/240 6.37E-03
Pu 238	µCi/mL	=	8.23E-03	
Relative Counting Error		=	2.7%	Pu 238 7.38E-03
Pu 236 Tracer Recovery		=	37.5%	

Data Entry by: Date: 24-Jan-94

Approved by: Date: 25 Jan 1994

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PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#1 1-21-94 mb

J1446-5781
#5

6445
60 - 9

WHC-SD-WM-DP-062, REV. 0

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

#6 6949

Serial No	Sample Point	Date	Time Issued	Priority
J 1446.-5781	BECHTOLD	1- 4-94	13:26	20

Determination	Method/Standard	Result Units	Charge Code	Reruns
Pu239/40	LA-503-156	uCi/ML	E14157	3

Sample Size	Customer ID
? .100mL -10- .300mL	KE83D

Remarks Calculations Results TRIP

COUNT AS uCI/L

RERUN

.05mL 77B43

"AEA" - 45 MIN 24 HR

ATTACH PRINTOUT

WHC-SD-WM-DP-062, REV. 0 3.91×10^{-2} uCi/ml

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs 1-22-94 +1-23-94	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1-21-94			

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

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

Serial No.						SAMPLE
J1446-5781	Date Counted		01/22/94	Pu 236 AEA Frac.	(C236)	0.32
Batch ID	Sample Volume in mL	(SS)	0.300	Pu 238 AEA Frac.	(C238)	0.092
2561	Sample D.F.	(DF)	101	Pu 239 AEA Frac.	(C239)	0.548
Rerun No.	Tracer Volume in mL	(SPKV)	0.050	Total AT Counts		7796
1	Digest D.F.	(DDF)	1	AT Count Time (min)	(TC)	60
Analyst	Tracer Book No.		77B43	Background in cpm	(Bkg)	4
VAN SANT	Tracer Preparation Date		10/12/93	Pu 236 cpm		19
Date	Pu-236 Preparation Value	(dpm/mL)	3226	Pu 238 cpm		5.46
01/21/94	Pu-236 Decay Corr'd value	(dpm/mL)	3014.17	Pu 239 cpm		32.52
Sample Type	Pu-238 Tracer Value	(dpm/mL)	133	AEA Count Time	(min)	1440
LIQUID	<<<<<<<<< Enter a Sample Type <<<<<<<<<			Pu 239/240 µCi/L		3.9139E+01

Decay Time = Date Counted - Tracer Preparation Date

Pu-238 Decay Corr'd Value = Pu-238 Preparation Value * e to the power of {(-ln2 * Decay Time) / 1040.95 }

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SPKV

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

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

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

				DETECTION LEVELS in µCi/mL
Pu 239/240	µCI/mL	=	3.91E-02	
Relative Counting Error		=	1.5%	
				Pu 239/240 4.01E-03
Pu 238	µCI/mL	=	5.56E-03	
Relative Counting Error		=	2.5%	Pu 238 5.02E-03
Pu 236 Tracer Recovery		=	53.5%	

Data Entry by:	Date:	24-Jan-94
Approved by:	Date:	25 Jan 1994

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

EB 1-21-94 m03

7796

~~11317~~ -4

60

J1446-5781
#6

WHC-SD-WM-DP-062, REV. 0

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

#7 7476

Serial No	Sample Point	Date	Time Issued	Priority
J 1446.-5081	BECHTOLD	1- 4-94	12:26	26

Determination	Method/Standard	Result Units	Charge Code	Reruns
PU239/24	LA-503-156	% RECOVERY	E14157	1

Sample Size	Customer ID
? .100mL-10-.300mL	KE83D

Remarks Calculations Results

SAMPLE SPIKED ID 63B43 .100-10-.100mL

RERUN

SPIKE ID 77B43

SPIKE VOLUME COUNT AS uCI/L .05mL 99.0% 24HR

"AEA" ATTACH PRINTOUT

WHC-SD-WM-DP-062, REV. 0

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
[signature]	[signature]	[signature]		
Hrs	Hrs	Hrs 1-22-94 + 1-23-94	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1-21-94		[signature]	[signature]

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

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

Serial No.	Date Counted		01/22/94	Pu 236 AEA Frac. (C236)	ERR
J1446-5081	Sample Volume in mL	(SS)	0.300	Pu 238 AEA Frac. (C238)	0.068
Batch ID	Sample D.F.	(DF)	101	Pu 239 AEA Frac. (C239)	0.64
2561	Tracer Volume in mL	(SPKV)	0.050	Total AT Counts	11771
Rerun No.	Digest D.F.	(DDF)	1	AT Count Time (min) (TC)	60
1	Tracer Book No.		77B43	Background in cpm (Bkg)	1
Analyst	Tracer Preparation Date		10/12/93	Pu 236 cpm	13.39
J VAN SANT	Pu-236 Preparation Value	(dpm/mL)	3226	Pu 238 cpm	5.11
Date	Pu-236 Decay Corr'd value	(dpm/mL)	3014.17	Pu 239 cpm	47.75
01/21/94	Pu-238 Tracer Value	(dpm/mL)	133	AEA Count Time (min)	1440
Sample Type					
LIQUID	<<<<<<<<< Enter a Sample Type <<<<<<<<<			Pu 239/240 µCi/L	8.1717E+01

Decay Time = Date Counted - Tracer Preparation Date

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

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SPKV

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

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

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

				DETECTION LEVELS in µCi/mL
Pu 239/240	µCi/mL	=	8.17E-02	
Relative Counting Error		=	1.6%	
NOTE: Pu 238 Result is a LESS THAN Value.				Pu 239/240 8.26E-03
Pu 238	µCi/mL	=	< 9.27E-03	
Relative Counting Error		=	2.7%	Pu 238 9.27E-03
Pu 236 Tracer Recovery		=	46.4%	

Data Entry by:	[signature]	Date:	25-Jan-94
Approved by:	[signature]	Date:	

(81.717 - 38.640)(101/.1)(101/.3)(100) = 99.0% 2.10.94

130.5

Form 5 Rev. 1

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Page 1 of 1

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#2 1-21-94 mb

11771

~~6986~~ - 1

60

J 1446-5081

#7

WHC-SD-WM-DP-062, REV. 0

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

#8 8689

Serial No	Sample Point	Date	Time Issued	Priority
J 1446.-5981	BECHTOLD	1- 4-94	12:26	26

Determination	Method Standard	Result Units	Charge Code	Reruns
Pu239/24	LA-503-156	% RECOVERY	S14157	1

Sample Size: ? ,100mL-10-.300mL

Customer ID: KE&SD

Remarks Calculations Results DUP

SAMPLE SPIKED ID 63B43 .100-10 ~~RERUN~~ mL

SPIKE ID 77B43

SPIKE VOLUME COUNT AS µCi/L .05mL

"AEA" 24 HR

WHC-SD-WM-DP-062, REV. 0 107.8% ATTACH PRINTOUT

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs 1-22-94 1-23-94	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
1-21-94		

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

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

CHK EXT NO.

Serial No.	Date Counted		01/22/94	Pu 236 AEA Frac.	(C236)	0.121
J1446-5981	Sample Volume in mL	(SS)	0.300	Pu 238 AEA Frac.	(C238)	0
Batch ID	Sample D.F.	(DF)	101	Pu 239 AEA Frac.	(C239)	0.468
2561	Tracer Volume in mL	(SPKV)	0.050	Total AT Counts		672
Rerun No.	Digest D.F.	(DDF)	1	AT Count Time (min)	(TC)	60
1	Tracer Book No.		77B43	Background in cpm	(Bkg)	9
Analyst	Tracer Preparation Date		10/12/93	Pu 236 cpm		0.16
VAN SANT	Pu-236 Preparation Value	(dpm/mL)	3226	Pu 238 cpm		0
Date	Pu-236 Decay Corr'd value	(dpm/mL)	3014.17	Pu 239 cpm		0.6
01/21/94	Pu-238 Tracer Value	(dpm/mL)	133	AEA Count Time	(min)	1440
Sample Type						
LIQUID	<<<<<<<<< Enter a Sample Type <<<<<<<<<			Pu 239/240 µCi/L		8.8398E+01

Decay Time = Date Counted - Tracer Preparation Date

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

Pu 238 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C238 * 100 / Pu-236 Decay Corr'd Value * SPKV

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

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C2381 - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

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

Pu 239/240	µCi/mL	=	8.84E-02	DETECTION LEVELS in µCi/mL
Relative Counting Error		=	14.5%	
NOTE: Pu 238 Result is a LESS THAN Value.				Pu 239/240 5.67E-02
Pu 238	µCi/mL	=	< 5.77E-02	
Relative Counting Error		=	100.0%	Pu 238 5.77E-02
Pu 236 Tracer Recovery		=	0.4%	

Data Entry by:		Date:	24-Jan-94
Approved by:		Date:	25 Jan 1994

Form 5 Rev. 1

5P6

8.8398+01 = (100)(T/T)(T/101)(64.4-8.8)(.3/.1)(1/1)(1/.468)(1/.121)(1/.001)

130.5

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

BI 1-21-94 MS

672 - 9
60

J1446-5981
#8

WHC-SD-WM-DP-062, REV. 0

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT

WHC-SD-WM-DP-062, REV. 0

SAMPLE
J1447-5581 STD
File ID: 2a2550.CNF

Counted on: 1/22/94 @10:11
Detector: AEA2
Geometry number: 1
Count time: 86402. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	836.1	836.1	359.529	359.502	24.000	16.979	12.000	4.366
2	54.3	54.3	266.800	264.430	100.000	1.000	50.000	0.100
3	1542.8	1542.8	228.927	228.063	20.000	15.039	10.000	3.898
4?	10.3	10.3	33.398	31.973	336.000	51.361	168.000	176.449

PEAK RESULTS
Peak Error Limit: 25%

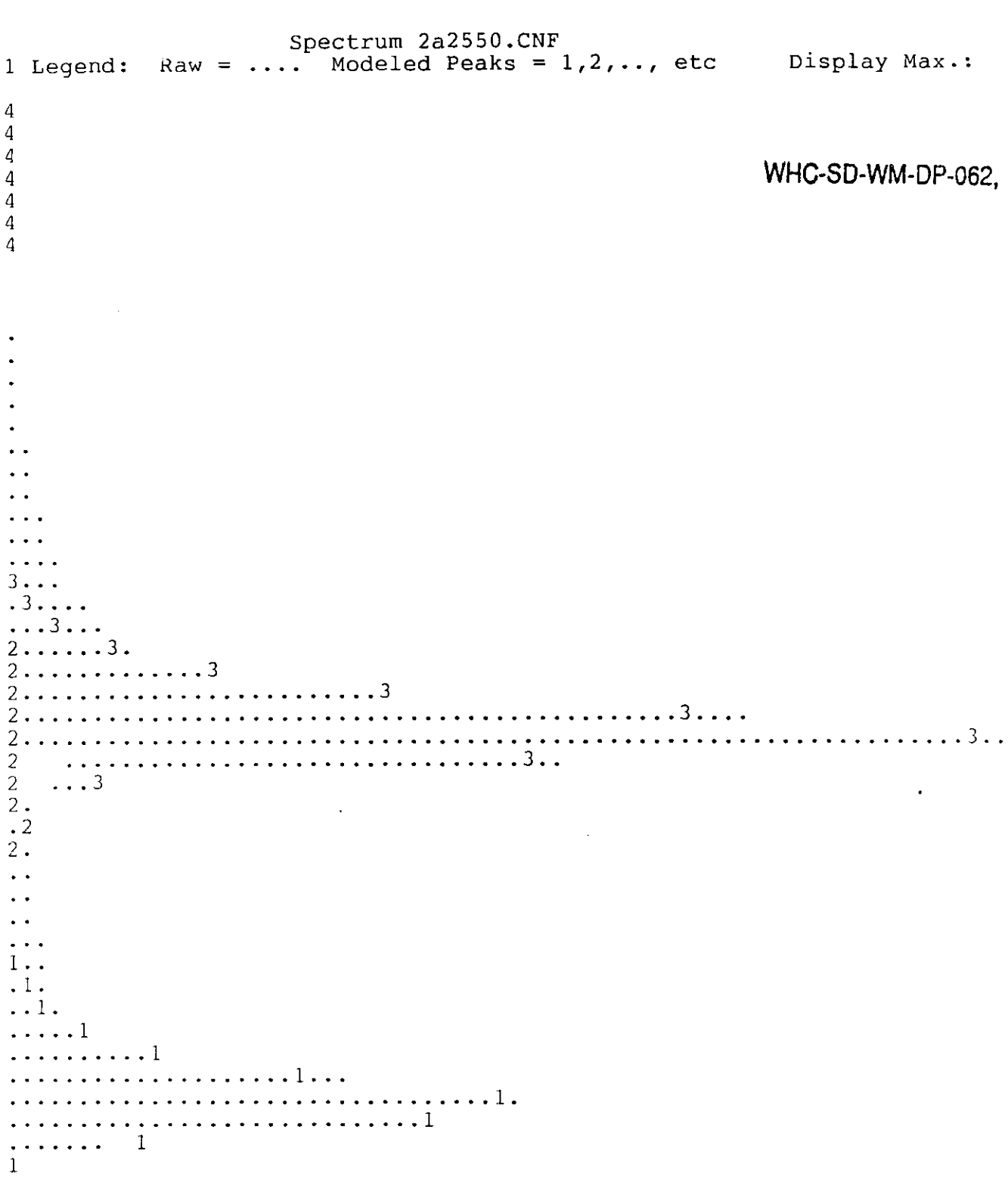
Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Cm243	0.305	5.786	5.776	0.010	0.08	15.12	1.3	176.9	0.797E-04
	Cm244		5.796	5.776	0.020				129.2	0.582E-04
2		0.029		5.330	0.00		1.46	4.3	12.4	0.560E-05
3	Pu239	0.543	5.143	5.159	-.016	0.07	26.93	1.0	230.0	0.104E-03
	Pu240		5.144	5.159	-.015				230.0	0.104E-03
4		????		4.237			0.24	10.6		
Totals:		0.878	<--valid peaks only-->				43.51			

DETECTOR CALIBRATION
Energy(MEV) = 4.087 + (0.0047)*Channel
Energy range (MeV): 4.087 TO 6.493
Efficiency = 0.1171 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	71368.0	100.000
Smoothed	71368.0	100.000
Composite fit	63001.8	88.277
Residuals	8366.2	11.723

Analyzed by: _____
ALJ


Spectrum 2a2550.CNF
1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.: 12038.8

Raw Data Dump for AEA Spectrum: 2a2550.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	3.	4.	7.	6.
21	6.	7.	6.	5.	5.	9.	8.	7.	8.	5.
31	16.	10.	10.	9.	7.	10.	3.	6.	8.	6.
41	11.	8.	10.	17.	3.	7.	9.	16.	12.	9.
51	12.	6.	18.	15.	12.	21.	15.	14.	9.	13.
61	12.	22.	18.	19.	14.	14.	9.	21.	13.	19.
71	20.	22.	26.	16.	15.	20.	10.	20.	20.	19.
81	19.	12.	29.	20.	29.	22.	27.	28.	29.	27.
91	22.	38.	25.	22.	26.	20.	30.	30.	38.	18.
101	36.	23.	28.	38.	34.	38.	24.	28.	41.	48.
111	43.	44.	33.	41.	34.	37.	36.	45.	39.	38.
121	38.	53.	40.	41.	45.	42.	44.	52.	48.	53.
131	48.	49.	58.	47.	59.	58.	51.	63.	58.	61.
141	56.	69.	50.	59.	66.	62.	57.	62.	68.	74.
151	63.	81.	89.	79.	82.	79.	74.	85.	82.	87.
161	83.	85.	91.	99.	101.	98.	108.	86.	109.	96.
171	118.	89.	116.	92.	119.	119.	122.	124.	143.	145.
181	138.	146.	146.	136.	138.	146.	152.	164.	170.	149.
191	148.	166.	173.	214.	205.	201.	213.	237.	231.	222.
201	275.	295.	320.	282.	303.	364.	380.	445.	416.	487.
211	539.	585.	667.	666.	761.	779.	927.	985.	1045.	1122.
221	1317.	1352.	1432.	1504.	1571.	1584.	1649.	1606.	1627.	1548.
231	1508.	1319.	1263.	1059.	949.	749.	627.	497.	395.	279.
241	210.	137.	102.	77.	58.	42.	40.	43.	42.	44.
251	43.	43.	44.	49.	49.	45.	51.	43.	44.	38.
261	59.	50.	54.	58.	47.	54.	47.	54.	71.	47.
271	45.	40.	34.	41.	42.	49.	47.	41.	29.	50.
281	52.	44.	36.	43.	58.	43.	50.	59.	67.	66.
291	66.	57.	45.	63.	61.	57.	68.	63.	75.	81.
301	68.	96.	70.	77.	84.	87.	69.	70.	69.	78.
311	72.	73.	86.	68.	70.	81.	76.	75.	76.	83.
321	83.	95.	112.	115.	95.	96.	96.	109.	142.	106.
331	136.	118.	142.	143.	169.	168.	173.	229.	243.	244.
341	281.	296.	320.	383.	401.	419.	513.	494.	561.	658.
351	676.	697.	748.	824.	811.	870.	821.	927.	811.	816.
361	841.	783.	710.	689.	574.	469.	437.	314.	272.	190.
371	139.	93.	66.	43.	34.	18.	16.	7.	3.	3.
381	1.	1.	1.	0.	1.	0.	0.	0.	0.	0.
391	0.	1.	0.	0.	0.	0.	2.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
411	2.	0.	0.	2.	0.	1.	0.	0.	2.	0.
421	0.	0.	1.	0.	1.	0.	1.	0.	1.	1.
431	1.	1.	1.	1.	0.	2.	0.	3.	0.	0.
441	1.	0.	0.	0.	0.	0.	1.	0.	1.	0.
451	0.	0.	1.	1.	0.	3.	0.	2.	1.	0.
461	2.	1.	1.	2.	1.	1.	5.	2.	2.	1.
471	1.	4.	4.	5.	3.	4.	1.	3.	3.	0.
481	1.	0.	1.	1.	2.	1.	2.	1.	0.	0.
491	1.	1.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT

WHC-SD-WM-DP-062, REV. 0

SAMPLE
J1448-5681 BLK
File ID: 3a3610.CNF

Counted on: 1/22/94 @10:11
Detector: AEA3
Geometry number: 1
Count time: 86401. Sec

PEAK ANALYSIS

Peak	Peak height		Peak center		FWHM		Tau	
ID	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	593.8	593.8	361.245	362.520	20.000	13.764	10.000	1.418
2	24.1	24.1	166.235	165.334	308.000	1.000	154.000	0.100

PEAK RESULTS
Peak Error Limit: 25%

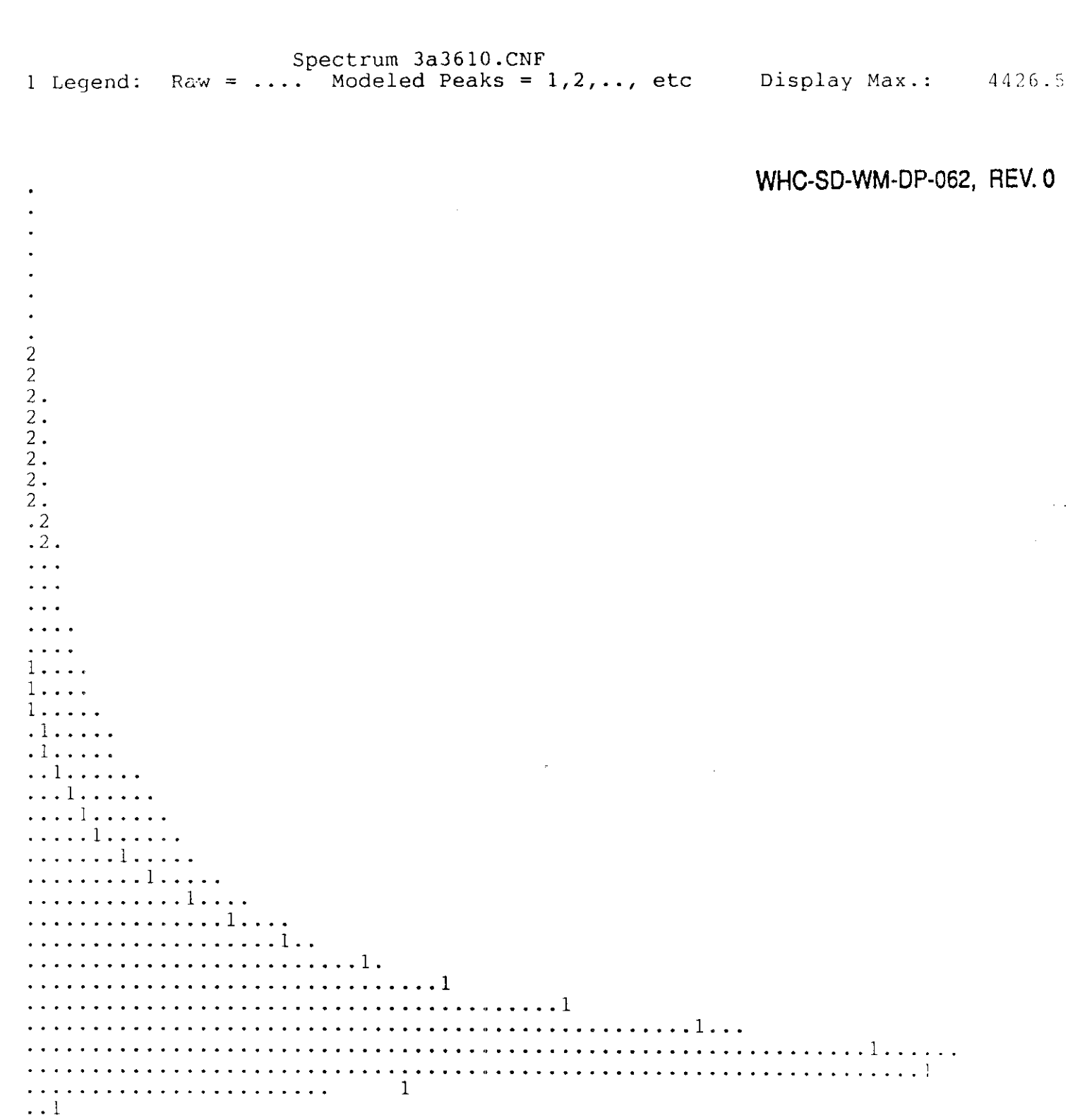
Peak		AEA	Peak Centroid				Count	%err		Activity
ID	Isotope	Frac	Exp.	Obs.	Diff.	FWHM	Rate c/m	@95	d/m	uCi/ea
	Cm243	0.779	5.786	5.752	0.034	0.06	18.45	1.2	197.1	0.888E-04
	Pu236		5.756	5.752	0.004				146.8	0.661E-04
2		0.027		4.845	0.00		0.64	6.8	5.0	0.225E-05
Totals:		0.806	<--valid peaks only-->				19.09			

DETECTOR CALIBRATION
Energy(MEV) = 4.084 + (0.0046)*Channel
Energy range (MeV): 4.084 TO 6.440
Efficiency = 0.1282 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	34085.0	100.000
Smoothed	34084.0	99.997
Composite fit	27484.0	80.634
Residuals	6601.0	19.366

Analyzed by: _____
ALJ


Spectrum 3a3610.CNF
1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.: 4426.5

Raw Data Dump for AEA Spectrum: 3a3610.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	3.	4.	5.	7.
21	8.	10.	7.	12.	11.	7.	3.	13.	10.	12.
31	9.	6.	5.	4.	6.	10.	11.	7.	10.	10.
	8.	13.	15.	13.	13.	6.	9.	10.	10.	14.
51	12.	7.	7.	13.	15.	13.	8.	11.	11.	11.
61	8.	10.	13.	13.	15.	8.	12.	22.	11.	12.
71	15.	10.	15.	13.	14.	12.	13.	9.	17.	9.
81	17.	11.	13.	13.	14.	11.	15.	15.	10.	14.
91	8.	16.	13.	18.	15.	16.	14.	11.	7.	11.
101	18.	20.	15.	16.	18.	19.	17.	17.	16.	19.
111	20.	14.	17.	14.	17.	23.	20.	11.	17.	14.
121	19.	15.	14.	26.	23.	16.	14.	22.	21.	22.
131	14.	25.	8.	17.	26.	17.	28.	15.	19.	20.
141	28.	17.	12.	15.	18.	24.	17.	19.	15.	23.
151	28.	22.	12.	19.	19.	24.	25.	29.	27.	20.
161	27.	26.	23.	20.	32.	24.	27.	23.	19.	26.
171	27.	23.	20.	25.	23.	27.	20.	29.	31.	25.
181	35.	22.	31.	35.	29.	25.	30.	36.	35.	33.
191	32.	28.	23.	25.	35.	43.	39.	34.	40.	42.
201	31.	39.	40.	41.	40.	34.	38.	30.	39.	45.
211	29.	39.	41.	42.	61.	44.	30.	51.	42.	54.
221	43.	50.	45.	56.	56.	43.	64.	46.	54.	35.
231	54.	47.	61.	46.	62.	51.	63.	57.	59.	72.
241	66.	77.	67.	55.	65.	53.	60.	50.	79.	85.
251	68.	78.	75.	73.	70.	94.	90.	83.	80.	76.
261	76.	70.	81.	101.	81.	95.	93.	78.	106.	101.
271	80.	104.	96.	101.	83.	88.	117.	109.	101.	91.
281	101.	101.	106.	96.	103.	122.	115.	134.	101.	100.
291	126.	132.	113.	127.	138.	129.	154.	130.	113.	143.
301	160.	136.	170.	134.	159.	130.	164.	182.	167.	166.
3	157.	174.	165.	173.	197.	173.	183.	169.	202.	220.
32	181.	211.	199.	251.	195.	224.	251.	244.	256.	272.
331	256.	235.	248.	274.	299.	275.	313.	315.	309.	297.
341	324.	359.	333.	379.	341.	387.	434.	445.	461.	488.
351	479.	514.	537.	520.	578.	600.	585.	568.	564.	536.
361	611.	579.	605.	578.	526.	487.	470.	417.	287.	249.
371	188.	131.	73.	49.	25.	17.	13.	9.	1.	0.
381	1.	0.	0.	0.	0.	1.	0.	0.	1.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
411	0.	2.	0.	0.	1.	0.	0.	0.	0.	0.
421	0.	0.	1.	0.	0.	0.	0.	0.	1.	1.
431	0.	1.	0.	0.	0.	0.	1.	1.	0.	0.
441	2.	0.	0.	0.	1.	0.	0.	0.	0.	0.
451	0.	1.	1.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	1.	2.	1.	2.	0.	0.	0.	1.
471	2.	0.	0.	1.	1.	1.	0.	1.	0.	1.
481	1.	0.	0.	0.	1.	0.	1.	0.	0.	0.
491	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	1.	0.								

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT **WHC-SD-WM-DP-062, REV. 0**

SAMPLE
J1446-5781 SAM
File ID: 4a4118.CNF

Counted on: 1/22/94 @10:12
Detector: AEA4
Geometry number: 1
Count time: 86405. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	894.8	894.8	361.161	362.560	14.000	6.577	7.000	1.171
2	227.7	227.7	303.781	303.596	14.000	6.587	7.000	1.016
3	1627.9	1627.9	230.796	230.598	14.000	7.859	7.000	1.619
4?	15.6	15.6	65.900	65.553	262.000	1.000	131.000	0.100
5?	5.7	5.7	43.142	41.367	8.000	2.323	4.000	0.508

PEAK RESULTS
Peak Error Limit: 25%

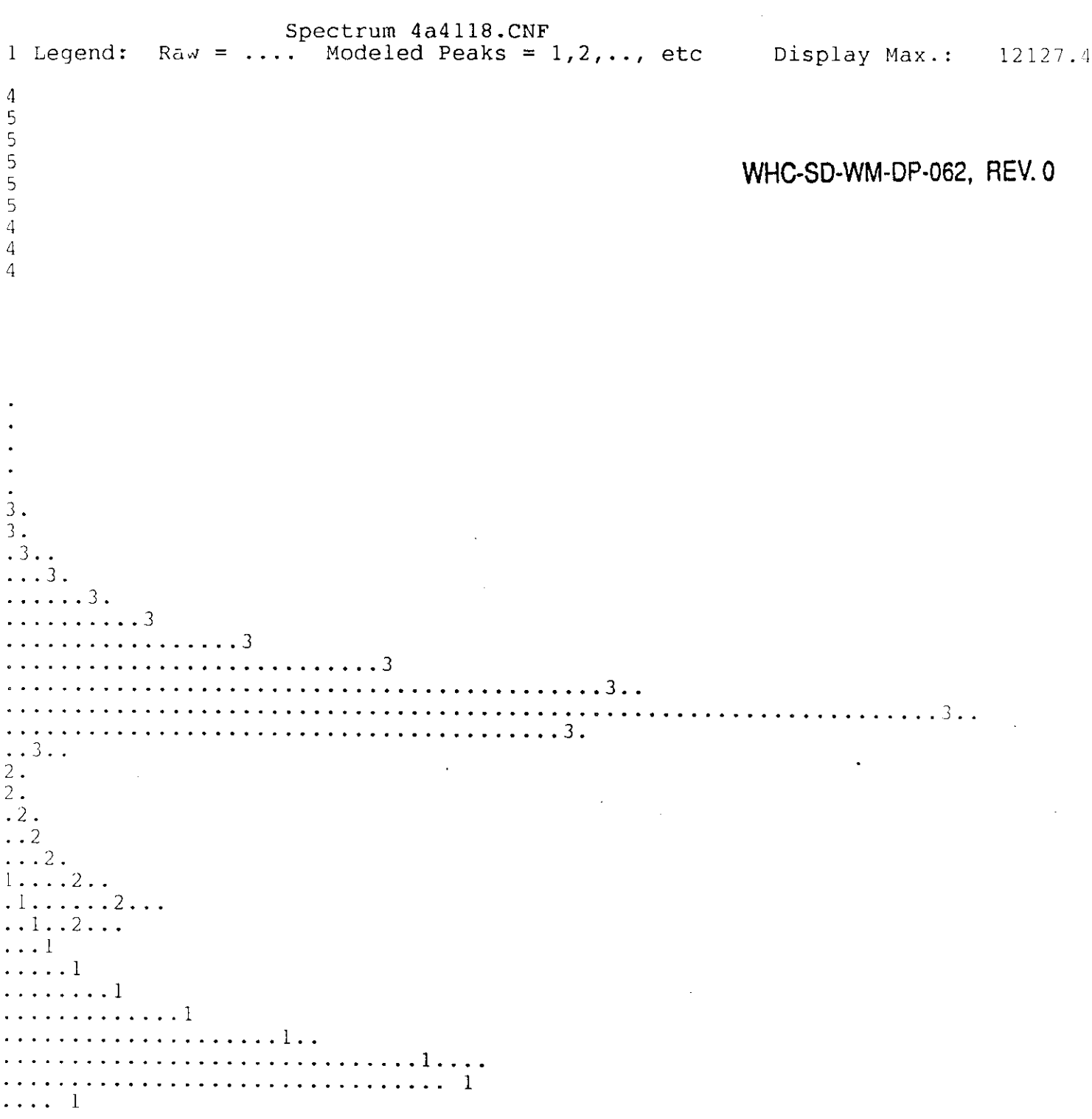
Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Cm244	0.320	5.796	5.787	0.009	0.03	16.81	1.3	196.1	0.883E-03
	Cm243		5.786	5.787	-.001				268.7	0.121E-02
2	Pu238	0.091	5.499	5.510	-.011	0.03	4.76	2.7	77.1	0.347E-04
	Am241		5.480	5.510	-.030				59.0	0.266E-04
3	Pu239	0.541	5.143	5.167	-.024	0.04	28.35	1.0	330.8	0.149E-03
	Pu240		5.144	5.167	-.023				330.8	0.149E-03
4		????		4.391			0.35	8.8		
5		????		4.277			0.08	36.0		
Totals:		0.952	<--valid peaks only-->				49.92			

DETECTOR CALIBRATION
Energy(MEV) = 4.083 + (0.0047)*Channel
Energy range (MeV): 4.083 TO 6.489
Efficiency = 0.0857 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	75525.0	100.000
Smoothed	75523.8	99.998
Composite fit	72498.2	95.992
Residuals	3026.8	4.008

Analyzed by: _____
ALJ


Spectrum 4a4118.CNF
1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.: 12127.4

Raw Data Dump for AEA Spectrum: 4a4118.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	7.	6.	7.	12.
21	7.	12.	9.	9.	14.	6.	10.	7.	15.	1.
31	16.	8.	7.	12.	8.	9.	15.	12.	9.	8.
41	20.	12.	15.	8.	14.	9.	12.	12.	4.	7.
51	16.	12.	10.	12.	19.	12.	11.	13.	17.	8.
61	13.	16.	13.	18.	15.	16.	19.	13.	13.	9.
71	12.	11.	14.	11.	9.	15.	20.	23.	19.	21.
81	10.	21.	15.	15.	18.	15.	23.	11.	15.	19.
91	16.	24.	22.	14.	19.	28.	15.	20.	15.	14.
101	11.	24.	19.	22.	19.	23.	18.	36.	22.	17.
111	20.	21.	16.	25.	22.	24.	18.	26.	25.	22.
121	25.	23.	33.	25.	23.	31.	24.	28.	22.	27.
131	32.	22.	31.	37.	39.	30.	29.	28.	32.	35.
141	26.	46.	44.	41.	40.	39.	28.	35.	38.	45.
151	51.	52.	39.	53.	51.	43.	60.	53.	54.	63.
161	57.	68.	60.	62.	65.	76.	56.	78.	90.	78.
171	85.	78.	97.	121.	98.	97.	103.	96.	109.	109.
181	125.	133.	146.	161.	180.	146.	160.	178.	183.	174.
191	204.	212.	254.	259.	253.	226.	283.	269.	311.	320.
201	317.	374.	396.	400.	380.	433.	433.	490.	538.	534.
211	513.	630.	638.	697.	710.	740.	796.	865.	919.	1055.
221	1097.	1152.	1291.	1280.	1390.	1502.	1502.	1611.	1672.	1647.
231	1763.	1696.	1582.	1337.	1153.	863.	583.	380.	249.	114.
241	71.	61.	38.	26.	35.	22.	39.	29.	37.	41.
251	49.	42.	33.	61.	45.	50.	49.	53.	58.	50.
261	50.	47.	58.	64.	67.	61.	56.	71.	67.	69.
271	70.	88.	74.	66.	68.	78.	81.	94.	94.	86.
281	90.	95.	101.	121.	136.	124.	139.	156.	143.	155.
291	180.	206.	206.	218.	243.	239.	257.	260.	301.	263.
301	239.	292.	264.	292.	290.	289.	264.	227.	172.	139.
311	98.	88.	81.	70.	82.	66.	83.	87.	97.	86.
321	92.	119.	129.	125.	120.	151.	142.	155.	185.	176.
331	170.	180.	198.	210.	238.	255.	265.	248.	290.	279.
341	329.	331.	373.	376.	421.	436.	456.	529.	562.	621.
351	636.	758.	727.	758.	811.	773.	779.	800.	814.	856.
361	955.	898.	921.	820.	720.	555.	392.	251.	131.	59.
371	22.	10.	3.	1.	0.	0.	1.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
391	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	1.	0.	0.	2.
411	0.	0.	0.	1.	0.	0.	2.	0.	1.	0.
421	0.	0.	1.	0.	1.	1.	0.	2.	0.	0.
431	0.	0.	0.	0.	0.	1.	1.	0.	0.	1.
441	0.	2.	0.	0.	0.	0.	0.	0.	0.	1.
451	2.	1.	0.	0.	1.	0.	0.	0.	0.	1.
461	1.	1.	1.	2.	1.	1.	0.	2.	0.	0.
471	3.	1.	2.	3.	1.	0.	1.	3.	3.	2.
481	1.	2.	6.	1.	1.	1.	1.	0.	1.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	1.	0.								

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT

WHC-SD-WM-DP-062, REV. 0

SAMPLE
J1446-5781 DUP
File ID: 5a5039.CNF

Counted on: 1/22/94 @10:13
Detector: AEA5
Geometry number: 1
Count time: 86406. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	627.1	627.1	358.752	358.094	24.000	20.635	12.000	4.413
2	212.6	212.6	300.699	298.542	26.000	24.742	13.000	4.088
3	1140.0	1140.0	228.080	227.361	20.000	16.858	10.000	3.295

PEAK RESULTS
Peak Error Limit: 25%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Cm243	0.287	5.786	5.744	0.042	0.09	13.04	1.4	130.5	0:588E-04
	Pu236		5.756	5.744	0.012				97.2	0.438E-04
2	Am241	0.116	5.480	5.470	0.010	0.11	5.29	2.5	41.1	0.185E-04
	Pu238		5.499	5.470	0.029				53.6	0.242E-04
3	Pu239	0.521	5.143	5.143	0.000	0.08	23.72	1.1	173.2	0.780E-04
	Pu240		5.144	5.143	0.001				173.2	0.780E-04
Totals:		0.924	<--valid peaks only-->				42.04			

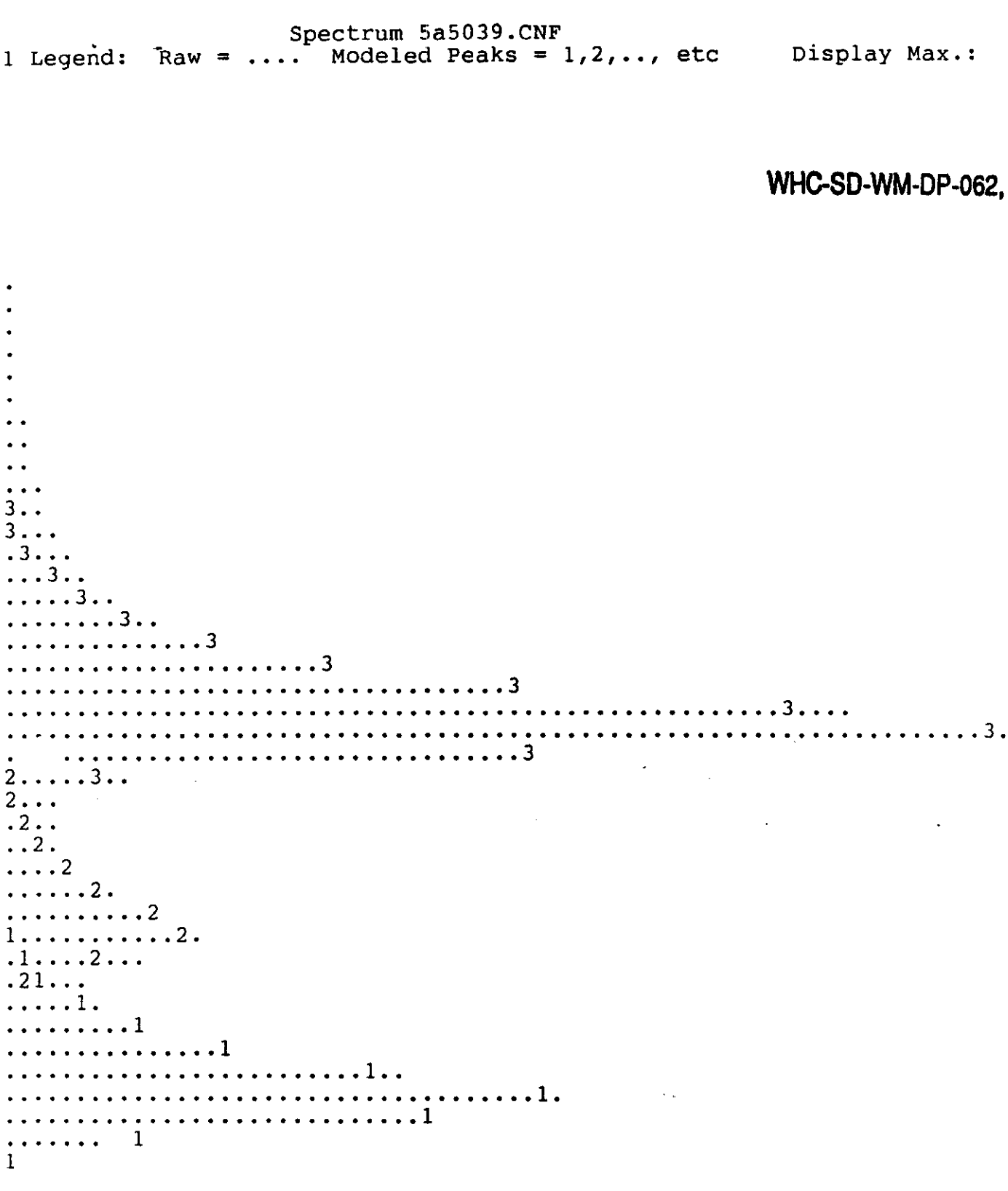
DETECTOR CALIBRATION
Energy(MEV) = 4.097 + (0.0046)*Channel
Energy range (MeV): 4.097 TO 6.452
Efficiency = 0.1369 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	65496.0	100.000
Smoothed	65495.1	99.999
Composite fit	60540.4	92.434
Residuals	4955.6	7.566

Analyzed by: ALJ

588


Spectrum 5a5039.CNF
1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.: 8709.8

Raw Data Dump for AEA Spectrum: 5a5039.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	4.	9.	15.	10.
21	11.	9.	16.	9.	11.	13.	14.	12.	5.	10.
31	3.	9.	14.	14.	10.	12.	10.	11.	11.	9.
41	9.	6.	10.	14.	14.	16.	8.	11.	18.	14.
51	9.	16.	10.	8.	15.	12.	23.	11.	14.	15.
61	14.	16.	24.	12.	20.	18.	14.	18.	10.	20.
71	14.	22.	14.	16.	18.	15.	14.	15.	20.	19.
81	12.	18.	19.	20.	19.	18.	26.	21.	24.	22.
91	16.	19.	27.	31.	23.	31.	17.	17.	26.	38.
101	28.	29.	25.	22.	39.	26.	27.	29.	29.	29.
111	34.	29.	33.	32.	38.	24.	36.	30.	41.	39.
121	46.	38.	35.	38.	35.	28.	34.	51.	47.	33.
131	40.	55.	47.	48.	41.	42.	64.	40.	56.	50.
141	52.	51.	52.	52.	59.	56.	61.	61.	55.	67.
151	61.	69.	72.	68.	62.	75.	67.	84.	86.	88.
161	79.	88.	89.	89.	87.	87.	87.	108.	105.	102.
171	111.	108.	100.	129.	116.	106.	105.	129.	149.	127.
181	120.	151.	142.	175.	152.	150.	167.	152.	186.	196.
191	185.	221.	197.	217.	225.	239.	241.	255.	275.	271.
201	291.	298.	341.	352.	350.	403.	424.	416.	446.	506.
211	546.	575.	601.	683.	730.	736.	810.	808.	931.	925.
221	1021.	1120.	1056.	1131.	1086.	1168.	1190.	1233.	1147.	1044.
231	1045.	948.	817.	778.	653.	535.	437.	371.	253.	214.
241	174.	136.	98.	66.	76.	62.	84.	60.	62.	68.
251	60.	58.	59.	64.	78.	56.	64.	73.	61.	76.
261	60.	82.	72.	81.	88.	78.	67.	81.	70.	58.
271	79.	83.	86.	78.	86.	92.	92.	85.	91.	82.
281	97.	113.	118.	143.	140.	140.	133.	166.	162.	163.
291	171.	173.	203.	208.	227.	233.	223.	248.	258.	228.
301	220.	220.	227.	184.	201.	201.	181.	156.	137.	117.
311	119.	136.	96.	90.	89.	107.	84.	86.	88.	85.
321	104.	99.	107.	108.	118.	110.	131.	147.	143.	145.
331	140.	193.	173.	189.	197.	194.	198.	222.	255.	255.
341	281.	297.	290.	346.	385.	418.	412.	492.	495.	494.
351	550.	564.	617.	598.	647.	638.	666.	634.	631.	588.
361	582.	618.	565.	461.	387.	324.	290.	227.	184.	157.
371	113.	80.	39.	32.	23.	10.	9.	2.	3.	1.
381	2.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	1.	2.	0.	0.	0.	0.
401	2.	0.	2.	0.	0.	0.	1.	1.	2.	0.
411	0.	1.	0.	1.	1.	1.	0.	0.	1.	0.
421	1.	1.	0.	2.	0.	1.	1.	0.	1.	1.
431	2.	0.	2.	4.	1.	0.	0.	0.	0.	0.
441	1.	1.	1.	0.	1.	1.	0.	1.	2.	1.
451	0.	0.	0.	0.	1.	0.	2.	2.	1.	0.
461	0.	1.	0.	0.	1.	0.	0.	2.	0.	5.
471	2.	0.	5.	4.	1.	9.	1.	3.	5.	3.
481	2.	2.	3.	5.	0.	2.	2.	3.	2.	0.
491	0.	0.	1.	0.	1.	1.	0.	0.	0.	0.
511	1.	0.								

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT

WHC-SD-WM-DP-062, REV. 0

SAMPLE
J1446-5781 TRIP
File ID: 6a6949.CNF

Counted on: 1/22/94 @10:14
Detector: AEA6
Geometry number: 1
Count time: 86402. Sec

PEAK ANALYSIS

Peak	Peak height		Peak center		FWHM		Tau	
ID	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	866.6	866.6	362.778	364.549	24.000	21.036	12.000	4.095
2	268.5	268.5	302.282	301.104	24.000	20.058	12.000	4.418
3	1719.6	1719.6	229.444	228.214	24.000	22.687	12.000	6.430
4?	8.6	8.6	31.867	32.294	326.000	27.476	163.000	160.889

PEAK RESULTS
Peak Error Limit: 25%

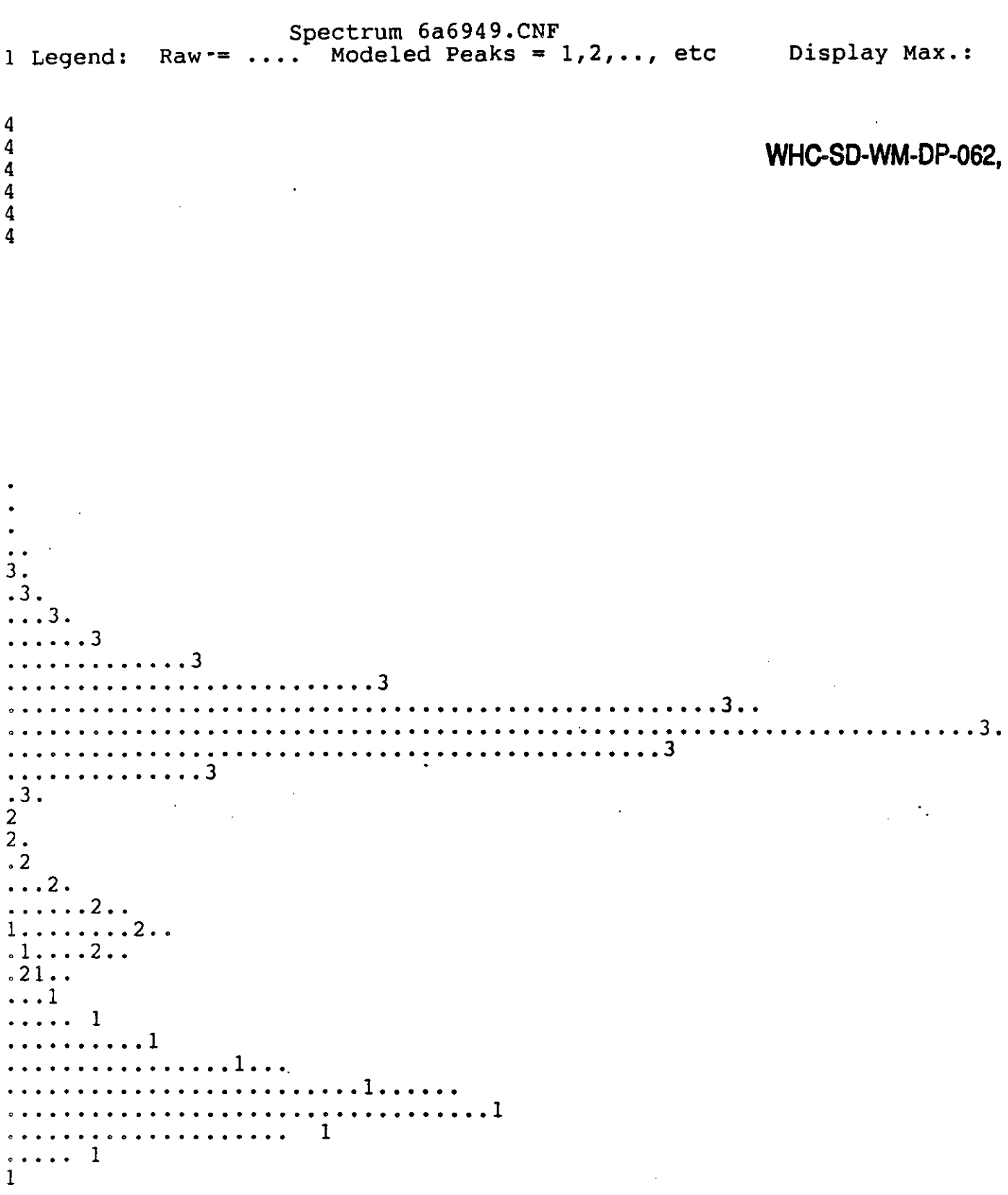
Pe		AEA	Peak Centroid				Count	%err		Activity
ak	Isotope	Frac	Exp.	Obs.	Diff.	FWHM	Rate c/m	@95	d/m	uCi/ea
1	Cm243	0.320	5.786	5.775	0.011	0.10	19.00	1.2	198.9	0.896E-04
	Pu236		5.756	5.775	-.019				148.2	0.668E-04
2	Am241	0.092	5.480	5.483	-.003	0.09	5.46	2.5	44.4	0.200E-04
	Pu238		5.499	5.483	0.016				58.0	0.261E-04
3	Pu239	0.548	5.143	5.148	-.005	0.10	32.52	0.9	248.6	0.112E-03
	Pu240		5.144	5.148	-.004				248.6	0.112E-03
4		????		4.247			0.15	13.4		
		-----					---------			
Totals:		0.960	<--valid peaks only-->				56.98			

DETECTOR CALIBRATION
Energy(MEV) = 4.098 + (0.0046)*Channel
Energy range (MeV): 4.098 TO 6.453
Efficiency = 0.1308 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	85474.0	100.000
Smoothed	85483.0	100.011
Composite fit	82261.8	96.242
Residuals	3212.2	3.758

Analyzed by: ALJ


Spectrum 6a6949.CNF
1 Legend: Raw-= .... Modeled Peaks = 1,2,.., etc
Display Max.: 13355.8

Raw Data Dump for AEA Spectrum: 6a6949.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	2.	3.	5.	2.
21	2.	4.	6.	5.	6.	9.	11.	6.	14.	3.
31	6.	10.	10.	9.	5.	3.	5.	8.	10.	6.
41	7.	11.	5.	6.	2.	2.	6.	3.	7.	6.
[illegible]	7.	4.	5.	9.	5.	2.	7.	5.	4.	7.
61	7.	7.	3.	5.	10.	11.	7.	7.	9.	4.
71	6.	10.	12.	15.	5.	8.	8.	7.	14.	9.
81	12.	8.	9.	11.	6.	9.	11.	18.	10.	18.
91	9.	11.	12.	8.	6.	9.	16.	12.	11.	10.
101	11.	11.	12.	14.	9.	18.	11.	20.	15.	24.
111	19.	10.	10.	27.	23.	23.	14.	20.	21.	15.
121	19.	26.	21.	19.	17.	25.	22.	20.	12.	13.
131	27.	24.	25.	25.	31.	37.	32.	35.	19.	29.
141	22.	29.	41.	29.	35.	38.	41.	39.	38.	33.
151	41.	37.	31.	46.	42.	40.	45.	45.	50.	45.
161	43.	47.	46.	56.	48.	65.	54.	67.	72.	58.
171	71.	73.	79.	61.	72.	61.	80.	87.	94.	83.
181	96.	84.	103.	119.	112.	94.	127.	118.	132.	136.
191	133.	149.	177.	138.	181.	186.	199.	210.	228.	240.
201	261.	274.	284.	327.	348.	334.	415.	467.	484.	518.
211	617.	659.	746.	806.	828.	997.	1059.	1125.	1179.	1227.
221	1458.	1530.	1564.	1697.	1683.	1746.	1778.	1833.	1719.	1699.
231	1707.	1551.	1494.	1377.	1218.	1174.	919.	860.	783.	626.
241	507.	383.	330.	246.	203.	137.	122.	97.	65.	54.
251	49.	48.	38.	46.	34.	40.	34.	32.	33.	64.
261	35.	46.	51.	43.	55.	47.	29.	47.	52.	54.
271	59.	53.	62.	58.	70.	72.	65.	85.	79.	85.
281	98.	97.	107.	126.	139.	139.	163.	171.	187.	196.
291	214.	257.	259.	280.	268.	315.	305.	297.	308.	276.
301	315.	300.	313.	287.	295.	258.	266.	225.	206.	194.
31	180.	146.	150.	137.	127.	117.	88.	88.	92.	72.
321	99.	69.	75.	81.	93.	77.	93.	108.	114.	103.
331	124.	139.	132.	144.	156.	179.	187.	209.	228.	243.
341	293.	322.	323.	359.	396.	443.	503.	491.	560.	555.
351	618.	662.	695.	760.	793.	803.	820.	889.	926.	910.
361	862.	881.	834.	854.	880.	808.	741.	718.	644.	623.
371	508.	438.	427.	337.	279.	246.	198.	153.	117.	94.
381	71.	52.	35.	29.	15.	14.	14.	5.	6.	2.
391	2.	0.	1.	2.	1.	1.	0.	1.	0.	0.
401	0.	0.	0.	1.	0.	0.	1.	1.	0.	1.
411	0.	0.	0.	0.	0.	0.	1.	1.	0.	0.
421	0.	1.	1.	0.	1.	0.	0.	2.	0.	0.
431	1.	0.	0.	1.	0.	2.	3.	1.	1.	0.
441	0.	1.	0.	2.	0.	0.	1.	1.	1.	0.
451	1.	1.	0.	0.	2.	0.	1.	1.	0.	0.
461	0.	0.	0.	2.	0.	2.	2.	4.	3.	1.
471	5.	4.	5.	3.	11.	5.	5.	2.	2.	0.
481	0.	1.	0.	0.	1.	1.	1.	0.	2.	0.
491	1.	1.	2.	3.	8.	10.	20.	7.	0.	0.
511	0.	0.								

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT

WHC-SD-WM-DP-062, REV. 0

SAMPLE
J1446-5081 SPK
File ID: 7a7476.CNF

Counted on: 1/22/94 @10:15
Detector: AEA7
Geometry number: 1
Count time: 86401. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	774.4	774.4	360.891	360.891	16.000	9.888	8.000	2.197
2	277.0	277.0	302.552	302.233	16.000	11.610	8.000	2.445
3?	42.3	42.3	263.838	262.267	28.000	5.679	14.000	2.321
4	2965.9	2965.9	229.462	229.456	16.000	9.809	8.000	2.450
5?	25.6	25.6	50.344	50.342	282.000	1.000	141.000	0.100
6?	7.7	7.7	25.227	24.323	12.000	3.816	6.000	13.287

PEAK RESULTS
Peak Error Limit: 25%

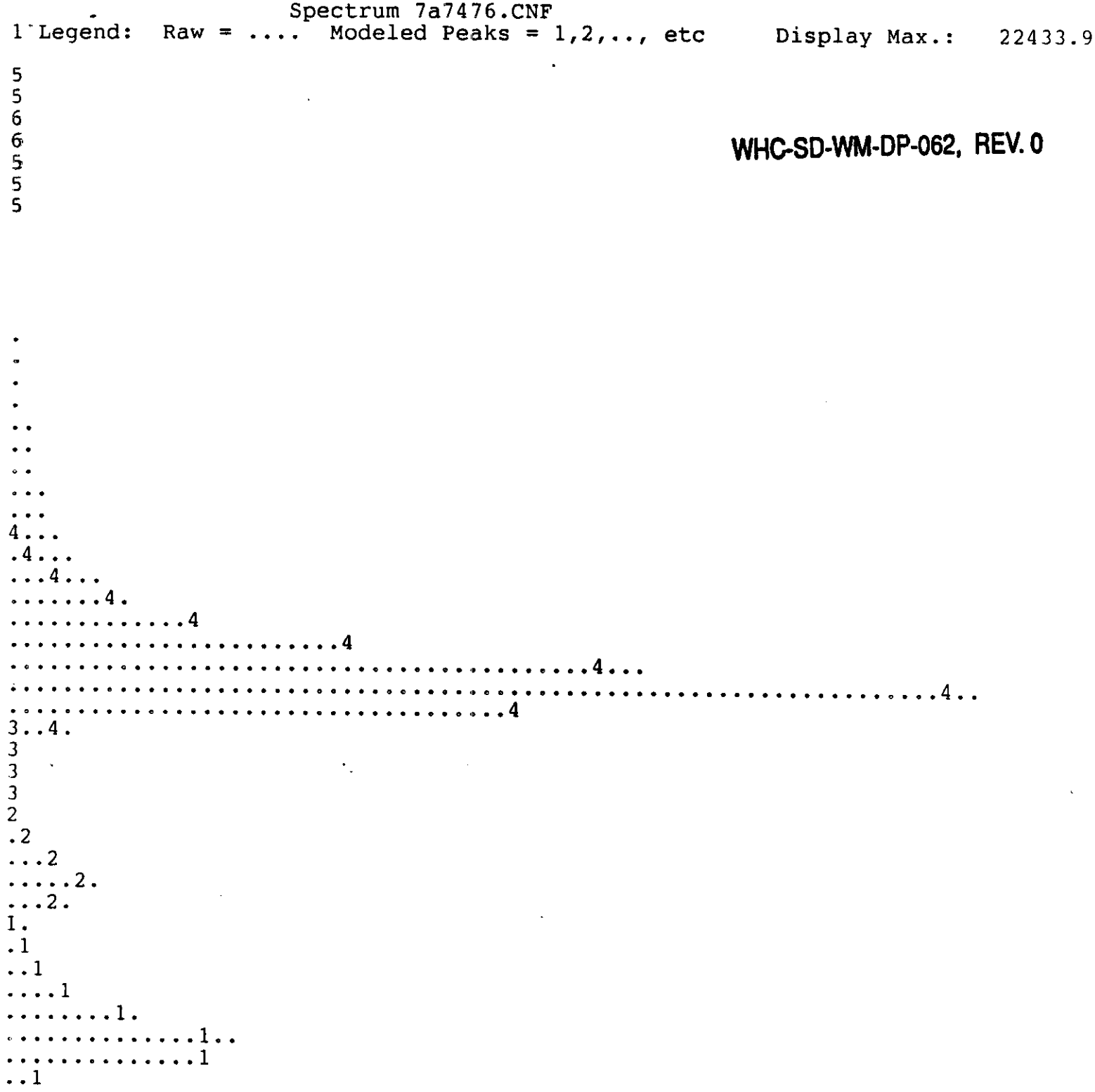
Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Cm244	0.179	5.796	5.784	0.0120.05		13.39	1.4	133.4	0.601E-04
	Cm243		5.786	5.784	0.002				182.7	0.823E-04
2	Am241	0.068	5.480	5.508	-.0280.05		5.11	2.5	54.1	0.244E-04
	Pu238		5.499	5.508	-.009				70.6	0.318E-04
3		????		5.320			0.46	13.1		
4	Pu239	0.640	5.143	5.166	-.0230.05		47.75	0.7	475.6	0.214E-03
	Pu240		5.144	5.166	-.022				475.6	0.214E-03
5		????		4.324			0.51	7.2		
6		????		4.202			0.05	58.6		
Totals:		0.887	<--valid peaks only-->				66.24			

DETECTOR CALIBRATION
Energy(MEV) = 4.088 + (0.0047)*Channel
Energy range (MeV): 4.088 TO 6.494
Efficiency = 0.1004 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	107509.0	100.000
Smoothed	107509.4	100.000
Composite fit	96870.0	90.104
Residuals	10639.0	9.896

Analyzed by: ALJ


Spectrum 7a7476.CNF
Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.: 22433.9

Raw Data Dump for AEA Spectrum: 7a7476.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	2.	20.	20.	15.
21	19.	22.	19.	18.	26.	18.	21.	13.	23.	14.
31	13.	21.	20.	19.	19.	12.	16.	20.	18.	23.
41	30.	19.	22.	20.	27.	19.	25.	23.	14.	28.
	22.	25.	18.	14.	27.	25.	12.	16.	19.	29.
61	35.	27.	28.	23.	32.	16.	31.	24.	21.	28.
71	22.	32.	26.	25.	29.	33.	33.	30.	37.	29.
81	29.	29.	30.	40.	37.	27.	35.	39.	44.	37.
91	40.	37.	41.	36.	34.	51.	32.	46.	40.	36.
101	52.	52.	56.	42.	53.	52.	51.	54.	53.	65.
111	45.	44.	53.	63.	57.	57.	63.	64.	60.	56.
121	55.	84.	63.	66.	67.	79.	88.	67.	75.	74.
131	88.	99.	77.	74.	98.	88.	92.	85.	106.	96.
141	114.	119.	99.	107.	109.	109.	99.	113.	133.	147.
151	97.	99.	113.	118.	129.	147.	113.	139.	121.	128.
161	157.	141.	160.	158.	154.	177.	140.	142.	198.	171.
171	193.	161.	199.	206.	210.	213.	201.	230.	215.	248.
181	253.	227.	252.	250.	270.	269.	287.	282.	298.	274.
191	317.	329.	324.	314.	389.	410.	380.	393.	438.	463.
201	458.	452.	495.	572.	594.	609.	668.	662.	747.	799.
211	872.	990.	1012.	1133.	1249.	1372.	1463.	1670.	1784.	1932.
221	2057.	2150.	2355.	2452.	2691.	2884.	2938.	3051.	3117.	3147.
231	3083.	2763.	2476.	2126.	1709.	1296.	958.	710.	454.	285.
241	172.	116.	78.	52.	43.	43.	43.	37.	34.	51.
251	52.	55.	49.	69.	63.	53.	61.	59.	63.	72.
261	56.	62.	67.	87.	61.	67.	58.	55.	66.	65.
271	60.	60.	56.	63.	59.	72.	81.	89.	83.	83.
281	86.	105.	101.	99.	105.	109.	147.	123.	146.	178.
291	168.	210.	222.	243.	247.	241.	279.	275.	294.	320.
301	283.	307.	318.	313.	277.	265.	238.	229.	162.	138.
3	130.	104.	72.	64.	55.	55.	79.	70.	73.	75.
321	83.	83.	88.	84.	79.	93.	96.	98.	94.	128.
331	122.	129.	152.	129.	134.	154.	164.	185.	193.	204.
341	247.	243.	263.	307.	326.	349.	376.	442.	469.	494.
351	558.	590.	623.	656.	690.	691.	734.	768.	775.	808.
361	809.	787.	790.	701.	584.	500.	385.	332.	184.	136.
371	66.	43.	30.	12.	2.	2.	0.	0.	0.	1.
381	0.	0.	0.	2.	0.	0.	0.	0.	0.	1.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
401	0.	0.	1.	0.	0.	0.	0.	0.	0.	1.
411	0.	0.	1.	1.	1.	0.	0.	1.	1.	0.
421	0.	0.	0.	0.	0.	0.	0.	0.	1.	1.
431	0.	1.	0.	1.	0.	0.	0.	1.	0.	1.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
461	1.	0.	0.	1.	0.	1.	0.	0.	1.	2.
471	1.	0.	1.	1.	1.	1.	0.	0.	1.	1.
481	1.	1.	0.	1.	3.	0.	0.	1.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	19.	0.								

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT

WHC-SD-WM-DP-062, REV. 0

SAMPLE
J1446-5981 SPDUP
File ID: 8a8689.CNF

Counted on: 1/22/94 @10:16
Detector: AEA8
Geometry number: 1
Count time: 86401. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	14.1	14.1	362.496	362.496	10.000	4.359	5.000	1.558
2	59.1	59.1	230.727	230.727	12.000	5.561	6.000	2.611

PEAK RESULTS
Peak Error Limit: 25%

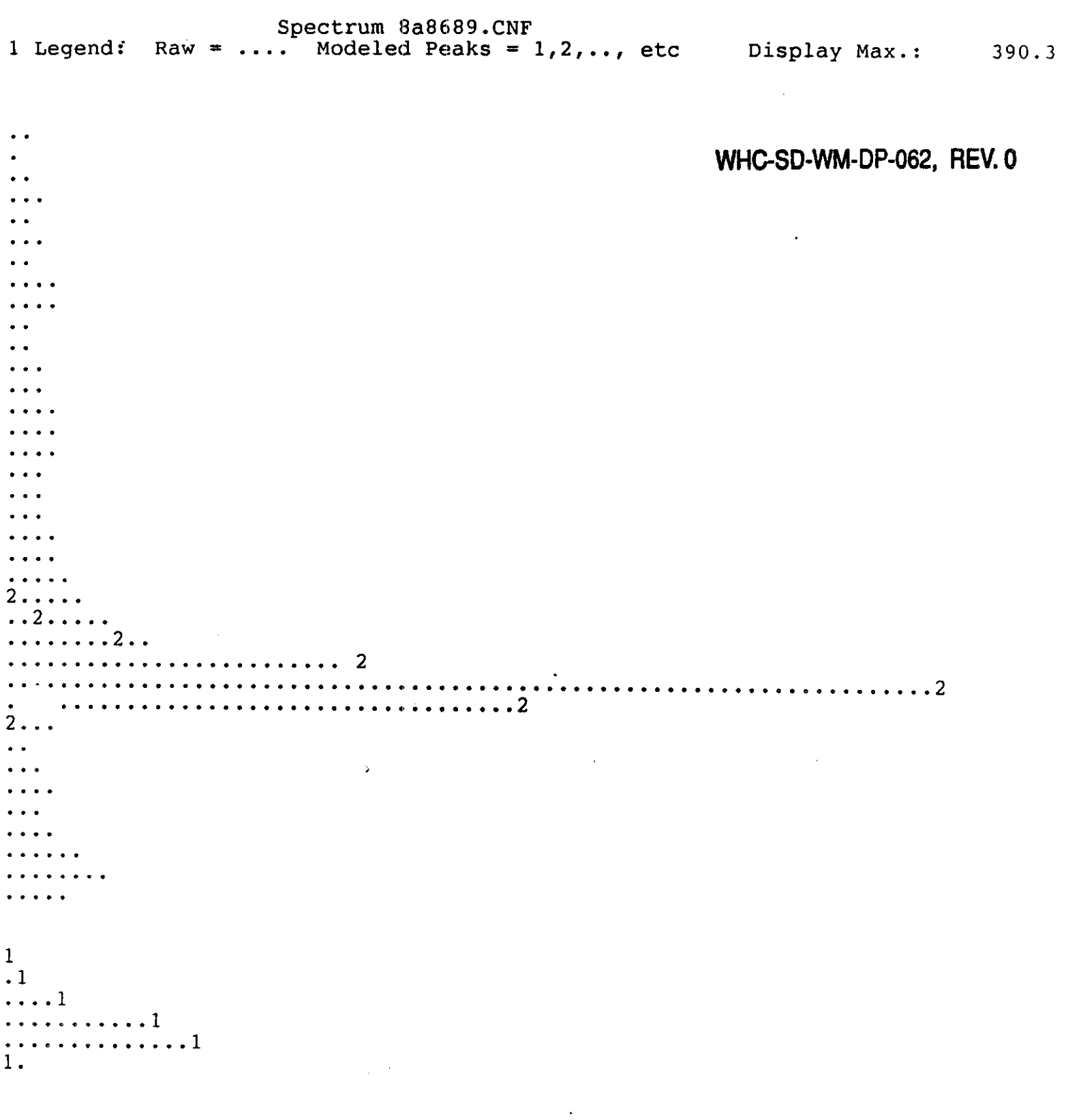
Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Cm243	0.121	5.786	5.799	-.013	0.02	0.16	13.1	1.6	0.740E-0(
	Cm244		5.796	5.799	-.003				1.2	0.540E-06
2	Pu239	0.468	5.143	5.179	-.036	0.03	0.60	6.7	4.6	0.209E-05
	Pu240		5.144	5.179	-.035				4.6	0.209E-05
Totals:		0.589	<--valid peaks only-->				0.75			

DETECTOR CALIBRATION
Energy(MEV) = 4.095 + (0.0047)*Channel
Energy range (MeV): 4.095 TO 6.501
Efficiency = 0.1294 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	1846.0	100.000
Smoothed	1846.0	100.000
Composite fit	1086.8	58.872
Residuals	759.2	41.128

Analyzed by: ALJ


Spectrum 8a8689.CNF
1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.: 390.3

Raw Data Dump for AEA Spectrum: 8a8689.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	1.	0.	2.	3.
21	3.	3.	3.	2.	0.	6.	3.	3.	3.	2.
31	1.	3.	2.	2.	1.	2.	4.	1.	3.	2.
41	0.	2.	2.	3.	4.	4.	2.	4.	4.	1.
51	5.	1.	0.	0.	0.	3.	0.	2.	8.	2.
61	5.	2.	3.	1.	0.	0.	4.	3.	1.	3.
71	1.	2.	3.	3.	7.	4.	2.	2.	2.	4.
81	2.	4.	3.	6.	4.	3.	2.	0.	6.	0.
91	1.	1.	2.	1.	1.	2.	4.	2.	1.	2.
101	2.	0.	3.	1.	5.	1.	3.	0.	4.	3.
111	4.	0.	2.	2.	0.	1.	2.	6.	5.	0.
121	3.	1.	5.	6.	3.	2.	4.	3.	1.	6.
131	3.	2.	5.	3.	3.	3.	3.	4.	3.	4.
141	2.	2.	1.	1.	8.	1.	3.	3.	1.	2.
151	1.	0.	2.	5.	0.	2.	4.	4.	2.	2.
161	0.	1.	5.	3.	3.	2.	4.	3.	4.	3.
171	2.	2.	2.	4.	4.	3.	6.	4.	2.	3.
181	2.	4.	3.	4.	4.	4.	4.	2.	5.	3.
191	5.	8.	2.	2.	5.	4.	8.	6.	7.	4.
201	3.	7.	7.	5.	5.	9.	4.	9.	7.	10.
211	8.	6.	8.	15.	8.	4.	12.	15.	14.	14.
221	17.	24.	26.	38.	28.	42.	51.	59.	54.	66.
231	69.	63.	53.	39.	25.	21.	15.	9.	4.	3.
241	5.	1.	0.	1.	1.	2.	3.	0.	1.	0.
251	3.	3.	1.	0.	1.	2.	5.	3.	1.	6.
261	0.	5.	1.	1.	2.	5.	3.	4.	6.	1.
271	1.	1.	4.	3.	3.	2.	1.	6.	1.	3.
281	3.	4.	2.	6.	2.	3.	5.	3.	4.	3.
291	3.	7.	8.	6.	6.	3.	2.	8.	5.	6.
301	9.	4.	7.	9.	6.	5.	7.	7.	2.	0.
311	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
321	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
331	0.	0.	0.	1.	1.	0.	0.	0.	3.	1.
341	0.	2.	1.	4.	2.	3.	3.	1.	5.	4.
351	6.	8.	8.	10.	7.	9.	8.	9.	10.	20.
361	7.	13.	18.	17.	9.	3.	4.	5.	1.	5.
371	0.	1.	0.	1.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
411	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	1.	0.	0.	1.
431	1.	1.	0.	0.	1.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
471	1.	0.	0.	0.	0.	0.	0.	0.	1.	0.
481	1.	1.	0.	1.	1.	0.	0.	1.	1.	0.
491	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

WESTINGHOUSE HANFORD COMPANY

222-S LABORATORY

ANALYTICAL BATCH 2401

Segment Serial No.	Customer ID:
J-1426	KE65A
Analysis: Pu 239/40	**Sample Prep:** DIRECT

Instrument: WB 537237	**Procedure/ Rev:** LA 503-156 D-0
Technologist: Joel M VanSant	**Date:** ~~1-3-93~~ ~~1-3~~ 1-3-94 1.24.94
Starting Time: 0800	**Temperature** 25 °C
Ending Time: 1400	**Chemist:** L FRITTS

Comments: 24 HRS "A EA"

	Description	Lab ID
1	LMCS	J1418-5591
2	BLANK	J1421-5691
3	Sample	J1426-5781
4	Sample Dup	J1426-5791
5	Sample Trip	J1426-5791
6	Spike	J1426-5981
7	Spike Dup	J1426-5981
8		
9		
10		

	Description	Lab ID
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS	63893	.100-10-.05mL		
Spike	77893	.05mL		

ANALYTICAL BATCH SUMMARY SHEET

METHOD: LA-503-156

DATE START: January 3, 1994

PREPARED BY: L.L. Fritts 1-14-94

DATE COMPLETE: January 14, 1994

	UNITS:	uCi/mL									
SPL NAME	SPL ID	ANALYTE	RESULT #1	RESULT #2	RESULT #3	AVERAGE	2*SD	PREC	%REC	DET LIM	% CT ER
STD 63B43	J1418	Pu-239/40	1.35E+2						103.4	1.07E-2	0.8
BLANK	J1421	Pu-239/40	<7.56E-4						39.3	7.56E-4	100.0
KE65A	J1426	Pu-239/40	1.12E-2	2.15E-2	2.20E-2	1.82E-2	1.22E-2	67.0	154.1	1.55E-3	2.7
									25.3	2.13E-3	1.2
									69.9	2.13E-3	0.7
KE65A	J1426	239 Spike	144.2	109.1							
STD 63B43	J1418	Pu-236	<1.65E+1						N/A	1.65E-2	100.0
BLANK	J1421	Pu-236	<5.04E-3						39.3	5.04E-3	100.0
KE65A	J1426	Pu-236	1.94E-3	<7.82E-3	3.26E-3	N/A	N/A	N/A	154.1	1.29E-3	4.6
									25.3	7.82E-3	2.0
									69.9	2.84E-3	1.2

NARRATIVE: ☐ NO SPECIAL PROBLEMS/METHOD VARIATIONS IN THIS BATCH

LIST SPECIFIC PROBLEMS/VARIATIONS FOR THIS BATCH:

The results for the standard are in uCi/L.

The results for the spike are in percent recovery.

This batch is a candidate for rerun assuming availability of tracer. The sample has a total alpha count rate that is much higher than the sample duplicate and triplicate. This gives a 154% tracer recovery and invalid results.
If this data is to be used, the sample result should be discounted and the spike result calculated using the sample triplicate.

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#9 1466 Batch 2401

Serial No.	Sample Point	Date	Time Issued	Priority
J 1418.-5581	BECHTOLD	12-16-93	9:11	22

Determination	Method/Standard	Result Units	Charge Code	Reruns
Pu239/40	LA-503-156	% RECOVERY	E14157	0

Sample Size	Customer ID
?.100-10-.1mL	STD

Remarks, Calculations, Results:
EDP R211 AR001
24 HRS
"AEA" - ~~480MIN~~
STD# 63843 RESULT 135
ATTACH PRINTOUT
STD VAL. 1.305E12 %REC 103.4%
.05mL 77843

~~Analyst - 1~~	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs 1-3-94	Hrs 1-5-94	Hrs	Hrs 1-11-94
Date 1-3-~~93~~ 94	Time Completed	Lab Unit Mgr.	1-11-94	

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

#1 1-3-94 AG

8200/60 - 7

J1418-5581

#9

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#11 3340

Serial No.	Sample Point	Date	Time Issued	Priority
J 1421.-5681	BECHTOLD	12-16-93	9:13	22

Determination	Method/Standard	Result Units	Charge Code	Reruns
Pu239/40	LA-503-156	uCi/ML	E14157	0

Sample Size	Customer ID
? 1mL - 10 - .050ML	BLK

Remarks, Calculations, Results:

REAGENT BLANK

COUNT AS uCI/L

.05mL 77843

$< 7.56 \times 10^{-4}$ uCi/ml

ATTACH PRINTOUT

~~"AEA" ASSAY~~

24HRS

~~< 7.54E-4 uCi/ml~~

1-12-94

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
	1-3-94	D. Hamilton		
Date	Time Completed	Lab Unit Manager		
1-3-94			1-11-94	

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

#2 1-3-94

J1421-5681

#11

1859/60 - 1

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#12 4327/2-2530

Serial No.	Sample Point	Date	Time Issued	Priority
J 1426.-5781	BECHTOLD -	12-16-93	13:18	22

Determination	Method/Standard	Result Units	Charge Code	Reruns
Pu239/40	LA-503-156	uCi/ML	E14157	0

Sample Size	Customer ID
? 1ml - 10mL - .05mL	KE65A

Remarks, Calculations, Results:

COUNT AS uCI/L SAM

24 HRS

"AEA" - ~~480MIN~~

ATTACH PRINTOUT

.05mL 77843

1.12E-2uci/ml

Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	Raymond		
Hrs	Hrs	Hrs	Hrs
1-3-94	1-5-94		
Date	Time Completed	Lab Unit Mgr.	
1-3.93			1-11-94

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

#3 1-3-94

14639/60 - 3

J1426-5781

#12

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#8 8651

Serial No.	Sample Point	Date	Time Issued	Priority
J 1426.-5781	BECHTOLD	12-16-93	13:18	22

Determination	Method/Standard	Result Units	Charge Code	Reruns
Pu239/40	LA-503-156	uCi/ML	E14157	0

Sample Size	Customer ID
?1ml - 10mL - .05mL	KE65A

Remarks, Calculations, Results

COUNT AS uCI/L Dup

"AEA" 24HRS

ATTACH PRINTOUT

.05mL77B43

2.15 E-2 uci/ml

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	[signature]	Raymond		
Hrs	Hrs 1-3-94	Hrs 1-4-94	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1-3-93		[signature]	1-11-94 [signature]

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

#1 1-3-94 [initials]

3689/60 -7

J1426-5781

#8

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#5 5000

Serial No.	Sample Point	Date	Time Issued	Priority
J 1426.-5781	BECHTOLD	12-16-93	13:18	22

Determination	Method/Standard	Result Units	Charge Code	Reruns
Pu239/40	LA-503-156	uCi/ML	E14157	0

Sample Size	Customer ID
?1mL-10-.05mL	KE65A

Remarks, Calculations, Results:
COUNT AS uCI/L TRIP "AEA" - ~~400MIN~~ 24HRS
ATTACH PRINTOUT

.05mL77843

~~2.19E-2 uCi/ml~~ 1-12-94
2.20×10^{-2} uCi/ml

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs 1-3-94	Hrs 1-4-94	Hrs 1-5-94	Hrs

Date	Time Completed	Lab Unit Mgr	
1-3-94			1-11-94

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

#2 1-3-94 J1426-5781

#5

9866/60 - 1

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

6910

Serial No.	Sample Point	Date	Time Issued	Priority
J 1426.-5981	BECHTOLD	12-16-93	13:18	22

Determination	Method/Standard	Result Units	Charge Code	Reruns
Pu239/24	LA-503-156	% RECOVERY	E14157	0

Sample Size	Customer ID
?1mL-10mL-.05mL	KE65A

Remarks, Calculations, Results:

SAMPLE SPIKED ID 63843 SK .100mL-10-1mL

SPIKE ID 77843

SPIKE VOLUME
COUNT AS uCI/L .05mL

24 HRS

~~"AEA" - 480MIN.~~

144.2 % ATTACH PRINTOUT

~~143.9 % Rec.~~ 1.12.94

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
	1-3-94	1-4-93		

Date	Time Completed	Lab Unit Mgr.	
1-3-93			1-11-94

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

#3 1-3-94 AG J1426-5981

#6

7860 -3
60

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

#7 7438

Serial No.	Sample Point	Date	Time Issued	Priority
J 1426.-5981	BECHTOLD	12-16-93	13:18	22

Determination	Method/Standard	Result Units	Charge Code	Reruns
Pu239/24	LA-503-156	% RECOVERY	E14157	0

Sample Size	Customer ID
? 1mL - 10 - .05mL	KE65A

Remarks, Calculations, Results:

SAMPLE SPIKED ID 63B43 SKDVP .100-10-.100

SPIKE ID 77B43

SPIKE VOLUME
COUNT AS uCI/L .05mL

24HRS

109.1%

108.7 % Rec

1-12-94

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	[signature]	Raymond	Raymond	
Hrs	Hrs 1-3-94	Hrs 1-4-94	Hrs 1-5-94	Hrs

Date	Time Completed	Lab Unit Mgr	
1-3-94		[signature]	1-11-94 [signature]

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

#1 1-3-94 AJ J1426-5981

10942 7
60

#7

Weyrauch
1-5-94

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT

WHC-SD-WM-DP-062, REv. 0

SAMPLE
J1418-5581
File ID: 9a1466.CNF

Counted on: 1/ 3/94 @23: 4
Detector: AEA9
Geometry number: 1
Count time: 86402. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	2225.2	2225.2	363.156	363.156	10.000	3.034	5.000	1.565
2?	56.3	56.3	304.592	304.574	12.000	3.562	6.000	1.710
3?	26.8	26.8	264.607	264.580	10.000	4.242	5.000	0.770
4	4892.5	4892.5	230.265	230.265	12.000	3.382	6.000	2.455

PEAK RESULTS
Peak Error Limit: 25%

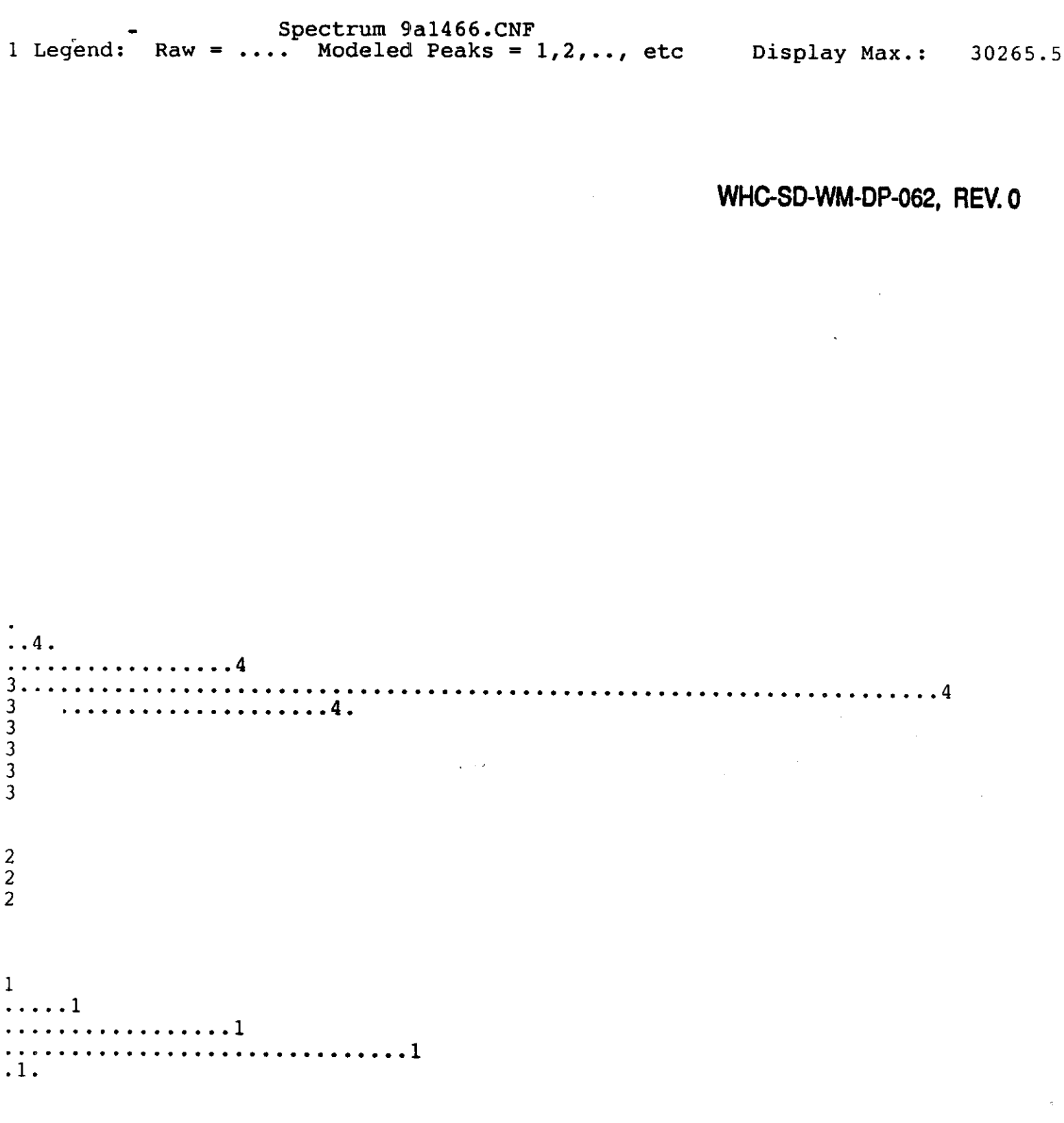
Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Cm244	0.324	5.796	5.777	0.019	0.01	18.46	1.2	133.8	0.603E-04
	Cm243		5.786	5.777	0.009				183.3	0.826E-04
2		????		5.508			0.50	7.4		
3		????		5.324			0.47	7.6		
4	Pu239	0.630	5.143	5.166	-.023	0.02	35.87	0.9	260.0	0.117E-03
	Pu240		5.144	5.166	-.022				260.0	0.117E-03
Totals:		0.954	<--valid peaks only-->				54.34			

DETECTOR CALIBRATION
Energy(MEV) = 4.107 + (0.0046)*Channel
Energy range (MeV): 4.107 TO 6.462
Efficiency = 0.1380 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	82053.0	100.000
Smoothed	82053.0	100.000
Composite fit	79651.9	97.074
Residuals	2401.1	2.926

Analyzed by: _____
ALJ


Spectrum 9a1466.CNF
1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.: 30265.5

Raw Data Dump for AEA Spectrum: 9a1466.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	1.	0.	1.	0.	0.	2.	1.	1.	1.
21	0.	4.	0.	0.	0.	0.	0.	1.	0.	2.
31	0.	1.	0.	0.	0.	1.	0.	0.	0.	0.
41	2.	0.	0.	0.	1.	0.	1.	0.	0.	0.
51	0.	0.	1.	1.	1.	1.	1.	2.	2.	0.
61	1.	1.	1.	1.	1.	0.	1.	0.	1.	0.
71	2.	1.	0.	0.	0.	1.	0.	0.	0.	1.
81	0.	1.	2.	0.	3.	1.	0.	0.	0.	1.
91	0.	0.	1.	0.	1.	0.	1.	3.	1.	2.
101	0.	1.	2.	1.	0.	2.	2.	1.	0.	0.
111	0.	2.	2.	2.	0.	0.	0.	2.	1.	2.
121	2.	0.	1.	0.	1.	2.	1.	3.	0.	2.
131	1.	1.	1.	4.	2.	3.	4.	2.	1.	2.
141	2.	1.	2.	2.	5.	1.	2.	3.	1.	5.
151	4.	5.	3.	7.	3.	4.	3.	5.	9.	4.
161	10.	7.	2.	8.	7.	3.	8.	9.	10.	8.
171	5.	9.	8.	9.	8.	9.	6.	21.	13.	13.
181	17.	15.	27.	15.	20.	20.	20.	23.	29.	31.
191	29.	38.	33.	32.	44.	50.	41.	60.	68.	65.
201	63.	77.	67.	89.	85.	111.	119.	125.	128.	161.
211	185.	190.	248.	262.	384.	426.	546.	718.	881.	1013.
221	1137.	1276.	1428.	1645.	2166.	2721.	3577.	4481.	5374.	6069.
231	5880.	4873.	3346.	1891.	854.	367.	125.	35.	9.	9.
241	8.	6.	8.	12.	7.	10.	6.	9.	6.	14.
251	5.	8.	14.	10.	11.	10.	7.	7.	9.	11.
261	19.	28.	31.	24.	34.	31.	22.	10.	12.	5.
271	4.	5.	6.	1.	1.	2.	5.	3.	4.	3.
281	1.	3.	6.	7.	6.	9.	9.	5.	12.	15.
291	12.	9.	16.	17.	27.	23.	24.	35.	20.	21.
301	40.	39.	49.	78.	70.	56.	47.	19.	14.	7.
311	4.	12.	12.	13.	8.	3.	3.	9.	12.	10.
321	15.	15.	12.	13.	16.	23.	23.	27.	30.	19.
331	40.	27.	26.	29.	48.	44.	57.	46.	62.	70.
341	87.	96.	90.	97.	133.	164.	194.	252.	355.	420.
351	586.	733.	933.	988.	988.	975.	907.	953.	1199.	1561.
361	1929.	2439.	2774.	2675.	2138.	1359.	662.	233.	54.	16.
371	2.	1.	1.	0.	0.	0.	0.	0.	0.	0.
381	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	1.	0.	0.	1.	0.	1.
401	0.	0.	0.	0.	0.	0.	0.	1.	2.	2.
411	2.	1.	0.	5.	0.	0.	0.	1.	1.	0.
421	0.	3.	0.	2.	3.	2.	0.	0.	0.	1.
431	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	2.	0.	0.	0.	0.	0.
481	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

1-5-94

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT WHC-SD-WM-DP-062, REV. 0

SAMPLE
J1421-5681
File ID: 11a0.CNF 3340 D/M

Counted on: 1/ 3/94 @23: 5
Detector: AEA11
Geometry number: 1
Count time: 86402. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	287.3	287.3	361.133	361.133	30.000	6.277	15.000	15.694
2	259.5	259.5	351.791	351.791	20.000	2.223	10.000	0.107
3?	0.0	0.1	221.209	221.209	0.000	0.100	0.000	0.100
4?	0.0	0.1	213.470	213.470	0.000	0.100	0.000	0.100

PEAK RESULTS
Peak Error Limit: 25%

Pe ak	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Pu236	0.184	5.756	5.768	-.012	0.03	2.39	3.3	17.7	0.796E-05
	Cm243		5.786	5.768	0.018				23.7	0.107E-04
2		1.085		5.725	0.01		14.10	1.4	102.4	0.461E-04
3		????		5.125			0.00	*****		
4		????		5.089			0.00	*****		
Totals:		1.269	<--valid peaks only-->				16.48			

DETECTOR CALIBRATION
Energy(MEV) = 4.107 + (0.0046)*Channel
Energy range (MeV): 4.107 TO 6.462
Efficiency = 0.1377 CPM/DPM

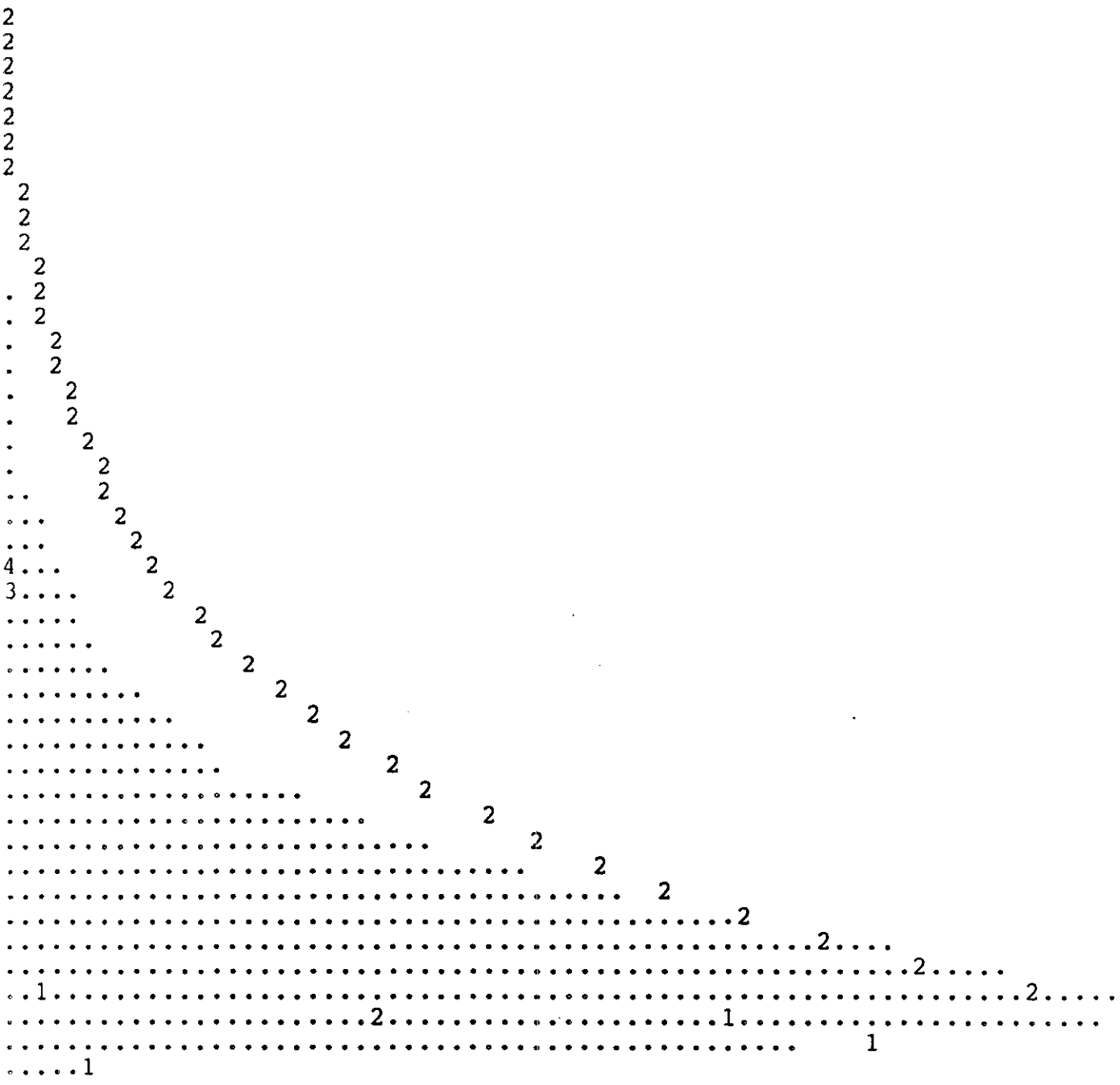
TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	18709.0	100.000
Smoothed	18709.0	100.000
Composite fit	23734.7	126.863
Residuals	-5025.7	-26.863

Analyzed by: ALJ

Spectrum 11a0.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 2129.4



Raw Data Dump for AEA Spectrum: 11a0.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	1.	1.
11	2.	1.	1.	3.	0.	1.	0.	0.	2.	2.
21	2.	0.	0.	0.	2.	2.	3.	1.	1.	0.
31	4.	2.	1.	1.	1.	1.	2.	2.	4.	1.
41	1.	2.	3.	1.	2.	1.	0.	2.	2.	0.
	3.	1.	0.	3.	2.	2.	1.	2.	1.	1.
61	2.	1.	1.	2.	1.	3.	2.	3.	1.	2.
71	3.	0.	1.	3.	2.	0.	1.	1.	5.	2.
81	3.	1.	2.	0.	1.	4.	6.	5.	0.	2.
91	1.	4.	5.	3.	4.	4.	2.	3.	0.	4.
101	2.	0.	3.	5.	2.	1.	1.	3.	2.	1.
111	2.	1.	1.	2.	1.	2.	0.	3.	3.	3.
121	1.	5.	2.	2.	2.	9.	7.	8.	7.	6.
131	10.	3.	5.	3.	5.	5.	5.	8.	9.	6.
141	3.	0.	6.	6.	7.	3.	5.	10.	6.	4.
151	9.	6.	5.	5.	4.	4.	7.	11.	7.	8.
161	3.	5.	6.	7.	4.	12.	10.	10.	3.	6.
171	6.	6.	5.	12.	9.	8.	7.	7.	6.	5.
181	11.	11.	7.	4.	8.	10.	9.	6.	13.	16.
191	9.	10.	18.	8.	17.	13.	14.	13.	13.	12.
201	13.	13.	13.	9.	14.	16.	15.	19.	16.	23.
211	18.	14.	27.	16.	26.	11.	17.	16.	26.	15.
221	26.	22.	22.	13.	24.	18.	20.	20.	20.	24.
231	31.	30.	33.	32.	24.	13.	26.	29.	25.	24.
241	30.	36.	27.	26.	26.	31.	42.	27.	32.	37.
251	44.	42.	36.	25.	37.	48.	38.	48.	37.	39.
261	44.	37.	50.	60.	54.	51.	40.	54.	53.	52.
271	46.	57.	62.	40.	42.	63.	57.	63.	69.	62.
281	72.	77.	75.	76.	67.	87.	91.	74.	71.	94.
291	93.	82.	99.	87.	99.	94.	95.	96.	99.	111.
301	120.	102.	103.	105.	128.	110.	119.	139.	144.	118.
3	136.	139.	149.	145.	155.	157.	146.	139.	159.	155.
321	163.	194.	172.	200.	184.	180.	210.	193.	211.	219.
331	199.	229.	208.	233.	216.	215.	237.	232.	268.	264.
341	221.	253.	278.	243.	221.	260.	282.	272.	256.	261.
351	278.	340.	260.	274.	243.	257.	265.	227.	255.	276.
361	281.	258.	322.	222.	200.	96.	55.	16.	6.	2.
371	0.	0.	0.	0.	0.	0.	0.	3.	0.	1.
381	1.	0.	0.	0.	1.	1.	0.	1.	0.	1.
391	0.	1.	0.	1.	2.	0.	0.	2.	1.	0.
401	0.	0.	1.	1.	0.	1.	1.	0.	1.	0.
411	1.	0.	0.	0.	1.	1.	2.	0.	2.	1.
421	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
481	1.	0.	1.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

Raymond 1-3-94

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT

WHC-SD-WM-DP-062, REV. 0

SAMPLE
J1426-5781
File ID: 12a4327.CNF

Counted on: 1/ 3/94 @23: 6
Detector: AEA12
Geometry number: 1
Count time: 86404. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	230.0	230.0	350.564	350.564	10.000	3.188	5.000	1.231
2	26.9	26.9	291.807	291.763	12.000	5.798	6.000	1.445
3	180.8	180.8	218.132	218.131	12.000	4.369	6.000	2.131

PEAK RESULTS
Peak Error Limit: 25%

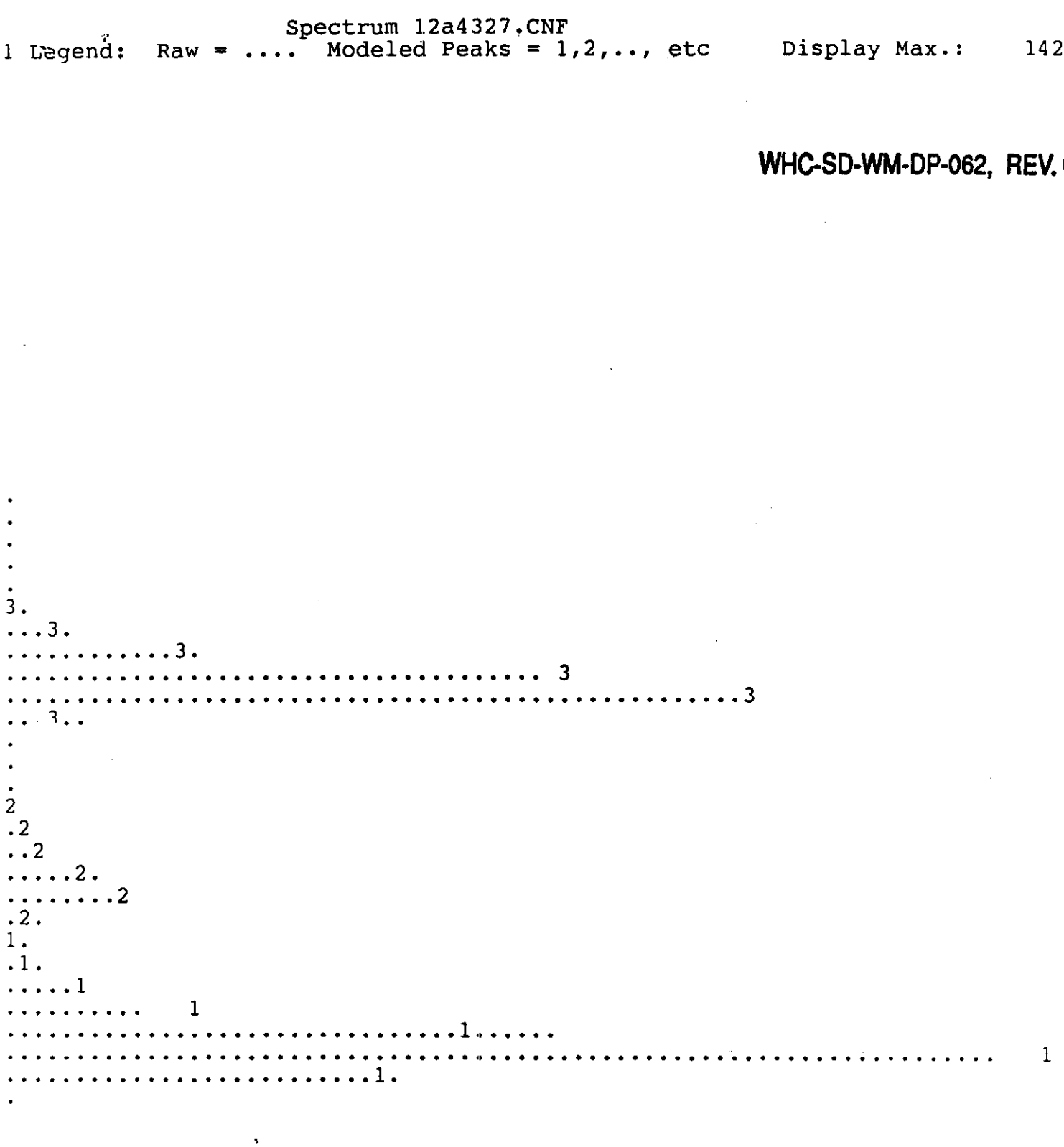
Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Peak Centroid Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Pu236	0.488	5.756	5.753	0.003	0.01	2.28	3.4	19.1	0.863E-05
2	Am241	0.084	5.480	5.477	0.003	0.03	0.39	8.4	3.4	0.155E-05
	Pu238		5.499	5.477	0.022				4.5	0.202E-05
3	Pu239	0.362	5.143	5.131	0.012	0.02	1.69	4.0	13.9	0.627E-05
	Pu240		5.144	5.131	0.013				13.9	0.627E-05
Totals:		0.934	<--valid peaks only-->				4.36			

DETECTOR CALIBRATION
Energy(MEV) = 4.106 + (0.0047)*Channel
Energy range (MeV): 4.106 TO 6.512
Efficiency = 0.1213 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	6722.0	100.000
Smoothed	6722.0	100.000
Composite fit	6275.3	93.354
Residuals	446.7	6.646

Analyzed by: ALJ


Spectrum 12a4327.CNF
Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.: 1427.1

Raw Data Dump for AEA Spectrum: 12a4327.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	1.	0.	0.	1.	0.	0.	0.	0.	1.	0.
21	0.	0.	0.	0.	0.	0.	1.	0.	1.	1.
31	0.	0.	0.	0.	0.	0.	0.	1.	2.	0.
41	0.	0.	0.	0.	0.	1.	1.	1.	0.	0.
51	1.	0.	0.	0.	0.	0.	2.	1.	0.	0.
61	1.	1.	1.	0.	0.	1.	2.	1.	0.	0.
71	0.	0.	1.	1.	1.	0.	0.	1.	1.	1.
81	2.	1.	2.	1.	2.	0.	0.	0.	2.	2.
91	0.	0.	1.	2.	1.	2.	3.	1.	1.	1.
101	1.	1.	0.	3.	0.	1.	1.	3.	2.	4.
111	0.	3.	1.	2.	3.	2.	0.	3.	2.	3.
121	2.	2.	3.	0.	3.	3.	3.	2.	1.	2.
131	2.	0.	3.	2.	7.	0.	2.	3.	2.	4.
141	1.	2.	2.	2.	1.	4.	4.	3.	4.	4.
151	6.	0.	1.	2.	4.	1.	5.	9.	2.	5.
161	8.	3.	3.	4.	3.	4.	1.	7.	7.	4.
171	4.	5.	2.	6.	2.	5.	3.	8.	3.	5.
181	3.	7.	7.	3.	8.	3.	5.	6.	7.	12.
191	16.	7.	6.	15.	18.	13.	17.	18.	11.	19.
201	23.	30.	41.	28.	48.	45.	56.	53.	64.	77.
211	95.	75.	93.	116.	147.	195.	197.	209.	204.	191.
221	125.	85.	52.	36.	10.	4.	1.	2.	2.	2.
231	1.	1.	5.	1.	4.	3.	4.	3.	3.	3.
241	0.	3.	1.	6.	3.	3.	4.	0.	4.	5.
251	5.	2.	9.	2.	6.	3.	2.	0.	4.	2.
261	6.	8.	4.	5.	5.	6.	5.	2.	6.	4.
271	7.	4.	7.	8.	9.	11.	18.	11.	12.	9.
281	17.	20.	20.	21.	24.	18.	22.	11.	22.	33.
291	27.	31.	29.	29.	16.	15.	10.	4.	4.	3.
301	5.	4.	5.	5.	7.	12.	3.	5.	8.	6.
311	6.	8.	8.	8.	7.	9.	11.	15.	15.	8.
321	12.	12.	13.	17.	17.	11.	8.	15.	11.	21.
331	21.	14.	31.	28.	32.	49.	88.	98.	124.	136.
341	143.	136.	97.	87.	85.	114.	151.	198.	214.	289.
351	277.	262.	172.	103.	32.	21.	9.	0.	0.	0.
361	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.
371	0.	0.	0.	0.	2.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
391	0.	0.	1.	0.	0.	1.	2.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
461	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	0.	0.	0.	1.	1.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

Raymond 1-5-94

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT

WHC-SD-WM-DP-062, REV. 0

SAMPLE
J1426-5781 DUP
File ID: 8a8651.CNF

Counted on: 1/ 3/94 @23:10
Detector: AEA8
Geometry number: 1
Count time: 86401. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	557.8	557.8	358.214	358.214	18.000	10.804	9.000	3.238
2	137.1	137.1	301.112	301.031	16.000	6.206	8.000	1.445
3	29.1	29.1	260.373	259.605	20.000	10.494	10.000	0.642
4	837.5	837.5	226.987	226.968	16.000	9.880	8.000	3.172
5?	5.6	5.6	146.047	145.212	12.000	4.432	6.000	0.976

PEAK RESULTS
Peak Error Limit: 25%

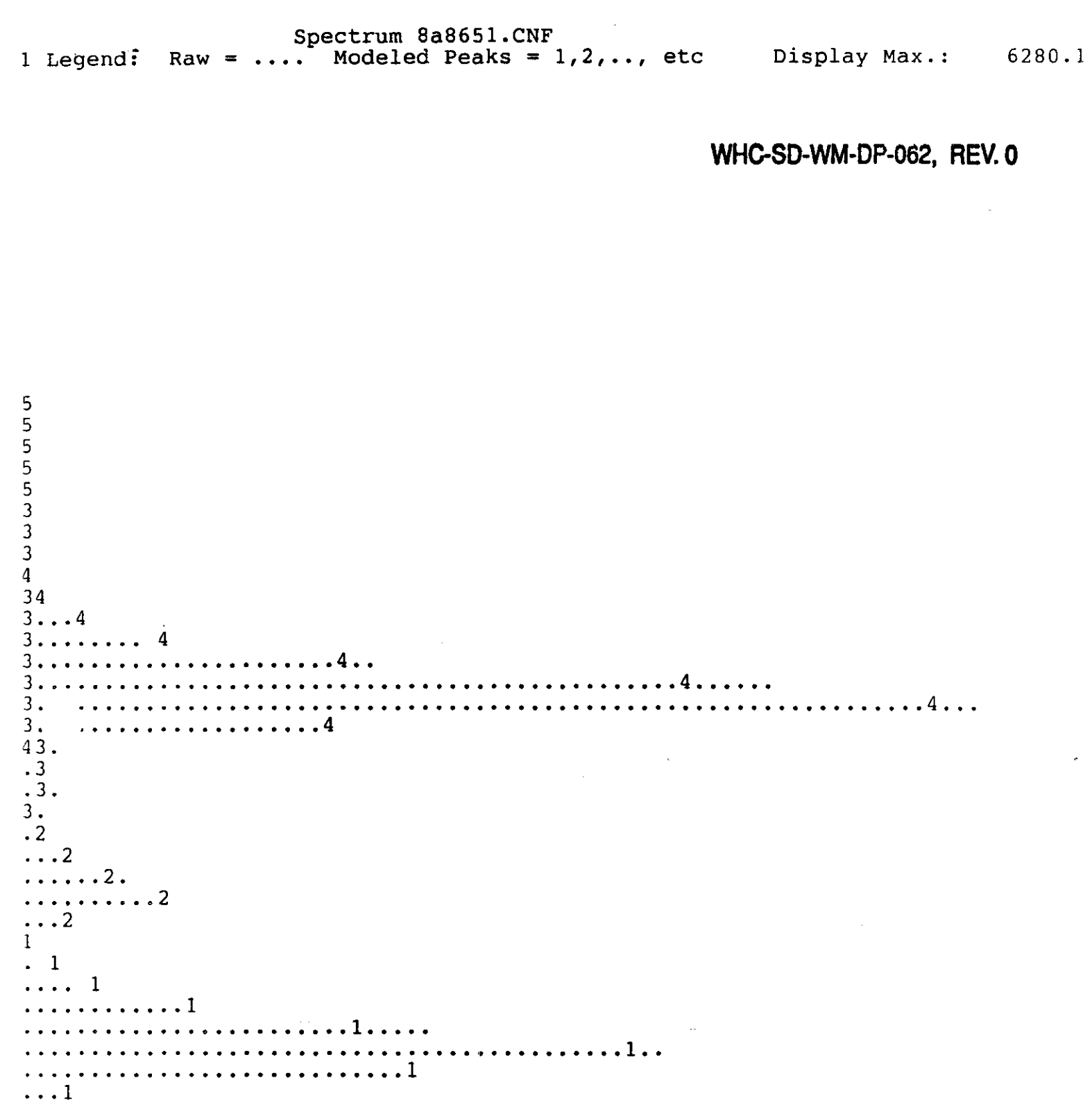
Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Cm243	0.355	5.786	5.739	0.047	0.05	8.33	1.8	85.6	0.386E-04
	Pu236		5.756	5.739	0.017				63.8	0.287E-04
2	Am241	0.090	5.480	5.476	0.004	0.03	2.12	3.7	16.9	0.761E-05
	Pu238		5.499	5.476	0.023				22.0	0.993E-05
3	Am243	0.057	5.276	5.285	-.009	0.05	1.34	5.1	10.2	0.459E-05
4	Pu239	0.504	5.143	5.135	0.008	0.05	11.83	1.6	88.7	0.400E-04
	Pu240		5.144	5.135	0.009				88.7	0.400E-04
5		????		4.759			0.09	33.3		
Totals:		1.006	<--valid peaks only-->				23.62			

DETECTOR CALIBRATION
Energy(MEV) = 4.091 + (0.0046)*Channel
Energy range (MeV): 4.091 TO 6.446
Efficiency = 0.1333 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	33807.0	100.000
Smoothed	33807.0	100.000
Composite fit	34136.0	100.973
Residuals	-329.0	-0.973

Analyzed by: _____
ALJ


Spectrum 8a8651.CNF
1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.: 6280.1

Raw Data Dump for AEA Spectrum: 8a8651.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	1.	4.	7.	8.
21	5.	5.	14.	5.	8.	5.	4.	7.	5.	1.
31	1.	4.	2.	2.	5.	2.	1.	4.	3.	5.
41	3.	3.	3.	3.	2.	6.	6.	4.	1.	3.
51	5.	3.	4.	2.	5.	3.	1.	0.	6.	2.
61	7.	6.	3.	3.	3.	6.	1.	3.	2.	1.
71	2.	2.	6.	2.	5.	5.	6.	3.	3.	5.
81	7.	5.	1.	2.	8.	2.	2.	2.	2.	3.
91	6.	0.	1.	3.	0.	1.	1.	3.	4.	6.
101	6.	3.	3.	5.	1.	2.	1.	0.	3.	4.
111	4.	10.	1.	1.	1.	1.	5.	2.	2.	5.
121	4.	6.	4.	8.	5.	3.	3.	3.	8.	6.
131	8.	4.	9.	8.	6.	6.	7.	10.	9.	8.
141	12.	9.	11.	11.	7.	12.	13.	7.	11.	9.
151	7.	8.	4.	3.	6.	4.	3.	2.	3.	4.
161	6.	4.	4.	7.	7.	9.	9.	7.	9.	7.
171	6.	9.	8.	3.	8.	4.	12.	8.	10.	10.
181	12.	16.	22.	14.	20.	12.	14.	10.	27.	25.
191	34.	22.	28.	35.	42.	48.	60.	66.	59.	60.
201	81.	81.	97.	113.	126.	119.	165.	166.	209.	239.
211	280.	302.	322.	371.	428.	438.	507.	535.	594.	683.
221	751.	742.	756.	775.	886.	923.	908.	883.	870.	740.
231	695.	578.	471.	333.	240.	165.	111.	70.	36.	31.
241	24.	16.	16.	13.	15.	22.	28.	20.	19.	24.
251	40.	22.	30.	31.	33.	34.	34.	31.	44.	45.
261	46.	24.	45.	38.	41.	30.	35.	22.	38.	20.
271	24.	12.	9.	16.	20.	32.	37.	23.	26.	21.
281	34.	42.	48.	64.	51.	58.	52.	75.	93.	85.
291	81.	100.	119.	110.	119.	132.	135.	125.	116.	162.
301	164.	127.	157.	128.	77.	81.	53.	41.	22.	19.
311	13.	12.	7.	7.	8.	11.	11.	12.	6.	13.
321	13.	10.	20.	22.	23.	27.	24.	35.	33.	42.
331	46.	54.	61.	56.	70.	88.	99.	105.	106.	141.
341	146.	176.	211.	214.	249.	258.	332.	358.	376.	425.
351	472.	477.	509.	494.	546.	602.	540.	590.	582.	547.
361	543.	475.	420.	312.	267.	149.	138.	77.	44.	20.
371	10.	7.	0.	0.	0.	2.	0.	0.	0.	0.
381	1.	0.	0.	0.	1.	0.	0.	0.	1.	0.
391	1.	1.	0.	0.	0.	0.	2.	0.	0.	3.
401	2.	1.	0.	1.	1.	1.	1.	1.	0.	1.
411	2.	0.	4.	2.	2.	1.	0.	1.	0.	3.
421	1.	0.	0.	0.	0.	0.	0.	0.	1.	0.
431	0.	0.	1.	0.	1.	2.	0.	0.	0.	2.
441	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	2.	2.	0.	1.	1.	0.	0.	0.
471	0.	1.	1.	0.	0.	2.	0.	2.	1.	0.
481	2.	0.	0.	2.	0.	0.	1.	1.	1.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

Keyword
1-5-94

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT

WHC-SD-WM-DP-062, REV. 0

SAMPLE
J1426-5781
File ID: 5a5000.CNF

Counted on: 1/ 4/94 @ 3:12
Detector: AEA5
Geometry number: 1
Count time: 86402. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	1400.7	1400.7	358.814	358.814	20.000	15.997	10.000	5.019
2	349.1	349.1	301.626	301.470	20.000	13.111	10.000	3.383
3	2149.8	2149.8	227.476	227.472	22.000	15.759	11.000	5.654
4	26.8	26.8	140.704	140.640	92.000	1.000	46.000	0.100
5?	4.3	4.3	105.359	102.949	12.000	3.603	6.000	0.225

PEAK RESULTS
Peak Error Limit: 25%

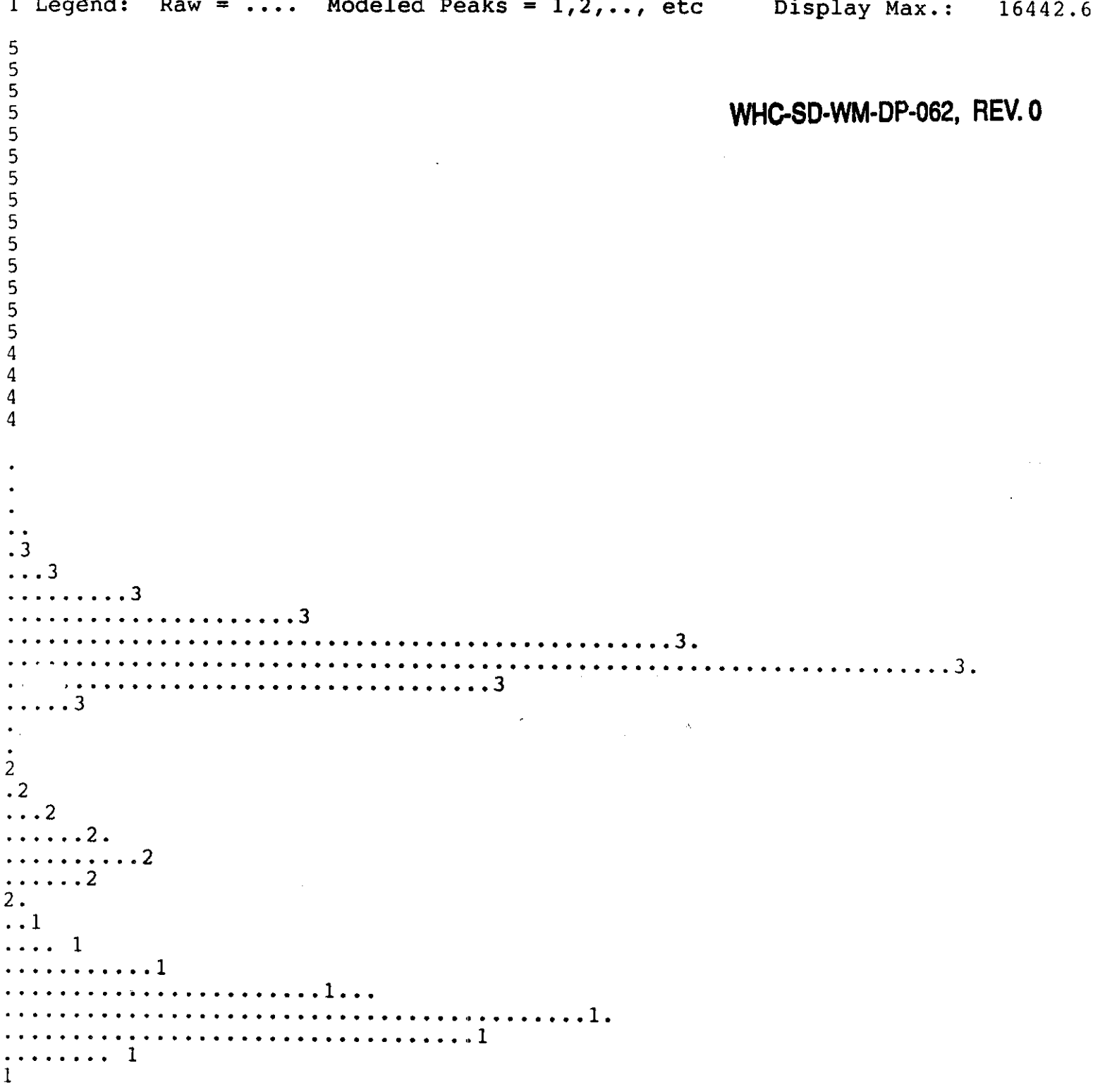
Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Cm243	0.355	5.786	5.782	0.004	0.08	22.87	1.1	232.1	0.105E-03
	Cm244		5.796	5.782	0.014				169.4	0.763E-04
2	Am241	0.092	5.480	5.513	-.033	0.06	5.90	2.2	46.5	0.209E-04
	Pu238		5.499	5.513	-.014				60.7	0.273E-04
3	Pu239	0.516	5.143	5.165	-.022	0.07	33.25	0.9	246.3	0.111E-03
	Pu240		5.144	5.165	-.021				246.3	0.111E-03
4		0.011		4.757		0.00	0.70	6.2	5.2	0.235E-05
5		????		4.579			0.15	22.8		
Totals:		0.973	<--valid peaks only-->				62.72			

DETECTOR CALIBRATION
Energy(MEV) = 4.096 + (0.0047)*Channel
Energy range (MeV): 4.096 TO 6.502
Efficiency = 0.1350 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	92841.0	100.000
Smoothed	92840.7	100.000
Composite fit	90547.4	97.530
Residuals	2293.6	2.470

Analyzed by: VR


Spectrum 5a5000.CNF
Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.: 16442.6

Raw Data Dump for AEA Spectrum: 5a5000.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	3.	9.	11.	7.
21	12.	6.	7.	11.	10.	8.	6.	5.	9.	5.
31	9.	11.	9.	7.	5.	7.	6.	6.	8.	4.
41	4.	6.	2.	12.	12.	7.	4.	13.	4.	7.
51	7.	5.	5.	7.	8.	7.	13.	6.	5.	8.
61	4.	9.	7.	10.	6.	6.	8.	9.	8.	6.
71	7.	9.	10.	7.	6.	9.	9.	7.	10.	6.
81	14.	10.	3.	16.	6.	12.	6.	10.	12.	9.
91	10.	11.	5.	11.	9.	17.	9.	11.	17.	10.
101	9.	14.	16.	16.	10.	13.	19.	9.	13.	11.
111	10.	10.	12.	8.	16.	17.	11.	14.	18.	14.
121	10.	21.	23.	17.	21.	13.	21.	12.	21.	15.
131	13.	16.	20.	27.	27.	16.	24.	24.	23.	30.
141	33.	24.	24.	24.	16.	23.	25.	30.	26.	28.
151	34.	30.	22.	34.	36.	31.	37.	34.	34.	42.
161	34.	34.	29.	33.	39.	46.	34.	50.	43.	46.
171	38.	44.	40.	57.	55.	53.	63.	64.	56.	57.
181	68.	60.	85.	77.	63.	66.	89.	68.	84.	103.
191	98.	116.	123.	128.	129.	152.	135.	146.	183.	201.
201	224.	224.	233.	277.	274.	319.	365.	400.	469.	531.
211	564.	660.	755.	781.	911.	984.	1145.	1254.	1387.	1529.
221	1654.	1839.	1984.	2071.	2206.	2279.	2276.	2262.	2169.	2024.
231	1980.	1823.	1622.	1383.	1162.	963.	767.	568.	477.	327.
241	230.	191.	104.	61.	53.	38.	48.	32.	33.	31.
251	30.	39.	43.	38.	38.	41.	46.	43.	42.	42.
261	64.	47.	47.	42.	52.	52.	39.	42.	52.	46.
271	39.	65.	34.	45.	49.	57.	71.	60.	61.	86.
281	72.	96.	99.	132.	112.	150.	141.	168.	175.	200.
291	220.	233.	261.	291.	315.	319.	337.	380.	336.	344.
301	393.	374.	357.	367.	287.	291.	232.	235.	175.	145.
311	126.	119.	103.	70.	63.	70.	60.	62.	38.	54.
321	60.	72.	71.	63.	82.	102.	79.	96.	109.	103.
331	120.	160.	131.	180.	181.	217.	246.	236.	280.	325.
341	402.	409.	457.	554.	603.	671.	718.	894.	951.	1003.
351	1071.	1191.	1251.	1250.	1358.	1415.	1430.	1467.	1454.	1434.
361	1367.	1324.	1162.	1121.	972.	808.	710.	485.	414.	276.
371	199.	164.	98.	82.	30.	24.	19.	10.	6.	2.
381	3.	1.	0.	0.	1.	1.	1.	1.	1.	2.
391	2.	4.	1.	0.	2.	2.	7.	1.	1.	0.
401	2.	3.	2.	3.	3.	7.	2.	2.	5.	3.
411	6.	3.	9.	6.	5.	8.	7.	5.	5.	6.
421	4.	4.	3.	3.	3.	5.	3.	1.	3.	3.
431	1.	2.	2.	0.	1.	1.	3.	2.	0.	0.
441	0.	0.	0.	0.	1.	0.	1.	0.	0.	0.
451	1.	0.	0.	0.	4.	0.	0.	0.	1.	0.
461	2.	0.	1.	1.	1.	1.	2.	6.	1.	4.
471	2.	2.	2.	3.	3.	3.	3.	6.	6.	3.
481	6.	5.	3.	3.	5.	3.	1.	2.	0.	3.
491	0.	0.	0.	1.	0.	1.	0.	0.	0.	0.
511	0.	0.								

1-5-94

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT

WHC-SD-WM-DP-062, REV. 0

SAMPLE
J1426-5981
File ID: 6a0.CNF 6910 Dpm.

Counted on: 1/ 4/94 @ 3:13
Detector: AEA6
Geometry number: 1
Count time: 86404. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1?	12.7	12.7	496.230	496.230	8.000	0.927	4.000	1.779
2	667.4	667.4	360.801	360.801	24.000	25.059	12.000	8.207
3	181.8	181.8	298.919	298.842	26.000	23.397	13.000	8.164
4?	134.7	134.7	258.096	257.468	12.000	0.035	6.000	6.050
5	2636.7	2636.7	226.907	226.907	22.000	20.097	11.000	8.067
6	19.6	19.6	155.233	154.241	38.000	110.476	19.000	39.183
7?	1.8	1.8	150.193	150.193	8.000	0.000	4.000	3.686

PEAK RESULTS
Peak Error Limit: 25%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1		????		6.418			0.04	24.6		
2	Cm243	0.207	5.786	5.782	0.004	0.12	12.45	1.5	135.4	0.610E-04
	Cm244		5.796	5.782	0.014				98.8	0.445E-04
3	Am241	0.054	5.480	5.491	-.011	0.11	3.25	3.0	27.5	0.124E-04
	Pu238		5.499	5.491	0.008				35.8	0.161E-04
4		????		5.296			0.07	24.8		
5	Pu239	0.715	5.143	5.153	-.010	0.09	42.99	0.8	341.2	0.154E-03
	Pu240		5.144	5.153	-.009				341.2	0.154E-03
6	Np237	0.011	4.640	4.811	-.171	0.52	0.69	21.3	90.8	0.409E-04
	Np237		4.781	4.811	-.030				6.3	0.282E-05
7		????		4.792			0.00	1000.		
Totals:		0.988	<--valid peaks only-->				59.38			

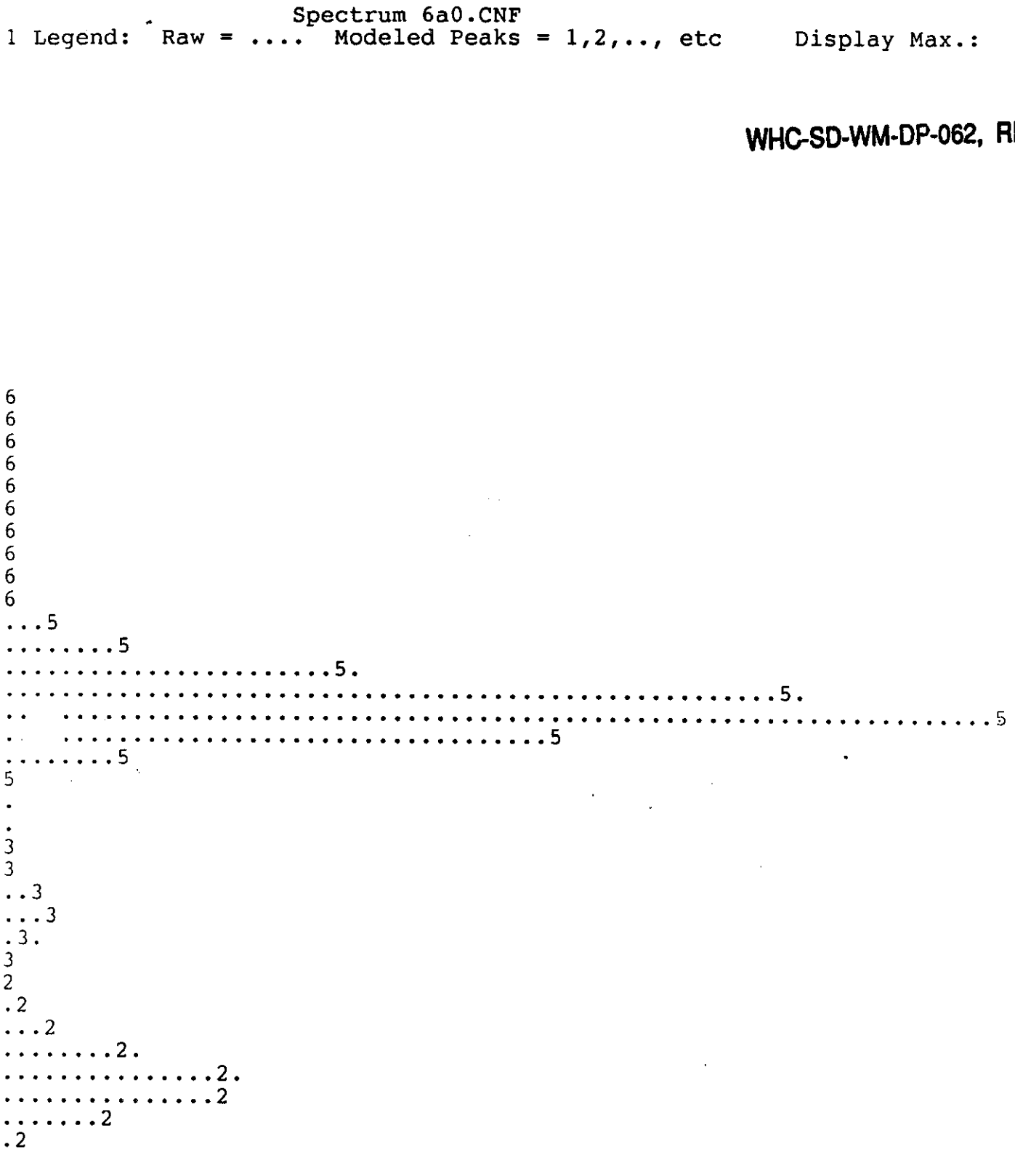
DETECTOR CALIBRATION
Energy(MEV) = 4.086 + (0.0047)*Channel
Energy range (MeV): 4.086 TO 6.493
Efficiency = 0.1260 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	86585.0	100.000

Smoothed	86591.5	100.008
Composite fit	85679.4	98.954
Residuals	905.6	1.046

Analyzed by: VR


Spectrum 6a0.CNF
1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.: 19940.7

Raw Data Dump for AEA Spectrum: 6a0.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	2.	5.	3.	1.
21	8.	1.	3.	2.	7.	7.	7.	10.	8.	7.
31	12.	6.	6.	11.	11.	4.	7.	10.	6.	6.
41	8.	7.	11.	7.	4.	6.	6.	5.	6.	5.
51	1.	3.	4.	7.	7.	3.	3.	3.	5.	2.
61	5.	2.	4.	1.	3.	3.	1.	5.	5.	7.
71	8.	2.	5.	1.	1.	6.	3.	7.	4.	1.
81	6.	5.	4.	6.	6.	5.	6.	4.	7.	0.
91	3.	6.	7.	3.	2.	4.	4.	7.	5.	7.
101	3.	6.	4.	7.	7.	2.	3.	4.	2.	4.
111	9.	6.	3.	6.	11.	7.	16.	9.	4.	9.
121	10.	6.	9.	14.	4.	7.	7.	9.	5.	9.
131	14.	12.	10.	13.	15.	17.	11.	12.	10.	18.
141	15.	15.	23.	20.	25.	17.	16.	11.	16.	21.
151	18.	16.	15.	14.	18.	17.	20.	10.	15.	16.
161	17.	26.	19.	17.	29.	29.	22.	20.	20.	20.
171	27.	29.	22.	31.	21.	29.	31.	30.	46.	34.
181	32.	44.	39.	46.	48.	49.	53.	48.	62.	73.
191	79.	80.	86.	99.	99.	103.	134.	143.	192.	163.
201	210.	234.	267.	326.	315.	398.	461.	531.	628.	690.
211	788.	928.	1032.	1118.	1300.	1485.	1560.	1736.	1965.	2107.
221	2294.	2454.	2525.	2703.	2681.	2762.	2745.	2694.	2637.	2377.
231	2293.	2107.	1879.	1742.	1501.	1303.	1052.	909.	729.	535.
241	458.	331.	283.	194.	145.	146.	79.	79.	66.	63.
251	45.	55.	52.	37.	26.	38.	53.	48.	57.	41.
261	53.	48.	48.	40.	53.	35.	38.	46.	41.	27.
271	36.	35.	35.	32.	25.	36.	35.	42.	37.	42.
281	58.	57.	61.	65.	62.	97.	80.	101.	120.	131.
291	164.	146.	131.	163.	160.	161.	182.	212.	203.	176.
301	176.	173.	173.	153.	180.	147.	132.	114.	92.	78.
311	84.	69.	60.	61.	37.	35.	33.	25.	33.	17.
321	23.	21.	11.	17.	20.	37.	26.	36.	37.	38.
331	46.	60.	51.	65.	87.	104.	102.	117.	134.	161.
341	157.	187.	226.	240.	289.	314.	325.	366.	404.	505.
351	485.	536.	542.	614.	597.	670.	680.	652.	686.	659.
361	695.	668.	681.	595.	597.	537.	510.	507.	393.	327.
371	314.	240.	231.	203.	148.	135.	114.	85.	53.	45.
381	45.	22.	20.	14.	11.	6.	3.	4.	1.	0.
391	0.	2.	1.	1.	0.	0.	0.	1.	1.	2.
401	1.	3.	1.	1.	0.	0.	0.	0.	0.	3.
411	1.	1.	1.	0.	2.	3.	3.	4.	2.	0.
421	1.	1.	3.	1.	5.	2.	3.	1.	2.	4.
431	1.	2.	0.	3.	1.	0.	2.	0.	1.	2.
441	1.	1.	1.	1.	0.	0.	1.	0.	0.	0.
451	2.	1.	0.	2.	0.	1.	0.	0.	2.	0.
461	1.	0.	0.	2.	1.	4.	1.	0.	4.	12.
471	3.	5.	12.	6.	4.	9.	7.	2.	1.	3.
481	1.	1.	0.	0.	1.	1.	0.	0.	1.	2.
491	2.	1.	3.	3.	8.	23.	20.	5.	0.	0.
511	0.	0.								

Raymond
1-5-94

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT

WHC-SD-WM-DP-062, REV. 0

SAMPLE
J1426-5981
File ID: 7a7438.CNF

Counted on: 1/ 4/94 @ 3:18
Detector: AEA7
Geometry number: 1
Count time: 86402. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	746.3	746.3	355.895	355.895	28.000	26.911	14.000	8.956
2	181.2	181.2	298.758	298.471	24.000	20.108	12.000	4.282
3	2609.9	2609.9	226.205	226.198	22.000	20.145	11.000	5.179

PEAK RESULTS
Peak Error Limit: 25%

Peak	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Cm243	0.214	5.786	5.770	0.016	0.13	14.23	1.4	190.5	0.858E-04
	Pu236		5.756	5.770	-.014				141.9	0.639E-04
2	Am241	0.056	5.480	5.500	-.020	0.09	3.75	2.8	39.0	0.176E-04
	Pu238		5.499	5.500	-.001				50.9	0.229E-04
3	Pu239	0.743	5.143	5.161	-.018	0.09	49.50	0.7	483.9	0.218E-03
	Pu240		5.144	5.161	-.017				483.9	0.218E-03
Totals:		1.013	<--valid peaks only-->				67.48			

DETECTOR CALIBRATION
Energy(MEV) = 4.098 + (0.0047)*Channel
Energy range (MeV): 4.098 TO 6.504
Efficiency = 0.1023 CPM/DPM

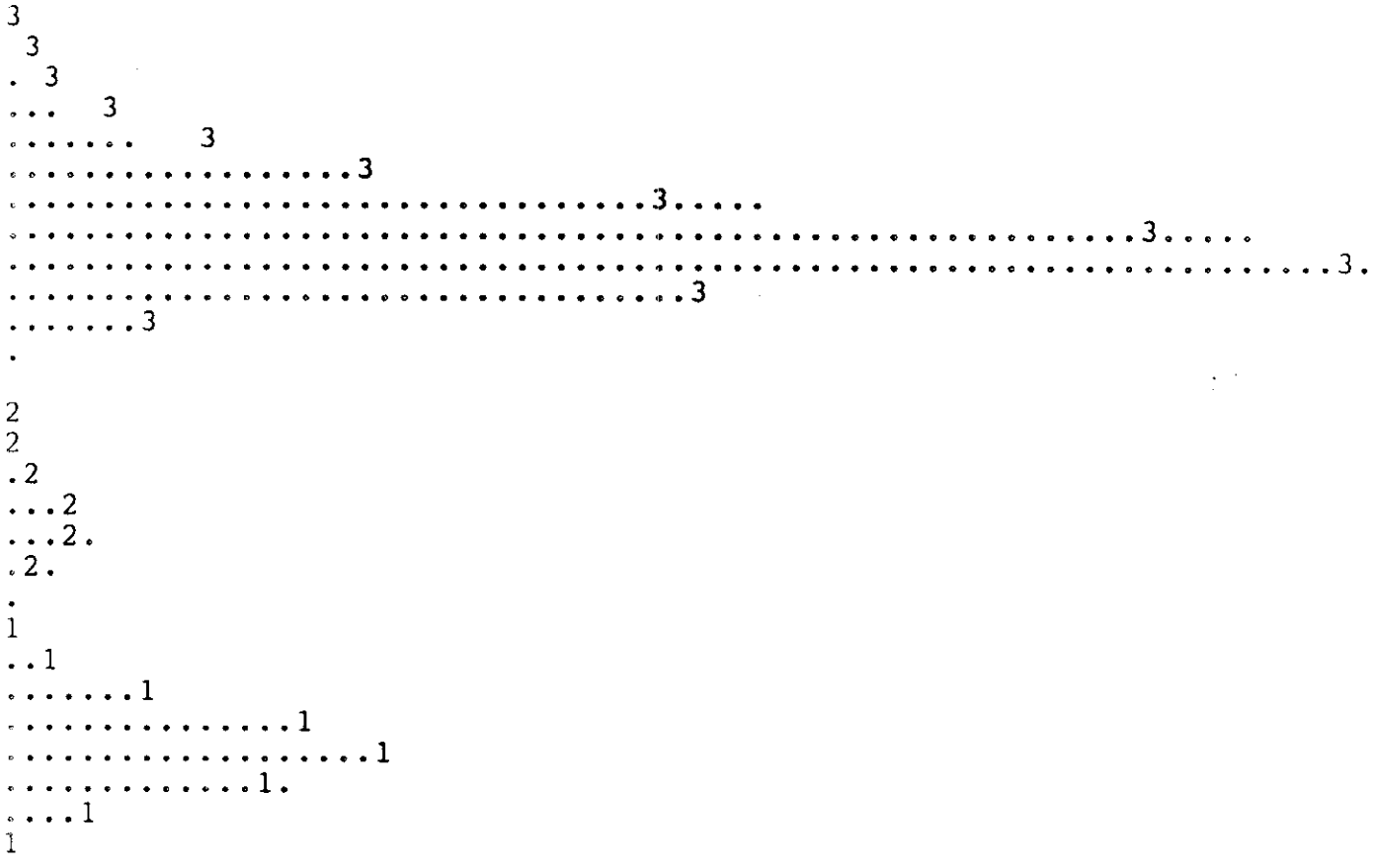
TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	95933.0	100.000
Smoothed	95933.1	100.000
Composite fit	97179.1	101.299
Residuals	-1246.1	-1.299

Analyzed by: VR

Spectrum 7a7438.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 19532.2



Raw Data Dump for AEA Spectrum: 7a7438.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	2.	3.	4.	4.
21	6.	3.	2.	5.	3.	3.	4.	4.	2.	2.
31	3.	0.	2.	1.	0.	1.	0.	0.	0.	0.
41	1.	1.	0.	0.	3.	0.	0.	0.	1.	1.
5	0.	0.	0.	1.	0.	2.	2.	0.	0.	1.
61	2.	3.	2.	3.	2.	0.	0.	3.	1.	0.
71	1.	0.	2.	2.	2.	4.	4.	1.	1.	1.
81	1.	3.	0.	1.	3.	1.	2.	2.	2.	1.
91	0.	0.	1.	2.	1.	1.	2.	4.	2.	2.
101	2.	1.	1.	2.	3.	1.	3.	3.	1.	2.
111	5.	4.	3.	7.	2.	4.	2.	7.	4.	3.
121	5.	2.	4.	4.	5.	6.	8.	5.	2.	7.
131	4.	2.	7.	8.	7.	3.	6.	8.	5.	12.
141	7.	6.	8.	6.	9.	8.	6.	10.	10.	12.
151	7.	3.	6.	11.	8.	6.	9.	3.	9.	14.
161	8.	3.	5.	14.	11.	15.	13.	10.	23.	14.
171	16.	21.	23.	20.	20.	35.	25.	41.	38.	33.
181	39.	46.	54.	73.	79.	74.	85.	100.	113.	136.
191	160.	175.	184.	206.	259.	261.	307.	316.	392.	436.
201	477.	520.	566.	673.	763.	833.	912.	964.	1067.	1157.
211	1273.	1403.	1553.	1700.	1826.	1882.	2005.	2136.	2256.	2325.
221	2458.	2547.	2673.	2671.	2678.	2621.	2684.	2648.	2537.	2361.
231	2075.	1973.	1831.	1527.	1371.	1102.	889.	802.	551.	427.
241	286.	256.	166.	117.	84.	64.	64.	37.	29.	26.
251	21.	25.	26.	28.	26.	25.	28.	25.	35.	27.
261	34.	30.	36.	31.	31.	31.	27.	39.	44.	37.
271	48.	37.	38.	42.	46.	54.	51.	54.	67.	60.
281	82.	83.	87.	94.	107.	107.	107.	132.	134.	122.
291	158.	159.	164.	166.	199.	186.	198.	177.	199.	189.
301	179.	181.	161.	147.	145.	140.	128.	109.	84.	100.
31	77.	50.	44.	33.	28.	31.	40.	28.	40.	23.
321	32.	37.	42.	46.	57.	52.	56.	79.	90.	100.
331	120.	122.	148.	158.	161.	196.	234.	240.	294.	292.
341	298.	379.	410.	435.	502.	509.	585.	602.	609.	655.
351	677.	713.	752.	757.	802.	779.	711.	730.	755.	702.
361	707.	670.	611.	516.	516.	432.	369.	283.	228.	185.
371	147.	111.	77.	53.	34.	28.	16.	9.	4.	6.
381	5.	4.	2.	0.	1.	0.	0.	1.	1.	0.
391	0.	2.	1.	0.	0.	1.	1.	2.	1.	2.
401	0.	1.	2.	4.	0.	1.	3.	1.	1.	2.
411	0.	2.	0.	3.	0.	0.	0.	1.	0.	0.
421	1.	1.	0.	0.	2.	0.	1.	1.	1.	0.
431	1.	0.	0.	0.	0.	0.	1.	1.	0.	0.
441	0.	0.	0.	1.	0.	0.	0.	0.	1.	0.
451	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
461	0.	0.	0.	1.	1.	0.	0.	0.	1.	0.
471	0.	1.	0.	1.	2.	0.	0.	0.	1.	0.
481	0.	2.	0.	2.	1.	1.	1.	0.	2.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	24.	0.								

Batch 2512

WESTINGHOUSE HANFORD COMPANY

222-S LABORATORY

ANALYTICAL BATCH

WHC-SD-WM-DP-062, REV. 0

Lab Segment Serial No. J1446	Customer ID: KE83D
Analysis: Pu 239/40	Sample Prep: DIRECT

Instrument: WB 537237	Procedure/ Rev: LA 503 - 156
Technologist: Joel M VanSant	Date: 1-17-94
Starting Time: 0830	Temperature 25°C
Ending Time:	Chemist: L Fitts

Comments: 24HR AEA
This batch was rerun do to an OSCR! 121.8% recovery was 1% higher than control limits!
[illegible]

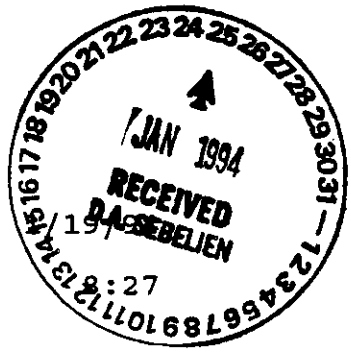
OUT FOR RERUN

	Description	Lab ID		Description	Lab ID
1	LMCS	J1447-5591	11		
2	BLANK	J1448-5681	12		
3	Sample	J1446-5791	13		
4	Sample Dup	J1446-5791	14		
5	Sample Top	J1446-5781	15		
6	Spike	J1446-5081	16		
7	Spike Dup	J1446-5981	17		
8			18		
9			19		
10			20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS	63843 .100	-10 -.100mL		
Spike	77843 .05mL			

A-6000-881 (03/92)

JAN 1994
RECEIVED
D.A. SEBELIEN



OFF-STANDARD CONDITION REPORT

OSCR #: 006550 DETERMINATION: PU239/40 DATE: 1/19/94

EDP CODE: R211 METHOD: LA-503-156 TIME: 8:27

MATERIAL: AR-001

	LOW	HIGH
CONTROL LIMITS:	74.0400%	120.8200%
WARNING LIMITS:	81.8300%	113.0200%

			STD. ID	STD. VAL	RESULT	% RECOVERY
ANALYSIS 1:	1/17/94	8:26	63B43	1.3050E 02	1.5900E 02	121.8391%

DESCRIBE THE CAUSE OF THE OFF-STANDARD CONDITION

OSCR due to concentration of the standard aliquot.

LIST CORRECTIVE ACTION TAKEN:

Used a new aliquot of standard 63343 and run 2 standards. Recoveries on the reruns were within limits at 97.5% and 88.4%. 1/19/94 08:10

LIST CORRECTIVE ACTIONS STILL REMAINING:

None - tech causing OSCR also cleared it.

METHOD REQUALIFICATION REQUIRED? NO YES

CLEAR HISTORY DATA? NO / YES /

FINAL REPORT |X|

INTERIM REPORT |_|

OSCR COMPLETED DATE 1/21/94

UNIT MANAGER C Akita

CHEMIST [signature]

GROUP MANAGER [signature]

DMC CHEMIST [signature] 1/25/94

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

③ 3598 Batch 2512

Serial No	Sample Point	Date	Time Issued	Priority
J 1447.-5581	BECHTOLD	1- 4-94	13:50	26

Determination	Method/Standard	Result Units	Charge Code	Reruns
Pu239/40	LA-503-156	% RECOVERY	E14157	0

Sample Size	Customer ID
? .100 - 10 - .100mL	STD

Remarks, Calculations, Results

EDP R211 AROO1

STD# 63843 RESULT 1.59 E+2 "AEA" - ATTACH PRINTOUT

STD VAL. 1.305 E+2 %REC 121.8 %

.05mL 77843

OUT FOR RERUN

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
1-17-94		

1-17-94

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

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

Serial No.				STANDARD
J1447-5581	Date Counted	01/17/94	Pu 236 AEA Frac. (C236)	0.281
Batch ID	Sample Volume in mL (SS)	0.1	Pu 238 AEA Frac. (C238)	0
2512	Sample D.F. (DF)	101	Pu 239 AEA Frac. (C239)	0.649
Rerun No.	Tracer Volume in mL (SPKV)	0.05	Total AT Counts	4377
0	Digest D.F. (DDF)	1	Time Counted in min (TC)	30
Analyst	Tracer Book No.	77B43	Background in cpm (Bkg)	7
J VAN SANT	Tracer Preparation Date	10/12/93	Pu 236 Counts	18.93
Date	Pu-236 Preparation Value	3226	Pu 238 Counts	0
01/17/94	Pu-236 Decay Corr'd Value	3024.22	Pu 239 Counts	43.72
	Pu-238 Tracer Value	133	AEA Count Time in min	1440

Decay Time = Date Counted - Tracer Preparation Date

WHC-SD-WM-DP-062, REV. 0

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

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SS

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

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

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

Pu-239/240 µCi/L	=	1.59E+02

NOTE: Tracer values are in dpm/mL.

Pu-239/240 µCi/mL	=	1.59E-01
Relative Counting Error	=	0.7%
Pu-238 µCi/mL	=	< 1.76E-02
Relative Counting Error	=	100.0%
Pu 236 Tracer Recovery	=	51.6%

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

DETECTION LEVELS in µCi/mL					
Pu 239/240	=	1.22E-02	Pu 238	=	1.76E-02

Data Entry by:		Date:	19-Jan-94
Approved by:		Date:	

#1 1-17-94 Dr.
4377
30 -7

J 1447-5581
#3

WHC-SD-WM-DP-062, REV. 0

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

② 2538

Serial No.	Sample Point	Date	Time Issued	Priority
J 1446.-5781	BECHTOLD	1- 4-94	12:26	26

Determination	Method/Standard	Result Units	Charge Code	Reruns
Pu239/40	LA-503-156	uCi/ML	E14157	0

Sample Size	Customer ID
? .100 - 10 - .800 mL	KE83D

Remarks, Calculations, Results

COUNT AS uCI/L
SAM

.05mL 77843

WHC-SD-WM-DP-062, REV. 0

ZAHRO
"AEA" - ~~ASCMIN~~
ATTACH PRINTOUT

OUT FOR RERUN

Analyst	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
VAN SANT	D.H. Milian	[signature]		
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1-17-94		[signature]	1-19-94 [signature]

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

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

				SAMPLE
Serial No.	Date Counted	01/17/94	Pu 236 AEA Frac. (C236)	0.353
J1446-5781	Sample Volume in mL (SS)	0.3	Pu 238 AEA Frac. (C238)	0.077
Batch ID	Sample D.F. (DF)	101	Pu 239 AEA Frac. (C239)	0.583
2512	Tracer Volume in mL (SPKV)	0.05	Total AT Counts	4792
Rerun No.	Digest D.F. (DDF)	1	Time Counted in min (TC)	30
0	Tracer Book No.	77843	Background in cpm (Bkg)	4
Analyst	Tracer Preparation Date	10/12/93	Pu 236 Counts	23.11
J VAN SANT	Pu-236 Preparation Value	3226	Pu 238 Counts	5.04
Date	Pu-236 Decay Corr'd Value	3024.22	Pu 239 Counts	38.15
01/17/94	Pu-238 Tracer Value	133	AEA Count Time in min	1440

Decay Time = Date Counted - Tracer Preparation Date

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

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * 2 * C236 * 100 / Pu-236 Decay Corr'd Value * SS

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

Pu 238 dpm = ((Total AT Counts / TC) - Bkg * 2 * C238) - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

Pu-238 µCi/mL = (Pu238 dpm * DF * DDF) / ((Pu 236 Tracer Recovery / 100) * (2220000dpm/µCi) * SS)

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

Pu-239/240 µCi/L	=	3.79E+01

NOTE: Tracer values are in dpm/mL.

Pu-239/240 µCi/mL	=	3.79E-02
Relative Counting Error	=	0.7%
Pu-238 µCi/mL	=	< 4.17E-03
Relative Counting Error	=	1.3%
Pu 236 Tracer Recovery	=	72.7%

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

DETECTION LEVELS in µCi/mL					
Pu 239/240	=	3.25E-03	Pu 238	=	4.17E-03

Data Entry by:		Date:	19-Jan-94
Approved by:		Date:	

#3 1-12-94 Dm
4792
30 - 4

J1446-3781
#2

WHC-SD-WM-DP-062, REV. 0

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

(3) 5028

Serial No	Sample Point	Date	Time Issued	Priority
J 1446.-5781	BECHTOLD	1- 4-94	12:26	26

Determination	Method/Standard	Result Units	Charge Code	Reruns
Pu239/40	LA-503-156	uCi/ML	E14157	0

Sample Size	Customer ID
? .100 - 10 - .300mL	KE83D

Remarks, Calculations, Results

COUNT AS uCI/L
Dup
.05mL 77843

"AEA" - ~~ASCRIM~~
ATTACH PRINTOUT

OUT FOR RERUN

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
[signature]	D.H. Millin	[signature]		
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1-17-94		[signature]	1-19-94 [signature]

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

#3 1-17-94 Dm
6748/30 - 4

J1446-5781
#5

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-062, REV. 0

(6) 6938

Serial No	Sample Point	Date	Time Issued	Priority
J 1446.-5781	BECHTOLD	1- 4-94	12:26	26

Determination	Method/Standard	Result Units	Charge Code	Reruns
Pu239/40	LA-503-156	uCi/ML	E14157	0

Sample Size	Customer ID
? .100 - 10 - .300 mL	KE83D

Remarks, Calculations, Results

COUNT AS uCI/L
TRIP
.05mL 77843

24HRS
"AEA" - ~~[illegible]~~
ATTACH PRINTOUT

OUT FOR RERUN

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
[signature]	Raymond	[signature]		
Hrs	Hrs	Hrs	Hrs	Hrs
	1-17-94			

Date	Time Completed	Lab Unit Mgr	
1-17-94		[signature]	1-19-94 [signature]

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

#1 VR 1-17-94

4721/30 -7

J1446-5781
#6

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

8 8628

WHC-SD-WM-DP-062, REV. 0

Serial No.	Sample Point	Date	Time Issued	Priority
J 1446.-5981	BECHTOLD	1- 4-94	12:26	26

Determination	Method-Standard	Result Units	Charge Code	Reruns
Pu239/24	LA-503-156	% RECOVERY	E14157	0

Sample Size	Customer ID
? .100 -10 - .300mL	KE83D

Remarks, Calculations, Results: Dup
SAMPLE SPIKED ID 63843 .100 - 10 - .100mL
SPIKE ID 77843
SPIKE VOLUME .05mL
COUNT AS uCI/L
24 HRS
"AEA" - ~~ACCUMIN~~
ATTACH PRINTOUT

OUT FOR RERUN

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
	Raymond			
Hrs	Hrs	Hrs	Hrs	Hrs
	1.17.94			
Date	Time Completed	Lab Unit Mgr		
1-17-94			1-19-94	

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

#3R 1-17-94
8156/30 - 4

J1446-5981
#8

PLUTONIUM 239\240 ANALYSIS - UNDIGESTED SAMPLE

WHC-SD-WM-DP-062, REV. 0

(7) 7465

Serial No	Sample Point	Date	Time Issued	Priority
J 1446.-5081	BECHTOLD	1- 4-94	12:26	26

Determination	Method/Standard	Result Units	Charge Code	Reruns
PU239/24	LA-503-156	% RECOVERY	E14157	0

Sample Size	Customer ID
? .100 - 10 - .300 mL	KE83D

Remarks, Calculations, Results

SAMPLE SPIKED ID 63843 .100 - 10 - .100mL

SPIKE ID 77843

SPIKE VOLUME COUNT AS uCI/L .05mL

"AEA" - ~~[illegible]~~ 24HR

ATTACH PRINTOUT

OUT FOR RERUN

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
[signature]	Raymond [signature]	[signature]		
Hrs	Hrs 1-17-94	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1-17-94		[signature]	1-19-94 JKMcFarland

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

#2 R 1-17-94

7582/30 - 1

J1446-5081

#7

WHC-SD-WM-DP-062, REV. 0

(9) 4107

Serial No.	Sample Point	Date	Time Issued	Priority
J 1448.-5681	BECHTOLD	1- 4-94	13:52	26

Determination	Method-Standard	Result Units	Charge Code	Reruns
Pu239/40	LA-503-156	uCi/ML	E14157	0

Sample Size	Customer ID
? 1mL	BLANK

Remarks, Calculations, Results:

REAGENT BLANK

COUNT AS uCI/L

.05mL 77843

24 HRS

"AEA" - ~~[illegible]~~

ATTACH PRINTOUT

OUT FOR RERUN

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
[signature]	D.H. Milicia	[signature]		
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1-17-94		Rakeh	1-19-94 [signature]

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

#2 1-17-94 DM

$\frac{1304}{30}$ -1

J1448-5681

#4

N/B Crown - 1-18-94

Westinghouse Hanford Co.

GENERAL ALPHA ENERGY ANALYSIS
Rev. 2.01

DATA REDUCTION REPORT

WHC-SD-WM-DP-062, REV. 0

SAMPLE
J 1447-5581
File ID: 3a3598.CNF

Counted on: 1/17/94 @17: 4
Detector: AEA3
Geometry number: 1
Count time: 86402. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	1023.6	1023.6	362.696	362.696	18.000	8.814	9.000	1.708
2?	28.0	28.0	259.934	259.469	10.000	6.108	5.000	1.708
3	2643.7	2643.7	230.801	230.796	16.000	8.030	8.000	1.800
4?	20.4	20.4	111.339	110.986	172.000	1.000	86.000	0.100
5?	2.5	2.5	90.978	90.474	6.000	0.415	3.000	3.969

PEAK RESULTS
Peak Error Limit: 25%

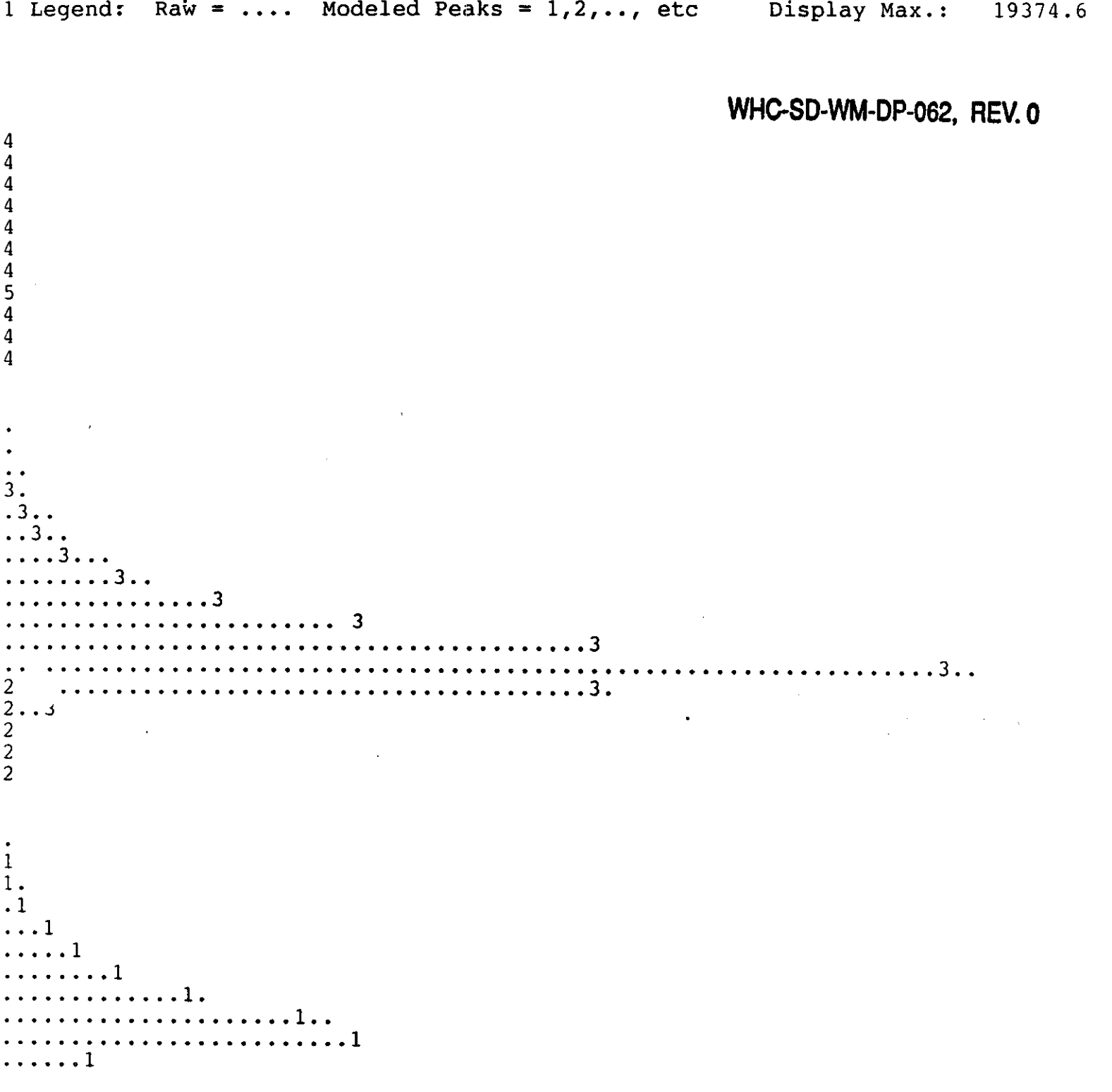
Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Cm244	0.281	5.796	5.779	0.017	0.04	18.93	1.2	146.2	0.658E-04
	Cm243		5.786	5.779	0.007				200.2	0.902E-04
2		????		5.294			0.38	9.6		
3	Pu239	0.649	5.143	5.159	-.016	0.04	43.72	0.8	337.6	0.152E-03
	Pu240		5.144	5.159	-.015				337.6	0.152E-03
4		????		4.596			0.52	7.3		
5		????		4.499			0.01	539.		
Totals:		0.930	<--valid peaks only-->				62.65			

DETECTOR CALIBRATION
Energy(MEV) = 4.074 + (0.0047)*Channel
Energy range (MeV): 4.074 TO 6.480
Efficiency = 0.1295 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	97012.0	100.000
Smoothed	97012.0	100.000
Composite fit	91531.3	94.350
Residuals	5480.8	5.650

Analyzed by: _____


Spectrum 3a3598.CNF
1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.: 19374.6

Raw Data Dump for AEA Spectrum: 3a3598.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	1.	1.	3.	1.
21	5.	4.	0.	5.	4.	1.	1.	4.	2.	6.
31	7.	4.	4.	7.	4.	2.	2.	2.	2.	3.
41	1.	6.	5.	1.	0.	3.	6.	4.	4.	4.
51	2.	3.	12.	4.	2.	4.	8.	3.	5.	3.
61	5.	4.	5.	12.	7.	8.	6.	7.	10.	7.
71	5.	8.	7.	9.	6.	14.	6.	11.	9.	9.
81	6.	14.	9.	7.	9.	12.	11.	6.	14.	18.
91	18.	14.	15.	10.	8.	13.	9.	14.	12.	21.
101	10.	10.	19.	12.	13.	18.	15.	12.	21.	11.
111	24.	12.	20.	16.	12.	8.	15.	22.	25.	25.
121	26.	26.	24.	22.	23.	27.	25.	33.	24.	34.
131	37.	36.	38.	32.	25.	33.	44.	40.	41.	37.
141	36.	54.	45.	45.	39.	45.	64.	55.	56.	74.
151	61.	66.	64.	62.	77.	59.	77.	85.	72.	82.
161	93.	93.	89.	95.	120.	118.	110.	119.	119.	128.
171	125.	133.	160.	165.	174.	194.	177.	206.	193.	201.
181	226.	197.	218.	245.	290.	232.	264.	276.	300.	320.
191	336.	322.	353.	411.	396.	399.	393.	468.	476.	486.
201	462.	544.	588.	573.	645.	618.	654.	689.	732.	776.
211	805.	810.	905.	943.	1070.	1068.	1193.	1285.	1443.	1580.
221	1579.	1809.	1860.	2043.	2153.	2183.	2565.	2581.	2673.	2793.
231	2791.	2793.	2585.	2250.	1960.	1496.	1092.	694.	427.	229.
241	103.	51.	36.	12.	6.	11.	9.	8.	6.	13.
251	10.	10.	10.	15.	11.	15.	16.	14.	19.	20.
261	19.	14.	16.	16.	10.	20.	21.	16.	21.	17.
271	16.	22.	21.	36.	17.	22.	18.	23.	18.	23.
281	24.	27.	34.	33.	35.	31.	41.	41.	37.	44.
291	57.	59.	48.	48.	63.	63.	73.	62.	66.	74.
301	63.	65.	75.	70.	86.	86.	73.	91.	92.	98.
311	76.	87.	85.	85.	85.	93.	111.	97.	109.	109.
321	133.	130.	147.	160.	142.	138.	168.	177.	180.	199.
331	177.	198.	207.	238.	253.	209.	266.	260.	262.	297.
341	285.	338.	366.	363.	407.	468.	525.	527.	558.	577.
351	632.	722.	762.	791.	850.	839.	908.	949.	1045.	956.
361	1005.	1109.	1040.	1059.	1003.	909.	809.	613.	463.	294.
371	183.	66.	37.	22.	1.	1.	2.	0.	0.	0.
381	1.	1.	1.	0.	0.	0.	0.	1.	0.	0.
391	0.	1.	0.	1.	0.	0.	0.	3.	0.	2.
401	1.	0.	1.	0.	0.	0.	0.	0.	0.	1.
411	0.	0.	0.	2.	1.	2.	1.	0.	0.	1.
421	0.	0.	3.	0.	2.	4.	1.	0.	0.	0.
431	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	1.	0.	0.	0.	0.	0.	1.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	1.	0.								

H/G Stromm 1-18-94

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT **WHC-SD-WM-DP-062, REV. 0**

SAMPLE
J 1448-5681
File ID: 4a4107.CNF

Counted on: 1/17/94 @17: 4
Detector: AEA4
Geometry number: 1
Count time: 86400. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	579.8	579.8	355.218	355.218	24.000	18.504	12.000	5.026
2	14.2	14.2	270.783	270.568	60.000	156.078	30.000	17.021

PEAK RESULTS
Peak Error Limit: 25%

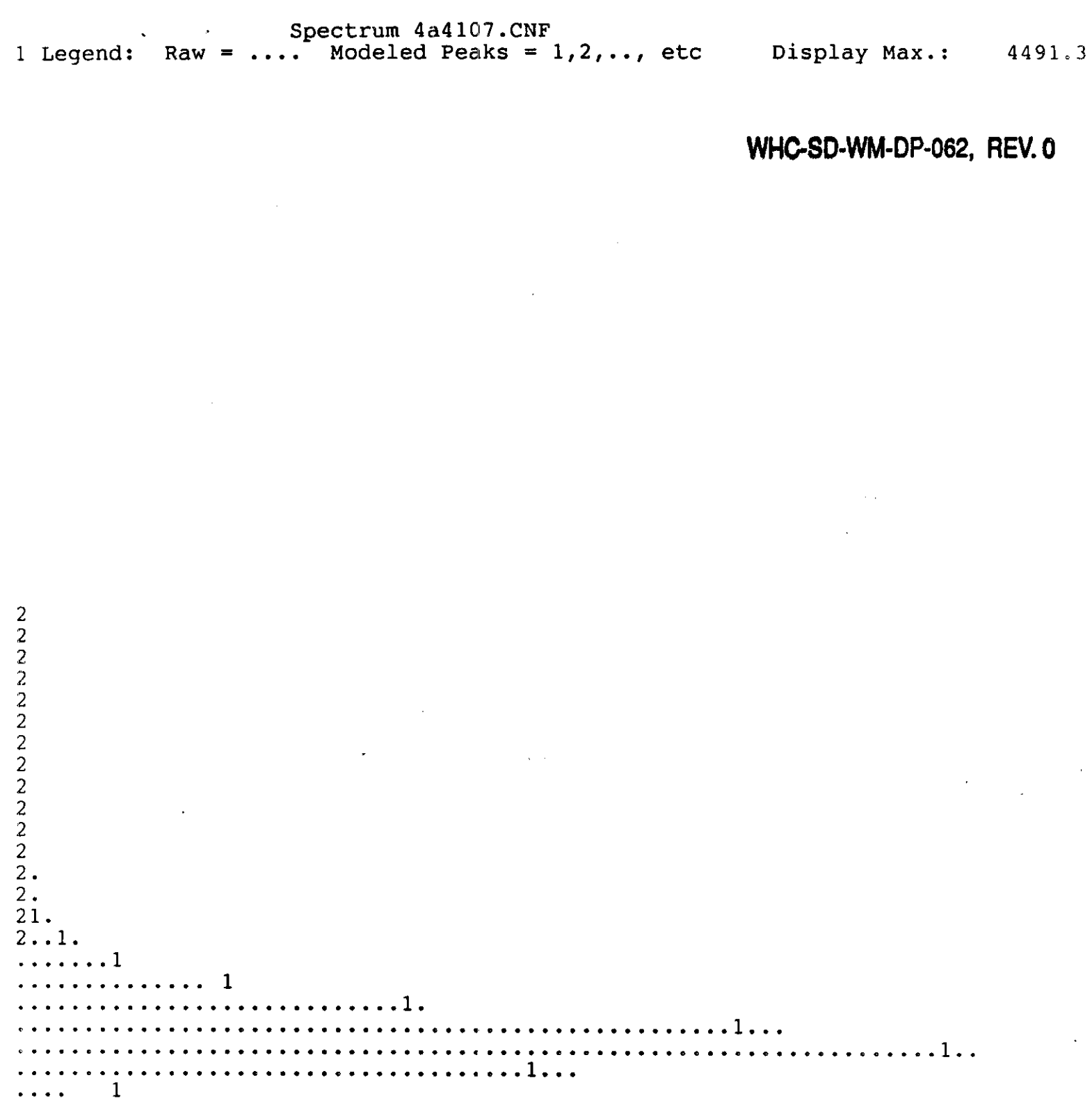
Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
[illegible]	Ra224	0.936	5.680	5.721	-.041	0.09	10.48	1.6	152.8	0.688E-04
	Pu236		5.756	5.721	0.035				146.5	0.660E-04
2	Th228	0.063	5.430	5.331	0.099	0.72	0.70	13.5	13.6	0.611E-05
	Am243		5.276	5.331	-.055				9.7	0.438E-05
Totals:		0.999	<--valid peaks only-->				11.19			

DETECTOR CALIBRATION
Energy(MEV) = 4.087 + (0.0046)*Channel
Energy range (MeV): 4.087 TO 6.442
Efficiency = 0.0730 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	16127.0	100.000
Smoothed	16127.0	100.000
Composite fit	16108.8	99.887
Residuals	18.2	0.113

Analyzed by: _____
MB


Spectrum 4a4107.CNF
1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 4491.3

Raw Data.Dump for AEA Spectrum: 4a4107.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
21	0.	0.	0.	0.	0.	2.	1.	1.	0.	0.
31	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
41	0.	0.	0.	0.	0.	0.	0.	0.	2.	0.
51	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
61	0.	0.	1.	0.	0.	0.	0.	2.	1.	2.
71	1.	0.	0.	0.	0.	0.	0.	1.	0.	0.
81	0.	2.	1.	0.	1.	2.	0.	0.	0.	1.
91	0.	0.	0.	2.	0.	2.	1.	1.	4.	0.
101	1.	1.	1.	0.	0.	0.	0.	1.	0.	0.
111	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
121	0.	1.	1.	1.	1.	0.	1.	0.	0.	4.
131	0.	2.	1.	1.	0.	0.	0.	1.	3.	1.
141	2.	0.	3.	0.	0.	2.	2.	1.	1.	2.
151	3.	0.	2.	1.	1.	0.	1.	0.	0.	0.
161	3.	2.	0.	1.	0.	2.	2.	0.	1.	1.
171	1.	0.	4.	4.	0.	1.	2.	1.	4.	2.
181	2.	0.	1.	5.	3.	1.	3.	4.	0.	2.
191	4.	3.	3.	1.	2.	3.	2.	3.	1.	3.
201	4.	4.	3.	6.	4.	6.	5.	3.	1.	6.
211	2.	2.	4.	7.	4.	6.	6.	9.	2.	6.
221	3.	3.	3.	10.	5.	8.	3.	6.	5.	5.
231	2.	7.	1.	6.	5.	1.	2.	5.	4.	5.
241	3.	4.	4.	6.	6.	2.	3.	5.	6.	6.
251	10.	7.	8.	4.	11.	6.	12.	5.	2.	4.
261	11.	9.	20.	9.	14.	9.	13.	12.	19.	13.
271	19.	15.	13.	14.	15.	14.	12.	11.	11.	12.
281	11.	15.	9.	15.	13.	12.	22.	14.	18.	16.
291	15.	18.	22.	24.	15.	17.	24.	16.	19.	13.
301	20.	22.	23.	25.	22.	38.	26.	32.	27.	27.
311	40.	28.	33.	48.	29.	32.	39.	52.	48.	62.
321	65.	60.	63.	66.	76.	74.	73.	82.	101.	92.
331	102.	112.	109.	140.	147.	152.	173.	193.	231.	235.
341	269.	280.	330.	363.	415.	388.	462.	460.	464.	531.
351	532.	573.	577.	615.	608.	609.	548.	554.	561.	515.
361	523.	436.	408.	357.	252.	174.	111.	68.	35.	12.
371	7.	1.	0.	0.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
401	1.	0.	1.	1.	0.	0.	0.	1.	0.	0.
411	2.	0.	0.	0.	1.	0.	0.	0.	1.	0.
421	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	2.	0.	1.	0.	0.	1.	0.	0.	0.	0.
441	0.	0.	0.	1.	0.	0.	0.	0.	0.	1.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	1.	0.	0.	0.	0.	1.	0.
471	1.	1.	0.	0.	1.	0.	0.	1.	1.	0.
481	1.	4.	1.	1.	1.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

W/Bloom 1-18-94

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT

WHC-SD-WM-DP-062, REV. 0

SAMPLE
J 1446-5781
File ID: 2a2538.CNF

Counted on: 1/17/94 @17: 3
Detector: AEA2
Geometry number: 1
Count time: 86406. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	856.2	856.2	353.791	353.791	28.000	27.774	14.000	4.149
2	193.9	193.9	298.307	294.762	24.000	20.357	12.000	2.926
3	1390.1	1390.1	224.908	224.836	24.000	22.221	12.000	3.005
4?	1.5	1.5	103.849	101.920	4.000	0.000	2.000	3.758

PEAK RESULTS
Peak Error Limit: 25%

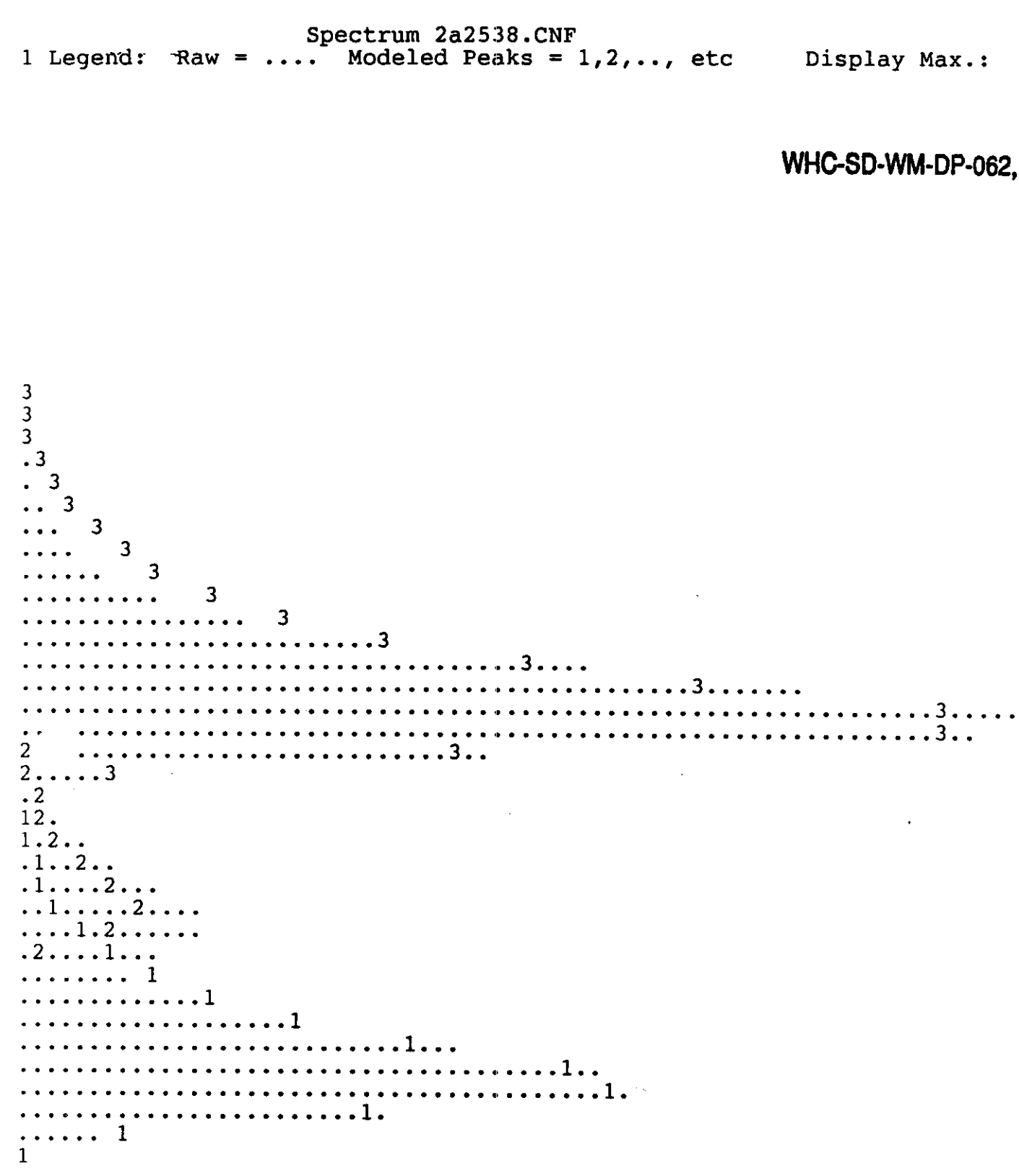
Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Cm243	0.353	5.786	5.743	0.043	0.13	23.11	1.1	316.3	0.142E-03
	Pu236		5.756	5.743	0.013				235.6	0.106E-03
2	Am241	0.077	5.480	5.465	0.015	0.10	5.04	3.1	53.6	0.241E-04
	Pu238		5.499	5.465	0.034				69.9	0.315E-04
3	Pu239	0.583	5.143	5.137	0.006	0.10	38.15	0.8	381.1	0.172E-03
	Pu240		5.144	5.137	0.007				381.1	0.172E-03
4		????		4.559			0.00	1000.		
Totals:		1.013	<--valid peaks only-->				66.30			

DETECTOR CALIBRATION
Energy(MEV) = 4.080 + (0.0047)*Channel
Energy range (MeV): 4.080 TO 6.486
Efficiency = 0.1001 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	94227.0	100.000
Smoothed	94227.0	100.000
Composite fit	95477.3	101.327
Residuals	-1250.3	-1.327

Analyzed by: MB


Spectrum 2a2538.CNF
1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.: 10721.9

Raw Data Dump for AEA Spectrum: 2a2538.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	2.	1.	6.
21	3.	4.	3.	5.	3.	4.	2.	9.	6.	1.
31	1.	1.	6.	2.	2.	6.	5.	2.	10.	1.
41	10.	8.	7.	2.	5.	2.	6.	2.	6.	7.
51	7.	7.	2.	9.	9.	7.	7.	8.	10.	5.
61	11.	4.	3.	12.	3.	11.	10.	4.	14.	8.
71	11.	4.	12.	6.	8.	7.	16.	9.	4.	10.
81	10.	11.	12.	7.	13.	9.	10.	15.	8.	8.
91	7.	8.	16.	13.	15.	11.	12.	12.	10.	15.
101	12.	25.	13.	15.	20.	16.	14.	14.	11.	14.
111	15.	14.	18.	17.	20.	13.	26.	20.	26.	28.
121	25.	33.	23.	22.	15.	28.	20.	29.	33.	20.
131	38.	19.	40.	25.	29.	29.	31.	36.	32.	47.
141	32.	40.	24.	37.	45.	50.	42.	61.	56.	41.
151	51.	51.	44.	57.	71.	61.	57.	83.	70.	92.
161	70.	81.	90.	82.	93.	102.	105.	104.	124.	135.
171	118.	120.	151.	150.	142.	160.	189.	174.	188.	196.
181	219.	220.	258.	251.	264.	259.	313.	316.	328.	378.
191	391.	425.	416.	455.	476.	517.	543.	594.	608.	637.
201	694.	702.	707.	761.	831.	863.	884.	996.	954.	1017.
211	994.	1048.	1156.	1225.	1147.	1155.	1339.	1322.	1346.	1428.
221	1404.	1394.	1382.	1442.	1418.	1464.	1340.	1433.	1288.	1180.
231	1157.	1048.	882.	783.	642.	571.	461.	396.	287.	233.
241	166.	136.	95.	64.	58.	65.	47.	45.	37.	52.
251	39.	50.	50.	42.	58.	58.	49.	63.	62.	64.
261	80.	74.	83.	75.	80.	109.	88.	88.	121.	119.
271	117.	118.	136.	144.	143.	151.	143.	157.	158.	167.
281	161.	165.	202.	197.	219.	236.	205.	232.	255.	252.
291	239.	265.	262.	271.	305.	280.	266.	278.	290.	279.
301	265.	257.	253.	251.	219.	219.	190.	194.	188.	142.
311	174.	147.	156.	142.	157.	162.	154.	179.	169.	174.
321	245.	231.	258.	242.	278.	254.	299.	302.	326.	353.
331	413.	374.	419.	459.	491.	545.	545.	534.	604.	621.
341	641.	681.	700.	727.	749.	739.	746.	839.	822.	886.
351	845.	849.	904.	839.	862.	832.	873.	792.	824.	778.
361	715.	668.	525.	459.	437.	374.	275.	245.	185.	114.
371	81.	74.	35.	31.	24.	11.	10.	6.	1.	3.
381	1.	1.	2.	0.	0.	0.	0.	0.	1.	1.
391	0.	0.	0.	0.	1.	3.	0.	2.	1.	1.
401	0.	1.	1.	0.	0.	1.	1.	2.	2.	1.
411	1.	0.	1.	0.	2.	2.	1.	1.	0.	1.
421	0.	0.	1.	3.	0.	1.	3.	1.	0.	0.
431	0.	3.	0.	1.	0.	0.	2.	0.	0.	1.
441	0.	1.	0.	0.	0.	1.	1.	1.	0.	1.
451	2.	2.	1.	0.	1.	0.	0.	0.	1.	0.
461	0.	1.	2.	1.	1.	2.	2.	2.	1.	3.
471	4.	5.	3.	1.	2.	5.	2.	8.	1.	3.
481	4.	0.	2.	4.	1.	0.	2.	0.	1.	1.
491	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.
511	0.	0.								

H/6 [illegible] 1-18-94

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT

WHC-SD-WM-DP-062, REV. 0

SAMPLE
J 1446-5781
File ID: 5a5028.CNF

Counted on: 1/17/94 @17: 5
Detector: AEA5
Geometry number: 1
Count time: 86403. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	1021.8	1021.8	347.756	347.756	36.000	45.912	18.000	2.041
2	698.4	698.4	219.228	218.743	30.000	28.969	15.000	1.353
3?	0.0	0.1	29.188	29.188	0.000	0.100	0.000	0.100

PEAK RESULTS
Peak Error Limit: 25%

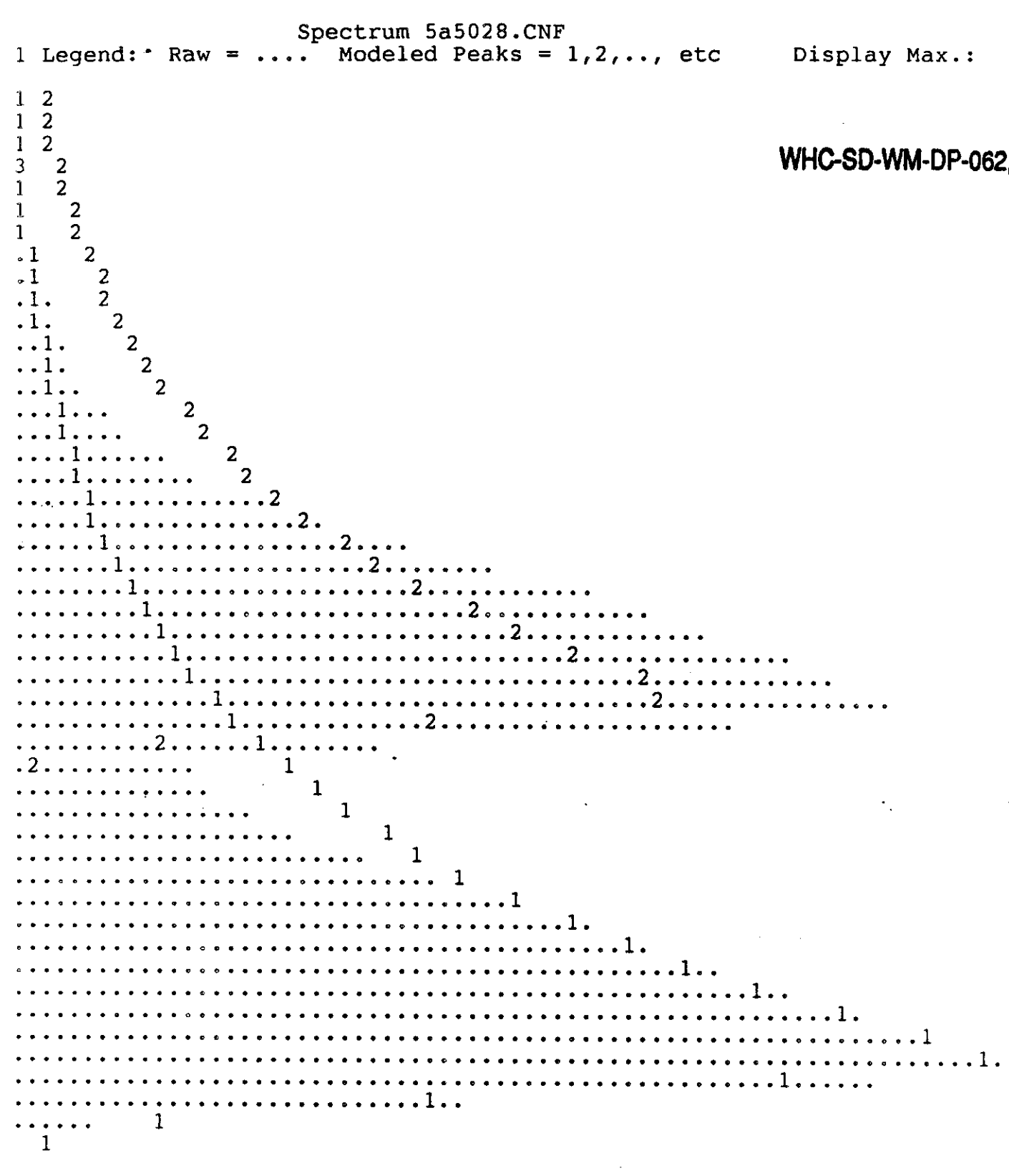
Peak	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Pu236	0.706	5.756	5.691	0.065	0.21	69.19	0.6	450.5	0.203E-03
	Ra224		5.680	5.691	-.011				469.7	0.212E-03
2	Pu239	0.427	5.143	5.097	0.046	0.13	41.85	0.9	267.1	0.120E-03
	Pu240		5.144	5.097	0.047				267.1	0.120E-03
3		????		4.225			0.00	*****		
Totals:		1.133	<--valid peaks only-->				111.04			

DETECTOR CALIBRATION
Energy(MEV) = 4.091 + (0.0046)*Channel
Energy range (MeV): 4.091 TO 6.446
Efficiency = 0.1567 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	141143.0	100.000
Smoothed	141142.7	100.000
Composite fit	159898.6	113.288
Residuals	-18755.6	-13.288

Analyzed by: _____
MB


Spectrum 5a5028.CNF
Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.: 8086.0

Raw Data Dump for AEA Spectrum: 5a5028.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	5.	29.	16.	19.
21	27.	24.	26.	23.	19.	36.	19.	20.	35.	26.
31	22.	24.	18.	22.	24.	20.	33.	29.	23.	32.
41	25.	27.	29.	28.	31.	27.	24.	22.	26.	20.
	32.	23.	21.	33.	30.	39.	28.	37.	25.	37.
6.	35.	39.	42.	38.	38.	47.	37.	37.	37.	31.
71	43.	32.	64.	55.	44.	32.	55.	48.	41.	47.
81	49.	42.	55.	42.	56.	48.	49.	71.	61.	64.
91	57.	59.	60.	77.	61.	62.	55.	67.	89.	59.
101	64.	73.	80.	101.	71.	87.	86.	106.	74.	73.
111	95.	96.	98.	90.	111.	102.	107.	111.	111.	106.
121	116.	134.	133.	134.	135.	134.	132.	145.	155.	168.
131	161.	146.	176.	172.	184.	171.	178.	188.	177.	206.
141	194.	202.	214.	223.	245.	272.	264.	255.	286.	285.
151	305.	297.	277.	340.	323.	306.	342.	369.	383.	355.
161	394.	376.	398.	464.	397.	415.	458.	487.	481.	473.
171	504.	480.	505.	506.	516.	528.	599.	585.	547.	636.
181	634.	597.	629.	630.	678.	639.	625.	665.	697.	665.
191	656.	728.	682.	730.	687.	726.	719.	687.	747.	769.
201	812.	778.	833.	778.	823.	807.	810.	905.	814.	867.
211	886.	821.	803.	864.	854.	887.	901.	950.	934.	894.
221	932.	858.	898.	900.	824.	811.	820.	779.	753.	646.
231	615.	512.	470.	488.	361.	329.	277.	267.	238.	215.
241	209.	180.	195.	169.	173.	173.	168.	171.	203.	192.
251	190.	213.	209.	211.	233.	227.	238.	249.	235.	265.
261	247.	268.	283.	250.	292.	298.	295.	302.	299.	318.
271	332.	347.	295.	335.	354.	346.	397.	396.	406.	415.
281	419.	451.	448.	441.	445.	461.	479.	485.	524.	511.
291	541.	510.	542.	555.	566.	586.	600.	554.	614.	624.
301	626.	606.	613.	637.	709.	633.	711.	654.	617.	661.
3	683.	653.	683.	705.	775.	759.	706.	776.	747.	738.
32.	802.	796.	826.	812.	815.	832.	853.	824.	869.	835.
331	843.	821.	935.	926.	911.	959.	879.	948.	945.	975.
341	963.	989.	939.	964.	1005.	1048.	1070.	1009.	1025.	1010.
351	1014.	1004.	967.	953.	972.	880.	928.	772.	765.	709.
361	662.	540.	524.	445.	392.	302.	246.	207.	127.	105.
371	67.	50.	32.	16.	12.	11.	1.	2.	1.	0.
381	0.	0.	0.	0.	0.	0.	2.	0.	1.	1.
391	1.	2.	0.	1.	1.	0.	0.	3.	6.	1.
401	3.	1.	0.	1.	1.	1.	1.	0.	2.	1.
411	0.	2.	1.	3.	1.	5.	0.	1.	0.	0.
421	1.	3.	0.	0.	1.	0.	3.	1.	0.	2.
431	4.	2.	1.	1.	1.	0.	0.	2.	1.	1.
441	1.	4.	0.	0.	0.	1.	1.	1.	0.	2.
451	0.	0.	1.	0.	3.	1.	2.	0.	1.	1.
461	1.	2.	1.	1.	2.	2.	3.	3.	1.	2.
471	1.	0.	2.	2.	0.	4.	2.	4.	4.	2.
481	1.	6.	2.	2.	0.	1.	3.	1.	1.	1.
491	0.	1.	0.	0.	0.	0.	1.	0.	0.	0.
511	0.	0.								

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT

WHC-SD-WM-DP-062, REV. 0

SAMPLE
J 1446-5781
File ID: 6a6938.CNF

Counted on: 1/17/94 @17: 5
Detector: AEA6
Geometry number: 1
Count time: 86401. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1?	12.2	12.2	497.121	496.742	8.000	1.228	4.000	2.292
2	307.4	307.4	340.789	338.855	76.000	130.910	38.000	54.044
3	184.5	184.5	322.854	322.854	20.000	0.279	10.000	0.013
4	200.0	200.0	297.295	293.777	34.000	23.774	17.000	0.504
5	489.1	489.1	219.214	217.662	32.000	43.735	16.000	19.512
6	446.0	446.0	191.312	191.312	44.000	20.297	22.000	0.892

PEAK RESULTS
Peak Error Limit: 25%

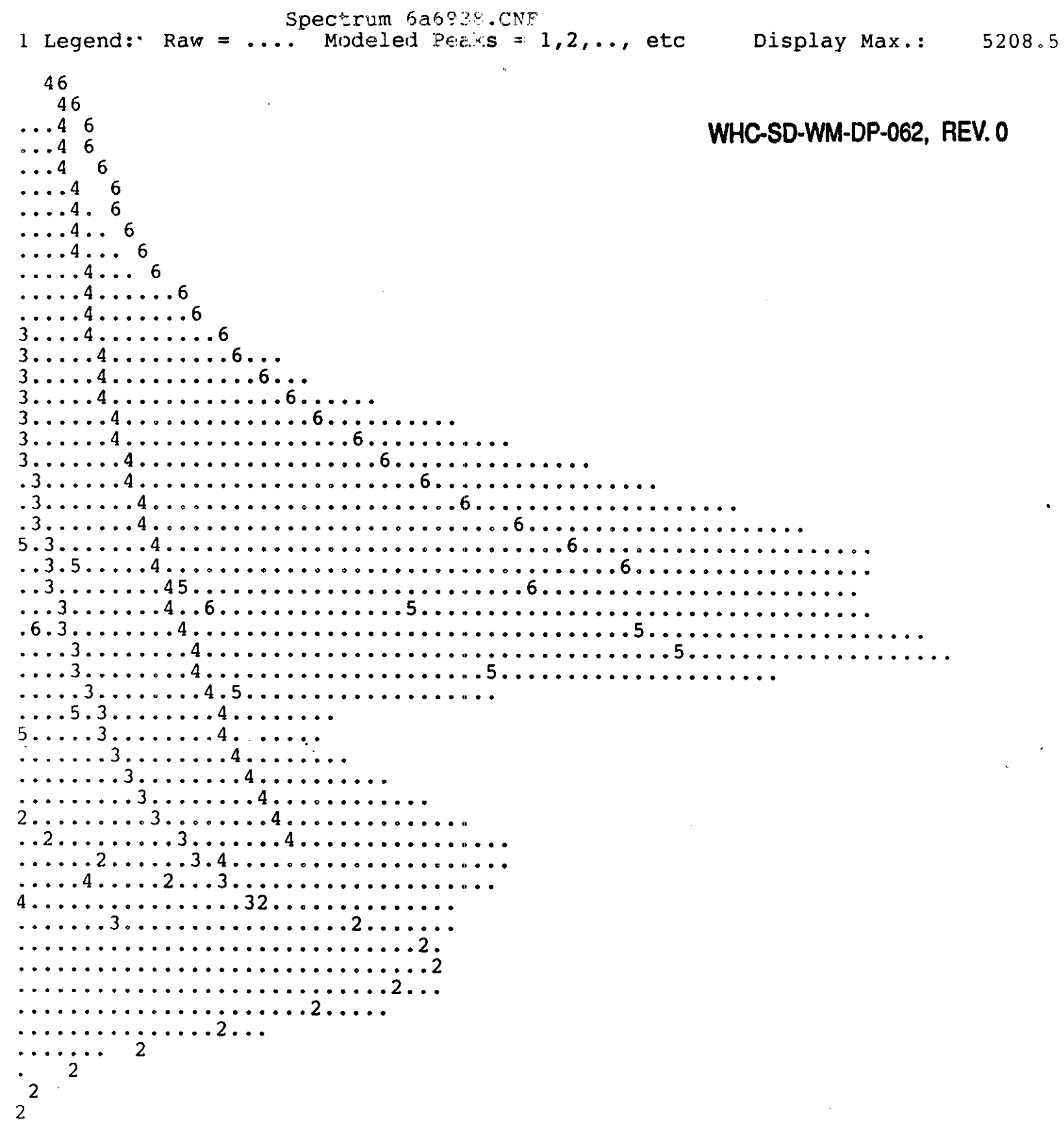
Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1		????		6.376			0.05	23.7		
2	Pu238	0.157	5.499	5.650	-.151	0.60	11.66	1.5	127.1	0.573E-04
	Ra224		5.680	5.650	0.030				97.4	0.439E-04
3		0.132		5.576	0.00		9.74	1.9	76.5	0.345E-04
4	Th228	0.284	5.430	5.443	-.013	0.11	21.06	1.4	232.8	0.105E-03
	Am241		5.480	5.443	0.037				175.8	0.792E-04
5	Pu239	0.147	5.143	5.092	0.051	0.20	10.90	2.6	85.5	0.385E-04
	Pu240		5.144	5.092	0.052				85.5	0.385E-04
6		0.356		4.971	0.09		26.40	1.3	207.2	0.933E-04
Totals:		1.077	<--valid peaks only-->				79.76			

DETECTOR CALIBRATION
Energy(MEV) = 4.091 + (0.0046)*Channel
Energy range (MeV): 4.091 TO 6.446
Efficiency = 0.1274 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	106660.0	100.000
Smoothed	106672.8	100.012
Composite fit	114925.9	107.750
Residuals	-8265.9	-7.750

Analyzed by: MB


Spectrum 6a6938.CNF
1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 5208.5

Raw Data Dump for AEA Spectrum: 6a6938.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	17.	38.	26.	36.
21	41.	44.	27.	47.	46.	41.	43.	32.	48.	35.
31	48.	34.	40.	45.	50.	38.	39.	51.	37.	66.
41	48.	43.	61.	46.	48.	64.	53.	59.	48.	59.
	60.	47.	51.	61.	69.	56.	53.	66.	82.	65.
61	91.	70.	92.	74.	84.	78.	57.	75.	79.	85.
71	91.	88.	74.	104.	74.	85.	120.	96.	99.	90.
81	112.	103.	108.	126.	124.	126.	124.	110.	134.	121.
91	128.	123.	142.	130.	138.	165.	138.	162.	134.	144.
101	128.	176.	172.	160.	167.	182.	200.	191.	193.	214.
111	182.	215.	207.	179.	214.	196.	243.	231.	234.	213.
121	250.	242.	248.	249.	267.	262.	264.	298.	302.	307.
131	318.	328.	315.	309.	329.	315.	339.	345.	356.	373.
141	327.	352.	364.	383.	400.	398.	418.	385.	409.	421.
151	429.	432.	420.	434.	439.	486.	458.	466.	499.	492.
161	465.	533.	514.	507.	544.	494.	522.	537.	492.	555.
171	580.	584.	560.	542.	584.	572.	599.	618.	602.	601.
181	598.	594.	596.	593.	630.	590.	601.	588.	533.	626.
191	623.	581.	661.	575.	567.	577.	584.	609.	554.	594.
201	575.	603.	585.	626.	599.	608.	624.	585.	588.	631.
211	645.	651.	651.	621.	658.	679.	648.	677.	679.	648.
221	671.	601.	665.	632.	609.	593.	584.	492.	491.	474.
231	443.	459.	382.	367.	307.	326.	285.	299.	249.	278.
241	210.	237.	214.	222.	187.	221.	198.	189.	197.	216.
251	223.	235.	230.	233.	240.	232.	230.	235.	219.	225.
261	239.	270.	251.	258.	260.	249.	281.	274.	272.	261.
271	279.	255.	285.	274.	275.	315.	291.	335.	328.	327.
281	309.	304.	307.	338.	357.	312.	317.	347.	316.	362.
291	351.	360.	339.	358.	381.	339.	369.	344.	354.	335.
301	346.	354.	324.	328.	375.	356.	321.	340.	345.	317.
3	312.	344.	307.	326.	284.	299.	300.	305.	300.	310.
321	318.	319.	293.	320.	296.	324.	327.	274.	309.	318.
331	300.	297.	303.	289.	331.	273.	283.	317.	323.	306.
341	288.	301.	303.	293.	335.	294.	259.	306.	312.	323.
351	300.	290.	289.	304.	269.	253.	266.	248.	236.	237.
361	213.	220.	189.	190.	168.	148.	139.	115.	95.	84.
371	68.	55.	54.	42.	38.	21.	21.	13.	10.	6.
381	1.	6.	3.	4.	1.	1.	1.	1.	1.	0.
391	1.	0.	2.	1.	0.	2.	1.	1.	2.	2.
401	0.	0.	2.	2.	1.	1.	0.	1.	2.	1.
411	1.	1.	3.	0.	1.	3.	0.	4.	0.	0.
421	1.	0.	0.	1.	1.	0.	3.	4.	1.	1.
431	1.	2.	2.	2.	0.	1.	2.	0.	2.	1.
441	2.	2.	1.	0.	0.	0.	1.	0.	1.	1.
451	1.	0.	3.	1.	1.	0.	0.	2.	0.	2.
461	1.	0.	1.	2.	2.	1.	1.	0.	2.	5.
471	8.	0.	5.	7.	7.	4.	2.	2.	1.	0.
481	1.	2.	0.	0.	4.	0.	0.	2.	3.	0.
491	2.	1.	7.	4.	8.	21.	20.	4.	0.	0.
511	0.	0.								

1-18-94

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT

WHC-SD-WM-DP-062, REV. 0

SAMPLE
J 1446-5981
File ID: 8a8678.CNF

Counted on: 1/17/94 @17: 7
Detector: AEA8
Geometry number: 1
Count time: 86400. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	1892.4	1892.4	359.980	359.980	14.000	7.543	7.000	3.277
2	569.5	569.5	301.380	301.365	16.000	8.377	8.000	3.887
3	7706.9	7706.9	228.037	228.037	16.000	7.899	8.000	4.378

PEAK RESULTS
Peak Error Limit: 25%

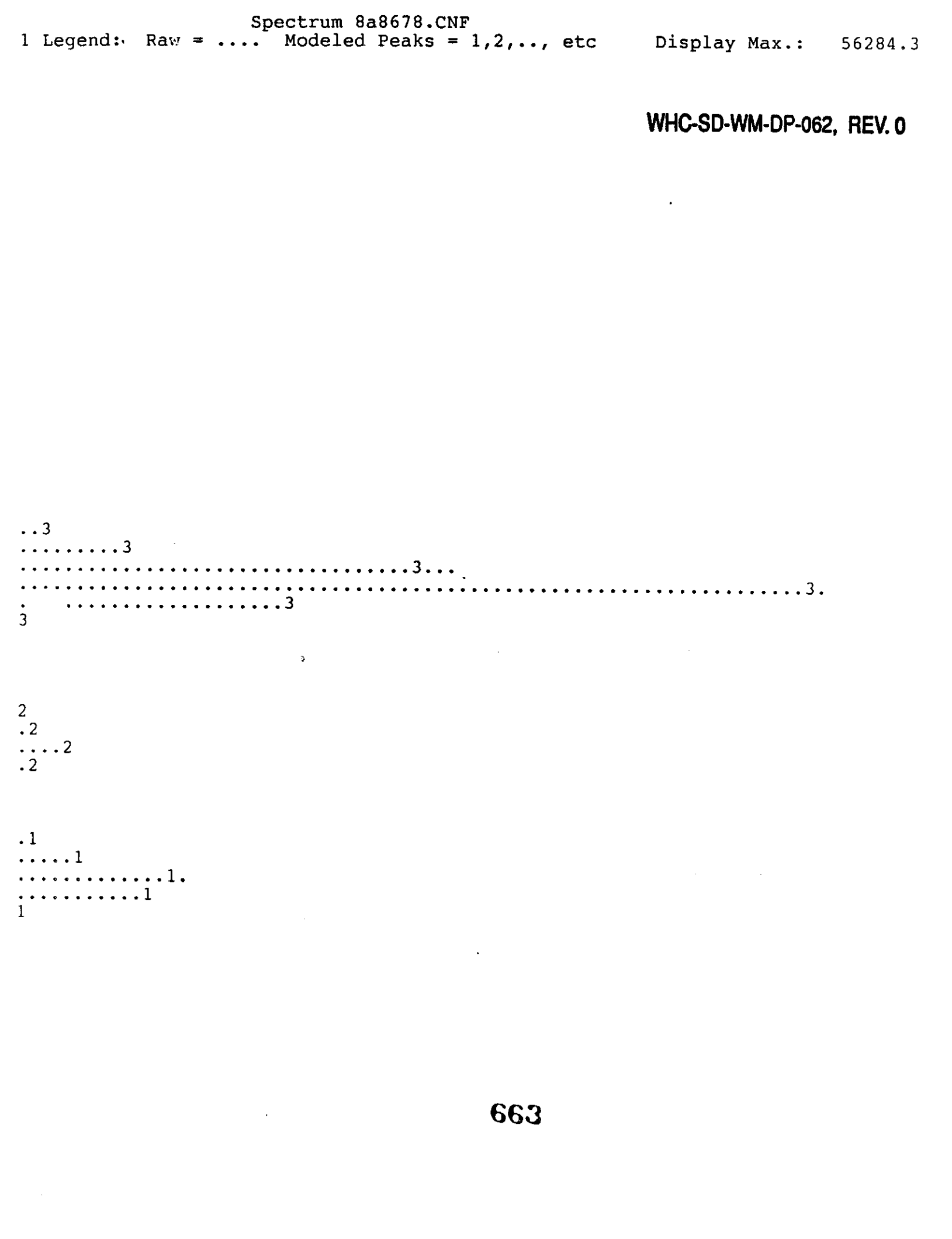
Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Cm244	0.196	5.796	5.788	0.008	0.04	21.66	1.1	170.1	0.766E-04
	Cm243		5.786	5.788	-.002				233.0	0.105E-03
2	Pu238	0.059	5.499	5.512	-.013	0.04	6.56	2.0	71.5	0.322E-04
	Am241		5.480	5.512	-.032				54.8	0.247E-04
3	Pu239	0.742	5.143	5.168	-.025	0.04	81.98	0.6	644.0	0.290E-03
	Pu240		5.144	5.168	-.024				644.0	0.290E-03
Totals:		0.998	<--valid peaks only-->				110.19			

DETECTOR CALIBRATION
Energy(MEV) = 4.096 + (0.0047)*Channel
Energy range (MeV): 4.096 TO 6.502
Efficiency = 0.1273 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	159048.0	100.000
Smoothed	159048.0	100.000
Composite fit	158673.3	99.764
Residuals	374.7	0.236

Analyzed by: MB


Spectrum 8a8678.CNF
1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc
Display Max.: 56284.3

Raw Data Dump for AEA Spectrum: 8a8678.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	1.	1.	7.	3.
21	3.	2.	2.	5.	2.	2.	1.	4.	1.	4.
31	0.	4.	1.	3.	0.	1.	1.	4.	6.	3.
41	3.	5.	4.	6.	0.	3.	1.	4.	2.	5.
51	1.	4.	2.	6.	3.	2.	3.	4.	3.	5.
61	1.	2.	2.	5.	3.	2.	3.	0.	3.	3.
71	3.	5.	4.	1.	3.	5.	4.	2.	4.	1.
81	2.	3.	3.	6.	4.	6.	4.	2.	6.	2.
91	8.	5.	4.	3.	5.	4.	9.	6.	3.	8.
101	6.	3.	5.	4.	2.	5.	2.	3.	5.	5.
111	7.	2.	5.	8.	3.	8.	7.	6.	5.	7.
121	4.	6.	3.	6.	6.	5.	8.	5.	4.	5.
131	6.	3.	4.	3.	5.	6.	8.	10.	5.	8.
141	13.	5.	4.	5.	4.	5.	10.	8.	11.	10.
151	8.	9.	8.	6.	10.	9.	4.	13.	15.	7.
161	12.	13.	12.	13.	6.	10.	20.	14.	17.	12.
171	16.	12.	17.	10.	13.	16.	21.	18.	23.	24.
181	31.	27.	26.	32.	23.	41.	28.	35.	46.	40.
191	63.	62.	57.	57.	53.	79.	79.	75.	96.	112.
201	149.	138.	151.	163.	214.	268.	327.	342.	488.	513.
211	717.	802.	1050.	1320.	1518.	1932.	2286.	2805.	3093.	3772.
221	4456.	5069.	5700.	6690.	7420.	8061.	8402.	8428.	8252.	7534.
231	6642.	5394.	4291.	3083.	2119.	1349.	831.	496.	234.	131.
241	53.	19.	15.	10.	2.	4.	4.	4.	5.	3.
251	9.	5.	8.	6.	9.	11.	6.	6.	9.	8.
261	7.	13.	15.	8.	12.	13.	7.	13.	16.	19.
271	19.	11.	8.	12.	18.	16.	20.	18.	17.	26.
281	27.	46.	60.	64.	88.	86.	116.	138.	203.	210.
291	201.	270.	309.	366.	444.	400.	479.	543.	572.	621.
301	619.	618.	580.	521.	463.	373.	294.	193.	131.	74.
311	49.	32.	13.	10.	8.	5.	4.	13.	6.	7.
321	8.	8.	15.	16.	19.	15.	14.	22.	25.	18.
331	23.	37.	26.	33.	46.	68.	68.	85.	112.	125.
341	158.	210.	253.	280.	359.	474.	537.	695.	795.	931.
351	979.	1051.	1216.	1356.	1523.	1715.	1791.	1947.	2013.	2059.
361	2000.	1880.	1590.	1296.	995.	688.	443.	274.	162.	70.
371	36.	11.	6.	5.	0.	0.	1.	2.	0.	0.
381	0.	1.	0.	0.	0.	1.	0.	0.	0.	0.
391	0.	1.	0.	0.	0.	1.	1.	0.	0.	1.
401	2.	0.	2.	0.	2.	3.	3.	0.	1.	2.
411	3.	3.	1.	5.	3.	1.	4.	1.	6.	6.
421	2.	3.	6.	0.	1.	1.	1.	0.	0.	0.
431	0.	0.	1.	0.	0.	0.	1.	1.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	2.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
471	1.	0.	1.	0.	0.	2.	1.	0.	1.	0.
481	0.	0.	2.	0.	0.	0.	0.	1.	0.	1.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	1.	0.								

N16 [illegible] 1-18-94

Westinghouse Hanford Co.

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

DATA REDUCTION REPORT **WHC-SD-WM-DP-062, REV. 0**

SAMPLE
J 1446-5081
File ID: 7a7465.CNF

Counted on: 1/17/94 @17: 6
Detector: AEA7
Geometry number: 1
Count time: 86404. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	727.6	727.6	354.991	354.587	26.000	26.867	13.000	4.287
2	199.2	199.2	299.090	296.706	24.000	19.421	12.000	2.561
3	2652.1	2652.1	224.363	222.972	26.000	25.432	13.000	3.751

PEAK RESULTS
Peak Error Limit: 25%

Peak	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Cm243	0.198	5.786	5.753	0.033	0.13	18.79	1.2	249.6	0.112E-03
	Pu236		5.756	5.753	0.003				185.9	0.838E-04
2	Am241	0.057	5.480	5.481	-.001	0.09	5.43	2.8	56.0	0.252E-04
	Pu238		5.499	5.481	0.018				73.1	0.329E-04
3	Pu239	0.747	5.143	5.134	0.009	0.12	70.80	0.6	686.7	0.309E-03
	Pu240		5.144	5.134	0.010				686.7	0.309E-03
		---					---			
Totals:		1.002	<--valid peaks only-->				95.01			

DETECTOR CALIBRATION
Energy(MEV) = 4.086 + (0.0047)*Channel
Energy range (MeV): 4.086 TO 6.493
Efficiency = 0.1031 CPM/DPM

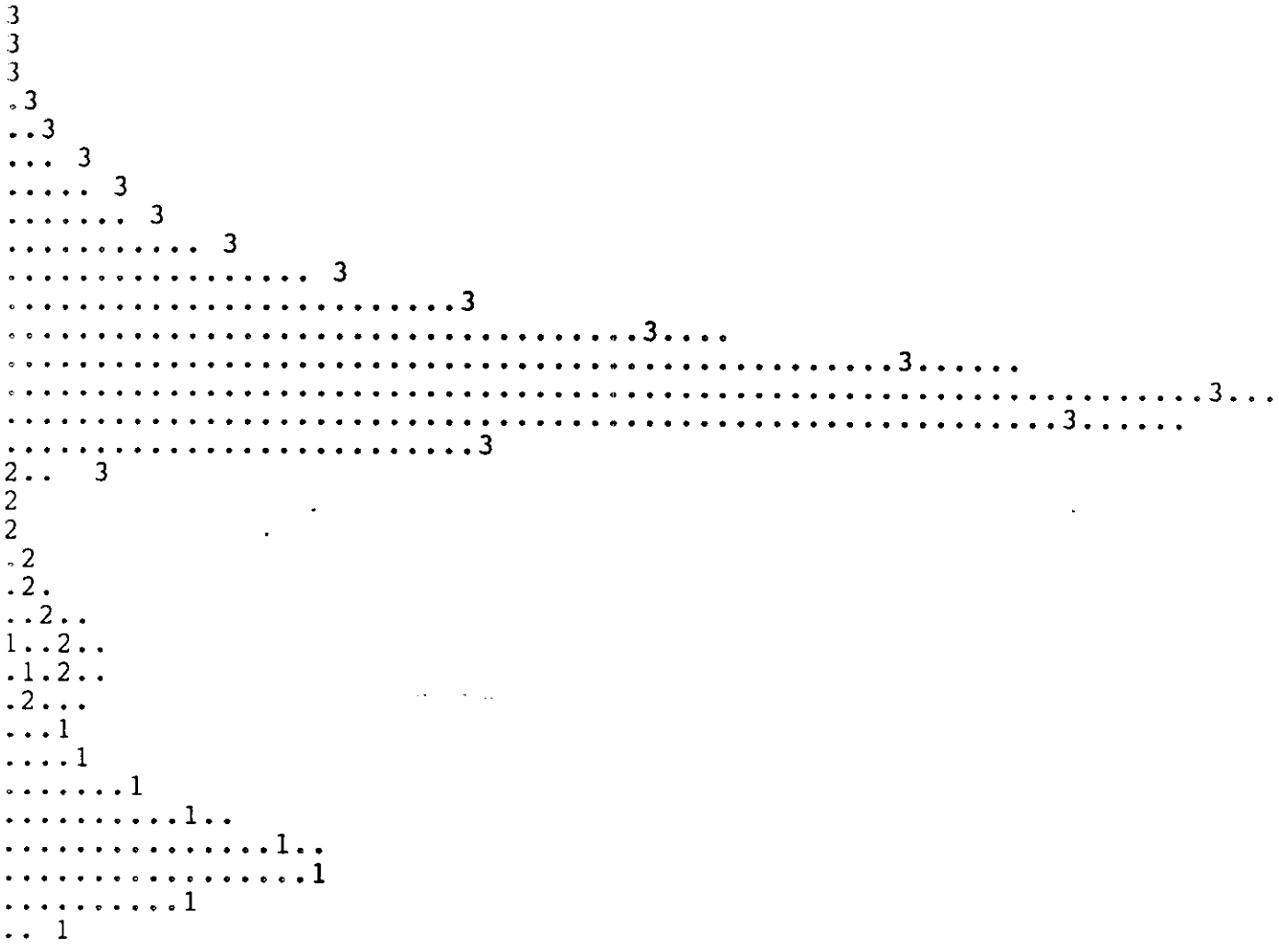
TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	136551.0	100.000
Smoothed	136537.9	99.990
Composite fit	136821.7	100.198
Residuals	-270.7	-0.198

Analyzed by: _____
MB

Spectrum 7a7465.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 20688.2



Raw Data Dump for ASA Spectrum: a7465.CNT

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	2.	12.	13.	3.
21	13.	7.	12.	15.	13.	11.	13.	8.	11.	11.
31	9.	9.	10.	8.	16.	8.	12.	13.	8.	11.
41	9.	7.	11.	12.	12.	9.	15.	9.	14.	8.
51	14.	13.	10.	21.	14.	7.	12.	12.	13.	11.
61	8.	23.	10.	19.	20.	12.	18.	14.	25.	22.
71	10.	8.	22.	14.	15.	17.	15.	12.	11.	25.
81	22.	14.	20.	27.	25.	26.	26.	22.	27.	22.
91	19.	16.	23.	33.	22.	24.	28.	38.	18.	38.
101	30.	35.	31.	33.	26.	36.	33.	33.	23.	31.
111	35.	32.	29.	38.	37.	40.	48.	59.	42.	41.
121	35.	52.	50.	41.	40.	55.	58.	45.	51.	51.
131	58.	51.	66.	53.	80.	82.	70.	60.	75.	73.
141	79.	74.	104.	89.	88.	94.	90.	92.	95.	120.
151	113.	108.	111.	151.	160.	129.	132.	145.	175.	165.
161	141.	180.	178.	198.	187.	219.	204.	229.	256.	275.
171	256.	269.	277.	308.	343.	365.	363.	382.	408.	387.
181	462.	436.	494.	464.	494.	578.	637.	630.	683.	739.
191	775.	808.	874.	847.	938.	1010.	1000.	1043.	1153.	1258.
201	1339.	1402.	1386.	1538.	1530.	1583.	1794.	1875.	1868.	1932.
211	2079.	2056.	2158.	2347.	2409.	2481.	2523.	2609.	2563.	2660.
221	2714.	2699.	2749.	2663.	2656.	2603.	2550.	2519.	2392.	2366.
231	2073.	1910.	1649.	1353.	1091.	767.	542.	402.	226.	164.
241	106.	56.	45.	38.	39.	30.	29.	38.	33.	44.
251	37.	35.	37.	30.	47.	42.	50.	59.	57.	60.
261	57.	60.	67.	71.	80.	83.	90.	78.	103.	108.
271	97.	106.	104.	112.	126.	155.	127.	132.	170.	159.
281	168.	174.	190.	169.	231.	211.	234.	229.	213.	265.
291	251.	232.	255.	235.	248.	267.	289.	250.	263.	257.
301	270.	212.	254.	230.	229.	226.	215.	164.	176.	146.
311	118.	122.	109.	152.	118.	122.	144.	132.	144.	168.
321	190.	183.	174.	211.	224.	226.	258.	271.	272.	296.
331	310.	329.	361.	342.	386.	373.	432.	428.	503.	494.
341	522.	543.	525.	579.	663.	708.	676.	680.	679.	702.
351	699.	706.	778.	741.	732.	710.	694.	654.	675.	631.
361	589.	576.	484.	455.	374.	318.	192.	165.	120.	73.
371	38.	20.	7.	5.	4.	0.	1.	0.	1.	0.
381	0.	0.	0.	0.	1.	0.	0.	0.	1.	0.
391	1.	0.	0.	1.	0.	0.	0.	0.	1.	1.
401	1.	3.	0.	1.	0.	1.	2.	2.	1.	0.
411	1.	0.	0.	2.	0.	0.	1.	0.	1.	0.
421	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.
431	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	2.	0.	0.
461	0.	0.	0.	0.	1.	0.	2.	1.	0.	0.
471	2.	0.	0.	0.	0.	0.	0.	0.	1.	0.
481	0.	4.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	14.	0.								

WESTINGHOUSE HANFORD COMPANY WHC-SD-WM-DP-062, REV. 0

222-S LABORATORY

ANALYTICAL BATCH 2394

Lab Segment Serial No.	Customer ID:
J-1424	KE65L
Analysis:	**Sample Prep:**
Am241	Direct

Instrument: WB537237	Procedure/ Rev: LA-503-156 D-0
Technologist: Teresa Mix	Date: ~~1-3-94~~ 1-5-94 2.10.94
Starting Time: 0800	Temperature 25°C
Ending Time: 1400	Chemist: L. Fritts

Comments: _____

	Description	Lab ID
1	LMCS- Std.	J1401-5582
2	Blank	J1402-5682
3	Sample	J1424-5782
4	Sample dup.	J1424-5782
5	Sample Trip.	J1424-5782
6	Spike	J1424-5982
7	Spike dup.	J1424-5982
8		
9		
10		

	Description	Lab ID
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Standard Type	Primary Book No. and Aliquot Vol.	Second Book No. and Aliquot Vol.	Third Book No. and Aliquot Vol.	Final Vol. of Standard
LMCS	63B43	.100mL-10-1mL		
Spike	78B43	.100mL		

A-6000-881 (03/92)

ANALYTICAL BATCH SUMMARY SHEET

METHOD: LA-503-156

DATE START: January 5, 1994

PREPARED BY: L.L. Fritts LL Fritts 1.13.94

DATE COMPLETE: January 13, 1994

	UNITS:	uCi/mL									
SPL NAME	SPL ID	ANALYTE	RESULT #1	RESULT #2	RESULT #3	AVERAGE	2*SD	PREC	%REC	DET LIM	% CT ER
STD 63B43	J1401	Am-241	3.22E+1						120.2	4.98E-3	8.0
BLANK	J1402	Am-241	<2.63E-3						35.5	2.63E-3	74.3
KE65D	J1424	Am-241	8.24E-3	8.64E-3	8.28E-3	8.39E-3	4.41E-4	5.3	43.7	2.14E-3	9.4
									51.6	1.81E-3	9.2
									29.2	3.20E-3	10.3
KE65D	J1424	241 Spike	112.1	101.9							

NARRATIVE: [X] NO SPECIAL PROBLEMS/METHOD VARIATIONS IN THIS BATCH

LIST SPECIFIC PROBLEMS/VARIATIONS FOR THIS BATCH:

The results for the standard are in uCi/L.

The results for the spike are in percent recovery.

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

Serial No	Sample Point	Date	Time Issued	Priority
J 1401.-5582	BENCHCOLD	12-15-93	9: 0	22

Determination	Method/Standard	Result Units	Charge Code	Reruns
Am241	LA-503-156	% RECOVERY	E14157	0

Sample Size: ? .100mL - 10 - 1mL

Customer ID: STD

Remarks, Calculations, Results:

EDP R201 AE001 ~~112~~ 1-12-94 "AEA" - 480MIN

STD# 63843 RESULT ~~92.2~~ 3.22E+1 ATTACH PRINTOUT

STD VAL ~~268E+1~~ 26.79 %REC ~~120.19%~~ ~~112~~ 1-12-94

.1mL 78843 ~~112~~ 1-12-94 120.2% WA # 5372

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs	Hrs	Hrs	Hrs
	1-6-94			

Date	Time Completed	Lab Unit Mgr.
1-5-94		

54-5800-061 (R-10-83)

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

			STANDARD
Serial No.	Spike (Tracer) Book Number		78843
J1401-5582	Activity of Am243 Tracer in dpm/mL	(SPKA)	7537
Batch ID	Spike (Tracer) Volume in mL	(SPKV)	0.100
2394	Volume of Sample in mL	(SS)	1.000
Rerun No.	Dilution Factor	(DF)	101
0	Digest Dilution Factor	(DDF)	1
Analyst	Am-241 Area Peak Height from AEA	(C241)	1167
TERESA MIX	Am-243 Area Peak Height from AEA	(C243)	1243
Date	Cm-243/244 Area Peak Height from AEA	(CM)	5
01/05/94	Total AT Count	(ATOT)	7762
Sample Type	AT Count Time in Minutes	(MIN CTd)	30
LIQUID	Background in CPM	(BKG)	7
	Am 241 µCi/L =		3.2193E+01

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

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

Tracer % Recovery = ((ATOT / MIN CTd - BKG) * 2 * (C243 / (C241 + C243)) / (SPKA * SPKV)) * 100

Relative Counting Error (Am-241) = Square Root of ((1 / C241) + (1/C243)) * 1.96 * 100

Relative Counting Error (Cm-243/244) = Square Root of ((1 / CM) + (1/C243)) * 1.96 * 100

Am 241 µCi/mL	=	3.22E-02	Detection Level in µCi/mL
Cm 243/244 µCi/mL	=	< 4.98E-03	
Relative counting error (Am-241)	=	8.0%	
Relative counting error (Cm-243/244)	=	87.8%	
Am-243 Tracer Recovery	=	34.5%	4.98E-03

Data Entry by:	CA Clark	Date:	11-Jan-94
Approved by:	LL Fritts	Date:	12 Jan 1994

Form 6 Rev. 1.0

AMERICIUM 241 ANALYSIS - UNDIGESTED SAMPLE

#1 1-6-94 AG

7762/30 - 7

J1401-5582
#9

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

#10 2370

Serial No	Sample Point	Date	Time Issued	Priority
J 1402.-5682	BECHTOLD	12-15-93	9: 4	22

Determination	Method/Standard	Result Units	Charge Code	Reruns
Am241	LA-503-156	uCi/ML	E14157	0

Sample Size	Customer ID
? mL - 10 - .2mL	BLK

Remarks, Calculations, Results

REAGENT BLANK

COUNT AS uCI/L

"AEA" - 480MIN
ATTACH PRINTOUT

.1ml 78843

WHC-SD-WM-DP-062, REV. 0

< 2.63E-3 uCi/mL

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Teresa Mix	[signature]	[signature]		
Hrs	Hrs 1-6-94	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1-5-94		[signature]	[signature]

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

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

			BLANK
Serial No.	Spike (Tracer) Book Number		78843
J1402-5682	Activity of Am243 Tracer in dpm/mL	(SPKA)	7537
Batch ID	Spike (Tracer) Volume in mL	(SPKV)	0.100
2394.	Volume of Sample in mL	(SS)	0.200
Rerun No.	Dilution Factor	(DF)	11
0 .	Digest Dilution Factor	(DDF)	1
Analyst	Am-241 Area Peak Height from AEA	(C241)	7
TERESA MIX	Am-243 Area Peak Height from AEA	(C243)	1094
Date	Cm-243/244 Area Peak Height from AEA	(CM)	4
01/05/94	Total AT Count	(ATOT)	4066
Sample Type	AT Count Time in Minutes	(MIN CT'd)	30
LIQUID	Background in CPM	(BKG)	1
	Am 241 µCi/L = <		2.6320E+00

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

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

Tracer % Recovery = ((ATOT / MIN CT'd - BKG) * 2 * (C243 / (C241 + C243)) / (SPKA * SPKV)) * 100

Relative Counting Error (Am-241) = Square Root of ((1 / C241) + (1/C243)) * 1.96 * 100

Relative Counting Error (Cm-243/244) = Square Root of ((1 / CM) + (1/C243)) * 1.96 * 100

NOTE: Am 241 Result is a LESS THAN Value

			Detection Level in µCi/mL
Am 241 µCi/mL	=	< 2.63E-03	
Cm 243/244 µCi/mL	=	< 2.63E-03	
Relative counting error (Am-241)	=	74.3%	
Relative counting error (Cm-243/244)	=	98.2%	
Am-243 Tracer Recovery	=	35.5%	2.63E-03

Data Entry by:	[signature]	Date:	11-Jan-94
Approved by:	[signature]	Date:	13 Jan 1994

Form 6 Rev. 1.0

#2 1-6-94 AG

WHC-SD-WM-DP-062, REV. 0

4066/30 - 1

J1402-5682
#10

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

#11 3343

Serial No	Sample Point	Date	Time Issued	Priority
J 1424.-5782	BECHTOLD	12-16-93	13: 7	22

Determination	Method Standard	Result Units	Charge Code	Reruns
Am241	LA-503-156	uCi/ML	E14157	0

Sample Size	Customer ID
?1mL-10-.2mL	KE65D

Remarks, Calculations, Results:
COUNT AS uCI/L SAM "AEA" - 480MIN
ATTACH PRINTOUT
.1mL 78B43
WHC-SD-WM-DP-062, REV.0 24 E-3 uCi/mL

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Teresa Mix	[signature]			
Hrs	Hrs 1/6-94	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr.	
1-5-94		[signature]	[signature]

54-5800-061 (R-10-83)

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

Serial No.			SAMPLE
J1424-5782	Spike (Tracer) Book Number		78B43
Batch ID	Activity of Am243 Tracer in dpm/mL	(SPKA)	7537
2394	Spike (Tracer) Volume in mL	(SPKV)	0.100
Rerun No.	Volume of Sample in mL	(SS)	0.200
0	Dilution Factor	(DF)	11
Analyst	Digest Dilution Factor	(DDF)	1
TERESA MIX	Am-241 Area Peak Height from AEA	(C241)	633
Date	Am-243 Area Peak Height from AEA	(C243)	1435
01/05/94	Cm-243/244 Area Peak Height from AEA	(CM)	6
Sample Type	Total AT Count	(ATOT)	7206
LIQUID	AT Count Time in Minutes	(MIN CTd)	30
	Background in CPM	(BKG)	3
	Am 241 µCi/L =		8.2368E+00

Cm-243/244 µCi/L = CM * SPKA * SPKV * DF * DDF * (1000mL/L) / (C243 * SS * (2220000dpm/µCi))
Am-241 µCi/L = C241 * SPKA * SPKV * DF * DDF * (1000mL/L) / (C243 * SS * (2220000dpm/µCi))
Tracer % Recovery = ((ATOT / MIN CTd - BKG) * 2 * (C243 / (C241 + C243)) / (SPKA * SPKV)) * 100
Relative Counting Error (Am-241) = Square Root of ((1 / C241) + (1/C243)) * 1.96 * 100
Relative Counting Error (Cm-243/244) = Square Root of ((1 / CM) + (1/C243)) * 1.96 * 100

			Detection Level in µCi/mL
Am 241 µCi/mL	=	8.24E-03	
Cm 243/244 µCi/mL	=	< 2.14E-03	
Relative counting error (Am-241)	=	9.4%	
Relative counting error (Cm-243/244)	=	80.2%	
Am-243 Tracer Recovery	=	43.7%	2.14E-03

Data Entry by:	C.A. Clark	Date:	11-Jan-94
Approved by:	[signature]	Date:	13 Jan 1994

Form 6 Rev. 1.0

#3 1-6-94 AB - WHC-SD-WM-DP-062, REV. 0

7206/30 - 3

J1424-5782

#11

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

#12 4331

Serial No	Sample Point	Date	Time Issued	Priority
J 1424.-5782	EECHTOLD	12-16-93	13: 7	22

Determination	Method Standard	Result Units	Charge Code	Reruns
Am241	LA-503-156	uCi/ML	E14157	0

Sample Size	Customer ID
? 1ml - 10 - 12ml	KE65D

Remarks, Calculations, Results

COUNT AS uCI/L DUP "AEA" - 480MIN ATTACH PRINTOUT

.1ml 78843

8.64×10^{-3} uCi/ml

~~8.64E-3 uCi/ml~~

1-13-94

WHC-SD-WM-DP-062, REV. 0

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs 1-6-94	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr.
1-5-94		

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

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

Serial No.			SAMPLE
J1424-5782	Spike (Tracer) Book Number		78843
Batch ID	Activity of Am243 Tracer in dpm/mL	(SPKA)	7537
2394	Spike (Tracer) Volume in mL	(SPKV)	0.100
Rerun No.	Volume of Sample in mL	(SS)	0.200
0	Dilution Factor	(DF)	11
Analyst	Digest Dilution Factor	(DDF)	1
T MIX	Am-241 Area Peak Height from AEA	(C241)	665
Date	Am-243 Area Peak Height from AEA	(C243)	1437
01/05/94	Cm-243/244 Area Peak Height from AEA	(CM)	9
Sample Type	Total AT Count	(ATOT)	8742
LIQUID	AT Count Time in Minutes	(MIN CTd)	30
	Background in CPM	(BKG)	7
	Am 241 µCi/L =		8.6412E+00

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

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

Tracer % Recovery = ((ATOT / MIN CTd - BKG) * 2 * (C243 / (C241 + C243)) / (SPKA * SPKV)) * 100

Relative Counting Error (Am-241) = Square Root of ((1 / C241) + (1/C243)) * 1.96 * 100

Relative Counting Error (Cm-243/244) = Square Root of ((1 / CM) + (1/C243)) * 1.96 * 100

			Detection Level in µCi/mL
Am 241 µCi/mL	=	8.64E-03	
Cm 243/244 µCi/mL	=	< 1.81E-03	
Relative counting error (Am-241)	=	9.2%	
Relative counting error (Cm-243/244)	=	65.5%	
Am-243 Tracer Recovery	=	51.6%	1.81E-03

Data Entry by:	Date:	13-Jan-94
Approved by:	Date:	

Form 6 Rev. 1.0

AMERICIUM 241 ANALYSIS - UNDIGESTED SAMPLE

#1 1-6-94 AG

8742-7
30

"WHC-SD-WM-DP-062, REV. 0

J1424-5782
#12

PLACE ANALYTICAL CARD IN BOX BELOW DO NOT WRITE IN SPACE

3527

Serial No.	Sample Point	Date	Time Issued	Priority
J 1424.-5782	BECHTOLD	12-18-93	13: 7	22

Determination	Method Standard	Result Units	Charge Code	Reruns
Am241	LA-503-156	uCi/ML	E14157	0

Sample Size	Customer ID
? 1ml-10-.2ml	KE65D

Remarks, Calculations, Results

COUNT AS uCi/L TRIP "AEA" - 480MIN ATTACH PRINTOUT

.1ml 78843

WHC-SD-WM-DP-062, REV. 0

8.28 E-3 uCi/mL

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Teresa Mix				
Hrs	Hrs 1-6-94	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr.	
1-5-94			

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

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

Serial No.			SAMPLE
J1424-5782	Spike (Tracer) Book Number		78843
Batch ID	Activity of Am243 Tracer in dpm/mL	(SPKA)	7537
2394	Spike (Tracer) Volume in mL	(SPKV)	0.100
Rerun No.	Volume of Sample in mL	(SS)	0.200
0	Dilution Factor	(DF)	11
Analyst	Digest Dilution Factor	(DDF)	1
TERESA MIX	Am-241 Area Peak Height from AEA	(C241)	522
Date	Am-243 Area Peak Height from AEA	(C243)	1177
01/05/94	Cm-243/244 Area Peak Height from AEA	(CM)	8
Sample Type	Total AT Count	(ATOT)	4797
LIQUID	AT Count Time in Minutes	(MIN CT'd)	30
	Background in CPM	(BKG)	1
	Am 241 µCi/L =		8.2814E+00

Cm-243/244 µCi/L = CM * SPKA * SPKV * DF * DDF * (1000mL/L) / (C243 * SS * (2220000dpm/µCi))
Am-241 µCi/L = C241 * SPKA * SPKV * DF * DDF * (1000mL/L) / (C243 * SS * (2220000dpm/µCi))
Tracer % Recovery = ((ATOT / MIN CT'd - BKG) * 2 * (C243 / (C241 + C243)) / (SPKA * SPKV)) * 100
Relative Counting Error (Am-241) = Square Root of ((1 / C241) + (1/C243)) * 1.96 * 100
Relative Counting Error (Cm-243/244) = Square Root of ((1 / CM) + (1/C243)) * 1.96 * 100

Am 241 µCi/mL	=	8.28E-03	Detection Level in µCi/mL
Cm 243/244 µCi/mL	=	< 3.20E-03	
Relative counting error (Am-241)	=	10.3%	
Relative counting error (Cm-243/244)	=	69.5%	
Am-243 Tracer Recovery	=	29.2%	3.20E-03

Data Entry by:	CA Clark	Date:	11-Jan-94
Approved by:	LK Fitts	Date:	13 Jan 1994

Form 6 Rev. 1.0

#2 1-6-94 AB

4797
30 -1

WHC-SD-WM-DP-062, REV. 0

J1424-5782

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

#4 5304

Serial No	Sample Point	Date	Time Issued	Priority
J 1424.-5982	BECHTOLD	12-16-93	13: 7	22

Determination	Method Standard	Result Units	Charge Code	Reruns
Am241	LA-503-156	% RECOVERY	E14157	0

Sample Size	Customer ID
? 1mL - 10 - .2mL	KE65D

Remarks, Calculations, Results:
SAMPLE SPIKED ID 63845K .100-10-1mL "AEA" - 480MIN
SPIKE ID 78B43 ATTACH PRINTOUT
SPIKE VOLUME
COUNT AS µCi/L 200mL

112.1 % Rec.

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Hrs	Hrs 1-6-94	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
1-5-94		

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

WHC-SD-WM-DP-062, REV. 0

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

Serial No.			CHK EXT NO.
J1424-5982	Spike (Tracer) Book Number		78B43
Batch ID	Activity of Am243 Tracer in dpm/mL	(SPKA)	7537
2394	Spike (Tracer) Volume in mL	(SPKV)	0.200
Rerun No.	Volume of Sample in mL	(SS)	0.200
0	Dilution Factor	(DF)	11
Analyst	Digest Dilution Factor	(DDF)	1
TERESA MIX	Am-241 Area Peak Height from AEA	(C241)	1200
Date	Am-243 Area Peak Height from AEA	(C243)	1825
01/05/94	Cm-243/244 Area Peak Height from AEA	(CM)	7
Sample Type	Total AT Count	(ATOT)	10981
LIQUID	AT Count Time in Minutes	(MIN CT'd)	30
	Background in CPM	(BKG)	3
	Am 241 µCi/L =		2.4556E+01

Cm-243/244 µCi/L = CM * SPKA * SPKV * DF * DDF * (1000mL/L) / (C243 * SS * (2220000dpm/µCi))
Am-241 µCi/L = C241 * SPKA * SPKV * DF * DDF * (1000mL/L) / (C243 * SS * (2220000dpm/µCi))
Tracer % Recovery = ((ATOT / MIN CT'd - BKG) * 2 * (C243 / (C241 + C243)) / (SPKA * SPKV)) * 100
Relative Counting Error (Am-241) = Square Root of ((1 / C241) + (1/C243)) * 1.96 * 100
Relative Counting Error (Cm-243/244) = Square Root of ((1 / CM) + (1/C243)) * 1.96 * 100

Am 241 µCi/mL	=	2.46E-02	Detection Level in µCi/mL
Cm 243/244 µCi/mL	=	< 6.43E-03	
Relative counting error (Am-241)	=	7.3%	
Relative counting error (Cm-243/244)	=	74.2%	
Am-243 Tracer Recovery	=	29.1%	6.43E-03

Data Entry by:	CA Clark	Date:	11-Jan-94
Approved by:		Date:	13 Jan 1994

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$$\frac{(24.6 - 9.24)\left(\frac{101}{1} / \frac{11}{12}\right)(100)}{26.790} = 112.1\%$$

AMERICIUM 241 ANALYSIS - UNDIGESTED SAMPLE

3 1-6-94 ~~AO~~ - WHC-SD-WM-DP-062, REV. 0

10981
30 - 3

J1424-5982
#5

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

2512

Serial No	Sample Point	Date	Time Issued	Priority
J 1424.-5982	BECHTOLD	12-16-93	13: 7	22

Determination	Method/Standard	Result Units	Charge Code	Reruns
Am241	LA-503-156	% RECOVERY	E14157	0

Sample Size	Customer ID
? 1ml - 10 - 2ml	KE65D

Remarks, Calculations, Results

SAMPLE SPIKED ID SK DUP

SPIKE ID 78B43

SPIKE VOLUME
COUNT AS uCI/L

"AEA" - 480MIN
ATTACH PRINTOUT

101.9% 1-13-94

~~101.5 %~~ Rec.

WHC-SD-WM-DP-062, REV. 0

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
Teresa Mix	[signature]	[signature]	[signature]	
Hrs	Hrs 1-6-94	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
1-5-94		[signature]	[signature]

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

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

			CHK EXT NO.
Serial No.	Spike (Tracer) Book Number		78B43
J1424-5982	Activity of Am243 Tracer in dpm/mL	(SPKA)	7537
Batch ID	Spike (Tracer) Volume in mL	(SPKV)	0.200
2394	Volume of Sample in mL	(SS)	0.200
Rerun No.	Dilution Factor	(DF)	11
0	Digest Dilution Factor	(DDF)	1
Analyst	Am-241 Area Peak Height from AEA	(C241)	1024
TERESA MIX	Am-243 Area Peak Height from AEA	(C243)	1628
Date	Cm-243/244 Area Peak Height from AEA	(CM)	8
01/05/94	Total AT Count	(ATOT)	13397
Sample Type	AT Count Time in Minutes	(MIN CT'd)	30
LIQUID	Background in CPM	(BKG)	7
	Am 241 µCi/L =		2.3490E+01

Cm-243/244 µCi/L = CM * SPKA * SPKV * DF * DDF * (1000mL/L) / (C243 * SS * (2220000dpm/µCi))
Am-241 µCi/L = C241 * SPKA * SPKV * DF * DDF * (1000mL/L) / (C243 * SS * (2220000dpm/µCi))
Tracer % Recovery = ((ATOT / MIN CT'd - BKG) * 2 * (C243 / (C241 + C243)) / (SPKA * SPKV)) * 100
Relative Counting Error (Am-241) = Square Root of ((1 / C241) + (1/C243)) * 1.96 * 100
Relative Counting Error (Cm-243/244) = Square Root of ((1 / CM) + (1/C243)) * 1.96 * 100

			Detection Level in µCi/mL
Am 241 µCi/mL	=	2.35E-02	
Cm 243/244 µCi/mL	=	< 5.22E-03	
Relative counting error (Am-241)	=	7.8%	
Relative counting error (Cm-243/244)	=	69.5%	
Am-243 Tracer Recovery	=	35.8%	5.22E-03

Data Entry by:	CA Clark	Date:	11-Jan-94
Approved by:	[signature]	Date:	13 Jan 1994

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1-13-94

101.9%

$(23.5 - \cancel{8.69}\ 8.64)\left(\frac{101}{1} / \frac{11}{.2}\right)(100) = \cancel{101.5\%}$