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Title/Desc:

FINAL REPORT FOR TANK 241AP108 GRAB SAMPLES
8AP-96-1 8AP-96-2 & 8AP-96-FB [SEC 1 OF 2 PAGE 1
TO 193]

Pages: 202

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

Document number: SD-WM-DP-166

Section 1 of 2

Title: Final Report for Tank 241-AP-108,
Grab Samples 8AP-96-1, 8AP-96-2 and
8AP-96-FB

Date: 4/19/96 Revision: 1

Originator: Esch, Ruth A

Co: _____

Recipient: _____

Co: _____

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ECN

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629019

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FINAL REPORT FOR TANK 241-AP-108, GRAB SAMPLES 8AP-96-1, 8AP-96-2 AND 8AP-96-FB

Ruth A. Esch

Westinghouse Hanford Company, Richland, WA 99352
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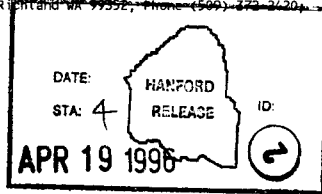
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ANALYTICAL SERVICES

**FINAL REPORT FOR
TANK 241-AP-108, GRAB SAMPLES
8AP-96-1, 8AP-96-2 AND 8AP-96-FB**

Project Coordinator: RUTH A. ESCH

**Prepared for the U.S. Department of Energy
Office of Environmental Restoration
and Waste Management**

by

**Westinghouse Hanford Company
Box 1970
Richland, Washington**

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This Document Consists of two sections.

Part I consists of pages 1 through 323, plus pages 2, 13, 22, 81, 85, 88, 156 and 198 were intentionally left blank.

Part II consists of pages 2-1 through 2-39, plus pages 2-4, 2-9, 2-12, 2-17, and 2-21 were intentionally left blank.

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NARRATIVE

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FINAL REPORT FOR TANK 241-AP-108
GRAB SAMPLES 8AP-96-1, 8AP-96-2 AND 8AP-96-FB

Summary

Two grab samples (8AP-96-1 and 8AP-96-2) and one field blank (8AP-96-FB) were taken from tank 241-AP-108. The safety screening results were presented in the 45-Day Report (Rev. 0, Part II of this document). No safety screening secondary analyses were required. Additional analyses were performed in support of the Waste Compatibility program, as specified in the Tank Sampling and Analysis Plan (TSAP) (reference 1) and the Data Quality Objectives for Tank Farms Waste Compatibility Program (reference 2).

For criticality concerns, the $^{239/240}\text{Pu}$ results were four orders of magnitude below the prevention limit of 0.013 g/L (0.8 $\mu\text{Ci/mL}$) specified in the Tank Waste Compatibility DQO.

The average specific gravity (Sp.G.) result for the two supernate samples was less than the 1.41 limit specified for commingled waste, and less than the 1.30 limit specified for source waste. Therefore, the potential for flammable gas accumulation is low.

Waste Compatibility energetics decisions are based on the result of the exothermic energy divided by the endothermic energy. For all subsamples analyzed, this result was 0.0 since there were no exotherms.

The hydroxide (OH^-) results for the three samples analyzed were within the acceptable concentration ranges required for corrosion control.

Scope

This document is the final report deliverable for the tank 241-AP-108 grab samples. The samples were subsampled and analyzed in accordance with the TSAP. Included in this report are the results for the Waste Compatibility analyses, with the exception of DSC and thermogravimetric analysis (TGA) results which were presented in the 45 Day report (Part II of this document). The raw data for all analyses, with the exception of DSC and TGA, are also included in this report.

Analytical Results

Attachments

Attachment 1 (page 11) is provided as a cross-reference for relating the tank farm customer ID numbers with the 222-S Laboratory sample numbers. The subsamples that were generated in the laboratory for analysis are also identified in these diagrams.

A summary of the analytical results is presented in Table 1 (pages 14 - 16).

Since the results for the sodium (Na) for samples 8AP-96-1 (S96T000090) and 8AP-96-2 (S96T000097) by inductively coupled plasma (ICP) exceeded the added spike concentrations by more than a factor of four, the matrix spike recovery results should not be used. The result for sample S96T000090 was reported as 181.0% recovery, and that for S96T000097 as "n/a". The accuracy of this analysis was assessed by evaluating the serial dilution results. These results are identified in the raw data with an "L" appended to the sample number. The samples were analyzed both undiluted and with a 5-fold serial dilution. For acceptable performance, the relative percent difference (RPD) between the serial dilution and the undiluted results must be $\leq 10\%$. The results provided in Table 2 (page 17) indicate that the accuracy of the analyses was acceptable.

Following the data summary tables is a section which contains the Data Verification and Deliverable (DVD) summary report for radionuclide analyses. This report summarizes the total alpha activity results and provides data qualifiers and total propagated uncertainty (TPU) values for results. The TPU values are based on the uncertainties inherent in each step of the analysis process. They are used to determine "reasonable" RPD values which may be used to accept valid data that do not meet the TSAP acceptance criteria. A report guide is provided on pages 23 through 79 to assist in understanding this summary report.

The DVD report presents "less than detection limit" results differently than how they are presented in Table 1. In DVD, both the sample and duplicate aliquots are reported based only on the value that was calculated for the sample. Table 1 presents values that are calculated individually for the sample and duplicate aliquots.

Compatibility Study Results Summary

Criticality Decision Rule

Plutonium ($^{239/240}\text{Pu}$)

$^{239/240}\text{Pu}$ concentration was measured to evaluate criticality safety for waste transfers. The results ranged from $5.88\text{e-}5$ to $6.15\text{e-}5 \mu\text{Ci/mL}$. The field blank result was less than the detection limit of $7.70\text{e-}6 \mu\text{Ci/mL}$. These results are four orders of magnitude below the criticality prevention limit of $0.80 \mu\text{Ci/mL}$ stated in the compatibility DQO.

Americium (^{241}Am)

^{241}Am was also analyzed. The results (for the two samples and the field blank) were all less than the lowest sample detection limit of $2.05\text{e-}5 \mu\text{Ci/mL}$.

Flammable Gas Accumulation Decision Rule

Specific Gravity (Sp.G.)

The Sp.G. of the waste is currently used for determination of the potential to cause an accumulation of flammable gases. The flammable gas decision rule

requires that the weighted mean Sp.G. not exceed 1.41 for commingled waste, or that the Sp.G. for the source be less than 1.3. The results ranged from 1.018 to 1.023, with a mean value of 1.022. This result is less than either of the required values. The field blank had an average Sp.G. of 0.969. These results indicate that the potential of flammable gas accumulation during waste transfer is low.

Energetics Decision Rule

Differential Scanning Calorimetry (DSC)

For waste compatibility energetics decision concerns, the exotherm/endotherm ratio must be less than one (1). This requirement is satisfied for all samples. The actual exotherm and endotherm results and the calculated ratios are presented Table 3 (page 18).

Corrosion Decision Rule

Nitrate (NO_3^-), Hydroxide (OH^-) and Nitrite (NO_2^-)

The results with respect to the waste compatibility corrosion rules are presented in Table 4 (pages 19 - 20). This table presents the NO_3^- , OH^- , and NO_2^- results in $\mu\text{g/mL}$ and molarity (M) units. The spreadsheet compares the results to the concentration ranges specified in the waste compatibility DQO. A "YES" will appear in the appropriate space for the condition that is met. Only one of three sets of conditions must be met for OH^- and NO_2^- based on the range that the NO_3^- concentration falls in. If "NO" appears in the space under a condition, that condition is not met and a notification is required. For this project, all of the results were within the applicable range limits. The NO_3^- concentration was less than 1.0 M (0.235 to 0.242 M), OH^- was between 0.01 M and 5.0 M (0.158 to 0.165 M), and NO_2^- between 0.011 M and 5.5 M (0.079 to 0.081 M).

For the field blank, sample 8AP-96-FB (S96T000091), the OH^- result for the sample is reported as "pH=8.74" and the duplicate is reported as "n/a". The reason for this is that the OH^- test cannot be run if the pH is less than 10. The reported pH of 8.74 that measured after the addition of barium chloride (BaCl_2). The pH measured on the sample was 7.51 without the addition of BaCl_2 .

Deviations

Due to the absence of solids in the supernate samples, the volume percent solids by centrifugation test was not performed on those samples.

There were several analytes detected in the field blank. These were sodium, nitrate, and strontium (^{90}Sr). The concentrations detected were below the sample detection limits, and at least five orders of magnitude less than those measured in the samples. This low level may be considered insignificant. Nitrate, chloride and ^{90}Sr were also detected in the method blanks. Here again the concentrations are insignificant since they are below the sample detection limits.

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The pH results ranged from 13.02 to 13.33 for the samples. Results for pH that are greater than 12.5 are suspect and should be considered estimates because the highest calibration buffer available is 12.5 and pH electrode performance degrades at high pH. The average pH for the field blank was 7.51.

For the total organic carbon (TOC) and total inorganic carbon (TIC) analyses, the duplicate analysis was inadvertently omitted from the runs for sample 8AP-96-2 (S96T000097). The sample was not rerun for several reasons: 1) the sample results were consistent with those for sample 8AP-96-1 (S96T000090); 2) they were analyzed in the same batch with 8AP-96-1 which had very good precision for these two analytes (RPD for TOC = 5.29%; and TIC = 0.58%) and for liquid samples, it was believed that the precision for sample 8AP-96-2 may be similar; and 3) the TOC sample result was two orders of magnitude below the action limit of 30,000 $\mu\text{g/mL}$. For the above reasons, it was believed that a rerun to include a duplicate analysis would have little added benefit.

The GEA detected both ^{137}Cs and ^{134}Cs . The ^{137}Cs results are reported along with ^{60}Co in Table 1. The average concentrations of ^{134}Cs for the two samples were: $2.10\text{e-}2 \mu\text{Ci/mL}$ for 8AP-96-1 (S96T000092) and $1.96\text{e-}2 \mu\text{Ci/mL}$ for 8AP-96-2 (S96T000098).

For the ^{90}Sr analysis, samples 8AP-96-2 and 8AP-96-FB each had a high relative percent difference (RPD) between the sample and duplicate results. For sample 8AP-96-2 (S96T000098) the RPD = 31.2% with a total propagated uncertainty (TPU) of 17%; and for sample 8AP-96-FB (S96T000093) the RPD = 97.3% with a TPU of 91%. These high RPDs and large TPU values were attributed to low activity in the sample. No reruns were performed because historically additional analyses on low activity samples have not improved the RPDs.

Procedures

Table 5 lists the analytical procedures used for performing the sample analyses. Abbreviations for analyses are defined in the table notes.

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Table 5: Analytical Procedures

Analysis	Sample Portion	Preparation Procedure +	Analysis Procedure
DSC	Supernate	N/A	LA-514-114 Rev. C-1
TGA	Supernate	N/A	LA-514-114 Rev. C-1
Sp.G.	Supernate	N/A	LA-510-112 Rev. C-3
pH	Supernate	N/A	LA-212-106 Rev. A-0
OH ⁻	Supernate	N/A	LA-211-102 Rev. C-0
IC: 2Cl^- , F^- , PO_4^{3-} , SO_4^{2-} , NO_3^- , NO_2^-	Supernate	N/A	LA-533-105 Rev. D-1
ICP: Al, Fe, Na	Supernate	N/A	LA-505-151 Rev. D-3
TOC	Supernate	N/A	LA-344-105 Rev. C-0
TIC	Supernate	N/A	LA-622-102 Rev. C-0
AT	Supernate	N/A	LA-508-101 Rev. D-2
GEA: ^{137}Cs	Supernate	N/A	LA-548-121 Rev. D-1
^{90}Sr	Supernate	N/A	LA-220-101 Rev. D-1
^{241}Am	Supernate	N/A	LA-953-103 Rev. A-4
$^{239/240}\text{Pu}$	Supernate	N/A	LA-943-127 Rev. B-1

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Abbreviations:

N/A = not applicable (these are direct samples)
DSC = differential scanning calorimetry
TGA = thermogravimetric analysis
Sp.G. = specific gravity
OH = hydroxide
IC = ion chromatography
ICP = inductively coupled plasma
TOC = total organic carbon
TIC = total inorganic carbon
AT = total alpha
GEA = gamma energy analysis

Reference

1. WHC-SD-WM-TSAP-071, Rev. 0B, "Tank 241-AP-108 Grab Sampling and Analysis Plan", dated April 15, 1996, Westinghouse Hanford Company, Richland, WA 99352.
2. WHC-SD-WM-DQO-001, Rev. 1, "Data Quality Objectives for Tank Farms Waste Compatibility Program", dated April 24, 1995, Westinghouse Hanford Company, Richland, WA 99352.

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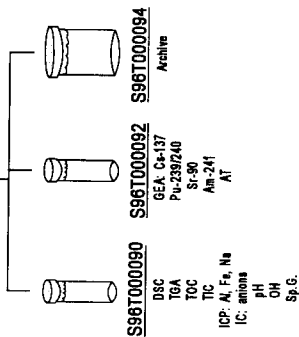
ATTACHMENT 1

AP-108, GRAB SAMPLE BREAKDOWN

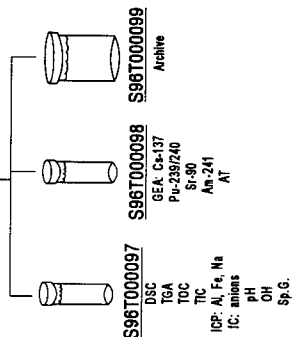
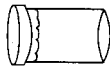
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Attachment 1 AP-108 GRAB SAMPLE BREAKDOWN

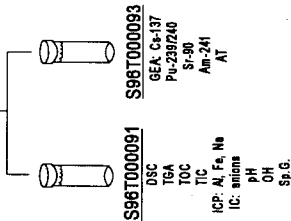
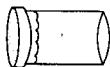
645 in.
Riser 1 @30°
8AP-96-1
S96T000088



645 in.
Riser 1 @150°
8AP-96-2
S96T000096



240 in.
Riser 1 @30°
8AP-96-FB
S96T000089



SAMPLE DATA SUMMARY

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RISE: 1330
SEGMENT #: 8AP-96-1

SEGMENT PORTION: Supernate

Table 1: Final Results for Compatibility Study
AP-108 GRAB

Sample#	R #	Analyte	Unit	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S961000090		Tot Inorg Carbon by Coul.	ug/mL	99.17	1.600	1.72e+03	1.730e3	1.720e3	0.58	104.2	20.00	n/a
S961000090		% Water by IGA on Perkin Elmer	%	102.2	n/a	93.23	9.231e1	9.277e1	0.98	n/a	n/a	n/a
S961000090		Specific Gravity	Sp.G.	97.35	n/a	1.025	1.018e0	1.022e0	0.69	n/a	1.000e-3	n/a
S961000090		Oil Rect	ppm	n/a	n/a	13.33	1.332e1	1.337e1	0.08	n/a	1.000e-2	n/a
S961000090		Oil - by Pot. titration	ug/mL	98.56	<2.00	2.76e+03	2.790e3	2.780e3	0.08	n/a	625.0	n/a
S961000090		PSC Extraction on Perkin Elmer	ug/mL	99.51	n/a	0.00e+00	6.000e0	0.000e0	0.00	n/a	n/a	n/a
S961000090		D Aluminum ICP Actd DIL.	ug/mL	97.00	<5.000e-2	1.05e+03	1.050e3	1.050e3	0.00	94.30	5.05e0	n/a
S961000090		D Iron ICP Actd DIL.	ug/mL	100.6	<5.000e-2	< 5.050	<5.050	n/a	n/a	100.0	5.050	n/a
S961000090		D Sodium ICP Actd DIL.	ug/mL	96.80	<1.000e-1	1.67e+04	1.680e4	1.680e4	0.60	181.0	5.050	n/a
S961000090		Sulfate by IC-Dionex40001/4500	ug/mL	93.66	<1.500e-1	4.06e+02	4.140e2	4.097e2	1.73	92.55	15.10	n/a
S961000090		Phosphate-IC-Dionex 40001/4500	ug/mL	96.15	<1.700e-1	2.53e+02	2.500e2	2.426e2	10.3	93.60	13.10	n/a
S961000090		Nitrate-IC - Dionex 40001/4500	ug/mL	94.19	<1.400e-1	1.50e+04	1.490e4	1.500e4	0.67	103.4	135.5	n/a
S961000090		Fluoride-IC-Dionex 40001/4500	ug/mL	91.76	<1.070e-1	3.74e+03	3.690e3	3.710e3	1.35	96.44	118.9	n/a
S961000090		Chloride-IC-Dionex 40001/4500	ug/mL	92.20	<1.500e-2	5.50e+02	5.470e2	5.486e2	0.35	93.56	14.46	n/a
S961000092		Strontium-89/90 High Level	uCi/mL	94.94	<1.700e-2	1.78e+02	1.820e2	1.698e2	9.41	92.28	18.89	n/a
S961000092		Pu-239/240 by TRU-SPEC Resin	uCi/mL	103.9	<6.130e-6	2.68e+02	2.750e-2	2.620e-2	4.62	n/a	2.000e-3	9.11E+00
S961000092		Cesium-137 by GEA	uCi/mL	101.6	<3.830e-4	5.91e+05	6.030e-5	5.970e-5	2.01	n/a	1.700e-3	5.14E+00
S961000092		Cobalt-60 by GEA	uCi/mL	99.52	<7.050e-4	<6.33e-04	<6.02e-4	n/a	n/a	n/a	1.000e-3	n/a
S961000092		Am-241 by Extraction	uCi/mL	86.97	<2.390e-5	<2.33e-05	<2.23E-5	n/a	n/a	n/a	2.340e-3	1.00E+02
S961000092		Alpha in Liquid Samples	uCi/mL	82.47	<6.030e-4	<6.03E-4	<6.03E-4	n/a	n/a	95.15	1.000e-3	5.00E+02

WHC-SD-WM-DP-166, REV. I

RISER: 1a150

SEGMENT #: BAP-96-2

SEGMENT PORTION: Supernate

Table 1: Final Results for Compatibility Study
AP-108 GRAB

Sample#	R #	Analyte	Unit	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count	Err%
5961000097		Tot. Inorg. Carbon by Coul.	ug/mL	99.17	1.800	1.74e+03	n/a	n/a	n/a	n/a	20.00	n/a	n/a
5961000097		% Water by TGA on Perkin Elmer	%	102.2	n/a	93.43	9.319e1	9.331e1	0.26	n/a	n/a	n/a	n/a
5961000097		Specific Gravity	SP. G.	97.35	n/a	1.023	1.020e0	1.022e0	0.29	n/a	1.000e-3	n/a	n/a
5961000097		pH Direct	pH	n/a	n/a	13.02	1.304e1	1.303e1	0.15	n/a	1.000e-2	n/a	n/a
5961000097		OH- by Pot. Titration	ug/mL	94.95	<2.00	2.81e+03	2.690e3	2.750e3	4.36	n/a	625.0	n/a	n/a
5961000097		DSC Exotherm on Perkin Elmer	Joules/g	99.51	n/a	0.00e+00	0.000e0	0.000e0	0.00	n/a	n/a	n/a	n/a
5961000097	D	Aluminium-ICP-Acid Dil.	ug/mL	97.00	<5.000e-2	1.09e+03	1.090e3	1.090e3	0.00	77.20	5.050	n/a	n/a
5961000097	D	Iron-ICP-Acid Dil.	ug/mL	100.6	<5.000e-2	< 5.050	<5.05e0	n/a	n/a	100.0	5.050	n/a	n/a
5961000097	D	Sodium-ICP-Acid Dil.	ug/mL	96.60	<1.000e-1	1.80e+04	1.800e4	1.800e4	0.00	n/a	10.10	n/a	n/a
5961000097		Sulfate by IC-Dionex40001/4500	ug/mL	97.78	<1.360e-1	6.11e+02	6.280e2	6.195e2	2.74	92.71	151.0	n/a	n/a
5961000097		Phosphate-IC-Dionex 40001/4500	ug/mL	97.25	<1.190e-1	3.44e+02	3.660e2	3.551e2	6.20	93.59	132.1	n/a	n/a
5961000097		Nitrate-IC - Dionex 40001/4500	ug/mL	99.84	2.40e-01	1.46e+04	1.460e4	1.460e4	0.00	112.7	155.5	n/a	n/a
5961000097		Nitrite-IC - Dionex 40001/4500	ug/mL	94.94	<1.070e-1	3.65e+03	3.80e3	3.740e3	4.81	97.57	118.9	n/a	n/a
5961000097		Fluoride-IC-Dionex 40001/4500	ug/mL	96.78	<1.300e-2	5.97e+02	6.070e2	6.020e2	1.66	99.83	14.44	n/a	n/a
5961000097		Chloride-IC-Dionex 40001/4500	ug/mL	91.90	2.50e-02	2.10e+02	2.100e2	2.102e2	0.00	91.39	18.89	n/a	n/a
5961000098		Strontium-89/90 High Level	uCi/mL	94.36	9.85e-07	3.93e-02	2.870e-2	3.400e-2	31.2	n/a	2.000e-3	7.46E+00	n/a
5961000098		Pu-239/240 by TRU-SPEC Resin	uCi/mL	103.9	<6.130e-6	6.13e-05	5.880e-5	6.010e-5	4.49	n/a	1.990e-5	4.70E+00	n/a
5961000098		Cesium-137 by GEA	uCi/mL	101.6	<3.830e-4	19.41	1.990e1	1.966e1	2.54	n/a	n/a	0.16	n/a
5961000098		Cobalt-60 by GEA	uCi/mL	99.52	<7.050e-4	<6.82e-04	<6.55e-4	n/a	n/a	n/a	1.000e-3	n/a	n/a
5961000098		Am-241 by Extraction	uCi/mL	86.97	<2.390e-5	<2.05e-05	<2.06E-5	n/a	n/a	n/a	2.050e-5	1.00E+02	n/a
5961000098		Alpha in Liquid Samples	uCi/mL	82.47	<6.030e-4	<6.67e-04	<9.84E-4	n/a	n/a	n/a	1.000e-3	5.00E+02	n/a

WHC-SD-WM-DP-166, REV. I

RISER: 1230
SEGMENT #: 8AP-96-F8

Table 1: Final Results for Compatibility Study
AP-108 GRAB

SEGMENT PORTION: Field Blank

Sample#	R#	Analyte	Unit	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count	Err%
S961000091		Tot. Inorg. Carbon by Coul.	ug/mL	99.17	1.600	< 5.000e-1	<5.00	n/a	n/a	n/a	5.000		n/a
S961000091		% Water by TGA on Perkin Elmer	%	102.2	n/a	99.59	9.947e1	9.953e1	0.12	n/a	n/a		n/a
S961000091		Specific Gravity	Sp. G.	97.35	n/a	9.66e-01	9.720e-1	9.690e-1	0.62	n/a	1.000e-3		n/a
S961000091		pH Direct	pH	n/a	n/a	7.520	7.500e0	7.510e0	0.27	n/a	1.000e-2		n/a
S961000091		OH- by Pot. Titration	ug/mL	98.56	<42.00	ph=8.74	n/a	n/a	n/a	n/a	125.0		n/a
S961000091		DSC Exotherm on Perkin Elmer	Joules/g	99.51	n/a	0.00e+00	0.000e0	0.000e0	0.00	n/a	n/a		n/a
S961000091		D Aluminum-ICP-Acid Dil.	ug/mL	97.00	<5.000e-2	<5.00e-02	<5.00e-2	n/a	n/a	98.50	5.000e-2		n/a
S961000091		D Iron-ICP-Acid Dil.	ug/mL	100.6	<5.000e-2	<5.00e-02	<5.00e-2	n/a	n/a	100.8	5.000e-2		n/a
S961000091		D Sodium-ICP-Acid Dil.	ug/mL	96.60	<1.000e-1	9.47e-01	9.420e-1	9.440e-1	0.53	101.8	1.000e-1		n/a
S961000091		Sulfate by IC-Dionex 40001/4500	ug/mL	91.66	<1.360e-1	<1.36e-01	<1.36e-1	n/a	n/a	n/a	1.360e-1		n/a
S961000091		Phosphate-IC-Dionex 40001/4500	ug/mL	96.15	<1.190e-1	<1.19e-01	<1.19e-1	n/a	n/a	n/a	1.190e-1		n/a
S961000091		Nitrate-IC - Dionex 40001/4500	ug/mL	94.79	<1.400e-1	<1.40e-01	1.400e-1	1.400e-1	0.00	n/a	1.400e-1		n/a
S961000091		Nitrite-IC - Dionex 40001/4500	ug/mL	91.76	<1.070e-1	<1.07e-01	<1.07e-1	n/a	n/a	n/a	1.070e-1		n/a
S961000091		Fluoride-IC-Dionex 40001/4500	ug/mL	92.20	<1.300e-2	<1.30e-02	<1.30e-2	n/a	n/a	n/a	1.300e-2		n/a
S961000091		Chloride-IC-Dionex 40001/4500	ug/mL	94.94	<1.700e-2	<1.70e-02	1.900e-2	n/a	n/a	n/a	1.700e-2		n/a
S961000093		Strontium-89/90 High Level	uCi/mL	94.36	9.85e-07	5.80e-07	1.680e-6	1.130e-6	97.3	n/a	6.760e-7	9.01e+01	n/a
S961000093		Pu-239/240 by TRU-SPEC Resin	uCi/mL	103.9	<6.130e-6	<7.70e-06	<5.89e-6	n/a	n/a	n/a	7.700e-6	1.18e+01	n/a
S961000093		Cesium-137 by GEA	uCi/mL	101.6	<3.830e-4	<6.18e-05	<6.07e-5	n/a	n/a	n/a	6.180e-5	n/a	n/a
S961000093		Cobalt-60 by GEA	uCi/mL	99.52	<7.050e-4	<2.64e-05	<2.29e-5	n/a	n/a	n/a	2.640e-5	n/a	n/a
S961000093		Am-241 by Extraction	uCi/mL	86.97	<2.390e-5	<2.42e-05	<2.13E-5	n/a	n/a	n/a	2.420e-5	1.00e+02	n/a
S961000093		Alpha in Liquid Samples	uCi/mL	82.47	<6.030e-4	<2.75e-07	<1.99E-7	n/a	n/a	n/a	4.580e-7	5.00e+02	n/a

WHC-SD-WM-DP-166, REV. /

WHC-SD-WM-DP-166, REV. I

Table 2

ICP Serial Dilution Results for Tank 241-AP-108
Waste Compatibility Study

Risers 1@30° and 1@150°

Sample ID	Analyte	Sample Result (µg/mL) Undiluted	Serial Dilution Result (µg/mL)	RPD
S96T000090				
8AP-96-1	Al	1.05E+03	1.06E+03	0.8
	Na	1.67E+04	1.75E+04	4.7
S96T000097				
8AP-96-2	Al	1.09E+03	1.11E+03	1.8
	Na	1.80E+04	1.86E+04	3.3

RPD (Relative Percent Difference) = $(\text{ABS}(\text{Sample} - \text{Serial Dilution})) / [(\text{Sample} + \text{Serial Dilution}) / 2] \times 100$

WHC-SQ-WM-DP-166, REV. 1
Table 3

Additional DSC Results for Tank 241-AP-108
Waste Compatibility Study

Risers 1@30° and 1@150°

Sample ID		Exothermic Energy (Joules/g)	Temp (° C)	Endothermic Energy (Joules/g)	Temp (° C)	Energy Ratio *
S96T000090						
8AP-96-1	Samp	0.0	n/a	2166.8	113.4	0.00
	Dup	0.0	n/a	2052.9	113.8	0.00
S96T000097						
8AP-96-2	Samp	0.0	n/a	2161.2	109.7	0.00
	Dup	0.0	n/a	2035.2	109.0	0.00

Energy Ratio = Exothermic Energy /Endothermic Energy

* - This ratio must be < 1 for Compatibility Energetics

Table 4 (1 of 2)

WASTE COMPATIBILITY CORROSION RULES

Sample ID	Analyte	Result (ug/mL)	Result (M)	Is [NO3]... ≤ 1.0 M? YES	Is [OH]... 0.010 M ≤ [OH] ≤ 5.0 M? YES	Is [NO2]... 0.011 M ≤ [NO2] ≤ 5.5 M YES	Is [OH] * [NO2]...
S96T000090 8AP-96-1	NO3	1.50E+04	0.242				
	OH	2.76E+03	0.162				
	NO2	3.74E+03	0.081				>= 0.4 * [NO3]?
				3.0 M < [NO3] ≤ 5.5 M?	0.3 ≤ [OH] < 10 M?		>= 1.2 M?

Sample ID	Analyte	Result (ug/mL)	Result (M)	Is [NO3]... ≤ 1.0 M? YES	Is [OH]... 0.010 M ≤ [OH] ≤ 5.0 M? YES	Is [NO2]... 0.011 M ≤ [NO2] ≤ 5.5 M YES	Is [OH] * [NO2]...
S96T000090 8AP-96-1 DUP	NO3	1.49E+04	0.240				
	OH	2.79E+03	0.164				
	NO2	3.69E+03	0.080				>= 0.4 * [NO3]?
				3.0 M < [NO3] ≤ 5.5 M?	0.3 ≤ [OH] < 10 M?		>= 1.2 M?

WHC-SD-WM-DP-166, REV. I

Table 4 (2 of 2)

WASTE COMPATIBILITY CORROSION RULES

Sample ID	Analyte	Result (ug/mL)	Result (M)	Is [NO3]... ≤ 1.0 M? YES	Is [OH]... 0.010 M ≤ [OH] ≤ 5.0 M? YES	Is [NO2]... 0.011 M ≤ [NO2] ≤ 5.5 M YES	Is [OH] + [NO2]...
S961000097 8AP-96-2	NO3	1.46E+04	0.235				
	OH	2.81E+03	0.165				
	NO2	3.65E+03	0.079				>= 0.4 * [NO3]?
							>= 1.2 M?

Sample ID	Analyte	Result (ug/mL)	Result (M)	Is [NO3]... ≤ 1.0 M? YES	Is [OH]... 0.010 M ≤ [OH] ≤ 5.0 M? YES	Is [NO2]... 0.011 M ≤ [NO2] ≤ 5.5 M YES	Is [OH] + [NO2]...
S961000097 8AP-96-2 DUP	NO3	1.46E+04	0.235				
	OH	2.69E+03	0.158				
	NO2	3.83E+03	0.083				>= 0.4 * [NO3]?
							>= 1.2 M?

WHC-SD-WM-DP-166, REV. 1

RADIOCHEMISTRY SAMPLE REPORT

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WHC 222-S LABORATORY

TANK AP108, GROUP 96000010

SDG 96000010

Contact R. A. Esch

SAMPLE SUMMARY

Client TWRS

Tank AP108

WHC-SD-WM-DP-166, REV. 1

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB		PRIORITY COLLECTED	RECEIVED
				SAMPLE ID			
AP108 FB Radchem Tests	R: 1a30 S: 8AP-96-FB C:	LIQUID		S96T000093			01/04/96 14:45
AP108 FB Radchem Tests-D	R: 1a30 S: 8AP-96-FB C:	LIQUID		S96T000093D			
AP108 S1 Radchem Tests	R: 1a30 S: 8AP-96-1 C: n	LIQUID		S96T000092			01/04/96 15:10
AP108 S1 Radchem Tests-D	R: 1a30 S: 8AP-96-1 C: n	LIQUID		S96T000092D			
AP108 S1 Radchem Tests-S	R: 1a30 S: 8AP-96-1 C: n	LIQUID		S96T000092S			
DI Blank		LIQUID		B4855-2			
DI Blank		LIQUID		B4883-2			
DI Blank		LIQUID		B4884-2			
DI Blank		LIQUID		B4889-2			
DI Blank		LIQUID		B4892-2			
Lab Control Sample		LIQUID		S4855-1			
Lab Control Sample		LIQUID		S4883-1			
Lab Control Sample		LIQUID		S4884-1			
Lab Control Sample		LIQUID		S4889-1			
Lab Control Sample		LIQUID		S4892-1			

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SAMPLE SUMMARY

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WHC 222-S LABORATORY

TANK AP108, GROUP 96000010

SDG 96000010

Contact R. A. Esch

Client THRS

Tank AP108

QC SUMMARY

WHC-SD-WM-DP-166, REV. 1

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	X SAMPLE		BASIS	DAYS FROM/TO		COLL	RCVD	LAB	DEPARTMENT
				MOIST	AMOUNT		RCVD	RPTD			SAMPLE ID	SAMPLE ID
96000010-L	n/a	AP108 FB Radchem Tests	LIQUID						97		S96T000093	
		AP108 S1 Radchem Tests	LIQUID						97		S96T000092	
		AP108 FB Radchem Tests-D	LIQUID						97		S96T000093D	
		AP108 S1 Radchem Tests-D	LIQUID						97		S96T000092D	
		AP108 S1 Radchem Tests-S	LIQUID						97		S96T000092S	
LIQUID		DI Blank	LIQUID								B4855-2	
		DI Blank	LIQUID								B4883-2	
		DI Blank	LIQUID								B4884-2	
		DI Blank	LIQUID								B4889-2	
		DI Blank	LIQUID								B4892-2	
		Lab Control Sample	LIQUID								S4855-1	
		Lab Control Sample	LIQUID								S4883-1	
		Lab Control Sample	LIQUID								S4884-1	
		Lab Control Sample	LIQUID								S4889-1	
		Lab Control Sample	LIQUID								S4892-1	

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WHC 222-S LABORATORY

TANK AP108, GROUP 96000010

SDG 96000010

Contact R. A. Esch

Client TWRS

Tank AP108

PREP BATCH SUMMARY

WHC-SD-WM-DP-166, REV. I

TEST MATRIX	METHOD	PREPARATION BATCH	ERROR 2σ %	PLANCHETS ANALYZED		RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
				CLIENT	MORE						
Alpha Spectroscopy											
AM	LIQUID	Americium-241	96000343	15.0	2		1	1	2/2		
PU	LIQUID	Plutonium-239	96000340	15.0	2		1	1	2/2		
Gas Proportional Counting											
SR	LIQUID	Strontium-89/90	96000341	15.0	2		1	1	2/2		
Gas Proportional Counting											
AT	LIQUID	Alpha Analysis	96000306	15.0	2		1	1	2/2	1/1	
Gamma Energy Analysis											
GEA	LIQUID	Gamma Spectroscopy	96000348	15.0	2		1	1	2/2		

Duplicates and Matrix Spikes are those with original (Client) sample in this Sample Delivery Group.

Blank and LCS planchets are those in the same preparation batch as some Client, Duplicate or Spike sample.

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PREP BATCH SUMMARY

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WHC 222-S LABORATORY

TANK AP108, GROUP 96000010

WORK SUMMARY

WHC-SD-WM-DP-166, REV. J

SDG 96000010
Contact R. A. Esch

Client TMRS
Tank AP108

CLIENT SAMPLE ID		LAB SAMPLE ID		SUF-		REVIEWED	BY	METHOD
LOCATION	MATRIX	COLLECTED	PLANCHET	TEST	FIX ANALYZED			
CUSTODY	Priority	RECEIVED						
AP108 FB Radchem Tests		S96T000093	4883-5	AM	01/19/96	LLF		Americium-241
R: 1a30 S: 8AP-96-FB C: LIQUID			4855-7	AT	01/14/96	SLF		Alpha Analysis
n/a		01/04/96	4892-5	GEA	01/16/96	PPB		Gamma Spectroscopy
			4884-5	PU	01/22/96	LLF		Plutonium-239
			4889-6	SR	01/17/96	SLF		Strontium-89/90
AP108 FB Radchem Tests-D		S96T000093D	4883-6	AM	01/19/96	LLF		Americium-241
R: 1a30 S: 8AP-96-FB C: LIQUID			4855-8	AT	01/14/96	SLF		Alpha Analysis
		01/04/96	4892-6	GEA	01/16/96	PPB		Gamma Spectroscopy
			4884-6	PU	01/22/96	LLF		Plutonium-239
			4889-7	SR	01/17/96	SLF		Strontium-89/90
AP108 S1 Radchem Tests		S96T000092	4883-3	AM	01/19/96	LLF		Americium-241
R: 1a30 S: 8AP-96-1 C: n LIQUID			4855-4	AT	01/14/96	SLF		Alpha Analysis
n/a		01/04/96	4892-3	GEA	01/16/96	PPB		Gamma Spectroscopy
			4884-3	PU	01/22/96	LLF		Plutonium-239
			4889-4	SR	01/17/96	SLF		Strontium-89/90
AP108 S1 Radchem Tests-D		S96T000092D	4883-4	AM	01/19/96	LLF		Americium-241
R: 1a30 S: 8AP-96-1 C: n LIQUID			4855-5	AT	01/14/96	SLF		Alpha Analysis
		01/04/96	4892-4	GEA	01/16/96	PPB		Gamma Spectroscopy
			4884-4	PU	01/22/96	LLF		Plutonium-239
			4889-5	SR	01/17/96	SLF		Strontium-89/90
AP108 S1 Radchem Tests-S		S96T000092S	4855-6	AT	01/14/96	SLF		Alpha Analysis
R: 1a30 S: 8AP-96-1 C: n LIQUID		01/04/96						
DI Blank		B4855-2	4855-2	AT	01/14/96	SLF		Alpha Analysis
	LIQUID							
DI Blank		B4883-2	4883-2	AM	01/19/96	LLF		Americium-241
	LIQUID							
DI Blank		B4884-2	4884-2	PU	01/22/96	LLF		Plutonium-239
	LIQUID							
DI Blank		B4889-2	4889-2	SR	01/17/96	SLF		Strontium-89/90
	LIQUID							

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WHC 222-S LABORATORY

TANK AP108, GROUP 96000010

WORK SUMMARY, cont.

Client TWRS

Tank AP108

WHC-SD-WM-DP-166, REV. I

CLIENT SAMPLE ID LOCATION CUSTODY	MATRIX Priority	LAB SAMPLE ID COLLECTED RECEIVED	PLANCHET	TEST	SUF- FIX	ANALYZED	REVIEWED	BY	METHOD
D1 Blank	LIQUID	B4892-2	4892-2	GEA		01/16/96		PPB	Gamma Spectroscopy
Lab Control Sample	LIQUID	S4855-1	4855-1	AT		01/14/96		SLF	Alpha Analysis
Lab Control Sample	LIQUID	S4883-1	4883-1	AM		01/19/96		LLF	Americium-241
Lab Control Sample	LIQUID	S4884-1	4884-1	PU		01/22/96		LLF	Plutonium-239
Lab Control Sample	LIQUID	S4889-1	4889-1	SR		01/17/96		SLF	Strontium-89/90
Lab Control Sample	LIQUID	S4892-1	4892-1	GEA		01/16/96		PPB	Gamma Spectroscopy

COUNTS OF TESTS BY SAMPLE TYPE

TEST	Priority	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP	SPIKE	TOTAL
AM		Americium-241	222-S Lab Analytical Procedure	2			1	1	2		6
AT		Alpha Analysis	222-S Lab Analytical Procedure	2			1	1	2	1	7
GEA		Gamma Spectroscopy	222-S Lab Analytical Procedure	2			1	1	2		6
PU		Plutonium-239	222-S Lab Analytical Procedure	2			1	1	2		6
SR		Strontium-89/90	222-S Lab Analytical Procedure	2			1	1	2		6
TOTALS				10			5	5	10	1	31

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WHC 222-S LABORATORY

TANK AP108, GROUP 96000010

SDG 96000010

Contact R. A. Esch

Client TWRS

Tank AP108

BLANKS

WHC-SD-WM-DP-166, REV. I

Lab sample id <u>B4855-2</u>		Client sample id <u>DI Blank</u>					
Dept sample id _____		Material/Matrix _____ LIQUID					
ANALYTE	CAS NO	RESULT uCi/mL	2σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS	TEST PREP BATCH
Total Alpha	12587-46-1	<1.4E-03		1.4E-03		U	AT 96000306

Lab sample id <u>B4883-2</u>		Client sample id <u>DI Blank</u>					
Dept sample id _____		Material/Matrix _____ LIQUID					
ANALYTE	CAS NO	RESULT uCi/mL	2σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS	TEST PREP BATCH
Americium 241	14596-10-2	<2.4E-05		2.4E-05		U	AM 96000343

Lab sample id <u>B4884-2</u>		Client sample id <u>DI Blank</u>					
Dept sample id _____		Material/Matrix _____ LIQUID					
ANALYTE	CAS NO	RESULT uCi/mL	2σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS	TEST PREP BATCH
Plutonium 239/240		<6.1E-06		6.1E-06		U	PU 96000340

Lab sample id <u>B4889-2</u>		Client sample id <u>DI Blank</u>					
Dept sample id _____		Material/Matrix _____ LIQUID					
ANALYTE	CAS NO	RESULT uCi/mL	2σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS	TEST PREP BATCH
Strontium 90	10098-97-2	9.85E-07	58	6.8E-07			SR 96000341

Supernatant liquid

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WHC 222-S LABORATORY

TANK AP108, GROUP 96000010

SDG 96000010

Contact R. A. Esch

Client TWRS

Tank AP108

BLANKS

WHC-SD-WM-DP-166, REV. 1

Lab sample id <u>84892-2</u>		Client sample id <u>DI Blank</u>					
Dept sample id _____		Material/Matrix _____ <u>LIQUID</u>					
ANALYTE	CAS NO	RESULT uCi/mL	2σ TPU %	NDA uCi/mL	RDL uCi/mL	QUALI- FIERS	TEST PREP BATCH
GEA Analytes							
Cobalt 60	10198-40-0	<7.0E-04		7.0E-04		U	GEA 96000348
Cesium 137	10045-97-3	<3.8E-04		3.8E-04		U	GEA 96000348

Supernatant liquid

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BLANKS

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Lab id	<u>222-s</u>
Protocol	<u>GRAB</u>
Version	<u>1.0</u>
Form	<u>DVD-BLANK</u>
Version	<u>3.08</u>
Report date	<u>04/10/96</u>

WHC 222-S LABORATORY

TANK AP108, GROUP 96000010

LAB CONTROL SAMPLES

WHC-SD-WM-DP-166, REV. I

SDG 96000010

Contact R. A. Esch

Client TWRS

Tank AP108

Lab sample id <u>S4855-1</u>										Client sample id <u>Lab Control Sample</u>			
Dept sample id _____										Material/Matrix <u>LIQUID</u>			
ANALYTE	RESULT uCi/mL	2σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS	TEST	ADDED uCi/mL	2σ ERR %	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS	PREP BATCH	
Total Alpha	1.27E-05	16	1.4E-07			AT	1.54E-5	5.0	82	79-121	70-123	96000306	

Lab sample id <u>S4883-1</u>										Client sample id <u>Lab Control Sample</u>			
Dept sample id _____										Material/Matrix <u>LIQUID</u>			
ANALYTE	RESULT uCi/mL	2σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS	TEST	ADDED uCi/mL	2σ ERR %	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS	PREP BATCH	
Americium 241	2.67E-02	15	4.1E-03			AM	3.07E-2	5.0	87	79-121	80-120	96000343	

Lab sample id <u>S4884-1</u>										Client sample id <u>Lab Control Sample</u>			
Dept sample id _____										Material/Matrix <u>LIQUID</u>			
ANALYTE	RESULT uCi/mL	2σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS	TEST	ADDED uCi/mL	2σ ERR %	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS	PREP BATCH	
Plutonium 239/240	1.33E-01	15	1.3E-02			PU	1.28E-1	5.0	104	75-125	80-120	96000340	

Lab sample id <u>S4889-1</u>										Client sample id <u>Lab Control Sample</u>			
Dept sample id _____										Material/Matrix <u>LIQUID</u>			
ANALYTE	RESULT uCi/mL	2σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS	TEST	ADDED uCi/mL	2σ ERR %	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS	PREP BATCH	
Strontium 90	1.17E-03	15	3.4E-06			SR	1.24E-3	5.0	94	77-123	80-112	96000341	

Supernatant liquid

Final Report

LAB CONTROL SAMPLES

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Lab id 222-S

Protocol GRAB

Version 1.0

Form DVD-LCS

Version 3.08

Report date 04/10/96

WHC 222-S LABORATORY

TANK AP108, GROUP 96000010

LAB CONTROL SAMPLES

WHC-SD-WM-DP-166, REV. 1

SDG 96000010

Contact R. A. Esch

Client TMRs

Tank AP108

Lab sample id S4892-1

Dept sample id

Client sample id Lab Control Sample

Material/Matrix LIQUID

ANALYTE	RESULT uCi/mL	2σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS	TEST	ADDED uCi/mL	2σ ERR %	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS	PREP BATCH
GEA Analytes												
Cobalt 60	2.07E-02	15				GEA	2.08E-2	5.0	100	76-124	80-120	96000348
Cesium 137	2.57E-02	15				GEA	2.53E-2	5.0	102	76-124	80-120	96000348

Supernatant liquid

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LAB CONTROL SAMPLES

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Lab id 222-S

Protocol GRAB

Version 1.0

Form DVD-LCS

Version 3.08

Report date 04/10/96

WHC 222-S LABORATORY

TANK AP108, GROUP 96000010

S96T000092D

AP108 S1 Radchem Tests

DUPLICATE

WHC-SD-WM-DP-166, REV. /

SDG 96000010

Contact R. A. Esch

DUPLICATE

Lab sample id S96T000092D

Dept sample id

ORIGINAL

Lab sample id S96T000092

Dept sample id

Received 01/04/96

Client TWRS

Tank AP108

Client sample id AP108 S1 Radchem Tests

Location/Matrix R: 1a30 S: 8AP-96-1 C: n LIQUID

Collected

Chain of custody id n/a

ANALYTE	DUPLICATE uCi/mL	2σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS	TEST	ORIGINAL uCi/mL	2σ TPU %	MDA uCi/mL	QUALI- FIERS	RPD %	3σ TOT	PROT LIMIT
Total Alpha	<1.4E-03		1.4E-03		U	AT	<1.4E-03		1.4E-03	U	-		
Strontium 90	2.75E-02	18	1.7E-03			SR	2.88E-02	17	1.7E-03		5	37	20
Americium 241	<2.2E-05		2.2E-05		U	AM	<2.3E-05		2.3E-05	U	-		
Plutonium 239/240	6.03E-05	16	1.5E-05			PU	5.91E-05	16	1.7E-05		2	33	54
GEA Analytes													
Cobalt 60	<6.3E-04		6.3E-04		U	GEA	<6.3E-04		6.3E-04	U	-		
Cesium 137	1.91E 01	15	0.0E 00			GEA	1.96E 01	15	0.0E 00		3	32	20

Supernatant liquid

Loc: Riser: 1a30 Seg: 8AP-96-1 Core: n/a

Loc: Riser: 1a30 Seg: 8AP-96-1 Core: n/a

Final Report

DUPLICATES

Page 1

SUMMARY DATA SECTION

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Lab id 222-S

Protocol GRAB

Version 1.0

Form DVD-DUP

Version 3.08

Report date 04/10/96

WHC 222-S LABORATORY

TANK AP108, GROUP 96000010

S96T0000930

AP108 FB Radchem Tests

DUPLICATE

WHC-SD-WM-DP-166, REV. /

SDG <u>96000010</u>		Client <u>TWRS</u>
Contact <u>R. A. Esch</u>		Tank <u>AP108</u>
DUPLICATE	ORIGINAL	
Lab sample id <u>S96T0000930</u>	Lab sample id <u>S96T000093</u>	Client sample id <u>AP108 FB Radchem Tests</u>
Dept sample id _____	Dept sample id _____	Location/Matrix <u>R: 1a30 S: 8AP-96-FB C: LIQUID</u>
	Received <u>01/04/96</u>	Collected _____
		Chain of custody id <u>n/a</u>

ANALYTE	DUPLICATE uCi/mL	2σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS	TEST	ORIGINAL uCi/mL	2σ TPU %	MDA uCi/mL	QUALI- FIERS	RPD %	3σ TOT	PROT LIMIT
Total Alpha	<4.6E-07		4.6E-07		U	AT	<4.6E-07		4.6E-07	U	-		
Strontium 90	1.68E-06	38	6.7E-07		B	SR	5.80E-07	91	6.8E-07	U	97	110	120
Americium 241	<2.1E-05		2.1E-05		U	AM	<2.4E-05		2.4E-05	U	-		
Plutonium 239/240	<5.9E-06		5.9E-06		U	PU	<7.7E-06		7.7E-06	U	-		
GEA Analytes													
Cobalt 60	<2.6E-05		2.6E-05		U	GEA	<2.6E-05		2.6E-05	U	-		
Cesium 137	<6.2E-05		6.2E-05		U	GEA	<6.2E-05		6.2E-05	U	-		

Supernatant liquid

Loc: Riser: 1a30 Seg: 8AP-96-FB Core: n/a

Loc: Riser: 1a30 Seg: 8AP-96-FB Core: n/a

Final Report

DUPLICATES

Page 2

SUMMARY DATA SECTION

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Lab id 222-S
 Protocol GRAB
 Version 1.0
 Form DVD-DUP
 Version 3.08
 Report date 04/10/96

WHC 222-S LABORATORY

TANK AP108, GROUP 96000010

S96T000092S

AP108 S1 Radchem Tests

MATRIX SPIKE

WHC-SD-WM-DP-166, REV. 1

SDG <u>96000010</u>	Client <u>TWRS</u>
Contact <u>R. A. Esch</u>	Tank <u>AP108</u>
MATRIX SPIKE	ORIGINAL
Lab sample id <u>S96T000092S</u>	Lab sample id <u>S96T000092</u>
Dept sample id _____	Dept sample id _____
	Received <u>01/04/96</u>
	Client sample id <u>AP108 S1 Radchem Tests</u>
	Location/Matrix <u>R: 1a30 S: 8AP-96-1 C: n LIQUID</u>
	Collected _____
	Chain of custody id <u>n/a</u>

ANALYTE	SPIKE uCi/mL	2σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS TEST	ADDED uCi/mL	2σ ERR %	ORIGINAL uCi/mL	2σ TPU %	REC 3σ % (TOTAL)	LMTS LIMITS
Total Alpha	3.73E-02				AT	3.92E-2	5.0			95	77-123 80-120

Supernatant liquid

Loc: Riser: 1a30 Seg: 8AP-96-1 Core: n/a

Loc: Riser: 1a30 Seg: 8AP-96-1 Core: n/a

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MATRIX SPIKES

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SUMMARY DATA SECTION

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Lab id <u>222-S</u>
Protocol <u>GRAB</u>
Version <u>1.0</u>
Form <u>DVD-MS</u>
Version <u>3.08</u>
Report date <u>04/10/96</u>

WHC 222-S LABORATORY

TANK AP108, GROUP 96000010

S96T000093

AP108 FB Radchem Tests

DATA SHEET

WHC-SD-WM-DP-166, REV. 1

SDG <u>96000010</u>	Client <u>TWRS</u>
Contact <u>R. A. Esch</u>	Tank <u>AP108</u>
Lab sample id <u>S96T000093</u>	Client sample id <u>AP108 FB Radchem Tests</u>
Dept sample id _____	Location/Matrix <u>R: 1830 S: 8AP-96-FB C: LIQUID</u>
Received <u>01/04/96</u>	Collected _____
Chain of custody id <u>n/a</u>	

ANALYTE	CAS NO	RESULT uCi/mL	2σ TPU %	NDA uCi/mL	RDL uCi/mL	QUALI- FIERS	TEST
Total Alpha	12587-46-1	<4.6E-07	91	4.6E-07		U	AT
Strontium 90	10098-97-2	5.80E-07		6.8E-07		U	SR
Americium 241	14596-10-2	<2.4E-05		2.4E-05		U	AM
Plutonium 239/240		<7.7E-06		7.7E-06		U	PU
GEA Analytes							
Cobalt 60	10198-40-0	<2.6E-05		2.6E-05		U	GEA
Cesium 137	10045-97-3	<6.2E-05		6.2E-05		U	GEA

Supernatant liquid

Loc: Riser: 1830 Seg: 8AP-96-FB Core: n/a

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DATA SHEETS

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Lab id <u>222-s</u>
Protocol <u>GRAB</u>
Version <u>1.0</u>
Form <u>DVD-DS</u>
Version <u>3.08</u>
Report date <u>04/10/96</u>

WHC 222-S LABORATORY

TANK AP108, GROUP 96000010

S96T000092

AP108 S1 Radchem Tests

DATA SHEET

WHC-SD-WM-DP-166, REV. /

SDG 96000010

Client TWRS

Contact R. A. Esch

Tank AP108

Lab sample id S96T000092

Client sample id AP108 S1 Radchem Tests

Dept sample id

Location/Matrix R: 1030 S; 8AP-96-1 C: n LIQUID

Received 01/04/96

Collected

Chain of custody id n/a

ANALYTE	CAS NO	RESULT uCi/mL	2σ TPU %	NDA uCi/mL	RDL uCi/mL	QUALI- FIERS	TEST
Total Alpha	12587-46-1	<1.4E-03		1.4E-03		U	AT
Strontium 90	10098-97-2	2.88E-02	17	1.7E-03			SR
Americium 241	14596-10-2	<2.3E-05		2.3E-05		U	AM
Plutonium 239/240		5.91E-05	16	1.7E-05			PU
GEA Analytes							
Cobalt 60	10198-40-0	<6.3E-04		6.3E-04		U	GEA
Cesium 137	10045-97-3	1.96E 01	15	0.0E 00			GEA

Supernatant liquid

Loc: Riser: 1030 Seg: 8AP-96-1 Core: n/a

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DATA SHEETS

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SUMMARY DATA SECTION

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Lab id 222-s
 Protocol GRAB
 Version 1.0
 Form DVD-DS
 Version 3.08
 Report date 04/10/96

WHC 222-S LABORATORY

TANK AP108, GROUP 96000010

METHOD SUMMARY

AMERICIUM-241
ALPHA SPECTROSCOPY

WHC-SD-WM-DP-166, REV. 1

Test AM Matrix LIQUID

SDG 96000010

Contact R. A. Esch

Client TVRS

Tank AP108

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- PLANCHET	Americium 241
Preparation batch 96000343				
AP108 FB Radchem Tests	S96T000093		4883-5	U
AP108 FB Radchem Tests-D	S96T000093D		4883-6	- U
AP108 S1 Radchem Tests	S96T000092		4883-3	U
AP108 S1 Radchem Tests-D	S96T000092D		4883-4	- U
DI Blank	B4883-2		4883-2	U
Lab Control Sample	S4883-1		4883-1	ok

Nominal values and limits from method RDLs (uCi/mL)
Supernatant liquid

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- FIX	MDA uCi/mL	ALIQ mL	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FUHM keV	DRIFT KeV	DAYS HELD	ANAL- PREPARED	YZED	DETECTOR
Preparation batch 96000343 2σ prep error 15.0 % Reference																
AP108 FB Radchem Tests	S96T000093			2.4E-05	1.00	1.00	1.00	82	50	30				01/19/96		AL105402
AP108 FB Radchem Tests-D	S96T000093D			2.1E-05	1.00	1.00	1.00	95	50	30				01/19/96		AL105413
AP108 S1 Radchem Tests	S96T000092			2.3E-05	1.00	1.00	1.00	91	50	30				01/19/96		AL105413
AP108 S1 Radchem Tests-D	S96T000092D			2.2E-05	1.00	1.00	1.00	92	50	30				01/19/96		AL105391
DI Blank	B4883-2			2.4E-05	1.00		1.00	82	50	30				01/19/96		AL105402
Lab Control Sample	S4883-1			4.1E-03	1.00	1.00	101	87	50	30				01/19/96		AL105391

Nominal values and limits from method 0.100 30-105 30
20-55

Final Report

METHOD SUMMARIES

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SUMMARY DATA SECTION

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Lab id 222-S

Protocol GRAB

Version 1.0

Form DVD-CMS

Version 3.08

Report date 04/10/96

WHC 222-S LABORATORY

TANK AP108, GROUP 96000010

Test AM Matrix LIQUIDSDG 96000010Contact R. A. EschClient TVRSTank AP108**METHOD SUMMARY, cont.**

AMERICIUM-241

ALPHA SPECTROSCOPY

WHC-SD-WM-DP-166, REV. I

PROCEDURES	REFERENCE	222-S Lab Analytical Procedure
LO-160-103	Core Segment Extrusion Process and Sample Preparation, rev 17	
LA-953-103	Determinatin of Americium by Extraction by TRU.Spec Resin, rev 13	
LA-508-104	Total Alpha Counting by Alpha Proportional Counting, rev 14	
LA-508-161	Alpha Energy Analysis Using the Genie System, rev 11	

AVERAGES $\pm$ 2 SD	MDA <u>7.0E-04</u> $\pm$ <u>3.3E-03</u>
FOR 6 SAMPLES	YIELD <u>88</u> $\pm$ <u>11</u>
	EFFICIENCY <u>50</u> $\pm$ <u>0</u>

Final Report**METHOD SUMMARIES**

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SUMMARY DATA SECTION

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Lab id	<u>222-s</u>
Protocol	<u>GRAB</u>
Version	<u>1.0</u>
Form	<u>DVD-CMS</u>
Version	<u>3.08</u>
Report date	<u>04/10/96</u>

WHC 222-S LABORATORY

TANK AP108, GROUP 96000010

Test PU Matrix LIQUID

SDG 96000010

Contact R. A. Esch

METHOD SUMMARY

PLUTONIUM-239

ALPHA SPECTROSCOPY

Client TWRS

Tank AP108

WHC-SD-WM-DP-166, REV. 1

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- PLANCHET	Plutonium 239/240
------------------	------------------	-----------------	------------------	----------------------

Preparation batch 96000340

AP108 FB Radchem Tests	S96T000093	4884-5	U
AP108 FB Radchem Tests-D	S96T000093D	4884-6	- U
AP108 S1 Radchem Tests	S96T000092	4884-3	5.91E-05
AP108 S1 Radchem Tests-D	S96T000092D	4884-4	ok
DI Blank	B4884-2	4884-2	U
Lab Control Sample	S4884-1	4884-1	ok

Nominal values and limits from method

RDIs (uCi/mL)

Supernatant liquid

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- TEST FIX	MDA uCi/mL	ALIQ ml	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- PREPARED	YZED	DETECTOR
Preparation batch 96000340 2σ prep error 15.0 % Reference																
AP108 FB Radchem Tests	S96T000093			7.7E-06	1.00	1.00	1.00	45	50	30				01/22/96	AL105391	
AP108 FB Radchem Tests-D	S96T000093D			5.9E-06	1.00	1.00	1.00	55	50	30				01/22/96	AL105402	
AP108 S1 Radchem Tests	S96T000092			1.7E-05	1.00	1.00	1.00	32	50	30				01/22/96	AL105391	
AP108 S1 Radchem Tests-D	S96T000092D			1.5E-05	1.00	1.00	1.00	37	50	30				01/22/96	AL105402	
DI Blank	B4884-2			6.1E-06	1.00		1.00	53	50	30				01/22/96	AL105402	
Lab Control Sample	S4884-1			1.3E-02	0.100	1.00	101	57	50	30				01/22/96	AL105391	

Nominal values and limits from method

0.100

30-105

30

20-55

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METHOD SUMMARIES

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SUMMARY DATA SECTION

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Lab id 222-S

Protocol GRAB

Version 1.0

Form DVD-CMS

Version 3.08

Report date 04/10/96

WHC 222-S LABORATORY

TANK AP108, GROUP 96000010

Test PU Matrix LIQUIDSDG 96000010Contact R. A. EschClient THRSTank AP108**METHOD SUMMARY, cont.**

PLUTONIUM-239

ALPHA SPECTROSCOPY

WHC-SD-WM-DP-166, REV. /

PROCEDURES	REFERENCE	222-S Lab Analytical Procedure
	LD-160-103	Core Segment Extrusion Process and Sample Preparation, rev 17
	LA-943-127	Determination of Pu by Ion Exchange, rev 10
	LA-508-104	Total Alpha Counting by Alpha Proportional Counting, rev 14
	LA-508-161	Alpha Energy Analysis Using the Genie System, rev 11

AVERAGES $\pm$ 2 SD	MDA <u>2.2E-03</u> $\pm$ <u>1.1E-02</u>
FOR 6 SAMPLES	YIELD <u>46</u> $\pm$ <u>21</u>
	EFFICIENCY <u>50</u> $\pm$ <u>0</u>

Final Report**METHOD SUMMARIES**

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SUMMARY DATA SECTION

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Lab id	<u>222-S</u>
Protocol	<u>GRAB</u>
Version	<u>1.0</u>
Form	<u>DVD-CMS</u>
Version	<u>3.08</u>
Report date	<u>04/10/96</u>

WHC 222-S LABORATORY

TANK AP108, GROUP 96000010

METHOD SUMMARY

STRONTIUM-89/90

GAS PROPORTIONAL COUNTING

Client THRS

Tank AP108

RESULTS

WHC-SD-WM-DP-166, REV. 1

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- PLANCHET	Strontium 90
------------------	------------------	-----------------	------------------	--------------

Preparation batch 96000341

AP108 FB Radchem Tests	S96T000093	4889-6	U
AP108 FB Radchem Tests-D	S96T000093D	4889-7	ok
AP108 S1 Radchem Tests	S96T000092	4889-4	2.88E-02
AP108 S1 Radchem Tests-D	S96T000092D	4889-5	ok
DI Blank	B4889-2	4889-2	9.85E-07
Lab Control Sample	S4889-1	4889-1	ok

Nominal values and limits from method

RDLs (uCi/mL)

Supernatant liquid

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- MDA uCi/mL	ALIQ ml	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- PREPARED	YZZED	DETECTOR
Preparation batch 96000341 2σ prep error 15.0 % Reference															
AP108 FB Radchem Tests	S96T000093		6.8E-07	5.00	1.00	1.00	94	41	10				01/17/96	WB2687010	
AP108 FB Radchem Tests-D	S96T000093D		6.7E-07	5.00	1.00	1.00	95	41	10				01/17/96	WB2687010	
AP108 S1 Radchem Tests	S96T000092		1.7E-03	0.200	1.00	101	94	41	10				01/17/96	WB2687010	
AP108 S1 Radchem Tests-D	S96T000092D		1.7E-03	0.200	1.00	101	94	41	10				01/17/96	WB2687010	
DI Blank	B4889-2		6.8E-07	5.00		1.00	95	41	10				01/17/96	WB2687010	
Lab Control Sample	S4889-1		3.4E-06	1.00	1.00	1.00	94	41	10				01/17/96	WB2687010	

Nominal values and limits from method

0.100

30-105

10

20-55

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METHOD SUMMARIES

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SUMMARY DATA SECTION

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Lab id 222-S

Protocol GRAB

Version 1.0

Form DVD-CMS

Version 3.0B

Report date 04/10/96

WHC 222-S LABORATORY

TANK AP108, GROUP 96000010

Test SR Matrix LIQUID
SDG 96000010
Contact R. A. Esch

METHOD SUMMARY, cont.

STRONTIUM-89/90

GAS PROPORTIONAL COUNTING

Client TWRSTank AP108

WHC-SD-WM-DP-166, REV. 1

PROCEDURES	REFERENCE	222-S Lab Analytical Procedure
	LO-160-103	Core Segment Extrusion Process and Sample Preparation, rev 17
	LA-220-101	High level Strontium 89/90 in aqueous samples, rev 41
	LA-508-11NB	Operation of the [Tennelec LB-5500 (n=0, A-5), LB-1000 (n=1, A-3), Gamma Products (n=4, A-2)] Alpha/Beta Counting Systems

AVERAGES $\pm$ 2 SD

FOR 6 SAMPLES

MDA 5.7E-04 $\pm$ 1.8E-03YIELD 94 $\pm$ 1EFFICIENCY 41 $\pm$ 0**Final Report**

METHOD SUMMARIES

Page 6

SUMMARY DATA SECTION

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Lab id 222-SProtocol GRABVersion 1.0Form DVD-CMSVersion 3.08Report date 04/10/96

WHC 222-S LABORATORY

TANK AP108, GROUP 96000010

Test AT Matrix LIQUID

SDG 96000010

Contact R. A. Esch

METHOD SUMMARY

ALPHA ANALYSIS

GAS PROPORTIONAL COUNTING

Client TWRS

Tank AP108

RESULTS

WHC-SD-WM-DP-166, REV. 1

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF- TEST FIX	PLANCHET	1: Total Alpha	2: Sum, Alpha Emitters	RESULT RATIO (%) 2+1 2σ
Preparation batch 96000306						
AP108 FB Radchem Tests	S96T000093		4855-7	U		
AP108 FB Radchem Tests-D	S96T000093D		4855-8	- U		
AP108 S1 Radchem Tests	S96T000092		4855-4	U	5.91E-05	
AP108 S1 Radchem Tests-D	S96T000092D		4855-5	- U	6.03E-05	
AP108 S1 Radchem Tests-S	S96T000092S		4855-6	ok		
DI Blank	B4855-2		4855-2	U		
Lab Control Sample	S4855-1		4855-1	ok		

Nominal values and limits from method

RDLs (uCi/mL)

Supernatant liquid

80

Average

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW SUF- TEST FIX	MDA uCi/mL	ALIQ mL	PREP FAC	DILU- TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS	ANAL- PREPARED	YZED	DETECTOR
Preparation batch 96000306 2σ prep error 15.0 % Reference															
AP108 FB Radchem Tests	S96T000093		4.6E-07	3.00	1.00	1.00		23	30				01/14/96	WB27807	
AP108 FB Radchem Tests-D	S96T000093D		4.6E-07	3.00	1.00	1.00		23	30				01/14/96	WB27807	
AP108 S1 Radchem Tests	S96T000092		1.4E-03	0.100	1.00	101		23	30				01/14/96	WB27807	
AP108 S1 Radchem Tests-D	S96T000092D		1.4E-03	0.100	1.00	101		23	30				01/14/96	WB27807	
AP108 S1 Radchem Tests-S	S96T000092S			0.100	1.00	1.00		23	30				01/14/96	WB27807	
DI Blank	B4855-2		1.4E-03	0.100		101		23	30				01/14/96	WB27807	
Lab Control Sample	S4855-1		1.4E-07	10.0	1.00	1.00		23	30				01/14/96	WB27807	

Nominal values and limits from method

0.100

30

20-55

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METHOD SUMMARIES

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Lab id 222-S

Protocol GRAB

Version 1.0

Form DVD-CMS

Version 3.08

Report date 04/10/96

WHC 222-S LABORATORY

TANK AP108, GROUP 96000010

METHOD SUMMARY, cont.

ALPHA ANALYSIS

GAS PROPORTIONAL COUNTING

Client TWRSTank AP108

WHC-SD-WM-DP-166, REV. 1

PROCEDURES	REFERENCE	222-S Lab Analytical Procedure
	LO-160-103	Core Segment Extrusion Process and Sample Preparation, rev 17
	LA-508-101A	Alpha in liquid samples, rev 42
	LA-508-11NA	Operation of the (Tennelec LB-5500 (n=0, A-5), LB-1000 (n=1, A-3), Gamma Products (n=4, A-2)) Alpha/Beta Counting Systems

AVERAGES ± 2 SDMDA 7.0E-04 $\pm$ 1.5E-03

FOR 7 SAMPLES

EFFICIENCY 23 $\pm$ 0**Final Report**

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WHC 222-S LABORATORY

TANK AP108, GROUP 96000010

Test GEA Matrix LIQUID

SDG 96000010

Contact R. A. Esch

Client TWRS

Tank AP108

METHOD SUMMARY

GAMMA SPECTROSCOPY

GAMMA ENERGY ANALYSIS

RESULTS

WHC-SD-WM-DP-166, REV. 1

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- PLANCHET	Cobalt 60	Cesium 137	Americium 241	Europium 154	Europium 155
Preparation batch 96000348								
AP108 FB Radchem Tests	S96T000093		4892-5	U	U			
AP108 FB Radchem Tests-D	S96T000093D		4892-6	- U	- U			
AP108 S1 Radchem Tests	S96T000092		4892-3	U	1.96E 01			
AP108 S1 Radchem Tests-D	S96T000092D		4892-4	- U	ok			
DI Blank	B4892-2		4892-2	U	U			
Lab Control Sample	S4892-1		4892-1	ok	ok			

Nominal values and limits from method

RDLs (uCi/mL)

Supernatant liquid

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- TEST FIX	MAX MDA uCi/mL	ALIQ mL	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- PREPARED	YZZED	DETECTOR
Preparation batch 96000348 2σ prep error 15.0 % Reference																
AP108 FB Radchem Tests	S96T000093			6.2E-05	1.00	1.00	1.00			50						01/16/96
AP108 FB Radchem Tests-D	S96T000093D			6.2E-05	1.00	1.00	1.00			50						01/16/96
AP108 S1 Radchem Tests	S96T000092			6.3E-04	0.100	1.00	1.00			50						01/16/96
AP108 S1 Radchem Tests-D	S96T000092D			6.3E-04	0.100	1.00	1.00			50						01/16/96
DI Blank	B4892-2			7.0E-04	1.00		1.00			50						01/16/96
Lab Control Sample	S4892-1				1.00		1.00			50						01/16/96

Nominal values and limits from method

0.100

50

PROCEDURES	REFERENCE	222-S Lab Analytical Procedure
LO-160-103	Core Segment Extrusion Process and Sample Preparation, rev 17	
LA-548-121	Preparation of Sample Mounts for Gamma Energy Analysis, rev 41	
LA-508-162	Gamma Energy Analysis - the Genie System, rev 11	

AVERAGES ± 2 SD
FOR 5 SAMPLES

MDA 4.2E-04 ± 6.5E-04
YIELD _____ ± _____

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WHC 222-S LABORATORY

TANK AP108, GROUP 96000011

SDG 96000011

Contact R. A. Esch

Client TMRS

Tank AP108

SAMPLE SUMMARY

WHC-SD-WM-DP-166, REV. I

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	PRIORITY COLLECTED	RECEIVED
AP108 S2 Radchem Tests	R: 1Q150 S: 8AP-96-2 C:	LIQUID		S96T000098		01/04/96 15:10
AP108 S2 Radchem Tests-D	R: 1Q150 S: 8AP-96-2 C:	LIQUID		S96T000098D		
AP108 S2 Radchem Tests-S	R: 1Q150 S: 8AP-96-2 C:	LIQUID		S96T000098S		
DI Blank		LIQUID		B4855-2		
DI Blank		LIQUID		B4883-2		
DI Blank		LIQUID		B4884-2		
DI Blank		LIQUID		B4889-2		
DI Blank		LIQUID		B4892-2		
Lab Control Sample		LIQUID		S4855-1		
Lab Control Sample		LIQUID		S4883-1		
Lab Control Sample		LIQUID		S4884-1		
Lab Control Sample		LIQUID		S4889-1		
Lab Control Sample		LIQUID		S4892-1		

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SAMPLE SUMMARY

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Lab id 222-S

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WHC 222-S LABORATORY

TANK AP108, GROUP 96000011

QC SUMMARY

Client TWRS

Tank AP108

WHC-SD-WM-DP-166, REV. /

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	X MOIST	SAMPLE BASIS AMOUNT	BASIS AMOUNT	DAYS FROM/TO		LAB SAMPLE ID	DEPARTMENT SAMPLE ID
							COLL	RCVD		
96000011-L	n/a	AP108 S2 Radchem Tests	LIQUID						97	S96T000098
		AP108 S2 Radchem Tests-D	LIQUID						97	S96T000098D
		AP108 S2 Radchem Tests-S	LIQUID						97	S96T000098S
LIQUID		DI Blank	LIQUID							B4855-2
		DI Blank	LIQUID							B4883-2
		DI Blank	LIQUID							B4884-2
		DI Blank	LIQUID							B4889-2
		DI Blank	LIQUID							B4892-2
		Lab Control Sample	LIQUID							S4855-1
		Lab Control Sample	LIQUID							S4883-1
		Lab Control Sample	LIQUID							S4884-1
		Lab Control Sample	LIQUID							S4889-1
		Lab Control Sample	LIQUID							S4892-1

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QC SUMMARY

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WHC 222-S LABORATORY

TANK AP108, GROUP 96000011

SDG 96000011

Contact R. A. Esch

Client TWRS

Tank AP108

PREP BATCH SUMMARY

WHC-SD-WM-DP-166, REV. I

TEST	MATRIX	METHOD	PREPARATION	ERROR			PLANCHETS ANALYZED				QUALIFIERS	
			BATCH	2σ %	CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG		MS/ORIG
Alpha Spectroscopy												
AM	LIQUID	Americium-241	96000343	15.0	1			1	1	1/1		
PU	LIQUID	Plutonium-239	96000340	15.0	1			1	1	1/1		
Gas Proportional Counting												
SR	LIQUID	Strontium-89/90	96000341	15.0	1			1	1	1/1		
Gas Proportional Counting												
AT	LIQUID	Alpha Analysis	96000306	15.0	1			1	1	1/1	1/1	
Gamma Energy Analysis												
GEA	LIQUID	Gamma Spectroscopy	96000348	15.0	1			1	1	1/1		

Duplicates and Matrix Spikes are those with original (Client) sample in this Sample Delivery Group.

Blank and LCS plachets are those in the same preparation batch as some Client, Duplicate or Spike sample.

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PREP BATCH SUMMARY

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Lab id 222-S

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Version 1.0

Form DVD-PBS

Version 3.08

Report date 04/10/96

WHC 222-S LABORATORY

TANK AP108, GROUP 96000011

WORK SUMMARY

WHC-SD-WM-DP-166, REV. /

SDG 96000011
Contact R. A. Esch

Client TWRS
Tank AP108

CLIENT SAMPLE ID		LAB SAMPLE ID		SUF-		REVIEWED BY	METHOD
LOCATION	MATRIX	COLLECTED	PLANCHET	TEST	FIX ANALYZED		
CUSTODY	Priority	RECEIVED					
AP108 S2 Radchem Tests		S96T000098	4883-7	AM	01/19/96	LLF	Americium-241
R: 1Q150 S: 8AP-96-2 C: LIQUID			4855-9	AT	01/14/96	SLF	Alpha Analysis
n/a		01/04/96	4892-7	GEA	01/16/96	PPB	Gamma Spectroscopy
			4884-7	PU	01/22/96	LLF	Plutonium-239
			4889-8	SR	01/17/96	SLF	Strontium-89/90
AP108 S2 Radchem Tests-D		S96T000098D	4883-8	AM	01/19/96	LLF	Americium-241
R: 1Q150 S: 8AP-96-2 C: LIQUID			4855-10	AT	01/14/96	SLF	Alpha Analysis
		01/04/96	4892-8	GEA	01/16/96	PPB	Gamma Spectroscopy
			4884-8	PU	01/22/96	LLF	Plutonium-239
			4889-9	SR	01/17/96	SLF	Strontium-89/90
AP108 S2 Radchem Tests-S		S96T000098S	4855-11	AT	01/14/96	SLF	Alpha Analysis
R: 1Q150 S: 8AP-96-2 C: LIQUID		01/04/96					
DI Blank	LIQUID	B4855-2	4855-2	AT	01/14/96	SLF	Alpha Analysis
DI Blank	LIQUID	B4883-2	4883-2	AM	01/19/96	LLF	Americium-241
DI Blank	LIQUID	B4884-2	4884-2	PU	01/22/96	LLF	Plutonium-239
DI Blank	LIQUID	B4889-2	4889-2	SR	01/17/96	SLF	Strontium-89/90
DI Blank	LIQUID	B4892-2	4892-2	GEA	01/16/96	PPB	Gamma Spectroscopy
Lab Control Sample	LIQUID	S4855-1	4855-1	AT	01/14/96	SLF	Alpha Analysis
Lab Control Sample	LIQUID	S4883-1	4883-1	AM	01/19/96	LLF	Americium-241
Lab Control Sample	LIQUID	S4884-1	4884-1	PU	01/22/96	LLF	Plutonium-239

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WORK SUMMARY
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Lab id 222-S
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Version 1.0
Form DVD-CWS
Version 3.08
Report date 04/10/96

WHC 222-S LABORATORY

TANK AP108, GROUP 96000011

WORK SUMMARY, cont.

Client LMRS

Tank AP108

WHC-SD-WM-DP-166, REV. 1

CLIENT SAMPLE ID	MATRIX	LAB SAMPLE ID	TEST	SUF-	ANALYZED	REVIEWED	BY	METHOD
LOCATION	PRIORITY	COLLECTED	PLANCHET	FIX				
CUSTODY		RECEIVED						
Lab Control Sample		S4889-1	4889-1	SR	01/17/96		SLF	Strontium-89/90
	LIQUID							
Lab Control Sample		S4892-1	4892-1	GEA	01/16/96		PPB	Gamma Spectroscopy
	LIQUID							

COUNTS OF TESTS BY SAMPLE TYPE

TEST	PRIORITY	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP	SPIKE	TOTAL
AM		Americium-241	222-S Lab Analytical Procedure	1			1	1	1		4
AT		Alpha Analysis	222-S Lab Analytical Procedure	1			1	1	1	1	5
GEA		Gamma Spectroscopy	222-S Lab Analytical Procedure	1			1	1	1		4
PU		Plutonium-239	222-S Lab Analytical Procedure	1			1	1	1		4
SR		Strontium-89/90	222-S Lab Analytical Procedure	1			1	1	1		4
TOTALS				5			5	5	5	1	21

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WORK SUMMARY

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WHC 222-S LABORATORY

TANK AP108, GROUP 96000011

SDG 96000011

Contact R. A. Esch

Client TWRS

Tank AP108

BLANKS

WHC-SD-WM-DP-166, REV. 7

Lab sample id <u>B4855-2</u>		Client sample id <u>DI Blank</u>					
Dept sample id _____		Material/Matrix _____ LIQUID					
ANALYTE	CAS NO	RESULT uCi/mL	2σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS	TEST PREP BATCH
Total Alpha	12587-46-1	<1.4E-03		1.4E-03		U	AT 96000306

Lab sample id <u>B4883-2</u>		Client sample id <u>DI Blank</u>					
Dept sample id _____		Material/Matrix _____ LIQUID					
ANALYTE	CAS NO	RESULT uCi/mL	2σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS	TEST PREP BATCH
Americium 241	14596-10-2	<2.4E-05		2.4E-05		U	AM 96000343

Lab sample id <u>B4884-2</u>		Client sample id <u>DI Blank</u>					
Dept sample id _____		Material/Matrix _____ LIQUID					
ANALYTE	CAS NO	RESULT uCi/mL	2σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS	TEST PREP BATCH
Plutonium 239/240		<6.1E-06		6.1E-06		U	PU 96000340

Lab sample id <u>B4889-2</u>		Client sample id <u>DI Blank</u>					
Dept sample id _____		Material/Matrix _____ LIQUID					
ANALYTE	CAS NO	RESULT uCi/mL	2σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS	TEST PREP BATCH
Strontium 90	10098-97-2	9.85E-07	58	6.8E-07			SR 96000341

Supernatant liquid

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BLANKS

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Lab id 222-S

Protocol GRAB

Version 1.0

Form DVD-BLANK

Version 3.08

Report date 04/10/96

WHC 222-S LABORATORY

TANK AP108, GROUP 96000011

SDG 96000011

Contact R. A. Esch

BLANKS

Client TWRS

Tank AP108

WHC-SD-WM-DP-166, REV. 1

Lab sample id <u>B4892-2</u>		Client sample id <u>DI Blank</u>					
Dept sample id _____		Material/Matrix <u>LIQUID</u>					
ANALYTE	CAS NO	RESULT uCi/mL	2σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS	TEST PREP BATCH
GEA Analytes							
Cobalt 60	10198-40-0	<7.0E-04		7.0E-04		U	GEA 96000348
Cesium 137	10045-97-3	<3.8E-04		3.8E-04		U	GEA 96000348

Supernatant liquid

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BLANKS

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Lab id	<u>222-S</u>
Protocol	<u>GRAB</u>
Version	<u>1.0</u>
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WHC 222-S LABORATORY

TANK AP108, GROUP 96000011

LAB CONTROL SAMPLES

SDG 96000011

Contact R. A. Esch

Client TWRS

Tank AP108

WHC-SD-WM-DP-166, REV. /

Lab sample id <u>S4855-1</u>										Client sample id <u>Lab Control Sample</u>				
Dept sample id _____										Material/Matrix <u>LIQUID</u>				
ANALYTE	RESULT uCi/mL	2σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS	TEST	ADDED uCi/mL	2σ ERR %	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS	PREP BATCH		
Total Alpha	1.27E-05	16	1.4E-07			AT	1.54E-5	5.0	82	79-121	70-123	96000306		

Lab sample id <u>S4883-1</u>										Client sample id <u>Lab Control Sample</u>				
Dept sample id _____										Material/Matrix <u>LIQUID</u>				
ANALYTE	RESULT uCi/mL	2σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS	TEST	ADDED uCi/mL	2σ ERR %	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS	PREP BATCH		
Americium 241	2.67E-02	15	4.1E-03			AM	3.07E-2	5.0	87	79-121	80-120	96000343		

Lab sample id <u>S4884-1</u>										Client sample id <u>Lab Control Sample</u>				
Dept sample id _____										Material/Matrix <u>LIQUID</u>				
ANALYTE	RESULT uCi/mL	2σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS	TEST	ADDED uCi/mL	2σ ERR %	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS	PREP BATCH		
Plutonium 239/240	1.33E-01	15	1.3E-02			PU	1.28E-1	5.0	104	75-125	80-120	96000340		

Lab sample id <u>S4889-1</u>										Client sample id <u>Lab Control Sample</u>				
Dept sample id _____										Material/Matrix <u>LIQUID</u>				
ANALYTE	RESULT uCi/mL	2σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS	TEST	ADDED uCi/mL	2σ ERR %	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS	PREP BATCH		
Strontium 90	1.17E-03	15	3.4E-06			SR	1.24E-3	5.0	94	77-123	80-112	96000341		

Supernatant liquid

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LAB CONTROL SAMPLES

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Lab id 222-S

Protocol GRAB

Version 1.0

Form DVD-LCS

Version 3.08

Report date 04/10/96

WHC 222-S LABORATORY

TANK AP108, GROUP 96000011

SDG 96000011

Contact R. A. Esch

LAB CONTROL SAMPLES

Client THRS

Tank AP108

WHC-SD-WM-DP-166, REV. I

Lab sample id S4892-1

Client sample id Lab Control Sample

Dept sample id

Material/Matrix

LIQUID

ANALYTE	RESULT uCi/mL	2σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS	TEST	ADDED uCi/mL	2σ ERR %	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS	PREP BATCH
GEA Analytes												
Cobalt 60	2.07E-02	15				GEA	2.08E-2	5.0	100	76-124	80-120	96000348
Cesium 137	2.57E-02	15				GEA	2.53E-2	5.0	102	76-124	80-120	96000348

Supernatant liquid

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LAB CONTROL SAMPLES

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Lab id 222-S

Protocol GRAB

Version 1.0

Form DVD-LCS

Version 3.08

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WHC 222-8 LABORATORY

TANK AP108, GROUP 96000011

S96T0000980

AP108 S2 Radchem Tests

DUPLICATE

WHC-SD-WM-DP-166, REV. I

SDG <u>96000011</u>	Client <u>TWRS</u>
Contact <u>R. A. Esch</u>	Tank <u>AP108</u>
DUPLICATE	ORIGINAL
Lab sample id <u>S96T0000980</u>	Lab sample id <u>S96T000098</u>
Dept sample id _____	Dept sample id _____
	Received <u>01/04/96</u>
	Client sample id <u>AP108 S2 Radchem Tests</u>
	Location/Matrix <u>R: 10150 S: BAP-96-2 C: LIQUID</u>
	Collected _____
	Chain of custody id <u>n/a</u>

ANALYTE	DUPLICATE uCi/mL	2σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS	TEST	ORIGINAL uCi/mL	2σ TPU %	MDA uCi/mL	QUALI- FIERS	RPD %	3σ TOT	PROT LIMIT
Total Alpha	<1.4E-03		1.4E-03		U	AT	<1.4E-03		1.4E-03	U	-		
Strontium 90	2.87E-02	17	1.7E-03			SR	3.93E-02	17	1.7E-03		31	36	20
Americium 241	<2.1E-05		2.1E-05		U	AM	<2.0E-05		2.0E-05	U	-		
Plutonium 239/240	5.88E-05	16	1.5E-05			PU	6.15E-05	16	2.0E-05		4	33	58
GEA Analytes													
Cobalt 60	<6.8E-04		6.8E-04		U	GEA	<6.8E-04		6.8E-04	U	-		
Cesium 137	1.99E 01	15	0.0E 00			GEA	1.94E 01	15	0.0E 00		3	32	20

Supernatant liquid

Loc: Riser: 10150 Seg: BAP-96-2 Core: n/a

Loc: Riser: 10150 Seg: BAP-96-2 Core: n/a

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DUPLICATES

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Lab id 222-S
 Protocol GRAB
 Version 1.0
 Form DVD-DUP
 Version 3.08
 Report date 04/10/96

WHC 222-S LABORATORY

TANK AP108, GROUP 96000011

S96T000098S

AP108 S2 Radchem Tests

MATRIX SPIKE

WHC-SD-WM-DP-166, REV. 1

SDG 96000011

Contact R. A. Esch

MATRIX SPIKE

ORIGINAL

Client TWRS

Tank AP108

Lab sample id S96T000098S

Lab sample id S96T000098

Client sample id AP108 S2 Radchem Tests

Dept sample id _____

Dept sample id _____

Location/Matrix R: 10150 S: BAP-96-2 C: LIQUID

Received 01/04/96

Collected _____

Chain of custody id n/a

ANALYTE	SPIKE uCi/mL	2σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS TEST	ADDED uCi/mL	2σ ERR %	ORIGINAL uCi/mL	2σ TPU %	REC 3σ % (TOTAL)	LMTS LIMITS	PROTOCOL
Total Alpha	3.80E-02				AT	3.92E-2	5.0			97	77-123	80-120

Supernatant liquid

Loc: Riser: 10150 Seg: BAP-96-2 Core: n/a

Loc: Riser: 10150 Seg: BAP-96-2 Core: n/a

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MATRIX SPIKES

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SUMMARY DATA SECTION

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Lab id 222-S

Protocol GRAB

Version 1.0

Form DVD-MS

Version 3.08

Report date 04/10/96

WHC 222-S LABORATORY

TANK AP108, GROUP 96000011

S96T000098

AP108 S2 Radchem Tests

DATA SHEET

WHC-SD-WM-DP-166, REV. /

SDG 96000011
Contact R. A. Esch

Client TWRS
Tank AP108

Lab sample id S96T000098
Dept sample id
Received 01/04/96

Client sample id AP108 S2 Radchem Tests
Location/Matrix R: 10150 S: 8AP-96-2 C: LIQUID
Collected
Chain of custody id n/a

ANALYTE	CAS NO	RESULT uCi/mL	2σ TPU %	MDA uCi/mL	RDL uCi/mL	QUALI- FIERS	TEST
Total Alpha	12587-46-1	<1.4E-03		1.4E-03		U	AT
Strontium 90	10098-97-2	3.93E-02	17	1.7E-03			SR
Americium 241	14596-10-2	<2.0E-05		2.0E-05		U	AM
Plutonium 239/240		6.15E-05	16	2.0E-05			PU
GEA Analytes							
Cobalt 60	10198-40-0	<6.8E-04		6.8E-04		U	GEA
Cesium 137	10045-97-3	1.94E 01	15	0.0E 00			GEA

Supernatant liquid

Loc: Riser: 10150 Seg: 8AP-96-2 Core: n/a

Final Report

DATA SHEETS

Page 1

SUMMARY DATA SECTION

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Lab id 222-s
Protocol GRAB
Version 1.0
Form DVD-DS
Version 3.08
Report date 04/10/96

WHC 222-S LABORATORY

TANK AP108, GROUP 96000011

Client TWRS
Tank AP108

Test AM Matrix LIQUID
SDG 96000011
Contact R. A. Esch

METHOD SUMMARY

AMERICIUM-241
ALPHA SPECTROSCOPY

RESULTS

WHC-SD-WM-DP-166, REV. /

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	AMERICIUM PLANCHET	241
Preparation batch 96000343					
AP108 S2 Radchem Tests	S96T000098	4883-7		U	
AP108 S2 Radchem Tests-D	S96T000098D	4883-8		-	U
DI Blank	B4883-2	4883-2		U	
Lab Control Sample	S4883-1	4883-1		ok	

Nominal values and limits from method RDLs (uCi/mL)
Supernatant liquid

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MDA uCi/mL	ALIQ ml	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT keV	DAYS HELD	ANAL- PREPARED	YZED	DETECTOR
Preparation batch 96000343 2σ prep error 15.0 % Reference																
AP108 S2 Radchem Tests	S96T000098	2.0E-05	1.00	1.00	1.00	94	50	30						01/19/96	AL105391	
AP108 S2 Radchem Tests-D	S96T000098D	2.1E-05	1.00	1.00	1.00	95	50	30						01/19/96	AL105402	
DI Blank	B4883-2	2.4E-05	1.00	1.00	1.00	82	50	30						01/19/96	AL105402	
Lab Control Sample	S4883-1	4.1E-03	1.00	1.00	101	87	50	30						01/19/96	AL105391	

Nominal values and limits from method 0.100 30-105 30
20-55

PROCEDURES REFERENCE 222-S Lab Analytical Procedure
LO-160-103 Core Segment Extrusion Process and Sample Preparation, rev 17
LA-953-103 Determination of Americium by Extraction by TRU.Spec Resin, rev 13
LA-508-104 Total Alpha Counting by Alpha Proportional Counting, rev 14
LA-508-161 Alpha Energy Analysis Using the Genie System, rev 11

AVERAGES ± 2 SD MDA 1.0E-03 ± 4.1E-03
FOR 4 SAMPLES YIELD 90 ± 12
EFFICIENCY 50 ± 0

Final Report

METHOD SUMMARIES

Page 1

SUMMARY DATA SECTION

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Lab id 222-S
Protocol GRAB
Version 1.0
Form DVD-CHS
Version 3.08
Report date 04/10/96

WHC 222-S LABORATORY

TANK AP108, GROUP 96000011

METHOD SUMMARY

PLUTONIUM-239

ALPHA SPECTROSCOPY

Client TWRS

Tank AP108

RESULTS

WHC-SD-WM-DP-166, REV. 1

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- PLANCHET	Plutonium 239/240
------------------	------------------	-----------------	------------------	----------------------

Preparation batch 96000340

AP108 S2 Radchem Tests	S96T000098	4884-7	6.15E-05
AP108 S2 Radchem Tests-D	S96T000098D	4884-8	ok
DI Blank	B4884-2	4884-2	U
Lab Control Sample	S4884-1	4884-1	ok

Nominal values and limits from method RDLs (uCi/mL)
Supernatant liquid

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- uCi/mL	MDA ml	ALIQ FAC	PREP TION	DILU- %	YIELD %	EFF min	COUNT keV	FMHM KeV	DRIFT HOLD	DAYS PREPARED	ANAL- YZED	DETECTOR
Preparation batch 96000340 2σ prep error 15.0 % Reference															
AP108 S2 Radchem Tests	S96T000098	2.0E-05	1.00	1.00	1.00	27	50	30					01/22/96	AL105413	
AP108 S2 Radchem Tests-D	S96T000098D	1.5E-05	1.00	1.00	1.00	36	50	30					01/22/96	AL105402	
DI Blank	B4884-2	6.1E-06	1.00	1.00	1.00	53	50	30					01/22/96	AL105402	
Lab Control Sample	S4884-1	1.3E-02	0.100	1.00	101	57	50	30					01/22/96	AL105391	

Nominal values and limits from method 0.100 30-105 30
20-55

PROCEDURES REFERENCE 222-S Lab Analytical Procedure
LO-160-103 Core Segment Extrusion Process and Sample Preparation, rev 17
LA-943-127 Determination of Pu by Ion Exchange, rev 10
LA-508-104 Total Alpha Counting by Alpha Proportional Counting, rev 14
LA-508-161 Alpha Energy Analysis Using the Genie System, rev 11

AVERAGES ± 2 SD MDA 3.3E-03 ± 1.3E-02
FOR 4 SAMPLES YIELD 43 ± 28
EFFICIENCY 50 ± 0

Final Report

METHOD SUMMARIES

Page 2

SUMMARY DATA SECTION

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Lab id 222-S

Protocol GRAB

Version 1.0

Form DVD-CMS

Version 3.08

Report date 04/10/96

WHC 222-S LABORATORY

TANK AP108, GROUP 96000011

Test SR Matrix LIQUID
SDG 96000011
Contact R. A. Esch

METHOD SUMMARY

STRONTIUM-89/90
GAS PROPORTIONAL COUNTING

Client THRS
Tank AP108

RESULTS

WHC-SD-WM-DP-166, REV. 1

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- PLANCHET	Strontium 90
------------------	------------------	-----------------	------------------	--------------

Preparation batch 96000341

AP108 S2 Radchem Tests	S96T000098	4889-8	3.93E-02
AP108 S2 Radchem Tests-D	S96T000098D	4889-9	OUT
DI Blank	B4889-2	4889-2	9.85E-07
Lab Control Sample	S4889-1	4889-1	ok

Nominal values and limits from method RDLs (uCi/mL)
Supernatant liquid

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST FIX	SUF- TEST FIX	MDA uCi/mL	ALIQ ml	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT keV	DAYS HELD	ANAL- PREPARED	YZED	DETECTOR
Preparation batch 96000341 2σ prep error 15.0 % Reference																
AP108 S2 Radchem Tests	S96T000098	1.7E-03	0.200	1.00	101	96	41	10						01/17/96	WB2687010	
AP108 S2 Radchem Tests-D	S96T000098D	1.7E-03	0.200	1.00	101	95	41	10						01/17/96	WB2687010	
DI Blank	B4889-2	6.8E-07	5.00	1.00	95	41	10							01/17/96	WB2687010	
Lab Control Sample	S4889-1	3.4E-06	1.00	1.00	1.00	94	41	10						01/17/96	WB2687010	

Nominal values and limits from method 0.100 30-105 10
20-55

PROCEDURES REFERENCE 222-S Lab Analytical Procedure
LO-160-103 Core Segment Extrusion Process and Sample Preparation, rev 17
LA-220-101 High level Strontium 89/90 in aqueous samples, rev 41
LA-508-11NB Operation of the ITennelec LB-5500 (n=0, A-5), LB-1000 (n=1, A-3), Gamma Products (n=4, A-2)] Alpha/Beta Counting Systems

AVERAGES ± 2 SD MDA 8.5E-04 ± 2.0E-03
FOR 4 SAMPLES YIELD 95 ± 2
EFFICIENCY 41 ± 0

Final Report

METHOD SUMMARIES

Page 3

SUMMARY DATA SECTION

Page 17

Lab id 222-S
Protocol GRAB
Version 1.0
Form DVD-CMS
Version 3.08
Report date 04/10/96

WHC 222-S LABORATORY

TANK AP108, GROUP 96000011

Test AT Matrix LIQUID
SDG 96000011
Contact R. A. Esch

Client TMRS
Tank AP108

METHOD SUMMARY

ALPHA ANALYSIS
GAS PROPORTIONAL COUNTING

WHC-SD-WM-DP-166, REV. 1

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	1: Total Alpha	2: Sum, Alpha Emitters	RESULT RATIO (%) 2+1 2σ
Preparation batch 96000306						
AP108 S2 Radchem Tests	S96T000098	4855-9		U	6.15E-05	
AP108 S2 Radchem Tests-D	S96T000098D	4855-10		- U	5.88E-05	
AP108 S2 Radchem Tests-S	S96T000098S	4855-11		ok		
DI Blank	B4855-2	4855-2		U		
Lab Control Sample	S4855-1	4855-1		ok		

Nominal values and limits from method RDLs (uCi/mL) 80
Supernatant liquid Average

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MDA uCi/mL	ALIQ mL	PREP FAC	DILU- TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	ANAL- PREPARED	Y2ED	DETECTOR
Preparation batch 96000306 2σ prep error 15.0 % Reference																
AP108 S2 Radchem Tests	S96T000098	1.4E-03	0.100	1.00	101			23	30					01/14/96	WB27807	
AP108 S2 Radchem Tests-D	S96T000098D	1.4E-03	0.100	1.00	101			23	30					01/14/96	WB27807	
AP108 S2 Radchem Tests-S	S96T000098S	0.100	1.00	1.00				23	30					01/14/96	WB27807	
DI Blank	B4855-2	1.4E-03	0.100		101			23	30					01/14/96	WB27807	
Lab Control Sample	S4855-1	1.4E-07	10.0	1.00	1.00			23	30					01/14/96	WB27807	

Nominal values and limits from method 0.100 30
20-55

PROCEDURES REFERENCE 222-S Lab Analytical Procedure
LO-160-103 Core Segment Extrusion Process and Sample
Preparation, rev 17
LA-508-101A Alpha in liquid samples, rev 42
LA-508-11NA Operation of the [Tennelec LB-5500 (n=0, A-5),
LB-1000 (n=1, A-3), Gamma Products (n=4, A-2)]
Alpha/Beta Counting Systems

AVERAGES ± 2 SD MDA 1.1E-03 ± 1.4E-03
FOR 5 SAMPLES EFFICIENCY 23 ± 0

Final Report

METHOD SUMMARIES

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SUMMARY DATA SECTION

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Lab id 222-S
Protocol GRAB
Version 1.0
Form DVD-CMS
Version 3.08
Report date 04/10/96

WHC 222-S LABORATORY

TANK AP108, GROUP 96000011

Test GEA Matrix LIQUID

SDG 96000011

Contact R. A. Esch

Client TWRS

Tank AP108

METHOD SUMMARY

GAMMA SPECTROSCOPY

GAMMA ENERGY ANALYSIS

WHC-SD-WM-DP-166, REV. I

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Cobalt 60	Cesium 137	Americium 241	Europium 154	Europium 155
Preparation batch 96000348									
AP108 S2 Radchem Tests	S96T000098	4892-7			U	1.94E 01			
AP108 S2 Radchem Tests-D	S96T000098D	4892-8			- U	ok			
DI Blank	B4892-2	4892-2			U	U			
Lab Control Sample	S4892-1	4892-1			ok	ok			

Nominal values and limits from method

RDLs (uCi/mL)

Supernatant liquid

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MAX MDA uCi/mL	ALIQ ml	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT keV	DAYS HELD	ANAL- PREPARED	YZED	DETECTOR
Preparation batch 96000348 2σ prep error 15.0 % Reference																
AP108 S2 Radchem Tests	S96T000098	6.8E-04	0.100	1.00	1.00					50						01/16/96
AP108 S2 Radchem Tests-D	S96T000098D	6.8E-04	0.100	1.00	1.00					50						01/16/96
DI Blank	B4892-2	7.0E-04	1.00		1.00					50						01/16/96
Lab Control Sample	S4892-1		1.00		1.00					50						01/16/96

Nominal values and limits from method

0.100

50

PROCEDURES REFERENCE 222-S Lab Analytical Procedure
 LO-160-103 Core Segment Extrusion Process and Sample Preparation, rev 17
 LA-548-121 Preparation of Sample Mounts for Gamma Energy Analysis, rev 41
 LA-508-162 Gamma Energy Analysis - the Genie System, rev 11

AVERAGES ± 2 SD
 FOR 3 SAMPLES

MDA 6.9E-04 ± 2.3E-05
 YIELD _____ ± _____

Final Report

METHOD SUMMARIES

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SUMMARY DATA SECTION

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Version 1.0

Form DVD-CMS

Version 3.08

Report date 04/10/96

WHC 222-S LABORATORY

TANK AP108, GROUP 96000011

SDG 96000011

Contact R. A. Esch

Client TWRS

Tank AP108

REPORT GUIDE

WHC-SD-WM-DP-166, REV.)

ABOUT THE DATA SUMMARY SECTION

The Data Summary Section of a Data Package has all data, in several useful orders, necessary for first level, routine review of the data package for a Sample Delivery Group (SDG). This section follows the Data Package Narrative, which has an overview of the data package and a discussion of special problems. It is followed by the Raw Data Section, which has full details.

The Data Summary Section has several groups of reports:

SAMPLE SUMMARIES

The Sample and QC Summary Reports show all samples, including QC samples, reported in one SDG. These reports cross-reference client and lab sample identifiers.

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches (lab groupings reflecting how work was organized) relevant to the reported SDG with information necessary to check the completeness and consistency of the SDG.

WORK SUMMARY

The Work Summary Report shows all samples and work done on them relevant to the reported SDG.

METHOD BLANKS

The Method Blank Reports, one for each Method Blank relevant to the SDG, show all results and primary supporting information for the blanks.

LAB CONTROL SAMPLES

The Lab Control Sample Reports, one for each Lab Control Sample relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

DUPLICATES**Final Report****REPORT GUIDES**

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SUMMARY DATA SECTION

Page 1

Lab id 222-S
Protocol GRAB
Version 1.0
Form DVD-RG
Version 3.08
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WHC 222-S LABORATORY

TANK AP108, GROUP 96000011

SDG 96000011

Contact R. A. EschClient TWRSTank AP108**GUIDE, cont.**

WHC-SD-WM-DP-166, REV. I

ABOUT THE DATA SUMMARY SECTION

The Duplicate Reports, one for each Duplicate and Original sample pair relevant to the SDG, show all results, differences and primary supporting information for these QC samples.

MATRIX SPIKES

The Matrix Spike Reports, one for each Spiked and Original sample pair relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

DATA SHEETS

The Data Sheet Reports, one for each client sample in the SDG, show all results and primary supporting information for these samples.

METHOD SUMMARIES

The Method Summary Reports, one for each test used in the SDG, show all results, QC and method performance data for one analyte on one or two pages. (A test is a short code for the method used to do certain work to the client's specification.)

REPORT GUIDES

The Report Guides, one for each of the above groups of reports, have documentation on how to read the associated reports.

Final Report**REPORT GUIDES**

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SUMMARY DATA SECTION

Page 2

Lab id 222-S
Protocol GRAB
Version 1.0
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WHC 222-S LABORATORY

TANK AP108, GROUP 96000011

SDG 96000011Contact R. A. EschClient THRSTank AP108**REPORT GUIDE**

WHC-SD-WM-DP-166, REV. 7

SAMPLE SUMMARY

The Sample and QC Summary Reports show all samples, including QC samples, reported in one Sample Delivery Group (SDG).

The Sample Summary Report fully identifies client samples and gives the corresponding lab sample identification. The QC Summary Report shows at the sample level how the lab organized the samples into batches and generated QC samples. The Preparation Batch and Method Summary Reports show this at the analysis level.

The following notes apply to these reports:

- * LAB SAMPLE ID is the lab's primary identification for a sample.
- * DEPARTMENT SAMPLE ID is an alternate lab id, for example one assigned by a radiochemistry department in a lab.
- * CLIENT SAMPLE ID is the client's primary identification for a sample. It includes any sample preparation done by the client that is necessary to identify the sample.
- * QC BATCH is a lab assigned code that groups samples to be processed and QCed together. These samples should have similar matrices.

QC BATCH is not necessarily the same as SDG, which reflects samples received and reported together.
- * All Lab Control Samples, Method Blanks, Duplicates and Matrix Spikes are shown that QC any of the samples. Due to possible reanalyses, not all results for all these QC samples may be relevant to the SDG. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

Final Report**REPORT GUIDES**

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SUMMARY DATA SECTION

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WHC 222-S LABORATORY

TANK AP108, GROUP 96000011

SDG 96000011

Contact R. A. Esch

Client TWRS

Tank AP108

REPORT GUIDE

WHC-SD-WM-DP-166, REV. /

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches in one Sample Delivery Group (SDG) with information necessary to check the completeness and consistency of the SDG.

The following notes apply to this report:

- * The preparation batches are shown in the same order as the Method Summary Reports are printed.
- * Only analyses of planchets relevant to the SDG are included.
- * Each preparation batch should have at least one Method Blank and LCS in it to validate client sample results.
- * The QUALIFIERS shown are all qualifiers other than U, J, B, L and H that occur on any analysis in the preparation batch. The Method Summary Report has these qualifiers on a per sample basis.

These qualifiers should be reviewed as follows:

- X Some data has been manually entered or modified. Transcription errors are possible.
- P One or more results are 'preliminary'. The data is not ready for final reporting.
- 2 There were two or more results for one analyte on one planchet imported at one time. The results in DVD may not be the same as on the raw data sheets.

Other lab defined qualifiers may occur. In general, these should be addressed in the SDG narrative.

Final Report**REPORT GUIDES**

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SUMMARY DATA SECTION

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Lab id 222-s

Protocol GRAB

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Report date 04/10/96

WHC 222-S LABORATORY

TANK AP108, GROUP 96000011

SDG 96000011Contact R. A. EschClient TWRSTank AP108**REPORT GUIDE**

WHC-SD-WM-DP-166, REV. 1

WORK SUMMARY

The Work Summary Report shows all samples, including QC samples, and all relevant analyses in one Sample Delivery Group (SDG). This report is often useful as supporting documentation for an invoice.

The following notes apply to this report:

- * TEST is a code for the method used to measure associated analytes. Results and related information for each analyte are on the Data Sheet Report. In special cases, a test code used in the summary data section is not the same as in associated raw data. In this case, both codes are shown on the Work Summary.
- * SUFFIX is the lab's code to distinguish multiple analyses (recounts, reworks, reanalyses) of a fraction of the sample. The suffix indicates which result is being reported. An empty suffix normally identifies the first attempt to analyze the sample.
- * The LAB SAMPLE ID, TEST and SUFFIX uniquely identify all supporting data for a result. The Method Summary Report for each TEST has method performance data, such as yield, for each lab sample id and suffix and procedures used in the method.
- * PLANCHET is an alternate lab identifier for work done for one test. It, combined with the TEST and SUFFIX, may be the best link to raw data.
- * For QC samples, only analyses that directly QC some regular sample are shown. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.
- * The SAS (Special Analytical Services) Number is a client or lab assigned code that reflects special processing for samples, such as rapid turn around. Counts of tests done are lists by SAS number since it is likely to affect prices.

Final Report**REPORT GUIDES**

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SUMMARY DATA SECTION

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Lab id 222-sProtocol GRABVersion 1.0Form DVD-RGVersion 3.08Report date 04/10/96

WHC 222-S LABORATORY

TANK AP108, GROUP 96000011

SDG 96000011

Contact R. A. Esch

Client IWR

Tank AP108

REPORT GUIDE

WHC-SD-WM-DP-166, REV. 1

DATA SHEET

The Data Sheet Report shows all results and primary supporting information for one client sample or Method Blank. This report corresponds to both the CLP Inorganics and Organics Data Sheet.

The following notes apply to this report:

- * TEST is a code for the method used to measure an analyte. If the TEST is empty, no data is available; the analyte was not analyzed for.
- * The LAB SAMPLE ID and TEST uniquely identify work within the Summary Data Section of a Data Package. The Work Summary and Method Summary Reports further identify raw data that underlies this work.

The Method Summary Report for each TEST has method performance data, such as yield, for each Lab Sample ID and a list of procedures used in the method.

- * ERRORS can be labeled TOTAL or COUNT. TOTAL implies a preparation (non-counting method) error has been added, as square root of sum of squares, to the counting error denoted by COUNT. The preparation errors, which may vary by preparation batch, are shown on the Method Summary Report.
- * A RESULT can be 'N.R.' (Not Reported). This means the lab did this work but chooses not to report it now, possibly because it was reported at another time.
- * When reporting a Method Blank, a RESULT can be 'N.A.' (Not Applicable). This means there is no reported client sample work in the same preparation batch as the Blank's result. This is likely to occur when the Method Blank is associated with reanalyses of selected work for a few samples in the SDG.

The following qualifiers are defined by the DVD system:

- U The RESULT is less than the MDA (Minimum Detectable Activity). If the MDA is blank, the ERROR is used as the limit.

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REPORT GUIDES

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SUMMARY DATA SECTION

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WHC 222-S LABORATORY

TANK AP108, GROUP 96000011

SDG 96000011

Contact R. A. Esch

Client TWRS

Tank AP108

GUIDE, cont.

WHC-SD-WM-DP-166, REV. 1 DATA SHEET

- J** The RESULT is less than the RDL (Required Detection Limit) and no U qualifier is assigned.
- B** A Method Blank associated with this sample had a result without a U flag and, after correcting for possibly different aliquots, that result is greater than or equal to the MDA for this sample.
- Normally, B is not assigned if U is. When method blank subtraction is shown on this report, B flags are assigned based on the unsubtracted values while U's are assigned based on the subtracted ones. Both flags can be assigned in this case.
- For each sample result, all Method Blank results in the same preparation batch are compared. The Method Summary Report documents this and other QC relationships.
- L** Some Lab Control Sample that QC's this sample had a low recovery. The lab can disable assignment of this qualifier.
- H** Similar to 'L' except the recovery was high.
- P** The RESULT is 'preliminary'.
- X** Some data necessary to compute the RESULT, ERROR or MDA was manually entered or modified.
- 2** There were two or more results available for this analyte. The reported result may not be the same as in the raw data.
- Other qualifiers are lab defined. Definitions should be in the SDG narrative.

The following values are underlined to indicate possible problems:

- * An MDA is underlined if it is bigger than its RDL.
- * An ERROR is underlined if the 1.645 sigma counting error is bigger than both the MDA and the RESULT, implying that the MDA

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REPORT GUIDES

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SUMMARY DATA SECTION

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WHC 222-S LABORATORY

TANK AP108, GROUP 96000011

SDG 96000011Contact R. A. EschClient TWRSTank AP108**GUIDE, cont.**

WHC-SD-WM-DP-166, REV. /

DATA SHEET

may not be a good estimate of the 'real' minimum detectable activity.

- * A negative RESULT is underlined if it is less than the negative of its 2 sigma counting ERROR.
- * When reporting a Method Blank, a RESULT is underlined if greater than its MDA. If the MDA is blank, the 2 sigma counting error is used in the comparison.

Final Report**REPORT GUIDES**

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SUMMARY DATA SECTION

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Lab id 222-sProtocol GRABVersion 1.0Form DVD-RGVersion 3.08Report date 04/10/96

WHC 222-S LABORATORY

TANK AP108, GROUP 96000011

SDG 96000011Contact R. A. EschClient TWRSTank AP108**REPORT GUIDE**

WHC-SD-WM-DP-166, REV.1

LAB CONTROL SAMPLE

The Lab Control Sample Report shows all results, recoveries and primary supporting information for one Lab Control Sample.

The following notes apply to this report:

- * All fields in common with the Data Sheet Report have similar usage. Refer to its Report Guide for details.
- * An amount **ADDED** is the Lab's value for the actual amount spiked into this sample with its **ERROR** an estimate of the error of this amount.

An amount added is underlined if its ratio to the corresponding RDL is outside protocol specified limits.
- * **REC (Recovery)** is **RESULT** divided by **ADDED** expressed as a percent.
- * The first, computed limits for the recovery reflect:
 1. The error of **RESULT**, including that introduced by rounding the result prior to printing.

If the limits are labeled (**TOTAL**), they include preparation error in the result. If labeled (**COUNT**), they do not.
 2. The error of **ADDED**.
 3. A lab specified, per analyte bias. The bias changes the center of the computed limits.
- * The second limits are protocol defined upper and lower QC limits for the recovery.
- * The recovery is underlined if it is outside either of these ranges.

Final Report**REPORT GUIDES**

Page 7

SUMMARY DATA SECTION

Page 26

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Lab id 222-SProtocol GRABVersion 1.0Form DVD-RGVersion 3.08Report date 04/10/96

WHC 222-S LABORATORY

TANK AP108, GROUP 96000011

SDG 96000011

Contact R. A. Esch

Client TWRS

Tank AP108

REPORT GUIDE

DUPLICATE WHC-SD-WM-DP-166, REV. I

The Duplicate Report shows all results, differences and primary supporting information for one Duplicate and associated Original sample.

The following notes apply to this report:

- * All fields in common with the Data Sheet Report have similar usage. This applies both to the Duplicate and Original sample data. Refer to the Data Sheet Report Guide for details.

If the Duplicate has data for a TEST and the lab did not do this test to the Original, the Original's RESULTS are underlined.

- * The RPD (Relative Percent Difference) is the absolute value of the difference of the RESULTS divided by their average expressed as a percent.

If both RESULTS are less than their MDAs, no RPD is computed and a '-' is printed.

For an analyte, if the lab did work for both samples but has data for only one, the MDA from the sample with data is used as the other's result in the RPD.

- * The first, computed limit is the sum, as square root of sum of squares, of the errors of the results divided by the average result as a percent, hence the relative error of the difference rather than the error of the relative difference. The errors include those introduced by rounding the RESULTS prior to printing.

If this limit is labeled TOT, it includes the preparation error in the RESULTS. If labeled CNT, it does not.

This value reported for this limit is at most 999.

- * The second limit for the RPD is the larger of:

1. A fixed percentage specified in the protocol.

Final Report

REPORT GUIDES

Page 8

SUMMARY DATA SECTION

Page 27

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Lab id 222-S

Protocol GRAB

Version 1.0

Form DVD-RG

Version 3.08

Report date 04/10/96

WHC 222-8 LABORATORY

TANK AP108, GROUP 96000011

SDG 96000011

Contact R. A. Esch

Client TWRS

Tank AP108

GUIDE, cont.

DUPLICATE WHC-SD-WM-DP-166, REV. 1

2. A protocol factor (typically 2) times the average MDA as a percent of the average result. This limit applies when the results are close to the MDAs.

* The RPD is underlined if it is greater than either limit.

* If specified by the lab, the second limit column is replaced by the Difference Error Ratio (DER), which is the absolute value of the difference of the results divided by the quadratic sum of their one sigma errors, the same errors as used in the first limit.

Except for differences due to rounding, the DER is the same as the RPD divided by the first RPD limit with the limit scaled to 1 sigma.

* The DER is underlined if it is greater than the sigma factor, typically 2 or 3, shown in the header for the first RPD limit.

Final Report

REPORT GUIDES

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SUMMARY DATA SECTION

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Lab id 222-S

Protocol GRAB

Version 1.0

Form DVD-RG

Version 3.08

Report date 04/10/96

WHC 222-S LABORATORY

TANK AP108, GROUP 96000011

SDG 96000011

Contact R. A. Esch

Client TWRS

Tank AP108

REPORT GUIDE

MATRIX SPIKE WHC-SD-WM-DP-166, REV. 1

The Matrix Spike Report shows all results, recoveries and primary supporting information for one Matrix Spike and associated Original sample.

The following notes apply to this report:

- * All fields in common with the Data Sheet Report have similar usage. This applies both to the Spiked and Original sample data. Refer to the Data Sheet Report Guide for details.

If the Spike has data for a TEST and the Lab did not do this test to the Original, the Original's RESULTS are underlined.

- * An amount ADDED is the lab's value for the actual amount spiked into the Spike sample with its ERROR an estimate of the error of this amount.

An amount is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

- * REC (Recovery) is the Spike RESULT minus the Original RESULT divided by ADDED expressed as a percent.

- * The first, computed limits for the recovery reflect:

1. The errors of the two RESULTS, including those introduced by rounding them prior to printing.

If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

2. The error of ADDED.

3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

- * The second limits are protocol defined upper and lower QC limits for the recovery.

Final Report

REPORT GUIDES

Page 10

SUMMARY DATA SECTION

Page 29

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Lab id 222-S

Protocol GRAB

Version 1.0

Form DVD-RG

Version 3.08

Report date 04/10/96

WHC 222-S LABORATORY

TANK AP108, GROUP 96000011

SDG 96000011Contact R. A. EschClient TWRSTank AP108**GUIDE, cont.****MATRIX SPIKE WHC-SD-WM-DP-166, REV. 1**

These limits are left blank if the Original RESULT is more than a protocol defined factor (typically 4) times ADDED. This is a way of accounting for that when the spike is small compared to the amount in the original sample, the recovery is unreliable.

- * The recovery is underlined (out of spec) if it is outside either of these ranges.

Final Report**REPORT GUIDES**

Page 11

SUMMARY DATA SECTION

Page 30

Lab id 222-S
Protocol GRAB
Version 1.0
Form DVD-RG
Version 3.08
Report date 04/10/96

WHC 222-S LABORATORY

TANK AP108, GROUP 96000011

SDG 96000011

Contact R. A. Esch

Client TWRS

Tank AP108

REPORT GUIDE

METHOD SUMMARY WHC-SD-WM-DP-166, REV. I

The Method Summary Report has two tables. One shows up to five results measured using one method. The other has performance data for the method. There is one report for each TEST, as used on the Data Sheet Report.

The following notes apply to this report:

- * Each table is subdivided into sections, one for each preparation batch. A preparation batch is a group of aliquots prepared at roughly the same time in one work area of the lab using the same method.

There should be Lab Control Sample and Method Blank results in each preparation batch since this close correspondence makes the QC meaningful. Depending on lab policy, Duplicates need not occur in each batch since they QC sample dependencies such as matrix effects.

- * The RAW TEST column shows the test code used in the raw data to identify a particular analysis if it is different than the test code in the header of the report. This occurs in special cases due to method specific details about how the lab labels work.

The Lab Sample or Planchet ID combined with the (Raw) Test Code and Suffix uniquely identify the raw data for each analysis.

- * If a result is less than both its MDA and RDL, it is replaced by just 'U' on this report. If it is greater than or equal to the RDL but less than the MDA, the result is shown with a 'U' flag.

The J and X flags are as on the data sheet.

- * Non-U results for Method Blanks are underlined to indicate possible contamination of other samples in the preparation batch. The Method Blank Report has supporting data.

- * Lab Control Sample and Matrix Spike results are shown as: ok, No data, LOW or HIGH, with the last two underlined. 'No data' means no amount ADDED was specified. 'LOW' and 'HIGH'

Final Report

REPORT GUIDES

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SUMMARY DATA SECTION

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Lab id 222-S
Protocol GRAB
Version 1.0
Form DVD-RG
Version 3.08
Report date 04/10/96

WHC 222-S LABORATORY

TANK AP108, GROUP 96000011

SDG 96000011

Contact R. A. Esch

Client TWRS

Tank AP108

GUIDE, cont.

METHOD SUMMARY WHC-SD-WM-DP-166, REV. 1

correspond to when the recovery is underlined on the Lab Control Sample or Matrix Spike Report. See these reports for supporting data.

* Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.

* If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.

MDAs are underlined if greater than the printed RDL.

* Aliquots are underlined if less than the nominal value specified for the method.

* Preparation factors are underlined if greater than the nominal value specified for the QC batch.

* Dilution factors are underlined if greater than the nominal value specified for the method.

* Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.

* Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.

* Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

* Count times are underlined if less than the nominal value

Final Report

REPORT GUIDES

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SUMMARY DATA SECTION

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Lab id 222-S

Protocol GRAB

Version 1.0

Form DVD-RG

Version 3.08

Report date 04/10/96

WHC 222-S LABORATORY

TANK AP108, GROUP 96000011

SDG 96000011Contact R. A. EschClient TURSTank AP108**GUIDE, cont.****METHOD SUMMARY WHC-SD-WM-DP-166, REV. 1**

specified for the method.

- * Resolutions (as FWHM; Full Width at Half Max) are underlined if greater than the method specified limit.
- * Tracer drifts are underlined if their absolute values are greater than the method specified limit. Tracer drifts are not printed if percent moistures are.
- * Days Held (Analyzed - Collected) are underlined if greater than the holding time specified in the protocol.
- * Analysis dates are underlined if before their planchet's preparation date or, if a limit is specified, too far after it.

For some methods, ratios as percentages and error estimates for them are computed for pairs of results. A ratio column header like '1+3' means the ratio of the first result column and the third result column.

Ratios are not computed for Lab Control Sample, Method Blank or Matrix Spike results since their matrices are not necessarily similar to client samples'.

The error estimate for a ratio of results from one planchet reflects only counting errors since other errors should be correlated. For a ratio involving different planchets, if QC limits are computed based on total errors, the error for the ratio allows for the preparation errors for the planchets.

The ratio is underlined (out of spec) if the absolute value of its difference from the nominal value is greater than its error estimate. If no nominal value is specified, this test is not done.

For Gross Alpha or Gross Beta results, there may be a column showing the sum of other Alpha or Beta emitters. This sum includes all relevant results in the DVD database, whether reported or not. Results in the sum are weighted by a particles/decay value specified by the lab for each relevant analyte. Results less than their MDA are not included.

Final Report**REPORT GUIDES**

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SUMMARY DATA SECTION

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Lab id 222-SProtocol GRABVersion 1.0Form DVD-RGVersion 3.08Report date 04/10/96

WHC 222-S LABORATORY

TANK AP108, GROUP 96000011

SDG 96000011

Contact R. A. Esch

Client TWRS

Tank AP108

GUIDE, cont.**METHOD SUMMARY WHC-SD-WM-DP-166, REV. 1**

No sums are computed for Lab Control, Method Blank or Matrix Spike samples since their various planchets may not be physically related.

If a ratio of total isotopic to Gross Alpha or Beta is shown, the error for the ratio reflects both the error in the Gross result and the sum, as square root of sum of squares, of the errors in the isotopic results.

For total elemental uranium or thorium results, there may be a column showing the total weight computed from associated isotopic results. Ignoring results less than their MDAs, this is a weighted sum of the isotopic results. The weights depend on the molecular weight and half-life of each isotope so as to convert activities (decays) to weight (atoms).

If a ratio of total computed to measured elemental uranium or thorium is shown, the error for the ratio reflects the errors in all the measurements.

Final Report**REPORT GUIDES**

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SUMMARY DATA SECTION

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Lab id	222-S
Protocol	GRAB
Version	1.0
Form	DVD-RG
Version	3.08
Report date	04/10/96

WHC-SD-WM-DP-166, REV. 1

CHAIN OF CUSTODY FORMS

WHC-SD-WM-DP-166, REV. 1

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Westinghouse Hanford Company				CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				C.O.C. No. <i>N/A</i>	
				Page <i>1</i> of <i>1</i>					
Collection	<i>R. Penznick</i>			Contact/Requestor	<i>N/A</i>			Telephone No.	<i>373-7751</i>
SAF No.	<i>N/A</i>			Sample Origin	<i>241-AP-108</i>			Purchase Order/Charge Code	<i>N/A</i>
Project Title	<i>N/A</i>			Logbook No.	<i>N/A</i>			Ice Chest No.	<i>N/A</i>
Shipped To (Lab)	<i>2225</i>			Method of Shipment	<i>WHC TRANSPORTATION</i>			Bill of Lading/Avail. No.	<i>N/A</i>
Protocol	<i>N/A</i>			Data Turnaround	<i>N/A</i>			Offsite Property No.	<i>N/A</i>
Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis				Preserial
<i>BAP-96-1</i>	<i>2225</i>	<i>1-14-96</i>	<i>1010</i>	<i>1 Glass (15ml)</i>	<i>base on contract 20 m R/hr</i>				<i>N/A</i>
<i>BAP-96-2</i>	<i>2225</i>	<i>1-14-96</i>	<i>1125</i>	<i>1 Glass (15ml)</i>	<i>base on contract 15 m R/hr</i>				<i>N/A</i>
					<i>SEAL #3</i>				
					<i>BAP-96-1 - 1062</i>				
					<i>BAP-96-2 - 1063</i>				
				SPECIAL INSTRUCTIONS				Hold Time	
				MSDS ☐ Yes ☒ No				WHC-SD-WM-DP-166, REV. 1	
POSSIBLE SAMPLE HAZARDOUS MARKS (List all known wastes)									
<i>Radioactive</i>									
Requisitioned By	Sign	Date/Time	Received By	Sign	Date/Time	Matrix*			
<i>James Sickels</i>	<i>James Sickels</i>	<i>1-4-96</i>	<i>James Sickels</i>	<i>James Sickels</i>	<i>1-4-96</i>	DS = Drum So			
Requisitioned By	Sign	Date/Time	Received By	Sign	Date/Time	SE = Sediment			
<i>James Sickels</i>	<i>James Sickels</i>	<i>1-4-96</i>	<i>James Sickels</i>	<i>James Sickels</i>	<i>1-4-96</i>	SO = Solid			
Requisitioned By	Sign	Date/Time	Received By	Sign	Date/Time	SL = Sludge			
<i>James Sickels</i>	<i>James Sickels</i>	<i>1-4-96</i>	<i>James Sickels</i>	<i>James Sickels</i>	<i>1-4-96</i>	W = Water			
Requisitioned By	Sign	Date/Time	Received By	Sign	Date/Time	O = Oil			
<i>James Sickels</i>	<i>James Sickels</i>	<i>1-4-96</i>	<i>James Sickels</i>	<i>James Sickels</i>	<i>1-4-96</i>	A = Air			
Requisitioned By	Sign	Date/Time	Received By	Sign	Date/Time	X = Other			
<i>James Sickels</i>	<i>James Sickels</i>	<i>1-4-96</i>	<i>James Sickels</i>	<i>James Sickels</i>	<i>1-4-96</i>				
Disposal Method (e.g., Return to customer, per lab procedure, used in process)				Disposed By					
FINAL SAMPLE DISPOSITION									

All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.

**Westinghouse Hanford
Company**

100

509 373 1432

15:57

01/04/96

[illegible]

ALL samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.

DISTRIBUTION: White - Remain with Sample 6
Color - Customer

BC-5000-H20 (09/05)

SAMPLE HANDLING

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LABCORE Data Entry Template for Worklist#

4852

Analyst: DPB Instrument: NONE Book # N/A

Method: LA-519-151 Rev/Mod E-2

Worklist Comment: AP-108 @BRKDWN

GROUP	PROJECT	S TYPE	SAMPLE#	R A	-----TEST-----	MATRIX	ACTUAL	FOUND	DL	UNIT
96000010	AP-108 GRAB	1 SAMPLE	S96T000088	0	@BRKDWN1 DOSERATE	LIQUID	N/A	110		mrad/hour
96000010	AP-108 GRAB	1 SAMPLE	S96T000088	0	@BRKDWN1 SAMPANT2	LIQUID	N/A	125		mL
96000010	AP-108 GRAB	2 SAMPLE	S96T000089	0	@BRKDWN1 DOSERATE	LIQUID	N/A	<0.5		mrad/hour
96000010	AP-108 GRAB	2 SAMPLE	S96T000089	0	@BRKDWN1 SAMPANT2	LIQUID	N/A	125		mL
96000011	AP-108 GRAB	3 SAMPLE	S96T000096	0	@BRKDWN1 DOSERATE	LIQUID	N/A	110		mrad/hour
96000011	AP-108 GRAB	3 SAMPLE	S96T000096	0	@BRKDWN1 SAMPANT2	LIQUID	N/A	125		mL

Final page for worklist #

4852

Tim P. Brumby 1/12/96 1045
Analyst Signature Date

Jan Hammett 1-13-96
Analyst Signature Date

<u>Sample ID</u>	<u>Color</u>	<u>Clarity</u>	<u>Solids?</u>	<u>Org. layer?</u>
S96T000088	Yellow	Clear	No	No
S96T000089	colorless	clear	No	No
S96T000096	Yellow	Clear	No	No

Reviewed by RK Fuller 1/15/96

Data Entry Comments:

INORGANIC ANALYSES

WHC-SD-WM-DP-166, REV. 1

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LABCORE Data Entry Template for Worklist#

4994

Analyst: SLH Instrument: BA001 Book # 133N16-A

Method: LA-510-112 Rev/Mod C-3

Worklist Comment: SpG AP-108 (Do not run replicates)

GROUP	PROJECT	S TYPE	SAMPLE#	R A	TEST-----	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 STD			SPG-01	LIQUID	<u>1.398</u>	<u>1.361</u>	<u>N/A</u>	Sp.G.
								<u>1.025</u>	<u>RWS 2/27/96</u>	
96000010	AP-108 GRAB	2 SAMPLE	S96T000090	0	SPG-01	LIQUID	<u>N/A</u>	<u>1.029</u>	<u>N/A</u>	Sp.G.
							<u>1.025</u>			
96000010	AP-108 GRAB	3 DUP	S96T000090	0	SPG-01	LIQUID	<u>1.029</u>	<u>1.018</u>	<u>N/A</u>	Sp.G.
								<u>0.966</u>	<u>RWS 2/27/96</u>	
96000010	AP-108 GRAB	4 SAMPLE	S96T000091	0	SPG-01	LIQUID	<u>N/A</u>	<u>9667</u>	<u>N/A</u>	Sp.G.
								<u>0.966</u>		
96000010	AP-108 GRAB	5 DUP	S96T000091	0	SPG-01	LIQUID	<u>N/A</u>	<u>0.972</u>	<u>N/A</u>	Sp.G.
								<u>9667</u>	<u>RWS 2/27/96</u>	
96000011	AP-108 GRAB	6 SAMPLE	S96T000097	0	SPG-01	LIQUID	<u>N/A</u>	<u>1.023</u>	<u>N/A</u>	Sp.G.
96000011	AP-108 GRAB	7 DUP	S96T000097	0	SPG-01	LIQUID	<u>1.023</u>	<u>1.020</u>	<u>N/A</u>	Sp.G.

Final page for worklist # 4994

Sandra Hord Boatright 2-20-96
Analyst Signature Date

SLH 02/21/96
Analyst Signature Date

Reviewed RW Schroeder
2/27/96

Data Entry Comments:

all sample / STD sizes are 150.17ml
SLH

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

SPECIFIC GRAVITY: LA-510-112 (C-3)

WORKLIST
#ANALYST
SIGNATUREANALYSIS
DATEINSTRUMENT
CODE

4994

Sandra Howard Postniet

2-20-96

2310

☒ SAMPLE
STANDARD☐ DUPLICATE

SAMPLE # =

STD # = 133N/6-A

TARE WEIGHT (g)

1.83556

GROSS WEIGHT (g)

2.09430

VOL. of SOLUTION (mL)

2.0474

net weight (g)

2.0409

REPLICATE
1.84024
2.09433
2.0409

net 4/19/96

☒ SAMPLE
STANDARD☒ DUPLICATE

SAMPLE # =

STD # =

TARE WEIGHT (g)

1.84627

GROSS WEIGHT (g)

1.99819

VOL. of SOLUTION (mL)

1.5292

net weight (g)

1.5292

REPLICATE

net 4/19/96

☒ SAMPLE
STANDARD☒ DUPLICATE

SAMPLE # =

STD # =

TARE WEIGHT (g)

1.83397

GROSS WEIGHT (g)

1.96589

VOL. of SOLUTION (mL)

1.4592

net weight (g)

1.4592

REPLICATE

net 4/19/96

☒ SAMPLE
STANDARD☒ DUPLICATE

SAMPLE # =

STD # =

TARE WEIGHT (g)

1.84934

GROSS WEIGHT (g)

2.00251

VOL. of SOLUTION (mL)

1.5317

net weight (g)

1.5317

REPLICATE

net 4/19/96

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-166, REV. |

SPECIFIC GRAVITY : LA-510-112 (C-3)

Type		STANDARD	STANDARD
STANDARD	Gross Weight (W2)	2.0943	2.0643
Work List	Tare Weight (W1)	1.8896	1.8602
4994	Weight of Solution (W2-W1)	0.20474	0.20409
Test Code	Volume of Solution μ L	150.1700	150.1700
	Specific Gravity	1.3634	1.3591
Matrix	Specific Gravity (Average)	1.3612	
LIQUID			
Sample #			
Instrument Code	Gross Weight (W2) = Wt. of vial + cap + cotton + solution		
BA001	Tare Weight (W1) = Wt. of vial + cap + cotton		
Analyst			
SLH	Specific Gravity = $[(W2-W1) * 1000 \mu\text{L/mL}] / [\text{Vol. of Solution } \mu\text{L} * 1.000 \text{ g/mL}]$		
Date	v RESULT v		
02/20/96			
Time	Specific Gravity Average =	1.361	
11:10 PM			

Data Entry by: *SLH*

Date: 02/21/96

Approved by:

RW, Schneider

Date: 2/27/96

Form 510112L1 Rev. 1.1

Page 1 of 1

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-166, REV. I

SPECIFIC GRAVITY : LA-510-112 (C-3)

Type	Sample	REPLICATE
Sample	Gross Weight (W2)	1.9917
Work List	Tare Weight (W1)	1.8378
4994	Weight of Solution (W2-W1)	0.1539
Test Code	Volume of Solution μ L	150.1700
	Specific Gravity	1.0248
Matrix		NA
LIQUID		
Sample #		
S96T000090		
Instrument Code	Gross Weight (W2) = Wt. of vial + cap + cotton + solution	
	Tare Weight (W1) = Wt. of vial + cap + cotton	
Analyst	Specific Gravity = $[(W2-W1) \times 1000 \mu\text{L/mL}] / [\text{Vol. of Solution } \mu\text{L} \times 1.000 \text{ g/mL}]$	
SLH		
Date		
02/20/96		
Time		

v RESULT v	
Specific Gravity =	1.025

Data Entry by:	<i>RWS</i>	Date:	02/27/96
Approved by:	<i>Rw. Schaefer</i>	Date:	2/27/96

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PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-166, REV. /

SPECIFIC GRAVITY : LA-510-112 (C-3)

Type		Duplicate	REPLICATE
Duplicate	Gross Weight (W2)	1.9992	
Work List	Tare Weight (W1)	1.8463	
4994	Weight of Solution (W2-W1)	0.1529	0
Test Code	Volume of Solution μ L	150.1700	
	Specific Gravity	1.0182	NA
Matrix			
LIQUID			
Sample #			
S96T000090			
Instrument Code	Gross Weight (W2) = Wt. of vial + cap + cotton + solution		
	Tare Weight (W1) = Wt. of vial + cap + cotton		
Analyst			
SLH	Specific Gravity = $[(W2-W1) * 1000 \mu\text{L/mL}] / [\text{Vol. of Solution } \mu\text{L} * 1.000 \text{ g/mL}]$		
Date	v RESULT v		
02/20/96	Specific Gravity =	1.018	
Time			

Data Entry by:	<i>KWS</i>	Date:	02/27/96
Approved by:	<i>RW Schroeder</i>	Date:	2/27/96

Form 510112L1 Rev. 1.1 Page 1 of 1

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-166, REV. 1

SPECIFIC GRAVITY : LA-510-112 (C-3)

Type	Sample	REPLICATE
Sample	Gross Weight (W2)	1.9708
Work List	Tare Weight (W1)	1.8257
4994	Weight of Solution (W2-W1)	0.1451
Test Code	Volume of Solution μ L	150.1700
	Specific Gravity	0.9662
Matrix		NA
LIQUID		
Sample #		
S96T000091		
Instrument Code	Gross Weight (W2) = Wt. of vial + cap + cotton + solution	
	Tare Weight (W1) = Wt. of vial + cap + cotton	
Analyst	Specific Gravity = $[(W2-W1) * 1000 \mu\text{L/mL}] / [\text{Vol. of Solution } \mu\text{L} * 1.000 \text{ g/mL}]$	
SLH		
Date		
02/20/96	$\checkmark$ RESULT $\checkmark$	
Time	Specific Gravity =	0.966

Data Entry by:	<i>RWS</i>	Date:	02/27/96
Approved by:	<i>R. J. Schaefer</i>	Date:	2/27/96

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-166, REV. I

SPECIFIC GRAVITY : LA-510-112 (C-3)

Type		Duplicate	REPLICATE
Duplicate	Gross Weight (W2)	1.9699	
Work List	Tare Weight (W1)	1.8240	
4994	Weight of Solution (W2-W1)	0.1459	0
Test Code	Volume of Solution μ L	150.1700	
	Specific Gravity	0.9716	NA
Matrix			
LIQUID			
Sample #			
S96T000091			
Instrument Code	Gross Weight (W2) = Wt. of vial + cap + cotton + solution		
	Tare Weight (W1) = Wt. of vial + cap + cotton		
Analyst			
SLH	Specific Gravity = $[(W2-W1) * 1000 \mu\text{L/mL}] / [\text{Vol. of Solution } \mu\text{L} * 1.000 \text{ g/mL}]$		
Date			
02/20/96	ν RESULT ν		
Time	Specific Gravity =	0.972	

Data Entry by:	<i>RWS</i>	Date:	02/27/96
Approved by:	<i>RW Schneider</i>	Date:	2/27/96

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-166, REV. I

SPECIFIC GRAVITY : LA-510-112 (C-3)

Type	Sample	REPLICATE
Sample	Gross Weight (W2)	1.9033
Work List	Tare Weight (W1)	1.7497
4994	Weight of Solution (W2-W1)	0.1536
Test Code	Volume of Solution μ L	150.1700
	Specific Gravity	1.0228
Matrix		NA
LIQUID		
Sample #		
S96T000097		
Instrument Code	Gross Weight (W2) = Wt. of vial + cap + cotton + solution	
	Tare Weight (W1) = Wt. of vial + cap + cotton	
Analyst	Specific Gravity = $[(W2-W1) * 1000 \mu\text{L/mL}] / [\text{Vol. of Solution } \mu\text{L} * 1.000 \text{ g/mL}]$	
SLH		
Date		
02/20/96		
Time	Specific Gravity =	1.023

Data Entry by:	<i>RWS</i>	Date:	02/27/96
Approved by:	<i>RWS</i>	Date:	2/27/96
Form 510112L1 Rev. 1.1			

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-166, REV. I

SPECIFIC GRAVITY : LA-510-112 (C-3)

Type		Duplicate	REPLICATE
Duplicate	Gross Weight (W2)	2.0025	
Work List	Tare Weight (W1)	1.8493	
4994	Weight of Solution (W2-W1)	0.1532	0
Test Code	Volume of Solution μ L	150.1700	
	Specific Gravity	1.0202	NA
Matrix			
LIQUID			
Sample #			
S96T000097			
Instrument Code	Gross Weight (W2) = Wt. of vial + cap + cotton + solution Tare Weight (W1) = Wt. of vial + cap + cotton		
Analyst			
SLH	Specific Gravity = $[(W2-W1) * 1000 \mu\text{L/mL}] / [\text{Vol. of Solution } \mu\text{L} * 1.000 \text{ g/mL}]$		
Date			
02/20/96			
Time	$\checkmark$ RESULT $\checkmark$ Specific Gravity =	1.020	

Data Entry by:	<i>PWS</i>	Date:	02/27/96
Approved by:	<i>PW Schneider</i>	Date:	2/27/96

LABCORE Data Entry Template for Worklist#

5007

Analyst: WBB Instrument: PH01 Book # 144 N/6-B

Method: LA-212-106 Rev/Mod A0

Worklist Comment: PH FOR TK25-2 AND AP-108. RCJ

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1	STDPH				PH-01	LIQUID	<u>9.18</u>	<u>9.18</u>	<u>N/A</u>	PH
96000010	AP-108 GRAB	2	SAMPLE	S96T000090	0		PH-01	LIQUID	<u>N/A</u>	<u>13.33</u>	<u>0.01</u>	PH
96000010	AP-108 GRAB	3	DUP	S96T000090	0		PH-01	LIQUID	<u>13.33</u>	<u>13.32</u>	<u>N/A</u>	PH
96000010	AP-108 GRAB	4	SAMPLE	S96T000091	0		PH-01	LIQUID	<u>N/A</u>	<u>7.52</u>	<u>0.01</u>	PH
96000010	AP-108 GRAB	5	DUP	S96T000091	0		PH-01	LIQUID	<u>7.52</u>	<u>7.50</u>	<u>N/A</u>	PH
96000011	AP-108 GRAB	6	SAMPLE	S96T000097	0		PH-01	LIQUID	<u>N/A</u>	<u>13.02</u>	<u>0.01</u>	PH
96000011	AP-108 GRAB	7	DUP	S96T000097	0		PH-01	LIQUID	<u>13.02</u>	<u>13.04</u>	<u>N/A</u>	PH
95000224	ORG/AQ SAMPL	8	SAMPLE	S96R000041	0		PH-01	LIQUID	<u>N/A</u>	<u>7.22</u>	<u>0.01</u>	PH
95000224	ORG/AQ SAMPL	9	DUP	S96R000041	0		PH-01	LIQUID	<u>7.22</u>	<u>7.21</u>	<u>N/A</u>	PH
95000224	ORG/AQ SAMPL	10	SAMPLE	S96R000042	0		PH-01	LIQUID	<u>N/A</u>	<u>7.19</u>	<u>0.01</u>	PH

Final page for worklist #

5007

WBB
Analyst Signature Date 1-24-96/0230

Ray H. Hunsaker
Analyst Signature Date 1-24-96

Reviewed RW Schmedt 1/25/96

Data Entry Comments:

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

LABCORE Data Entry Template for Worklist#

5001

Analyst: RAW Instrument: PH01 WC06095 Book # 57N8

Method: LA-211-102 Rev/Mod C-O

Worklist Comment: OH- AP-108

GROUP	PROJECT	S TYPE	SAMPLE#	R A	-----TEST-----	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 BLNK			OH-01	LIQUID	<u>1</u>	<u><42</u>	<u>N/A</u>	ug/mL
		2 STD			OH-01	LIQUID	<u>1.66e4</u>	<u>1.64e4</u>	<u>N/A</u>	ug/mL
96000010	AP-108 GRAB	3 SAMPLE	S96T000090	0	OH-01	LIQUID	<u>N/A</u>	<u>2.76e3</u>	<u>6.25e2</u>	ug/mL
96000010	AP-108 GRAB	4 DUP	S96T000090	0	OH-01	LIQUID	<u>2.76e3</u>	<u>2.79e3</u>	<u>N/A</u>	ug/mL
96000010	AP-108 GRAB	5 SAMPLE	S96T000091	0	OH-01	LIQUID	<u>N/A</u>	<u>PH=8.74</u>	<u>N/A</u>	ug/mL
96000010	AP-108 GRAB	6 DUP	S96T000091	0	OH-01	LIQUID	<u>N/A</u>	<u>N/A</u>	<u>N/A</u>	ug/mL

Final page for worklist #

5001

see attached WL for signature
Analyst Signature _____ Date _____
RW Schmoedh
1/30/96

[Signature]
Analyst Signature _____ Date _____
Reviewed RW Schmoedh 2/1/96

Data Entry Comments:

Sample S96T000091 pH is too low, no OH. RWS
1/30/96

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

LABCORE Data Entry Template for Worklist#

5001

Analyst: RAW Instrument: PH01 WC06695 Book # 57N8

Method: LA-211-102 Rev/Mod _____

Worklist Comment: OH- AP-108

GROUP	PROJECT	S TYPE	SAMPLE#	R A	-----TEST-----	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 BLNK			OH-01	LIQUID	_____	_____	N/A	ug/mL
		2 STD			OH-01	LIQUID	_____	_____	N/A	ug/mL
96000011	AP-108 GRAB	3 SAMPLE	S96T000097	0	OH-01	LIQUID	N/A	_____	_____	ug/mL
96000011	AP-108 GRAB	4 DUP	S96T000097	0	OH-01	LIQUID	_____	_____	N/A	ug/mL
96000010	AP-108 GRAB	5 SAMPLE	S96T000090	0	OH-01	LIQUID	N/A	_____	_____	ug/mL
96000010	AP-108 GRAB	6 DUP	S96T000090	0	OH-01	LIQUID	_____	_____	N/A	ug/mL
96000010	AP-108 GRAB	7 SAMPLE	S96T000091	0	OH-01	LIQUID	N/A	_____	_____	ug/mL
96000010	AP-108 GRAB	8 DUP	S96T000091	0	OH-01	LIQUID	_____	_____	N/A	ug/mL

Final page for worklist #

5001

P. WENDLAND
Analyst Signature

1-23-96
Date

Analyst Signature

Date

Data Entry Comments:

STD - .050

90.97 - .200

91 - DIRECT PH ONLY

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

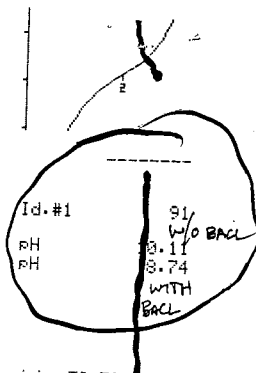
PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-166, REV. I

date 96-01-23 time 10:03
GET pH 12 # 41
Id.#1 1
Id.#2 .2005
pH(init) 4.09
manual stop
=====

date 96-01-23 time 10:04
GET pH 12 # 41
.10ml/div ΔpH=1/div
start V .000 ml

3 5
+-----+-----+



BEST AVAILABLE COPY

OH (AUTO) : LA-211-102 (C-0)

OH (AUTO) : LA-211-102 (C-0)		BLANK
Type	Sample Size (mL) SS	3.000
BLANK	Concentration of HNO3 (Molarity)	0.2005
Work List	HNO3 Titrant at OH end-point in mL	0.000
5001	Dilution Factor DF	1
Test Code	Concentration of OH in Sample (Molarity)	0.00E+00
OH-01	OH in Sample in µg/mL (PPM)	0.00E+00
Matrix	Detection Limit = 125µg / SS * DF	
Liquid		
Sample #		
STD BLK 1/30/96		
Instrument Code	Detection Limit (µg/mL)	4.17E+01
WC06695		
Analyst	OH Molarity = ((mL HNO3)*(M HNO3))/Sample Size in mL*Dilution Factor	
R A Wendland		
Date	OH in µg/mL = (OH MOLARITY)*(17.0g/mole)*((1000000µg/g)/(1000mL/L))	
01/23/96		
Time		
		BLANK
Concentration of OH in Sample (Molarity)		0.00E+00
OH in Sample in µg/mL (PPM)		<42

The Result is < Detection Limit

Data Entry by: *Rw Schmedt* Date: 01/30/96
Approved by: *Rw Schmedt* Date: 1/30/96

Form 211102_1 Rev. 1.3

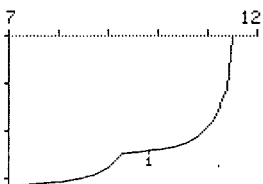
Page 1 of 1

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-166, REV. I

date 96-01-23 time 10:42
 GET pH 12 # 43
 Id.#1 1
 Id.#2 .2005
 pH(init) 11.46
 V/ml .240 pH 9.82
 EP1
 manual stop
 =====

date 96-01-23 time 10:42
 GET pH 12 # 43
 .10ml/div ΔpH=1/div
 start V .000 ml



BEST AVAILABLE COPY

OH (AUTO) : LA-211-102 (C-0)

		Standard
Type	Sample Size (mL) SS	0.050
Standard	Concentration of HNO3 (Molarity)	0.2005
Work List	HNO3 Titrant at OH end-point in mL	0.240
5001	Dilution Factor DF	1
Test Code	Concentration of OH in Sample (Molarity)	9.62E-01
OH-01	OH in Sample in µg/mL (PPM)	1.64E+04
Matrix		
Liquid		
Sample #		
STD		
Instrument Code		
WC06695		
Analyst	OH Molarity = ((mL HNO3)*(M HNO3))/Sample Size in mL*Dilution Factor	
R A Wendland		
Date	OH in µg/mL = (OH MOLARITY)*(17.0g/mole)*((1000000µg/g)/(1000mL/L))	
01/23/96		
Time		
		Standard
Concentration of OH in Sample (Molarity)		9.62E-01
OH in Sample in µg/mL (PPM)		1.64E+04

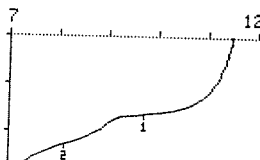
Data Entry by: *R.W. Schroeder* Date: 01/30/96
 Approved by: *R.W. Schroeder* Date: 1/30/96

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-166, REV. I

date 96-01-23 time 10:56
 GET pH 12 # 44
 Id.#1 90
 Id.#2 2005
 pH(init) 11.45
 V/ml
 EP1 .162 9.73
 EP2 .227 8.12
 manual stop
 =====

date 96-01-23 time 10:56
 GET pH 12 # 44
 .10ml/div Δ pH=1/div
 start V .000 ml



BEST AVAILABLE COPY

OH (AUTO) : LA-211-102 (C-0)

		Sample
Type	Sample Size (mL) SS	0.200
Sample	Concentration of HNO3 (Molarity)	0.2005
Work List	HNO3 Titrant at OH end-point in mL	0.162
6260 5001 ²⁰⁰⁵ 1/30/96	Dilution Factor DF	1
Test Code	Concentration of OH in Sample (Molarity)	1.62E-01
OH-01	OH in Sample in μ g/mL (PPM)	2.76E+03
Matrix		
Liquid		
Sample #	Detection Limit = 125 μ g / SS * DF	
S96T000090		
Instrument Code	Detection Limit (μ g/mL)	6.25E+02
WC06695		
Analyst	OH Molarity = ((mL HNO3)*(M HNO3))/Sample Size in mL*Dilution Factor	
R A Wendland		
Date	OH in μ g/mL = (OH MOLARITY)*(17.0g/mole)*((1000000 μ g/g)/(1000mL/L))	
01/23/96		
Time		
		Sample
Concentration of OH in Sample (Molarity)		1.62E-01
OH in Sample in μ g/mL (PPM)		2.76E+03

Data Entry by: <i>Rw. Schmedt</i>	Date: 01/30/96
Approved by: <i>Rw. Schmedt</i>	Date: 1/30/96

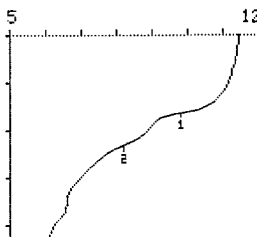
PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-166, REV. 1

date 96-01-23 time 11:24
 GET pH 12 # 45
 .10ml/div dPH=1/div
 start V .000 ml

- date 96-01-23 time 11:12
 GET pH 12 # 45
 Id.#1 90
 Id.#2 2805
 pH(init) 11.44

EP1 V/ml 1.64 pH 9.78
 EP2 .232 8.19
 stop volt. reached
 =====



BEST AVAILABLE COPY

OH (AUTO) : LA-211-102 (C-0)

		Duplicate
Type	Sample Size (mL) SS	0.200
Duplicate	Concentration of HNO3 (Molarity)	0.2005
Work List	HNO3 Titrant at OH end-point in mL	0.164
5250-5001 RWS 1/30/96	Dilution Factor DF	1
Test Code	Concentration of OH in Sample (Molarity)	1.64E-01
OH-01	OH in Sample in µg/mL (PPM)	2.79E+03
Matrix		
Liquid		
Sample #	Detection Limit = 125µg / SS * DF	
S96T000090		
Instrument Code	Detection Limit (µg/mL)	6.25E+02
WC06695		
Analyst	OH Molarity = ((mL HNO3)*(M HNO3))/Sample Size in mL*Dilution Factor	
R A Wendland		
Date	OH in µg/mL = (OH MOLARITY)*(17.0g/mole)*((1000000µg/g)/(1000mL/L))	
01/23/96		
Time		
		Duplicate
Concentration of OH in Sample (Molarity)		1.64E-01
OH in Sample in µg/mL (PPM)		2.79E+03

Data Entry by: *RWS* Date: 01/30/96
 Approved by: *RWS* Date: 1/30/96
 Form 211102_1 Rev. 1.3

LABCORE Data Entry Template for Worklist#

5250

Analyst: RAW **Instrument:** PH01 WC06695 **Book #** 57N8

Method: LA-211-102 Rev/Mod C-O

Worklist Comment: OH- AP-108

GROUP	PROJECT	S TYPE	SAMPLE#	R A	-----TEST-----	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 BLNK			OH-01	LIQUID	<u>1</u>	<u><42</u>	<u>N/A</u>	ug/mL
		2 STD			OH-01	LIQUID	<u>1.66e4</u>	<u>1.58e4</u>	<u>N/A</u>	ug/mL
96000011	AP-108 GRAB	3 SAMPLE	S96T000097	0	OH-01	LIQUID	<u>N/A</u>	<u>2.81e3</u>	<u>6.25e2</u>	ug/mL
96000011	AP-108 GRAB	4 DUP	S96T000097	0	OH-01	LIQUID	<u>2.81e3</u>	<u>2.69e3</u>	<u>N/A</u>	ug/mL

Final page for worklist #

5250

See attached WL for signature
Analyst Signature **Date** 1/30/96
RWS

R. Jones 1-30-96
Analyst Signature **Date**
Reviewed RWS/Johnson 2/1/96

Data Entry Comments:

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

LABCORE Data Entry Template for Worklist#

5001

Analyst: RAW Instrument: PH01 WC06695 Book # 57N8

Method: LA-211-102 Rev/Mod _____

Worklist Comment: OH- AP-108

GROUP	PROJECT	S TYPE	SAMPLE#	R A	-----TEST-----	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 BLNK			OH-01	LIQUID	_____	_____	N/A	ug/mL
		2 STD			OH-01	LIQUID	_____	_____	N/A	ug/mL
96000011	AP-108 GRAB	3 SAMPLE	S96T000097	0	OH-01	LIQUID	N/A	_____	_____	ug/mL
96000011	AP-108 GRAB	4 DUP	S96T000097	0	OH-01	LIQUID	_____	_____	N/A	ug/mL
96000010	AP-108 GRAB	5 SAMPLE	S96T000090	0	OH-01	LIQUID	N/A	_____	_____	ug/mL
96000010	AP-108 GRAB	6 DUP	S96T000090	0	OH-01	LIQUID	_____	_____	N/A	ug/mL
96000010	AP-108 GRAB	7 SAMPLE	S96T000091	0	OH-01	LIQUID	N/A	_____	_____	ug/mL
96000010	AP-108 GRAB	8 DUP	S96T000091	0	OH-01	LIQUID	_____	_____	N/A	ug/mL

Final page for worklist #

5001

R. W. WENDLAND
Analyst Signature Date 1-23-96

Analyst Signature Date

Data Entry Comments:

STD ~ .050

90.97 ~ .200

91 - DIRECT PH ONLY

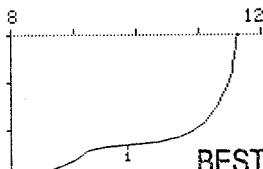
Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

date 96-01-25 time 10:49
GET pH 12 # 53
Id.#1 1
Id.#2 .2005
pH(init) 11.60
V/ml
EP1 .232 pH
manual stop
=====

WHC-SD-WM-DP-166, REV

date 96-01-25 time 10:52
GET pH 12 # 53
.10ml/div dPH=1/div
start V .000 ml



BEST AVAILABLE COPY

OH (AUTO) : LA-211-102 (C-0)

		Standard
Type	Sample Size (mL) SS	0.050
Standard	Concentration of HNO3 (Molarity)	0.2005
Work List	HNO3 Titrant at OH end-point in mL	0.232
5250	Dilution Factor DF	1
Test Code	Concentration of OH in Sample (Molarity)	9.30E-01
OH-01	OH in Sample in µg/mL (PPM)	1.58E+04
Matrix		
Liquid		
Sample #		
STD		
Instrument Code		
WC06695		
Analyst	OH Molarity = ((mL HNO3)*(M HNO3))/Sample Size in mL*Dilution Factor	
R A Wendland		
Date	OH in µg/mL = (OH MOLARITY)*(17.0g/mole)*((1000000µg/g)/(1000mL/L))	
01/25/96		
Time		
		Standard
Concentration of OH in Sample (Molarity)		9.30E-01
OH in Sample in µg/mL (PPM)		1.58E+04

Data Entry by: <i>RW Schneider</i>	Date: 01/30/96
Approved by: <i>RW Schneider</i>	Date: 1/30/96

Form 211102_1 Rev. 1.3

Page 1 of 1

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

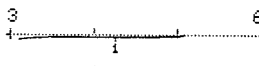
WHC-SD-WM-DP-166, REV. 1

BLK

calibration data
date 96-01-25
pH(S) 1 7.00
pH(S) 2 10.00
t.cal. 23.0 °C
slope(rel) .976
U(as) -21.7 mV
electr. input 1
=====

date 96-01-25 time 09:57
GET pH 12 # 50
Id.#1 0
Id.#2 .2005
pH(init) 5.05
V/ml
EP1 .005 pH
manual stop 4.26
=====

date 96-01-25 time 09:58
GET pH 12 # 50
.10ml/div pH=1/div
start V .000 ml



BEST AVAILABLE COPY

OH (AUTO) : LA-211-102 (C-0)

OH (AUTO) : LA-211-102 (C-0)		BLANK
Type	Sample Size (mL) SS	3.000
BLANK	Concentration of HNO3 (Molarity)	0.2005
Work List	HNO3 Titrant at OH end-point in mL	0.000
5250	Dilution Factor DF	1
Test Code	Concentration of OH in Sample (Molarity)	0.00E+00
OH-01	OH in Sample in µg/mL (PPM)	0.00E+00
Matrix		
Liquid		
Sample #	Detection Limit = 125µg / SS * DF	
BLK		
Instrument Code	Detection Limit (µg/mL)	4.17E+01
WC06695		
Analyst	OH Molarity = ((mL HNO3)*(M HNO3))/Sample Size in mL*Dilution Factor	
R A Wendland		
Date	OH in µg/mL = (OH MOLARITY)*(17.0g/mole)*((1000000µg/g)/(1000mL/L))	
01/25/96		
Time		
		BLANK
	Concentration of OH in Sample (Molarity)	0.00E+00
	OH in Sample in µg/mL (PPM)	<42
The Result is < Detection Limit		

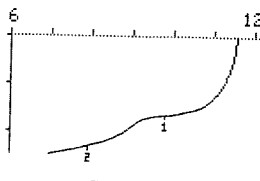
Data Entry by: *R. A. Wendland* Date: 01/30/96
Approved by: *R. A. Wendland* Date: 1/30/96
Form 211102_1 Rev. 1.3 Page 1 of 1

WHC-SD-WM-DP-166, REV. 1

```

date 96-01-25 time 11:03
GET pH      12  #    54
Id.#1      97
Id.#2      .2005
pH(linit)  11.55
          V/ml      pH
EP1      .165      9.78
EP2      .230      7.93
manual stop

```



BEST AVAILABLE COPY

OH (AUTO) : LA-211-102 (C-0)

OH (AUTO) : LA-211-102 (C-0)		Sample
Type	Sample Size (mL) SS	0.200
Sample	Concentration of HNO3 (Molarity)	0.2005
Work List	HNO3 Titrant at OH end-point in mL	0.165
5250	Dilution Factor DF	1
Test Code	Concentration of OH in Sample (Molarity)	1.65E-01
OH-01	OH in Sample in µg/mL (PPM)	2.81E+03
Matrix		
Liquid		
Sample #	Detection Limit = 125µg / SS * DF	
S96T000097		
Instrument Code	Detection Limit (µg/mL)	6.25E+02
WC06695		
Analyst	OH Molarity = ((mL HNO3)*(M HNO3))/Sample Size in mL*Dilution Factor	
R A Wendland		
Date	OH in µg/mL = (OH MOLARITY)*(17.0g/mole)*((1000000µg/g)/(1000mL/L))	
01/25/96		
Time		Sample
	Concentration of OH in Sample (Molarity)	1.65E-01
	OH in Sample in µg/mL (PPM)	2.81E+03

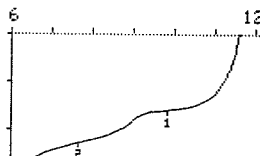
Data Entry by: RW Schneider Date: 01/30/96
Approved by: RW Schneider Date: 1/30/96
Form 211102 1 Rev. 1.3 Page 1 of 1

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-166, REV. I

date 96-01-25 time 11:28
GET pH 12 # 56
Id.#1 97
Id.#2 .2005
pH(init) 11.57
V/ml pH
EP1 .158 9.81
EP2 .228 7.67
stop volt.reached
=====

date 96-01-25 time 14:00
GET pH 12 # 56
.10ml/div dPH=1/div
start V .000 ml



BEST AVAILABLE COPY

OH (AUTO) : LA-211-102 (C-0)

		Duplicate
Type	Sample Size (mL) SS	0.200
Duplicate	Concentration of HNO3 (Molarity)	0.2005
Work List	HNO3 Titrant at OH end-point in mL	0.158
5250	Dilution Factor DF	1
Test Code	Concentration of OH in Sample (Molarity)	1.58E-01
OH-01	OH in Sample in µg/mL (PPM)	2.69E+03
Matrix		
Liquid		
Sample #	Detection Limit = 125µg / SS * DF	
S96T000097		
Instrument Code	Detection Limit (µg/mL)	6.25E+02
WC06695		
Analyst	OH Molarity = ((mL HNO3)*(M HNO3))/Sample Size in mL*Dilution Factor	
R A Wendland		
Date	OH in µg/mL = (OH MOLARITY)*(17.0g/mole)*((1000000µg/g)/(1000mL/L))	
01/25/96		
Time		
		Duplicate
Concentration of OH in Sample (Molarity)		1.58E-01
OH in Sample in µg/mL (PPM)		2.69E+03

Data Entry by: *RW Schneider* Date: 01/30/96
Approved by: *RW Schneider* Date: 1/30/96

LABCORE Completed Worklist Report for Worklist# 5013

Analyst: vlm

Instrument: IC03

Book# 122N9E

Method: LA-533-105 Rev/Mod D1

Worklist Comment: AP108 FOR IC RTS

Seq Type	Sample#	R A	Test	Matrix	Actual	Found	DL or Yield	Unit
1 CCB	0	0	•IC-QC F	QC	1	<1.30e-2		ug/mL
1 CCB	0	0	•IC-QC CL	QC	1	<1.70e-2		ug/mL
1 CCB	0	0	•IC-QC NO2	QC	1	<1.07e-1		ug/mL
1 CCB	0	0	•IC-QC BR	QC	1	<1.26e-1		ug/mL
1 CCB	0	0	•IC-QC NO3	QC	1	<1.40e-1		ug/mL
1 CCB	0	0	•IC-QC PO4	QC	1	<1.19e-1		ug/mL
1 CCB	0	0	•IC-QC SO4	QC	1	<1.36e-1		ug/mL
1 CCB	0	0	•IC-QC OXALATE2	QC	1	<1.05e-1		ug/mL
2 CCV	0	0	•IC-QC F	QC	59	5.44e+01	92.203 % Recovery	
2 CCV	0	0	•IC-QC CL	QC	79	7.50e+01	94.937 % Recovery	
2 CCV	0	0	•IC-QC NO2	QC	534	4.90e+02	91.760 % Recovery	
2 CCV	0	0	•IC-QC BR	QC	575	5.28e+02	91.826 % Recovery	
2 CCV	0	0	•IC-QC NO3	QC	614	5.82e+02	94.788 % Recovery	
2 CCV	0	0	•IC-QC PO4	QC	546	5.25e+02	96.154 % Recovery	
2 CCV	0	0	•IC-QC SO4	QC	631	5.91e+02	93.661 % Recovery	
2 CCV	0	0	•IC-QC OXALATE2	QC	526	4.93e+02	93.726 % Recovery	
3 SAMPLE	S96T000090	0	•IC-01 F-02	LIQUID	N/A	5.503e+02	14.440	ug/mL
3 SAMPLE	S96T000090	0	•IC-01 CL-02	LIQUID	N/A	1.775e+02	18.890	ug/mL
3 SAMPLE	S96T000090	0	•IC-01 NO2-02	LIQUID	N/A	3.738e+03	118.900	ug/mL
3 SAMPLE	S96T000090	0	•IC-01 NO3-02	LIQUID	N/A	1.500e+04	155.500	ug/mL
3 SAMPLE	S96T000090	0	•IC-01 PO4-02	LIQUID	N/A	2.552e+02	132.100	ug/mL
3 SAMPLE	S96T000090	0	•IC-01 SO4-02	LIQUID	N/A	4.059e+02	151.000	ug/mL
4 DUP	S96T000090	0	•IC-01 F-02	LIQUID	5.50e+02	5.47e+02	0.547	RPD
4 DUP	S96T000090	0	•IC-01 CL-02	LIQUID	1.78e+02	1.62e+02	9.412	RPD
4 DUP	S96T000090	0	•IC-01 NO2-02	LIQUID	3.74e+03	3.69e+03	1.346	RPD
4 DUP	S96T000090	0	•IC-01 NO3-02	LIQUID	1.50e+04	1.49e+04	0.669	RPD
4 DUP	S96T000090	0	•IC-01 PO4-02	LIQUID	2.55e+02	2.30e+02	10.309	RPD
4 DUP	S96T000090	0	•IC-01 SO4-02	LIQUID	4.06e+02	4.14e+02	1.951	RPD
5 SPK	S96T000090	0	•IC-01 F-02	LIQUID	59	5.52e+01	93.559 % Recovery	
5 SPK	S96T000090	0	•IC-01 CL-02	LIQUID	79	7.29e+01	92.278 % Recovery	
5 SPK	S96T000090	0	•IC-01 NO2-02	LIQUID	534	5.15e+02	96.442 % Recovery	
5 SPK	S96T000090	0	•IC-01 NO3-02	LIQUID	614	6.35e+02	103.420 % Recovery	
5 SPK	S96T000090	0	•IC-01 PO4-02	LIQUID	546	5.22e+02	95.604 % Recovery	
5 SPK	S96T000090	0	•IC-01 SO4-02	LIQUID	631	5.84e+02	92.552 % Recovery	
6 SAMPLE	S96T000091	0	•IC-01 F-02	LIQUID	N/A	< 1.300e-02	0.013	ug/mL
6 SAMPLE	S96T000091	0	•IC-01 CL-02	LIQUID	N/A	< 1.700e-02	0.017	ug/mL
6 SAMPLE	S96T000091	0	•IC-01 NO2-02	LIQUID	N/A	< 1.070e-01	0.107	ug/mL
6 SAMPLE	S96T000091	0	•IC-01 NO3-02	LIQUID	N/A	< 1.400e-01	0.140	ug/mL
6 SAMPLE	S96T000091	0	•IC-01 PO4-02	LIQUID	N/A	< 1.189e-01	0.119	ug/mL
6 SAMPLE	S96T000091	0	•IC-01 SO4-02	LIQUID	N/A	< 1.359e-01	0.136	ug/mL
7 DUP	S96T000091	0	•IC-01 F-02	LIQUID	<1.30e-2	<1.30e-2		RPD

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

LABCORE Completed Worklist Report for Worklist# 5013

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
7	DUP	S96T000091	0		•IC-01	CL-02	LIQUID	<1.70e-2	1.90e-02	RPD
7	DUP	S96T000091	0		•IC-01	NO2-02	LIQUID	<1.07e-1	<1.07e-1	RPD
7	DUP	S96T000091	0		•IC-01	NO3-02	LIQUID	1.40e-01	1.40e-01	0.000 RPD
7	DUP	S96T000091	0		•IC-01	PO4-02	LIQUID	<1.19e-1	<1.19e-1	RPD
7	DUP	S96T000091	0		•IC-01	SO4-02	LIQUID	<1.36e-1	<1.36e-1	RPD

Final page for worklist# 5013

Analyst Signature _____ Date _____

Analyst Signature _____ Date _____


Reviewer Signature _____ Date 4/19/96

LABCORE Data Entry Template for Worklist# 5013

Analyst: WLM Instrument: IC01 IC03 Book# 122N9-EMethod: LA-533-105 Rev/Mod D-1

WHC-SD-WM-DP-166, REV. I

Worklist Comment: AP108 FOR IC RTS

S Type	Sample#	R A	Test	Matrix	Group#	Project
1 CCB			@IC-QC	QC		
2 CCV			@IC-QC	QC		
3 SAMPLE	S96T000090 0		@IC-01	LIQUID	96000010	AP-108 GRAB
	Analytes Requested:		CL-02	, F-02	, NO2-02	, NO3-02 , PO4-02 ,
			SO4-02			
4 DUP	S96T000090 0		@IC-01	LIQUID		
5 SPK	S96T000090 0		@IC-01	LIQUID		
6 SAMPLE	S96T000091 0		@IC-01	LIQUID	96000010	AP-108 GRAB
	Analytes Requested:		CL-02	, F-02	, NO2-02	, NO3-02 , PO4-02 ,
			SO4-02			
7 DUP	S96T000091 0		@IC-01	LIQUID		

Final page for worklist # 5013

Valerie Z. Massie 02-20-96

Analyst Signature Date

Analyst Signature

Date

on site

uploaded 3/5/96 n. smyth

Data Entry Comments:

A-0010-IC				DATA FILE/WORKLIST RESOLUTION				05-Mar-96	
Worklist#: 5013				Data File: 5013FEB.CSV					
	Seq	Type	Sample #	Seq#	Data File	Sample Name	Dilution		
-	=>	1	CCB	-	1	96022001.d01	INSTR BLANK		1.00
	=>	2	CCV			96022001.d02	122N9-E STD		101.00
	=>	3	SAMPLE			96022001.d03	122N9-E STD		101.00
	=>	4	DUP	2	96022001.d04	122N9-E STD			101.00
	=>	5	SPK			96022001.d05	S96T000090 SAMPL	10201.00	
	=>	6	SAMPLE	3	96022001.d06	S96T000090 SAMPL		1111.00	
	=>	7	DUP	4	96022001.d07	S96T000090 DUP		1111.00	
			S96T000090	5	96022001.d08	S96T000090 SPIKE		1111.00	
			S96T000091			96022001.d09	S96T000091 SAMPL	41.00	
			S96T000091	6	96022001.d10	S96T000091 SAMPL		1.00	
				7	96022001.d11	S96T000091 DUP		1.00	
+				+					

Save(F4) Abort(Shift-F3) ListFiles(Shift-F1) UploadFile(F8)

WHC-SD-WM-DP-166, REV. I

Sample Name: INSTR BLANK

Date: 02/20/1996 08:33:06

Data File : C:\DX\DATA\96022001.d01

WHC-SD-WM-DP-166, REV. 1

Method : C:\DX\METHOD\ANIONS.MET

ACI Address: 1 System: 2 Inject#: 1

Detector: CDM-1

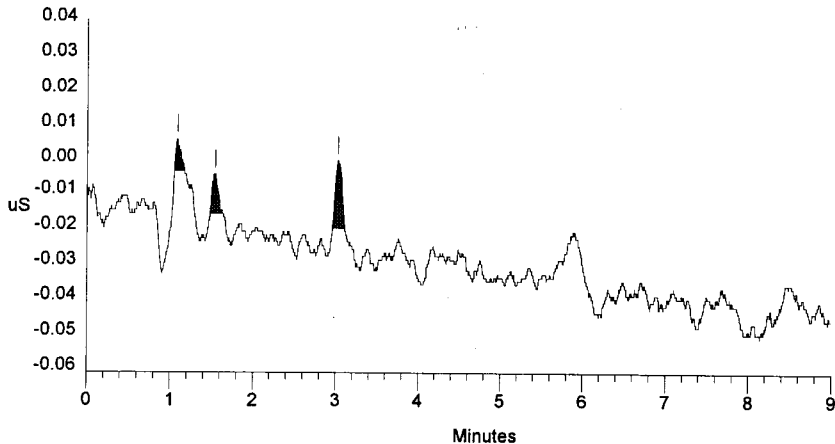
Analyst : *Paul Smith* Column:

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area	Reject
External	1	1	2700	5Hz	0.00	9.00		200

***** Peak Report: All Peaks *****

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
Totals			0.000	0	0		

File: 96022001.d01 Sample: INSTR BLANK



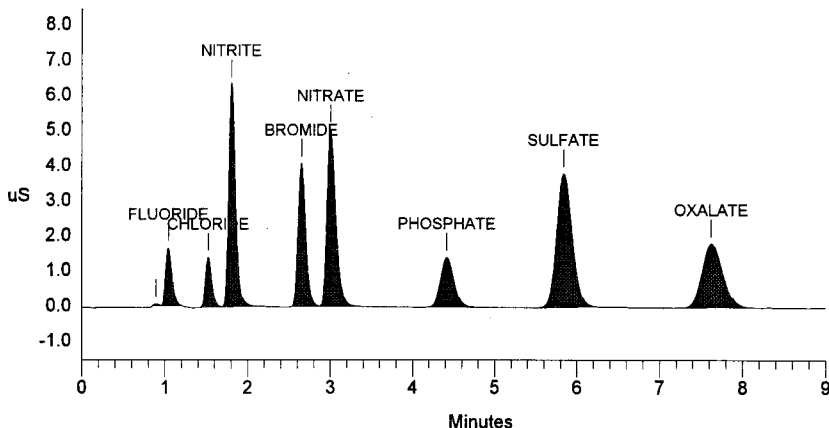
Westinghouse
 Sample Name: 122N9-E STD Date: 02/20/1996 10:17:07
 Data File: C:\DX\DATA\96022001.d04
 Method P.O. Box 1970 KAMAHANOWA, HI 96732 .MET
 ACI Address: 1 System: 2 Inject#: 4 Detector: CDM-1
 Analyst: JCL/MLL/2/27/96 Column: WHC-SD-WM-DP-166, REV. I

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area	Reject
External	1	101	2700	5Hz	0.00	9.00	200	

***** Peak Report: All Peaks *****

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
2	1.04	FLUORIDE	54.438	1630	8776	2	-1.57
3	1.52	CHLORIDE	75.025	1402	7480	1	-1.08
4	1.80	NITRITE	490.152	6325	36748	1	-0.92
5	2.65	BROMIDE	527.904	4059	26284	2	-1.49
6	3.00	NITRATE	581.979	5022	37896	2	-2.17
7	4.42	PHOSPHATE	524.804	1412	16006	1	-3.14
8	5.84	SULFATE	591.367	3793	49863	1	-4.47
9	7.62	OXALATE	492.632	1808	30976	1	-4.71
Totals			3338.301	25451	214029		

File: 96022001.d04 Sample: 122N9-E STD



Sample Name: S96TOOOO90 SAMPLE

Date: 02/20/1996 10:49:22

Data File : C:\DX\DATA\96022001.d06

WHC-SD-WM-DP-166, REV. I

Method : C:\DX\METHOD\ANIONS.MET

ACI Address: 1 System: 2 Inject#: 6

Detector: CDM-1

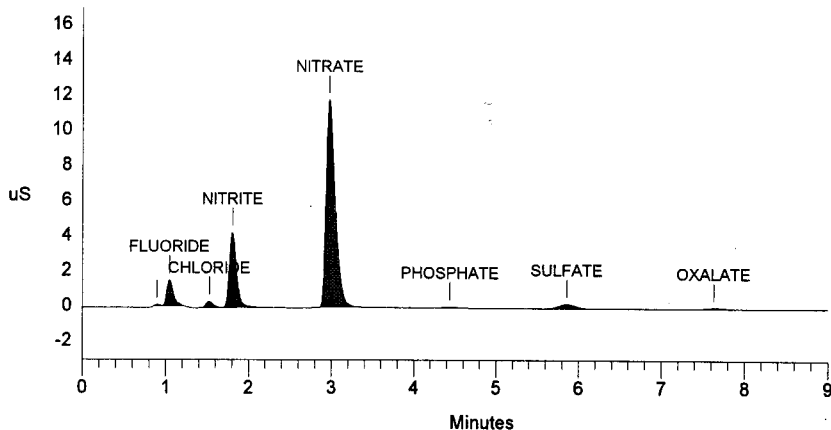
Analyst *J. M. Matt 2/27/96* Column:

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area	Reject
External	1	1111	2700	5Hz	0.00	9.00		200

***** Peak Report: All Peaks *****

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.90		0.000	67	241	2	
2	1.04	FLUORIDE	550.342	1462	8092	2	-1.57
3	1.52	CHLORIDE	177.474	348	1943	1	-1.08
4	1.80	NITRITE	3737.872	4245	25401	1	-0.92
5	2.97	NITRATE	14998.565	11757	91045	1	-3.26
6	4.44	PHOSPHATE	255.246	56	600	1	-2.70
7	5.86	SULFATE	405.938	239	3113	1	-4.15
8	7.63	OXALATE	179.247	63	965	1	-4.62
Totals			20304.684	18237	131401		

File: 96022001.d06 Sample: S96TOOOO90 SAMPLE



Sample Name: S96TOOOO90 DUP

Date: 02/20/1996 11:06:10

Data File : C:\DX\DATA\96022001.d07

Method : C:\DX\METHOD\ANIONS.MET

WHC-SD-WM-DP-166, REV. 1

ACI Address: 1 System: 2 Inject#: 7

Detector: CDM-1

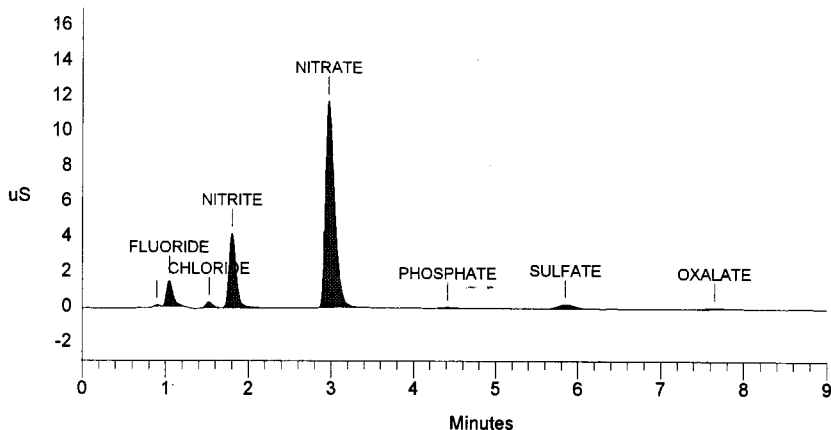
Analyst : *gwt* Column:

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area	Reject
External	1	1111	2700	5Hz	0.00	9.00	200	

***** Peak Report: All Peaks *****

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.90		0.000	70	256	1	
2	1.04	FLUORIDE	546.937	1458	8044	1	-1.57
3	1.52	CHLORIDE	161.910	335	1812	1	-1.08
4	1.80	NITRITE	3685.548	4213	25043	1	-0.92
5	2.97	NITRATE	14895.904	11703	90396	1	-3.26
6	4.42	PHOSPHATE	229.598	51	530	1	-3.14
7	5.85	SULFATE	414.102	240	3175	1	-4.26
8	7.65	OXALATE	151.008	56	805	1	-4.38
Totals			20085.007	18127	130060		

File: 96022001.d07 Sample: S96TOOOO90 DUP



Sample Name: S96TOOOO90 SPIKE

Date: 02/20/1996 11:19:47

Data File : C:\DX\DATA\96022001.d08

Method : C:\DX\METHOD\ANIONS.MET

WHC-SD-WM-DP-166, REV. I

ACI Address: 1 System: 2 Inject#: 8

Detector: CDM-1

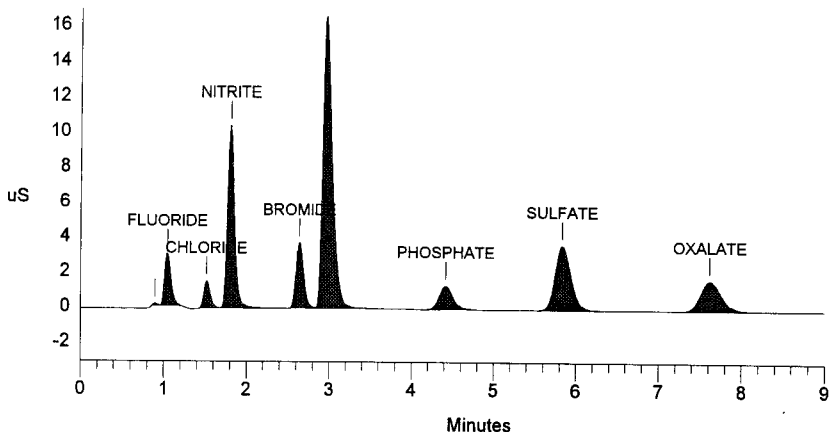
Analyst: *Vol Multi 2/24/96* Column:

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area	Reject
External	1	1111	2700	5Hz	0.00	9.00		200

***** Peak Report: All Peaks *****

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.90		0.000	114	410	2	
2	1.04	FLUORIDE	1107.564	2958	16022	2	-1.57
3	1.52	CHLORIDE	913.474	1524	8246	2	-1.52
4	1.80	NITRITE	8943.261	10391	61326	2	-0.92
5	2.64	BROMIDE	5263.440	3706	23774	2	-1.98
6	2.96	NITRATE	21410.482	16559	132335	2	-3.69
7	4.42	PHOSPHATE	5530.236	1327	15318	1	-3.14
8	5.83	SULFATE	6304.845	3671	48307	1	-4.58
9	7.62	OXALATE	5091.987	1704	29089	1	-4.79
Totals			54565.289	41953	334826		

File: 96022001.d08 Sample: S96TOOOO90 SPIKE



Data Reprocessed On 02/26/1996 15:44:43

Sample Name: S96T000091 SAMPLE

Data File : C:\DX\DATA\96022001.d10

Method : C:\DX\METHOD\ANIONS.MET

ACI Address: 1 System: 2 Inject#: 10

Analyst *W. J. Smith* Column:

Date: 02/20/1996 11:43:32

WHC-SD-WM-DP-166, REV. 1

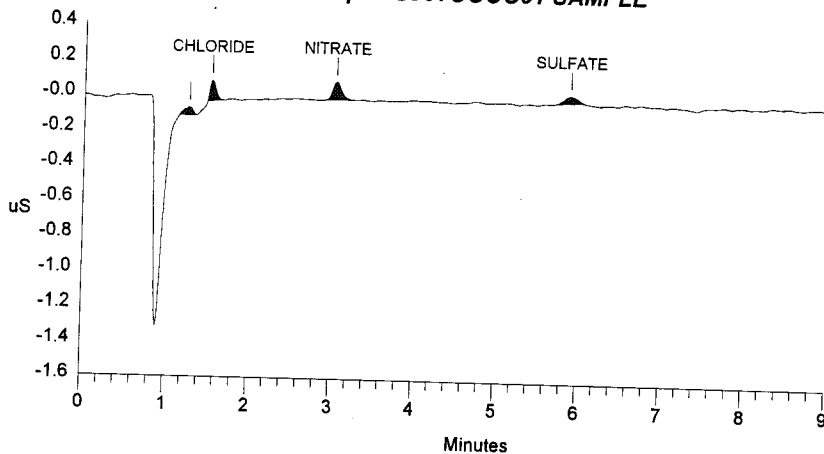
Detector: CDM-1

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area	Reject
External	1	1	2700	5Hz	0.00	9.00		200

***** Peak Report: All Peaks *****

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	1.26		0.000	43	300	1	
2	1.53	CHLORIDE	0.010	115	546	1	-0.65
3	3.04	NITRATE	0.140	98	697	1	-1.09
4	5.88	SULFATE	0.047	41	440	1	-3.71
Totals			0.196	296	1982		

File: 96022001.d10 Sample: S96T000091 SAMPLE



Data Reprocessed On 02/26/1996 15:44:45

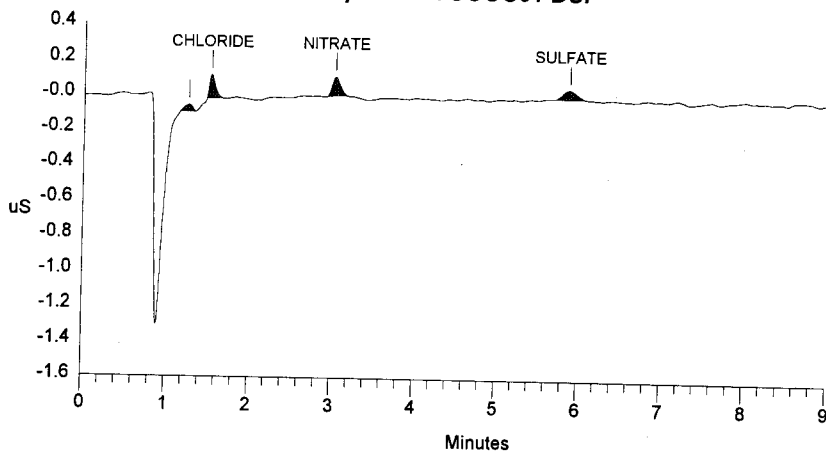
Sample Name: S96TOOOO91 DUP		Date: 02/20/1996 11:55:40
Data File : C:\DX\DATA\96022001.d11	WHC-SD-WM-DP-166, REV. I	
Method : C:\DX\METHOD\ANIONS.MET		
ACI Address: 1	System: 2	Inject#: 11
Analyst: <i>W. J. Smith</i>	Column:	Detector: CDM-1

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area	Reject
External	1	1	2700	5Hz	0.00	9.00		200

***** Peak Report: All Peaks *****

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	1.26		0.000	37	230	1	
2	1.53	CHLORIDE	0.019	131	624	1	-0.65
3	3.03	NITRATE	0.140	106	697	1	-1.30
4	5.88	SULFATE	0.061	49	556	1	-3.82
Totals			0.219	323	2107		

File: 96022001.d11 Sample: S96TOOOO91 DUP



LABCORE Completed Worklist Report for Worklist# 5019

Analyst: kgh

Instrument: IC01

Book# 12219E

Method: 1A-533-105 Rev/Mod D-1

Worklist Comment: AP108 FOR IC RTS!

WHC-SD-WM-DP-166, REV. 1

Seq Type	Sample# R A	Test	Matrix	Actual	Found	DL or Yield	Unit
1 CCB	0	•IC-QC F	QC	1	<1.30e-2		ug/mL
1 CCB	0	•IC-QC CL	QC	1	2.50e-02	0.025	ug/mL
1 CCB	0	•IC-QC NO2	QC	1	<1.07e-1		ug/mL
1 CCB	0	•IC-QC BR	QC	1	<1.26e-1		ug/mL
1 CCB	0	•IC-QC NO3	QC	1	2.40e-01	0.240	ug/mL
1 CCB	0	•IC-QC PO4	QC	1	<1.19e-1		ug/mL
1 CCB	0	•IC-QC SO4	QC	1	<1.36e-1		ug/mL
1 CCB	0	•IC-QC OXALATE2	QC	1	<1.05e-1		ug/mL
2 CCV	0	•IC-QC F	QC	59	5.71e+01	56.780 % Recovery	
2 CCV	0	•IC-QC CL	QC	79	7.26e+01	91.899 % Recovery	
2 CCV	0	•IC-QC NO2	QC	534	5.07e+02	96.944 % Recovery	
2 CCV	0	•IC-QC BR	QC	575	5.57e+02	96.870 % Recovery	
2 CCV	0	•IC-QC NO3	QC	614	6.13e+02	99.837 % Recovery	
2 CCV	0	•IC-QC PO4	QC	546	5.31e+02	97.253 % Recovery	
2 CCV	0	•IC-QC SO4	QC	631	6.17e+02	97.781 % Recovery	
2 CCV	0	•IC-QC OXALATE2	QC	526	5.28e+02	100.380 % Recovery	
3 SAMPLE	S96T000097 0	•IC-01 F-02	LIQUID	N/A	5.971e+02	14.440	ug/mL
3 SAMPLE	S96T000097 0	•IC-01 CL-02	LIQUID	N/A	2.105e+02	18.890	ug/mL
3 SAMPLE	S96T000097 0	•IC-01 NO2-02	LIQUID	N/A	3.646e+03	118.900	ug/mL
3 SAMPLE	S96T000097 0	•IC-01 NO3-02	LIQUID	N/A	1.458e+04	155.500	ug/mL
3 SAMPLE	S96T000097 0	•IC-01 PO4-02	LIQUID	N/A	3.442e+02	132.100	ug/mL
3 SAMPLE	S96T000097 0	•IC-01 SO4-02	LIQUID	N/A	6.109e+02	151.000	ug/mL
4 DUP	S96T000097 0	•IC-01 F-02	LIQUID	5.97e+02	6.07e+02	1.661	RPD
4 DUP	S96T000097 0	•IC-01 CL-02	LIQUID	2.10e+02	2.10e+02	0.000	RPD
4 DUP	S96T000097 0	•IC-01 NO2-02	LIQUID	3.65e+03	3.83e+03	4.813	RPD
4 DUP	S96T000097 0	•IC-01 NO3-02	LIQUID	1.46e+04	1.46e+04	0.000	RPD
4 DUP	S96T000097 0	•IC-01 PO4-02	LIQUID	3.44e+02	3.66e+02	6.197	RPD
4 DUP	S96T000097 0	•IC-01 SO4-02	LIQUID	6.11e+02	6.28e+02	2.744	RPD
5 SPK	S96T000097 0	•IC-01 F-02	LIQUID	59	5.89e+01	99.831 % Recovery	
5 SPK	S96T000097 0	•IC-01 CL-02	LIQUID	79	7.22e+01	91.392 % Recovery	
5 SPK	S96T000097 0	•IC-01 NO2-02	LIQUID	534	5.21e+02	97.566 % Recovery	
5 SPK	S96T000097 0	•IC-01 BR-02	LIQUID	575	0.00e+00	0.000 % Recovery	
5 SPK	S96T000097 0	•IC-01 NO3-02	LIQUID	614	6.92e+02	112.704 % Recovery	
5 SPK	S96T000097 0	•IC-01 PO4-02	LIQUID	546	5.11e+02	93.590 % Recovery	
5 SPK	S96T000097 0	•IC-01 SO4-02	LIQUID	631	5.85e+02	92.710 % Recovery	
5 SPK	S96T000097 0	•IC-01 OXALATE2	LIQUID	526	0.00e+00	0.000 % Recovery	

Final page for worklist# 5019

LABCORE Completed Worklist Report for Worklist# 5019

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

James L. Lyle 4/19/96
Reviewer Signature Date

WHC-SD-WM-DP-166, REV. /

LABCORE Data Entry Template for Worklist# 5019

Analyst: 504 Instrument: IC01 Book# 122N9-E

Method: LA-533-105 Rev/Mod D-1

Worklist Comment: AP108 FOR IC RTS!

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	CCB				@IC-QC	QC		
2	CCV				@IC-QC	QC		
3	SAMPLE	S96T000097 0			@IC-01	LIQUID	96000011	AP-108 GRAB
		Analytes Requested:			CL-02	, F-02	NO2-02	, NO3-02 , PO4-02 ,
					SO4-02			
4	DUP	S96T000097 0			@IC-01	LIQUID		
5	SPK	S96T000097 0			@IC-01	LIQUID		

Final page for worklist # 5019

Analyst Signature

Date

Analyst Signature

Date

In shell

uploaded 2/26/96 JMT
printed

Data Entry Comments:

A-0010-IC				DATA FILE/WORKLIST RESOLUTION				20-Feb-96			
Worklist#: 5019				Data File: 5019FEB.CSV							
	Seq	Type	Sample #	Seq#	Data File	Sample Name	Dilution				
-	=>	1 CCB	S96T000097 S96T000097 S96T000097	-	1	96021331.d01	BLANK	1.00			
	=>	2 CCV		2	96021331.d02	122N9-E STD	101.00				
	=>	3 SAMPLE			96021331.d03	S96T000097 SAM	10201.00				
	=>	4 DUP			96021331.d04	S96T000097 SAM	2121.00				
	=>	5 SPK			96021331.d05	S96T000097 SAM	1111.00				
				3	96021331.d06	S96T000097 SAM	1111.00				
				4	96021331.d07	S96T000097 DUP	1111.00				
				5	96021331.d08	S96T000097 SPK	1111.00				
+				+							

Save(F4) Abort(Shift-F3) ListFiles(Shift-F1) UploadFile(F8)

WHC-SD-WM-DP-166, REV.1

Sample Name: BLANK

Date: 02/14/1996 07:00:35

Data File : C:\DX\DATA\96021331.d01

Method : C:\DX\METHOD\KIT.MET

WHC-SD-WM-DP-166, REV. 1

ACI Address: 1 System: 1 Inject#: 1

Detector: CDM-2

Analyst : *MT* Column: AG4A/AS4A anion column

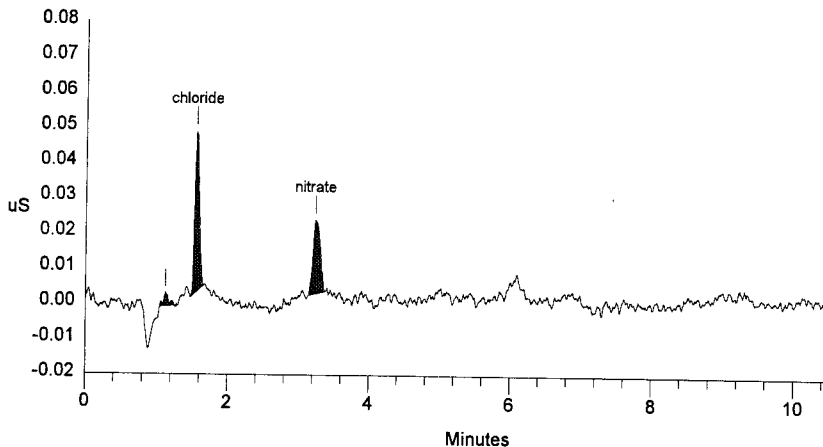
Calibration Volume Dilution Points Rate Start Stop Area Reject

External 1 1 3150 5Hz 0.00 10.50 20000

***** Peak Report: All Peaks *****

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
2	1.55	chloride	0.025	45506	205448	1	-1.06
3	3.23	nitrate	0.240	20833	147932	1	2.65
Totals			0.265	66339	353380		

File: 96021331.d01 Sample: BLANK



SIGNATURE ABOVE REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 126 TO 131.

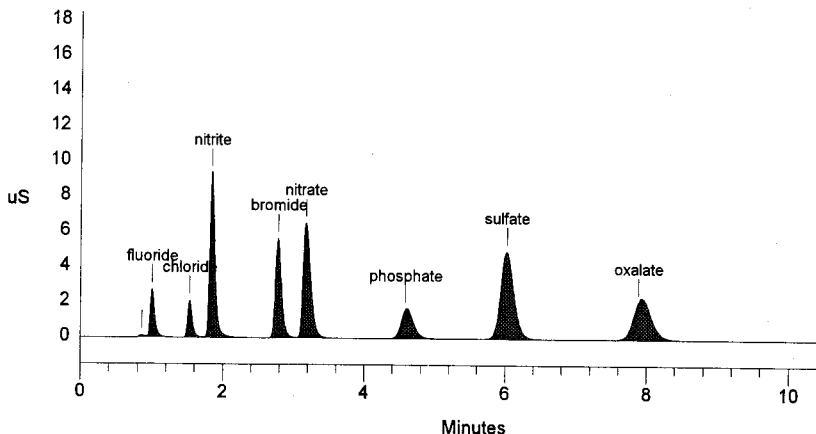
Sample Name: 122N9-E STD Date: 02/14/1996 07:22:34
 Data File : C:\DX\DATA\96021331.d02
 Method : C:\DX\METHOD\KIT.MET WHC-SD-WM-DP-166, REV. I
 ACI Address: 1 System: 1 Inject#: 2 Detector: CDM-2
 Analyst : *MTaylor Kelt* Column: AG4A/AS4A anion column

Calibration Volume Dilution Points Rate Start Stop Area Reject
 External 1 101 3150 5Hz 0.00 10.50 20000

***** Peak Report: All Peaks *****

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.86		0.000	89408	414258	2	
2	1.01	fluoride	57.095	2713726	12050511	2	-0.33
3	1.53	chloride	72.591	2098143	9594280	1	-2.34
4	1.84	nitrite	507.128	9329480	48497076	1	-3.66
5	2.78	bromide	556.800	5629006	34560540	1	-1.42
6	3.17	nitrate	612.765	6515255	49311116	1	0.74
7	4.59	phosphate	531.062	1667044	21082182	1	-2.20
8	6.03	sulfate	616.811	4972930	64890976	1	-2.64
9	7.89	oxalate	527.536	2132540	41531330	1	-2.67
Totals			3481.788	35147532	281932269		

File: 96021331.d02 Sample: 122N9-E STD



```

=====
Sample Name: S96T000097 SAM                      Date: 02/14/1996 09:32:49
Data File  : C:\DX\DATA\96021331.d06
Method     : C:\DX\METHOD\KIT.MET                WHC-SD-WM-DP-166, REV. 1
ACI Address: 1 System: 1 Inject#: 6                Detector: CDM-2
Analyst    : 1/15/96 Column: AG4A/AS4A anion column
=====

```

```

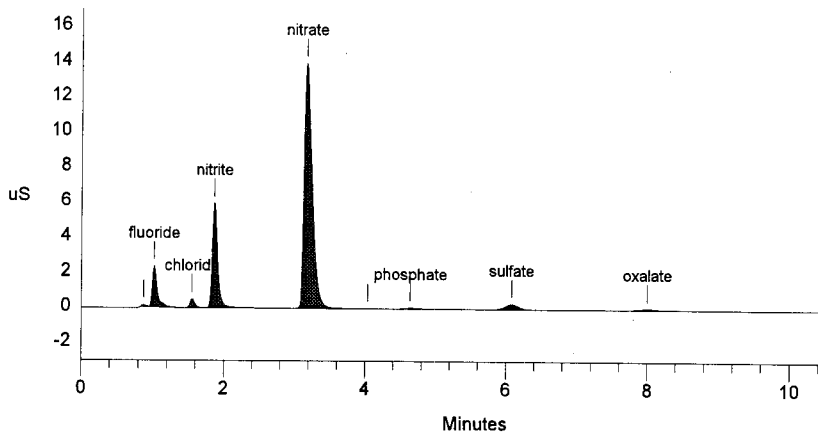
=====
Calibration Volume Dilution Points Rate Start Stop Area Reject
-----
External          1          1111 3150 5Hz 0.00 10.50      20000
=====

```

***** Peak Report: All Peaks *****

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.87		0.000	107787	494698	2	
2	1.02	fluoride	597.065	2324045	11436744	2	0.99
3	1.55	chloride	210.478	509479	2416374	1	-1.06
4	1.87	nitrite	3646.224	5942011	31130268	1	-2.27
5	3.17	nitrate	14577.702	13951382	110643814	1	0.53
6	4.03		0.000	10248	90164	1	
7	4.64	phosphate	344.228	58624	752288	1	-1.07
8	6.08	sulfate	610.858	299400	4035102	1	-1.78
9	8.00	oxalate	225.225	76700	1407272	1	-1.36
Totals			20211.781	23279676	162406724		

File: 96021331.d06 Sample: S96T000097 SAM



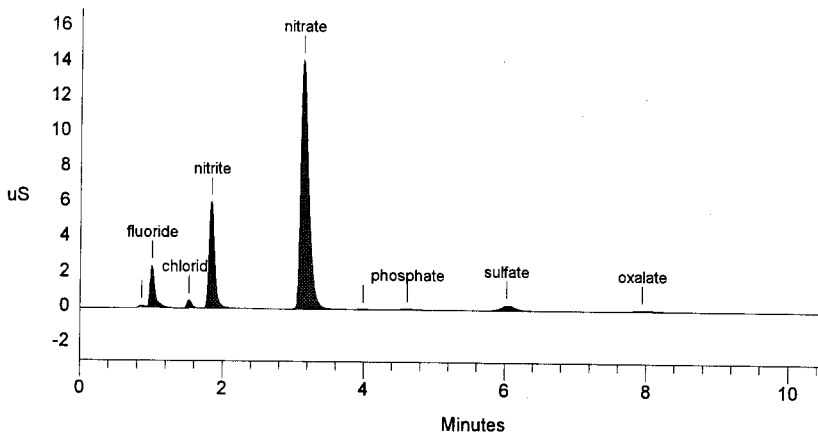
Sample Name: S96T000097 DUP	Date: 02/14/1996 09:48:53
Data File : C:\DX\DATA\96021331.d07	WHC-SD-WM-DP-166, REV. I
Method : C:\DX\METHOD\KIT.MET	
ACI Address: 1 System: 1 Inject#: 7	Detector: CDM-2
Analyst: <i>W. Smith</i>	Column: AG4A/AS4A anion column

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area	Reject
External	1	1111	3150	5Hz	0.00	10.50	20000	

***** Peak Report: All Peaks *****

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.86		0.000	98503	431785	2	
2	1.01	fluoride	606.866	2383613	11630898	2	-0.33
3	1.53	chloride	210.023	487158	2410850	1	-2.76
4	1.84	nitrite	3831.644	6059041	32795052	1	-3.66
5	3.13	nitrate	14608.731	14167194	110890832	1	-0.53
6	3.99		0.000	9764	79578	1	
7	4.61	phosphate	365.696	62257	830520	1	-1.63
8	6.03	sulfate	627.569	289378	4197338	1	-2.64
9	7.95	oxalate	219.970	73256	1369726	1	-2.01
Totals			20470.499	23630165	164636580		

File: 96021331.d07 Sample: S96T000097 DUP



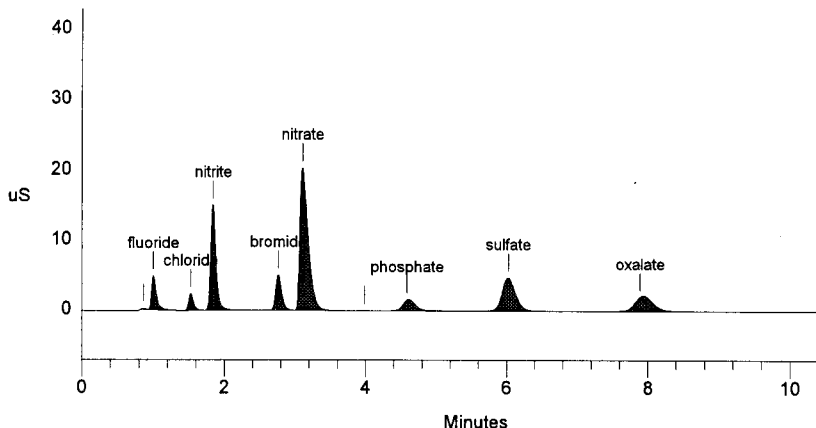
Sample Name: S96T000097 SPK		Date: 02/14/1996 10:07:36
Data File : C:\DX\DATA\96021331.d08		
Method : C:\DX\METHOD\KIT.MET		WHC-SD-WM-DP-166, REV. I
ACI Address: 1	System: 1	Inject#: 8
Analyst : <i>Neil Smith JWC</i>	Column: AG4A/AS4A anion column	Detector: CDM-2

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area	Reject
External	1	1111	3150	5Hz	0.00	10.50	20000	

***** Peak Report: All Peaks *****

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.86		0.000	156381	657720	2	
2	1.00	fluoride	1192.455	4830808	23263715	2	-0.99
3	1.53	chloride	939.770	2423293	11331642	1	-2.76
4	1.84	nitrite	8905.580	15064909	78500042	1	-3.66
5	2.76	bromide	5470.060	5067521	30690938	1	-2.13
6	3.11	nitrate	21568.579	20338427	167190372	1	-1.38
7	3.98		0.000	10135	86690	1	
8	4.59	phosphate	5508.960	1531204	19834350	1	-2.20
9	6.03	sulfate	6521.340	4753167	62254202	1	-2.64
10	7.89	oxalate	5384.848	1970363	38505334	1	-2.67
Totals			55491.593	56146208	432315005		

File: 96021331.d08 Sample: S96T000097 SPK



Sample Name: S96T000097 SPK
 Data File : C:\DX\DATA\96021331.D08
 Method : C:\DX\METHOD\KIT.MET
 ACI Address: 1 System: 1 Inject#: 8
 Analyst : *Jmf*

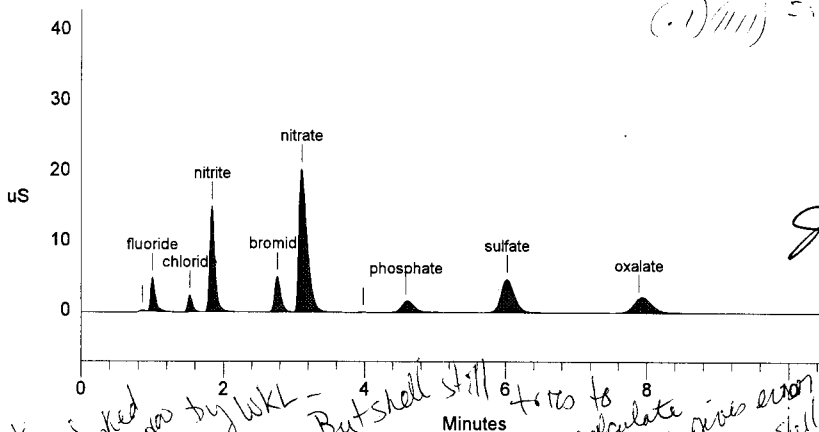
Date: 02/14/1996 10:07:36
 WHC-SD-WM-DP-166, REV. 1
 Detector: CDM-2
 Column: AG4A/AS4A anion column

Calibration Volume Dilution Points Rate Start Stop Area Reject
 External 1 1111 3150 5Hz 0.00 10.50 20000

***** Peak Report: All Peaks *****

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.86		0.000	156381	657720	2	
2	1.00	fluoride	1192.455	4830808	23263715	2	-0.99
3	1.53	chloride	939.770	2423293	11331642	1	-2.76
4	1.84	nitrite	8905.580	15064909	78500042	1	-3.66
5	2.76	bromide	5470.060	5067521	30690938	1	-2.13
6	3.11	nitrate	21568.579	20338427	167190372	1	-1.38
7	3.98		0.000	10135	86690	1	
8	4.59	phosphate	5508.960	1531204	19834350	1	-2.20
9	6.03	sulfate	6521.340	4753167	62254202	1	-2.64
10	7.89	oxalate	5384.848	1970363	38505334	1	-2.67
Totals			55491.593	56146208	432315005		

File: 96021331.D08 Sample: S96T000097 SPK



1/
 $(.1)(1111) = 0.990$

Jmf
 2/24/96

564 x 0.1111 = 62.644
5470 (11) / (11)(575)(1111) x 100% = 94.188%
(5384.848 - 225.225)(11) / (11)(526)(1111) x 100% = 97.12% for Oxalate
131
But shell still
to 100 to calculate & gives even flag
shell gave 95.324 for Br
1022 814 for oxalate

LABCORE Data Entry Template for Worklist# 4897

Analyst: JK 5270 Instrument: ICP01 _____ Book# 505485Method: LA-505-151/161 Rev/Mod 3-3

Worklist Comment: ICP AP-108 (DIRECT)

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	ICV				@ICP-QC	QC		
2	ICB				@ICP-QC	QC		
3	ICSA				@ICP-QC	QC		
4	ICSAB				@ICP-QC	QC		
5	SAMPLE	S96T000097	0	D	@ICP-D01	LIQUID	96000011	AP-108 GRAB
		Analytes Requested: AL-D-01 , FE-D-01 , NA-D-01						
6	DUP	S96T000097	0	D	@ICP-D01	LIQUID		
7	SPK	S96T000097	0	D	@ICP-D01	LIQUID		
8	CCV				@ICP-QC	QC		
9	CCB				@ICP-QC	QC		
10	SAMPLE	S96T000090	0	D	@ICP-D01	LIQUID	96000010	AP-108 GRAB
		Analytes Requested: AL-D-01 , FE-D-01 , NA-D-01						
11	DUP	S96T000090	0	D	@ICP-D01	LIQUID		
12	SPK	S96T000090	0	D	@ICP-D01	LIQUID		
13	SAMPLE	S96T000091	0	D	@ICP-D01	LIQUID	96000010	AP-108 GRAB
		Analytes Requested: AL-D-01 , FE-D-01 , NA-D-01						
14	DUP	S96T000091	0	D	@ICP-D01	LIQUID		
15	SPK	S96T000091	0	D	@ICP-D01	LIQUID		
16	ICSA				@ICP-QC	QC		
17	ICSAB				@ICP-QC	QC		

Data Entry Comments:

Note: ^{comment} See calculation of RPD of sample S95T000090 on the last page.

Data was reuploaded to correct the problem with the ^{RPDs on 4/10/96} _{re-enter} ^{80 4/10/96}

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

LABCORE Data Entry Template for Worklist# 4897

S Type	Sample#	R A	Test	Matrix	Group#	Project
18 CCV			@ICP-QC	QC		
19 CCB			@ICP-QC	QC		

Final page for worklist # 4897

JK Ltc 02-12-96
Analyst Signature Date

Remind by:
Paul H. Pang 2/12/96
Analyst Signature Date

5967000097L, 1.10-1.4nl, 31.505
 5967000097, 1.10, 101
 5967000097D, 1.10, 101
 5967000097Q, 1.10, 101, 1nl sample + 2nl 5575 + 8nl HNO₃
 5967000090L, 1.10-1.4nl, 31.505
 5967000090, 1.10, 101
 5967000090D, 1.10, 101
 5967000090Q, 1.10, 101, 1nl sample + 2nl 5575 + 8nl HNO₃
 5967000091L, 1.4nl, 31.5
 5967000091, direct, 1
 5967000091D, direct, 1
 5967000091Q, direct, 1.25, 4nl sample + 1nl 5575

Data Entry Comments:

File: 7602120

Identity 1: ICV

Identity 2: Quality Control

9:00 PM February 12, 1996

Task name : OPTIMA

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-166, REV. 1

	Zr (ppm)	Sr (ppm)	Bi (ppm)	Si (ppm)	Al (ppm)	Co (ppm)	Cu (ppm)	Li (ppm)
Mean	4.847	4.859	4.918	4.736	4.851	5.026	4.892	4.878
S.D.	0.014	0.015	0.016	0.007	0.011	0.023	0.013	0.022
% R.S.D.	0.299	0.318	0.327	0.154	0.237	0.451	0.271	0.458
	Zn (ppm)	Ni (ppm)	La (ppm)	Fe (ppm)	Ca (ppm)	Cr (ppm)	Nd (ppm)	U (ppm)
Mean	5.049	4.963	4.908	5.035	4.881	5.012	4.959	9.337
S.D.	0.013	0.013	0.017	0.024	0.018	0.025	0.021	0.029
% R.S.D.	0.263	0.270	0.352	0.486	0.359	0.490	0.417	0.312
	Ce (ppm)	Sm (ppm)	Ba (ppm)	P (ppm)	S (ppm)	Mg (ppm)	As (ppm)	Na (ppm)
Mean	4.981	4.868	4.859	4.868	4.928	4.901	5.010	4.835
S.D.	0.014	0.011	0.016	0.108	0.036	0.018	0.009	0.023
% R.S.D.	0.289	0.224	0.339	2.210	0.725	0.368	0.179	0.470
	Mo (ppm)	Se (ppm)	Ag (ppm)	Pb (ppm)	Ti (ppm)	Cd (ppm)	B (ppm)	K (ppm)
Mean	4.994	4.932	4.920	4.981	4.833	4.959	5.000	5.091
S.D.	0.016	0.043	0.014	0.034	0.016	0.018	0.011	0.043
% R.S.D.	0.311	0.876	0.282	0.679	0.323	0.373	0.211	0.839
	Mn (ppm)	Sb (ppm)	V (ppm)	Be (ppm)	Tl (ppm)			
Mean	4.989	4.696	4.986	5.051	4.799			
S.D.	0.020	0.064	0.018	0.014	0.017			
% R.S.D.	0.402	1.370	0.361	0.272	0.352			

K LA

02-12-96

GP-108 5947000097

5947000090

5947000091

Worklist # 4897

SIGNATURE ABOVE REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 134 TO 156

Task name : OPTIMA

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-166, REV. 1

	Zr (ppm)	Sr (ppm)	Bi (ppm)	Si (ppm)	Al (ppm)	Co (ppm)	Cu (ppm)	Li (ppm)
Mean	-0.001	0.000	0.001	0.001	-0.006	-0.002	-0.000	0.000
S.D.	0.002	0.000	0.003	0.002	0.002	0.001	0.000	0.000
% R.S.D.	164.233	113.389	230.652	233.168	25.079	86.562	98.017	107.146

	Zn (ppm)	Ni (ppm)	La (ppm)	Fe (ppm)	Ca (ppm)	Cr (ppm)	Nd (ppm)	U (ppm)
Mean	0.001	0.001	0.000	-0.002	-0.000	-0.000	-0.001	-0.038
S.D.	0.000	0.001	0.001	0.001	0.000	0.001	0.004	0.042
% R.S.D.	41.585	50.587	185.323	38.897	38.490	234.341	497.383	109.848

	Ce (ppm)	Sm (ppm)	Ba (ppm)	P (ppm)	S (ppm)	Mg (ppm)	As (ppm)	Na (ppm)
Mean	0.004	0.001	0.000	0.005	-0.002	-0.000	-0.004	0.011
S.D.	0.008	0.010	0.000	0.001	0.003	0.000	0.001	0.004
% R.S.D.	195.839	1275.368	378.594	20.142	148.327	173.205	24.035	32.473

	Mo (ppm)	Se (ppm)	Ag (ppm)	Pb (ppm)	Ti (ppm)	Cd (ppm)	B (ppm)	K (ppm)
Mean	-0.001	0.019	-0.001	-0.002	0.001	0.001	0.007	0.214
S.D.	0.001	0.006	0.001	0.001	0.000	0.001	0.001	0.018
% R.S.D.	51.669	29.624	59.193	68.163	47.929	62.366	14.750	8.612

	Mn (ppm)	Sb (ppm)	V (ppm)	Be (ppm)	Tl (ppm)
Mean	0.000	-0.021	0.001	0.000	0.012
S.D.	0.000	0.023	0.000	0.000	0.017
% R.S.D.	81.404	111.555	50.822	4.449	146.347

Identity 1: ICSA Identity 2: Quality Control

9:06 PM February 12, 1996

Task name : OPTIMA

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-166, REV. 1

	Zr	Sr	Bi	Si	Al	Co	Cu	Li
	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
Mean	0.010	0.002	-0.004	0.004	193.651	0.001	-0.000	-0.001
S.D.	0.001	0.000	0.004	0.003	1.238	0.002	0.001	0.000
% R.S.D.	13.215	5.357	124.429	83.691	0.639	408.409	385.326	18.170
	Zn	Ni	La	Fe	Ce	Cr	Nd	U
	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
Mean	-0.004	0.007	0.004	96.527	98.376	0.004	0.026	0.063
S.D.	0.000	0.001	0.001	0.535	0.640	0.000	0.003	0.059
% R.S.D.	8.406	17.125	17.877	0.555	0.650	11.777	12.394	93.141
	Ce	Sm	Ba	P	S	Mg	As	Na
	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
Mean	-0.002	0.056	0.003	0.025	0.016	100.207	-0.005	185.396
S.D.	0.013	0.013	0.000	0.001	0.009	0.389	0.005	1.482
% R.S.D.	531.955	23.274	8.227	5.903	58.661	0.388	99.917	0.799
	Mo	Se	Ag	Pb	Ti	Cd	B	K
	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
Mean	-0.003	-0.057	-0.001	-0.055	0.001	0.002	0.018	0.240
S.D.	0.001	0.008	0.001	0.012	0.000	0.001	0.001	0.019
% R.S.D.	31.455	14.053	91.611	21.360	44.672	45.801	3.507	7.767
	Mn	Sb	V	Be	Tl			
	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)			
Mean	0.003	-0.053	0.000	0.002	0.033			
S.D.	0.001	0.005	0.000	0.000	0.028			
% R.S.D.	28.915	8.579	255.788	13.666	85.094			

Identity 1: ICSAB Identity 2: Quality Control

9:09 PM February 12, 1996

Task name : OPTIMA

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-166, REV./

	Zr (ppm)	Sr (ppm)	Bi (ppm)	Si (ppm)	Al (ppm)	Co (ppm)	Cu (ppm)	Li (ppm)
Mean	0.005	0.002	-0.029	0.010	197.383	0.498	0.489	0.964
S.D.	0.002	0.000	0.013	0.002	0.281	0.004	0.001	0.002
% R.S.D.	31.528	7.059	42.997	18.384	0.142	0.860	0.184	0.232

	Zn (ppm)	Ni (ppm)	La (ppm)	Fe (ppm)	Ca (ppm)	Cr (ppm)	Nd (ppm)	U (ppm)
Mean	1.003	0.978	0.005	97.337	99.219	0.504	0.019	0.125
S.D.	0.002	0.005	0.001	0.311	0.271	0.005	0.010	0.059
% R.S.D.	0.156	0.521	15.623	0.319	0.273	0.965	51.918	47.051

	Ce (ppm)	Sm (ppm)	Ba (ppm)	P (ppm)	S (ppm)	Mg (ppm)	As (ppm)	Na (ppm)
Mean	-0.032	0.058	0.502	0.018	0.011	100.984	-0.011	190.172
S.D.	0.014	0.013	0.001	0.014	0.011	0.033	0.000	0.324
% R.S.D.	43.134	21.560	0.208	78.711	96.678	0.032	0.270	0.170

	Mo (ppm)	Se (ppm)	Ag (ppm)	Pb (ppm)	Ti (ppm)	Cd (ppm)	B (ppm)	K (ppm)
Mean	-0.005	0.021	1.012	0.976	0.002	0.995	0.019	0.168
S.D.	0.001	0.011	0.002	0.011	0.000	0.002	0.001	0.012
% R.S.D.	16.720	50.325	0.155	1.154	5.707	0.249	7.051	7.201

	Mn (ppm)	Sb (ppm)	V (ppm)	Be (ppm)	Tl (ppm)
Mean	0.502	-0.071	0.491	0.499	-0.001
S.D.	0.002	0.037	0.001	0.003	0.021
% R.S.D.	0.380	52.249	0.170	0.592	1889.029

Identity 1: S96T000097_L Identity 2: .1-10-1-4 ml

9:14 PM February 12, 1996

Task name : OPTIMA

WHC-SD-WM-DP-166, REV. I

Sample Weight : 1.0000 Solution Volume : 505.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppm)	Sr (ppm)	Bi (ppm)	Si (ppm)	Al (ppm)	Co (ppm)	Cu (ppm)	Li (ppm)
Mean	0.672	-0.153	9.106	21.806	1110.340	-2.506	-0.225	-0.356
S.D.	0.458	0.044	2.850	0.847	0.728	0.002	0.100	0.020
% R.S.D.	68.155	28.641	31.298	3.884	0.066	0.066	44.490	5.742
	Zn (ppm)	Ni (ppm)	La (ppm)	Fe (ppm)	Ca (ppm)	Cr (ppm)	Nd (ppm)	U (ppm)
Mean	0.891	2.980	0.856	4.625	0.464	18.001	-0.919	56.039
S.D.	0.071	0.981	0.952	0.779	0.176	0.550	3.701	12.914
% R.S.D.	7.917	32.932	111.231	16.848	37.962	3.054	402.692	23.045
	Ce (ppm)	Sm (ppm)	Ba (ppm)	P (ppm)	S (ppm)	Mg (ppm)	As (ppm)	Na (ppm)
Mean	-18.282	1.808	-0.266	105.833	163.904	1.935	-3.678	18639.618
S.D.	2.010	1.573	0.071	6.312	3.563	0.168	1.924	150.629
% R.S.D.	10.993	86.996	26.877	5.964	2.174	8.660	52.300	0.808
	Mo (ppm)	Se (ppm)	Ag (ppm)	Pb (ppm)	Ti (ppm)	Cd (ppm)	B (ppm)	K (ppm)
Mean	-0.057	1.959	-1.545	-11.143	0.722	0.315	3.228	3822.405
S.D.	0.187	5.285	0.227	3.658	0.245	0.210	0.272	33.830
% R.S.D.	325.494	269.761	14.716	32.833	33.955	66.451	8.438	0.885
	Mn (ppm)	Sb (ppm)	V (ppm)	Be (ppm)	Tl (ppm)			
Mean	0.034	-22.506	-1.914	-0.122	9.084			
S.D.	0.001	17.199	0.283	0.095	3.278			
% R.S.D.	4.241	76.420	14.788	77.691	36.089			

Identity 1: S96T000097 Identity 2: .1-10 ml

9:17 PM February 12, 1996

Task name : OPTIMA

Sample Weight : 1.0000 Solution Volume : 101.00

WHC-SD-WM-DP-166, REV. /

On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppm)	Sr (ppm)	Bi (ppm)	Si (ppm)	Al (ppm)	Co (ppm)	Cu (ppm)	Li (ppm)
Mean	-0.180	-0.031	-0.764	16.820	1092.059	-0.250	0.149	-0.049
S.D.	0.160	0.012	0.685	0.295	4.072	0.001	0.077	0.029
% R.S.D.	88.461	39.031	89.745	1.751	0.373	0.333	51.373	58.272

	Zn (ppm)	Ni (ppm)	La (ppm)	Fe (ppm)	Ca (ppm)	Cr (ppm)	Nd (ppm)	U (ppm)
Mean	0.317	1.396	-0.332	-0.466	0.597	18.929	-1.631	-0.772
S.D.	0.033	0.072	0.146	0.141	0.004	0.177	0.870	6.486
% R.S.D.	10.541	5.154	43.856	30.185	0.612	0.936	53.352	839.687

	Ce (ppm)	Sm (ppm)	Ba (ppm)	P (ppm)	S (ppm)	Mg (ppm)	As (ppm)	Na (ppm)
Mean	-3.577	1.322	0.050	105.434	161.957	0.135	-0.773	17966.838
S.D.	1.445	1.354	0.027	1.749	2.634	0.015	0.225	186.710
% R.S.D.	40.379	102.414	52.977	1.659	1.627	10.714	29.149	1.039

	Mo (ppm)	Se (ppm)	Ag (ppm)	Pb (ppm)	Ti (ppm)	Cd (ppm)	B (ppm)	K (ppm)
Mean	1.598	-1.333	-0.340	-3.293	-0.033	0.546	2.973	3725.004
S.D.	0.099	0.591	0.120	0.366	0.032	0.073	0.095	36.059
% R.S.D.	6.204	44.336	35.368	11.101	97.351	13.292	3.190	0.968

	Mn (ppm)	Sb (ppm)	V (ppm)	Be (ppm)	Tl (ppm)
Mean	-0.091	-2.531	-0.364	-0.063	0.750
S.D.	0.025	2.463	0.125	0.011	2.781
% R.S.D.	27.787	97.321	34.449	16.677	370.705

Identity 1: S96T000097_D Identity 2: .1-10 ml

9:20 PM February 12, 1996

Task name : OPTIMA

Sample Weight : 1.0000 Solution Volume : 101.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-166, REV. I

	Zr (ppm)	Sr (ppm)	Bi (ppm)	Si (ppm)	Al (ppm)	Co (ppm)	Cu (ppm)	Li (ppm)
Mean	-0.064	0.008	0.057	16.509	1093.122	0.083	0.324	0.012
S.D.	0.105	0.011	0.158	0.272	2.954	0.144	0.039	0.027
% R.S.D.	165.123	150.000	276.214	1.645	0.270	174.385	12.136	218.959
	Zn (ppm)	Ni (ppm)	La (ppm)	Fe (ppm)	Ca (ppm)	Cr (ppm)	Nd (ppm)	U (ppm)
Mean	0.408	1.329	-0.080	-0.193	0.867	19.114	0.230	6.168
S.D.	0.035	0.053	0.144	0.097	0.013	0.117	0.913	5.057
% R.S.D.	8.630	3.977	179.677	50.382	1.520	0.614	397.950	81.982
	Ce (ppm)	Sm (ppm)	Ba (ppm)	P (ppm)	S (ppm)	Mg (ppm)	As (ppm)	Na (ppm)
Mean	-0.646	2.406	0.115	104.450	160.284	0.140	-0.535	17989.093
S.D.	1.310	1.051	0.017	1.377	1.013	0.008	0.324	69.824
% R.S.D.	202.762	43.691	14.352	1.318	0.632	5.973	60.565	0.388
	Mo (ppm)	Se (ppm)	Ag (ppm)	Pb (ppm)	Ti (ppm)	Cd (ppm)	B (ppm)	K (ppm)
Mean	1.768	0.491	-0.063	-3.155	0.006	0.658	3.009	3795.812
S.D.	0.018	1.147	0.075	0.968	0.039	0.067	0.066	8.227
% R.S.D.	1.002	233.608	118.560	30.669	698.635	10.252	2.183	0.217
	Mn (ppm)	Sb (ppm)	V (ppm)	Be (ppm)	Tl (ppm)			
Mean	-0.001	-3.588	-0.121	0.058	-0.246			
S.D.	0.015	1.120	0.063	0.023	2.118			
% R.S.D.	1018.064	31.203	51.752	39.476	860.867			

Identity 1: S96T000097_A Identity 2: .1sam+2sst5+8hno3

9:23 PM February 12, 1996

Task name : OPTIMA

Sample Weight : 1.0000 Solution Volume : 101.00

WHC-SD-WM-DP-166, REV. I

On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppm)	Sr (ppm)	Bi (ppm)	Si (ppm)	Al (ppm)	Co (ppm)	Cu (ppm)	Li (ppm)
Mean	98.896	99.836	97.076	114.382	1171.774	99.260	101.338	97.716
S.D.	0.152	0.083	1.447	0.124	1.873	0.577	0.189	0.232
% R.S.D.	0.154	0.083	1.491	0.109	0.160	0.581	0.187	0.237
	Zn (ppm)	Ni (ppm)	La (ppm)	Fe (ppm)	Ca (ppm)	Cr (ppm)	Nd (ppm)	U (ppm)
Mean	99.487	99.712	101.141	101.149	100.576	118.897	104.386	190.711
S.D.	0.096	0.222	0.692	1.330	0.102	0.598	0.388	3.085
% R.S.D.	0.097	0.223	0.684	1.315	0.101	0.503	0.371	1.618
	Ce (ppm)	Sm (ppm)	Ba (ppm)	P (ppm)	S (ppm)	Mg (ppm)	As (ppm)	Na (ppm)
Mean	99.788	99.901	100.221	205.292	253.814	96.378	102.017	17623.591
S.D.	0.369	0.321	0.096	1.877	0.625	0.061	1.279	32.853
% R.S.D.	0.370	0.321	0.096	0.914	0.246	0.063	1.254	0.186
	Mo (ppm)	Se (ppm)	Ag (ppm)	Pb (ppm)	Ti (ppm)	Cd (ppm)	B (ppm)	K (ppm)
Mean	100.653	103.976	91.551	99.299	97.889	99.143	103.392	3815.577
S.D.	0.305	1.447	0.031	1.346	0.118	0.163	0.180	8.646
% R.S.D.	0.303	1.391	0.034	1.355	0.120	0.165	0.174	0.227
	Mn (ppm)	Sb (ppm)	V (ppm)	Be (ppm)	Tl (ppm)			
Mean	100.023	93.666	100.522	102.094	102.859			
S.D.	0.171	3.212	0.234	0.127	1.456			
% R.S.D.	0.171	3.429	0.233	0.124	1.416			

Identity 1: CCV Identity 2: Quality Control

9:27 PM February 12, 1996

Task name : OPTIMA

WHC-SD-WM-DP-166, REV. I

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppm)	Sr (ppm)	Bi (ppm)	Si (ppm)	Al (ppm)	Co (ppm)	Cu (ppm)	Li (ppm)
Mean	4.928	4.964	4.944	4.786	4.913	5.052	5.009	5.020
S.D.	0.006	0.009	0.004	0.011	0.003	0.016	0.012	0.026
% R.S.D.	0.112	0.183	0.084	0.228	0.064	0.319	0.247	0.509
	Zn (ppm)	Ni (ppm)	La (ppm)	Fe (ppm)	Ca (ppm)	Cr (ppm)	Nd (ppm)	U (ppm)
Mean	5.066	4.998	5.005	5.080	4.983	5.038	5.087	9.589
S.D.	0.005	0.006	0.016	0.015	0.009	0.017	0.023	0.032
% R.S.D.	0.097	0.123	0.325	0.299	0.189	0.336	0.448	0.333
	Ce (ppm)	Sm (ppm)	Ba (ppm)	P (ppm)	S (ppm)	Mg (ppm)	As (ppm)	Na (ppm)
Mean	5.078	4.985	4.978	5.051	4.968	4.927	5.073	4.975
S.D.	0.016	0.003	0.011	0.119	0.051	0.007	0.019	0.026
% R.S.D.	0.320	0.069	0.211	2.350	1.027	0.133	0.373	0.518
	Mo (ppm)	Se (ppm)	Ag (ppm)	Pb (ppm)	Ti (ppm)	Cd (ppm)	B (ppm)	K (ppm)
Mean	5.041	5.081	4.949	5.010	4.910	5.005	5.078	5.134
S.D.	0.010	0.037	0.003	0.048	0.007	0.006	0.013	0.041
% R.S.D.	0.202	0.730	0.067	0.963	0.152	0.121	0.248	0.792
	Mn (ppm)	Sb (ppm)	V (ppm)	Be (ppm)	Tl (ppm)			
Mean	5.031	4.693	5.040	5.146	4.859			
S.D.	0.005	0.076	0.004	0.009	0.006			
% R.S.D.	0.104	1.623	0.072	0.182	0.118			

Identity 1: CCB Identity 2: Quality Control

9:30 PM February 12, 1996

Task name : OPTIMA

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-166, REV. I

	Zr (ppm)	Sr (ppm)	Bi (ppm)	Si (ppm)	Al (ppm)	Co (ppm)	Cu (ppm)	Li (ppm)
Mean	0.002	0.000	0.003	0.001	0.007	-0.000	-0.000	0.000
S.D.	0.000	0.000	0.006	0.002	0.008	0.000	0.001	0.000
% R.S.D.	19.806	0.000	207.415	145.386	112.757	53.516	667.647	346.623
	Zn (ppm)	Ni (ppm)	La (ppm)	Fe (ppm)	Ca (ppm)	Cr (ppm)	Nd (ppm)	U (ppm)
Mean	0.001	0.003	-0.001	-0.000	-0.000	-0.001	0.006	0.050
S.D.	0.000	0.002	0.001	0.002	0.000	0.000	0.006	0.027
% R.S.D.	64.995	73.695	87.564	665.695	74.231	20.952	108.405	53.596
	Ce (ppm)	Sm (ppm)	Ba (ppm)	P (ppm)	S (ppm)	Mg (ppm)	As (ppm)	Na (ppm)
Mean	0.010	0.019	0.000	-0.026	-0.005	-0.000	-0.012	0.013
S.D.	0.004	0.006	0.000	0.004	0.005	0.000	0.002	0.002
% R.S.D.	35.041	29.901	164.429	16.294	105.558	0.000	15.794	19.244
	Mo (ppm)	Se (ppm)	Ag (ppm)	Pb (ppm)	Ti (ppm)	Cd (ppm)	B (ppm)	K (ppm)
Mean	-0.001	-0.002	-0.001	-0.012	0.001	-0.001	0.005	0.170
S.D.	0.001	0.015	0.001	0.007	0.000	0.000	0.001	0.011
% R.S.D.	44.890	647.513	80.229	59.298	48.481	25.076	22.006	6.257
	Mn (ppm)	Sb (ppm)	V (ppm)	Be (ppm)	Tl (ppm)			
Mean	0.000	-0.036	-0.001	0.000	-0.051			
S.D.	0.000	0.007	0.001	0.000	0.022			
% R.S.D.	87.822	18.316	79.002	1653.042	43.465			

Identity 1: S96T000090_L Identity 2: .1-10-1-4 ml

9:33 PM February 12, 1996

Task name : OPTIMA

Sample Weight : 1.0000 Solution Volume : 505.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-166, REV. J

	Zr (ppm)	Sr (ppm)	Bi (ppm)	Si (ppm)	Al (ppm)	Co (ppm)	Cu (ppm)	Li (ppm)
Mean	-1.485	0.172	2.767	14.814	1058.026	0.005	0.589	0.258
S.D.	1.090	0.083	5.250	1.061	4.913	0.006	0.310	0.214
% R.S.D.	73.428	48.113	189.736	7.165	0.464	111.641	52.647	82.786
	Zn (ppm)	Ni (ppm)	La (ppm)	Fe (ppm)	Ca (ppm)	Cr (ppm)	Nd (ppm)	U (ppm)
Mean	1.493	1.093	-1.056	-0.036	3.081	20.179	1.836	-41.425
S.D.	0.090	0.448	0.373	0.394	0.037	1.515	2.416	47.721
% R.S.D.	6.021	41.001	35.365	1098.099	1.186	7.508	131.561	115.199
	Ce (ppm)	Sm (ppm)	Ba (ppm)	P (ppm)	S (ppm)	Mg (ppm)	As (ppm)	Na (ppm)
Mean	12.728	-1.486	0.385	101.988	156.598	2.081	-3.994	17485.682
S.D.	10.118	9.264	0.203	4.795	5.739	0.084	1.092	107.045
% R.S.D.	79.494	623.446	52.651	4.701	3.665	4.028	27.342	0.612
	Mo (ppm)	Se (ppm)	Ag (ppm)	Pb (ppm)	Ti (ppm)	Cd (ppm)	B (ppm)	K (ppm)
Mean	0.388	-24.330	-0.128	1.243	-0.423	0.419	4.644	3744.189
S.D.	0.253	4.228	0.583	3.958	0.165	0.106	0.067	30.276
% R.S.D.	65.233	17.378	454.363	318.354	39.085	25.311	1.447	0.809
	Mn (ppm)	Sb (ppm)	V (ppm)	Be (ppm)	Tl (ppm)			
Mean	0.126	-5.205	0.967	0.154	-7.147			
S.D.	0.069	1.914	0.617	0.171	18.507			
% R.S.D.	55.200	36.761	63.849	110.547	258.965			

Identity 1: S96T000090 Identity 2: .1-10 ml

9:36 PM February 12, 1996

Task name : OPTIMA

Sample Weight : 1.0000 Solution Volume : 101.00

WHC-SD-WM-DP-166, REV 1

On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppm)	Sr (ppm)	Bi (ppm)	Si (ppm)	Al (ppm)	Co (ppm)	Cu (ppm)	Li (ppm)
Mean	0.172	0.002	0.468	15.871	1054.785	-0.001	0.245	-0.009
S.D.	0.083	0.006	0.484	0.113	6.587	0.250	0.038	0.018
% R.S.D.	48.618	300.000	103.430	0.710	0.624	19610.045	15.369	199.611

	Zn (ppm)	Ni (ppm)	La (ppm)	Fe (ppm)	Ca (ppm)	Cr (ppm)	Nd (ppm)	U (ppm)
Mean	0.601	1.239	0.047	0.126	0.483	19.069	-0.094	11.277
S.D.	0.019	0.088	0.070	0.187	0.007	0.202	0.258	3.424
% R.S.D.	3.240	7.080	150.464	148.861	1.513	1.057	273.982	30.359

	Ce (ppm)	Sm (ppm)	Ba (ppm)	P (ppm)	S (ppm)	Mg (ppm)	As (ppm)	Na (ppm)
Mean	0.084	-0.608	0.049	103.124	158.110	0.165	-0.183	16717.163
S.D.	0.770	0.587	0.015	0.766	0.439	0.015	0.287	55.552
% R.S.D.	917.220	96.665	30.598	0.743	0.277	8.824	157.495	0.332

	Mo (ppm)	Se (ppm)	Ag (ppm)	Pb (ppm)	Ti (ppm)	Cd (ppm)	B (ppm)	K (ppm)
Mean	1.556	-1.737	-0.215	-1.921	0.086	0.546	3.066	3539.668
S.D.	0.082	1.151	0.015	1.289	0.005	0.021	0.115	9.283
% R.S.D.	5.292	66.281	7.028	67.104	6.089	3.859	3.736	0.262

	Mn (ppm)	Sb (ppm)	V (ppm)	Be (ppm)	Tl (ppm)
Mean	-0.010	-3.124	-0.149	0.084	2.409
S.D.	0.014	2.208	0.015	0.011	0.150
% R.S.D.	145.296	70.666	10.321	12.675	6.229

Identity 1: S96T000090_0 Identity 2: .1-10 ml

9:39 PM February 12, 1996

Task name : OPTIMA

WHC-SD-WM-DP-166, REV. I

Sample Weight : 1.0000 Solution Volume : 101.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppm)	Sr (ppm)	Bi (ppm)	Si (ppm)	Al (ppm)	Co (ppm)	Cu (ppm)	Li (ppm)
Mean	0.258	-0.015	0.719	16.001	1049.724	-0.085	0.179	-0.063
S.D.	0.111	0.015	0.546	0.060	0.770	0.144	0.035	0.027
% R.S.D.	42.991	99.216	75.856	0.372	0.073	169.580	19.391	42.413

	Zn (ppm)	Ni (ppm)	La (ppm)	Fe (ppm)	Ca (ppm)	Cr (ppm)	Nd (ppm)	U (ppm)
Mean	0.524	1.349	-0.076	-0.484	0.521	18.997	-0.704	15.554
S.D.	0.038	0.041	0.192	0.197	0.007	0.197	1.040	5.196
% R.S.D.	7.211	3.026	253.857	40.755	1.403	1.038	147.755	33.408

	Ce (ppm)	Sm (ppm)	Ba (ppm)	P (ppm)	S (ppm)	Mg (ppm)	As (ppm)	Na (ppm)
Mean	-2.271	0.787	0.002	102.631	158.954	0.145	-0.214	16783.856
S.D.	1.060	1.104	0.023	2.975	1.890	0.008	0.218	33.824
% R.S.D.	46.683	140.328	1281.601	2.899	1.189	5.774	102.009	0.202

	Mo (ppm)	Se (ppm)	Ag (ppm)	Pb (ppm)	Ti (ppm)	Cd (ppm)	B (ppm)	K (ppm)
Mean	1.467	1.308	-0.377	-3.449	0.149	0.553	3.221	3559.017
S.D.	0.161	0.329	0.065	0.687	0.014	0.108	0.071	7.290
% R.S.D.	10.972	25.179	17.234	19.904	9.335	19.456	2.199	0.205

	Mn (ppm)	Sb (ppm)	V (ppm)	Be (ppm)	Tl (ppm)
Mean	-0.035	-3.250	-0.205	0.072	-6.613
S.D.	0.038	3.013	0.036	0.020	1.719
% R.S.D.	107.596	92.702	17.542	27.334	25.998

Identity 1: S961000090_A Identity 2: .1sam+2sst5+8hno3

9:42 PM February 12, 1996

Task name : OPTIMA

Sample Weight : 1.0000 Solution Volume : 101.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-166, REV. I

	Zr (ppm)	Sr (ppm)	Bi (ppm)	Si (ppm)	Al (ppm)	Co (ppm)	Cu (ppm)	Li (ppm)
Mean	97.315	97.451	96.597	115.126	1150.007	101.259	97.890	93.278
S.D.	0.236	0.220	1.761	0.262	2.757	0.577	0.259	0.433
% R.S.D.	0.243	0.226	1.823	0.227	0.240	0.570	0.265	0.464

	Zn (ppm)	Ni (ppm)	La (ppm)	Fe (ppm)	Ca (ppm)	Cr (ppm)	Nd (ppm)	U (ppm)
Mean	101.893	100.760	98.363	100.548	97.477	119.994	99.592	188.486
S.D.	0.077	0.329	0.313	1.158	0.183	0.614	0.967	1.767
% R.S.D.	0.075	0.326	0.318	1.152	0.188	0.512	0.971	0.938

	Ce (ppm)	Sm (ppm)	Ba (ppm)	P (ppm)	S (ppm)	Mg (ppm)	As (ppm)	Na (ppm)
Mean	98.406	98.745	96.928	200.691	257.719	97.951	100.842	16905.723
S.D.	0.410	0.461	0.235	2.465	1.868	0.134	0.400	70.902
% R.S.D.	0.417	0.467	0.243	1.228	0.725	0.137	0.397	0.419

	Mo (ppm)	Se (ppm)	Ag (ppm)	Pb (ppm)	Ti (ppm)	Cd (ppm)	B (ppm)	K (ppm)
Mean	101.790	99.662	92.866	99.029	96.959	99.619	101.482	3634.688
S.D.	0.257	4.341	0.265	1.496	0.202	0.374	0.161	9.442
% R.S.D.	0.253	4.356	0.286	1.511	0.208	0.375	0.158	0.260

	Mn (ppm)	Sb (ppm)	V (ppm)	Be (ppm)	Tl (ppm)
Mean	100.313	92.681	100.184	100.373	93.544
S.D.	0.127	1.355	0.132	0.233	1.699
% R.S.D.	0.126	1.462	0.132	0.232	1.816

Identity 1: S96T000091_L Identity 2: 1-4 ml

9:48 PM February 12, 1996

Task name : OPTIMA

Sample Weight : 1.0000 Solution Volume : 5.00

WHC-SD-WM-DP-166, REV. (

On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppm)	Sr (ppm)	Bi (ppm)	Si (ppm)	Al (ppm)	Co (ppm)	Cu (ppm)	Li (ppm)
Mean	-0.003	0.004	0.054	1.637	-0.056	0.012	-0.003	-0.001
S.D.	0.005	0.001	0.023	0.006	0.003	0.012	0.002	0.001
% R.S.D.	174.987	16.013	42.658	0.376	5.763	100.173	65.355	114.576

	Zn (ppm)	Ni (ppm)	La (ppm)	Fe (ppm)	Ca (ppm)	Cr (ppm)	Nd (ppm)	U (ppm)
Mean	0.008	-0.008	0.004	-0.020	0.606	-0.015	-0.051	0.008
S.D.	0.002	0.010	0.006	0.009	0.002	0.002	0.018	0.156
% R.S.D.	18.453	135.756	153.501	47.196	0.255	13.824	35.944	1878.759

	Ce (ppm)	Sm (ppm)	Ba (ppm)	P (ppm)	S (ppm)	Mg (ppm)	As (ppm)	Na (ppm)
Mean	-0.084	0.184	0.062	-0.030	-0.003	0.066	-0.022	0.994
S.D.	0.067	0.052	0.001	0.015	0.004	0.000	0.024	0.025
% R.S.D.	79.868	28.093	1.077	49.789	146.364	0.628	108.709	2.492

	Mo (ppm)	Se (ppm)	Ag (ppm)	Pb (ppm)	Ti (ppm)	Cd (ppm)	B (ppm)	K (ppm)
Mean	-0.028	0.022	-0.015	-0.133	0.000	-0.007	0.262	1.288
S.D.	0.002	0.040	0.004	0.035	0.001	0.003	0.005	0.049
% R.S.D.	8.247	182.487	27.184	25.936	111.080	43.405	1.804	3.837

	Mn (ppm)	Sb (ppm)	V (ppm)	Be (ppm)	Tl (ppm)
Mean	0.001	-0.177	-0.002	-0.001	0.008
S.D.	0.001	0.202	0.005	0.000	0.091
% R.S.D.	100.489	114.363	285.928	1.582	1138.879

Identity 1: S96T000091 Identity 2: Direct

9:51 PM February 12, 1996

Task name : OPTIMA

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-166, REV.1

	Zr (ppm)	Sr (ppm)	Bi (ppm)	Si (ppm)	Al (ppm)	Co (ppm)	Cu (ppm)	Li (ppm)
Mean	0.001	0.004	0.013	1.612	-0.001	-0.001	-0.001	0.000
S.D.	0.001	0.000	0.007	0.028	0.004	0.001	0.000	0.000
% R.S.D.	60.030	3.304	49.697	1.754	319.525	172.581	38.220	93.406
	Zn (ppm)	Ni (ppm)	La (ppm)	Fe (ppm)	Ca (ppm)	Cr (ppm)	Nd (ppm)	U (ppm)
Mean	0.005	0.002	-0.002	-0.003	0.564	-0.003	-0.013	0.037
S.D.	0.001	0.001	0.002	0.001	0.023	0.001	0.008	0.038
% R.S.D.	17.873	68.672	75.866	29.611	4.152	22.758	62.311	101.735
	Ce (ppm)	Sm (ppm)	Ba (ppm)	P (ppm)	S (ppm)	Mg (ppm)	As (ppm)	Na (ppm)
Mean	-0.034	0.024	0.051	-0.001	0.019	0.053	-0.009	0.947
S.D.	0.003	0.007	0.002	0.001	0.003	0.002	0.002	0.032
% R.S.D.	8.920	30.158	3.718	47.189	16.879	4.120	25.125	3.421
	Mo (ppm)	Se (ppm)	Ag (ppm)	Pb (ppm)	Ti (ppm)	Cd (ppm)	B (ppm)	K (ppm)
Mean	-0.004	-0.005	-0.004	-0.018	0.001	-0.003	0.243	0.291
S.D.	0.000	0.007	0.000	0.005	0.000	0.001	0.002	0.004
% R.S.D.	7.281	124.266	6.975	29.333	15.924	20.370	0.773	1.283
	Mn (ppm)	Sb (ppm)	V (ppm)	Be (ppm)	Tl (ppm)			
Mean	0.002	0.014	-0.003	-0.000	-0.022			
S.D.	0.000	0.028	0.001	0.000	0.011			
% R.S.D.	12.950	201.644	24.511	56.905	47.395			

Identity 1: S96T000091_D Identity 2: Direct

9:54 PM February 12, 1996

Task name : OPTIMA

Sample Weight : 1.0000 Solution Volume : 1.00

WHC-SD-WM-DP-166, REV. I

On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppm)	Sr (ppm)	Bi (ppm)	Si (ppm)	Al (ppm)	Co (ppm)	Cu (ppm)	Li (ppm)
Mean	0.002	0.003	0.022	1.610	0.002	-0.004	-0.001	-0.000
S.D.	0.001	0.000	0.013	0.028	0.006	0.001	0.000	0.000
% R.S.D.	70.890	1.991	57.870	1.747	259.995	34.631	40.740	26.953
	Zn (ppm)	Ni (ppm)	La (ppm)	Fe (ppm)	Ca (ppm)	Cr (ppm)	Nd (ppm)	U (ppm)
Mean	0.004	0.004	-0.001	-0.004	0.561	-0.002	-0.026	0.111
S.D.	0.000	0.002	0.001	0.003	0.020	0.000	0.005	0.037
% R.S.D.	7.173	39.803	86.296	85.161	3.553	7.174	17.681	33.085
	Ce (ppm)	Sm (ppm)	Ba (ppm)	P (ppm)	S (ppm)	Hg (ppm)	As (ppm)	Na (ppm)
Mean	-0.066	-0.012	0.050	-0.000	0.020	0.052	-0.010	0.941
S.D.	0.010	0.008	0.002	0.002	0.006	0.002	0.005	0.032
% R.S.D.	14.406	64.228	3.637	556.809	28.432	3.039	55.095	3.414
	Mo (ppm)	Se (ppm)	Ag (ppm)	Pb (ppm)	Ti (ppm)	Cd (ppm)	B (ppm)	K (ppm)
Mean	-0.005	0.003	-0.005	-0.024	0.001	-0.001	0.244	0.172
S.D.	0.000	0.014	0.001	0.014	0.001	0.001	0.003	0.018
% R.S.D.	6.996	407.397	15.306	60.780	35.186	75.879	1.323	10.286
	Mn (ppm)	Sb (ppm)	V (ppm)	Be (ppm)	Tl (ppm)			
Mean	0.002	-0.032	-0.004	-0.000	-0.025			
S.D.	0.000	0.019	0.001	0.000	0.023			
% R.S.D.	0.682	59.653	28.467	37.853	95.120			

Identity 1: S96T000091_A Identity 2: 4ml sam + 1ml sst5

9:57 PM February 12, 1996

Task name : OPTIMA

Sample Weight : 1.0000 Solution Volume : 1.25

On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-166, REV. I

	Zr (ppm)	Sr (ppm)	Bi (ppm)	Si (ppm)	Al (ppm)	Co (ppm)	Cu (ppm)	Li (ppm)
Mean	1.281	1.310	1.292	2.974	1.284	1.320	1.330	1.309
S.D.	0.003	0.012	0.017	0.005	0.006	0.005	0.015	0.023
% R.S.D.	0.201	0.940	1.347	0.173	0.455	0.405	1.127	1.773

	Zn (ppm)	Ni (ppm)	La (ppm)	Fe (ppm)	Ca (ppm)	Cr (ppm)	Nd (ppm)	U (ppm)
Mean	1.320	1.307	1.304	1.311	1.942	1.299	1.307	2.529
S.D.	0.005	0.002	0.010	0.009	0.016	0.006	0.008	0.164
% R.S.D.	0.413	0.120	0.753	0.692	0.833	0.461	0.617	6.471

	Ce (ppm)	Sm (ppm)	Ba (ppm)	P (ppm)	S (ppm)	Mg (ppm)	As (ppm)	Na (ppm)
Mean	1.274	1.327	1.375	1.269	1.299	1.330	1.303	2.273
S.D.	0.036	0.023	0.015	0.028	0.009	0.003	0.012	0.018
% R.S.D.	2.787	1.757	1.104	2.228	0.677	0.219	0.904	0.774

	Mo (ppm)	Se (ppm)	Ag (ppm)	Pb (ppm)	Ti (ppm)	Cd (ppm)	B (ppm)	K (ppm)
Mean	1.288	1.350	1.263	1.228	1.276	1.299	1.553	1.332
S.D.	0.005	0.009	0.003	0.025	0.007	0.001	0.005	0.058
% R.S.D.	0.414	0.670	0.237	2.064	0.524	0.040	0.350	4.369

	Mn (ppm)	Sb (ppm)	V (ppm)	Be (ppm)	Tl (ppm)
Mean	1.302	1.168	1.295	1.360	1.272
S.D.	0.005	0.053	0.003	0.010	0.085
% R.S.D.	0.417	4.559	0.195	0.727	6.701

Identity 1: ICSA Identity 2: Quality Control

10:00 PM February 12, 1996

Task name : OPTIMA

Sample Weight : 1.0000 Solution Volume : 1.00

WHC-SD-WM-DP-166, REV. I

On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppm)	Sr (ppm)	Bi (ppm)	Si (ppm)	Al (ppm)	Co (ppm)	Cu (ppm)	Li (ppm)
Mean	0.008	0.002	0.006	0.013	196.983	-0.003	0.000	-0.000
S.D.	0.001	0.000	0.004	0.002	0.386	0.001	0.000	0.000
% R.S.D.	8.218	5.196	61.447	14.731	0.196	41.092	29.441	81.406
	Zn (ppm)	Ni (ppm)	La (ppm)	Fe (ppm)	Ca (ppm)	Cr (ppm)	Nd (ppm)	U (ppm)
Mean	-0.005	0.002	0.006	97.815	100.962	0.003	0.010	0.093
S.D.	0.000	0.001	0.001	0.275	0.242	0.002	0.007	0.038
% R.S.D.	4.014	45.794	22.731	0.281	0.240	60.187	65.495	40.878
	Ce (ppm)	Sm (ppm)	Ba (ppm)	P (ppm)	S (ppm)	Mg (ppm)	As (ppm)	Na (ppm)
Mean	-0.011	0.052	0.003	0.029	-0.013	98.442	0.010	194.762
S.D.	0.008	0.007	0.000	0.009	0.005	0.144	0.007	0.294
% R.S.D.	77.361	14.202	6.668	31.301	40.269	0.146	72.535	0.151
	Mo (ppm)	Se (ppm)	Ag (ppm)	Pb (ppm)	Ti (ppm)	Cd (ppm)	B (ppm)	K (ppm)
Mean	-0.002	-0.007	-0.000	-0.027	0.001	0.002	0.014	-0.018
S.D.	0.001	0.010	0.000	0.006	0.000	0.001	0.002	0.014
% R.S.D.	44.768	137.689	94.798	20.511	15.731	47.522	11.247	75.944
	Mn (ppm)	Sb (ppm)	V (ppm)	Be (ppm)	Tl (ppm)			
Mean	0.002	-0.059	-0.002	0.002	0.010			
S.D.	0.001	0.031	0.001	0.000	0.021			
% R.S.D.	44.673	51.536	29.814	0.200	204.585			

Identity 1: ICSAB Identity 2: Quality Control

10:02 PM February 12, 1996

Task name: OPTIMA

Sample Weight : 1.0000 Solution Volume : 1.00

WHC-SD-WM-DP-166, REV I

On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppm)	Sr (ppm)	Bi (ppm)	Si (ppm)	Al (ppm)	Co (ppm)	Cu (ppm)	Li (ppm)
Mean	0.004	0.002	-0.038	0.010	196.594	0.484	0.511	1.001
S.D.	0.002	0.000	0.003	0.004	0.899	0.001	0.002	0.007
% R.S.D.	45.243	8.813	9.023	35.035	0.457	0.296	0.485	0.658
	Zn (ppm)	Ni (ppm)	La (ppm)	Fe (ppm)	Ca (ppm)	Cr (ppm)	Nd (ppm)	U (ppm)
Mean	0.977	0.970	-0.001	98.232	100.922	0.497	0.032	0.043
S.D.	0.001	0.001	0.004	0.088	0.288	0.001	0.004	0.059
% R.S.D.	0.097	0.130	279.531	0.090	0.285	0.282	13.224	136.857
	Ce (ppm)	Sm (ppm)	Ba (ppm)	P (ppm)	S (ppm)	Mg (ppm)	As (ppm)	Na (ppm)
Mean	-0.012	0.052	0.521	0.019	-0.016	97.369	0.005	196.079
S.D.	0.015	0.013	0.002	0.006	0.007	0.359	0.003	1.088
% R.S.D.	127.487	25.809	0.462	31.636	43.347	0.369	63.344	0.555
	Mo (ppm)	Se (ppm)	Ag (ppm)	Pb (ppm)	Ti (ppm)	Cd (ppm)	B (ppm)	K (ppm)
Mean	-0.005	0.024	1.005	0.963	0.000	0.985	0.013	-0.054
S.D.	0.001	0.014	0.000	0.006	0.000	0.002	0.001	0.015
% R.S.D.	23.513	56.994	0.046	0.605	91.717	0.233	8.631	27.082
	Mn (ppm)	Sb (ppm)	V (ppm)	Be (ppm)	Tl (ppm)			
Mean	0.498	0.020	0.493	0.508	-0.001			
S.D.	0.001	0.005	0.001	0.001	0.028			
% R.S.D.	0.190	27.175	0.130	0.265	1973.358			

Identity 1: CCV Identity 2: Quality Control 10:06 PM February 12, 1996

Task name : OPTIMA

Sample Weight : 1.0000 Solution Volume : 1.00

On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-166, REV. I

	Zr (ppm)	Sr (ppm)	Bi (ppm)	Si (ppm)	Al (ppm)	Co (ppm)	Cu (ppm)	Li (ppm)
Mean	4.931	4.981	4.958	4.764	4.881	5.025	5.029	5.017
S.D.	0.019	0.029	0.028	0.010	0.023	0.011	0.035	0.047
% R.S.D.	0.388	0.586	0.572	0.202	0.462	0.222	0.701	0.944
	Zn (ppm)	Ni (ppm)	La (ppm)	Fe (ppm)	Ca (ppm)	Cr (ppm)	Nd (ppm)	U (ppm)
Mean	5.013	4.973	5.005	5.035	4.986	5.005	5.134	9.694
S.D.	0.005	0.009	0.035	0.021	0.029	0.024	0.022	0.025
% R.S.D.	0.109	0.188	0.692	0.420	0.577	0.471	0.429	0.256
	Ce (ppm)	Sm (ppm)	Ba (ppm)	P (ppm)	S (ppm)	Mg (ppm)	As (ppm)	Na (ppm)
Mean	5.102	5.036	5.002	4.984	4.958	4.894	5.032	4.981
S.D.	0.013	0.020	0.033	0.043	0.011	0.007	0.009	0.039
% R.S.D.	0.258	0.388	0.655	0.860	0.228	0.149	0.176	0.791
	Mo (ppm)	Se (ppm)	Ag (ppm)	Pb (ppm)	Ti (ppm)	Cd (ppm)	B (ppm)	K (ppm)
Mean	5.014	5.049	4.911	4.942	4.910	4.977	5.065	5.027
S.D.	0.009	0.032	0.010	0.030	0.021	0.017	0.030	0.017
% R.S.D.	0.184	0.640	0.213	0.597	0.423	0.344	0.601	0.341
	Mn (ppm)	Sb (ppm)	V (ppm)	Be (ppm)	Tl (ppm)			
Mean	4.994	4.677	5.015	5.147	4.869			
S.D.	0.012	0.009	0.014	0.024	0.031			
% R.S.D.	0.241	0.201	0.289	0.472	0.638			

Identity 1: CCB

Identity 2: Quality Control

10:09 PM February 12, 1996

Task name : OPTIMA

Sample Weight : 1.0000 Solution Volume : 1.00

WHC-SD-WM-DP-166, REV. 1

On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppm)	Sr (ppm)	Bi (ppm)	Si (ppm)	Al (ppm)	Co (ppm)	Cu (ppm)	Li (ppm)
Mean	0.002	0.000	-0.004	0.005	-0.016	0.002	-0.001	-0.000
S.D.	0.002	0.000	0.004	0.005	0.005	0.000	0.001	0.000
% R.S.D.	126.559	326.917	105.282	105.148	33.206	0.518	101.978	826.626
	Zn (ppm)	Ni (ppm)	La (ppm)	Fe (ppm)	Ca (ppm)	Cr (ppm)	Nd (ppm)	U (ppm)
Mean	0.000	0.001	0.003	0.000	0.000	-0.001	-0.002	0.095
S.D.	0.000	0.001	0.003	0.001	0.000	0.001	0.017	0.099
% R.S.D.	411.412	102.744	107.718	340.041	24.744	52.467	671.597	104.444
	Ce (ppm)	Sm (ppm)	Ba (ppm)	P (ppm)	S (ppm)	Mg (ppm)	As (ppm)	Na (ppm)
Mean	-0.006	0.043	-0.000	-0.003	-0.006	0.000	-0.008	0.011
S.D.	0.023	0.019	0.001	0.005	0.001	0.000	0.002	0.006
% R.S.D.	385.345	44.253	462.556	194.723	14.826	152.753	19.982	49.604
	Mo (ppm)	Se (ppm)	Ag (ppm)	Pb (ppm)	Ti (ppm)	Cd (ppm)	B (ppm)	K (ppm)
Mean	-0.003	0.021	-0.002	-0.012	0.001	-0.001	0.003	0.108
S.D.	0.001	0.022	0.001	0.011	0.001	0.001	0.001	0.009
% R.S.D.	16.700	101.763	65.660	93.423	60.889	100.220	30.652	8.540
	Mn (ppm)	Sb (ppm)	V (ppm)	Be (ppm)	Tl (ppm)			
Mean	-0.000	0.007	-0.001	-0.000	-0.009			
S.D.	0.000	0.032	0.001	0.000	0.056			
% R.S.D.	135.820	495.285	98.011	84.037	645.515			

02-12-96

WHC-SD-WM-DP-166, REV. 1

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LABCORE Data Entry Template for Worklist#

5000

Analyst: SLH Instrument: TOC01 Book # TOC 16N12-D
Method: LA-344-105 Rev/Mod C-O TOC spk 11N12-G
Worklist Comment: TOC combustion AP-108 & 25-2

GROUP	PROJECT	S TYPE	SAMPLE#	R A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 BLNK			TOC-01	LIQUID	1	2.7	N/A	ug/mL
		2 STD			TOC-01	LIQUID	3.00e3	2.88e3	N/A	ug/mL
96000010	AP-108 GRAB	3 SAMPLE	S96T000090	0	TOC-01	LIQUID	3.81e2	3.68e2	7.00e0	ug/mL
96000010	AP-108 GRAB	4 DUP	S96T000090	0	TOC-01	LIQUID	3.87e2	3.88e2	N/A	ug/mL
96000010	AP-108 GRAB	5 SPK	S96T000090	0	TOC-01	LIQUID	100	115.5	N/A	ug/mL
96000010	AP-108 GRAB	6 SAMPLE	S96T000091	0	TOC-01	LIQUID	1.95e1	2.37e1	5.50e0	ug/mL
96000010	AP-108 GRAB	7 DUP	S96T000091	0	TOC-01	LIQUID	5.50	5.50	N/A	ug/mL
96000011	AP-108 GRAB	8 SAMPLE	S96T000097	0	TOC-01	LIQUID	3.91e2	3.88e2	7.00e0	ug/mL
95000224	ORG/AQ SAMPL	9 SAMPLE	S96R000041	0	TOC-01	LIQUID	N/A	7.55e3	5.50e1	ug/mL
95000224	ORG/AQ SAMPL	10 SAMPLE	S96R000042	0	TOC-01	LIQUID	N/A	6.77e3	5.50e1	ug/mL
95000224	ORG/AQ SAMPL	11 SPK	S96R000042	0	TOC-01	LIQUID	100	108.8	N/A	ug/mL
95000224	ORG/AQ SAMPL	12 SPK-DUP	S96R000042	0	TOC-01	LIQUID	108.8	107.6	N/A	ug/mL

Final page for worklist #

5000

Analyst Signature: Sandra Hord Date: 1/29/96

Analyst Signature: Kim Conlin Date: 1/29/96

Reviewed By: RW Schoedon Date: 2/1/96

Data Entry Comments:

Sample results were changed because the wrong blank value was used in the calculations of the sample results. Date 4/10/96

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

TOC: LA-344-105 (C-0)

WORKLIST
#

ANALYST

SIGNATURE

ANALYSIS

DATE

INSTRUMENT

CODE

ANALYSIS

TIME

Sandra H. H. Bostig 1-24-90

5000

0530

☒ SAMPLE STANDARD	☐ DUPLICATE BASELINE	☐ SPIKE BLANK	☐ TRIPLICATE
SAMPLE # =			
STD # =			
Amount of SAMPLE Used (mL)			
Volume H2SO4 Added to SAMPLE (mL)			
Volume INJECTED (mL)			
Was Sample Dilution Used for SPIKE? Y or N			
Amount SPIKE Standard Added (mL)			
Volume H2SO4 Added to SAMPLE + SPIKE (mL)			
Final Coulometer Reading in μg Carbon (Optional)			

DF 11

☒ SAMPLE STANDARD	☐ DUPLICATE BASELINE	☐ SPIKE BLANK	☐ TRIPLICATE
SAMPLE # = 59670090			
STD # =			
Amount of SAMPLE Used (mL)			
Volume H2SO4 Added to SAMPLE (mL)			
Volume INJECTED (mL)			
Was Sample Dilution Used for SPIKE? Y or N			
Amount SPIKE Standard Added (mL)			
Volume H2SO4 Added to SAMPLE + SPIKE (mL)			
Final Coulometer Reading in μg Carbon (Optional)			

DF 1.4

☐ SAMPLE STANDARD	☐ DUPLICATE BASELINE	☒ SPIKE BLANK	☐ TRIPLICATE
SAMPLE # =			
STD # =			
Amount of SAMPLE Used (mL)			
Volume H2SO4 Added to SAMPLE (mL)			
Volume INJECTED (mL)			
Was Sample Dilution Used for SPIKE? Y or N			
Amount SPIKE Standard Added (mL)			
Volume H2SO4 Added to SAMPLE + SPIKE (mL)			
Final Coulometer Reading in μg Carbon (Optional)			

DF 3

☐ SAMPLE STANDARD	☒ DUPLICATE BASELINE	☐ SPIKE BLANK	☐ TRIPLICATE
SAMPLE # = 59670091			
STD # =			
Amount of SAMPLE Used (mL)			
Volume H2SO4 Added to SAMPLE (mL)			
Volume INJECTED (mL)			
Was Sample Dilution Used for SPIKE? Y or N			
Amount SPIKE Standard Added (mL)			
Volume H2SO4 Added to SAMPLE + SPIKE (mL)			
Final Coulometer Reading in μg Carbon (Optional)			

DF 1.1

☒ SAMPLE STANDARD	☐ DUPLICATE BASELINE	☐ SPIKE BLANK	☐ TRIPLICATE
SAMPLE # =			
STD # =			
Amount of SAMPLE Used (mL)			
Volume H2SO4 Added to SAMPLE (mL)			
Volume INJECTED (mL)			
Was Sample Dilution Used for SPIKE? Y or N			
Amount SPIKE Standard Added (mL)			
Volume H2SO4 Added to SAMPLE + SPIKE (mL)			
Final Coulometer Reading in μg Carbon (Optional)			

DF 1.1

☒ SAMPLE STANDARD	☐ DUPLICATE BASELINE	☐ SPIKE BLANK	☐ TRIPLICATE
SAMPLE # =			
STD # =			
Amount of SAMPLE Used (mL)			
Volume H2SO4 Added to SAMPLE (mL)			
Volume INJECTED (mL)			
Was Sample Dilution Used for SPIKE? Y or N			
Amount SPIKE Standard Added (mL)			
Volume H2SO4 Added to SAMPLE + SPIKE (mL)			
Final Coulometer Reading in μg Carbon (Optional)			

DF 1.4

☐ SAMPLE STANDARD	☒ DUPLICATE BASELINE	☐ SPIKE BLANK	☐ TRIPLICATE
SAMPLE # = 59670090			
STD # =			
Amount of SAMPLE Used (mL)			
Volume H2SO4 Added to SAMPLE (mL)			
Volume INJECTED (mL)			
Was Sample Dilution Used for SPIKE? Y or N			
Amount SPIKE Standard Added (mL)			
Volume H2SO4 Added to SAMPLE + SPIKE (mL)			
Final Coulometer Reading in μg Carbon (Optional)			

DF 1.4

☒ SAMPLE STANDARD	☐ DUPLICATE BASELINE	☐ SPIKE BLANK	☐ TRIPLICATE
SAMPLE # = 59670091			
STD # =			
Amount of SAMPLE Used (mL)			
Volume H2SO4 Added to SAMPLE (mL)			
Volume INJECTED (mL)			
Was Sample Dilution Used for SPIKE? Y or N			
Amount SPIKE Standard Added (mL)			
Volume H2SO4 Added to SAMPLE + SPIKE (mL)			
Final Coulometer Reading in μg Carbon (Optional)			

DF 1.1

WHC-SD-WM-DP-166, REV. 1

6.3

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-166, REV. I

TOC : LA-344-105 (C-0)

LIQUIDS

		BLANK
Type	Sample Volume in mL (SS)	0.200
BLANK	H2SO4 Volume in mL (VR)	2.000
Work List	Volume Injected in mL (VI)	0.200
5000	Dilution Factor (DF)	1
Test Code	Digest Dilution Factor (DDF)	1
TOC01	µg of Carbon in Sample (C1)	4.7
Matrix	µg of Carbon in Blank (C2)	2
LIQUID	g of Carbon/L =	2.7 1.35E-02
Sample #		
	g of Carbon/L =	$\frac{(C1-C2) \cdot DF \cdot DDF}{VI \cdot 1000}$ <i>RWS 4/16/96</i>
Instrument Code		
WC16130		
Analyst		
S. HOOD-BOATRIGHT		
Date		
01/24/96		
Time		
10:01 PM		
	Detection Level (µg/mL)	$\frac{1 \mu g C \cdot DF \cdot DDF}{VI}$ <i>14.7-2.0 = 2.7</i>

µg Carbon/mL =	2.7	DETECTION LEVEL
	1.35E+01 <i>RWS 4/16/96</i>	in µg/mL
		5.00E+00

Data Entry by: <i>RWS</i>	Date: 01/26/96
Approved by: <i>RWS</i>	Date: 1/29/96

Form 344105_C Rev. 1.1

Page 1 of 1

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-166, REV. I

TOC : LA-344-105 (C-0)

LIQUIDS

STANDARD

Type	Sample Volume in mL	(SS)	0.200
STANDARD	H2SO4 Volume in mL	(VR)	2.000
Work List	Volume Injected in mL	(VI)	0.200
5000	Dilution Factor	(DF)	11
Test Code	Digest Dilution Factor	(DDF)	1
TOC01	µg of Carbon in Sample	(C1)	54.3
Matrix	µg of Carbon in Blank	(C2)	2
LIQUID	g of Carbon/L	=	2.88E+00
Sample #			
16N12D	g of Carbon/L	=	$\frac{(C1-C2) * DF * DDF}{VI * 1000}$
Instrument Code			
WC16130			
Analyst	µg of Carbon/mL	=	g of Carbon/L * 1000000 µg/g / 1000 mL/L
S. HOOD-BOATRIGHT			
Date			
01/24/96	Detection Level (µg/mL)	=	$\frac{1 \mu g C * DF * DDF}{VI}$
Time			
10:01 PM			

µg Carbon/mL =	2.88E+03	DETECTION LEVEL
		in µg/mL 5.50E+01

Data Entry by:	Nora Wright	Date:	01/26/96
Approved by:	RUS [Signature]	Date:	1/29/96
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PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

TOC : LA-344-105 (C-0)

LIQUIDS

		Sample
Type	Sample Volume in mL (SS)	1.000
Sample	H2SO4 Volume in mL (VR)	0.400
Work List	Volume Injected in mL (VI)	0.200
5000	Dilution Factor (DF)	1.4
Test Code	Digest Dilution Factor (DDF)	1
TOC-01	µg of Carbon in Sample (C1)	57.3
Matrix	µg of Carbon in Blank (C2)	2
Liquid	g of Carbon/L =	3.87E-01
Sample #		
S95T000090	g of Carbon/L = $\frac{(C1-C2) \cdot DF \cdot DDF}{VI \cdot 1000}$	
Instrument Code		
Analyst	µg of Carbon/mL = g of Carbon/L * 1000000 µg/g / 1000 mL/L	
SL Boatright		
Date		
01/24/96	Detection Level (µg/mL) = $\frac{1 \mu\text{g C} \cdot DF \cdot DDF}{VI}$	
Time		

µg Carbon/mL = 3.87E+02	DETECTION LEVEL
	in µg/mL 7.00E+00

Data Entry by: <i>RWS</i>	Date: 04/09/96
Approved by: <i>RW Schneider</i>	Date: 4/9/96

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PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

TOC : LA-344-105 (C-0)

LIQUIDS

Sample Duplicate

Type	Sample Volume in mL	(SS)	1.000
Sample Duplicate	H2SO4 Volume in mL	(VR)	0.400
Work List	Volume Injected in mL	(VI)	0.200
5000	Dilution Factor	(DF)	1.4
Test Code	Digest Dilution Factor	(DDF)	1
TOC-01	µg of Carbon in Sample	(C1)	60.1
Matrix	µg of Carbon in Blank	(C2)	2
Liquid	g of Carbon/L	=	4.07E-01
Sample #			
S95T000090	g of Carbon/L = $\frac{(C1-C2) \cdot DF \cdot DDF}{VI \cdot 1000}$		
Instrument Code			
Analyst			
SL Boatright	µg of Carbon/mL = g of Carbon/L * 1000000 µg/g / 1000 mL/L		
Date			
01/24/96	Detection Level (µg/mL) = $\frac{1 \mu\text{g C} \cdot DF \cdot DDF}{VI}$		
Time			

µg Carbon/mL = 4.07E+02

DETECTION LEVEL

in µg/mL

7.00E+00

Data Entry by:

RWS

Date:

04/09/96

Approved by:

RW, Schaefer

Date:

4/9/96

Form 344105_C Rev. 1.1

Page 1 of 1

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

TOC: LA-344-105
SPIKED SAMPLE
SPIKE

Type	>>>>> Sample Vial Data <<<<<<		>>>>> Spiked Vial Data <<<<<<	
SPIKE	Sample Volume in mL	1.000	Sample Size in mL (SS)	0.400
Work List	H2SO4 Volume in mL	0.400	Spike Volume in mL	0.400
5000	Volume Injected in mL	0.200	H2SO4 Volume in mL	0.400
Test Code	ug of Carbon in Sample	57.3	Volume Injected in mL	0.200
toc-01	ug of Carbon in Blank	2	Sample Pre-Spike Dil. Factor (PDF)	1
Matrix			Spike Value (ug/mL)	748
Liquid			ug C in Sample + Spike	85.4
Sample #			ug C in Blank	2
S95T000090				
Instrument Code				
Analyst	PERCENT SPIKE RE = $\frac{\text{ug Carbon Recovered from Spike} * 100}{\text{ug Carbon in Spike}}$			
SL Baotright	WHERE : $\text{ug Carbon Recovered from Spike} = [(\text{ugC in sample} + \text{spike} - \text{ugC in blank}) * (\text{Spike Correction Factor})]$			
Date	- [$(\text{ugC sample} - \text{ugC blank}) * (\text{Sample Correction Factor}) * (\text{Sample Size Correction Factor}) * (\text{PDF})$]			
01/24/96				
Time				

Spike Correction Factor = $\frac{\text{Total volume in spiked sample vial (mL)}}{\text{Volume injected (mL)}}$

Sample Correction Factor = $\frac{\text{Total volume in sample vial (mL)}}{\text{Volume injected (mL)}}$

Sample Size Correction Factor = $\frac{\text{Sample size in (mL) in spiked vial}}{\text{Sample size (mL) in sample}}$

Sample Pre-Spike Dilution Factor = $\frac{1}{\text{Dilution of Sample Before Added to Spike Vial}}$

WHERE : $\text{ug Carbon in Spike} = \text{Spike Value (ug/mL)} * \text{Spike Volume (mL)}$

Percent Spike Recovery 115.5%

Data Entry by:	RWS	Date: 09-Apr-96
Approved by:	Rw. Schroeder	Date: 4/9/96

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

TOC : LA-344-105 (C-0)

LIQUIDS

		Sample
Type	Sample Volume in mL (SS)	2.000
Sample	H2SO4 Volume in mL (VR)	0.200
Work List	Volume Injected in mL (VI)	0.200
5000	Dilution Factor (DF)	1.1
Test Code	Digest Dilution Factor (DDF)	1
TOC-01	µg of Carbon in Sample (C1)	5.5
Matrix	µg of Carbon in Blank (C2)	2
Liquid	g of Carbon/L =	1.93E-02
Sample #		
S95T000091	g of Carbon/L = $\frac{(C1-C2) \cdot DF \cdot DDF}{VI \cdot 1000}$	
Instrument Code		
Analyst	µg of Carbon/mL = g of Carbon/L * 1000000 µg/g / 1000 mL/L	
SL Boatright		
Date		
01/24/96	Detection Level (µg/mL) = $\frac{1 \mu\text{g C} \cdot DF \cdot DDF}{VI}$	
Time		

µg Carbon/mL = 1.93E+01	DETECTION LEVEL
	in µg/mL 5.50E+00

Data Entry by: <i>RWS</i>	Date: 04/09/96
Approved by: <i>RW Schneider</i>	Date: 4/9/96

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PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

TOC : LA-344-105 (C-0)		LIQUIDS		Sample Duplicate	
Type	Sample Volume in mL	(SS)			2.000
Sample Duplicate	H2SO4 Volume in mL	(VR)			0.200
Work List	Volume Injected in mL	(VI)			0.200
5000	Dilution Factor	(DF)			1.1
Test Code	Digest Dilution Factor	(DDF)			1
TOC-01	µg of Carbon in Sample	(C1)			6.3
Matrix	µg of Carbon in Blank	(C2)			2
Liquid	g of Carbon/L	=			2.37E-02
Sample #					
S95T000091	g of Carbon/L = $\frac{(C1-C2) \cdot DF \cdot DDF}{VI \cdot 1000}$				
Instrument Code					
Analyst	µg of Carbon/mL = g of Carbon/L * 1000000 µg/g / 1000 mL/L				
SL Boatright					
Date	Detection Level (µg/mL) = $\frac{1 \mu g C \cdot DF \cdot DDF}{VI}$				
01/24/96					
Time					

µg Carbon/mL =	2.37E+01	DETECTION LEVEL
		in µg/mL
		5.50E+00

Data Entry by:	<i>RWS</i>	Date:	04/09/96
Approved by:	<i>Rw. Schneider</i>	Date:	4/9/96
Form 344105_C Rev. 1.1		Page 1 of 1	

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

TOC : LA-344-105 (C-0)

LIQUIDS

		Sample
Type	Sample Volume in mL (SS)	1.000
Sample	H2SO4 Volume in mL (VR)	0.400
Work List	Volume Injected in mL (VI)	0.200
5000	Dilution Factor (DF)	1.4
Test Code	Digest Dilution Factor (DDF)	1
TOC-01	µg of Carbon in Sample (C1)	59
Matrix	µg of Carbon in Blank (C2)	2
Liquid	g of Carbon/L =	3.99E-01
Sample #	g of Carbon/L = $\frac{(C1-C2) \cdot DF \cdot DDF}{VI \cdot 1000}$	
S95T000097		
Instrument Code		
Analyst	µg of Carbon/mL = g of Carbon/L * 1000000 µg/g / 1000 mL/L	
SL Boatright		
Date	Detection Level (µg/mL) = $\frac{1 \mu\text{g C} \cdot DF \cdot DDF}{VI}$	
01/24/96		
Time		

µg Carbon/mL = 3.99E+02	DETECTION LEVEL
	In µg/mL 7.00E+00

Data Entry by: <u>BWS</u>	Date: <u>04/09/96</u>
Approved by: <u>BWS Schneider</u>	Date: <u>4/9/96</u>

Form 344105_C Rev. 1.1

Page 1 of 1

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0 WHC-SD-WM-DP-166, REV. 1
<<< BLANK ANALYSIS >>>

Sample: BLK

Date: 01/23/96

Time: 22:01:07

Sample Size = 200 uL
Dil Factor = 1
Blank ID # = BLK
Blank Value = N/A

Analyst : SL HOOD
Min Readings = 14
Max Readings = 14
% Difference = 10

== Reading ==	Analysis Time ==	Coulometer ==	% Difference ==
1	0.51	0.00	0.00
2	1.01	0.20	100.00
3	1.51	0.60	66.67
4	2.01	1.00	40.00
5	2.51	1.10	9.09
6	3.01	1.30	15.38
7	3.51	1.40	7.14
8	4.00	1.40	0.00
9	4.50	1.60	12.50
10	5.00	1.70	5.88
11	5.50	1.90	10.53
12	6.00	1.90	0.00
13	6.50	2.00	5.00
14	7.00	2.00	0.00

BLANK VALUE = 2 micrograms carbon
BLANK FACTOR = 2 / 7.004028 =

+2.9E-01 ug/min Carbon

Sample Run By: Sandra Hood Bortright 1-24-96
SL HOOD 00000

SIGNATURE ABOVE REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 166 TO 176.

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-166, REV. /

Sample: B-2

Date: 01/23/96

Time: 22:55:27

Sample Size = 200 uL
Dil Factor = 1
Blank ID # = BLK
Blank Value = .28555 ug/minute C

Analyst : SL HOOD
Min Readings = 14
Max Readings = 14
% Difference = 10

== Reading ==	==== Analysis Time ==	==== Coulometer ==	==== % Difference ==
1	0.51	0.00	0.00
2	1.01	0.50	100.00
3	1.51	1.50	66.67
4	2.01	2.20	31.82
5	2.51	2.60	15.38
6	3.01	2.90	10.34
7	3.51	3.10	6.45
8	4.01	3.40	8.82
9	4.51	3.70	8.11
10	5.01	3.90	5.13
11	5.51	4.10	4.88
12	6.01	4.30	4.65
13	6.51	4.50	4.44
14	7.00	4.70	4.26

BLANK VALUE = 2 micrograms carbon
BLANK FACTOR = 2 / 7.004028 =

+2.9E-01 ug/min Carbon

SAMPLE RESULTS:

(4.7 - 2.000244) (1)/(200) =
(4.7 - 2.000244) (1)/(200) (12) =

+1.3E-02 g/L Carbon
+1.1E-03 Molar Carbon

Sample Run By:

SL HOOD

00000

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-166, REV. 1

Sample: STD

Date: 01/23/96

Time: 22:45:23

Sample Size = 200 uL
Dil Factor = 11
Blank ID # = BLK
Blank Value = .28555 ug/minute C

Analyst : SL HOOD
Min Readings = 14
Max Readings = 14
% Difference = 10

Reading	Analysis Time	Coulometer	% Difference
1	0.51	0.00	0.00
2	1.01	4.10	100.00
3	1.51	23.80	82.77
4	2.00	37.90	37.20
5	2.50	45.30	16.34
6	3.00	48.60	6.79
7	3.51	50.30	3.38
8	4.01	51.40	2.14
9	4.50	52.10	1.34
10	5.00	52.70	1.14
11	5.50	53.20	0.94
12	6.01	53.70	0.93
13	6.51	54.00	0.56
14	7.00	54.30	0.55

BLANK VALUE = 2 micrograms carbon
BLANK FACTOR = 2 / 7.004028 =

+2.9E-01 ug/min Carbon

SAMPLE RESULTS:

(54.3 - 2.000209) (11)/(200) =
(54.3 - 2.000209) (11)/(200) (12) =

+2.88E+00 g/L Carbon
+2.40E-01 Molar Carbon

.200 - 2nd .571504

Sample Run By:

SL HOOD

00000

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-166, REV. 1

Sample: S96T0090

Date: 01/24/96

Time: 01:57:14

Sample Size = 200 uL

Dil Factor = 1.4

Blank ID # = BLK

Blank Value = .28555 ug/minute C

Analyst : SL HOOD

Min Readings = 14

Max Readings = 14

% Difference = 10

Reading	Analysis Time	Coulometer	% Difference
1	0.51	0.00	0.00
2	1.01	12.30	100.00
3	1.51	30.50	59.67
4	2.01	37.10	17.79
5	2.51	41.20	9.95
6	3.01	44.30	7.00
7	3.51	46.90	5.54
8	4.01	49.00	4.29
9	4.50	50.80	3.54
10	5.00	52.40	3.05
11	5.50	53.80	2.60
12	6.00	55.10	2.36
13	6.50	56.20	1.96
14	7.00	57.30	1.92

BLANK VALUE = 2 micrograms carbon
BLANK FACTOR = 2 / 7.004028 =

+2.9E-01 ug/min Carbon

SAMPLE RESULTS:

(57.3 - 1.999991) (1.4) / (200) =
(57.3 - 1.999991) (1.4) / (200) (12) =

+3.87E-01 g/L Carbon
+3.23E-02 Molar Carbon

1 ml + .400 ml 2M H₂SO₄

Sample Run By:

SL HOOD

00000

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-166, REV. 1

Sample: S96T0090 DUP Date: 01/24/96 Time: 02:06:34

Sample Size = 200 uL
Dil Factor = 1.4
Blank ID # = BLK
Blank Value = .28555 ug/minute C

Analyst: SL HOOD
Min Readings = 14
Max Readings = 14
% Difference = 10

== Reading ==	==== Analysis Time ==	==== Coulometer ==	==== % Difference ==
1	0.51	0.60	0.00
2	1.01	12.90	95.35
3	1.50	31.50	59.05
4	2.01	38.30	17.75
5	2.51	42.90	10.72
6	3.01	46.10	6.94
7	3.51	48.80	5.53
8	4.00	51.20	4.69
9	4.50	53.10	3.58
10	5.00	54.70	2.93
11	5.50	56.20	2.67
12	6.00	57.80	2.77
13	6.50	58.90	1.87
14	7.00	60.10	2.00

BLANK VALUE = 2 micrograms carbon
BLANK FACTOR = 2 / 7.004028 =

+2.9E-01 ug/min Carbon

SAMPLE RESULTS:

(60.1 - 1.999706) (1.4)/(200) = +4.07E-01 g/L Carbon
(60.1 - 1.999706) (1.4)/(200) (12) = +3.39E-02 Molar Carbon

1ml + .400ml 2M H₂SO₄

Sample Run By:

SL HOOD

00000

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-166, REV. 1

Sample: S96T000090SPK

Date: 01/24/96

Time: 02:37:31

Sample Size = 200 uL

Dil Factor = 3

Blank ID # = BLK

Blank Value = .28555 ug/minute C

Analyst : SL HOOD

Min Readings = 14

Max Readings = 14

% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.40	0.00
2	1.01	23.60	98.31
3	1.51	49.60	52.42
4	2.01	58.70	15.50
5	2.51	64.90	9.55
6	3.01	69.30	6.35
7	3.51	72.50	4.41
8	4.00	75.30	3.72
9	4.51	77.70	3.09
10	5.01	79.60	2.39
11	5.51	81.20	1.97
12	6.01	82.70	1.81
13	6.51	83.90	1.43
14	7.01	85.40	1.76

BLANK VALUE = 2 micrograms carbon

BLANK FACTOR = 2 / 7.004028 =

+2.9E-01 ug/min Carbon

SAMPLE RESULTS:

(85.4 - 2.000466) (3) / (200) =

+1.25E+00 g/L Carbon

(85.4 - 2.000466) (3) / (200) (12) =

+1.04E-01 Molar Carbon

400ml original sample + 400ml 2M H₂SO₄ + 400ml spk

Sample Run By:

SL HOOD

00000

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-166, REV. /

Sample: S96T0091

Date: 01/24/96

Time: 01:45:23

Sample Size = 200 uL
Dil Factor = 1.1
Blank ID # = BLK
Blank Value = .28555 ug/minute C

Analyst : SL HOOD
Min Readings = 14
Max Readings = 14
% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.10	0.00
2	1.01	0.70	85.71
3	1.51	1.50	53.33
4	2.01	1.90	21.05
5	2.51	2.30	17.39
6	3.01	2.80	17.86
7	3.51	3.10	9.68
8	4.01	3.40	8.82
9	4.50	3.80	10.53
10	5.00	4.20	9.52
11	5.51	4.60	8.70
12	6.01	4.90	6.12
13	6.51	5.20	5.77
14	7.00	5.50	5.45

BLANK VALUE = 2 micrograms carbon
BLANK FACTOR = 2 / 7.004028 =

+2.9E-01 ug/min Carbon

SAMPLE RESULTS:

(5.5 - 2.000229) (1.1)/(200) =
(5.5 - 2.000229) (1.1)/(200) (12) =

+1.9E-02 g/L Carbon
+1.6E-03 Molar Carbon

2ml + .200ml .5M H₂SO₄

Sample Run By:

SL HOOD

00000

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-166, REV. I

Sample: S96T0091 DUP

Date: 01/24/96

Time: 01:33:41

Sample Size = 200 uL

Dil Factor = 1.1

Blank ID # = BLK

Blank Value = .28555 ug/minute C

Analyst : SL HOOD

Min Readings = 14

Max Readings = 14

% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.10	0.00
2	1.01	0.90	88.89
3	1.51	1.70	47.06
4	2.00	2.10	19.05
5	2.50	2.60	19.23
6	3.00	3.20	18.75
7	3.50	3.60	11.11
8	4.00	4.00	10.00
9	4.50	4.40	9.09
10	5.00	4.80	8.33
11	5.50	5.30	9.43
12	6.00	5.50	3.64
13	6.50	6.00	8.33
14	7.00	6.30	4.76

BLANK VALUE = 2 micrograms carbon

BLANK FACTOR = 2 / 7.004028 =

+2.9E-01 ug/min Carbon

SAMPLE RESULTS:

(6.3 - 1.999708) (1.1) / (200) =

+2.4E-02 g/L Carbon

(6.3 - 1.999708) (1.1) / (200) (12) =

+2.0E-03 Molar Carbon

2ml + .200 ml .5M H₂SO₄

Sample Run By:

SL HOOD

00000

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT.
TICTOC REV 2.0

WHC-SD-WM-DP-166, REV. I

Sample: S96T0097

Date: 01/24/96

Time: 02:18:36

Sample Size = 200 uL
Dil Factor = 1.4
Blank ID # = BLK
Blank Value = .28555 ug/minute C

Analyst : SL HOOD
Min Readings = 14
Max Readings = 14
% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.50	0.00
2	1.01	14.90	96.64
3	1.51	31.90	53.29
4	2.01	38.10	16.27
5	2.51	42.30	9.93
6	3.01	45.40	6.83
7	3.51	48.00	5.42
8	4.01	50.20	4.38
9	4.50	52.20	3.83
10	5.00	53.80	2.97
11	5.50	55.20	2.54
12	6.00	56.60	2.47
13	6.50	57.90	2.25
14	7.00	59.00	1.86

BLANK VALUE = 2 micrograms carbon
BLANK FACTOR = 2 / 7.004028 =

+2.9E-01 ug/min Carbon

SAMPLE RESULTS:

(59 - 1.999943) (1.4)/(200) = +3.99E-01 g/L Carbon
(59 - 1.999943) (1.4)/(200) (12) = +3.33E-02 Molar Carbon

1ml + .400ml 2M H₂SO₄

Sample Run By:

SL HOOD

00000

LABCORE Data Entry Template for Worklist#

4998

Analyst: SLH **Instrument:** TIC01 **Book #** 17N12-F

Method: LA-622-102 Rev/Mod C-0

Worklist Comment: TIC AP-108 & 25-2

GROUP	PROJECT	S TYPE	SAMPLE#	R	A	-----TEST-----	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 BLNK				TIC-01	LIQUID	<u>1</u>	<u>1.6</u>	<u>N/A</u>	ug/mL
		2 STD				TIC-01	LIQUID	<u>6.01e2</u>	<u>5.96e2</u>	<u>N/A</u>	ug/mL
96000010	AP-108 GRAB	3 SAMPLE	S96T000090	0		TIC-01	LIQUID	<u>N/A</u>	<u>1.72e3</u>	<u>2.00e1</u>	ug/mL
96000010	AP-108 GRAB	4 DUP	S96T000090	0		TIC-01	LIQUID	<u>1.72e3</u>	<u>1.73e3</u>	<u>N/A</u>	ug/mL
96000010	AP-108 GRAB	5 SPK	S96T000090	0		TIC-01	LIQUID	<u>100</u>	<u>104.2</u>	<u>N/A</u>	ug/mL
96000010	AP-108 GRAB	6 SAMPLE	S96T000091	0		TIC-01	LIQUID	<u>N/A</u>	<u><5.00</u>	<u>5.00</u>	ug/mL
96000010	AP-108 GRAB	7 DUP	S96T000091	0		TIC-01	LIQUID	<u><5.00</u>	<u><5.00</u>	<u>N/A</u>	ug/mL
96000011	AP-108 GRAB	8 SAMPLE	S96T000097	0		TIC-01	LIQUID	<u>N/A</u>	<u>1.74e3</u>	<u>2.00e1</u>	ug/mL
95000224	ORG/AQ SAMPL	9 SAMPLE	S96R000041	0		TIC-01	LIQUID	<u>N/A</u>	<u><5.00</u>	<u>5.00</u>	ug/mL
95000224	ORG/AQ SAMPL	10 SPK	S96R000041	0		TIC-01	LIQUID	<u>100</u>	<u>97.4</u>	<u>N/A</u>	ug/mL
95000224	ORG/AQ SAMPL	11 SPK-DUP	S96R000041	0		TIC-01	LIQUID	<u>97.4</u>	<u>95.9</u>	<u>N/A</u>	ug/mL
95000224	ORG/AQ SAMPL	12 SAMPLE	S96R000042	0		TIC-01	LIQUID	<u>N/A</u>	<u>2.30e1</u>	<u>5.00</u>	ug/mL

Final page for worklist # 4998

Sandra Alford Bortrecht
Analyst Signature **Date**
1-30-96

Reichert 2/2/96
Analyst Signature **Date**
Reviewed RW Schorn 2/2/96

Data Entry Comments:

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

TIC: LA-622-102 (C-0)

WORKLIST
#ANALYST
SIGNATUREANALYSIS
DATEANALYSIS
TIMEINSTRUMENT
CODE

4998

Sandra K. Root-Breit

1-30-96

1600

☐ SAMPLE STANDARD ☒ DUPLICATE BASELINE ☐ SPIKE BLANK ☐ TRIPLICATE	☒ SAMPLE STANDARD ☒ DUPLICATE BASELINE ☐ SPIKE BLANK ☐ TRIPLICATE
SAMPLE # =	STD # = 17N12-F
Volume SAMPLE Used (mL)	0.200 mL
Volume H2O Added to SAMPLE	
Volume INJECTED (mL)	
Was Sample Dilution Used for SPIKE? Y or N	
Volume SPIKE Standard Added (mL)	
Amount SPIKE Standard Added (mL)	
Volume H2O Added to SAMPLE + SPIKE (mL)	
Final Coulometer Reading in μg Carbon (Optional)	123.0
SAMPLE # =	STD # =
Volume SAMPLE Used (mL)	0.200 mL
Volume H2O Added to SAMPLE	
Volume INJECTED (mL)	
Was Sample Dilution Used for SPIKE? Y or N	
Volume SPIKE Standard Added (mL)	
Amount SPIKE Standard Added (mL)	
Volume H2O Added to SAMPLE + SPIKE (mL)	
Final Coulometer Reading in μg Carbon (Optional)	89.9
SAMPLE # =	STD # =
Volume SAMPLE Used (mL)	0.500 mL
Volume H2O Added to SAMPLE	
Volume INJECTED (mL)	
Was Sample Dilution Used for SPIKE? Y or N	
Volume SPIKE Standard Added (mL)	
Amount SPIKE Standard Added (mL)	
Volume H2O Added to SAMPLE + SPIKE (mL)	
Final Coulometer Reading in μg Carbon (Optional)	53.4
SAMPLE # =	STD # =
Volume SAMPLE Used (mL)	0.500 mL
Volume H2O Added to SAMPLE	
Volume INJECTED (mL)	
Was Sample Dilution Used for SPIKE? Y or N	
Volume SPIKE Standard Added (mL)	
Amount SPIKE Standard Added (mL)	
Volume H2O Added to SAMPLE + SPIKE (mL)	
Final Coulometer Reading in μg Carbon (Optional)	2.90
SAMPLE # =	STD # =
Volume SAMPLE Used (mL)	0.200 mL
Volume H2O Added to SAMPLE	
Volume INJECTED (mL)	
Was Sample Dilution Used for SPIKE? Y or N	
Volume SPIKE Standard Added (mL)	
Amount SPIKE Standard Added (mL)	
Volume H2O Added to SAMPLE + SPIKE (mL)	
Final Coulometer Reading in μg Carbon (Optional)	3.6

178

DF = 3

100-~~XXXXXX~~10516-0)

WORKLIST
#

ANALYST
SIGNATURE

Sandra J. Hood Bortright 1-30-96

ANALYSIS
DATE

ANALYSIS
TIME

1600

INSTRUMENT
CODE

SAMPLE		DUPLICATE		SPIKE	
☒ STANDARD	☐ BLANK	☐ BASELINE	☐ BLANK	☐ BLANK	☐ TRIPLICATE
SAMPLE # = 59670097 STD # =					
Volume SAMPLE Used (mL)					
Volume H2SO4 Added to SAMPLE (mL)					
Volume INJECTED (mL)					
Was Sample Dilution Used for SPIKE? Y or N					
Amount SPIKE Standard Added (mL)					
Volume H2SO4 Added to SAMPLE + SPIKE (mL)					
Final Coulometer Reading in μ g Carbon (Optional)					
SAMPLE # = 59670041 STD # =					
Amount of SAMPLE Used (mL)					
Volume H2SO4 Added to SAMPLE (mL)					
Volume INJECTED (mL)					
Was Sample Dilution Used for SPIKE? Y or N					
Amount SPIKE Standard Added (mL)					
Volume H2SO4 Added to SAMPLE + SPIKE (mL)					
Final Coulometer Reading in μ g Carbon (Optional)					
SAMPLE # = 17N12-F STD # =					
Amount of SAMPLE Used (mL)					
Volume H2SO4 Added to SAMPLE (mL)					
Volume INJECTED (mL)					
Was Sample Dilution Used for SPIKE? Y or N					
Amount SPIKE Standard Added (mL)					
Volume H2SO4 Added to SAMPLE + SPIKE (mL)					
Final Coulometer Reading in μ g Carbon (Optional)					
SAMPLE # = 59670042 STD # =					
Amount of SAMPLE Used (mL)					
Volume H2SO4 Added to SAMPLE (mL)					
Volume INJECTED (mL)					
Was Sample Dilution Used for SPIKE? Y or N					
Amount SPIKE Standard Added (mL)					
Volume H2SO4 Added to SAMPLE + SPIKE (mL)					
Final Coulometer Reading in μ g Carbon (Optional)					
SAMPLE # = 59670043 STD # =					
Amount of SAMPLE Used (mL)					
Volume H2SO4 Added to SAMPLE (mL)					
Volume INJECTED (mL)					
Was Sample Dilution Used for SPIKE? Y or N					
Amount SPIKE Standard Added (mL)					
Volume H2SO4 Added to SAMPLE + SPIKE (mL)					
Final Coulometer Reading in μ g Carbon (Optional)					
SAMPLE # = 59670044 STD # =					
Amount of SAMPLE Used (mL)					
Volume H2SO4 Added to SAMPLE (mL)					
Volume INJECTED (mL)					
Was Sample Dilution Used for SPIKE? Y or N					
Amount SPIKE Standard Added (mL)					
Volume H2SO4 Added to SAMPLE + SPIKE (mL)					
Final Coulometer Reading in μ g Carbon (Optional)					

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-166, REV. I

TIC : LA-622-102 (C-0)

LIQUIDS

Type	Sample Volume in mL	(SS)	BLANK
BLANK	Dilution Factor	(DF)	0.200
Work List	Digest Dilution Factor	(DDF)	1.000
4998	µg of Carbon in Sample	(C1)	1.000
Test Code	µg of Carbon in Blank	(C2)	2.2
TIC01			3.8

Matrix	
LIQUID	g of Carbon/L = < 5.00E-03
Sample #	
Instrument Code	g of Carbon/L = $\frac{(C1-C2) \cdot DF \cdot DDF}{SS \cdot 1000}$
WC16130	
Analyst	µg of Carbon/mL = g of Carbon/L * 1000000 µg/g / 1000 m
SLH BOATRIGHT	
Date	Detection Level (µg/mL) = $\frac{1 \mu g C \cdot DF \cdot DDF}{SS}$
01/30/96	
Time	
10:10 AM	

NOTE: Reported Result is Below Detection Level.

µg Carbon/mL = < 5.00E+00	DETECTION LEVEL
	in µg/mL
	5.00E+00

Data Entry by: <i>AE Wright</i>	Date: 02/01/96
Approved by: <i>RW Schreder</i>	Date: 2/2/96

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-166, REV. I

TIC : LA-622-102 (C-0)

LIQUIDS

		STANDARD
Type	Sample Volume in mL (SS)	0.200
STANDARD	Dilution Factor (DF)	1.000
Work List	Digest Dilution Factor (DDF)	1.000
4998	µg of Carbon in Sample (C1)	123
Test Code	µg of Carbon in Blank (C2)	3.8
TIC01		
Matrix		
LIQUID	g of Carbon/L =	5.96E-01
Sample #		
17N12F	g of Carbon/L =	$\frac{(C1-C2) \cdot DF \cdot DDF}{SS \cdot 1000}$
Instrument Code		
WC16130		
Analyst	µg of Carbon/mL =	g of Carbon/L * 1000000 µg/g / 1000 m
SLH BOATRIGHT		
Date		
01/30/96	Detection Level (µg/mL) =	$\frac{1 \mu g C \cdot DF \cdot DDF}{SS}$
Time		
10:10 AM		

µg Carbon/mL =	5.96E+02	DETECTION LEVEL
		in µg/mL
		5.00E+00

Data Entry by: <i>AC Wright</i>	Date: 02/01/96
Approved by: <i>RW Schweden</i>	Date: 2/2/96

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-166, REV. /

TIC : LA-622-102 (C-0)

LIQUIDS

		SAMPLE
Type	Sample Volume in mL (SS)	0.050
SAMPLE	Dilution Factor (DF)	1.000
Work List	Digest Dilution Factor (DDF)	1.000
4998	µg of Carbon in Sample (C1)	89.9
Test Code	µg of Carbon in Blank (C2)	3.8
TIC01		
Matrix		
LIQUID	g of Carbon/L =	1.72E+00
Sample #		
S96T000090	g of Carbon/L =	$\frac{(C1-C2) \cdot DF \cdot DDF}{SS \cdot 1000}$
Instrument Code		
WC16130		
Analyst	µg of Carbon/mL =	g of Carbon/L * 1000000 µg/g / 1000 m
SLH BOATRIGHT		
Date		
01/30/96	Detection Level (µg/mL) =	$\frac{1 \mu g C \cdot DF \cdot DDF}{SS}$
Time		
10:10 AM		

µg Carbon/mL =	1.72E+03	DETECTION LEVEL
		in µg/mL
		2.00E+01

Data Entry by: <i>NE Wright</i>	Date: 02/01/96
Approved by: <i>RW Schroeder</i>	Date: 2/2/96

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-166, REV. 1

TIC : LA-622-102 (C-0)

LIQUIDS

		DUPLICATE
Type	Sample Volume in mL (SS)	0.050
DUPLICATE	Dilution Factor (DF)	1.000
Work List	Digest Dilution Factor (DDF)	1.000
4998	µg of Carbon in Sample (C1)	90.2
Test Code	µg of Carbon in Blank (C2)	3.8
TIC01		
Matrix		
LIQUID	g of Carbon/L =	1.73E+00
Sample #		
S96T000090	g of Carbon/L =	$\frac{(C1-C2) * DF * DDF}{SS * 1000}$
Instrument Code		
WC16130		
Analyst	µg of Carbon/mL =	g of Carbon/L * 1000000 µg/g / 1000 m
SLH BOATRIGHT		
Date	Detection Level (µg/mL) =	$\frac{1 \mu g C * DF * DDF}{SS}$
01/30/96		
Time		
10:10 AM		

µg Carbon/mL =	1.73E+03	DETECTION LEVEL
		in µg/mL 2.00E+01

Data Entry by:	<i>SLH</i>	Date:	02/01/96
Approved by:	<i>BW Schreder</i>	Date:	2/2/96

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-166, REV. 1

TIC : LA-622-102 (C-0)

SPIKED SAMPLE

SPIKE

Type	>>>>> Sample Vial Data <<<<<<		>>>>> Spiked Vial Data <<<<<	
SPIKE	Sample Volume in mL	0.050	Sample Volume in mL	0.050
Work List	µg of Carbon in Sample	89.9	Spike Volume in mL	0.100
4998	µg of Carbon in Blank	3.8	Volume Injected in mL	0.050
Test Code			Spike Value (µg/mL)	602
TIC01			µg C in Sample + Spike	53.4
Matrix			µg C in Blank	3.8
LIQUID				
Sample #				
S96R000090				
Instrument Code				
WC16130				
Analyst				
SLH BOATRIGT				
Date				
01/30/96				
Time				
12:53 PM				

PERCENT SPIKE RECOVERY = $\frac{\mu\text{g Carbon Recovered from Spike} * 100}{\mu\text{g Carbon in Spike}}$

WHERE : $\mu\text{g Carbon Recovered from Spike} = [(\mu\text{gC in sample} + \text{spike} - \mu\text{gC in blank}) * (\text{Spike Correction Factor})]$
 $-(\mu\text{gC sample} - \mu\text{gC blank}) * (\text{Sample Size Correction Factor})]$

Spike Correction Factor = $\frac{\text{Total volume in spiked sample vial (mL)}}{\text{Volume injected (mL)}}$

Sample Size Correction Factor = $\frac{\text{Sample size in (mL) in spiked vial}}{\text{Sample size (mL) in sample}}$

WHERE : $\mu\text{g Carbon in Spike} = [\text{Spike Value } (\mu\text{g/mL}) * \text{Spike Volume (mL)}]$

Percent Spike Recovery = 104.2%

Data Entry by: <i>RE Wright</i>	Date: 02/02/96
Approved by: <i>RE Schmidt</i>	Date: 2/2/96

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-166, REV. I

TIC : LA-622-102 (C-0)

LIQUIDS

		SAMPLE
Type	Sample Volume in mL (SS)	0.200
SAMPLE	Dilution Factor (DF)	1.000
Work List	Digest Dilution Factor (DDF)	1.000
4998	µg of Carbon in Sample (C1)	3.6
Test Code	µg of Carbon in Blank (C2)	3.8
TIC01		
Matrix		
LIQUID	g of Carbon/L =	< 5.00E-03
Sample #		
S96T000091	g of Carbon/L =	$\frac{(C1-C2) \cdot DF \cdot DDF}{SS \cdot 1000}$
Instrument Code		
WC16130		
Analyst	µg of Carbon/mL =	g of Carbon/L * 1000000 µg/g / 1000 m
SLH BOATRIGHT		
Date		
01/30/96	Detection Level (µg/mL) =	$\frac{1 \mu\text{g C} \cdot DF \cdot DDF}{SS}$
Time		
10:10 AM		

NOTE: Reported Result is Below Detection Level.

µg Carbon/mL =	< 5.00E+00	DETECTION LEVEL
		in µg/mL
		5.00E+00

Data Entry by: <i>NE Wright</i>	Date: 02/01/96
Approved by: <i>Ren. Schroeder</i>	Date: 2/2/96

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-166, REV. I

TIC : LA-622-102 (C-0)		LIQUIDS		DUPLICATE
Type	Sample Volume in mL	(SS)		0.200
DUPLICATE	Dilution Factor	(DF)		1.000
Work List	Digest Dilution Factor	(DDF)		1.000
4998	µg of Carbon in Sample	(C1)		2.9
Test Code	µg of Carbon in Blank	(C2)		3.8
TIC01				
Matrix				
LIQUID	g of Carbon/L	=	<	5.00E-03
Sample #				
S96T000091	g of Carbon/L	=	$\frac{(C1-C2) \cdot DF \cdot DDF}{SS \cdot 1000}$	
Instrument Code				
WC16130				
Analyst	µg of Carbon/mL	=	g of Carbon/L * 1000000 µg/g / 1000 m	
SLH BOATRIGHT				
Date				
01/30/96	Detection Level (µg/mL)	=	$\frac{1 \mu g C \cdot DF \cdot DDF}{SS}$	
Time				
10:10 AM				

NOTE: Reported Result is Below Detection Level.

µg Carbon/mL =	< 5.00E+00	DETECTION LEVEL
		In µg/mL 5.00E+00

Data Entry by: <i>SLH BOATRIGHT</i>	Date: 02/01/96
Approved by: <i>RW Schneider</i>	Date: 2/2/96

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHG-SD-WM-DP-166, REV. J

TIC : LA-622-102 (C-0)

LIQUIDS

		SAMPLE
Type	Sample Volume in mL (SS)	0.050
SAMPLE	Dilution Factor (DF)	1.000
Work List	Digest Dilution Factor (DDF)	1.000
4998	µg of Carbon in Sample (C1)	90.8
Test Code	µg of Carbon in Blank (C2)	3.8
TIC01		
Matrix		
LIQUID	g of Carbon/L =	1.74E+00
Sample #		
S96T000097	g of Carbon/L =	$\frac{(C1-C2) \cdot DF \cdot DDF}{SS \cdot 1000}$
Instrument Code		
WC16130		
Analyst	µg of Carbon/mL =	g of Carbon/L * 1000000 µg/g / 1000 m
SLH BOATRIGHT		
Date	Detection Level (µg/mL) =	$\frac{1 \mu g C \cdot DF \cdot DDF}{SS}$
01/30/96		
Time		
10:10 AM		

µg Carbon/mL =	1.74E+03	DETECTION LEVEL
		in µg/mL
		2.00E+01

Data Entry by: <i>SLH</i>	Date: 02/01/96
Approved by: <i>RW Schneider</i>	Date: 2/2/96

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT

TICTOC REV 2.0

<<< BLANK ANALYSIS >>> WHC-SD-WM-DP-166, REV. 1

Sample: BLK

Date: 01/30/96

Time: 10:10:56

Sample Size = 200 uL

Dil Factor = 1

Blank ID # = BLK

Blank Value = N/A

Analyst : SL HOOD

Min Readings = 14

Max Readings = 14

% Difference = 10

== Reading ==== Analysis Time ==== Coulometer ==== % Difference ==

1	0.51	0.20	0.00
2	1.01	0.60	66.67
3	1.51	0.90	33.33
4	2.01	1.30	30.77
5	2.51	1.50	13.33
6	3.01	1.90	21.05
7	3.51	2.10	9.52
8	4.01	2.40	12.50
9	4.50	2.60	7.69
10	5.00	2.80	7.14
11	5.50	3.00	6.67
12	6.00	3.30	9.09
13	6.51	3.50	5.71
14	7.00	3.80	7.89

BLANK VALUE = 3.8 micrograms carbon

BLANK FACTOR = 3.8 / 7.004883 =

+5.4E-01 ug/min Carbon

Sample Run By:

Sandra L Hood Bostryk 1-30-96
SL HOOD 00000SIGNATURE ABOVE REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 188 TO 196.

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-166, REV. 1

Sample: B-2

Date: 01/30/96

Time: 13:04:04

Sample Size = 200 uL

Dil Factor = 1

Blank ID # = BLK

Blank Value = .5424787 ug/minute C

Analyst : SL HOOD

Min Readings = 14

Max Readings = 14

% Difference = 10

== Reading ==== Analysis Time ==== Coulometer ==== % Difference ==

1	0.51	0.10	0.00
2	1.01	0.20	50.00
3	1.51	0.40	50.00
4	2.00	0.60	33.33
5	2.50	0.80	25.00
6	3.00	1.00	20.00
7	3.50	1.20	16.67
8	4.01	1.40	14.29
9	4.51	1.50	6.67
10	5.01	1.70	11.76
11	5.51	1.80	5.56
12	6.01	1.90	5.26
13	6.51	2.10	9.52
14	7.00	2.20	4.55

BLANK VALUE = 3.8 micrograms carbon

BLANK FACTOR = 3.8 / 7.004883 =

+5.4E-01 ug/min Carbon

SAMPLE RESULTS:

(2.2 - 3.799967) (1)/(200) =

< 5.00 E-3 g/L Carbon

(2.2 - 3.799967) (1)/(200) (12) =

< 4.17 E-4 Molar Carbon

Sample Run By:

SL HOOD

00000

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-166, REV. 1

Sample: STD

Date: 01/30/96

Time: 10:35:53

Sample Size = 200 uL

Dil Factor = 1

Blank ID # = BLK

Blank Value = .5424787 ug/minute C

Analyst : SL HOOD

Min Readings = 14

Max Readings = 14

% Difference = 10

== Reading ==	Analysis Time ==	Coulometer ==	% Difference ==
1	0.51	0.50	0.00
2	1.01	30.00	98.33
3	1.51	70.40	57.39
4	2.01	97.00	27.42
5	2.51	110.40	12.14
6	3.01	116.70	5.40
7	3.51	119.40	2.26
8	4.01	120.70	1.08
9	4.51	121.30	0.49
10	5.01	121.90	0.49
11	5.51	122.20	0.25
12	6.01	122.50	0.24
13	6.51	122.80	0.24
14	7.00	123.00	0.16

BLANK VALUE = 3.8 micrograms carbon

BLANK FACTOR = 3.8 / 7.004883 = +5.4E-01 ug/min Carbon

SAMPLE RESULTS:

(123 - 3.799967) (1)/(200) = +5.960E-01 g/L Carbon
(123 - 3.799967) (1)/(200) (12) = +4.967E-02 Molar Carbon

Sample Run By:

SL HOOD

00000

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-166, REV. 1

Sample: S96T0090

Date: 01/30/96

Time: 10:51:20

Sample Size = 50 uL

Analyst : SL HOOD

Dil Factor = 1

Min Readings = 14

Blank ID # = BLK

Max Readings = 14

Blank Value = .5424787 ug/minute C

% Difference = 10

== Reading ==== Analysis Time ==== Coulometer ==== % Difference ==

1	0.51	0.70	0.00
2	1.01	32.70	97.86
3	1.51	61.70	47.00
4	2.01	76.00	18.82
5	2.51	83.00	8.43
6	3.01	85.90	3.38
7	3.51	87.30	1.60
8	4.01	88.00	0.80
9	4.50	88.40	0.45
10	5.00	88.80	0.45
11	5.50	89.00	0.22
12	6.00	89.50	0.56
13	6.50	89.60	0.11
14	7.00	89.90	0.33

BLANK VALUE = 3.8 micrograms carbon

BLANK FACTOR = 3.8 / 7.004883 =

+5.4E-01 ug/min Carbon

SAMPLE RESULTS:

(89.9 - 3.799007) (1)/(50) =

+1.72E+00 g/L Carbon

(89.9 - 3.799007) (1)/(50) (12) =

+1.44E-01 Molar Carbon

Sample Run By:

SL HOOD

00000

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-166, REV. I

Sample: S95T0090 DUP

Date: 01/30/96

Time: 12:31:45

Sample Size = 50 uL

Dil Factor = 1

Blank ID # = BLK

Blank Value = .5424787 ug/minute C

Analyst : SL HOOD

Min Readings = 14

Max Readings = 14

% Difference = 10

== Reading ==== Analysis Time ==== Coulometer ==== % Difference ==

1	0.51	0.20	0.00
2	1.01	19.80	98.99
3	1.51	51.10	61.25
4	2.01	70.00	27.00
5	2.51	79.70	12.17
6	3.01	83.20	4.21
7	3.51	85.50	2.69
8	4.01	87.00	1.72
9	4.50	88.10	1.25
10	5.00	88.70	0.68
11	5.50	89.20	0.56
12	6.00	89.60	0.45
13	6.50	90.00	0.44
14	7.00	90.20	0.22

BLANK VALUE = 3.8 micrograms carbon

BLANK FACTOR = 3.8 / 7.004883 = +5.4E-01 ug/min Carbon

SAMPLE RESULTS:

(90.2 - 3.799437) (1)/(50) = +1.73E+00 g/L Carbon
(90.2 - 3.799437) (1)/(50) (12) = +1.44E-01 Molar Carbon

Sample Run By:

SL HOOD

00000

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-166, REV. I

Sample: S95T0090 SPK Date: 01/30/96 Time: 12:53:34

Sample Size = 50 uL Analyst : SL HOOD
Dil Factor = 3 Min Readings = 14
Blank ID # = BLK Max Readings = 14
Blank Value = .5424787 ug/minute C % Difference = 10

Reading	Analysis	Time	Coulometer	% Difference
1	0.51		0.10	0.00
2	1.01		1.10	90.91
3	1.51		11.20	90.18
4	2.01		26.10	57.09
5	2.51		37.40	30.21
6	3.01		43.90	14.81
7	3.51		47.90	8.35
8	4.01		50.00	4.20
9	4.50		51.20	2.34
10	5.00		52.00	1.54
11	5.51		52.50	0.95
12	6.01		52.90	0.76
13	6.51		53.10	0.38
14	7.00		53.40	0.56

BLANK VALUE = 3.8 micrograms carbon
BLANK FACTOR = 3.8 / 7.004883 =

+5.4E-01 ug/min Carbon

SAMPLE RESULTS:

(53.4 - 3.799967) (3)/(50) =
(53.4 - 3.799967) (3)/(50) (12) =

+2.98E+00 g/L Carbon
+2.48E-01 Molar Carbon

Sample Run By:

SL HOOD

00000

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Accession #: D196082260

Document #: SD-WM-DP-166

Title/Desc:

FINAL REPORT FOR TANK 241AP108 GRAB SAMPLES
8AP-96-1 & 8AP-96-2 & 8AP-96-FB [SEC 2 OF 2 PAGE
194 TO 2-39]

Pages: 172

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

Document number: SD-WH-DP-166

Section 2 of 2

Title: Final Report for Tank 241-AP-108,
Grab Samples 8AP-96-1, 8AP-96-2 and
8AP-96-FB

Date: 4/19/96 Revision: 1

Originator: Esch, Ruth A

Co: _____

Recipient: _____

Co: _____

References: ECN-629019

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-166, REV. 1

Sample: S96T0091

Date: 01/30/96

Time: 13:21:57

Sample Size = 200 uL

Dil Factor = 1

Blank ID # = BLK

Blank Value = .5424787 ug/minute C

Analyst : SL HOOD

Min Readings = 14

Max Readings = 14

% Difference = 10

== Reading ==	Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.10	0.00
2	1.01	0.20	50.00
3	1.51	0.60	66.67
4	2.00	1.30	53.85
5	2.50	1.70	23.53
6	3.00	2.20	22.73
7	3.50	2.50	12.00
8	4.00	2.70	7.41
9	4.50	2.90	6.90
10	5.00	3.10	6.45
11	5.50	3.20	3.13
12	6.00	3.40	5.88
13	6.50	3.50	2.86
14	7.00	3.60	2.78

BLANK VALUE = 3.8 micrograms carbon

BLANK FACTOR = 3.8 / 7.004883 =

+5.4E-01 ug/min Carbon

SAMPLE RESULTS:

(3.6 - 3.798477) (1)/(200) =

< 5.00 E-3 g/L Carbon

(3.6 - 3.798477) (1)/(200) (12) =

< 4.17 E-4 Molar Carbon

Sample Run By:

SL HOOD

00000

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-166, REV. 1

Sample: S95T0091 DUP

Date: 01/30/96

Time: 13:31:54

Sample Size = 200 uL

Dil Factor = 1

Blank ID # = BLK

Blank Value = .5424787 ug/minute C

Analyst : SL HOOD

Min Readings = 14

Max Readings = 14

% Difference = 10

== Reading ==	Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.10	0.00
2	1.01	0.20	50.00
3	1.51	0.50	60.00
4	2.01	1.00	50.00
5	2.51	1.30	23.08
6	3.01	1.60	18.75
7	3.51	1.90	15.79
8	4.01	2.00	5.00
9	4.50	2.20	9.09
10	5.00	2.30	4.35
11	5.50	2.50	8.00
12	6.00	2.60	3.85
13	6.50	2.70	3.70
14	7.00	2.90	6.90

BLANK VALUE = 3.8 micrograms carbon

BLANK FACTOR = 3.8 / 7.004883 =

+5.4E-01 ug/min Carbon

SAMPLE RESULTS:

(2.9 - 3.799437) (1)/(200) =

< 5.00 E-3 g/L Carbon

(2.9 - 3.799437) (1)/(200) (12) =

< 4.17 E-4 Molar Carbon

Sample Run By:

SL HOOD

00000

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-166, REV. 1

Sample: S96T0097

Date: 01/30/96

Time: 13:40:59

Sample Size = 50 uL

Dil Factor = 1

Blank ID # = BLK

Blank Value = .5424787 ug/minute C

Analyst : SL HOOD

Min Readings = 14

Max Readings = 14

% Difference = 10

== Reading ==	==== Analysis Time ==	==== Coulometer ==	==== % Difference ==
1	0.51	0.10	0.00
2	1.01	1.20	91.67
3	1.51	19.30	93.78
4	2.01	42.90	55.01
5	2.51	60.70	29.32
6	3.01	72.20	15.93
7	3.51	79.40	9.07
8	4.01	84.00	5.48
9	4.50	86.70	3.11
10	5.01	88.30	1.81
11	5.51	89.40	1.23
12	6.01	90.00	0.67
13	6.51	90.40	0.44
14	7.00	90.80	0.44

BLANK VALUE = 3.8 micrograms carbon

BLANK FACTOR = 3.8 / 7.004883 =

+5.4E-01 ug/min Carbon

SAMPLE RESULTS:

(90.8 - 3.799967) (1)/(50) =

+1.74E+00 g/L Carbon

(90.8 - 3.799967) (1)/(50) (12) =

+1.45E-01 Molar Carbon

Sample Run By:

SL HOOD

00000

RADIOCHEMICAL ANALYSES

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LABCORE Data Entry Template for Worklist# 4855

Analyst: RK Instrument: AB00 14 Book# 14856

Method: LA-508-101 Rev/Mod D-2

Worklist Comment: Determine sample size using Ludlum. Use .100 mL A-SPK. SLF

S Type	Sample#	R A	Test	Matrix	Group#	Project
1 STD			@ALPHA01	LIQUID		
2 BLNK			@ALPHA01	LIQUID		
3 BLNK/BKG			@ALPHA01	LIQUID		
4 SAMPLE	S96T000092 0		@ALPHA01	LIQUID	96000010	AP-108 GRAB
	Analytes Requested: ALPHA01 , ALPHA01E					
5 DUP	S96T000092 0		@ALPHA01	LIQUID		
6 SPK	S96T000092 0		@ALPHA01	LIQUID		
7 SAMPLE	S96T000093 0		@ALPHA01	LIQUID	96000010	AP-108 GRAB
	Analytes Requested: ALPHA01 , ALPHA01E					
8 DUP	S96T000093 0		@ALPHA01	LIQUID		
9 SAMPLE	S96T000098 0		@ALPHA01	LIQUID	96000011	AP-108 GRAB
	Analytes Requested: ALPHA01 , ALPHA01E					
10 DUP	S96T000098 0		@ALPHA01	LIQUID		
11 SPK	S96T000098 0		@ALPHA01	LIQUID		

Final page for worklist # 4855

No. 6 King 1/14/96
Analyst Signature Date

McBroom 1/15/96
Analyst Signature Date
McBroom 1/14/96

Data Entry Comments:

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

LABCORE Completed Worklist Report for Worklist# 4855

Analyst: rwk Instrument: AB14 Book# _____

Method: _____ Rev/Mod _____

Worklist Comment: Determine sample size using Ludlum. Use .100 mL A-SPK. SLF

Seq Type	Sample# R A	Test	Matrix	Actual	Found	DL or Yield	Unit
1 STD	0	0ALPHA01 ALPHA01	LIQUID	1.54E-05	1.27E-5	82.470 % Recovery	
1 STD	0	0ALPHA01 ALPHA01E	LIQUID	1.00	4.65E+00	4.650 % Ct. Error	
2 BLNK	0	0ALPHA01 ALPHA01	LIQUID	1	<6.03E-4	uCi/mL	
2 BLNK	0	0ALPHA01 ALPHA01E	LIQUID	1.00	5.00E+02	500.000 % Ct. Error	
3 BLNK/BKG	0	0ALPHA01 ALPHA01	LIQUID	1.00E+00	9.00E-01	0.900 uCi/mL	
4 SAMPLE	S96T000092 0	0ALPHA01 ALPHA01	LIQUID	N/A <	6.03E-04	1.390E-003 uCi/mL	
4 SAMPLE	S96T000092 0	0ALPHA01 ALPHA01E	LIQUID	N/A	5.00E+02	0.000 % Ct. Error	
5 DUP	S96T000092 0	0ALPHA01 ALPHA01	LIQUID	<6.03E-4	<6.03E-4	RPD	
5 DUP	S96T000092 0	0ALPHA01 ALPHA01E	LIQUID	1.00	5.00E+02	500.000 % Ct. Error	
6 SPK	S96T000092 0	0ALPHA01 ALPHA01	LIQUID	3.92E-02	3.73E-02	95.150 % Recovery	
7 SAMPLE	S96T000093 0	0ALPHA01 ALPHA01	LIQUID	N/A <	2.75E-07	4.580E-007 uCi/mL	
7 SAMPLE	S96T000093 0	0ALPHA01 ALPHA01E	LIQUID	N/A	5.00E+02	0.000 % Ct. Error	
8 DUP	S96T000093 0	0ALPHA01 ALPHA01	LIQUID	<2.75E-7	<1.99E-7	RPD	
8 DUP	S96T000093 0	0ALPHA01 ALPHA01E	LIQUID	1.00	5.00E+02	500.000 % Ct. Error	
9 SAMPLE	S96T000098 0	0ALPHA01 ALPHA01	LIQUID	N/A <	6.67E-04	1.390E-003 uCi/mL	
9 SAMPLE	S96T000098 0	0ALPHA01 ALPHA01E	LIQUID	N/A	5.00E+02	0.000 % Ct. Error	
10 DUP	S96T000098 0	0ALPHA01 ALPHA01	LIQUID	<6.67E-4	<9.84E-4	RPD	
10 DUP	S96T000098 0	0ALPHA01 ALPHA01E	LIQUID	1.00	5.00E+02	500.000 % Ct. Error	
11 SPK	S96T000098 0	0ALPHA01 ALPHA01	LIQUID	3.92E-02	3.80E-02	96.940 % Recovery	

Final page for worklist# 4855

Analyst Signature _____ Date _____

Analyst Signature _____ Date _____


Reviewer Signature _____ Date 1/18/96

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

WHC-SD-WM-DP-166, REV. I

WORKBOOK PAGE: STD1

AT : LA-508-101 (D-2)

STANDARD

		STANDARD	REPLICATE
Type	DETECTOR NUMBER	14	14
STD	DISH SIZE (1, 2, or 5) (MS)	2	2
Work List	GROSS COUNTS (GC)	2066	1822
4855	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
Test Code	DILUTION FACTOR (DF)	1	1
@ALPHA01	STANDARD BOOK NUMBER (Std BN)	14B56	14B56
Matrix	EFFICIENCY FACTOR (EFF)	0.2274	0.2274
LIQUID	Lc, Rmax, or Rs.(SAMPLE RATE) as APPROPRIATE	68.367	60.233
Batch Number	Standard Value in $\mu\text{Ci/mL}$	1.54E-05	
96000306	Concentration in $\mu\text{Ci/L}$ =	1.35E-02	
Rerun	Replicate Concentration in $\mu\text{Ci/L}$ =	1.19E-02	
0	AVERAGE CONCENTRATION in $\mu\text{Ci/L}$ =	1.2737E-02	
Sample Prep			
N/A			
Sample #	$R_s (\text{Sample Count Rate}) = (TC / CT) - BKG$		
WL#4855	$\text{ALPHA TOTAL } \mu\text{Ci/L} = R_s * 1000\text{mL/L} * DF / (EFF * SS * 2220000\text{dpm}/\mu\text{Ci})$		
Instrument Code	$\text{ALPHA TOTAL } \mu\text{Ci/mL} = \text{ALPHA TOTAL } \mu\text{Ci/L} / 1000\text{mL/L}$		
WB27807	$\text{Relative Counting Error} = [([(\text{The Square Root of } TC + BKG * CT) / (TC - BKG * CT)]) * 1.96 * 100$		
Prepared By	Detection Levels and Less Than Values are determined from Procedure LA-508-002.		
SEH			
Chemist			
SLF	ALPHA TOTAL CONCENTRATION in $\mu\text{Ci/mL}$	1.27E-05	DETECTION LEVEL
Analyst			
RWK			
Date Complete			1.37E-07
01/15/96	RELATIVE COUNTING ERROR =	4.6%	$\mu\text{Ci/mL}$
Analysis Date			
01/14/96			
Analysis Time			
05:00 AM			
Sample Point			
AP-108 GRAB			

Analyst	SEH	Date: 15-Jan-96
Signature of Chemist	SLF	Date: 1/17/96
STANDARD.WB1 Rev. 1.0	508101M/L	

AT : LA-508-101 (D-2) LIQUIDS

		BLNK	REPLICATE
Type	DETECTOR NUMBER	14	14
BLNK	DISH SIZE (1, 2, or 5) (MS)	2	2
Work List	GROSS COUNTS (GC)	13	14
4855	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
Test Code	DILUTION FACTOR (DF)	101	101
@ALPHA01	DIGEST DILUTION FACTOR (DDF)	1	1
Matrix	EFFICIENCY FACTOR (EFF)	0.2274	0.2274
LIQUID	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	0.301	0.301

Batch Number	
96000306	Blank Concentration in $\mu\text{Ci/L}$ < 6.03E-01
Rerun	Replicate Concentration in $\mu\text{Ci/L}$ < 6.03E-01
0	Maximum Concentration in $\mu\text{Ci/L}$ < 6.0270E-01

Sample Prep	
N/A	$R_s \text{ (Sample Count Rate)} = (TC / CT) - BKG$
Sample #	$ALPHA \text{ TOTAL } \mu\text{Ci/L} = R_s * 1000\text{mL/L} * DF * DDF / (EFF * SS * 2220000\text{dpm}/\mu\text{Ci})$
WL#4855	$ALPHA \text{ TOTAL } \mu\text{Ci/mL} = ALPHA \text{ TOTAL } \mu\text{Ci/L} / 1000\text{mL/L}$
Instrument Code	$Relative \text{ Counting Error} = [(The \text{ Square Root of } TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100$
WB27807	Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Prepared By	SEH	
Chemist		v RESULTS v
SLF	ALPHA TOTAL in $\mu\text{Ci/mL}$ < 6.03E-04	DETECTION LEVEL
Analyst	LESS Than Value was Determined from Lc. <i>1/15/96</i>	
RWK		
Date Complete	RELATIVE COUNTING ERROR 500.0%	1.39E-03 $\mu\text{Ci/mL}$
01/15/96		
Analysis Date		
01/14/96		
Analysis Time		
05:00 AM		
Sample Point		
AP-108 GRAB		

Analyst	SEH	Date: 15-Jan-96
Signature of Chemist: <i>[Signature]</i>	SLF	Date: 1/17/96
BLANK WB1 Rev 1.0	50801ML	

WORKBOOK PAGE: SAM4

AT : LA-508-101 (D-2) LIQUIDS

		SAMPLE	REPLICATE
Type	DETECTOR NUMBER	14	14
SAMPLE	DISH SIZE (1, 2, or 5) (MS)	2	2
Work List	GROSS COUNTS (GC)	9	15
4855	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
Test Code	DILUTION FACTOR (DF)	101	101
@ALPHA01	DIGEST DILUTION FACTOR (DDF)	1	1
Matrix	EFFICIENCY FACTOR (EFF)	0.2274	0.2274
LIQUID	Lc, Rmax, or Rs.(SAMPLE RATE) as APPROPRIATE	0.301	0.301

Batch Number	
96000306	Blank Concentration in $\mu\text{Ci/L}$ < 6.03E-01
Rerun	Replicate Concentration in $\mu\text{Ci/L}$ < 6.03E-01
0	Maximum Concentration in $\mu\text{Ci/L}$ < 6.0270E-01

Sample Prep	
N/A	R_s (Sample Count Rate) = $(TC / CT) - BKG$
Sample #	$ALPHA \text{ TOTAL } \mu\text{Ci/L} = R_s * 1000\text{mL/L} * DF * DDF / (EFF * SS * 2220000\text{dpm}/\mu\text{Ci})$
S96T000092	$ALPHA \text{ TOTAL } \mu\text{Ci/mL} = ALPHA \text{ TOTAL } \mu\text{Ci/L} / 1000\text{mL/L}$
Instrument Code	Relative Counting Error = $[(The \text{ Square Root of } TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100$
WB27807	Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Prepared By			
SEH			
Chemist			
SLF	ALPHA TOTAL	v RESULTS v in $\mu\text{Ci/mL}$	< 6.03E-04
Analyst			
RWK	LESS Than Value was Determined from Lc.	NOTE 1/12/96	
Date Complete			
01/15/96	RELATIVE COUNTING ERROR	500.0%	DETECTION LEVEL
Analysis Date			1.39E-03
01/14/96			$\mu\text{Ci/mL}$
Analysis Time			
05:00 AM			
Sample Point			
AP-108 GRAB			

Analyst:	SEH	Date: 15-Jan-96
Signature of Chemist:	SLF	Date: 1/17/96

SAMPLE WB1 Rev. 1.0

508101MM

AT : LA-508-101 (D-2)

LIQUIDS

		DUP	REPLICATE
Type	DETECTOR NUMBER	14	14
DUP	DISH SIZE (1, 2, or 5) (MS)	2	2
Work List	GROSS COUNTS (GC)	12	12
4855	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
Test Code	DILUTION FACTOR (DF)	101	101
@ALPHA01	DIGEST DILUTION FACTOR (DDF)	1	1
Matrix	EFFICIENCY FACTOR (EFF)	0.2274	0.2274
LIQUID	Lc, Rmax, or Rs.(SAMPLE RATE) as APPROPRIATE	0.301	0.301

Batch Number	
96000306	Blank Concentration in $\mu\text{Ci/L}$ < 6.03E-01
Rerun	Replicate Concentration in $\mu\text{Ci/L}$ < 6.03E-01
0	Maximum Concentration in $\mu\text{Ci/L}$ < 6.0270E-01

Sample Prep	
N/A	$R_s (\text{Sample Count Rate}) = (TC / CT) - BKG$
Sample #	$\text{ALPHA TOTAL } \mu\text{Ci/L} = R_s * 1000\text{mL/L} * DF * DDF / (EFF * SS * 2220000\text{dpm}/\mu\text{Ci})$
S96T000092	$\text{ALPHA TOTAL } \mu\text{Ci/mL} = \text{ALPHA TOTAL } \mu\text{Ci/L} / 1000\text{mL/L}$
Instrument Code	$\text{Relative Counting Error} = [(The \text{ Square Root of } TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100$
WB27807	Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Prepared By	
SEH	
Chemist	
SLF	v RESULTS v
Analyst	ALPHA TOTAL in $\mu\text{Ci/mL}$ < 6.03E-04
RWK	LESS Than Value was Determined from Lc. <i>note 1/14/96</i>
Date Complete	RELATIVE COUNTING ERROR 500.0%
01/15/96	
Analysis Date	
01/14/96	
Analysis Time	
05:00 AM	
Sample Point	
AP-108 GRAB	

Analyst	SEH	Date: 15-Jan-96
Signature of Chemist:	<i>[Signature]</i>	Date: 1/17/96
SAMPLE WB1 Rev. 1.0	508101ML	

AT : LA-508-101 (D-2) SPIKED SAMPLE

Type	DETECTOR NUMBER	SPIKE	REPLICATE
SPK	DISH SIZE 1, 2, or 5 (MS)	14	14
Work List	TOTAL COUNTS (TC)	2	2
4855	COUNT TIME in MINUTES (CT)	54588	58342
AT or TB ?	BACKGROUND in cpm (BKG)	30	30
AT	SAMPLE VOLUME in mL (Spiked Vial) (SS)	0.5	0.5
Test Code	SAMPLE DILUTION FACTOR (Spiked Vial) (DF)	0.100	0.100
@ALPHA01	DIGEST DILUTION FACTOR (DDF)	101	101
Matrix	SPIKE VOLUME in mL (SVol)	1	1
LIQUID	SPIKE DILUTION FACTOR (SDF)	0.100	0.100
Batch Number	SPIKE BOOK NUMBER (Spk BN)	1	1
96000306	SPIKE VALUE in $\mu\text{Ci/mL}$ (SVal)	119B43	119B43
Rerun	INSTRUMENT EFFICIENCY FACTOR (EFF)	3.9211E-02	3.9211E-02
0	SAMPLE + SPIKE $\mu\text{Ci/mL}$ (S+S)	0.2274	0.2274
Sample Prep	AVERAGE or MAXIMUM $\mu\text{Ci/mL}$ in SAMPLE	3.64E+00	3.89E+00
N/A		6.0270E-04	
Sample #			
S96T000092	R_s (Sample Count Rate) = $(TC / CT) - BKG$		
Instrument Code	$SAMPLE + SPIKE \mu\text{Ci/mL} = R_s * DF * DDF / (EFF * SS * 2220000\text{dpm}/\mu\text{Ci})$		
WB27807	$QC \text{ ACTUAL} = SVal$		
Prepared By	$QC \text{ FOUND} = (((S+S \mu\text{Ci/mL} - SAMPLE \mu\text{Ci/mL}) * ((SDF/SVol)/(DF*DDF/SS))))$		
SEH	$PERCENT \text{ SPIKE RECOVERY} = (QC \text{ FOUND} / QC \text{ ACTUAL}) * 100$		
Chemist			
SLF			
Analyst			
RWK			
Date Complete	NOTE: Original Sample result was a LESS THAN value. Zero (0) was subtracted from the spiked value for QC found calculation.		
01/15/96			
Analysis Date			
01/14/96	$QC \text{ ACTUAL} =$	3.92E-02	
Analysis Time	$QC \text{ FOUND} =$	3.73E-02	
05:00 AM	$AVG. \text{ PERCENT SPIKE RECOVERY} =$	95.1%	
Sample Point			
AP-108 GRAB			

Analyst	SEH	Date: 15-Jan-96
Signature of Chemist:	SLF	Date: 1/17/96
SPIKE WB1 Rev 1.0	508101ML	

AT : LA-508-101 (D-2)

LIQUIDS

		SAMPLE	REPLICATE
Type	DETECTOR NUMBER	14	14
SAMPLE	DISH SIZE (1, 2, or 5) (MS)	2	2
Work List	GROSS COUNTS (GC)	18	13
4855	COUNT TIME in MINUTES (CT)	30	30
AT or TB ?	BACKGROUND in cpm (BKG)	0.5	0.5
AT	SAMPLE SIZE in mL (SS)	3.000	3.000
Test Code	DILUTION FACTOR (DF)	1	1
@ALPHA01	DIGEST DILUTION FACTOR (DDF)	1	1
Matrix	EFFICIENCY FACTOR (EFF)	0.2274	0.2274
LIQUID	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	0.416	0.301
Batch Number			
96000306	Blank Concentration in $\mu\text{Ci/L}$	< 2.75E-04	
Rerun	Replicate Concentration in $\mu\text{Ci/L}$	< 1.99E-04	
0	Maximum Concentration in $\mu\text{Ci/L}$	< 2.7465E-04	
Sample Prep			
N/A	Rs (Sample Count Rate) = $(TC / CT) - BKG$		
Sample #	ALPHA TOTAL $\mu\text{Ci/L}$ = $R_s * 1000\text{mL/L} * DF * DDF / (EFF * SS * 2220000\text{dpm}/\mu\text{Ci})$		
S96T000093	ALPHA TOTAL $\mu\text{Ci/mL}$ = $ALPHA\ TOTAL\ \mu\text{Ci/L} / 1000\text{mL/L}$		
Instrument Code	Relative Counting Error = $[(The\ Square\ Root\ of\ TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100$		
WB27807	Detection Levels and Less Than Values are determined from Procedure LA-508-002.		
Prepared By			
SEH			
Chemist			
SLF			
Analyst	ALPHA TOTAL in $\mu\text{Ci/mL}$	< 2.75E-07	DETECTION LEVEL
RWK	LESS THAN Value was Determined from Rmax.		
Date Complete	RELATIVE COUNTING ERROR	500.0%	4.58E-07 $\mu\text{Ci/mL}$
01/15/96			
Analysis Date			
01/14/96			
Analysis Time			
05:00 AM			
Sample Point			
AP-108 GRAB			

Analyst:	SEH	Date: 15-Jan-96
Signature of Chemist:	SLF	Date: 1/17/96
SAMPLE WB1 Rev. 1.0	50810VML	

AT : LA-508-101 (D-2)

LIQUIDS

		DUP	REPLICATE
Type	DETECTOR NUMBER	14	14
DUP	DISH SIZE (1, 2, or 5)	(MS)	2
Work List	GROSS COUNTS	(GC)	13
4855	COUNT TIME in MINUTES	(CT)	30
AT or TB ?	BACKGROUND in cpm	(BKG)	0.5
AT	SAMPLE SIZE in mL	(SS)	3.000
Test Code	DILUTION FACTOR	(DF)	1
@ALPHA01	DIGEST DILUTION FACTOR	(DDF)	1
Matrix	EFFICIENCY FACTOR	(EFF)	0.2274
LIQUID	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	0.301	0.301
Batch Number			
96000306	Blank Concentration in $\mu\text{Ci/L}$	<	1.99E-04
Rerun	Replicate Concentration in $\mu\text{Ci/L}$	<	1.99E-04
0	Maximum Concentration in $\mu\text{Ci/L}$	<	1.9891E-04

Sample Prep	
N/A	$R_s (\text{Sample Count Rate}) = (TC / CT) - BKG$
Sample #	$\text{ALPHA TOTAL } \mu\text{Ci/L} = R_s * 1000\text{mL/L} * DF * DDF / (EFF * SS * 2220000\text{dpm}/\mu\text{Ci})$
S96T000093	$\text{ALPHA TOTAL } \mu\text{Ci/mL} = \text{ALPHA TOTAL } \mu\text{Ci/L} / 1000\text{mL/L}$
Instrument Code	$\text{Relative Counting Error} = [(\text{The Square Root of } TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100$
WB27807	Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Prepared By	SEH		
Chemist	SEH		
SLF	ALPHA TOTAL	in $\mu\text{Ci/mL}$	< 1.99E-07
Analyst	LESS Than Value was Determined from Lc.		
RWK			
Date Complete	01/15/96	RELATIVE COUNTING ERROR	500.0%
Analysis Date	01/14/96		
Analysis Time	05:00 AM		
Sample Point	AP-108 GRAB		

Analyst:	SEH	Date: 15-Jan-96
Signature of Chemist:	SLF	Date: 1/17/96
SAMPLE.WB1 Rev. 1.0	508101/mL	

WORKBOOK PAGE: SAMS

AT : LA-508-101 (D-2)

LIQUIDS

		SAMPLE	REPLICATE
Type	DETECTOR NUMBER	14	14
SAMPLE	DISH SIZE (1, 2, or 5)	(MS)	2
Work List	GROSS COUNTS	(GC)	25
4855	COUNT TIME in MINUTES	(CT)	30
AT or TB ?	BACKGROUND in cpm	(BKG)	0.5
AT	SAMPLE SIZE in mL	(SS)	0.100
Test Code	DILUTION FACTOR	(DF)	101
@ALPHA01	DIGEST DILUTION FACTOR	(DDF)	1
Matrix	EFFICIENCY FACTOR	(EFF)	0.2274
LIQUID	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE		0.301

Batch Number	
96000306	Blank Concentration in $\mu\text{Ci/L}$
Rerun	Replicate Concentration in $\mu\text{Ci/L}$
0	Maximum Concentration in $\mu\text{Ci/L}$

Sample Prep	
N/A	R_s (Sample Count Rate) = $(TC / CT) - BKG$
Sample #	$\text{ALPHA TOTAL } \mu\text{Ci/L} = R_s * 1000\text{mL/L} * DF * DDF / (EFF * SS * 2220000\text{dpm}/\mu\text{Ci})$
S96T000098	$\text{ALPHA TOTAL } \mu\text{Ci/mL} = \text{ALPHA TOTAL } \mu\text{Ci/L} / 1000\text{mL/L}$
Instrument Code	Relative Counting Error = $[(\text{The Square Root of } TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100$
WB27807	Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Prepared By	SEH
Chemist	v RESULTS v
SLF	ALPHA TOTAL in $\mu\text{Ci/mL}$ < 6.67E-04
Analyst	LESS THAN Value was Determined from R_s . <i>use Table</i>
DATE Complete	RELATIVE COUNTING ERROR 500.0%
01/15/96	
Analysis Date	
01/14/96	
Analysis Time	
05:00 AM	
Sample Point	
AP-108 GRAB	

Analyst:	SEH	Date: 15-Jan-96
Signature of Chemist:	SLF	Date: 1/17/96
SAMPLE.WB1 Rev. 1.0	508101ML	

WORKBOOK PAGE: DUP1

AT : LA-508-101 (D-2) LIQUIDS

		DUP	REPLICATE
Type	DETECTOR NUMBER	14	14
DUP	DISH SIZE (1, 2, or 5) (MS)	2	2
Work List	GROSS COUNTS (GC)	20	10
4855	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
Test Code	DILUTION FACTOR (DF)	101	101
@ALPHA01	DIGEST DILUTION FACTOR (DDF)	1	1
Matrix	EFFICIENCY FACTOR (EFF)	0.2274	0.2274
LIQUID	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	0.492	0.301

Batch Number	
96000306	Blank Concentration in $\mu\text{Ci/L}$ < 9.84E-01
Rerun	Replicate Concentration in $\mu\text{Ci/L}$ < 6.03E-01
0	Maximum Concentration in $\mu\text{Ci/L}$ < 9.844E-01

Sample Prep	
N/A	Rs (Sample Count Rate) = (TC / CT) - BKG
Sample #	ALPHA TOTAL $\mu\text{Ci/L}$ = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/ μCi)
S96T000098	ALPHA TOTAL $\mu\text{Ci/mL}$ = ALPHA TOTAL $\mu\text{Ci/L}$ / 1000mL/L
Instrument Code	Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100
WB27807	Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Prepared By	SEH
Chemist	
SLF	ALPHA TOTAL in $\mu\text{Ci/mL}$ < 9.84E-04
Analyst	LESS THAN Value was Determined from Rmax. <i>see 1/15/96</i>
RWK	
Date Complete	RELATIVE COUNTING ERROR 500.0%
01/15/96	
Analysis Date	
01/14/96	
Analysis Time	
05:00 AM	
Sample Point	
AP-108 GRAB	

Analyst:	SEH	Date: 15-Jan-96
Signature of Chemist:	<i>SEH</i>	SLF
SAMPLE WB1 Rev. 1.0	508101ML	Date: 1/17/96

AT : LA-508-101 (D-2) SPIKED SAMPLE

		SPIKE	REPLICATE
Type	DETECTOR NUMBER	14	14
SPK	DISH SIZE 1, 2, or 5 (MS)	2	2
Work List	TOTAL COUNTS (TC)	56164	58855
4855	COUNT TIME in MINUTES (CT)	30	30
AT or TB ?	BACKGROUND in cpm (BKG)	0.5	0.5
AT	SAMPLE VOLUME in mL (Spiked Vial) (SS)	0.100	0.100
Test Code	SAMPLE DILUTION FACTOR (Spiked Vial) (DF)	101	101
@ALPHA01	DIGEST DILUTION FACTOR (DDF)	1	1
Matrix	SPIKE VOLUME in mL (SVol)	0.100	0.100
LIQUID	SPIKE DILUTION FACTOR (SDF)	1	1
Batch Number	SPIKE BOOK NUMBER (Spk BN)	119B43	119B43
96000306	SPIKE VALUE in $\mu\text{Ci/mL}$ (SVal)	3.9211E-02	3.9211E-02
Rerun	INSTRUMENT EFFICIENCY FACTOR (EFF)	0.2274	0.2274
0	SAMPLE + SPIKE $\mu\text{Ci/mL}$ (S+S)	3.74E+00	3.92E+00
Sample Prep	AVERAGE or MAXIMUM $\mu\text{Ci/mL}$ in SAMPLE	< 6.6689E-04	
N/A			
Sample #			
S96T000098	R_s (Sample Count Rate) = $(TC / CT) - BKG$		
Instrument Code	$SAMPLE + SPIKE \mu\text{Ci/mL} = R_s * DF * DDF / (EFF * SS * 2220000 \text{dpm}/\mu\text{Ci})$		
WB27807	$QC \text{ ACTUAL} = SVal$		
Prepared By	$QC \text{ FOUND} = (((S+S \mu\text{Ci/mL} - SAMPLE \mu\text{Ci/mL}) * ((SDF/SVol)/(DF*DDF/SS))))$		
SEH	$PERCENT \text{ SPIKE RECOVERY} = (QC \text{ FOUND} / QC \text{ ACTUAL}) * 100$		
Chemist			
SLF			
Analyst			
RWK			
Date Complete	NOTE: Original Sample result was a LESS THAN value. Zero (0) was subtracted from the spiked value for QC found calculation.		
01/15/96			
Analysis Date			
01/14/96	QC ACTUAL =	3.92E-02	
Analysis Time	QC FOUND =	3.80E-02	
05:00 AM	AVG. PERCENT SPIKE RECOVERY =	96.8%	
Sample Point			
AP-108 GRAB			

Analyst:	SEH	Date: 15-Jan-96
Signature of Chemist:	SLF	Date: 1/17/96
SPIKE.WB1 Rev. 1.0	508101ML	

LABCORE Completed Worklist Report for Worklist# 4892

Analyst: slh

Instrument: GEA03

Book# 144852

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

Worklist Comment: AP-108 GEA RTS.

Seq Type	Sample# R A	Test	Matrix	Actual	Found	DL or Yield	Unit
1 STD	0	@GEA-01	CO60-02 LIQUID	0.0208	2.07e-02	99.520 % Recovery	
1 STD	0	@GEA-01	CO60-02E LIQUID	1	1.35	1.350 % Ct. Error	
1 STD	0	@GEA-01	CS13702 LIQUID	0.0253	2.57e-02	101.580 % Recovery	
1 STD	0	@GEA-01	CS13702E LIQUID	1	1.48	1.480 % Ct. Error	
2 BLNK	0	@GEA-01	CO60-02 LIQUID	1	<7.05e-4	uCi/mL	
2 BLNK	0	@GEA-01	CS13702 LIQUID	1	<3.83e-4	uCi/mL	
3 SAMPLE	S96T000092 0	@GEA-01	CO60-02 LIQUID	N/A	6.332e-04	6.332e-004 uCi/mL	
3 SAMPLE	S96T000092 0	@GEA-01	CO60-02E LIQUID	N/A	n/a	0.000 % Ct. Error	
3 SAMPLE	S96T000092 0	@GEA-01	CS13702 LIQUID	N/A	1.961e-01	0.000 uCi/mL	
3 SAMPLE	S96T000092 0	@GEA-01	CS13702E LIQUID	N/A	0.16	0.000 % Ct. Error	
4 DUP	S96T000092 0	@GEA-01	CO60-02 LIQUID	<6.33e-4	<6.02e-4	RPD	
4 DUP	S96T000092 0	@GEA-01	CO60-02E LIQUID	1	n/a	% Ct. Error	
4 DUP	S96T000092 0	@GEA-01	CS13702 LIQUID	1.96e+01	1.91e+01	2.580 RPD	
4 DUP	S96T000092 0	@GEA-01	CS13702E LIQUID	1	0.16	0.160 % Ct. Error	
5 SAMPLE	S96T000093 0	@GEA-01	CO60-02 LIQUID	N/A	2.643e-05	2.643e-005 uCi/mL	
5 SAMPLE	S96T000093 0	@GEA-01	CO60-02E LIQUID	N/A	n/a	0.000 % Ct. Error	
5 SAMPLE	S96T000093 0	@GEA-01	CS13702 LIQUID	N/A	6.183e-05	6.183e-005 uCi/mL	
5 SAMPLE	S96T000093 0	@GEA-01	CS13702E LIQUID	N/A	n/a	0.000 % Ct. Error	
6 DUP	S96T000093 0	@GEA-01	CO60-02 LIQUID	<2.64e-5	<2.29e-5	RPD	
6 DUP	S96T000093 0	@GEA-01	CO60-02E LIQUID	1	n/a	% Ct. Error	
6 DUP	S96T000093 0	@GEA-01	CS13702 LIQUID	<6.18e-5	<6.07e-5	RPD	
6 DUP	S96T000093 0	@GEA-01	CS13702E LIQUID	1	n/a	% Ct. Error	
7 SAMPLE	S96T000098 0	@GEA-01	CO60-02 LIQUID	N/A	6.823e-04	6.823e-004 uCi/mL	
7 SAMPLE	S96T000098 0	@GEA-01	CO60-02E LIQUID	N/A	n/a	0.000 % Ct. Error	
7 SAMPLE	S96T000098 0	@GEA-01	CS13702 LIQUID	N/A	1.941e+01	0.000 uCi/mL	
7 SAMPLE	S96T000098 0	@GEA-01	CS13702E LIQUID	N/A	0.16	0.000 % Ct. Error	
8 DUP	S96T000098 0	@GEA-01	CO60-02 LIQUID	<6.82e-4	<6.55e-4	RPD	
8 DUP	S96T000098 0	@GEA-01	CO60-02E LIQUID	1	n/a	% Ct. Error	
8 DUP	S96T000098 0	@GEA-01	CS13702 LIQUID	1.94e+01	1.99e+01	2.540 RPD	
8 DUP	S96T000098 0	@GEA-01	CS13702E LIQUID	1	0.16	0.160 % Ct. Error	

Comments Section:

Comments for sample# S96T000092 and test @GEA-01 .
DL=0 => n/a.

Comments for sample# S96T000098 and test @GEA-01 .
DL=0 => n/a.

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

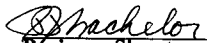
LABCORE Completed Worklist Report for Worklist# 4892

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

Final page for worklist# 4892

Analyst Signature _____ Date _____

Analyst Signature _____ Date _____


Reviewer Signature

1/25/96
Date

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

LABCORE Data Entry Template for Worklist# 4892

Analyst: SLH Instrument: GEA00 3 Book# 144352

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

Worklist Comment: AP-108 GEA RTS.

S Type	Sample#	R A	Test	Matrix	Group#	Project
1 STD			@GEA-01	LIQUID		
2 BLNK-PRBP- 02	<u>1/7/96</u>		@GEA-01	LIQUID		
3 SAMPLE	S96T000092 0		@GEA-01	LIQUID	96000010	AP-108 GRAB
Analytes Requested: CO60-02 , CO60-02E, CS13702 , CS13702E						
4 DUP	S96T000092 0		@GEA-01	LIQUID		
5 SAMPLE	S96T000093 0		@GEA-01	LIQUID	96000010	AP-108 GRAB
Analytes Requested: CO60-02 , CO60-02E, CS13702 , CS13702E						
6 DUP	S96T000093 0		@GEA-01	LIQUID		
7 SAMPLE	S96T000098 0		@GEA-01	LIQUID	96000011	AP-108 GRAB
Analytes Requested: CO60-02 , CO60-02E, CS13702 , CS13702E						
8 DUP	S96T000098 0		@GEA-01	LIQUID		

Final page for worklist # 4892

Sandra Howard Baerghut
Analyst Signature Date 1-16-96

Shachar
Analyst Signature Date 1/24/96

Data Entry Comments:

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*****
* 222-S Laboratory Counting Room    16-JAN-1996 10:11:08.09
*****
>>>>>>>> SAMPLE INFORMATION <<<<<<<<<   WHC-SD-WM-DP-166, REV. 1
Worklist #:          4892
Sample ID:           W/L4892-STD
Sample Size:         1.00000E-03 L
Dilution Factor:    1.00000E+00

>>>>>>>> COUNT INFORMATION <<<<<<<<<
Detector ID:         GEA3
File Number:         dka300:[spec.GEA3]3g3415.cnf
Geometry:            42
Count Time:          0 00:50:00.00 sec
Real Time:           0 00:50:08.31 sec
Dead Time:           0.3%

>>>>>>>> ANALYSIS INFORMATION <<<<<<<<<
Sample Count Time:   16-JAN-1996 09:20:15.71
Decayed to:          16-JAN-1996 09:20:15.71
Standard Deviations: 2
Analysis Library:     ENVGEA
Analyst:              ALJ
Background Subtract: DKA300:[SPEC.GEA3]3GBACK

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

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Removed by:

[Signature] 1-16-96

Verified by:

[Signature] 1/17/96

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/L
0	661.68*	22752	1.60	1323.54	1316	17	1.5		CS-137	25.7
0	1173.25	13126	1.88	2346.77	2337	20	1.9		CO-60	20.7
0	1332.52	11783	2.02	2665.41	2655	21	1.9		CO-60	20.6

Summary of Nuclide Activity
Sample ID : W/L4892-STD

Page : 2
Acquisition date : 16-JAN-1996 09:20:15

Total number of lines in spectrum 3 WHC-SD-WM-DP-166, REV. 1
Number of unidentified lines 0
Number of lines tentatively identified by NID 3 100.00%

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/L	Wtd Mean Decay Corr uCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CO-60	5.27Y	1.000	2.066E+01	2.066E+01	0.028E+01	1.35	
CS-137	30.00Y	1.000	2.572E+01	2.572E+01	0.038E+01	1.48	
Total Activity :			4.638E+01	4.638E+01			

Grand Total Activity : 4.638E+01 4.638E+01

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)	WHC-SD-WM-DP-166, REV. I
BE-7	1120.	477.59	1.1023E+00	
NA-22	89.	1274.53	7.3899E-02	
NA-24	19.	1368.55	3.6564E-02	
K-40	127.	1460.75	9.2336E-01	
SC-46	479.	1120.55	1.5421E-01	
CR-51	1063.	320.08	8.0834E-01	
MN-54	586.	834.83	1.3236E-01	
CO-56	612.	846.76	1.3695E-01	
CO-57	1100.	122.06	5.7400E-02	
CO-58	582.	810.78	1.2933E-01	
FE-59	661.	1099.25	3.1521E-01	
ZN-65	579.	1115.55	3.3281E-01	
SE-75	1262.	264.66	1.3194E-01	
KR-85	786.	514.00	2.3355E+01	
SR-85	786.	514.01	1.0558E-01	
Y-88	12.	1836.06	3.6311E-02	
Y-90	16.	1760.70	1.4156E-01	
Y-91	171.	1204.67	3.2616E+01	
NB-94	670.	871.09	1.4693E-01	
NB-95	501.	765.78	1.1394E-01	
ZR-95	489.	756.73	2.0393E-01	
RU-103	854.	497.08	1.1304E-01	
RURH-106	526.	621.93	1.9645E+00	
AG-108m	507.	722.94	1.1985E-01	
CD-109	1035.	88.03	1.8433E+00	
AG-110M	837.	657.76	1.3628E-01	
SN-113	1047.	391.69	1.4712E-01	
TE-123m	1187.	159.00	6.1344E-02	
SB-124	521.	602.73	9.6611E-02	
SB-125	1088.	427.89	3.5007E-01	
TE-125m	1056.	109.27	1.8312E+01	
I-129	990.	39.60	0.0000E+00	
I-131	1012.	364.48	1.0813E-01	
XE-131m	1187.	163.93	2.6681E+00	
BA-133	1023.	356.02	1.3961E-01	
CS-134	505.	604.70	9.5572E-02	
CS-136	629.	818.51	1.3533E-01	
CS-138	23.	1435.86	8.9003E-02	
CE-139	1213.	165.85	6.6492E-02	
BA-140	663.	537.31	3.9643E-01	
LA-140	20.	1596.21	4.4125E-02	
CE-141	1204.	145.44	1.0491E-01	
CE-144	1255.	133.51	4.6398E-01	
CEPR-144	1254.	133.51	9.2706E-01	
EU-152	19.	1408.01	1.7956E-01	
EU-154	88.	1274.51	2.1445E-01	
EU-155	1044.	86.54	2.0992E-01	
HF-181	1027.	482.18	1.3681E-01	
TA-182	910.	67.75	2.9450E-01	
HG-203	1223.	279.20	9.6849E-02	
BI-207	594.	569.70	9.8306E-02	

Sample ID : W/L4892-STD

Acquisition date : 16-JAN-1996 09:20:15

WHC-SD-WM-DP-166, REV.1

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
TL-208	1217.	277.36	1.2414E+00
PB-210	922.	46.50	0.0000E+00
BI-212	514.	727.18	1.6549E+00
PB-212	1457.	238.63	1.7634E-01
BI-214	636.	609.31	2.3516E-01
PB-214	1008.	351.92	4.2502E-01
RA-224	1394.	240.99	1.9148E+00
RA-226	1402.	186.10	1.7534E+00
AC-228	772.	911.21	6.1531E-01
TH-228	989.	84.37	5.5496E+00
TH-229	990.	88.47	2.6139E-01
U-232	910.	57.78	1.4120E+02
PA-233	1146.	312.17	2.1498E-01
PA-234M	618.	1001.03	2.6914E-01
TH-234	929.	63.29	3.6235E+00
U-235	1395.	185.71	1.0628E-01
NP-237	1044.	86.48	5.5624E-01
U-237	887.	59.54	6.5132E-01
NP-238	676.	984.45	5.9250E-01
NP-239	1083.	106.12	2.3530E-01
PU-239	1135.	129.30	7.6749E+02
AM-241	887.	59.54	6.2472E-01
AM-243	1046.	74.67	1.5946E-01

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*****
* 222-S Laboratory Counting Room 16-JAN-1996 12:43:00.62
*****
>>>>>>> SAMPLE INFORMATION <<<<<<<<< WHC-SD-WM-DP-166, REV. 1
Worklist #: 4892
Sample ID: W/L4892-BLK Removed by:
Sample Size: 1.00000E-03 L
Dilution Factor: 1.00000E+00 [Signature] 1-16-96

>>>>>>> COUNT INFORMATION <<<<<<<<<
Detector ID: GEA3
File Number: dka300:[spec.GEA3]3g3416.cnf Verified by:
Geometry: 42 [Signature] 1/17/96
Count Time: 0 00:50:00.00 sec
Real Time: 0 00:50:00.42 sec
Dead Time: 0.0%

>>>>>>> ANALYSIS INFORMATION <<<<<<<<<
Sample Count Time: 16-JAN-1996 11:52:20.75
Decayed to: 16-JAN-1996 11:52:20.75
Standard Deviations: 2
Analysis Library: ENVGEA
Analyst: ALJ
Background Subtract: DKA300:[SPEC.GEA3]3GBACK

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

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

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

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

WHC-SD-WM-DP-166, REV. 1

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BE-7	29.	477.59	1.7651E-01
NA-22	7.	1274.53	2.1045E-02
NA-24	4.	1368.55	1.6562E-02
K-40	122.	1460.75	9.0515E-01
SC-46	26.	1120.55	3.5918E-02
CR-51	53.	320.08	1.8070E-01
MN-54	24.	834.83	2.6828E-02
CO-56	12.	846.76	1.9245E-02
CO-57	86.	122.06	1.6044E-02
CO-58	18.	810.78	2.2746E-02
FE-59	6.	1099.25	3.0259E-02
CO-60	9.	1332.50	2.4415E-02
ZN-65	13.	1115.55	5.0457E-02
SE-75	67.	264.66	3.0454E-02
KR-85	48.	514.00	5.7523E+00
SR-85	47.	514.01	2.5947E-02
Y-88	1.	1836.06	1.0492E-02
Y-90	2.	1760.70	5.0232E-02
Y-91	16.	1204.67	9.8728E+00
NB-94	17.	871.09	2.3294E-02
NB-95	20.	765.78	2.3023E-02
ZR-95	14.	756.73	3.4217E-02
RU-103	34.	497.08	2.2424E-02
RURH-106	25.	621.93	4.3076E-01
AG-108m	15.	722.94	2.0421E-02
CD-109	65.	88.03	4.6331E-01
AG-110M	26.	657.76	2.4143E-02
SN-113	33.	391.69	2.6179E-02
TE-123m	70.	159.00	1.4845E-02
SB-124	22.	602.73	2.0066E-02
SB-125	34.	427.89	6.2039E-02
TE-125m	73.	109.27	4.8009E+00
I-129	58.	39.60	0.0000E+00
I-131	32.	364.48	1.9374E-02
XE-131m	79.	163.93	6.8669E-01
BA-133	42.	356.02	2.8197E-02
CS-134	25.	604.70	2.1282E-02
CS-136	14.	818.51	2.0162E-02
CS-137	123.	661.66	5.8371E-02
CS-138	8.	1435.86	5.2161E-02
CE-139	88.	165.85	1.7862E-02
BA-140	29.	537.31	8.2226E-02
LA-140	7.	1596.21	2.5283E-02
CE-141	72.	145.44	2.5709E-02
CE-144	71.	133.51	1.1072E-01
CEPR-144	71.	133.51	2.2117E-01
EU-152	6.	1408.01	9.8913E-02
EU-154	7.	1274.51	6.1311E-02
EU-155	62.	86.54	5.1340E-02
HF-181	28.	482.18	2.2752E-02
TA-182	72.	67.75	8.3021E-02

WHC-SD-WM-DP-166, REV. 1

Sample ID : W/L4892-BLK

Acquisition date : 16-JAN-1996 11:52:20

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
HG-203	61.	279.20	2.1653E-02
BI-207	34.	569.70	2.3425E-02
TL-208	65.	277.36	2.8743E-01
PB-210	54.	46.50	0.0000E+00
BI-212	22.	727.18	3.3983E-01
PB-212	85.	238.63	4.2630E-02
BI-214	62.	609.31	7.3234E-02
PB-214	77.	351.92	1.1711E-01
RA-224	69.	240.99	4.2466E-01
RA-226	79.	186.10	4.1576E-01
AC-228	39.	911.21	1.3845E-01
TH-228	65.	84.37	1.4187E+00
TH-229	62.	88.47	6.5384E-02
U-232	60.	57.78	3.6132E+01
PA-233	56.	312.17	4.7475E-02
PA-234M	15.	1001.03	4.1357E-02
TH-234	58.	63.29	9.0632E-01
U-235	79.	185.71	2.5237E-02
NP-237	62.	86.48	1.3606E-01
U-237	49.	59.54	1.5272E-01
NP-238	15.	984.45	8.6969E-02
NP-239	63.	106.12	5.6709E-02
PU-239	65.	129.30	1.8397E+02
AM-241	49.	59.54	1.4651E-01
AM-243	79.	74.67	4.3739E-02

W/C-SD-WM-DP-166, REV. 1

 * 222-S Laboratory Counting Room 16-JAN-1996 13:40:36.80

>>>>>>> SAMPLE INFORMATION <<<<<<<<<<
 Worklist #: 4892
 Sample ID: S96T000092-SAM
 Sample Size: 1.00000E-03 L
 Dilution Factor: 1.00000E+01

WHC-SD-WM-DP-166, REV. 1
 Removed by:

[Signature] 1-16-96

>>>>>>> COUNT INFORMATION <<<<<<<<<<
 Detector ID: GEA3
 File Number: dka300:[spec.GEA3]3g3417.cnf
 Geometry: 42
 Count Time: 0 00:50:00.00 sec
 Real Time: 0 00:53:46.42 sec
 Dead Time: 7.0%

Verified by:

[Signature] 1/17/96

>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<
 Sample Count Time: 16-JAN-1996 12:46:09.29
 Decayed to: 16-JAN-1996 12:46:09.29
 Standard Deviations: 2
 Analysis Library: ENVGEA
 Analyst: SEH
 Background Subtract: DKA300:[SPEC.GEA3]3GBACK

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

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/L
0	185.82	1083	1.74	372.06	370	6	65.1		RA-226	109.
0	569.32	565	1.08	1138.84	1136	7	57.9		CS-134	31.0
0	604.76	2051	1.51	1209.71	1205	10	20.2		CS-134	18.8
0	661.81*	1734788	1.58	1323.80	1315	18	0.2		CS-137	1.961E+04
0	795.96	1743	1.63	1592.09	1584	14	13.3		CS-134	23.0
0	1322.55	852	3.13	2645.46	2636	18	14.5			

Total number of lines in spectrum 6 WHC-SD-WM-DP-166, REV./
Number of unidentified lines 1
Number of lines tentatively identified by NID 5 83.33%

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/L	Wtd Mean Decay Corr uCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CS-134	2.06Y	1.000	2.151E+01	2.151E+01	0.236E+01	10.97	
CS-137	30.00Y	1.000	1.961E+04	1.961E+04	0.003E+04	0.16	
RA-226	1600.00Y	1.000	1.090E+02	1.090E+02	0.709E+02	65.07	BK
Total Activity :			1.974E+04	1.974E+04			

Grand Total Activity : 1.974E+04 1.974E+04

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

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)	WHC-SD-WM-DP-166, REV. /
BE-7	54016.	477.59	7.6568E+01	
NA-22	288.	1274.53	1.3311E+00	
NA-24	50.	1368.55	6.0074E-01	
K-40	145.	1460.75	9.8638E+00	
SC-46	543.	1120.55	1.6408E+00	
CR-51	41486.	320.08	5.0498E+01	
MN-54	1804.	834.83	2.3226E+00	
CO-56	1636.	846.76	2.2399E+00	
CO-57	42333.	122.06	3.5607E+00	
CO-58	1801.	810.78	2.2754E+00	
FE-59	613.	1099.25	3.0355E+00	
CO-60	61.	1332.50	6.3321E-01	
ZN-65	549.	1115.55	3.2412E+00	
SE-75	46054.	264.66	7.9707E+00	
KR-85	27270.	514.00	1.3756E+03	
SR-85	27265.	514.01	6.2195E+00	
Y-88	4.	1836.06	2.0984E-01	
Y-90	12.	1760.70	1.2364E+00	
Y-91	315.	1204.67	4.4289E+02	
NB-94	1502.	871.09	2.1993E+00	
NB-95	2218.	765.78	2.3966E+00	
ZR-95	2323.	756.73	4.4449E+00	
RU-103	33207.	497.08	7.0493E+00	
RURH-106	10194.	621.93	8.6519E+01	
AG-108m	2814.	722.94	2.8228E+00	
CD-109	36748.	88.03	1.0985E+02	
AG-110M	24192.	657.76	7.3268E+00	
SN-113	46141.	391.69	9.7656E+00	
TE-123m	44226.	159.00	3.7442E+00	
SB-124	12110.	602.73	4.6578E+00	
SB-125	53625.	427.89	2.4577E+01	
TE-125m	38935.	109.27	1.1118E+03	
I-129	34596.	39.60	0.0000E+00	
I-131	42887.	364.48	7.0402E+00	
XE-131m	44277.	163.93	1.6296E+02	
BA-133	42301.	356.02	8.9766E+00	
CS-136	1782.	818.51	2.2778E+00	
CS-138	20.	1435.86	8.4405E-01	
CE-139	44654.	165.85	4.0346E+00	
BA-140	19766.	537.31	2.1643E+01	
LA-140	14.	1596.21	3.6942E-01	
CE-141	43528.	145.44	6.3070E+00	
CE-144	43359.	133.51	2.7277E+01	
CEPR-144	43357.	133.51	5.4504E+01	
EU-152	22.	1408.01	1.9005E+00	
EU-154	287.	1274.51	3.8665E+00	
EU-155	36601.	86.54	1.2431E+01	
HF-181	43317.	482.18	8.8835E+00	
TA-182	34382.	67.75	1.8099E+01	
HG-203	43767.	279.20	5.7944E+00	
BI-207	12847.	569.70	4.5700E+00	

Sample ID : S96T000092-SAM

Acquisition date : 16-JAN-1996 12:46:09

Nuclide	Bckgnd Sum	Energy (keV)	MDA WHC-SD-WM-DP-166, REV. / (uCi/L)
TL-208	44134.	277.36	7.4747E+01
PB-210	34036.	46.50	0.0000E+00
BI-212	2744.	727.18	3.8251E+01
PB-212	51216.	238.63	1.0454E+01
BI-214	10503.	609.31	9.5551E+00
PB-214	42148.	351.92	2.8509E+01
RA-224	50829.	240.99	1.1566E+02
AC-228	1186.	911.21	7.6294E+00
TH-228	36470.	84.37	3.3705E+02
TH-229	36644.	88.47	1.5899E+01
U-232	33876.	57.78	8.6155E+03
PA-233	41586.	312.17	1.2952E+01
PA-234M	843.	1001.03	3.1439E+00
TH-234	33971.	63.29	2.1910E+02
U-235	58121.	185.71	6.8607E+00
NP-237	36600.	86.48	3.2928E+01
U-237	33937.	59.54	4.0295E+01
NP-238	942.	984.45	6.9949E+00
NP-239	38480.	106.12	1.4030E+01
PU-239	43238.	129.30	4.7367E+04
AM-241	33937.	59.54	3.8645E+01
AM-243	34916.	74.67	9.2132E+00

Summary of Nuclide Activity
Sample ID : S96T000092-DUP

Page : 2
Acquisition date : 16-JAN-1996 13:42:42

Total number of lines in spectrum 8 WHC-SD-WM-DP-166, REV.1
Number of unidentified lines 3
Number of lines tentatively identified by NID 5 62.50%

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/L	Wtd Mean Decay Corr uCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CS-134	2.06Y	1.000	2.045E+01	2.045E+01	0.227E+01	11.10	
CS-137	30.00Y	1.000	1.912E+04	1.912E+04	0.003E+04	0.16	
RA-226	1600.00Y	1.000	6.830E+01	6.830E+01	6.061E+01	88.74	BLK
Total Activity :			1.921E+04	1.921E+04			

Grand Total Activity : 1.921E+04 1.921E+04

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)	WHC-SD-WM-DP-166, REV. 1
BE-7	52273.	477.59	7.5323E+01	
NA-22	276.	1274.53	1.3036E+00	
NA-24	32.	1368.55	4.7630E-01	
K-40	148.	1460.75	9.9449E+00	
SC-46	551.	1120.55	1.6537E+00	
CR-51	40629.	320.08	4.9974E+01	
MN-54	1678.	834.83	2.2398E+00	
CO-56	1630.	846.76	2.2356E+00	
CO-57	41421.	122.06	3.5222E+00	
CO-58	1821.	810.78	2.2877E+00	
FE-59	624.	1099.25	3.0642E+00	
CO-60	55.	1332.50	6.0215E-01	
ZN-65	572.	1115.55	3.3100E+00	
SE-75	44681.	264.66	7.8510E+00	
KR-85	26683.	514.00	1.3607E+03	
SR-85	26681.	514.01	6.1526E+00	
Y-88	4.	1836.06	2.0984E-01	
Y-90	7.	1760.70	9.4367E-01	
Y-91	313.	1204.67	4.4199E+02	
NB-94	1481.	871.09	2.1839E+00	
NB-95	2054.	765.78	2.3064E+00	
ZR-95	2217.	756.73	4.3419E+00	
RU-103	32905.	497.08	7.0172E+00	
RURH-106	9826.	621.93	8.4941E+01	
AG-108m	2692.	722.94	2.7611E+00	
CD-109	36057.	88.03	1.0882E+02	
AG-110M	23530.	657.76	7.2259E+00	
SN-113	45097.	391.69	9.6545E+00	
TE-123m	43097.	159.00	3.6961E+00	
SB-124	11749.	602.73	4.5879E+00	
SB-125	52101.	427.89	2.4226E+01	
TE-125m	38507.	109.27	1.1057E+03	
I-129	33469.	39.60	0.0000E+00	
I-131	41960.	364.48	6.9638E+00	
XE-131m	42949.	163.93	1.6050E+02	
BA-133	41346.	356.02	8.8746E+00	
CS-136	1766.	818.51	2.2673E+00	
CS-138	25.	1435.86	9.6098E-01	
CE-139	43122.	165.85	3.9648E+00	
BA-140	18867.	537.31	2.1145E+01	
LA-140	11.	1596.21	3.2091E-01	
CE-141	42897.	145.44	6.2612E+00	
CE-144	42741.	133.51	2.7082E+01	
CEPR-144	42741.	133.51	5.4115E+01	
EU-152	21.	1408.01	1.8416E+00	
EU-154	276.	1274.51	3.7860E+00	
EU-155	35815.	86.54	1.2297E+01	
HF-181	41812.	482.18	8.7279E+00	
TA-182	33589.	67.75	1.7889E+01	
HG-203	42516.	279.20	5.7110E+00	
BI-207	12618.	569.70	4.5290E+00	

Sample ID : S96T000092-DUP

Acquisition date : 16-JAN-1996 13:42:42

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)	WHC-SD-WM-DP-166, REV. /
TL-208	42910.	277.36	7.3703E+01	
PB-210	33114.	46.50	0.0000E+00	
BI-212	2625.	727.18	3.7414E+01	
PB-212	49851.	238.63	1.0314E+01	
BI-214	10120.	609.31	9.3792E+00	
PB-214	41159.	351.92	2.8144E+01	
RA-224	49243.	240.99	1.1384E+02	
AC-228	1173.	911.21	7.5853E+00	
TH-228	35527.	84.37	3.3266E+02	
TH-229	36072.	88.47	1.5775E+01	
U-232	32766.	57.78	8.4732E+03	
PA-233	40696.	312.17	1.2812E+01	
PA-234M	817.	1001.03	3.0963E+00	
TH-234	33079.	63.29	2.1620E+02	
U-235	56578.	185.71	6.7690E+00	
NP-237	35798.	86.48	3.2565E+01	
U-237	32712.	59.54	3.9560E+01	
NP-238	846.	984.45	6.6295E+00	
NP-239	37735.	106.12	1.3893E+01	
PU-239	42527.	129.30	4.6976E+04	
AM-241	32712.	59.54	3.7941E+01	
AM-243	34073.	74.67	9.1012E+00	

Summary of Nuclide Activity
Sample ID : S96T000093-SAM

Page : 2
Acquisition date : 16-JAN-1996 14:40:46

Total number of lines in spectrum	1	WHC-SD-WM-DP-166, REV. 1
Number of unidentified lines	0	
Number of lines tentatively identified by NID	1	100.00%
**** There are no nuclides meeting summary criteria ****		

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)	WHC-SD-WM-DP-166, REV.1
BE-7	39.	477.59	2.0510E-01	
NA-22	13.	1274.53	2.8719E-02	
NA-24	7.	1368.55	2.2404E-02	
K-40	135.	1460.75	9.5183E-01	
SC-46	25.	1120.55	3.5183E-02	
CR-51	61.	320.08	1.9353E-01	
MN-54	18.	834.83	2.3027E-02	
CO-56	14.	846.76	2.0778E-02	
CO-57	69.	122.06	1.4325E-02	
CO-58	10.	810.78	1.6916E-02	
FE-59	15.	1099.25	4.7030E-02	
CO-60	11.	1332.50	2.6430E-02	
ZN-65	11.	1115.55	4.5748E-02	
SE-75	83.	264.66	3.3776E-02	
KR-85	39.	514.00	5.1910E+00	
SR-85	39.	514.01	2.3378E-02	
Y-88	5.	1836.06	2.3461E-02	
Y-90	5.	1760.70	7.9423E-02	
Y-91	11.	1204.67	8.1425E+00	
NB-94	19.	871.09	2.4884E-02	
NB-95	12.	765.78	1.7417E-02	
ZR-95	20.	756.73	4.1281E-02	
RU-103	32.	497.08	2.1932E-02	
RURH-106	22.	621.93	3.9899E-01	
AG-108m	16.	722.94	2.1288E-02	
CD-109	61.	88.03	4.4777E-01	
AG-110M	33.	657.76	2.6887E-02	
SN-113	40.	391.69	2.8582E-02	
TE-123m	94.	159.00	1.7245E-02	
SB-124	24.	602.73	2.0585E-02	
SB-125	41.	427.89	6.7664E-02	
TE-125m	74.	109.27	4.8327E+00	
I-129	68.	39.60	0.0000E+00	
I-131	53.	364.48	2.4711E-02	
XE-131m	75.	163.93	6.7032E-01	
BA-133	26.	356.02	2.2056E-02	
CS-134	23.	604.70	2.0333E-02	
CS-136	15.	818.51	2.0649E-02	
CS-137	138.	661.66	6.1833E-02	
CS-138	8.	1435.86	5.3626E-02	
CE-139	90.	165.85	1.8134E-02	
BA-140	21.	537.31	7.0583E-02	
LA-140	8.	1596.21	2.7550E-02	
CE-141	80.	145.44	2.6960E-02	
CE-144	80.	133.51	1.1728E-01	
CEPR-144	80.	133.51	2.3458E-01	
EU-152	13.	1408.01	1.4664E-01	
EU-154	13.	1274.51	8.3437E-02	
EU-155	69.	86.54	5.4098E-02	
HF-181	32.	482.18	2.4117E-02	
TA-182	58.	67.75	7.4240E-02	

Sample ID : S96T000093-SAM

Acquisition date : 16-JAN-1996 14:40:46

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)	WHC-SD-WM-DP-166, REV.1
HG-203	62.	279.20	2.1783E-02	
BI-207	34.	569.70	2.3539E-02	
TL-208	55.	277.36	2.6279E-01	
PB-210	42.	46.50	0.0000E+00	
BI-212	25.	727.18	3.6701E-01	
PB-212	115.	238.63	4.9530E-02	
BI-214	73.	609.31	7.9835E-02	
PB-214	82.	351.92	1.2096E-01	
RA-224	95.	240.99	4.9864E-01	
RA-226	91.	186.10	4.4770E-01	
AC-228	26.	911.21	1.1242E-01	
TH-228	67.	84.37	1.4428E+00	
TH-229	61.	88.47	6.5048E-02	
U-232	59.	57.78	3.6030E+01	
PA-233	60.	312.17	4.9022E-02	
PA-234M	11.	1001.03	3.5387E-02	
TH-234	55.	63.29	8.8512E-01	
U-235	95.	185.71	2.7755E-02	
NP-237	70.	86.48	1.4359E-01	
U-237	60.	59.54	1.6902E-01	
NP-238	11.	984.45	7.3938E-02	
NP-239	84.	106.12	6.5424E-02	
PU-239	83.	129.30	2.0815E+02	
AM-241	60.	59.54	1.6212E-01	
AM-243	99.	74.67	4.9168E-02	

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*****
* 222-S Laboratory Counting Room 16-JAN-1996 16:33:13.54
*****
>>>>>>> SAMPLE INFORMATION <<<<<<<<
Worklist #: 4892 WHC-SD-WM-DP-166, REV.1
Sample ID: S96T000093-DUP Removed by:
Sample Size: 1.00000E-03 L
Dilution Factor: 1.00000E+00 Ad Johnson 1-16-96

>>>>>>> COUNT INFORMATION <<<<<<<<
Detector ID: GEA3
File Number: dka300:[spec.GEA3]3g3420.cnf Verified by:
Geometry: 42 Bachelors 1/17/96
Count Time: 0 00:50:00.00 sec
Real Time: 0 00:50:00.44 sec
Dead Time: 0.0%

>>>>>>> ANALYSIS INFORMATION <<<<<<<<
Sample Count Time: 16-JAN-1996 15:42:35.26
Decayed to: 16-JAN-1996 15:42:35.26
Standard Deviations: 2
Analysis Library: ENVGEA
Analyst: ALJ
Background Subtract: DKA300:[SPEC.GEA3]3GBACK

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

```

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/L
0	351.81*	54	1.28	703.93	698	13	63.5			
0	1461.16*	17	2.30	2922.80	2912	23164	2		K-40	0.294

Total number of lines in spectrum 2 WHC-SD-WM-DP-166, REV. 1
Number of unidentified lines 0
Number of lines tentatively identified by NID 2 100.00%

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/L	Wtd Mean Decay Corr uCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error Flags
K-40	1.20E+09Y	1.000	2.941E-01	2.941E-01	4.831E-01	164.22BK6
Total Activity :			2.941E-01	2.941E-01		

Grand Total Activity : 2.941E-01 2.941E-01

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Nuclide	Bckgnd Sum	Energy (keV)	MDA WHC-SD-WM-DP-166, REV. I (uCi/L)
BE-7	35.	477.59	1.9478E-01
NA-22	10.	1274.53	2.4821E-02
NA-24	8.	1368.55	2.4643E-02
SC-46	22.	1120.55	3.2959E-02
CR-51	46.	320.08	1.6849E-01
MN-54	16.	834.83	2.2193E-02
CO-56	15.	846.76	2.1503E-02
CO-57	68.	122.06	1.4264E-02
CO-58	26.	810.78	2.7314E-02
FE-59	12.	1099.25	4.1899E-02
CO-60	8.	1332.50	2.2948E-02
ZN-65	16.	1115.55	5.5228E-02
SE-75	65.	264.66	2.9879E-02
KR-85	43.	514.00	5.4869E+00
SR-85	43.	514.01	2.4749E-02
Y-88	5.	1836.06	2.3354E-02
Y-90	3.	1760.70	6.1521E-02
Y-91	13.	1204.67	9.0381E+00
NB-94	17.	871.09	2.3618E-02
NB-95	21.	765.78	2.3046E-02
ZR-95	15.	756.73	3.5715E-02
RU-103	31.	497.08	2.1604E-02
RURH-106	22.	621.93	4.0207E-01
AG-108m	27.	722.94	2.7792E-02
CD-109	65.	88.03	4.6209E-01
AG-110M	28.	657.76	2.5141E-02
SN-113	49.	391.69	3.1979E-02
TE-123m	76.	159.00	1.5520E-02
SB-124	18.	602.73	1.7722E-02
SB-125	47.	427.89	7.2667E-02
TE-125m	66.	109.27	4.5799E+00
I-129	51.	39.60	0.0000E+00
I-131	48.	364.48	2.3500E-02
XE-131m	74.	163.93	6.6796E-01
BA-133	44.	356.02	2.8958E-02
CS-134	18.	604.70	1.7791E-02
CS-136	17.	818.51	2.2473E-02
CS-137	133.	661.66	6.0666E-02
CS-138	6.	1435.86	4.3618E-02
CE-139	75.	165.85	1.6499E-02
BA-140	17.	537.31	6.4126E-02
LA-140	3.	1596.21	1.5804E-02
CE-141	71.	145.44	2.5496E-02
CE-144	76.	133.51	1.1406E-01
CEPR-144	76.	133.51	2.2792E-01
EU-152	5.	1408.01	9.0164E-02
EU-154	10.	1274.51	7.2113E-02
EU-155	68.	86.54	5.3740E-02
HF-181	38.	482.18	2.6324E-02
TA-182	61.	67.75	7.6000E-02
HG-203	60.	279.20	2.1505E-02

Minimum Detectable Activity Report (continued)

Page : 4

Sample ID : S96T000093-DUP

Acquisition date : 16-JAN-1996 15:42:35

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)	WHC-SD-WM-DP-166, REV. 1
BI-207	20.	569.70	1.8162E-02	
TL-208	53.	277.36	2.5951E-01	
PB-210	53.	46.50	0.0000E+00	
BI-212	25.	727.18	3.6450E-01	
PB-212	85.	238.63	4.2570E-02	
BI-214	52.	609.31	6.7544E-02	
PB-214	104.	351.92	1.3659E-01	
RA-224	69.	240.99	4.2466E-01	
RA-226	89.	186.10	4.4237E-01	
AC-228	24.	911.21	1.0946E-01	
TH-228	67.	84.37	1.4426E+00	
TH-229	61.	88.47	6.4882E-02	
U-232	58.	57.78	3.5551E+01	
PA-233	40.	312.17	4.0200E-02	
PA-234M	9.	1001.03	3.2744E-02	
TH-234	60.	63.29	9.1905E-01	
U-235	86.	185.71	2.6377E-02	
NP-237	69.	86.48	1.4320E-01	
U-237	62.	59.54	1.7160E-01	
NP-238	15.	984.45	8.8424E-02	
NP-239	82.	106.12	6.4690E-02	
PU-239	67.	129.30	1.8677E+02	
AM-241	62.	59.54	1.6461E-01	
AM-243	51.	74.67	3.5072E-02	

Summary of Nuclide Activity
Sample ID : S96T000098-SAM

Page : 2
Acquisition date : 16-JAN-1996 16:45:19

Total number of lines in spectrum 5
Number of unidentified lines 2
Number of lines tentatively identified by NID 3 60.00%
WHC-SD-WM-DP-166, REV. 1

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/L	Wtd Mean Decay Corr uCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CS-134	2.06Y	1.000	1.953E+01	1.953E+01	0.234E+01	11.98	
CS-137	30.00Y	1.000	1.941E+04	1.941E+04	0.003E+04	0.16	
Total Activity :			1.943E+04	1.943E+04			

Grand Total Activity : 1.943E+04 1.943E+04

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)	WHC-SD-WM-DP-166, REV. I
BE-7	53825.	477.59	7.6433E+01	
NA-22	281.	1274.53	1.3164E+00	
NA-24	43.	1368.55	5.5794E-01	
K-40	127.	1460.75	9.2139E+00	
SC-46	586.	1120.55	1.7050E+00	
CR-51	41676.	320.08	5.0614E+01	
MN-54	1767.	834.83	2.2986E+00	
CO-56	1638.	846.76	2.2413E+00	
CO-57	41880.	122.06	3.5417E+00	
CO-58	1862.	810.78	2.3135E+00	
FE-59	611.	1099.25	3.0305E+00	
CO-60	70.	1332.50	6.8232E-01	
ZN-65	572.	1115.55	3.3091E+00	
SE-75	45317.	264.66	7.9067E+00	
KR-85	26995.	514.00	1.3686E+03	
SR-85	26992.	514.01	6.1883E+00	
Y-88	4.	1836.06	2.0525E-01	
Y-90	8.	1760.70	1.0050E+00	
Y-91	289.	1204.67	4.2459E+02	
NB-94	1457.	871.09	2.1658E+00	
NB-95	2159.	765.78	2.3643E+00	
ZR-95	2311.	756.73	4.4336E+00	
RU-103	33068.	497.08	7.0345E+00	
RURH-106	9985.	621.93	8.5627E+01	
AG-108m	2742.	722.94	2.7863E+00	
CD-109	36298.	88.03	1.0918E+02	
AG-110M	24152.	657.76	7.3207E+00	
SN-113	45198.	391.69	9.6653E+00	
TE-123m	44090.	159.00	3.7385E+00	
SB-124	11947.	602.73	4.6262E+00	
SB-125	52888.	427.89	2.4408E+01	
TE-125m	38550.	109.27	1.1063E+03	
I-129	34108.	39.60	0.0000E+00	
I-131	42422.	364.48	7.0020E+00	
XE-131m	43808.	163.93	1.6209E+02	
BA-133	42146.	356.02	8.9601E+00	
CS-136	1814.	818.51	2.2982E+00	
CS-138	21.	1435.86	8.7822E-01	
CE-139	43696.	165.85	3.9912E+00	
BA-140	19428.	537.31	2.1457E+01	
LA-140	12.	1596.21	3.4386E-01	
CE-141	43808.	145.44	6.3273E+00	
CE-144	42997.	133.51	2.7163E+01	
CEPR-144	42996.	133.51	5.4276E+01	
EU-152	29.	1408.01	2.2027E+00	
EU-154	282.	1274.51	3.8265E+00	
EU-155	36114.	86.54	1.2348E+01	
HF-181	42761.	482.18	8.8263E+00	
TA-182	33708.	67.75	1.7921E+01	
HG-203	43793.	279.20	5.7962E+00	
BI-207	12496.	569.70	4.5072E+00	

Sample ID : S96T000098-SAM

Acquisition date : 16-JAN-1996 16:45:19

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)	WHC-SD-WM-DP-166, REV.1
TL-208	43430.	277.36	7.4148E+01	
PB-210	33919.	46.50	0.0000E+00	
BI-212	2659.	727.18	3.7656E+01	
PB-212	50675.	238.63	1.0399E+01	
BI-214	10273.	609.31	9.4500E+00	
PB-214	41814.	351.92	2.8384E+01	
RA-224	50150.	240.99	1.1488E+02	
RA-226	58166.	186.10	1.1292E+02	
AC-228	1258.	911.21	7.8561E+00	
TH-228	35953.	84.37	3.3465E+02	
TH-229	36255.	88.47	1.5815E+01	
U-232	33228.	57.78	8.5328E+03	
PA-233	41443.	312.17	1.2929E+01	
PA-234M	840.	1001.03	3.1380E+00	
TH-234	33627.	63.29	2.1799E+02	
U-235	57474.	185.71	6.8224E+00	
NP-237	36121.	86.48	3.2712E+01	
U-237	33108.	59.54	3.9799E+01	
NP-238	843.	984.45	6.6202E+00	
NP-239	37891.	106.12	1.3922E+01	
PU-239	42944.	129.30	4.7206E+04	
AM-241	33108.	59.54	3.8170E+01	
AM-243	34817.	74.67	9.2000E+00	

 * 222-S Laboratory Counting Room 16-JAN-1996 18:41:40.82 *

>>>>>>> SAMPLE INFORMATION <<<<<<<<< WHC-SD-WM-DP-166, REV. 1
 Worklist #: 4892
 Sample ID: S96T98-DUP
 Sample Size: 1.00000E-03 L
 Dilution Factor: 1.00000E+01

Removed by:

Sh. H. H.

>>>>>>> COUNT INFORMATION <<<<<<<<<
 Detector ID: GEA3
 File Number: dka300:[spec.GEA3]3g3423.cnf
 Geometry: 42
 Count Time: 0 00:50:00.00 sec
 Real Time: 0 00:53:50.31 sec
 Dead Time: 7.1%

Verified by:

B. Bachelor 1/17/96

>>>>>>> ANALYSIS INFORMATION <<<<<<<<<
 Sample Count Time: 16-JAN-1996 17:47:14.58
 Decayed to: 16-JAN-1996 17:47:14.58
 Standard Deviations: 2
 Analysis Library: ENVGEA
 Analyst: DM
 Background Subtract: DKA300:[SPEC.GEA3]3GBACK

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

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/L
0	604.79	2129	1.51	1209.77	1205	9	17.7		CS-134	19.5
0	661.82*	1761056	1.57	1323.82	1315	18	0.2		CS-137	1.990E+04
0	796.09	1493	1.70	1592.35	1587	12	14.5		CS-134	19.7
0	1323.06	646	2.49	2646.49	2641	15	17.3			
0	1365.32	63	3.27	2731.03	2725	11	33.8			
0	1401.68	26	1.07	2803.79	2799	12	84.1			

Summary of Nuclide Activity

Sample ID : S96T98-DUP

Page : 2
Acquisition date : 16-JAN-1996 17:47:14

Total number of lines in spectrum

6

Number of unidentified lines

3

Number of lines tentatively identified by NID

3

WHC-SD-WM-DP-166, REV. 1

50.00%

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/L	Wtd Mean Decay Corr uCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CS-134	2.06Y	1.000	1.962E+01	1.962E+01	0.220E+01	11.24	
CS-137	30.00Y	1.000	1.990E+04	1.990E+04	0.003E+04	0.16	
Total Activity :			1.992E+04	1.992E+04			

Grand Total Activity : 1.992E+04

1.992E+04

Flags: "K" = Keyline not found

"E" = Manually edited

"M" = Manually accepted

"A" = Nuclide specific abn. limit

Nuclide	Bckgnd Sum	Energy (keV)	MDA
			WHC-SD-WM-DP-166, REV. 1 (uCi/L)
BE-7	54794.	477.59	7.7117E+01
NA-22	297.	1274.53	1.3527E+00
NA-24	55.	1368.55	6.2745E-01
K-40	123.	1460.75	9.0609E+00
SC-46	600.	1120.55	1.7248E+00
CR-51	42410.	320.08	5.1057E+01
MN-54	1870.	834.83	2.3644E+00
CO-56	1700.	846.76	2.2834E+00
CO-57	42815.	122.06	3.5810E+00
CO-58	1980.	810.78	2.3858E+00
FE-59	624.	1099.25	3.0637E+00
CO-60	64.	1332.50	6.5360E-01
ZN-65	626.	1115.55	3.4610E+00
SE-75	47004.	264.66	8.0526E+00
KR-85	28008.	514.00	1.3941E+03
SR-85	28005.	514.01	6.3034E+00
Y-88	3.	1836.06	1.7641E-01
Y-90	5.	1760.70	8.1147E-01
Y-91	310.	1204.67	4.3931E+02
NB-94	1583.	871.09	2.2575E+00
NB-95	2264.	765.78	2.4216E+00
ZR-95	2442.	756.73	4.5570E+00
RU-103	33448.	497.08	7.0749E+00
RURH-106	10376.	621.93	8.7285E+01
AG-108m	2807.	722.94	2.8195E+00
CD-109	37239.	88.03	1.1059E+02
AG-110M	24025.	657.76	7.3015E+00
SN-113	46677.	391.69	9.8221E+00
TE-123m	45048.	159.00	3.7789E+00
SB-124	12183.	602.73	4.6717E+00
SB-125	54501.	427.89	2.4777E+01
TE-125m	39482.	109.27	1.1196E+03
I-129	34804.	39.60	0.0000E+00
I-131	43877.	364.48	7.1211E+00
XE-131m	44589.	163.93	1.6353E+02
BA-133	42971.	356.02	9.0474E+00
CS-136	1949.	818.51	2.3824E+00
CS-138	26.	1435.86	9.6758E-01
CE-139	44926.	165.85	4.0469E+00
BA-140	20046.	537.31	2.1796E+01
LA-140	11.	1596.21	3.2633E-01
CE-141	44771.	145.44	6.3965E+00
CE-144	44512.	133.51	2.7637E+01
CEPR-144	44511.	133.51	5.5224E+01
EU-152	28.	1408.01	2.1712E+00
EU-154	297.	1274.51	3.9286E+00
EU-155	37091.	86.54	1.2514E+01
HF-181	43896.	482.18	8.9427E+00
TA-182	34751.	67.75	1.8196E+01
HG-203	44412.	279.20	5.8370E+00
BI-207	12789.	569.70	4.5597E+00

Sample ID : S96T98-DUP

Acquisition date : 16-JAN-1996 17:47:14

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)	WHC-SD-WM-DP-166, REV. I
TL-208	44578.	277.36	7.5122E+01	
PB-210	34400.	46.50	0.0000E+00	
BI-212	2800.	727.18	3.8640E+01	
PB-212	51594.	238.63	1.0492E+01	
BI-214	10659.	609.31	9.6259E+00	
PB-214	43055.	351.92	2.8832E+01	
RA-224	51291.	240.99	1.1618E+02	
RA-226	59051.	186.10	1.1378E+02	
AC-228	1300.	911.21	7.9870E+00	
TH-228	36776.	84.37	3.3846E+02	
TH-229	37357.	88.47	1.6053E+01	
U-232	34558.	57.78	8.7019E+03	
PA-233	42379.	312.17	1.3075E+01	
PA-234M	864.	1001.03	3.1833E+00	
TH-234	34675.	63.29	2.2136E+02	
U-235	58413.	185.71	6.8778E+00	
NP-237	37092.	86.48	3.3148E+01	
U-237	34430.	59.54	4.0586E+01	
NP-238	926.	984.45	6.9366E+00	
NP-239	38913.	106.12	1.4109E+01	
PU-239	44163.	129.30	4.7871E+04	
AM-241	34430.	59.54	3.8925E+01	
AM-243	36021.	74.67	9.3577E+00	

LABCORE Data Entry Template for Worklist# 4889

Analyst: KT Instrument: AB00 10 Book# 9856

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

Worklist Comment: Determine sample size using Ludlum. SLF

S Type	Sample#	R A	Test	Matrix	Group#	Project
1 STD			@SR90-01	LIQUID		
2 BLNK			@SR90-01	LIQUID		
3 BLNK/BKG			@SR90-01	LIQUID		
4 SAMPLE	S96T000092 0		@SR90-01	LIQUID	96000010	AP-108 GRAB
Analytes Requested: SR90-01 , SR90-01C, SR90-01E						
5 DUP	S96T000092 0		@SR90-01	LIQUID		
6 SAMPLE	S96T000093 0		@SR90-01	LIQUID	96000010	AP-108 GRAB
Analytes Requested: SR90-01 , SR90-01C, SR90-01E						
7 DUP	S96T000093 0		@SR90-01	LIQUID		
8 SAMPLE	S96T000098 0		@SR90-01	LIQUID	96000011	AP-108 GRAB
Analytes Requested: SR90-01 , SR90-01C, SR90-01E						
9 DUP	S96T000098 0		@SR90-01	LIQUID		

Final page for worklist # 4889

Kim Thomas 1-17-96
Analyst Signature Date

SE Hogan 1/18/96
Analyst Signature Date
M. B. Hill 1/18/96

Data Entry Comments:

RPD values for samples 93 + 98 are acceptable
due to low activities involved. H. B. Hill 1/23/96

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

LABCORE Completed Worklist Report for Worklist# 4889

Analyst: knt Instrument: AB10 Book# _____

Method: _____ Rev/Mod _____

Worklist Comment: Determine sample size using Ludlum. SLF

Seq Type	Sample#	R A	Test	Matrix	Actual	Found	DL or Yield	Unit
1 STD	0		BSR90-01 SR90-01 LIQUID		1.24E-03	1.17E-3	94.350 % Recovery	
1 STD	0		BSR90-01 SR90-01C LIQUID		100	9.40E+01	94.000 % Recovery	
1 STD	0		BSR90-01 SR90-01E LIQUID		1.00	1.80E+00	1.800 % Ct. Error	
2 BLNK	0		BSR90-01 SR90-01 LIQUID		1	9.85E-7	0.000 uCi/mL	
2 BLNK	0		BSR90-01 SR90-01C LIQUID		100	9.52E+01	95.200 % Recovery	
2 BLNK	0		BSR90-01 SR90-01E LIQUID		1.00	5.58E+01	55.800 % Ct. Error	
3 BLNK/BKG	0		BSR90-01 SR90-01 LIQUID		1	1.64E+00	1.640 uCi/mL	
4 SAMPLE	S96T000092	0	BSR90-01 SR90-01 LIQUID	N/A		2.88E-02	1.710E-003 uCi/mL	
4 SAMPLE	S96T000092	0	BSR90-01 SR90-01C LIQUID	N/A		9.42E+01	1.000E-004 % Recovery	
4 SAMPLE	S96T000092	0	BSR90-01 SR90-01E LIQUID	N/A		9.11E+00	0.000 % Ct. Error	
5 DUP	S96T000092	0	BSR90-01 SR90-01 LIQUID		2.88E-2	2.75E-2	4.620 RPD	
5 DUP	S96T000092	0	BSR90-01 SR90-01C LIQUID		100	9.35E+01	93.500 % Recovery	
5 DUP	S96T000092	0	BSR90-01 SR90-01E LIQUID		1.00	9.40E+00	9.400 % Ct. Error	
6 SAMPLE	S96T000093	0	BSR90-01 SR90-01 LIQUID	N/A		5.80E-07	6.760E-007 uCi/mL	
6 SAMPLE	S96T000093	0	BSR90-01 SR90-01C LIQUID	N/A		9.40E+01	1.000E-004 % Recovery	
6 SAMPLE	S96T000093	0	BSR90-01 SR90-01E LIQUID	N/A		9.01E+01	0.000 % Ct. Error	
7 DUP	S96T000093	0	BSR90-01 SR90-01 LIQUID		5.80E-7	1.68E-6	97.350 RPD	
7 DUP	S96T000093	0	BSR90-01 SR90-01C LIQUID		100	9.50E+01	95.000 % Recovery	
7 DUP	S96T000093	0	BSR90-01 SR90-01E LIQUID		1.00	3.51E+01	35.100 % Ct. Error	
8 SAMPLE	S96T000098	0	BSR90-01 SR90-01 LIQUID	N/A		3.93E-02	1.670E-003 uCi/mL	
8 SAMPLE	S96T000098	0	BSR90-01 SR90-01C LIQUID	N/A		9.57E+01	1.000E-004 % Recovery	
8 SAMPLE	S96T000098	0	BSR90-01 SR90-01E LIQUID	N/A		7.46E+00	0.000 % Ct. Error	
9 DUP	S96T000098	0	BSR90-01 SR90-01 LIQUID		3.93E-2	2.87E-2	31.180 RPD	
9 DUP	S96T000098	0	BSR90-01 SR90-01C LIQUID		100	9.52E+01	95.200 % Recovery	
9 DUP	S96T000098	0	BSR90-01 SR90-01E LIQUID		1.00	8.95E+00	8.950 % Ct. Error	

Final page for worklist# 4889

Analyst Signature _____ Date _____

Analyst Signature _____ Date _____


Reviewer Signature _____ Date 1/23/96

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

				STANDARD	
Type	DETECTOR NUMBER	10	CARRIER ADDED in mL (CVA)	1.000	
STD	TOTAL COUNTS (TC)	12081	GROSS WEIGHT (W2)	7.2671	
Work List	COUNT TIME in MINUTES (CT)	10	TARE WEIGHT (W1)	7.1731	
4889	BACKGROUND in cpm (BKG)	8.0	NET WEIGHT (W3)	0.0940	
Test Code	SAMPLE VOLUME in mL (SS)	1.000	DELTA TIME (HOURS) (DT)	19.08	
@SR90-01	DILUTION FACTOR (DF)	1			
Matrix	DIGEST DILUTION FACTOR (DDF)	1			
LIQUID	SAMPLE COUNT RATE (Rs)	1198.10	Sr-90 EFFICIENCY FACTO (C1)	0.4051	
Batch Number	CRITICAL LEVEL (Lc)	1.70	Y-90 EFFICIENCY FACTOR (C2)	0.4503	
96000341	TIME OF SEPARATION (ST)	14:30	Rmax		
Rerun	DATE OF SEPARATION (SD)	01/17/96	DETECTION LIMIT (Ld)	3.50	
0	TIME OF COUNT (TOC)	09:35	Sr-89/90 CONC. in $\mu\text{Ci/L}$	1.1742E+00	
Sample Prep	DATE OF COUNT (DOC)	01/18/96			
N/A	STANDARD BOOK #	9B56			
Sample #	STANDARD VALUE in $\mu\text{Ci/mL}$	1.2365E-03			
WL#4889					

Instrument Code	WB26870	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)			
Prepared By	SEH	Sr-89/90 CONC in $\mu\text{Ci/mL}$ REPLACE RS WITH RMAX IF RS <= Lc AND RS >= 0 OR REPLACE RS WITH Lc IF RS < 0			
Chemist	SLF	RS * DF * DDF * 1000 / ((C1 + C2 * (1 - e to the power of ((-natural log 2) / (64.2 * DT))) * SS * REC * 2220000)			
Analyst	KNT	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))			
Date Complete	01/18/96	Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT) * 1.96)			
Analysis Date	01/17/96	Percent Carrier Recovery = (Net Weight / Expected weight) * 100			
	02:30 PM	NOTE: Expected weight = CVA * 0.1			
Sample Point	AP-108 GRAB	Detection Levels and Less Than Values are determined from Procedure LA-508-002.			
		Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100			
		Sr-89/90 CONCENTRATION	1.17E-03	$\mu\text{Ci/mL}$	DETECTION LEVEL 3.43E-06 $\mu\text{Ci/L}$
		RELATIVE COUNTING ERROR	1.8%		
		PERCENT CARRIER RECOVERY	94.0%		

Analyst:	KNT	Date:	18-Jan-96
Signature of Chemist:	SLF	Date:	1/23/96

STANDARD WB1 REV 1.2

22010NML

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

					BLNK		
Type	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA) 1.000		
BLNK	TOTAL COUNTS	(TC)	131	GROSS WEIGHT	(W2) 7.2776		
Work Lbl	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1) 7.1824		
4889	BACKGROUND in cpm	(BKG)	8.0	NET WEIGHT	(W3) 0.0952		
Test Code	SAMPLE VOLUME in mL	(SS)	5.000	DELTA TIME (HOURS)	(DT) 19.33		
@SR90-01	DILUTION FACTOR	(DF)	1				
Main	DIGEST DILUTION FACTOR	(DDF)	1				
LIQUID	SAMPLE COUNT RATE	(Rs)	5.10	SR-90 EFFICIENCY FACTOR	(C1) 0.4051		
Batch Number	CRITICAL LEVEL	(Lc)	1.70	Y-90 EFFICIENCY FACTOR	(C2) 0.4503		
96000341	TIME OF SEPARATION	(ST)	14:30	Rmax	N/A		
Return	DATE OF SEPARATION	(SD)	01/17/96	DETECTION LIMIT	(Ld) 3.50		
0	TIME OF COUNT	(TOC)	09:50	Sr-89/90 CONC in $\mu\text{Ci/L}$	9.8509E-04		
Sample Prep	DATE OF COUNT	(DOC)	01/18/96				
N/A							
Sample #							
VL#4889							
Instrument Code	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)						
WB26870	Sr-89/90 CONC in $\mu\text{Ci/L}$ Replace RS with RMAX if $RS \leq Lc$ and $RS > 0$ or Replace RS with Lc if $RS < 0$						
Prepared By	$RS * DDF / ((C1 + C2) * (1 - e \text{ to the power of } ((- \text{natural log } 2) / (64.2 * DT)))) * SS * REC * 2220000$						
SEH	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery $((W2 - W1) / (CVA * 0.1000))$						
Chemist	Relative Counting Error = The Square Root of $((TC + BKG * CT) / (TC - BKG * CT) * 1.96)$						
SLF	Percent Carrier Recovery = (Net Weight / Expected weight) * 100						
Analyst	NOTE: Expected weight = CVA * 0.1						
KNT	Detection Levels and Less Than Values are determined from Procedure LA-508-002.						
Date Complete	Delta Time (hours) = $((DOC - SD) * 24) + (TOC - ST) / 100$						
01/18/96							
Analysis Date					<i>20c</i> <i>4/5/96</i> $\mu\text{Ci/mL}$ <table border="1"> <tr> <td>DETECTION LEVEL</td> </tr> <tr> <td>6.76E-07 $\mu\text{Ci/mL}$</td> </tr> </table>	DETECTION LEVEL	6.76E-07 $\mu\text{Ci/mL}$
DETECTION LEVEL							
6.76E-07 $\mu\text{Ci/mL}$							
01/17/96	Sr-89/90 CONCENTRATION	9.85E-07	$\mu\text{Ci/mL}$				
Analysis Time							
02:30 PM	RELATIVE COUNTING ERROR	55.8%					
Sample Point							
AP-108 GRAB	PERCENT CARRIER RECOVERY	95.2%					

Analyst:	KNT	Date:	18-Jan-96
Signature of Chemist:	SLF	Date:	1/23/96

BLANK.WB1 REV 1.2

22010NML

WORKBOOK PAGE: SAM4

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

LA-220-101 / D-1						Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)		SAMPLE	
Type	DETECTOR NUMBER			10	CARRIER ADDED In mL	(CVA)	1.000		
SAMPLE	TOTAL COUNTS		(TC)	669	GROSS WEIGHT	(W2)	7.3093		
Work List	COUNT TIME In MINUTES		(CT)	10	TARE WEIGHT	(W1)	7.2151		
4889	BACKGROUND In cpm		(BKG)	8.0	NET WEIGHT	(W3)	0.0942		
Test Code	SAMPLE VOLUME In mL		(SS)	0.200	DELTA TIME (HOURS)	(DT)	20.42		
@SR90-01	DILUTION FACTOR		(DF)	101					
Matrix	DIGEST DILUTION FACTOR		(DDF)	1					
LIQUID	SAMPLE COUNT RATE		(Rs)	58.90	Sr-90 EFFICIENCY FACTOR	(C1)	0.4051		
Batch Number	CRITICAL LEVEL		(Lc)	1.70	Y-90 EFFICIENCY FACTOR	(C2)	0.4503		
96000341	TIME OF SEPARATION		(ST)	14:30	Rmax		N/A		
Retun	DATE OF SEPARATION		(SD)	01/17/96	DETECTION LIMIT	(Ld)	3.50		
0	TIME OF COUNT		(TOC)	10:55	Sr-89/90 CONC In µCi/L		2.8782E+01		
Sample Prep	DATE OF COUNT		(DOC)	01/18/96					
N/A									
Sample #									
S96T000092									
Instrument Code	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)								
WB26870	Sr-89/90 CONC in µCi/L Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0								
Prepared By	RS*DF*DDF/((C1+C2*(1-e to the power of ((-natural log 2)/(64.2*DT))))*SS*REC*2220000)								
SEH	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))								
Chemist	Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT))*1.96)								
SLF	Percent Carrier Recovery = (Net Weight / Expected weight) * 100								
Analyst	NOTE: Expected weight = CVA * 0.1								
KNT	Detection Levels and Less Than Values are determined from Procedure LA-508-002.								
Date Complete	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100								
01/18/96									
Analysis Date						DETECTION LEVEL			
01/17/96	Sr-89/90 CONCENTRATION		2.88E-02		µCi/mL				
Analysis Time									
02:30 PM	RELATIVE COUNTING ERROR		9.1%						
Sample Point									
AP-108 GRAB	PERCENT CARRIER RECOVERY		94.2%		1.71E-03 µCi/mL				

Analyst:	KNT	Date:	18-Jan-96
Signature of Chemist:	SLF	Date:	1/23/96

SAMPLE.WB1 REV 1.2

22010NML

WORKBOOK PAGE: DUP5

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

DUP					
TYPE	DETECTOR NUMBER	10	CARRIER ADDED In mL	(CVA)	1.000
DUP	TOTAL COUNTS	(TC)	639	GROSS WEIGHT	(W2) 7.3289
Work Unit	COUNT TIME In MINUTES	(CT)	10	TARE WEIGHT	(W1) 7.2384
4889	BACKGROUND In cpm	(BKG)	8.0	NET WEIGHT	(W3) 0.0935
Test Code	SAMPLE VOLUME In mL	(SS)	0.200	DELTA TIME (HOURS)	(DT) 20.58
@SR90-01	DILUTION FACTOR	(DF)	101		
Matrix	DIGEST DILUTION FACTOR	(DDF)	1		
LIQUID	SAMPLE COUNT RATE	(Rs)	55.90	SR-90 EFFICIENCY FACTOR	(C1) 0.4051
Batch Number	CRITICAL LEVEL	(Lc)	1.70	Y-90 EFFICIENCY FACTOR	(C2) 0.4503
96000341	TIME OF SEPARATION	(ST)	14:30	Rmax	N/A
Retun	DATE OF SEPARATION	(SD)	01/17/96	DETECTION LIMIT	(Ld) 3.50
0	TIME OF COUNT	(TOC)	11:05	Sr-89/90 CONC In µCi/L	2.7484E+01
Sample Prep	DATE OF COUNT	(DOC)	01/18/96		
N/A					
Sample #					
S96T000092					
Instrument Code	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)				
WB26870	Sr-89/90 CONC In µCi/L Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0				
Prepared By	RS*DF*DDF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)				
SEH	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))				
Chemist	Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)				
SLF	Percent Carrier Recovery = (Net Weight / Expected weight) * 100				
Analyst	NOTE: Expected weight = CVA * 0.1				
KNT	Detection Levels and Less Than Values are determined from Procedure LA-508-002.				
Date Complete	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100				
01/18/96					
Analysis Date	Sr-89/90 CONCENTRATION	2.75E-02	µCi/mL	DETECTION LEVEL	
01/17/96					
Analysis Time	RELATIVE COUNTING ERROR	9.4%		1.72E-03	
02:30 PM				µCi/mL	
Sample Point					
AP-108 GRAB	PERCENT CARRIER RECOVERY	93.5%			

Analyst:	KNT	Date:	18-Jan-96
Signature of Chemist:	SLF	Date:	1/23/96
SAMPLE.WB1 REV 1.2	22010NML		

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

TYPE	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA)	SAMPLE
SAMPLE	TOTAL COUNTS	(TC)	110	GROSS WEIGHT	(W2)	1.000
Work List	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.2992
4889	BACKGROUND in cpm	(BKG)	8.0	NET WEIGHT	(W3)	7.2052
Test Code	SAMPLE VOLUME in mL	(SS)	5.000	DELTA TIME (HOURS)	(DT)	0.0940
@SR90-01	DILUTION FACTOR	(DF)	1			20.83
Matrix	DIGEST DILUTION FACTOR	(DDF)	1			
LIQUID	SAMPLE COUNT RATE	(Rs)	3.00	SR-90 EFFICIENCY FACTOR	(C1)	0.4051
Batch Numbr	CRITICAL LEVEL	(Lc)	1.70	Y-90 EFFICIENCY FACTOR	(C2)	0.4503
96000341	TIME OF SEPARATION	(ST)	14:30	Rmax		N/A
Rechn	DATE OF SEPARATION	(SD)	01/17/96	DETECTION LIMIT	(Ld)	3.50
0	TIME OF COUNT	(TOC)	11:20	Sr-89/90 CONC in µCi/L		5.7991E-04
Sample Rep	DATE OF COUNT	(DOC)	01/18/96			
N/A						
Sample #						
S96T000093						
Instrument Code	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)					
WB26870	Sr-89/90 CONC in µCi/L Replace RS with RMAX if RS < Lc and RS >= 0 or Replace RS with Lc if RS < 0					
Prepared By	RS * DF * DDF / ((C1 + C2 * (1 - e to the power of ((-natural log 2) / (64.2 * DT)))) * SS * REC * 2220000)					
SEH	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2 - W1) / (CVA * 0.1000))					
Chemist	Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT) * 1.96)					
SLF	Percent Carrier Recovery = (Net Weight / Expected weight) * 100					
Analyst	NOTE: Expected weight = CVA * 0.1					
KNT	Detection Levels and Less Than Values are determined from Procedure LA-508-002.					
Date Complete	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100					
01/18/96						
Analysis Date						
01/17/96	Sr-89/90 CONCENTRATION		5.80E-07	µCi/mL		DETECTION LEVEL
Analysis Time						
02:30 PM	RELATIVE COUNTING ERROR		90.1%			
Sample Point						
AP-108 GRAB	PERCENT CARRIER RECOVERY		94.0%			6.76E-07 µCi/mL

Analyst:	KNT	Date:	18-Jan-96
Signature of Chemist:	SLF	Date:	1/23/96

SAMPLE.WB1 REV 1.2

22010NML

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

Type	DETECTOR NUMBER		10	CARRIER ADDED In mL	(CVA)	DUP
DUP	TOTAL COUNTS	(TC)	168	GROSS WEIGHT	(W2)	1.000
Work Sheet	COUNT TIME In MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.3148
4889	BACKGROUND In cpm	(BKG)	8.0	NET WEIGHT	(W3)	7.2198
Test Case	SAMPLE VOLUME In mL	(SS)	5.000	DELTA TIME (HOURS)	(DT)	0.0950
@SR90-01	DILUTION FACTOR	(DF)	1			21.08
Matrix	DIGEST DILUTION FACTOR	(DDF)	1			
LIQUID	SAMPLE COUNT RATE	(Rs)	8.80	SR-90 EFFICIENCY FACTOR	(C1)	0.4051
Batch Number	CRITICAL LEVEL	(Lc)	1.70	Y-90 EFFICIENCY FACTOR	(C2)	0.4503
96000341	TIME OF SEPARATION	(ST)	14:30	Rmax		N/A
Remm	DATE OF SEPARATION	(SD)	01/17/96	DETECTION LIMIT	(Ld)	3.50
0	TIME OF COUNT	(TOC)	11:35	Sr-89/90 CONC In µCi/L		1.6799E-03
Sample Prep	DATE OF COUNT	(DOC)	01/18/96			
N/A						
Sample #						
S96T000093						
Instrument Code	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)					
WB26870	Sr-89/90 CONC In µCi/L					
Prepared By	Replace RS with RMAX if RS<Lc and RS>=0 or Replace RS with Lc if RS<0					
SEH	RS*DF*DDF/((C1+C2*(1-e to the power of ((-natural log 2)/(64.2*DT))))*SS*REC*2220000)					
Chemist	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))					
SLF	Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)					
Analyst	Percent Carrier Recovery = (Net Weight / Expected weight) * 100					
KNT	NOTE: Expected weight = CVA * 0.1					
Date Complete	Detection Levels and Less Than Values are determined from Procedure LA-508-002.					
01/18/96	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100					
Analysis Date						
01/17/96	Sr-89/90 CONCENTRATION		1.68E-06	µCi/mL		DETECTION LEVEL 6.68E-07 µCi/mL
Analysis Time	RELATIVE COUNTING ERROR		35.1%			
02:30 PM						
Sample Point	PERCENT CARRIER RECOVERY		95.0%			
AP-108 GRAB						

Analyst:

Signature of Chemist:

KNT

Date:

18-Jan-96

SLF

Date:

1/23/96

SAMPLE.WB1 REV 1.2

22010WML

Analyst:	KNT	Date:	18-Jan-96
Signature of Chemist:	SLF	Date:	1/23/96

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

				DUP	
Typ:	DETECTOR NUMBER		10	CARRIER ADDED In mL	(CVA) 1.000
DUP	TOTAL COUNTS	(TC)	888	GROSS WEIGHT	(W2) 7.2912
Work List	COUNT TIME In MINUTES	(CT)	10	TARE WEIGHT	(W1) 7.1960
4889	BACKGROUND In cpm	(BKG)	8.8	NET WEIGHT	(W3) 0.0952
Test Code	SAMPLE VOLUME In mL	(SS)	0.200	DELTA TIME (HOURS)	(DT) 22.92
@SR90-01	DILUTION FACTOR	(DF)	101		
Matrix	DIGEST DILUTION FACTOR	(DDF)	1		
LIQUID	SAMPLE COUNT RATE	(Rs)	60.60	Sr-90 EFFICIENCY FACTOR	(C1) 0.4051
Batch Number	CRITICAL LEVEL	(Lc)	1.70	Y-90 EFFICIENCY FACTOR	(C2) 0.4503
96000341	TIME OF SEPARATION	(ST)	14:30	Rmax	N/A
Run	DATE OF SEPARATION	(SD)	01/17/96	DETECTION LIMIT	(Ld) 3.50
0	TIME OF COUNT	(TOC)	13:28	Sr-89/90 CONC In µCi/L	2.8742E+01
Sample Prep	DATE OF COUNT	(DOC)	01/18/96		
N/A					
Sample #					
S96T000098					
Instrument Code	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)				
WB26870	Sr-89/90 CONC In µCi/L Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0				
Prepared By	RS*DF*DDF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT))))*SS*REC*2220000				
SEH	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))				
Chemist	Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)				
SLF	Percent Carrier Recovery = (Net Weight / Expected weight) * 100				
Analyst	NOTE: Expected weight = CVA * 0.1				
KNT	Detection Levels and Less Than Values are determined from Procedure LA-508-002.				
Date Complete	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100				
01/18/96					
Analysis Date					DETECTION LEVEL 1.66E-03 µCi/mL
01/17/96	Sr-89/90 CONCENTRATION	2.87E-02	µCi/mL		
Analysis Time					
02:30 PM	RELATIVE COUNTING ERROR	9.0%			
Sample Point					
AP-108 GRAB	PERCENT CARRIER RECOVERY	95.2%			

Analyst:	KNT	Date:	18-Jan-96
Signature of Chemist:	SLF	Date:	1/23/96

SAMPLE.WB1 REV 1.2

22010NML

LABCORE Completed Worklist Report for Worklist# 4883

Analyst: ak1

Instrument: AM01

Book# 104843

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

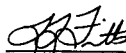
Worklist Comment: Determine Sample Size Using Ludlum / jls

Seq Type	Sample# R A	Test	Matrix	Actual	Found	DL or Yield	Unit
1 STD	0	BAH24101 AM24101 LIQUID		3.07E-02	2.67E-2	86.970 % Recovery	
1 STD	0	BAH24101 AM24101E LIQUID		1.00	1.24E+00	1.240 % Ct. Error	
1 STD	0	BAH24101 AM24101T LIQUID		100	8.70E+01	87.000 % Recovery	
2 BLNK	0	BAH24101 AM24101 LIQUID		1	<2.39E-5	uCi/mL	
2 BLNK	0	BAH24101 AM24101E LIQUID		1.00	1.00E+02	100.000 % Ct. Error	
2 BLNK	0	BAH24101 AM24101T LIQUID		100	8.15E+01	81.500 % Recovery	
3 SAMPLE	S96T000092 0	BAH24101 AM24101 LIQUID		N/A	< 2.34E-05	2.340E-005 uCi/mL	
3 SAMPLE	S96T000092 0	BAH24101 AM24101E LIQUID		N/A	1.00E+02	0.000 % Ct. Error	
3 SAMPLE	S96T000092 0	BAH24101 AM24101T LIQUID		N/A	9.06E+01	1.000E-007 % Recovery	
4 DUP	S96T000092 0	BAH24101 AM24101 LIQUID		<2.34E-5	<2.23E-5	RPD	
4 DUP	S96T000092 0	BAH24101 AM24101E LIQUID		1.00	1.00E+02	100.000 % Ct. Error	
4 DUP	S96T000092 0	BAH24101 AM24101T LIQUID		100	9.18E+01	91.800 % Recovery	
5 SAMPLE	S96T000093 0	BAH24101 AM24101 LIQUID		N/A	< 2.42E-05	2.420E-005 uCi/mL	
5 SAMPLE	S96T000093 0	BAH24101 AM24101E LIQUID		N/A	1.00E+02	0.000 % Ct. Error	
5 SAMPLE	S96T000093 0	BAH24101 AM24101T LIQUID		N/A	8.25E+01	1.000E-007 % Recovery	
6 DUP	S96T000093 0	BAH24101 AM24101 LIQUID		<2.42E-5	<2.13E-5	RPD	
6 DUP	S96T000093 0	BAH24101 AM24101E LIQUID		1.00	1.00E+02	100.000 % Ct. Error	
6 DUP	S96T000093 0	BAH24101 AM24101T LIQUID		100	9.48E+01	94.800 % Recovery	
7 SAMPLE	S96T000098 0	BAH24101 AM24101 LIQUID		N/A	< 2.05E-05	2.050E-005 uCi/mL	
7 SAMPLE	S96T000098 0	BAH24101 AM24101E LIQUID		N/A	1.00E+02	0.000 % Ct. Error	
7 SAMPLE	S96T000098 0	BAH24101 AM24101T LIQUID		N/A	9.43E+01	1.000E-007 % Recovery	
8 DUP	S96T000098 0	BAH24101 AM24101 LIQUID		<2.05E-5	<2.06E-5	RPD	
8 DUP	S96T000098 0	BAH24101 AM24101E LIQUID		1.00	1.00E+02	100.000 % Ct. Error	
8 DUP	S96T000098 0	BAH24101 AM24101T LIQUID		100	9.48E+01	94.800 % Recovery	

Final page for worklist# 4883

Analyst Signature _____ Date _____

Analyst Signature _____ Date _____

 23 Jan 96
Reviewer Signature _____ Date _____

LABCORE Data Entry Template for Worklist# 4883

Analyst: AKL Instrument: AM01 Book# 1091543

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

Worklist Comment: Determine Sample Size Using Ludlum / jls

S Type	Sample#	R A	Test	Matrix	Group#	Project
1 STD			@AM24101	LIQUID		
2 BLNK			@AM24101	LIQUID		
3 SAMPLE	S96T000092 0		@AM24101	LIQUID	96000010	AP-108 GRAB
	Analytes Requested: AM24101 , AM24101E, AM24101T					
4 DUP	S96T000092 0		@AM24101	LIQUID		
5 SAMPLE	S96T000093 0		@AM24101	LIQUID	96000010	AP-108 GRAB
	Analytes Requested: AM24101 , AM24101E, AM24101T					
6 DUP	S96T000093 0		@AM24101	LIQUID		
7 SAMPLE	S96T000098 0		@AM24101	LIQUID	96000011	AP-108 GRAB
	Analytes Requested: AM24101 , AM24101E, AM24101T					
8 DUP	S96T000098 0		@AM24101	LIQUID		

Final page for worklist # 4883

AKL 1/19/96
Analyst Signature Date

SE Hagan 1/22/96
Analyst Signature Date
M83 1/22/96

Data Entry Comments:

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

WORKBOOK PAGE: STD1

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

LIQUID

				STD
Type	Date Counted	JAN-19-96	Am 241 AEA Frac. (C241)	0.374
STD	Sample Volume in mL (SS)	1.000	Am 243 AEA Frac. (C243)	0.481
Work List	Sample D.F. (DF)	101	Cm 243/244 AEA Frac. (Cm)	0
4883	Tracer Volume in mL (SPKV)	0.100	Total AT Counts	20624
Test Code	Digest D.F. (DDF)	1.000	AT Count Time (min) (TC)	30
AM24101	Tracer Book No.	118B43	Background in cpm (Bkg)	5
Matrix	Am-243 Tracer Value (dpm/mL)	7550.4	Am 241 cpm	92.64
LIQUID	Detector Number	1	Am 243 cpm	118.98
Batch Number	Detector Efficiency (DetEm)	0.5000	Cm 243/244 cpm	0
98000343	Standard Book No	104B43	AEA Count Time (min)	480
ReRun	Standard Value in $\mu\text{Ci/mL}$	0.03067	Am 241 $\mu\text{Ci/L}$ =	2.6709E+01
0			Cm 243/244 $\mu\text{Ci/L}$ =	< 4.1065E+00
Sample Pkg				
N/A				
Sample Number	Am-241 $\mu\text{Ci/L}$ = (C241 * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/ μCi))			
WL#4883	Cm-243/244 $\mu\text{Ci/L}$ = (Cm * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/ μCi))			
Instrument Code	Relative Counting Error = Square Root of [(1/(Am-243 cpm * min)) + (1 / (Am-241 or Cm-243/244 cpm * min))] * 1.96 * 100			
AL10539	Am 243 Tracer Recovery = (Total AT Counts / TC - Bkg) * (1/DetEm) * C243 * 100 / Am-243 Tracer Value * SPKV			
Prepared By				
SEH				
Chemist				
LLF	Am 241 $\mu\text{Ci/mL}$ =	2.67E-02	DETECTION LEVELS In $\mu\text{Ci/mL}$	
Analyst	Relative Counting Error =	1.2%		
AKL			Am 241 4.11E-03 Cm 243/244 4.11E-03	
Date Complete	NOTE: Cm-243/244 Result is a LESS THAN Value.			
01/22/96	Cm 243/244 $\mu\text{Ci/mL}$	< 4.11E-03		
Analysis Date	Relative Counting Error =	100.0%		
01/19/96	Am 243 Tracer Recovery =	87.0%		
Analysis Time				
01:00 PM				
Sample Point				
AP-108				

Analyst:	AKL	Date:	01/22/96
Signature of Chemist: <i>SEH</i>	LLF	Date:	23 Jan 96

STANDARD.WB1 REV 1.2

953103ML

WORKBOOK PAGE: BLANK2

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

LIQUID / SOLID

				BLNK	
Type	Date Counted	JAN-19-96	Am 241 AEA Frac. (C241)	0	
BLNK	Sample Volume in mL (SS)	1.000	Am 243 AEA Frac. (C243)	0.873	
Work Unit	Sample D.F. (DF)	1	Cm 243/244 AEA Frac. (Cm)	0	
4883	Tracer Volume in mL (SPKV)	0.100	Total AT Counts	10667	
Test Code	Digest D.F. (DDF)	1.000	AT Count Time (min) (TC)	30	
AM24101	Tracer Book No.	118B43	Background in cpm (Bkg)	3	
Matrix	Am-243 Tracer Value (dpm/mL)	7550.4	Am 241 cpm	0	
LIQUID	Detector Number	2	Am 243 cpm	111.79	
Batch Number	Detector Efficiency (DetEff)	0.5000	Cm 243/244 cpm	0	
96000343			AEA Count Time (min)	480	
Return			Am 241 $\mu\text{Ci/L}$ =	< 2.3892E-02	
0			Cm 243/244 $\mu\text{Ci/L}$ =	< 2.3892E-02	
Sample Prep					
N/A					
Sample Number	Am-241 $\mu\text{Ci/L}$ = (C241 * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/ μCi))				
WL#4883	Cm-243/244 $\mu\text{Ci/L}$ = (Cm * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/ μCi))				
Instrument Code	Relative Counting Error = Square Root of [(1/(Am-243 cpm * min)) + (1 / (Am-241 or Cm-243/244 cpm * min))] * 1.96 * 100				
AL10540	Am 243 Tracer Recovery = (Total AT Counts / TC - Bkg) * (1/DetEff) * C243 * 100 / Am-243 Tracer Value * SPKV				
Prepared By	NOTE: Am-241 Result is a LESS THAN Value.				
SEH					
Chemist					
LLF	Am 241 $\mu\text{Ci/mL}$ =	< 2.39E-05	DETECTION LEVELS in $\mu\text{Ci/mL}$		
Analysis	Relative Counting Error =	100.0%			
AKL					
Date Complete	NOTE: Cm-243/244 Result is a LESS THAN Value.				
01/22/96	Cm 243/244 $\mu\text{Ci/mL}$	< 2.39E-05	Am 241		
Analysis Date	Relative Counting Error =	100.0%	2.39E-05		
01/19/96	Am 243 Tracer Recovery =	81.5%	Cm 243/244		
Analysis Time			2.39E-05		
01:00 PM					
Sample Point					
AP-108					

Analyst:	AKL	Date:	01/22/96
Signature of Chemist: <i>LLF</i>	LLF	Date:	23 Jan 96

BLANK.WB1 REV 1.2

953103ML

WORKBOOK PAGE: SAM3

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

LIQUID / SOLID

				SAMPLE				
Type	Date Counted	JAN-19-96	Am 241 AEA Frac.	(C241)	0			
SAMPLE	Sample Volume in mL (SS)	1.000	Am 243 AEA Frac.	(C243)	0.802			
Work Line	Sample D.F. (DF)	1	Cm 243/244 AEA Frac.	(Cm)	0			
4883	Tracer Volume in mL (SPKV)	0.100	Total AT Counts		12951			
Test Code	Digest D.F. (DDF)	1.000	AT Count Time (min) (TC)		30			
AM24101	Tracer Book No.	118B43	Background in cpm (Bkg)		5			
Matrix	Am-243 Tracer Value (dpm/mL)	7550.4	Am 241 cpm		0			
LIQUID	Detector Number	3	Am 243 cpm		125.13			
Batch Number	Detector Efficiency (DetEff)	0.5000	Cm 243/244 cpm		0			
96000343			AEA Count Time (min)		480			
Return			Am 241 $\mu\text{Ci/L}$ =	<	2.3391E-02			
0			Cm 243/244 $\mu\text{Ci/L}$ =	<	2.3391E-02			
Sample Prep								
N/A								
Sample Number	Am-241 $\mu\text{Ci/L}$ = (C241 * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/ μCi))							
S96T000092	Cm-243/244 $\mu\text{Ci/L}$ = (Cm * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/ μCi))							
Instrument Code	Relative Counting Error = Square Root of [(1/(Am-243 cpm * min)) + (1 / (Am-241 or Cm-243/244 cpm * min))] * 1.96 * 100							
AL10541	Am 243 Tracer Recovery = (Total AT Counts / TC - Bkg) * (1/DetEff) * C243 * 100 / Am-243 Tracer Value * SPKV							
Prepared By								
SEH								
Chemist	NOTE: Am-241 Result is a LESS THAN Value.							
LLF	Am 241 $\mu\text{Ci/mL}$ =	< 2.34E-05	DETECTION LEVELS In $\mu\text{Ci/mL}$					
Analyst	Relative Counting Error =	100.0%						
AKL								
Date Complete	NOTE: Cm-243/244 Result is a LESS THAN Value.							
01/22/96	Cm 243/244 $\mu\text{Ci/mL}$ =	< 2.34E-05	Am 241					
Analysis Date	Relative Counting Error =	100.0%	2.34E-05					
01/19/96	Am 243 Tracer Recovery =	90.6%	Cm 243/244					
Analysis Time								
01:00 PM								
Sample Point								
AP-108								

Analyst:	AKL	Date:	01/22/96
Signature of Chemist: <i>SEH</i>	LLF	Date:	23 Jan 96

SAMPLE.WB1 REV 1.2

953103ML

WORKBOOK PAGE: DUP4

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

LIQUID / SOLID

				DUP	
Type	Date Counted	JAN-19-96	Am 241 AEA Frac. (C241)	0	
DUP	Sample Volume In mL (SS)	1.000	Am 243 AEA Frac. (C243)	0.829	
Work Line	Sample D.F. (DF)	1	Cm 243/244 AEA Frac. (Cm)	0	
4883	Tracer Volume In mL (SPKV)	0.100	Total AT Counts	12693	
Test Code	Digest D.F. (DDF)	1.000	AT Count Time (min) (TC)	30	
AM24101	Tracer Book No.	118B43	Background In cpm (Bkg)	5	
MAT	Am-243 Tracer Value (dpm/mL)	7550.4	Am 241 cpm	0	
LIQUID	Detector Number	1	Am 243 cpm	125.95	
Batch Number	Detector Efficiency (DetEm)	0.5000	Cm 243/244 cpm	0	
96000343			AEA Count Time (min)	480	
Return			Am 241 μ Ci/L =	< 2.2343E-02	
0			Cm 243/244 μ Ci/L =	< 2.2343E-02	
Sample Prep					
N/A					
Sample Number	Am-241 μ Ci/L = (C241 * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/ μ Ci))				
S96T000092	Cm-243/244 μ Ci/L = (Cm * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/ μ Ci))				
Instrument Code	Relative Counting Error = Square Root of [(1/(Am-243 cpm * min)) * (1 / (Am-241 or Cm-243/244 cpm * min))] * 1.96 * 100				
AL10539	Am 243 Tracer Recovery = (Total AT Counts / TC - Bkg) * (1/DetEm) * C243 * 100 / Am-243 Tracer Value * SPKV				
Prepared By	NOTE: Am-241 Result is a LESS THAN Value.				
SEH					
Chemist	NOTE: Cm-243/244 Result is a LESS THAN Value.				
LLF	Am 241 μ Ci/mL =	< 2.23E-05	DETECTION LEVELS In μ Ci/mL		
Analyst	Relative Counting Error =	100.0%			
AKL					
Date Complete	NOTE: Cm-243/244 Result is a LESS THAN Value.				
01/22/96	Cm 243/244 μ Ci/mL =	< 2.23E-05	Am 241		
Analysis Date	Relative Counting Error =	100.0%	2.23E-05		
01/19/96	Am 243 Tracer Recovery =	91.8%	Cm 243/244		
Analysis Time			2.23E-05		
01:00 PM					
Sample Point					
AP-108					

Analyst:	AKL	Date:	01/22/96
Signature of Chemist: <i>AKL</i>	LLF	Date:	23 Jan 96
SAMPLE.WB1 REV 1.2	953103ML		

WORKBOOK PAGE: SAM5

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

LIQUID / SOLID

				SAMPLE				
Type	Date Counted	JAN-19-96	Am 241 AEA Frac.	(C241)	0			
SAMPLE	Sample Volume in mL (SS)	1.000	Am 243 AEA Frac.	(C243)	0.881			
Work List	Sample D.F. (DF)	1	Cm 243/244 AEA Frac.	(Cm)	0			
4883	Tracer Volume in mL (SPKV)	0.100	Total AT Counts		11078			
Test Code	Digest D.F. (DDF)	1.000	AT Count Time (min) (TC)		30			
AM24101	Tracer Book No.	118B43	Background in cpm (Bkg)		3			
Main	Am-243 Tracer Value (dpm/mL)	7550.4	Am 241 cpm		0			
LIQUID	Detector Number	2	Am 243 cpm		113.81			
Batch Number	Detector Efficiency (DetEM)	0.5000	Cm 243/244 cpm		0			
96000343			AEA Count Time (min)		480			
Retain			Am 241 $\mu\text{Ci/L}$ =	<	2.4207E-02			
0			Cm 243/244 $\mu\text{Ci/L}$ =	<	2.4207E-02			
Sample Prep								
N/A								
Sample Number	Am-241 $\mu\text{Ci/L}$ = (C241 * Am-243 Tracer Value * SPKV * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/ μCi))							
S96T000093	Cm-243/244 $\mu\text{Ci/L}$ = (Cm * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/ μCi))							
Instrument Code	Relative Counting Error = Square Root of [(1/(Am-243 cpm * min)) + (1 / (Am-241 or Cm-243/244 cpm * min))] * 1.96 * 100							
AL10540	Am 243 Tracer Recovery = (Total AT Counts / TC - Bkg) * (1/DetEM) * C243 * 100 / Am-243 Tracer Value * SPKV							
Prepared By								
SEH								
Chemist	NOTE: Am-241 Result is a LESS THAN Value.							
LLF	Am 241 $\mu\text{Ci/mL}$ =	< 2.42E-05	DETECTION LEVELS In $\mu\text{Ci/mL}$					
Analyst	Relative Counting Error =	100.0%						
AKL								
Date Complete	NOTE: Cm-243/244 Result is a LESS THAN Value.							
01/22/96	Cm 243/244 $\mu\text{Ci/mL}$	< 2.42E-05	Am 241					
Analysis Date	Relative Counting Error =	100.0%	2.42E-05					
01/19/96	Am 243 Tracer Recovery =	82.5%	Cm 243/244					
Analysis Time								
01:00 PM								
Sample Point								
AP-108								

Analyst:	AKL	Date:	01/22/96
Signature of Chemist: <i>AKL</i>	LLF	Date:	23 Jan 96

SAMPLE.WB1 REV 1.2

953103ML

WORKBOOK PAGE: DUP6

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

LIQUID / SOLID

				DUP	
Type	Date Counted	JAN-19-96	Am 241 AEA Frac.	(C241)	0
DUP	Sample Volume In mL (SS)	1.000	Am 243 AEA Frac.	(C243)	0.841
Work List	Sample D.F. (DF)	1	Cm 243/244 AEA Frac.	(Cm)	0
4883	Tracer Volume In mL (SPKV)	0.100	Total AT Counts		12912
Test Code	Digest D.F. (DDF)	1.000	AT Count Time (min) (TC)		30
AM24101	Tracer Book No.	118B43	Background In cpm (Bkg)		5
Matrix	Am-243 Tracer Value (dpm/mL)	7550.4	Am 241 cpm		0
LIQUID	Detector Number	3	Am 243 cpm		127.68
Batch Number	Detector Efficiency (DetEff)	0.5000	Cm 243/244 cpm		0
96000343			AEA Count Time (min)		480
Rem			Am 241 $\mu\text{Ci/L}$ =	<	2.1337E-02
0			Cm 243/244 $\mu\text{Ci/L}$ =	<	2.1337E-02
Sample Prep					
N/A					
Sample Number	Am-241 $\mu\text{Ci/L}$ = (C241 * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/ μCi))				
S96T000093	Cm-243/244 $\mu\text{Ci/L}$ = (Cm * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/ μCi))				
Instrument Code	Relative Counting Error = Square Root of [(1/(Am-243 cpm * min)) + (1 / (Am-241 or Cm-243/244 cpm * min))] * 1.96 * 100				
AL10541	Am 243 Tracer Recovery = (Total AT Counts / TC - Bkg) * (1/DetEff) * C243 * 100 / Am-243 Tracer Value * SPKV				
Prepared By					
SEH					
Chemist	NOTE: Am-241 Result is a LESS THAN Value.				
LLF	Am 241 $\mu\text{Ci/mL}$ =	< 2.13E-05	DETECTION LEVELS		
Analyst	Relative Counting Error =	100.0%	In $\mu\text{Ci/mL}$		
AKL			Am 241		
Date Complete	NOTE: Cm-243/244 Result is a LESS THAN Value.		2.13E-05		
01/22/96	Cm 243/244 $\mu\text{Ci/mL}$	< 2.13E-05	Cm 243/244		
Analysis Date	Relative Counting Error =	100.0%			
01/19/96	Am 243 Tracer Recovery =	94.8%			
Analysis Time					
01:00 PM					
Sample Point					
AP-108					

Analyst:	AKL	Date:	01/22/96
Signature of Chemist: <i>AKL</i>	LLF	Date:	23 Jan 96
SAMPLE.WB1 REV 1.2		953103ML	

WORKBOOK PAGE: SAM7

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

LIQUID / SOLID

		SAMPLE		
Type	Date Counted	JAN-19-96	Am 241 AEA Frac. (C241)	
SAMPLE	Sample Volume in mL (SS)	1.000	Am 243 AEA Frac. (C243)	
054241	Sample D.F. (DF)	1	Cm 243/244 AEA Frac. (Cm)	
4883	Tracer Volume in mL (SPKV)	0.100	Total AT Counts	
Test Code	Digest D.F. (DDF)	1.000	AT Count Time (min) (TC)	
AM24101	Tracer Book No.	118B43	Background in cpm (Bkg)	
Matrix	Am-243 Tracer Value (dpm/mL)	7550.4	Am 241 cpm	
LIQUID	Detector Number	1	Am 243 cpm	
Batch Number	Detector Efficiency (DetEm)	0.5000	Cm 243/244 cpm	
96000343			AEA Count Time (min)	
Retain			Am 241 $\mu\text{Ci/mL}$ =	
0			Cm 243/244 $\mu\text{Ci/mL}$ =	
Amplified				
N/A				
Sample Number	Am-241 $\mu\text{Ci/L}$ = (C241 * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/ μCi))			
S96T000098	Cm-243/244 $\mu\text{Ci/L}$ = (Cm * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/ μCi))			
Instrument Code				
AL10539	Relative Counting Error = Square Root of [(1/(Am-243 cpm * min)) + (1 / (Am-241 or Cm-243/244 cpm * min))] * 1.96 * 100			
Prepared By	Am 243 Tracer Recovery = (Total AT Counts / TC - Bkg) * (1/DetEm) * C243 * 100 / Am-243 Tracer Value * SPKV			
SEH				
Chemist	NOTE: Am-241 Result is a LESS THAN Value.			
LLF	Am 241 $\mu\text{Ci/mL}$ =	< 2.05E-05	DETECTION LEVELS in $\mu\text{Ci/mL}$	
Analyst	Relative Counting Error =	100.0%		
AKL			Am 241 2.05E-05 Cm 243/244 2.05E-05	
Date Complete	NOTE: Cm-243/244 Result is a LESS THAN Value.			
01/22/96	Cm 243/244 $\mu\text{Ci/mL}$	< 2.05E-05		
Analysis Date	Relative Counting Error =	100.0%		
01/19/96	Am 243 Tracer Recovery =	94.3%		
Analysis Time				
01:00 PM				
Sample Point				
AP-108				

Analyst:	AKL	Date:	01/22/96
Signature of Chemist: <i>LLF</i>	LLF	Date:	23 Jan 96
SAMPLE.WB1 REV 1.2	953103ML		

WORKBOOK PAGE: DUP8

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

LIQUID / SOLID

			LIQUID / SOLID		DUP			
Type	Date Counted		JAN-19-96	Am 241 AEA Frac. (C241)	0			
DUP	Sample Volume in mL	(SS)	1.000	Am 243 AEA Frac. (C243)	0.87			
10011	Sample D.F.	(DF)	1	Cm 243/244 AEA Frac. (Cm)	0			
4883	Tracer Volume in mL	(SPKV)	0.100	Total AT Counts	12436			
Test Code	Digest D.F.	(DDF)	1.000	AT Count Time (min)	30			
QAM24101	Tracer Book No.		118B43	Background in cpm (Bkg)	3			
Main	Am-243 Tracer Value	(dpm/mL)	7550.4	Am 241 cpm	0			
LIQUID	Detector Number		2	Am 243 cpm	120.93			
Batch Number	Detector Efficiency	(DetEm)	0.5000	Cm 243/244 cpm	0			
96000343				AEA Count Time (min)	480			
Recon				Am 241 $\mu\text{Ci/L}$ =	< 2.0610E-02			
0				Cm 243/244 $\mu\text{Ci/L}$ =	< 2.0610E-02			
Sample Prep								
N/A								
Sample Number	Am-241 $\mu\text{Ci/L}$ = (C241 * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/ μCi))							
S96T000098	Cm-243/244 $\mu\text{Ci/L}$ = (Cm * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/ μCi))							
Instrument Code	Relative Counting Error = Square Root of [(1/(Am-243 cpm * min)) + (1 / (Am-241 or Cm-243/244 cpm * min))] * 1.96 * 100							
AL10540	Am 243 Tracer Recovery = (Total AT Counts / TC - Bkg) * (1/DetEm) * C243 * 100 / Am-243 Tracer Value * SPKV							
Prepared By	NOTE: Am-241 Result is a LESS THAN Value.							
SEN								
Chemist								
LLF	Am 241 $\mu\text{Ci/mL}$ =	< 2.06E-05	DETECTION LEVELS In $\mu\text{Ci/mL}$					
Analys	Relative Counting Error =	100.0%						
AKL								
Date Complete	NOTE: Cm-243/244 Result is a LESS THAN Value.							
01/22/96	Cm 243/244 $\mu\text{Ci/mL}$	< 2.06E-05	Am 241					
Analysis Date	Relative Counting Error =	100.0%	2.06E-05					
01/19/96	Am 243 Tracer Recovery =	94.8%	Cm 243/244					
Analysis Time	2.06E-05							
01:00 PM								
Sample Point								
AP-108								

Analyst:	AKL	Date:	01/22/96
Signature of Chemist: <i>LLF</i>	LLF	Date:	23 Jan 96

SAMPLE WB1 REV 1.2

953103ML

Westinghouse Hanford Co.

GENERAL ALPHA ENERGY ANALYSIS
Rev. 2.01 WHC-SD-WM-DP-166, REV. 1
DATA REDUCTION REPORT

SAMPLE
WL4883-STD
File ID: 13a1387.CNF

Counted on: 1/19/96 @16: 4
Detector: AEA13
Geometry number: 1
Count time: 28805. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	3307.7	3307.7	299.981	299.981	12.000	4.183	6.000	1.997
2	4635.4	4635.4	254.099	254.096	10.000	3.230	5.000	1.616

PEAK RESULTS

Peak Error Limit: 30%

Peak ID	Isotope	AEA Frac	Peak Centroid		Count	%err	d/m	Activity	
			Exp.	Obs. Diff.	FWHM Rate c/m	@95		uCi/ea	
1	Pu238	0.374	5.487	5.498	-0.0110.02	92.64	0.9	61272.8	0.276E-01
	Am241		5.479	5.498	-0.019			46932.4	0.211E-01
2	Am243	0.481	5.270	5.287	-0.0170.01	118.98	0.8	57229.1	0.258E-01
Totals:		0.855	<--valid peaks only-->			211.62			

DETECTOR CALIBRATION

Energy (MeV) = 4.118 + (0.0046)*Channel
Energy range (MeV): 4.118 TO 6.473
Efficiency = 0.0021 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	118795.0	100.000
Smoothed	118795.0	100.000
Composite fit	101597.1	85.523
Residuals	17197.9	14.477

Analyzed by:

EMB

WHC-SD-WM-DP-166, REV. 1

[illegible]

Raw Data	Dump	for AEA	Spectrum:	13a1387.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.	3.	2.	1.	4.	0.
31	0.	0.	3.	1.	0.	2.	2.	1.	0.
41	3.	1.	0.	1.	3.	5.	5.	0.	4.
51	1.	2.	3.	3.	3.	4.	4.	0.	1.
61	3.	4.	3.	1.	4.	3.	2.	5.	3.
71	5.	3.	3.	4.	3.	3.	3.	6.	4.
81	4.	4.	6.	4.	3.	2.	4.	5.	5.
91	6.	6.	6.	6.	4.	9.	6.	8.	8.
101	8.	5.	3.	1.	9.	4.	8.	8.	4.
111	7.	13.	9.	12.	8.	6.	8.	13.	9.
121	15.	11.	9.	9.	13.	15.	10.	15.	11.
131	11.	12.	21.	16.	25.	16.	15.	14.	20.
141	19.	23.	23.	20.	32.	16.	27.	24.	30.
151	33.	30.	26.	32.	30.	37.	39.	42.	36.
161	51.	39.	45.	45.	39.	48.	43.	56.	49.
171	60.	53.	68.	69.	71.	60.	62.	64.	75.
181	85.	78.	96.	89.	80.	76.	87.	87.	95.
191	98.	100.	110.	110.	129.	121.	127.	116.	135.
201	129.	129.	164.	165.	164.	143.	180.	196.	185.
211	186.	202.	199.	203.	234.	251.	242.	269.	288.
221	309.	322.	374.	350.	389.	367.	403.	402.	469.
231	561.	604.	623.	654.	672.	710.	770.	821.	918.
241	1066.	1171.	1265.	1450.	1759.	1768.	1827.	1821.	2073.
251	3029.	3931.	5033.	5889.	5790.	4273.	2263.	1068.	642.
261	484.	435.	432.	445.	414.	464.	402.	365.	348.
271	328.	285.	282.	293.	310.	349.	357.	373.	422.
281	490.	512.	555.	551.	668.	704.	738.	865.	978.
291	1215.	1408.	1428.	1404.	1505.	1877.	2273.	2936.	3646.
301	3922.	2796.	1739.	1086.	745.	623.	567.	511.	390.
311	230.	181.	122.	59.	23.	7.	0.	0.	0.
321	0.	0.	0.	0.	0.	0.	0.	0.	0.
331	0.	0.	0.	0.	0.	0.	0.	0.	0.
341	1.	0.	0.	0.	1.	0.	3.	1.	1.
351	2.	0.	0.	0.	0.	2.	0.	1.	1.
361	2.	1.	1.	0.	1.	3.	1.	2.	0.
371	0.	1.	1.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.
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.	0.	0.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.	0.	0.	0.	0.	0.	0.	0.

WHC-SD-WM-DP-166, REV.1

Westinghouse Hanford Co.

GENERAL ALPHA ENERGY ANALYSIS

Rev. 2.01

WHC-SD-WM-DP-166, REV. 1

DATA REDUCTION REPORT

SAMPLE

WL4883-DUP BLK

File ID: 14a1492.CNF

Counted on: 1/19/96 @16: 5
Detector: AEA14
Geometry number: 1
Count time: 28805. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1?	10.1	10.1	300.853	300.853	10.000	2.858	5.000	1.170
2	6246.1	6246.1	255.598	255.598	8.000	2.491	4.000	2.467
3	24.1	24.1	195.114	195.114	90.000	1.000	45.000	0.100

PEAK RESULTS

Peak Error Limit: 30%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1		????		5.482			0.28	16.8		
2	Am243	0.873	5.270	5.273	-.0030	0.01	111.79	0.8	14115.0	0.636E-02
3		0.015		4.995		0.00	1.93	6.4	241.3	0.109E-03
Totals:		0.888	<--valid peaks only-->				113.72			

DETECTOR CALIBRATION

Energy(MEV) = 4.098 + (0.0046)*Channel
Energy range (MeV): 4.098 TO 6.453
Efficiency = 0.0080 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	61502.0	100.000
Smoothed	61502.0	100.000
Composite fit	54731.2	88.991
Residuals	6770.8	11.009

Analyzed by:

EMB

1 Legend: Raw = Modeled Peaks = 1,2,..., etc

Display Max.: 29234.3

WHC-SD-WM-DP-166, REV.)

3
3
3
3
3
3
3
3
3
3.
2..

.....2....

.....2..... 2
.....2....
.....1
1
1
1

Raw Data Dump for AEA Spectrum: 14a1492.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.	1.	0.	2.	0.	0.	1.
31	1.	0.	1.	1.	0.	0.	0.	1.	0.	0.
41	0.	0.	0.	0.	2.	0.	0.	0.	0.	2.
51	0.	2.	1.	1.	0.	0.	1.	0.	1.	1.
61	0.	0.	0.	1.	1.	1.	0.	0.	0.	1.
71	2.	0.	1.	1.	0.	1.	0.	1.	4.	0.
81	1.	0.	1.	1.	2.	1.	0.	2.	2.	1.
91	1.	1.	3.	1.	1.	2.	1.	1.	1.	0.
101	3.	1.	1.	2.	1.	1.	1.	2.	2.	2.
111	4.	1.	3.	1.	1.	4.	1.	7.	3.	3.
121	3.	4.	3.	3.	3.	2.	2.	3.	0.	5.
131	2.	4.	3.	3.	2.	6.	3.	6.	5.	7.
141	2.	10.	3.	7.	4.	5.	7.	4.	5.	8.
151	4.	7.	4.	9.	7.	5.	3.	6.	8.	7.
161	6.	11.	11.	9.	11.	7.	7.	12.	11.	11.
171	11.	10.	11.	6.	15.	9.	13.	6.	16.	11.
181	15.	10.	14.	23.	14.	25.	22.	14.	16.	14.
191	21.	22.	15.	26.	31.	19.	26.	14.	17.	14.
201	22.	18.	20.	27.	29.	20.	26.	40.	29.	31.
211	33.	29.	32.	38.	29.	24.	31.	43.	29.	46.
221	50.	39.	51.	58.	61.	53.	58.	87.	89.	86.
231	118.	104.	121.	159.	202.	209.	186.	190.	199.	253.
241	276.	358.	467.	643.	904.	1131.	1361.	1375.	1238.	1489.
251	1951.	2853.	4237.	6035.	7941.	8720.	6901.	3765.	1553.	702.
261	470.	395.	343.	296.	327.	363.	349.	325.	215.	185.
271	143.	107.	87.	35.	2.	1.	0.	0.	1.	1.
281	0.	2.	2.	1.	1.	1.	1.	0.	0.	5.
291	3.	3.	0.	2.	2.	3.	5.	10.	4.	12.
301	15.	12.	5.	3.	3.	2.	2.	0.	2.	1.
311	1.	0.	3.	0.	0.	0.	0.	0.	0.	0.
321	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
331	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
341	0.	0.	1.	0.	0.	0.	0.	0.	0.	1.
351	0.	0.	0.	0.	0.	0.	0.	2.	1.	2.
361	0.	0.	2.	1.	0.	0.	3.	1.	0.	3.
371	1.	1.	0.	0.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
431	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

WHC-SD-WM-DP-166. REV. 1

Raymond
1-20-96

Westinghouse Hanford Co.

GENERAL ALPHA ENERGY ANALYSIS
Rev. 2.01

DATA REDUCTION REPORT WHC-SD-WM-DP-166, REV. 1

SAMPLE
S96T92-SAM
File ID: 15a1573.CNF

Counted on: 1/19/96 @16: 5
Detector: AEA15
Geometry number: 1
Count time: 28805. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1?	50.9	50.9	301.405	301.405	10.000	3.430	5.000	2.914
2	7321.7	7321.7	255.026	255.026	10.000	2.316	5.000	2.458
3	98.1	98.1	200.530	200.530	78.000	1.000	39.000	0.100
4?	0.2	0.1	153.556	153.000	4.000	0.100	2.000	0.100

PEAK RESULTS

Peak Error Limit: 30%

Peak ID	Isotope	AEA Frac	Peak Centroid		FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
			Exp.	Obs. Diff.					
1		????	5.500			1.07	8.7		
2	Am243	0.802	5.270	5.287 -0.017	0.01	125.13	0.8	1265.2	0.570E-03
3		0.050		5.036	0.00	7.87	3.2	78.8	0.355E-04
4		????	4.817			0.00	*****		
Totals:		0.852	<--valid peaks only-->			133.00			

DETECTOR CALIBRATION

Energy(MEV) = 4.114 + (0.0046)*Channel
Energy range (MeV): 4.114 TO 6.469
Efficiency = 0.0999 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	74916.0	100.000
Smoothed	74916.0	100.000
Composite fit	64364.8	85.916
Residuals	10551.2	14.084

Analyzed by:

EMB

1 Legend: Raw = Modeled Peaks = 1,2,..., etc

Display Max.: 35809.2

WHC-SD-WM-DP-166, REV. 1

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Raw Data Dump for AEA Spectrum: 15a1573.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.	1.	2.	1.	1.	4.	3.
31	2.	1.	0.	1.	1.	1.	0.	0.	1.
41	1.	0.	0.	2.	0.	4.	0.	1.	1.
51	0.	0.	2.	0.	1.	0.	0.	1.	2.
61	0.	0.	1.	1.	4.	0.	1.	0.	1.
71	1.	4.	3.	1.	0.	4.	4.	3.	3.
81	4.	2.	3.	1.	1.	4.	2.	2.	2.
91	3.	5.	4.	2.	3.	4.	2.	5.	1.
101	2.	6.	2.	6.	5.	4.	6.	10.	4.
111	4.	8.	6.	5.	6.	11.	10.	7.	3.
121	3.	9.	6.	8.	8.	9.	7.	17.	9.
131	11.	10.	8.	12.	15.	16.	14.	20.	10.
141	16.	13.	23.	20.	14.	19.	19.	11.	22.
151	23.	16.	36.	31.	22.	16.	26.	24.	20.
161	37.	30.	26.	22.	35.	37.	37.	44.	41.
171	46.	35.	46.	36.	40.	42.	52.	63.	47.
181	52.	63.	48.	49.	66.	70.	69.	69.	57.
191	72.	58.	63.	68.	72.	73.	62.	93.	88.
201	89.	89.	72.	84.	87.	83.	91.	95.	92.
211	97.	115.	103.	108.	115.	121.	93.	121.	122.
221	131.	144.	145.	148.	123.	184.	158.	165.	179.
231	182.	237.	230.	258.	269.	284.	290.	291.	316.
241	358.	537.	649.	913.	1197.	1446.	1426.	1319.	1351.
251	2437.	3654.	6000.	8561.	10236.	9279.	5794.	2474.	980.
261	506.	426.	357.	387.	411.	360.	409.	359.	277.
271	157.	104.	44.	19.	2.	1.	3.	0.	2.
281	2.	2.	3.	3.	2.	2.	0.	5.	4.
291	9.	17.	8.	16.	17.	9.	12.	22.	40.
301	58.	69.	54.	29.	15.	11.	13.	6.	7.
311	6.	2.	1.	2.	1.	0.	0.	0.	0.
321	0.	0.	0.	0.	1.	0.	0.	0.	0.
331	0.	0.	0.	0.	0.	1.	1.	0.	0.
341	0.	0.	0.	0.	0.	0.	0.	0.	0.
351	0.	0.	0.	0.	0.	0.	0.	0.	0.
361	1.	1.	4.	0.	1.	0.	3.	1.	5.
371	6.	2.	2.	1.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	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.	0.	0.	1.	0.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.	0.	0.	0.	0.	0.	0.	0.

Westinghouse Hanford Co.

GENERAL ALPHA ENERGY ANALYSIS
Rev. 2.01

DATA REDUCTION REPORT

WHC-SD-WM-DP-166, REV. 1

SAMPLE
S96T92-DUP
File ID: 16a1661.CNF

Counted on: 1/19/96 @16: 6
Detector: AEA16
Geometry number: 1
Count time: 28804. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1?	26.1	26.1	301.236	301.236	10.000	3.056	5.000	2.240
2	7330.9	7330.9	255.509	255.509	8.000	2.406	4.000	2.633
3	53.0	53.0	184.609	184.609	116.000	1.000	58.000	0.100

PEAK RESULTS
Peak Error Limit: 30%

Peak ID	Isotope	AEA Frac	Peak Centroid		FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
			Exp.	Obs. Diff.					
1	Am243	0.829	5.270	5.264	0.0060	125.95	0.8	7028.9	0.317E-02
3		0.028		4.938	0.00	4.24	4.3	234.4	0.106E-03
Totals:			0.857	<--valid peaks only-->			130.19		

DETECTOR CALIBRATION
Energy(MEV) = 4.089 + (0.0046)*Channel
Energy range (MeV): 4.089 TO 6.444
Efficiency = 0.0181 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	72932.0	100.000
Smoothed	72931.9	100.000
Composite fit	62767.4	86.063
Residuals	10164.6	13.937

Analyzed by:

EMB

WHC-SD-WM-DP-166, REV. 1

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Raw	Data	Dump	for	AEA	Spectrum:	16a1661.CNF						
1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
21	0.	0.	0.	0.	0.	2.	0.	0.	0.	0.	0.	0.
31	0.	1.	2.	1.	0.	0.	1.	1.	0.	0.	0.	0.
41	1.	1.	1.	4.	2.	0.	3.	0.	3.	1.	1.	1.
51	1.	1.	1.	0.	3.	3.	0.	2.	0.	1.	1.	1.
61	2.	4.	1.	0.	1.	1.	4.	2.	1.	1.	1.	1.
71	0.	2.	0.	1.	2.	2.	3.	2.	0.	3.	3.	3.
81	4.	2.	1.	3.	4.	4.	2.	2.	3.	0.	3.	0.
91	3.	2.	4.	4.	4.	3.	4.	7.	3.	3.	3.	3.
101	1.	6.	4.	7.	4.	3.	0.	8.	3.	6.	6.	6.
111	6.	6.	7.	6.	8.	8.	4.	2.	11.	12.	12.	12.
121	9.	10.	6.	11.	11.	8.	11.	9.	11.	10.	10.	10.
131	7.	15.	9.	17.	19.	15.	10.	18.	13.	15.	15.	15.
141	12.	19.	15.	10.	14.	10.	17.	24.	19.	23.	23.	23.
151	24.	20.	21.	25.	23.	19.	24.	19.	26.	25.	25.	25.
161	25.	20.	25.	32.	30.	31.	41.	35.	18.	29.	29.	29.
171	37.	29.	25.	36.	37.	32.	44.	31.	37.	41.	41.	41.
181	34.	41.	55.	48.	49.	41.	53.	33.	39.	50.	50.	50.
191	57.	64.	52.	41.	52.	51.	49.	53.	58.	60.	60.	60.
201	56.	44.	60.	58.	52.	58.	63.	67.	56.	59.	59.	59.
211	61.	65.	66.	73.	63.	61.	86.	85.	74.	79.	79.	79.
221	88.	76.	80.	85.	114.	87.	91.	99.	109.	118.	118.	118.
231	146.	148.	176.	182.	212.	228.	191.	213.	224.	280.	280.	280.
241	253.	403.	505.	651.	1008.	1198.	1455.	1325.	1388.	1549.	1549.	1549.
251	2115.	3062.	4991.	7181.	10001.	10430.	7725.	3833.	1629.	819.	819.	819.
261	523.	478.	409.	388.	403.	432.	437.	346.	311.	238.	238.	238.
271	195.	128.	79.	21.	7.	0.	2.	0.	1.	2.	2.	2.
281	1.	1.	1.	1.	4.	2.	1.	3.	2.	3.	3.	3.
291	5.	9.	7.	7.	6.	8.	9.	12.	18.	29.	29.	29.
301	33.	41.	19.	10.	10.	2.	5.	6.	4.	4.	4.	4.
311	2.	2.	3.	2.	0.	0.	0.	0.	0.	0.	0.	0.
321	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
331	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
341	0.	0.	0.	0.	1.	1.	0.	0.	0.	0.	0.	0.
351	0.	0.	1.	0.	0.	1.	0.	1.	0.	1.	1.	1.
361	1.	2.	1.	1.	0.	1.	0.	2.	2.	3.	3.	3.
371	3.	2.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.										

WHC-SD-WM-DP-166, REV. 1

Westinghouse Hanford Co.

Raymond
1-20-96

GENERAL ALPHA ENERGY ANALYSIS
Rev. 2.01 WHC-SD-WM-DP-166, REV. 1

DATA REDUCTION REPORT

SAMPLE
S96T93-SAM
File ID: 17a1744.CNF

Counted on: 1/19/96 @16: 7
Detector: AEA17
Geometry number: 1
Count time: 28803. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	5313.2	5313.2	254.066	254.066	10.000	2.843	5.000	1.936
2	28.0	28.0	162.827	162.827	170.000	1.000	85.000	0.100

PEAK RESULTS

Peak Error Limit: 30%

Peak ID	Isotope	AEA Frac	Peak Centroid			Count Rate c/m	%err @95	d/m	Activity uCi/ea
			Exp.	Obs.	Diff.				
1	Am243	0.851	5.270	5.269	0.0010.01	113.81	0.8	6247.8	0.281E-02
2		0.017		4.849	0.00	2.23	6.0	121.1	0.546E-04
Totals:		0.868	<--valid peaks only-->			116.04			

DETECTOR CALIBRATION

Energy (MeV) = $4.100 + (0.0046) \cdot \text{Channel}$
Energy range (MeV): 4.100 TO 6.455
Efficiency = 0.0184 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	64206.0	100.000
Smoothed	64210.2	100.006
Composite fit	55704.3	86.759
Residuals	8501.7	13.241

Analyzed by:

EMB

1 Legend: Raw = Modeled Peaks = 1,2,..., etc

Display Max.: 31431.9

WHC-SD-WM-DP-166, REV. 1

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Raw Data	Dump	for AEA Spectrum:	17a1744.CNF
1	0.	0.	1.
11	0.	0.	0.
21	2.	1.	0.
31	1.	1.	4.
41	2.	2.	3.
51	0.	0.	1.
61	3.	4.	0.
71	3.	1.	4.
81	2.	5.	2.
91	4.	6.	5.
101	3.	5.	8.
111	4.	6.	4.
121	10.	5.	12.
131	8.	17.	9.
141	13.	13.	18.
151	21.	18.	30.
161	26.	30.	32.
171	29.	25.	30.
181	29.	38.	32.
191	39.	56.	45.
201	62.	56.	57.
211	81.	70.	74.
221	130.	147.	147.
231	255.	300.	357.
241	779.	859.	1068.
251	3388.	4544.	5904.
261	347.	321.	330.
271	66.	34.	6.
281	0.	1.	1.
291	1.	1.	5.
301	11.	7.	7.
311	0.	0.	0.
321	0.	0.	0.
331	0.	0.	0.
341	0.	0.	0.
351	1.	0.	0.
361	0.	0.	1.
371	3.	0.	0.
381	0.	0.	0.
391	0.	0.	0.
401	0.	0.	0.
411	0.	0.	0.
421	0.	0.	0.
431	0.	0.	0.
441	0.	0.	0.
451	0.	0.	0.
461	0.	0.	0.
471	0.	0.	0.
481	0.	0.	0.
491	0.	0.	0.
511	0.	0.	0.

WHC-SD-WM-DP-166, REV. 1

Westinghouse Hanford Co.

GENERAL ALPHA ENERGY ANALYSIS
Rev. 2.01

WHC-SD-WM-DP-166, REV. 1
DATA REDUCTION REPORT

SAMPLE
S96T93-DUP
File ID: 18a1820.CNF

Counted on: 1/19/96 @16: 8
Detector: AEA18
Geometry number: 1
Count time: 28801. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1?	13.6	13.6	297.593	297.593	8.000	2.666	4.000	2.081
2	7772.6	7772.6	252.034	252.034	10.000	2.239	5.000	2.630

PEAK RESULTS

Peak Error Limit: 30%

Peak ID	Isotope	AEA Frac	Peak Centroid	Count	%err	Activity
		Exp.	Obs. Diff.	FWHM Rate c/m	@95	uCi/ea
1		????	5.482	0.27	17.2	
2	Am243	0.841	5.270 5.273 -.0030.01	127.65	0.8	1165.8 0.525E-03
Totals:		0.841	<--valid peaks only-->		127.65	

DETECTOR CALIBRATION

Energy(MEV) = 4.113 + (0.0046)*Channel
Energy range (MeV): 4.113 TO 6.469
Efficiency = 0.1106 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	72836.0	100.000
Smoothed	72836.0	100.000
Composite fit	61402.9	84.303
Residuals	11433.1	15.697

Analyzed by:

EMB

1 Legend: Raw = Modeled Peaks = 1,2,..., etc Display Max.: 44075.6

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Raw Data Dump for AEA Spectrum: 18a1820.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	2.	0.	0.	0.	0.	0.	0.	0.	0.	0.
21	0.	1.	0.	0.	0.	2.	1.	0.	0.	0.
31	0.	0.	1.	0.	0.	0.	0.	4.	1.	1.
41	0.	1.	0.	0.	0.	1.	0.	0.	1.	0.
51	1.	0.	2.	0.	1.	1.	0.	1.	0.	1.
61	3.	0.	0.	0.	0.	0.	0.	0.	2.	3.
71	1.	3.	0.	0.	1.	0.	2.	2.	4.	2.
81	2.	0.	0.	0.	1.	3.	1.	2.	0.	1.
91	4.	0.	3.	2.	2.	1.	5.	2.	1.	2.
101	4.	2.	3.	5.	3.	4.	6.	3.	6.	7.
111	5.	0.	6.	6.	3.	10.	7.	4.	7.	6.
121	3.	4.	6.	8.	6.	5.	8.	10.	8.	5.
131	7.	5.	11.	6.	11.	3.	14.	9.	10.	10.
141	11.	12.	17.	9.	13.	13.	12.	13.	13.	6.
151	16.	14.	28.	18.	21.	15.	15.	19.	17.	16.
161	22.	19.	18.	27.	28.	28.	15.	24.	23.	23.
171	25.	37.	25.	23.	27.	40.	30.	26.	34.	30.
181	39.	36.	37.	39.	38.	34.	28.	38.	36.	26.
191	30.	49.	46.	44.	45.	31.	35.	46.	49.	37.
201	61.	66.	54.	48.	48.	57.	53.	44.	54.	52.
211	57.	63.	56.	70.	69.	63.	87.	80.	72.	73.
221	67.	91.	97.	95.	111.	106.	123.	97.	130.	189.
231	191.	198.	194.	213.	209.	208.	262.	294.	395.	543.
241	790.	1187.	1385.	1343.	1286.	1305.	1636.	2309.	3892.	6273.
251	8953.	11088.	9820.	6008.	2586.	1039.	655.	503.	404.	400.
261	390.	423.	445.	420.	350.	295.	230.	172.	105.	36.
271	9.	1.	0.	0.	0.	1.	1.	1.	0.	0.
281	0.	1.	0.	2.	2.	5.	0.	1.	5.	4.
291	5.	3.	3.	5.	9.	12.	17.	21.	13.	8.
301	3.	2.	4.	1.	1.	2.	0.	0.	0.	1.
311	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
321	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
331	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
341	0.	0.	0.	1.	0.	0.	0.	1.	0.	0.
351	0.	0.	0.	0.	1.	1.	0.	0.	1.	0.
361	0.	0.	0.	1.	3.	2.	1.	0.	1.	0.
371	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

Raymond
1-20-96

Westinghouse Hanford Co.

GENERAL ALPHA ENERGY ANALYSIS
Rev. 2.01

WHC-SD-WM-DP-166, REV. 1
DATA REDUCTION REPORT

SAMPLE
S96T98-SAM
File ID: 19a1999.CNF

Counted on: 1/19/96 @16: 8
Detector: AEA19
Geometry number: 1
Count time: 28800. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1?	22.7	22.7	298.457	298.457	10.000	3.817	5.000	2.729
2	7195.5	7195.5	253.036	253.036	10.000	2.457	5.000	2.484

PEAK RESULTS

Peak Error Limit: 30%

Peak ID	Isotope	AEA Frac	Peak Centroid		Count Rate c/m	%err @95	d/m	Activity uCi/ea
			Exp.	Obs. Diff.				
1		????		62.551	0.52	12.4		
2		0.880		33.854	1.55	127.38	0.8	10030.3
Totals:		0.880	<--valid peaks only-->			127.38		

DETECTOR CALIBRATION

Energy(MEV) = ***** + (0.6318)*Channel
Energy range (MeV): ***** TO *****
Efficiency = 0.0127 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	69451.0	100.000
Smoothed	69450.9	100.000
Composite fit	61395.6	88.401
Residuals	8055.4	11.599

Analyzed by: _____

EMB

1 Legend: Raw = Modeled Peaks = 1,2,..., etc

Display Max.: 41688.5

WHC-SD-WM-DP-166, REV. 1

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2..
.....2.
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.....2..... 2
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1
1

Raw Data	Dump	for AEA	Spectrum:	19a1999.CNF
1	0.	0.	1.	0.
11	3.	1.	1.	0.
21	3.	1.	1.	2.
31	0.	0.	3.	0.
41	3.	1.	1.	2.
51	1.	0.	3.	2.
61	0.	2.	1.	2.
71	0.	2.	0.	3.
81	1.	1.	2.	2.
91	3.	1.	0.	2.
101	3.	3.	2.	8.
111	2.	2.	4.	3.
121	4.	3.	2.	4.
131	2.	2.	7.	4.
141	6.	2.	7.	10.
151	7.	3.	4.	6.
161	5.	8.	2.	14.
171	8.	6.	13.	3.
181	13.	8.	10.	23.
191	11.	24.	19.	22.
201	21.	25.	19.	11.
211	37.	33.	31.	30.
221	51.	60.	57.	62.
231	135.	185.	224.	214.
241	577.	810.	1124.	1400.
251	6001.	8175.	9873.	9163.
261	344.	328.	379.	396.
271	47.	7.	1.	0.
281	0.	1.	0.	0.
291	8.	6.	7.	5.
301	11.	10.	6.	4.
311	2.	0.	1.	0.
321	0.	0.	0.	0.
331	0.	0.	0.	0.
341	0.	0.	0.	0.
351	0.	0.	1.	0.
361	0.	0.	1.	1.
371	0.	0.	0.	0.
381	0.	0.	0.	0.
391	0.	0.	0.	0.
401	0.	0.	0.	0.
411	0.	0.	0.	0.
421	0.	0.	0.	0.
431	1.	1.	0.	0.
441	0.	0.	0.	0.
451	0.	0.	0.	0.
461	0.	0.	0.	0.
471	0.	0.	0.	0.
481	0.	0.	0.	0.
491	0.	0.	0.	0.
511	0.	0.	0.	0.

WHC-SD-WM-DP-166, REV. 1

Westinghouse Hanford Co.

GENERAL ALPHA ENERGY ANALYSIS
Rev. 2.01

DATA REDUCTION REPORT

SAMPLE
S96T98-DUP
File ID: 20a2001.CNF

WHC-SD-WM-DP-166, REV.1

Counted on: 1/19/96 @16: 9
Detector: AEA20
Geometry number: 1
Count time: 28801. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1?	23.9	23.9	299.875	299.875	10.000	3.242	5.000	3.115
2	7599.1	7599.1	254.151	254.151	10.000	2.131	5.000	2.635
3	19.8	19.8	198.421	198.421	84.000	1.000	42.000	0.100

PEAK RESULTS

Peak Error Limit: 30%

Peak ID	Isotope	AEA Frac	Peak Centroid		FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
			Exp.	Obs. Diff.					
1		????		5.483		0.47	13.0		
2	Am243	0.870	5.270	5.272	-0.0020.01	120.93	0.8	15080.9	0.679E-02
3		0.011		5.016	0.00	1.59	7.1	196.3	0.884E-04
Totals:			0.882	<--valid peaks only-->		122.52			

DETECTOR CALIBRATION

Energy(MEV) = 4.103 + (0.0046)*Channel
Energy range (MeV): 4.103 TO 6.459
Efficiency = 0.0081 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	66688.0	100.000
Smoothed	66688.4	100.001
Composite fit	59040.8	88.533
Residuals	7647.2	11.467

Analyzed by:

EMB

1 Legend: Raw = Modeled Peaks = 1,2,..., etc

Display Max.: 39617.3

WHC-SD-WM-DP-166, REV. 1

3
3
3
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3
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1
1

Raw Data Dump for AEA Spectrum: 20a2001.CNF

1	0.	0.	2.	0.	0.	0.	0.	0.	1.
11	0.	0.	0.	0.	0.	0.	1.	0.	0.
21	0.	1.	1.	0.	1.	0.	0.	1.	0.
31	0.	0.	1.	0.	0.	0.	0.	0.	1.
41	0.	0.	0.	1.	1.	0.	2.	1.	0.
51	1.	0.	0.	0.	0.	0.	0.	1.	0.
61	0.	1.	0.	0.	1.	0.	1.	3.	1.
71	1.	0.	1.	0.	0.	0.	1.	0.	1.
81	1.	0.	2.	0.	0.	1.	1.	1.	1.
91	0.	0.	0.	0.	0.	0.	1.	1.	0.
101	1.	3.	2.	1.	0.	1.	1.	0.	1.
111	0.	1.	0.	1.	3.	0.	0.	1.	1.
121	2.	1.	2.	1.	1.	5.	2.	0.	4.
131	1.	1.	2.	4.	3.	3.	1.	1.	5.
141	5.	1.	4.	3.	2.	2.	2.	6.	5.
151	4.	6.	4.	4.	5.	2.	3.	3.	5.
161	7.	8.	9.	10.	5.	6.	10.	6.	5.
171	8.	4.	7.	3.	8.	5.	8.	9.	8.
181	11.	13.	7.	10.	16.	10.	11.	10.	17.
191	13.	7.	18.	15.	13.	13.	13.	18.	18.
201	11.	15.	9.	19.	18.	19.	27.	17.	16.
211	16.	22.	21.	25.	26.	34.	30.	29.	25.
221	34.	31.	35.	35.	52.	41.	44.	59.	58.
231	77.	127.	142.	152.	125.	145.	143.	144.	187.
241	292.	440.	685.	995.	1258.	1254.	1180.	1167.	1518.
251	3445.	5513.	8424.	10855.	10207.	6079.	2498.	1030.	681.
261	407.	320.	365.	415.	389.	371.	315.	251.	231.
271	101.	40.	12.	1.	0.	1.	0.	2.	3.
281	0.	1.	0.	0.	2.	1.	1.	2.	1.
291	1.	5.	4.	8.	7.	9.	20.	22.	31.
301	33.	17.	11.	5.	5.	3.	2.	3.	1.
311	1.	2.	2.	0.	0.	0.	0.	0.	0.
321	0.	0.	0.	0.	0.	1.	0.	0.	0.
331	0.	0.	1.	0.	0.	0.	0.	0.	0.
341	1.	0.	0.	0.	0.	1.	0.	0.	0.
351	0.	0.	0.	0.	0.	1.	0.	2.	1.
361	0.	1.	2.	0.	0.	0.	1.	2.	3.
371	0.	0.	0.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.
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.	0.	0.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.							

WHC-SD-WM-DP-166, REV. I

LABCORE Completed Worklist Report for Worklist# 4884

Analyst: ak1

Instrument: PU01

Book# 104843

Method: LA-943-127 Rev/Mod B-1

Worklist Comment: Determine Sample Size Using Ludlum / jls

Seq Type	Sample#	R A	Test	Matrix	Actual	Found	DL or Yield	Unit
1 STD	0		APU23901 PU23901	LIQUID	1.28E-01	1.33E-1	103.910 %	Recovery
1 STD	0		APU23901 PU23901E	LIQUID	1.00	2.64E+00	2.640 %	Ct. Error
1 STD	0		APU23901 PU23901T	LIQUID	100	5.73E+01	57.300 %	Recovery
2 BLNK	0		APU23901 PU23901	LIQUID	1	<6.13E-6		uCi/mL
2 BLNK	0		APU23901 PU23901T	LIQUID	100	5.26E+01	52.600 %	Recovery
2 BLNK	0		APU23901 PU23901E	LIQUID	1.00	1.00E+02	100.000 %	Ct. Error
3 SAMPLE	S96T000092	0	APU23901 PU23901	LIQUID	N/A	5.91E-05	1.700E-005	uCi/mL
3 SAMPLE	S96T000092	0	APU23901 PU23901T	LIQUID	N/A	3.16E+01	1.000E-007	% Recovery
3 SAMPLE	S96T000092	0	APU23901 PU23901E	LIQUID	N/A	5.14E+00	0.000 %	Ct. Error
4 DUP	S96T000092	0	APU23901 PU23901	LIQUID	5.91E-5	6.03E-5	2.010	RPD
4 DUP	S96T000092	0	APU23901 PU23901T	LIQUID	100	3.70E+01	37.000 %	Recovery
4 DUP	S96T000092	0	APU23901 PU23901E	LIQUID	1.00	4.80E+00	4.800 %	Ct. Error
5 SAMPLE	S96T000093	0	APU23901 PU23901	LIQUID	N/A	< 7.70E-06	7.700E-006	uCi/mL
5 SAMPLE	S96T000093	0	APU23901 PU23901T	LIQUID	N/A	4.49E+01	1.000E-007	% Recovery
5 SAMPLE	S96T000093	0	APU23901 PU23901E	LIQUID	N/A	1.18E+01	0.000 %	Ct. Error
6 DUP	S96T000093	0	APU23901 PU23901	LIQUID	<7.70E-6	<5.89E-6		RPD
6 DUP	S96T000093	0	APU23901 PU23901T	LIQUID	100	5.54E+01	55.400 %	Recovery
6 DUP	S96T000093	0	APU23901 PU23901E	LIQUID	1.00	1.00E+02	100.000 %	Ct. Error
7 SAMPLE	S96T000098	0	APU23901 PU23901	LIQUID	N/A	6.15E-05	1.990E-005	uCi/mL
7 SAMPLE	S96T000098	0	APU23901 PU23901T	LIQUID	N/A	2.74E+01	1.000E-007	% Recovery
7 SAMPLE	S96T000098	0	APU23901 PU23901E	LIQUID	N/A	4.70E+00	0.000 %	Ct. Error
8 DUP	S96T000098	0	APU23901 PU23901	LIQUID	6.15E-5	5.88E-5	4.490	RPD
8 DUP	S96T000098	0	APU23901 PU23901T	LIQUID	100	3.58E+01	35.800 %	Recovery
8 DUP	S96T000098	0	APU23901 PU23901E	LIQUID	1.00	5.02E+00	5.020 %	Ct. Error

Final page for worklist# 4884

Analyst Signature _____ Date _____

Analyst Signature _____ Date _____

J. Little 5 Feb 96
Reviewer Signature _____ Date _____

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

LABCORE Data Entry Template for Worklist# 4884

Analyst: AKL Instrument: PU01 Book# 104643

Method: LA-943-127 Rev/Mod B-1

Worklist Comment: Determine Sample Size Using Ludlum / jls

S Type	Sample#	R A	Test	Matrix	Group#	Project
1 STD			@PU23901	LIQUID		
2 BLNK			@PU23901	LIQUID		
3 SAMPLE	S96T000092 0		@PU23901	LIQUID	96000010	AP-108 GRAB
Analytes Requested: PU23901 , PU23901E, PU23901T						
4 DUP	S96T000092 0		@PU23901	LIQUID		
5 SAMPLE	S96T000093 0		@PU23901	LIQUID	96000010	AP-108 GRAB
Analytes Requested: PU23901 , PU23901E, PU23901T						
6 DUP	S96T000093 0		@PU23901	LIQUID		
7 SAMPLE	S96T000098 0		@PU23901	LIQUID	96000011	AP-108 GRAB
Analytes Requested: PU23901 , PU23901E, PU23901T						
8 DUP	S96T000098 0		@PU23901	LIQUID		

Final page for worklist # 4884

A. Lewis
Analyst Signature
1-22-96
Date

SE Hogan
Analyst Signature
1/28/96
Date
C.J. Quinn
1/30/96

Data Entry Comments:

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

WHC-SD-WM-DP-166, REV. 1
LIQUID

Pu 238 and 239/240 : LA-943-127 (B-1)

				STD	
Type	DATE COUNTED	JAN-22-96	PU 236 AEA FRAC (C236)		0.425
STD	SAMPLE VOLUME in mL	SS 0.100	PU 238 AEA FRAC (C238)		0.000
Work List	SAMPLE DILUTION FACTOR	DF 101.000	PU 239 AEA FRAC (C239)		0.528
4884	TRACER VOLUME in mL	SPKV 0.100	TOTAL AT COUNTS		4931
Test Code	DIGEST DILUTION FACTOR	DDF 1.000	AT COUNT TIME (MIN)		30
@PU23901	TRACER BOOK NO	120B43	BACKGROUND in cpm (Bkg)		6.000
Matrix	DETECTOR NUMBER	1	PU 236 cpm		20.640
LIQUID	EFFICIENCY FACTOR	EFF 0.500	PU 238 cpm		0.000
Batch Number	TRACER PREPARATION DATE	12/27/95	PU 239 cpm		25.680
96000340	TRACER PREPARATION VALUE (dpm/mL)	2390.000	AEA COUNT TIME		480
Retun	PU-236 DECAY CORR'D VALUE (dpm/mL)	2348.978	Pu 239/240 $\mu\text{Ci/L}$		1.3277E+02
0	PU-238 TRACER VALUE (dpm/mL)	0.000			
Sample Prep	STANDARD BOOK NO	104B43			
N/A	STANDARD VALUE in $\mu\text{Ci/mL}$	0.128			
Sample #					
WL#4884					
Instrument Code	Decay Time = Date Counted - Tracer Preparation Date				
AL10539	$\text{Pu-236 Decay Corr'd Value} = \text{Pu-236 Preparation Value} * [e \text{ to the power of } \{-(\ln 2 * \text{Decay Time}/1040.95)\}]$				
Prepared By	$\text{Pu 236 Tracer Recovery} = (\text{Total AT Counts} / \text{TC} - \text{Bkg}) * 1/\text{EFF} * \text{C236}/100 / \text{Pu-236 Decay Corr'd Value} * \text{SPKV}$				
SEH	$\text{Pu 239/240 } \mu\text{Ci/L} = (\text{C239}) / (\text{Pu 236 Decay Corr'd Value}) * (\text{SPKV}) / (1000 \text{ mL/L}) * (\text{DF}) / (\text{DDF}) / [(\text{C236}) / (\text{SS}) * (2220000 \text{ dpm}/\mu\text{Ci})]$				
Chemist	$\text{Pu 238 dpm} = [(\text{Total AT Counts} / \text{TC} - \text{Bkg} * 1/\text{EFF} * \text{C238}) - (\text{Pu-238 Tracer Value} * \text{SPKV} * \text{Pu 236 Tracer Recovery} / 100)]$				
LLF	$\text{Pu 238 } \mu\text{Ci/L} = [(\text{Pu 238 dpm}) / (\text{DF}) / (\text{DDF}) / (1000 \text{ mL/L})] / [(\text{Pu-236 Tracer Recovery} / 100) * (2220000 \text{ dpm}/\mu\text{Ci}) / (\text{D g/L}) / (\text{SS})]$				
Analyst	Relative Counting Error = Square Root of $\{[(1/(\text{Pu 236 cpm} * \text{min})) + (1/(\text{Pu 238 or 239/240 cpm} * \text{min}))] * 1.96 * 100$				
AKL					
Date Complete	v RESULTS v				
01/29/96	Pu 239/240 $\mu\text{Ci/mL}$	1.33E-01	DETECTION LEVELS in $\mu\text{Ci/mL}$ Pu 239/240 1.32E-02		
Analysis Date	Relative Counting Error	= 2.6%			
01/22/96					
Analysis Time					
02:30 PM					
Sample Point					
AP-108 GRAB	Pu 236 Tracer Recovery	= 57.3%			

Analyst:	AKL	Date:	29-Jan-96
Signature of Chemist: <i>[Signature]</i>	LLF	Date:	31 Jan 96

STANDARD WB1 REV 1.2

943127ML

Pu 238 and 239/240 : LA-943-127 (B-1)

LIQUID / SOLID

Type	DATE COUNTED		BLNK
BLNK	SAMPLE VOLUME in mL	SS 1.000	PU 236 AEA FRAC (C236) 0.985
Work List	SAMPLE DILUTION FACTOR	DF 1.000	PU 238 AEA FRAC (C238) 0.000
4884	TRACER VOLUME in mL	SPKV 0.100	PU 239 AEA FRAC (C239) 0.000
Test Code	DIGEST DILUTION FACTOR	DDF 1.0000	TOTAL AT COUNTS 1972
@PU23901	TRACER BOOK NO	120B43	AT COUNT TIME (MIN) 30
Matrix	DETECTOR NUMBER	2	BACKGROUND in cp (Bkg) 3.000
LIQUID	EFFICIENCY FACTOR	EFF 0.5000	PU 236 cpm 11.560
Batch Number	TRACER PREPARATION DATE	12/27/95	PU 238 cpm 0.000
96000340	TRACER PREPARATION VALUE (dpm/mL)	2390.00	PU 239 cpm 0.000
Rerun	PU-236 DECAY CORR'D VALUE (dpm/mL)	2348.98	AEA COUNT TIME 480
0	PU-238 TRACER VALUE (dpm/mL)	0.00	Pu 239/240 $\mu\text{Ci/L}$ = < 6.125E-03
Sample Prep			
N/A			
Sample #	Decay Time = Date Counted - Tracer Preparation Date		
WL4884	Pu-236 Decay Corr'd Value = Pu-236 Preparation Value * [e to the power of ((-ln2 * Decay Time)/1040.95)]		
Instrument Code	Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * C236 * 100 / (Pu-236 Decay Corr'd Value * SPKV * EFF)		
AL10540	Pu 239/240 $\mu\text{Ci/L}$ = (C239) (Pu 236 Decay Corr'd Value) (SPKV) (1000 mL/L) (DF) (DDF) / [(C236) (SS) (D g/L) (2220000 dpm/ μCi)]		
Prepared By	Pu 238 dpm = [(Total AT Counts / TC) - Bkg * 1/EFF * C238] - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)		
SEH	Pu 238 $\mu\text{Ci/L}$ = [(Pu 238 dpm) (DF) (DDF) (1000 mL/L)] / [(Pu-236 Tracer Recovery / 100) (2220000 dpm/ μCi) (D g/L) (SS)]		
Chemist	Relative Counting Error = Square Root of [(1/(Pu 236 cpm * min)) + (1 / (Pu 238 or 239/240 cpm * min))] * 1.96 * 100		
LLF			
Analyst			
AKL			
Date Complete	v RESULTS v		
01/29/96	Pu 239/240 $\mu\text{Ci/mL}$	< 6.13E-06	DETECTION LEVELS in $\mu\text{Ci/mL}$ Pu 239/240 6.13E-06 Pu 238 6.13E-06
Analysis Date	Relative Counting Error	= 100.0%	
01/22/96			
Analysis Time	NOTE: Pu 238 Result is a LESS THAN Value.		
02:30 PM	Pu 238 $\mu\text{Ci/mL}$	< 6.13E-06	
Sample Point	Relative Counting Error	= 100.0%	
AP-108 GRAB	Pu 236 Tracer Recovery	= 52.6%	

Analyst:	AKL	Date:	29-Jan-96
Signature of Chemist:	LLF	Date:	29 31 Jan 96

BLANK.WB1 REV 1.2

943127ML

WORKBOOK PAGE: SAM3

Pu 238 and 239/240 : LA-943-127 (B-1)

LIQUID / SOLID

				SAMPLE
Type	DATE COUNTED	JAN-22-96	PU 236 AEA FRAC (C236)	0.591
SAMPLE	SAMPLE VOLUME in mL	SS	1.000 PU 238 AEA FRAC (C238)	0.064
Work List	SAMPLE DILUTION FACTOR	DF	1.000 PU 239 AEA FRAC (C239)	0.330
4884	TRACER VOLUME in mL	SPKV	0.100 TOTAL AT COUNTS	2064
Test Code	DIGEST DILUTION FACTOR	DDF	1.0000 AT COUNT TIME (MIN)	30
@PU23901	TRACER BOOK NO	120B43	BACKGROUND in cpm (Bkg)	6.000
Matrix	DETECTOR NUMBER	1	PU 236 cpm	8.460
LIQUID	EFFICIENCY FACTOR	EFF	0.500 PU 238 cpm	0.910
Batch Number	TRACER PREPARATION DATE	12/27/95	PU 239 cpm	4.720
96000340	TRACER PREPARATION VALUE (dpm/mL)	2390.000	AEA COUNT TIME	480
Rerun	PU-238 DECAY CORR'D VALUE (dpm/mL)	2348.978	Pu 239/240 μ Ci/L	5.9082E-02
0	PU-238 TRACER VALUE (dpm/mL)	0.000		

Sample Prep

N/A

Sample #

Decay Time = Date Counted - Tracer Preparation Date

S96T000092

Pu-236 Decay Corr'd Value = Pu-236 Preparation Value * [e to the power of $\{(-\ln 2 * \text{Decay Time}/1040.95)\}$]

Instrument Code

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

AL10539

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

Prepared By

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

SEH

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

Chemist

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

LLF

Analyst

AKL

Date Complete

v RESULTS v

01/29/96

Pu 239/240 μ Ci/mL

5.91E-05

Analysis Date

Relative Counting Error =

5.1%

01/22/96

Analysis Time

NOTE: Pu 238 Result is a LESS THAN Value.

02:30 PM

Pu 238 μ Ci/mL

< 1.70E-05

Sample Point

Relative Counting Error =

9.9%

AP-108 GRAB

Pu 236 Tracer Recovery =

31.6%

DETECTION

LEVELS

in μ Ci/mL

Pu 239/240

1.70E-05

Pu 238

1.70E-05

Analyst:

AKL

Date: 29-Jan-96

Signature of Chemist

LLF

Date: 31 Jan 96

SAMPLE WB1 REV 1.2

943127ML

LIQUID / SOLID

Pu 238 and 239/240 : LA-943-127 (B-1)				LIQUID / SOLID		DUP	
Type	DATE COUNTED		JAN-22-96		PU 236 AEA FRAC (C236)		0.579
DUP	SAMPLE VOLUME in mL		SS	1.000	PU 238 AEA FRAC (C238)		0.062
Work List	SAMPLE DILUTION FACTOR		DF	1.000	PU 239 AEA FRAC (C239)		0.330
4884	TRACER VOLUME in mL		SPKV	0.100	TOTAL AT COUNTS		2341
Test Code	DIGEST DILUTION FACTOR		DDF	1.0000	AT COUNT TIME (MIN)		30
@PU23901	TRACER BOOK NO		120B43	BACKGROUND in cpm (Bkg)			3.000
Matrix	DETECTOR NUMBER		2	PU 236 cpm			9.570
LIQUID	EFFICIENCY FACTOR		EFF	0.500	PU 238 cpm		1.020
Batch Number	TRACER PREPARATION DATE		12/27/95		PU 239 cpm		5.450
96000340	TRACER PREPARATION VALUE (dpm/mL)		2390.000		AEA COUNT TIME		480
Retun	PU-236 DECAY CORR'D VALUE (dpm/mL)		2348.978		Pu 239/240 µCi/L		6.0306E-02
0	PU-238 TRACER VALUE (dpm/mL)		0.000				
Sample Prep							
N/A							
Sample #							
S95T000092	Decay Time = Date Counted - Tracer Preparation Date						
Instrument Code	Pu-236 Decay Corr'd Value = Pu-236 Preparation Value * [e to the power of {(ln-2 * Decay Time)/1040.95}]						
AL10540	Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * C236*100/(Pu-236 Decay Corr'd Value * SPKV * EFF)						
Prepared By	Pu 239/240 µCi/L = (C239)/(Pu 236 Decay Corr'd Value)(SPKV)(1000mL/L)(DF)(DDF) / [(C236)(SS)(D g/L)(2220000 dpm/µCi)]						
SEH	Pu 238 dpm = [(Total AT Counts / TC) - Bkg * 1/EFF * C238] - (Pu-238 Tracer Value * SPKV * Pu 238 Tracer Recovery / 100)						
Chemist	Pu 238 µCi/L = [(Pu 238 dpm)(DF)(DDF)(1000mL/L)] / [(Pu-236 Tracer Recovery / 100)(2220000 dpm/µCi)(D g/L)(SS)]						
LLF	Relative Counting Error = Square Root of {[1/(Pu 236 cpm * min)] + 1 / (Pu 238 or 239/240 cpm * min)]} * 1.96 * 100						
Analyst							
AKL							
Date Complete	v RESULTS v						
01/29/96	Pu 239/240 µCi/mL		6.03E-05		DETECTION LEVELS in µCi/mL		
Analysis Date	Relative Counting Error		= 4.8%				
01/22/96							
Analysis Time	NOTE: Pu 238 Result is a LESS THAN Value.						
02:30 PM	Pu 238 µCi/mL		< 1.48E-05		Pu 239/240		
Sample Point	Relative Counting Error		= 9.3%		1.48E-05		
AP-108 GRAB	Pu 236 Tracer Recovery		= 37.0%		Pu 238		
					1.48E-05		

Analyst:	AKL	Date:	29-Jan-96
Signature of Chemist:	LLF	Date:	31 Jan 96
SAMPLE.WB1 REV 1.2 943127MI			

Pu 238 and 239/240 : LA-943-127 (B-1)

LIQUID / SOLID

Pu 238 and 239/240 : LA-943-127 (B-1)				LIQUID / SOLID		SAMPLE	
Type	DATE COUNTED	JAN-22-96	PU 236 AEA FRAC	(C236)		0.917	
SAMPLE	SAMPLE VOLUME in mL	SS	1.000	PU 238 AEA FRAC	(C238)	0.028	
Work List	SAMPLE DILUTION FACTOR	DF	1.000	PU 239 AEA FRAC	(C239)	0.043	
4884	TRACER VOLUME in mL	SPKV	0.100	TOTAL AT COUNTS		1907	
Test Code	DIGEST DILUTION FACTOR	DDF	1.0000	AT COUNT TIME (MIN)		30	
@PU23901	TRACER BOOK NO	120B43	BACKGROUND in cpm	(Bkg)		6.000	
Matrix	DETECTOR NUMBER	1	PU 236 cpm			12.830	
LIQUID	EFFICIENCY FACTOR	EFF	0.500	PU 238 cpm		0.390	
Batch Number	TRACER PREPARATION DATE	12/27/95	PU 239 cpm			0.600	
96000340	TRACER PREPARATION VALUE (dpm/mL)	2390.000	AEA COUNT TIME			480	
Retun	PU-236 DECAY CORR'D VALUE (dpm/mL)	2348.978	Pu 239/240 μ Ci/L =	<		7.701E-03	
0	PU-238 TRACER VALUE (dpm/mL)	0.000					
Sample Prep							
N/A							
Sample #	Decay Time = Date Counted - Tracer Preparation Date						
S96T000093	Pu-236 Decay Corr'd Value = Pu-236 Preparation Value $\times$ [e to the power of $\{(-\ln 2 \times$ Decay Time/1040.95)]						
Instrument Code	Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) $\times$ C236 $\times$ 100/(Pu-236 Decay Corr'd Value $\times$ SPKV $\times$ EFF)						
AL10539	Pu 239/240 μ Ci/L = (C239)/(Pu 236 Decay Corr'd Value)(SPKV)(1000mL/L)(DF)(DDF) / [(C236)(SS)/(D g/L)(2220000 dpm/ μ Ci)]						
Prepared By	Pu 238 dpm = [(Total AT Counts / TC) - Bkg $\times$ 1/EFF $\times$ C238] - (Pu-238 Tracer Value $\times$ SPKV $\times$ Pu 236 Tracer Recovery / 100)						
SEH	Pu 238 μ Ci/L = [(Pu 238 dpm)(DF)(DDF)(1000mL/L)] / [(Pu-236 Tracer Recovery / 100)(2220000 dpm/ μ Ci)(D g/L)(SS)]						
Chemist	Relative Counting Error = Square Root of $\{[1/(\text{Pu 236 cpm} \times \text{min})] + [1/(\text{Pu 238 or 239/240 cpm} \times \text{min})]\} \times 1.96 \times 100$						
LLF							
Analyst							
AKL							
Date Complete	v RESULTS v						
01/29/96	Pu 239/240 μ Ci/mL	< 7.70E-06	DETECTION LEVELS in μ Ci/mL				
Analysis Date	Relative Counting Error =	11.8%					
01/22/96							
Analysis Time	NOTE: Pu 238 Result is a LESS THAN Value.						
02:30 PM	Pu 238 μ Ci/mL	< 7.70E-06	Pu 239/240				
Sample Point	Relative Counting Error =	14.5%	7.70E-06				
AP-108 GRAB	Pu 238 Tracer Recovery =	44.9%	Pu 238				
			7.70E-06				

Analyst:	AKL	Date:	29-Jan-96
Signature of Chemist: <i>AKL</i>	LLF	Date:	31 Jan 96
SAMPLE NAME: 00443			

WHC-SD-WM-DP-166, REV. I

WORKBOOK PAGE: DUP6

Pu 238 and 239/240 : LA-943-127 (B-1)

LIQUID / SOLID

				DUP
Type	DATE COUNTED	JAN-22-96	PU 236 AEA FRAC (C236)	0.972
DUP	SAMPLE VOLUME in mL	SS	1.000 PU 238 AEA FRAC (C238)	0.000
Work List	SAMPLE DILUTION FACTOR	DF	1.000 PU 239 AEA FRAC (C239)	0.000
4884	TRACER VOLUME in mL	SPKV	0.100 TOTAL AT COUNTS	2099
Test Code	DIGEST DILUTION FACTOR	DDF	1.0000 AT COUNT TIME (MIN)	30
@PU23901	TRACER BOOK NO	120B43	BACKGROUND in cpm (Bkg)	3.000
Matrix	DETECTOR NUMBER	2	PU 236 cpm	11.760
LIQUID	EFFICIENCY FACTOR	EFF	0.500 PU 238 cpm	0.000
Batch Number	TRACER PREPARATION DATE	12/27/95	PU 239 cpm	0.000
96000340	TRACER PREPARATION VALUE (dpm/mL)	2390.000	AEA COUNT TIME	480
Re-run	PU-236 DECAY CORR'D VALUE (dpm/mL)	2348.978	Pu 239/240 µCi/L =	< 5.8926E-03
0	PU-238 TRACER VALUE (dpm/mL)	0.000		

Sample Prep

N/A

Sample #

S96T000093

Instrument Code

AL10540

Prepared By

SEH

Chemist

LLF

Analyst

AKL

Date Complete

01/29/96

Analysis Date

01/22/96

Analysis Time

02:30 PM

Sample Point

AP-108 GRAB

Decay Time = Date Counted - Tracer Preparation Date

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

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

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

Pu 238 dpm = [(Total AT Counts / TC) - Bkg * 1/EFF * C236] - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)

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

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

v RESULTS v

01/29/96	Pu 239/240 µCi/mL	< 5.89E-06	DETECTION LEVELS in µCi/mL
Analysis Date	Relative Counting Error	= 100.0%	
01/22/96			
Analysis Time	NOTE: Pu 238 Result is a LESS THAN Value.		
02:30 PM	Pu 238 µCi/mL	< 5.89E-06	
Sample Point	Relative Counting Error	= 100.0%	Pu 238
AP-108 GRAB	Pu 236 Tracer Recovery	= 55.4%	5.89E-06

Analyst:	AKL	Date:	29-Jan-96
Signature of Chemist:	<i>AKL</i>	Date:	31 Jan 96

SAMPLE.VB1 REV 1.2

943127ML

WHC-SD-WM-DP-166, REV. I

WORKBOOK PAGE: SAM7

Pu 238 and 239/240 : LA-943-127 (B-1)

LIQUID / SOLID

Pu 238 and 239/240 : LA-943-127 (B-1)				LIQUID / SOLID		SAMPLE
Type	DATE COUNTED	JAN-23-96	PU 236 AEA FRAC (C236)			0.581
SAMPLE	SAMPLE VOLUME in mL	SS	1.000	PU 238 AEA FRAC (C238)		0.065
Work List	SAMPLE DILUTION FACTOR	DF	1.000	PU 239 AEA FRAC (C239)		0.338
4884	TRACER VOLUME in mL	SPKV	0.100	TOTAL AT COUNTS		1839
Test Code	DIGEST DILUTION FACTOR	DDF	1.0000	AT COUNT TIME (MIN)		30
@PU23901	TRACER BOOK NO	120B43		BACKGROUND in cpm (Bkg)		6.000
Matrix	DETECTOR NUMBER	3	PU 236 cpm			9.830
LIQUID	EFFICIENCY FACTOR	EFF	0.500	PU 238 cpm		0.940
Batch Number	TRACER PREPARATION DATE	12/27/95	PU 239 cpm			5.720
96000340	TRACER PREPARATION VALUE (dpm/mL)	2390.000	AEA COUNT TIME			480
Rerun	PU-236 DECAY CORR'D VALUE (dpm/mL)	2347.415	Pu 239/240 µCi/L			6.1514E-02
0	PU-238 TRACER VALUE (dpm/mL)	0.000				

Sample Prep

N/A

Sample #

S96T000098

Instrument Code

AL10541

Prepared By

SEH

Chemist

LLF

Analyst

AKL

Date Complete

v RESULTS v

01/29/96	Pu 239/240 µCi/mL	6.15E-05	DETECTION LEVELS in µCi/mL
Analysis Date	Relative Counting Error =	4.7%	
01/22/96			
Analysis Time	NOTE: Pu 238 Result is a LESS THAN Value.		
02:30 PM	Pu 238 µCi/mL	< 1.99E-05	Pu 239/240
Sample Point	Relative Counting Error =	9.7%	1.99E-05
AP-108 GRAB	Pu 236 Tracer Recovery =	27.4%	Pu 238
			1.99E-05

Analyst:	AKL	Date:	29-Jan-96
Signature of Chemist:	LLF	Date:	31 Jan 96

SAMPLE.WB1 REV 1.2

943127ML

Pu 238 and 239/240 : LA-943-127 (B-1)

LIQUID / SOLID

				DUP	
Type	DATE COUNTED		JAN-23-96	PU 236 AEA FRAC (C236)	0.593
DUP	SAMPLE VOLUME in mL	SS	1.000	PU 236 AEA FRAC (C238)	0.061
Work List	SAMPLE DILUTION FACTOR	DF	1.000	PU 239 AEA FRAC (C239)	0.330
4884	TRACER VOLUME in mL	SPKV	0.100	TOTAL AT COUNTS	2217
Test Code	DIGEST DILUTION FACTOR	DDF	1.0000	AT COUNT TIME (MIN)	30
@PU23901	TRACER BOOK NO		120B43	BACKGROUND in cpm (Bkg)	3.000
Matrix	DETECTOR NUMBER		2	PU 236 cpm	8.900
LIQUID	EFFICIENCY FACTOR	EFF	0.500	PU 238 cpm	0.760
Batch Number	TRACER PREPARATION DATE		12/27/95	PU 239 cpm	4.950
96000340	TRACER PREPARATION VALUE (dpm/mL)		2390.000	AEA COUNT TIME	480
Rerun	PU-236 DECAY CORR'D VALUE (dpm/mL)		2347.415	Pu 239/240 μ Ci/L	5.8843E-02
0	PU-238 TRACER VALUE (dpm/mL)		0.000		
Sample Prep					
N/A					
Sample #	Decay Time = Date Counted - Tracer Preparation Date				
S96T000098	Pu-236 Decay Corr'd Value = Pu-236 Preparation Value * [e to the power of {(-ln2 * Decay Time/1040.95)}]				
Instrument Code	Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * C236 * 100 / (Pu-236 Decay Corr'd Value * SPKV * EFF)				
AL10540	Pu 239/240 μ Ci/L = (C239) (Pu 236 Decay Corr'd Value) (SPKV) (1000mL/L) (DF) (DDF) / [(C236) (SS) (D g/L) (2220000 dpm/ μ Ci)]				
Prepared By	Pu 238 dpm = [(Total AT Counts / TC) - Bkg * 1/EFF * C238] - (Pu-238 Tracer Value * SPKV * Pu 236 Tracer Recovery / 100)				
SEH	Pu 238 μ Ci/L = [(Pu 238 dpm) (DF) (DDF) (1000mL/L)] / [(Pu-236 Tracer Recovery / 100) (2220000 dpm/ μ Ci) (D g/L) (SS)]				
Chemist	Relative Counting Error = Square Root of [(1 / (Pu 236 cpm * min)) + (1 / (Pu 238 or 239/240 cpm * min))] * 1.96 * 100				
LLF					
Analyst					
AKL					
Date Complete	v RESULTS v				
01/29/96	Pu 239/240 μ Ci/mL		5.88E-05	DETECTION LEVELS in μ Ci/mL	
Analysis Date	Relative Counting Error	=	5.0%		
01/22/96				Pu 239/240	
Analysis Time	NOTE: Pu 238 Result is a LESS THAN Value.				
02:30 PM	Pu 238 μ Ci/mL		< 1.49E-05	1.49E-05	
Sample Point	Relative Counting Error	=	10.7%	Pu 238	
AP-108 GRAB	Pu 236 Tracer Recovery	=	35.8%	1.49E-05	

Analyst:	AKL	Date:	29-Jan-96
Signature of Chemist: <i>2007</i>	LLF	Date:	31 Jan 96

Westinghouse Hanford Co.

GENERAL ALPHA ENERGY ANALYSIS
Rev. 2.01

WHC-SD-WM-DP-166, REV.)

DATA REDUCTION REPORT

SAMPLE

WL4884-STD

File ID: 13a1393.CNF

Counted on: 1/22/96 @23:57

Detector: AEA13

Geometry number: 1

Count time: 28803. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	936.6	936.6	360.782	360.782	8.000	2.136	4.000	1.189
2?	18.9	18.9	303.085	303.071	10.000	3.254	5.000	1.866
3	1249.1	1249.1	227.823	227.823	10.000	2.771	5.000	2.044

PEAK RESULTS

Peak Error Limit: 30%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Pu236	0.425	5.755	5.759	-.0040	0.01	20.64	2.0	1163.7	0.524E-03
2	????	???	5.494				0.45	13.4		
3	Pu239	0.528	5.147	5.147	0.0000	0.01	25.68	1.8	1419.0	0.639E-03
	Pu240		5.144	5.147	-.003				1419.0	0.639E-03

Totals:		0.953	<--valid peaks only-->				46.33			

DETECTOR CALIBRATION

Energy(MEV) = 4.099 + (0.0046)*Channel

Energy range (MeV): 4.099 TO 6.455

Efficiency = 0.0181 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	23338.0	100.000
Smoothed	23338.0	100.000
Composite fit	22457.0	96.225
Residuals	881.0	3.775

Analyzed by:

VR

1 Legend: Raw = Modeled Peaks = 1,2,..., etc

Display Max.: 7649.7

WHC-SD-WM-DP-166, REV. 1

3.
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2

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Raw Data	Dump	for AEA	Spectrum:	13a1393.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.	0.	0.	0.	0.	0.
31	0.	0.	0.	0.	0.	0.	0.	0.	0.
41	0.	0.	0.	0.	0.	0.	0.	0.	0.
51	0.	0.	0.	0.	0.	0.	0.	0.	0.
61	0.	0.	0.	1.	0.	0.	0.	0.	0.
71	0.	0.	0.	0.	0.	0.	1.	0.	1.
81	0.	0.	0.	1.	0.	0.	0.	0.	0.
91	0.	1.	0.	1.	0.	0.	0.	0.	0.
101	0.	0.	0.	1.	0.	0.	1.	0.	0.
111	1.	1.	0.	0.	0.	0.	2.	0.	0.
121	0.	0.	1.	1.	0.	1.	1.	1.	0.
131	1.	1.	2.	0.	1.	1.	0.	0.	0.
141	1.	2.	0.	2.	2.	0.	1.	2.	1.
151	1.	0.	0.	2.	1.	1.	2.	4.	1.
161	0.	1.	2.	2.	1.	0.	1.	2.	0.
171	0.	3.	4.	2.	2.	4.	4.	3.	3.
181	2.	2.	7.	6.	5.	3.	6.	8.	7.
191	12.	13.	11.	6.	7.	11.	14.	10.	15.
201	19.	34.	26.	36.	28.	38.	26.	37.	52.
211	51.	81.	109.	128.	168.	201.	262.	321.	274.
221	328.	422.	523.	698.	902.	1242.	1463.	1568.	1468.
231	477.	191.	84.	19.	4.	1.	0.	1.	0.
241	0.	1.	0.	1.	0.	1.	0.	0.	1.
251	0.	1.	0.	1.	2.	0.	0.	0.	1.
261	0.	0.	1.	0.	2.	1.	0.	0.	1.
271	1.	2.	0.	2.	1.	2.	0.	2.	0.
281	1.	1.	2.	0.	2.	2.	3.	1.	2.
291	4.	4.	11.	8.	7.	7.	8.	5.	7.
301	20.	21.	24.	22.	20.	9.	6.	1.	1.
311	1.	5.	3.	1.	6.	3.	2.	4.	7.
321	3.	5.	6.	4.	7.	6.	12.	4.	14.
331	6.	11.	23.	18.	18.	18.	24.	16.	22.
341	40.	48.	57.	64.	88.	102.	140.	208.	255.
351	444.	453.	329.	309.	287.	338.	419.	542.	819.
361	1273.	1138.	680.	226.	36.	4.	0.	0.	2.
371	2.	0.	0.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	1.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.
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.	0.	1.	0.	0.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.	0.	0.	0.	0.	0.	0.	0.

WHC-SD-WM-DP-166, REV.1

Westinghouse Hanford Co.

GENERAL ALPHA ENERGY ANALYSIS

Rev. 2.01

WHC-SD-WM-DP-166, REV. 1

DATA REDUCTION REPORT

SAMPLE

WL4884-BLK

File ID: 14a1498.CNF

Counted on: 1/22/96 @23:57
 Detector: AEA14
 Geometry number: 1
 Count time: 28804. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	514.8	514.8	364.812	364.812	8.000	2.203	4.000	1.201

PEAK RESULTS

Peak Error Limit: 30%

Peak ID	Isotope	AEA Frac	Peak Centroid		FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea	
			Exp.	Obs. Diff.						
1	Pu236	0.985	5.755	5.765	-0.010	0.01	11.56	2.6	648.0	0.292E-03
	Cm243		5.779	5.765	0.014				869.9	0.392E-03

Totals:		0.985	<--valid peaks only-->				11.56			

DETECTOR CALIBRATION

Energy (MEV) = $4.086 + (0.0046) \times \text{Channel}$
 Energy range (MeV): 4.086 TO 6.442
 Efficiency = 0.0182 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	5633.0	100.000
Smoothed	5633.0	100.000
Composite fit	5548.5	98.500
Residuals	84.5	1.500

Analyzed by: MB

VR

1 Legend: Raw = Modeled Peaks = 1,2,..., etc Display Max.: 3039.7

WHC-SD-WM-DP-166, REV. 1

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Raw Data	Dump	for AEA	Spectrum:	14a1498.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.	0.	0.	0.	0.	0.
31	0.	0.	0.	0.	0.	0.	0.	0.	0.
41	0.	1.	0.	0.	0.	0.	0.	0.	0.
51	0.	0.	0.	0.	0.	0.	0.	0.	0.
61	0.	0.	0.	0.	0.	1.	0.	0.	0.
71	0.	1.	0.	0.	0.	0.	0.	0.	0.
81	0.	0.	0.	0.	0.	0.	0.	0.	1.
91	0.	0.	0.	0.	0.	0.	0.	0.	0.
101	0.	0.	1.	0.	0.	0.	0.	0.	0.
111	0.	1.	0.	0.	0.	1.	0.	0.	0.
121	0.	0.	0.	1.	0.	0.	0.	0.	0.
131	0.	0.	0.	0.	0.	0.	0.	1.	0.
141	0.	0.	1.	0.	1.	0.	2.	0.	1.
151	2.	2.	0.	2.	0.	0.	0.	0.	0.
161	0.	1.	0.	0.	0.	1.	0.	0.	0.
171	0.	0.	0.	0.	0.	1.	0.	0.	0.
181	0.	0.	0.	0.	1.	0.	0.	0.	1.
191	0.	0.	0.	0.	0.	0.	1.	0.	0.
201	1.	0.	0.	0.	1.	1.	1.	0.	0.
211	0.	0.	0.	0.	0.	0.	2.	1.	0.
221	0.	2.	2.	0.	0.	3.	1.	0.	1.
231	3.	3.	1.	1.	1.	0.	0.	1.	0.
241	0.	0.	0.	0.	1.	0.	0.	0.	1.
251	0.	0.	1.	1.	0.	0.	1.	1.	0.
261	1.	0.	2.	0.	0.	0.	0.	0.	1.
271	0.	0.	1.	1.	0.	0.	0.	1.	0.
281	0.	0.	0.	0.	2.	0.	0.	2.	1.
291	2.	0.	1.	1.	0.	1.	1.	1.	1.
301	2.	1.	5.	2.	4.	5.	6.	2.	0.
311	0.	0.	1.	2.	1.	2.	3.	1.	0.
321	1.	0.	5.	0.	5.	2.	0.	3.	0.
331	2.	3.	2.	3.	3.	4.	6.	5.	5.
341	8.	12.	7.	19.	15.	16.	17.	31.	39.
351	72.	106.	163.	214.	268.	219.	211.	156.	157.
361	239.	298.	462.	567.	693.	635.	382.	137.	35.
371	0.	0.	1.	0.	1.	1.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.
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.	0.	0.	0.	0.	0.
481	0.	0.	0.	0.	0.	0.	0.	1.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.							

WHC-SD-WM-DP-166, REV. 1

Westinghouse Hanford Co.

GENERAL ALPHA ENERGY ANALYSIS
Rev. 2.01 WHC-SD-WM-DP-166, REV. 1

DATA REDUCTION REPORT

SAMPLE
S96T92-SAM
File ID: 15a1579.CNF

Counted on: 1/22/96 @23:58
Detector: AEA15
Geometry number: 1
Count time: 28801. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	363.5	363.5	361.669	361.669	8.000	2.301	4.000	1.197
2	40.3	40.3	303.101	303.098	10.000	2.262	5.000	1.226
3	209.5	209.5	227.989	227.989	10.000	3.358	5.000	2.277

PEAK RESULTS
Peak Error Limit: 30%

Peak ID	Isotope	AEA Frac	Peak Centroid		Count Rate	%err @95	d/m	Activity uCi/ea
			Exp.	Obs. Diff.	c/m			
1	Pu236	0.591	5.755	5.775	-0.0200	0.1	1003.8	0.452E-03
	Cm243		5.779	5.775	0.004		1347.6	0.607E-03
2	Pu238	0.064	5.487	5.505	-0.0180	0.1	147.5	0.665E-04
	Am241		5.479	5.505	-0.026		113.0	0.509E-04
3	Pu239	0.330	5.147	5.160	-0.0130	0.2	548.9	0.247E-03
	Pu240		5.144	5.160	-0.016		548.9	0.247E-03
Totals:			0.984	<--valid peaks only-->		14.09		

DETECTOR CALIBRATION
Energy (MEV) = 4.111 + (0.0046)*Channel
Energy range (MeV): 4.111 TO 6.466
Efficiency = 0.0086 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	6874.0	100.000
Smoothed	6874.0	100.000
Composite fit	6765.6	98.422
Residuals	108.4	1.578

Analyzed by:

[Signature] 1/23/96
VR

WHC-SD-WM-DP-166, REV. 1

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Raw Data Dump for AEA Spectrum: 15a1579.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
21	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
31	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
41	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
51	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
61	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
71	0.	0.	0.	1.	1.	1.	0.	0.	0.	0.
81	0.	0.	0.	0.	1.	0.	0.	0.	1.	1.
91	0.	1.	0.	0.	0.	1.	0.	0.	1.	0.
101	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
111	0.	2.	0.	0.	1.	1.	0.	0.	0.	0.
121	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
131	0.	0.	0.	0.	0.	1.	0.	0.	1.	1.
141	1.	0.	0.	4.	0.	0.	0.	1.	1.	1.
151	2.	0.	2.	1.	1.	2.	1.	3.	1.	1.
161	1.	2.	0.	0.	0.	1.	1.	1.	0.	1.
171	3.	0.	1.	0.	0.	0.	0.	1.	0.	0.
181	1.	0.	1.	2.	2.	1.	2.	0.	1.	0.
191	1.	1.	1.	1.	2.	1.	4.	1.	3.	4.
201	1.	2.	4.	0.	7.	3.	6.	9.	12.	8.
211	8.	12.	13.	30.	21.	35.	49.	62.	48.	61.
221	73.	90.	94.	123.	144.	204.	248.	259.	240.	196.
231	124.	61.	36.	8.	4.	0.	1.	0.	0.	0.
241	0.	0.	0.	1.	1.	0.	0.	0.	1.	0.
251	2.	4.	0.	0.	0.	2.	2.	0.	1.	2.
261	0.	1.	0.	0.	0.	0.	2.	1.	2.	2.
271	1.	0.	0.	0.	0.	1.	3.	0.	0.	2.
281	3.	4.	6.	2.	2.	4.	0.	7.	7.	6.
291	10.	11.	9.	20.	19.	21.	15.	15.	20.	23.
301	28.	42.	59.	42.	42.	12.	5.	2.	1.	1.
311	2.	0.	1.	1.	2.	1.	3.	1.	2.	0.
321	1.	1.	3.	3.	2.	3.	0.	2.	1.	5.
331	5.	5.	3.	5.	3.	6.	5.	10.	8.	2.
341	12.	10.	15.	21.	30.	24.	35.	58.	85.	123.
351	148.	168.	185.	156.	116.	128.	171.	195.	220.	307.
361	460.	475.	438.	247.	82.	21.	4.	1.	0.	1.
371	1.	1.	0.	0.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

WHC-SD-WM-DP-166, REV. 1.

Westinghouse Hanford Co.

GENERAL ALPHA ENERGY ANALYSIS
Rev. 2.01

WHC-SD-WM-DP-166, REV. 1

DATA REDUCTION REPORT

SAMPLE
S96T92-DUP
File ID: 16a1667.CNFCounted on: 1/22/96 @23:58
Detector: AEA16
Geometry number: 1
Count time: 28801. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	343.9	343.9	360.472	360.472	12.000	2.981	6.000	1.253
2	32.7	32.7	302.113	302.091	10.000	3.686	5.000	1.375
3	202.4	202.4	228.522	228.522	10.000	3.683	5.000	1.787

PEAK RESULTS

Peak Error Limit: 30%

Peak ID	Isotope	AEA Frac	Peak Centroid		Count Rate	%err c/m @95	d/m	Activity uCi/ea
		Exp.	Obs.	Diff.	FWHM			
1	Pu236	0.579	5.755	5.759	-0.0040.01	9.57	2.9	96.5 0.435E-04
2	Pu238	0.062	5.487	5.490	-0.0030.02	1.02	9.0	14.0 0.631E-05
	Am241		5.479	5.490	-0.011			10.7 0.483E-05
3	Pu239	0.330	5.147	5.152	-0.0050.02	5.45	3.8	53.8 0.243E-04
	Pu240		5.144	5.152	-0.008			53.8 0.243E-04
Totals:			0.971	<--valid peaks only-->		16.04		

DETECTOR CALIBRATION

Energy(MEV) = 4.101 + (0.0046)*Channel
Energy range (MeV): 4.101 TO 6.456
Efficiency = 0.1012 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	7930.0	100.000
Smoothed	7930.0	100.000
Composite fit	7698.0	97.075
Residuals	232.0	2.925

Analyzed by:  1/23/96
VR

WHC-SD-WM-DP-166, REV. 1

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Raw Data Dump for AEA Spectrum: 16a1667.CNF										
1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
21	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
31	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
41	0.	0.	0.	0.	0.	0.	0.	0.	0.	3.
51	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
61	0.	0.	0.	0.	0.	0.	1.	0.	1.	0.
71	0.	0.	1.	0.	1.	0.	0.	0.	0.	0.
81	0.	1.	0.	0.	0.	1.	0.	1.	0.	0.
91	0.	1.	0.	0.	0.	1.	0.	0.	1.	0.
101	0.	0.	0.	0.	0.	1.	1.	1.	0.	0.
111	1.	0.	0.	0.	1.	1.	0.	1.	0.	0.
121	1.	0.	0.	3.	0.	0.	1.	0.	0.	0.
131	2.	1.	2.	0.	0.	0.	0.	0.	0.	1.
141	3.	1.	1.	0.	2.	1.	1.	1.	1.	1.
151	0.	0.	2.	2.	0.	1.	0.	0.	0.	1.
161	0.	3.	1.	0.	3.	1.	1.	3.	3.	1.
171	2.	2.	2.	1.	1.	0.	2.	2.	0.	1.
181	1.	1.	2.	2.	7.	3.	4.	2.	6.	1.
191	2.	2.	5.	6.	4.	5.	9.	9.	8.	6.
201	7.	11.	10.	11.	6.	9.	8.	17.	9.	17.
211	17.	19.	29.	35.	38.	53.	61.	74.	67.	82.
221	95.	103.	105.	132.	160.	175.	215.	226.	237.	224.
231	169.	101.	46.	24.	5.	0.	0.	0.	1.	0.
241	1.	2.	0.	3.	1.	0.	0.	3.	2.	2.
251	0.	2.	1.	1.	1.	0.	0.	0.	0.	1.
261	1.	2.	1.	0.	1.	0.	3.	1.	0.	2.
271	2.	2.	1.	0.	4.	4.	5.	3.	4.	4.
281	3.	3.	3.	2.	5.	4.	7.	11.	9.	16.
291	10.	22.	11.	21.	21.	26.	19.	22.	21.	24.
301	38.	46.	29.	32.	29.	8.	6.	2.	1.	7.
311	4.	3.	0.	2.	6.	1.	3.	4.	8.	4.
321	8.	11.	5.	8.	12.	10.	7.	12.	8.	12.
331	7.	14.	18.	23.	15.	20.	20.	26.	23.	23.
341	31.	29.	50.	57.	50.	73.	71.	93.	130.	158.
351	170.	217.	203.	143.	175.	194.	205.	276.	354.	430.
361	400.	398.	257.	126.	28.	5.	0.	1.	5.	1.
371	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

Westinghouse Hanford Co.

GENERAL ALPHA ENERGY ANALYSIS
Rev. 2.01

WHC-SD-WM-DP-166, REV. 1

DATA REDUCTION REPORT

SAMPLE

S96T93-SAM

File ID: 17a1750.CNF

Counted on: 1/22/96 @23:59
 Detector: AEA17
 Geometry number: 1
 Count time: 28802. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	589.2	589.2	360.062	360.062	10.000	2.387	5.000	1.426
2	16.5	16.5	301.331	301.323	10.000	4.323	5.000	3.197
3	28.2	28.2	228.537	228.537	10.000	3.001	5.000	2.145

PEAK RESULTS

Peak Error Limit: 30%

Peak ID	Isotope	AEA Frac	Peak Centroid			Count Rate	%err c/m @95	d/m	Activity uCi/ea
			Exp.	Obs.	Diff.				
1	Pu236	0.917	5.755	5.755	0.0000.01	12.83	2.5	999.2	0.450E-03
2	Pu238	0.028	5.487	5.485	0.0020.02	0.39	14.4	41.3	0.186E-04
	Am241		5.479	5.485	-.006			31.7	0.143E-04
3	Pu239	0.043	5.147	5.150	-.0030.01	0.60	11.5	45.9	0.207E-04
	Pu240		5.144	5.150	-.006			45.9	0.207E-04
Totals:			0.988	<--valid peaks only-->			13.82		

DETECTOR CALIBRATION

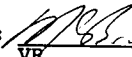
Energy(MEV) = 4.099 + (0.0046)*Channel

Energy range (MeV): 4.099 TO 6.454

Efficiency = 0.0131 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	6717.0	100.000
Smoothed	6717.0	100.000
Composite fit	6633.7	98.760
Residuals	83.3	1.240

Analyzed by:  1/23/96

VR

1 Legend: Raw = Modeled Peaks = 1,2,..., etc

Display Max.:

2864.5

WHC-SD-WM-DP-166, REV. 1

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Raw Data	Dump	for	AEA	Spectrum:	17a1750.CNF				
1	0.	0.	0.	0.	0.	0.	0.	1.	0.
11	0.	0.	0.	0.	0.	0.	0.	1.	2.
21	0.	0.	0.	0.	0.	0.	0.	0.	0.
31	0.	0.	0.	0.	0.	0.	0.	0.	0.
41	0.	0.	0.	0.	0.	1.	0.	0.	0.
51	0.	0.	0.	0.	1.	0.	0.	0.	0.
61	0.	0.	0.	0.	0.	0.	0.	0.	0.
71	0.	0.	0.	0.	0.	0.	0.	0.	0.
81	0.	1.	0.	0.	0.	1.	0.	0.	0.
91	0.	0.	0.	0.	0.	1.	0.	0.	0.
101	0.	1.	0.	0.	0.	0.	0.	0.	0.
111	0.	1.	0.	0.	0.	1.	0.	0.	0.
121	0.	0.	0.	0.	0.	0.	0.	0.	0.
131	0.	1.	0.	2.	0.	0.	1.	0.	0.
141	1.	2.	2.	0.	1.	1.	0.	1.	1.
151	0.	1.	1.	3.	0.	0.	1.	0.	0.
161	0.	1.	0.	1.	0.	0.	0.	0.	0.
171	0.	0.	0.	1.	0.	0.	0.	0.	0.
181	0.	0.	0.	0.	0.	0.	0.	1.	0.
191	0.	0.	1.	0.	0.	1.	0.	0.	0.
201	0.	0.	0.	1.	1.	0.	0.	0.	0.
211	0.	2.	1.	2.	4.	6.	3.	7.	6.
221	6.	14.	13.	16.	19.	28.	21.	32.	39.
231	18.	11.	5.	2.	0.	1.	0.	0.	0.
241	1.	1.	0.	0.	0.	0.	0.	0.	0.
251	0.	0.	2.	1.	3.	0.	0.	0.	1.
261	0.	0.	0.	0.	0.	1.	0.	0.	0.
271	0.	0.	1.	1.	0.	0.	0.	1.	0.
281	1.	0.	2.	1.	0.	1.	2.	0.	2.
291	7.	4.	7.	5.	3.	7.	8.	8.	18.
301	17.	21.	15.	17.	3.	5.	3.	3.	0.
311	4.	1.	1.	0.	2.	0.	2.	3.	0.
321	0.	0.	0.	1.	2.	0.	2.	2.	1.
331	3.	5.	4.	5.	4.	3.	7.	4.	6.
341	12.	13.	19.	22.	41.	56.	88.	157.	213.
351	232.	249.	194.	181.	197.	266.	370.	505.	680.
361	769.	555.	232.	60.	11.	4.	1.	2.	0.
371	1.	0.	0.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.
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.	0.	0.	0.	0.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.	0.	0.	0.	0.	0.	0.	0.

Westinghouse Hanford Co.

GENERAL ALPHA ENERGY ANALYSIS
Rev. 2.01 WHC-SD-WM-DP-166, REV. I

DATA REDUCTION REPORT

SAMPLE
S96T93-DUP
File ID: 18a1826.CNFCounted on: 1/22/96 @23:59
Detector: AEA18
Geometry number: 1
Count time: 28801. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	570.7	570.7	359.586	359.586	8.000	2.165	4.000	1.374

PEAK RESULTS
Peak Error Limit: 30%

Peak ID	Isotope	AEA Frac	Peak Centroid			FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
			Exp.	Obs.	Diff.					
1	Pu236	0.972	5.755	5.761	-0.0060.01	11.76	2.6	109.5	0.493E-04	
	Cm243		5.779	5.761	0.018			147.0	0.662E-04	

Totals:			0.972	<--valid peaks only-->			11.76			

DETECTOR CALIBRATION
Energy(MEV) = 4.107 + (0.0046)*Channel
Energy range (MeV): 4.107 TO 6.462
Efficiency = 0.1096 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	5809.0	100.000
Smoothed	5809.0	100.000
Composite fit	5646.2	97.198
Residuals	162.8	2.802

Analyzed by: *WCB* / 1/23/96

VR

WHC-SD-WM-DP-166, REV. 1

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Raw Data Dump for AEA Spectrum: 18a1826.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
21	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
31	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
41	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
51	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
61	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
71	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
81	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
91	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
101	0.	0.	0.	0.	2.	1.	0.	0.	0.	0.
111	0.	0.	0.	2.	0.	0.	0.	0.	0.	0.
121	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
131	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
141	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.
151	0.	1.	0.	0.	0.	1.	0.	1.	0.	0.
161	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
171	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
181	0.	0.	0.	1.	1.	0.	0.	0.	0.	0.
191	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
201	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
211	0.	0.	0.	0.	0.	0.	0.	1.	1.	0.
221	1.	0.	2.	1.	0.	0.	3.	0.	1.	0.
231	1.	1.	0.	0.	0.	0.	0.	0.	0.	0.
241	1.	0.	0.	0.	0.	0.	0.	0.	0.	1.
251	1.	0.	1.	0.	0.	1.	0.	0.	0.	1.
261	2.	0.	1.	1.	1.	0.	0.	1.	1.	0.
271	0.	1.	0.	0.	1.	2.	0.	1.	1.	1.
281	0.	0.	0.	1.	2.	1.	0.	1.	3.	1.
291	0.	1.	0.	2.	3.	2.	1.	3.	5.	3.
301	8.	5.	2.	2.	0.	4.	1.	2.	2.	0.
311	0.	0.	2.	3.	1.	3.	2.	2.	1.	0.
321	3.	3.	4.	1.	7.	1.	3.	3.	1.	5.
331	4.	4.	2.	4.	3.	1.	5.	8.	3.	6.
341	18.	11.	18.	24.	43.	62.	98.	166.	213.	228.
351	255.	185.	163.	151.	193.	279.	346.	582.	662.	782.
361	668.	343.	108.	19.	0.	1.	1.	0.	0.	0.
371	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
431	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

Westinghouse Hanford Co.

GENERAL ALPHA ENERGY ANALYSIS
Rev. 2.01

WHC-SD-WM-DP-166, REV. I

DATA REDUCTION REPORT

SAMPLE
S96T98-SAM
File ID: 19a1906.CNFCounted on: 1/23/96 @ 0: 1
Detector: AEA19
Geometry number: 1
Count time: 28801. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	478.9	478.9	358.120	358.120	10.000	2.107	5.000	1.330
2	41.7	41.7	300.204	300.203	10.000	2.514	5.000	1.448
3	280.7	280.7	226.598	226.598	12.000	3.046	6.000	2.499

PEAK RESULTS

Peak Error Limit: 30%

Peak ID	Isotope	AEA Frac	Peak Centroid			Count Rate	%err c/m @95	d/m	Activity uCi/ea
			Exp.	Obs.	Diff. FWHM				
1	Cm244	0.581	5.795	5.779	0.0160.01	9.83	2.9	537.2	0.242E-03
	Cm243		5.779	5.779	0.000			735.8	0.331E-03
2	Pu238	0.055	5.487	5.507	-0.0200.01	0.94	9.3	71.1	0.320E-04
	Am241		5.479	5.507	-0.028			54.4	0.245E-04
3	Pu239	0.338	5.147	5.161	-0.0140.01	5.72	3.7	312.4	0.141E-03
	Pu240		5.144	5.161	-0.017			312.4	0.141E-03

Totals:		0.974	<--valid peaks only-->			16.48			

DETECTOR CALIBRATION

Energy(MEV) = 4.096 + (0.0047)*Channel
Energy range (MeV): 4.096 TO 6.502
Efficiency = 0.0183 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	8122.0	100.000
Smoothed	8122.0	100.000
Composite fit	7911.9	97.414
Residuals	210.1	2.586

Analyzed by: 17831011-1/23/96
VR

WHC-SD-WM-DP-166, REV. 1

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Raw Data Dump for AEA Spectrum: 19a1906.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.	1.
31	1.	0.	1.	0.	0.	0.	0.	0.	0.	0.
41	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
51	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
61	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
71	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
81	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
91	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
101	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
111	1.	0.	1.	0.	0.	0.	0.	0.	0.	1.
121	1.	1.	0.	0.	1.	0.	0.	1.	1.	0.
131	0.	0.	0.	1.	0.	1.	0.	0.	1.	0.
141	0.	1.	1.	1.	0.	1.	0.	0.	1.	0.
151	1.	0.	0.	0.	0.	0.	0.	0.	1.	0.
161	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
171	0.	1.	3.	1.	0.	1.	0.	0.	0.	0.
181	0.	0.	0.	1.	0.	0.	1.	1.	1.	2.
191	0.	1.	0.	1.	1.	1.	3.	1.	1.	0.
201	3.	1.	4.	3.	6.	1.	4.	5.	3.	6.
211	14.	11.	26.	29.	33.	51.	67.	74.	80.	81.
221	87.	121.	152.	216.	272.	377.	360.	292.	209.	116.
231	68.	20.	6.	2.	0.	0.	0.	0.	0.	0.
241	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
251	0.	1.	1.	2.	0.	1.	0.	0.	2.	0.
261	1.	1.	1.	2.	1.	0.	1.	1.	0.	1.
271	1.	1.	1.	2.	0.	0.	1.	0.	0.	0.
281	1.	2.	1.	0.	3.	5.	5.	11.	10.	12.
291	17.	24.	25.	18.	15.	13.	18.	37.	42.	52.
301	62.	30.	27.	9.	1.	0.	0.	0.	0.	0.
311	1.	0.	3.	1.	1.	1.	0.	0.	4.	2.
321	1.	3.	1.	1.	4.	4.	6.	2.	2.	2.
331	2.	4.	3.	10.	8.	9.	4.	9.	15.	14.
341	23.	16.	32.	48.	70.	102.	153.	210.	202.	161.
351	139.	139.	157.	186.	266.	376.	496.	638.	641.	417.
361	175.	38.	5.	1.	1.	0.	0.	0.	0.	0.
371	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	1.	0.	0.	0.	0.	0.	1.	0.	0.
471	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

WHC-SD-WM-DP-166, REV. 1

Westinghouse Hanford Co.

GENERAL ALPHA ENERGY ANALYSIS
Rev. 2.01

DATA REDUCTION REPORT

SAMPLE
S96T98-DUP
File ID: 20a2009.CNF

WHC-SD-WM-DP-166, REV. I

Counted on: 1/23/96 @ 0: 1
Detector: AEA20
Geometry number: 1
Count time: 28803. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	398.7	398.7	361.656	361.656	8.000	2.252	4.000	1.253
2	36.0	36.0	303.446	303.444	8.000	2.309	4.000	1.441
3	222.7	222.7	229.415	229.415	12.000	3.221	6.000	2.187

PEAK RESULTS

Peak Error Limit: 30%

Peak ID	Isotope	AEA Frac	Peak Centroid			FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
			Exp.	Obs.	Diff.					
1	Pu236	0.593	5.755	5.755	0.0000	0.01	8.90	3.0	472.8	0.213E-03
2	Pu238	0.051	5.487	5.487	0.0000	0.01	0.76	10.3	55.0	0.248E-04
	Am241		5.479	5.487	-0.008				42.1	0.190E-04
3	Pu239	0.330	5.147	5.147	0.0000	0.01	4.95	4.0	257.9	0.116E-03
	Pu240		5.144	5.147	-0.003				257.9	0.116E-03

Totals: 0.973 <--valid peaks only--> 14.61

DETECTOR CALIBRATION

Energy(MEV) = 4.092 + (0.0046)*Channel
Energy range (MeV): 4.092 TO 6.447
Efficiency = 0.0192 CPM/DPM

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	7206.0	100.000
Smoothed	7206.0	100.000
Composite fit	7012.8	97.319
Residuals	193.2	2.681

Analyzed by: MRB 1/23/96
VR

1 Legend: Raw = Modeled Peaks = 1,2,..., etc

Display Max.:

1873.8

WHC-SD-WM-DP-166, REV. 1

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Raw Data	Dump	for AEA	Spectrum:	20a2009.CNF						
1	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
11	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
21	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
31	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
41	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
51	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.
61	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
71	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.
81	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
91	0.	1.	0.	0.	1.	0.	0.	0.	0.	2.
101	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
111	0.	1.	0.	0.	0.	0.	0.	1.	0.	0.
121	0.	0.	0.	0.	0.	1.	1.	0.	0.	0.
131	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
141	0.	1.	0.	0.	0.	0.	3.	1.	0.	0.
151	0.	1.	1.	0.	1.	0.	0.	1.	1.	0.
161	0.	2.	1.	0.	0.	0.	0.	1.	1.	1.
171	0.	0.	1.	0.	0.	1.	0.	1.	2.	1.
181	1.	2.	1.	2.	1.	0.	1.	1.	0.	2.
191	3.	2.	0.	3.	0.	1.	1.	1.	1.	4.
201	2.	3.	3.	5.	5.	9.	4.	7.	5.	7.
211	8.	13.	15.	16.	20.	26.	32.	43.	46.	68.
221	55.	78.	69.	101.	116.	165.	185.	220.	288.	268.
231	228.	160.	81.	48.	16.	3.	0.	1.	0.	0.
241	0.	0.	1.	1.	2.	0.	0.	0.	1.	0.
251	2.	0.	0.	1.	1.	2.	0.	1.	0.	0.
261	1.	1.	2.	0.	1.	1.	0.	2.	0.	1.
271	2.	2.	0.	0.	0.	1.	0.	0.	3.	1.
281	3.	1.	3.	1.	2.	3.	1.	3.	6.	2.
291	7.	6.	15.	14.	16.	7.	10.	15.	19.	15.
301	25.	38.	44.	48.	42.	19.	6.	0.	2.	0.
311	2.	0.	2.	0.	1.	1.	0.	4.	1.	2.
321	2.	2.	4.	1.	1.	4.	2.	5.	5.	5.
331	3.	5.	5.	7.	11.	7.	11.	8.	8.	12.
341	11.	17.	12.	17.	26.	33.	36.	62.	89.	108.
351	161.	187.	180.	166.	124.	126.	148.	199.	262.	354.
361	502.	527.	464.	289.	76.	19.	0.	0.	0.	0.
371	2.	0.	1.	0.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	1.	1.	0.	0.	0.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

WHC-SD-WM-DP-166, REV. 1



Westinghouse
Hanford Company

WHC-SD-WM-DP-166, REV. I

P.O. Box 1970 Richland, WA 99352

PART II

WHC-SD-WM-DP-166, REV. 0

ANALYTICAL SERVICES

45-DAY SAFETY SCREENING RESULTS FOR TANK 241-AP-108, GRAB SAMPLES 8AP-96-1, 8AP-96-2 AND 8AP-96-FB

Project Coordinator: RUTH A. ESCH

Prepared for the U.S. Department of Energy
Office of Environmental Restoration
and Waste Management

by

Westinghouse Hanford Company
Box 1970
Richland, Washington

WHC-SD-WM-DP-166, REV. /

WHC-SD-WM-DP-166, REV. 0
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This Document consists of pages 2-1 through 2-39, plus pages 2-4, 2-9, 2-12, 2-17, and 2-21 were intentionally left blank.

WHC-SD-WM-DP-166, REV. 1

WHC-SD-WM-DP-166, REV. 0

NARRATIVE

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45 DAY SAFETY SCREENING RESULTS FOR TANK 241-AP-108
GRAB SAMPLES 8AP-96-1, 8AP-96-2 and 8AP-96-FB

Summary

Two supernate grab samples (8AP-96-1, 8AP-96-2) and one field blank (8AP-96-FB) were taken from tank 241-AP-108. The following analyses were performed in support of the Safety Screening program: differential scanning calorimetry (DSC), thermogravimetric analysis (TGA), density by specific gravity (Sp.G.), and total alpha activity (AT). As appropriate, the results were compared to the safety screening limits at a confidence level of 95%. All analytical results were within the action limits stated in the TSAP (reference 1).

Based on the results of vapor monitoring prior to sampling, the vapor in tank AP-108 dome space is far below the lower flammability limits (LFL) stated in the TSAP. None of the data indicate that the tank is "unsafe" when compared to the criteria (energetics, criticality, and flammability) in the Safety Screening Data Quality Objective. (reference 2).

Scope

This document serves as the 45 day deliverable for the tank 241-AP-108 liquid grab samples. One supernate grab sample (8AP-95-1) and one field blank (8AP-95-FB) were taken from tank 241-AP-108 riser 1 @30° and one supernate grab sample (8AP-96-2) was taken from tank 241-AP-108 riser 1 @150° on January 4, 1996. The 222-S Laboratory received the samples on the same day, and subsampled and analyzed the samples to support the safety screening program in accordance with the TSAP (reference 1). Included in this report are the primary safety screening results obtained from the analyses, and copies of the raw data. The results for the Sp.G. analysis will be included in the final report, as indicated in the TSAP. The data for the tank dome space flammability screening are also included in this report.

These samples will also be analyzed to support the Waste Compatibility Safety program. The results for these analyses will be reported in a revision to this document.

Tank Dome Space Flammability Screening

As requested in the TSAP (reference 1), prior to sampling tank AP-108, the dome space was sampled and analyzed for the presence of flammable gases. Although the TSAP indicates that the results shall be reported as a percentage of the lower flammability limit (LFL), the instrumentation used to collect the data reports as a percentage of the lower explosive limit (LEL). The Industrial Hygiene engineer responsible for the testing stated that the two values are similar. The results of the combustible gas monitoring inside both risers 1 @30° and 1 @150° are presented in Table 1.

Table 1: Characteristics of Vapor Space as Determined by Combustible Gas Monitoring

Tank 241-AP-108, Dome Space

Vapor Characteristic Measured	Results	
	Riser 1 @30'	Riser 1 @150'
Flammable vapor concentration as percent of lower explosion limit (LEL)	0%	0%
Volume percent oxygen gas	20.9%	20.8%
Concentration of ammonia gas	0 ppm	0 ppm
Concentration of total organic carbon vapor	0.0 ppm	0.0 ppm

ppm = parts per million

Appearance, Over-the-Top Readings (OTR), and Sample Breakdown

Attachment 1 is provided as a cross-reference for relating the tank farm customer ID numbers with the 222-S Laboratory LABCORE sample numbers. It also identifies the subsamples that were analyzed safety screening and waste compatibility analyses. Each subsample was approximately 20 mL (40 mL for the field blank subsample).

Table 2 summarizes the appearance information and the over-the-top (OTR) dose rate readings that were taken for these samples. The reported sampling depths were recorded from the tank farm sample labels attached to the sample containers.

Table 2: Appearance and OTR for Tank 241-AP-108 Liquid Grab Samples

Customer ID	Lab ID	Samp Depth (in.)	Appearance				OTR (mrad/hr)
			Color	Clarity	Org Layer	Solids	
8AP-96-1	S96T000088	645	Yellow	Clear	None	None	110
8AP-96-2	S96T000096	645	Yellow	Clear	None	None	110
8AP-96-FB Field Blank	S96T000089	240	Colorless	Clear	None	None	< 0.5

Analytical Results

Attachments

Table 3 is the summary report from the Laboratory Information Management System (LABCORE).

Differential Scanning Calorimetry (DSC)

The energetics determination was performed by DSC using procedure LA-514-114 Rev. C-1. The analysis was performed in duplicate on direct samples. Since none of the samples exhibited exotherms, the dry calculated results were not requested. Also, the statistical calculation of an upper 95% confidence level for the samples is unnecessary when the results are all 0.0 joules/g.

Thermogravimetric Analysis (TGA)

The percent moisture content was determined by TGA using procedure LA-514-114 Rev. C-1. The analysis was performed in duplicate on direct samples. The average results were 92.77 percent moisture for 8AP-96-1, and 93.31 percent moisture for 8AP-96-2. The field blank gave an average result of 99.53 percent moisture. The relative percent difference (RPD) between sample and duplicate results for all samples were within $\pm 10\%$.

Total Alpha (AT)

The AT determination was performed using procedure LA-508-101 Rev. D-2. The analysis was performed in duplicate on direct samples. Each sample was analyzed in replicate. All results were less than the detection level and the highest of the two replicates was reported as the "less than" result. The detection limit is calculated based on the detector background at the time each analytical batch is analyzed. Since all of the results were less than the detection limit, the statistical calculation of an upper 95% confidence level is unnecessary.

References

1. WHC-SD-WM-TSAP-071, REV. 0A, "Tank 241-AP-108 Grab Sampling and Analysis Plan", dated December 28, 1995, Westinghouse Hanford Company, Richland, WA 99352.
2. WHC-SD-WM-SP-004, Rev. 2, "Tank Safety Screening Data Quality Objective", dated August 31, 1995, Westinghouse Hanford Company, Richland, WA 99352.

WHC-SD-WM-DP-166, REV. I

WHC-SD-WM-DP-166, REV. 0

ATTACHMENT 1

AP-108 GRAB SAMPLE BREAKDOWN

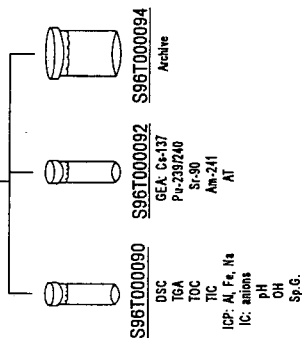
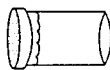
WHC-SD-WM-DP-166, REV. 1

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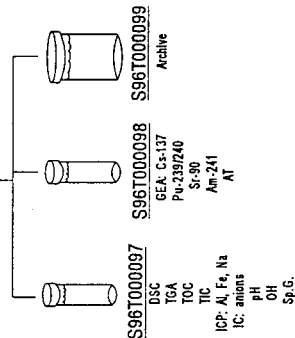
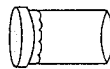
Attachment 1

AP-108 GRAB SAMPLE BREAKDOWN

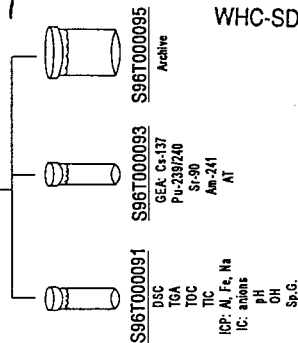
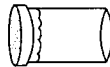
645 in.
Riser 1 @30°
8AP-96-1
S96T000088



645 in.
Riser 1 @150°
8AP-96-2
S96T000096



240 in.
Riser 1 @30°
8AP-96-FB
S96T000089



WHC-SD-WM-DP-166, REV. 1

WHC-SD-WM-DP-166, REV. 0

SAMPLE DATA SUMMARY

WHC-SD-WM-DP-166, REV. 1

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Table 3: 45 Day Safety Screening Results
AP-108 GRAB

RISE: 1230
SEGMENT #: BAP-96-1

SEGMENT PORTION: Supernate

Sample#	Q	A#	Analyte	Unit	Action Limits		Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S961000090			% Water by TGA on Perkin Elmer	%	Lower	Upper	Standard %							
S961000090			OSC Exotherm on Perkin Elmer	Joules/g	None	None	102.2	n/a	93.22	92.31	0.98	n/a	n/a	n/a
S961000092			Alpha in Liquid Samples	UCI/mL	-1.0e+00	480.0	99.51	n/a	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a
					-1.0e+00	61.50	82.47	<6.03e-04	<6.03E-04	<6.03E-4	n/a	95.15	1.39e-03	5.00E+02

=> Limit violated
=> Selected Limit

WHC-SD-WM-DP-166, REV. 1

WHC-SD-WM-DP-166, REV. 0

RI SER: 18150
SEGMENT #: BAP-96-2

Table 3: 45 Day Safety Screening Results
AP-103 GRAB

SEGMENT PORTION: Supernate

Sample#	R AP	Analyte	Unit	Action	Limits	Standard %	Blank	Result	Duplicate	Average	RPD % Spk Rec %	Det Limit	Count Error
S961000097		% Water by TGA on Perkin Elmer	%	None	None	102.2	n/a	93.43	93.19	93.31	0.26	n/a	n/a
S961000097		DSC Exotherm on Perkin Elmer	Joules/g	-1.0e+00	480.0	99.51	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a
S961000098		Alpha in Liquid Samples	uCi/mL	-1.0e+00	613.50	82.47	<6.03e-04	<6.67E-04	<9.84E-4	n/a	n/a	96.94	1.39e-03
													5.00e+02

=> Limit Violated
=> Selected Limit

WHC-SD-WM-DP-166, REV. /
WHC-SD-WM-DP-166, REV. 0

Table 3: 45 Day Safety Screening Results
AP-100 GRAB

RISER: 1230
SEGMENT #: BAP-96-F8

SEGMENT PORTION: Supernate

Sample#	R/A#	Analyte	Unit	Action Limits		Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S961000091		% Water by TGA on Perkin Elmer	%	None	None	n/a	99.59	99.47	99.53	0.12	n/a	n/a	n/a
S961000091		DSC Exotherm on Perkin Elmer	Joules/g	-1.0e+00	400.0	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a
S961000093		Alpha in Liquid Samples	uCi/mL	-1.0e+00	61.50	<6.03e-04	<2.75E-07	<1.99E-7	n/a	n/a	n/a	4.58e-07	5.00E+02

=> Limit Violated
=> Selected Limit

WHC-SD-WM-DP-166, REV. /
WHC-SD-WM-DP-166, REV. 0

WHC-SD-WM-DP-166, REV. 1

WHC-SD-WM-DP-166, REV. 0

DOVE SPACE DATA

WHC-SD-WM-DP-166, REV. 1

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Tank No. AP108 WHC-SD-WM-DP-166, REV. 1NE

Location (Breather, Vent, Riser, Dome Space, Breathing zone) 1NE

Vapor	Results
<u>O2</u>	<u>20.9%</u>
<u>LEL</u>	<u>0%</u>
<u>T.O.C.</u>	<u>1.7 ppm</u>
<u>NH3</u>	<u>35 ppm</u>

Tank No. AP108 Riser No. 1NE

Location (Breather, Vent, Riser, Dome Space, Breathing zone) _____

Vapor	Results
<u>O2</u>	<u>21.0%</u>
<u>LEL</u>	<u>0%</u>
<u>T.O.C.</u>	<u>0.0 ppm</u>
<u>NH3</u>	<u>0 ppm</u>

Tank No. AP108 Riser No. 1NE

Location (Breather, Vent, Riser, Dome Space, Breathing zone) _____

Vapor	Results
<u>O2</u>	<u>20.9%</u>
<u>LEL</u>	<u>0%</u>
<u>T.O.C.</u>	<u>0.0 ppm</u>
<u>NH3</u>	<u>0 ppm</u>

COMMENTS: Breathing zone T.O.C. = 0.0 ppm

[Signature] / 1-4-96
I&S Signature/Date

BEST AVAILABLE COPY

Tank No. 10944Riser No. 1SELocation (Breather, Vent, Riser, Dome Space, Breathing zone) 185A

Vapor WHC-SD-WM-DP-166, REV. 1

Results

O220.9%LEL0%T.O.C.0.0 ppmNH335 ppmTank No. 108-APRiser No. 1SELocation (Breather, Vent, Riser, Dome Space, Breathing zone) 185A

Vapor

Results

O220.8%LEL0%T.O.C.0.0 ppmNH30 ppmTank No. 108-APRiser No. 1SELocation (Breather, Vent, Riser, Dome Space, Breathing zone) 185A

Vapor

Results

O220.8%LEL0%T.O.C.0.0 ppmNH30 ppmCOMMENTS: Breathing zone T.O.C. = 0.0 ppmR. M. H. S. / 1.4.96
IH&S Signature/Date

WHC-SD-WM-DP-166, REV. 0

WHC-SD-WM-DP-166, REV. I

WHC-SD-WM-DP-166, REV. 0

INORGANIC ANALYSES

WHC-SD-WM-DP-166, REV. 1

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LABCORE Data Entry Template for Worklist#

4858

Analyst: ADP Instrument: DSC0 3 Book # 12N14B

Method: LA-514-114 Rev/Mod C-1 WHC-SD-WM-DP-166, REV. /

Worklist Comment: Please run AP-108 DSCs under N2. bdv

GROUP	PROJECT	S TYPE	SAMPLE#	R A	-----TEST-----	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 STD			DSC-03	LIQUID	<u>28.45</u>	<u>28.31</u>	<u>N/A</u>	Joules/g
96000010	AP-108 GRAB	2 SAMPLE	S96T000091	0	DSC-03	LIQUID	<u>N/A</u>	<u>Ø</u>		Joules/g
96000010	AP-108 GRAB	3 DUP	S96T000091	0	DSC-03	LIQUID	<u>Ø</u>	<u>Ø</u>	<u>N/A</u>	Joules/g
96000010	AP-108 GRAB	4 SAMPLE	S96T000090	0	DSC-03	LIQUID	<u>N/A</u>	<u>Ø</u>		Joules/g
96000010	AP-108 GRAB	5 DUP	S96T000090	0	DSC-03	LIQUID	<u>Ø</u>	<u>Ø</u>	<u>N/A</u>	Joules/g
96000011	AP-108 GRAB	6 SAMPLE	S96T000097	0	DSC-03	LIQUID	<u>N/A</u>	<u>Ø</u>		Joules/g
96000011	AP-108 GRAB	7 DUP	S96T000097	0	DSC-03	LIQUID	<u>Ø</u>	<u>Ø</u>	<u>N/A</u>	Joules/g

Final page for worklist #

4858

See attached for signatures
Analyst Signature _____ Date 11/15/96

RT 266 1-16-96
Analyst Signature _____ Date _____

Verified by Blandina BBV
Valenzuela 11/17/96

S96T000091 produced an endotherm at 108.9°C with a delta H of 2276 J/g

S.
Data Entry Comments: S96T000090 produced an endotherm at 113.4°C with a delta H of 2166.8 J/g.

S96T000097 produced an endotherm at 109.7°C with a delta H of 2161.2 J/g.

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

LABCORE Data Entry Template for Worklist#

4858

Analyst: ADP Instrument: DSC0 _____ Book # 12/14-B

Method: LA-514-113 Rev/Mod C-1 WHC-SD-WM-DP-166, REV. 1

Worklist Comment: Please run AP-108 DSCs under N2. bdv

GROUP	PROJECT	S TYPE	SAMPLE#	R A	-----TEST-----	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 STD			DSC-01	LIQUID	_____	_____	N/A	Joules/g
96000010	AP-108 GRAB	2 SAMPLE	S96T000091	0	DSC-01	LIQUID	N/A	_____	_____	Joules/g
96000010	AP-108 GRAB	3 DUP	S96T000091	0	DSC-01	LIQUID	_____	_____	N/A	Joules/g
96000010	AP-108 GRAB	4 SAMPLE	S96T000090	0	DSC-01	LIQUID	N/A	_____	_____	Joules/g
96000010	AP-108 GRAB	5 DUP	S96T000090	0	DSC-01	LIQUID	_____	_____	N/A	Joules/g
96000011	AP-108 GRAB	6 SAMPLE	S96T000097	0	DSC-01	LIQUID	N/A	_____	_____	Joules/g
96000011	AP-108 GRAB	7 DUP	S96T000097	0	DSC-01	LIQUID	_____	_____	N/A	Joules/g

Final page for worklist #

4858

Anthony Purinton

Analyst Signature Date

Lucie McJilton 1-14-96

Analyst Signature

Date

Other instrument
was used.
1/15/96
BBV

Data Entry Comments:

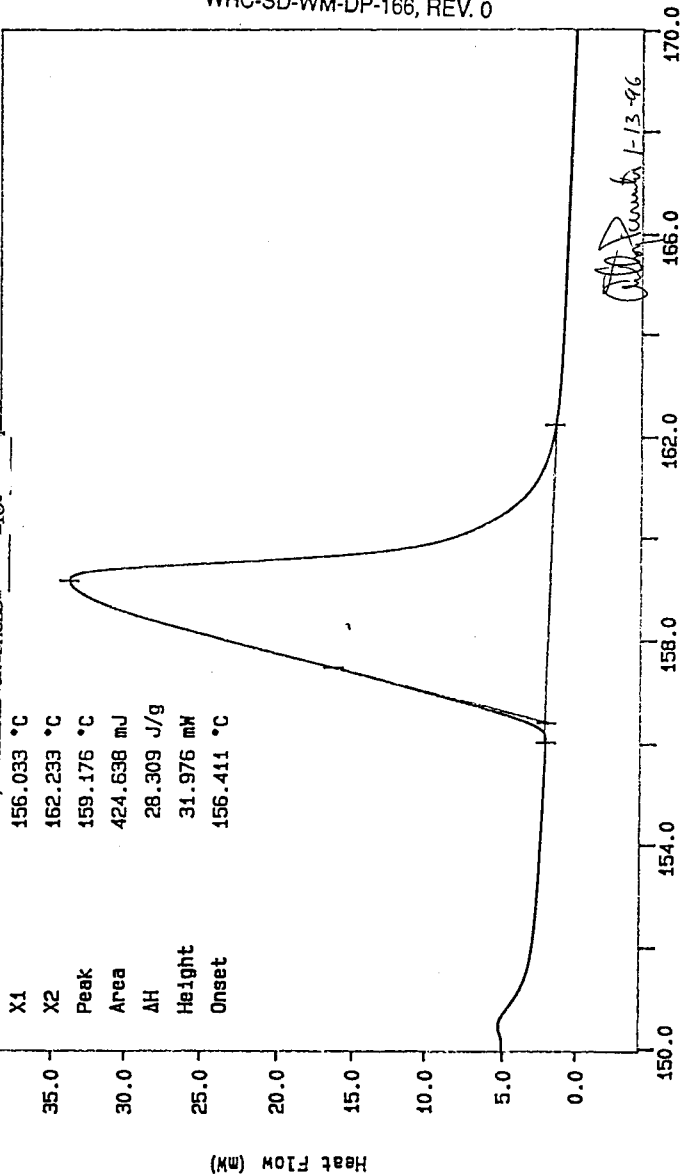
Curve 1: DSC

File Info: IND0011302 Sat Jan 13 21:14:53 1996

Sample Weight: 15.000 mg

12N14B Indium at 10C/min

SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES... TO...



2-24

N2, EXOTHERM DOWN

TEMP: 150.0 °C TIME: 0.0 min RATE: 10.0 °C/min

AD PURINTON

PERKIN-ELMER

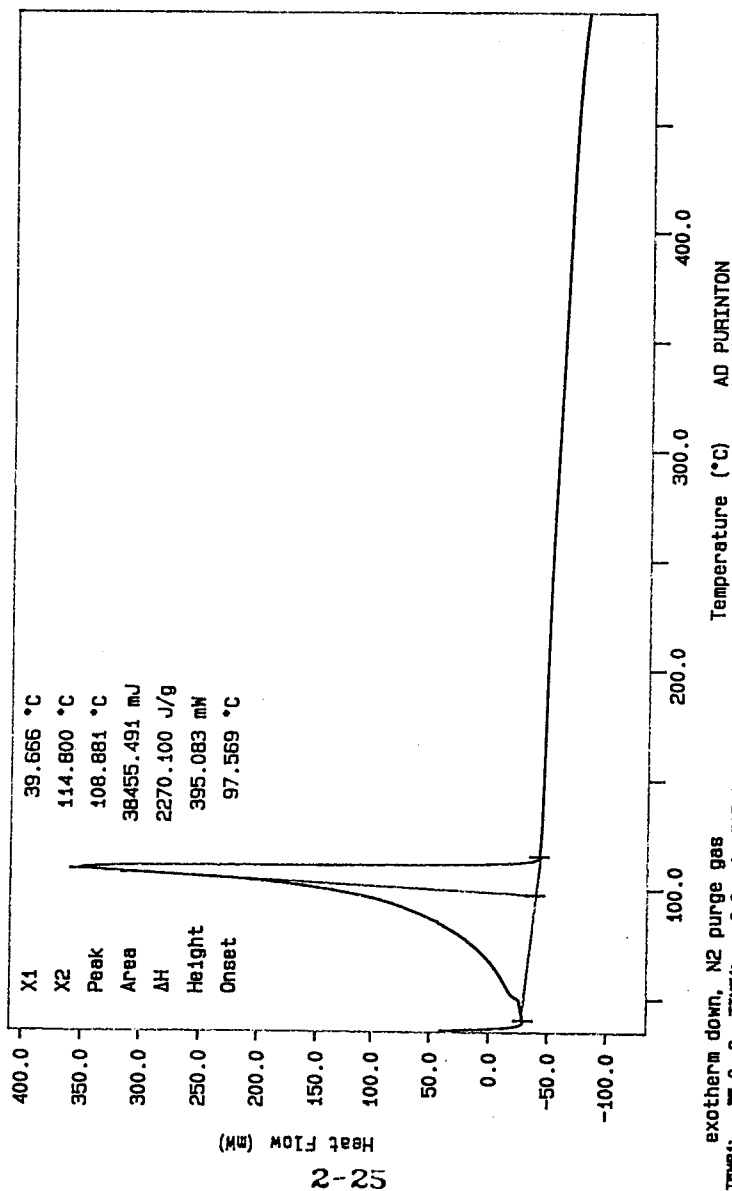
7 Series Thermal Analysis System

Sat Jan 13 21:27:50 1996

WHC-SD-WM-DP-166, REV. 0

WHC-SD-WM-DP-166, REV. 1

Curve 1: DSC
File Info: SAM011306 Sat Jan 13 23: 46: 13 1996
Sample Weight: 16.940 mg
S96T000091 SAM



AD PURINTON
PERKIN-ELMER
7 Series Thermal Analysis System
Sun Jan 14 00: 56: 41 1996

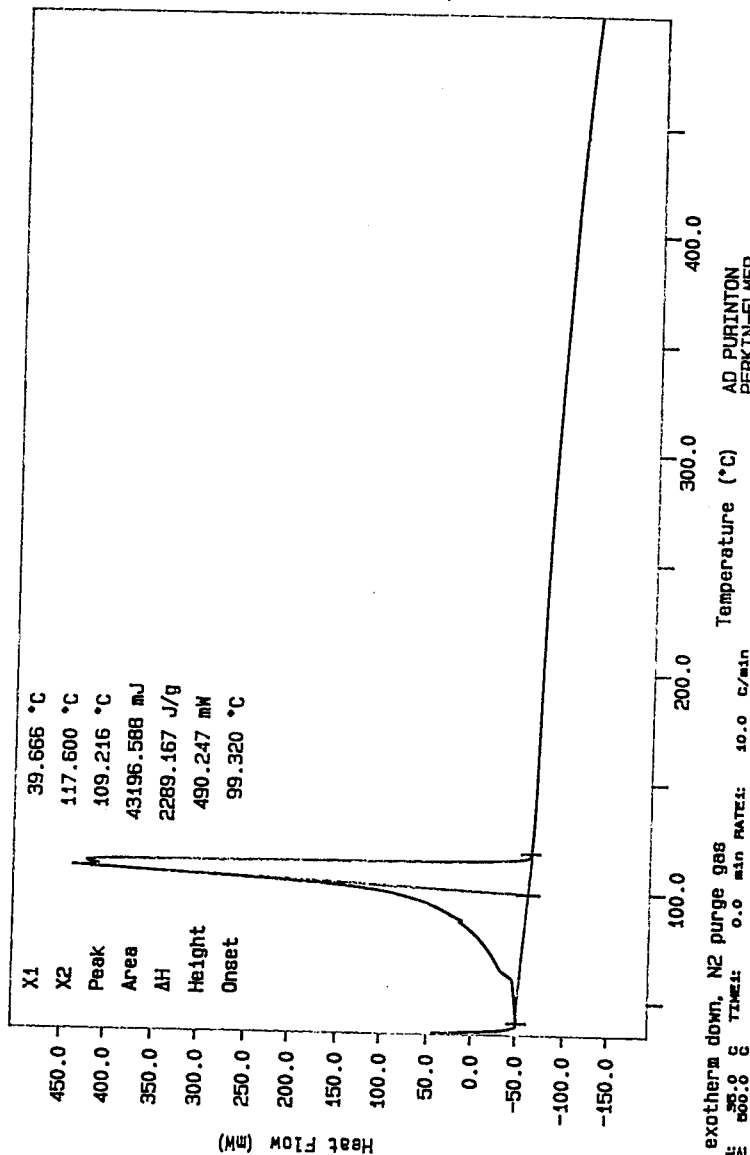
Curve 1: DSC

File Info: SAM011401 Sun Jan 14 02:14:12 1996

Sample Weight: 18.870 mg

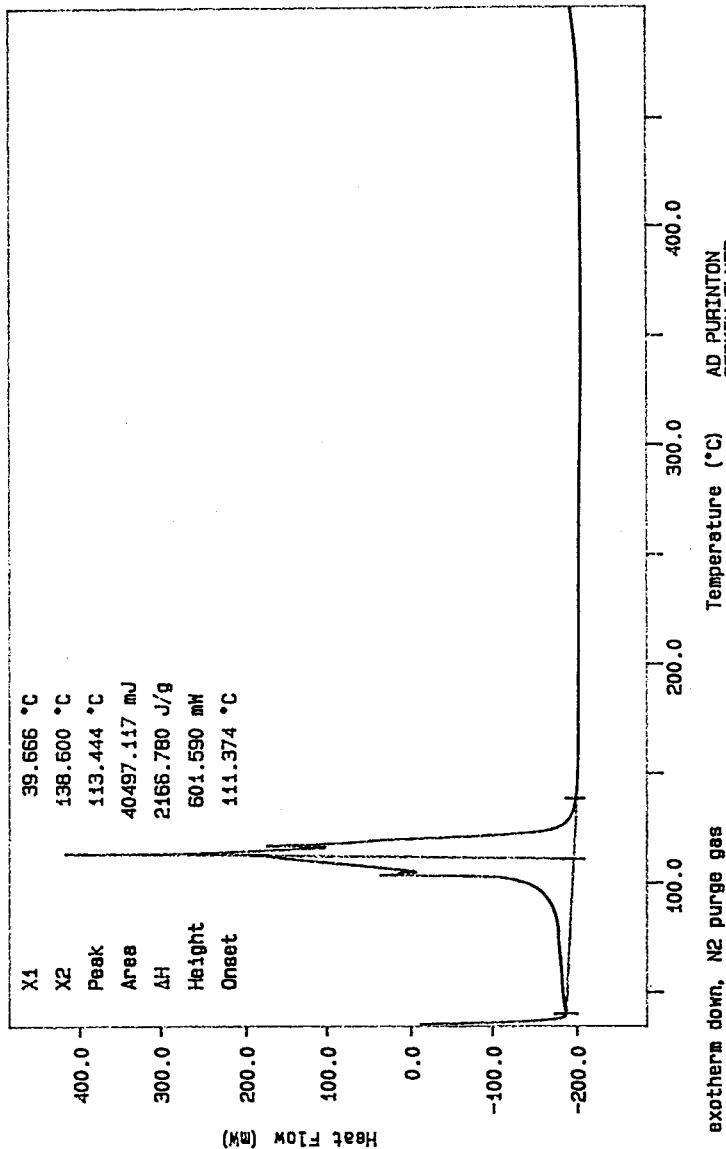
S96T000091 DUP

WHC-SD-WM-DP-166, REV. 1
WHC-SD-WM-DP-166, REV. 0



AD PURINTON
PERKIN-ELMER
7 Series Thermal Analysis System
Sun Jan 14 02:16:11 1996

Curve 1: DSC
File info: SAM011402 Sun Jan 14 03:35:26 1996
Sample Weight: 18.690 mg
S96000090 SAM



exotherm down, N2 purge gas
TEMP: 35.0 °C TIME: 0.0 min RATE: 10.0 °C/min
AD PURINTON
PERKIN-ELMER
7 Series Thermal Analysis System
Sun Jan 14 04:18:43 1996

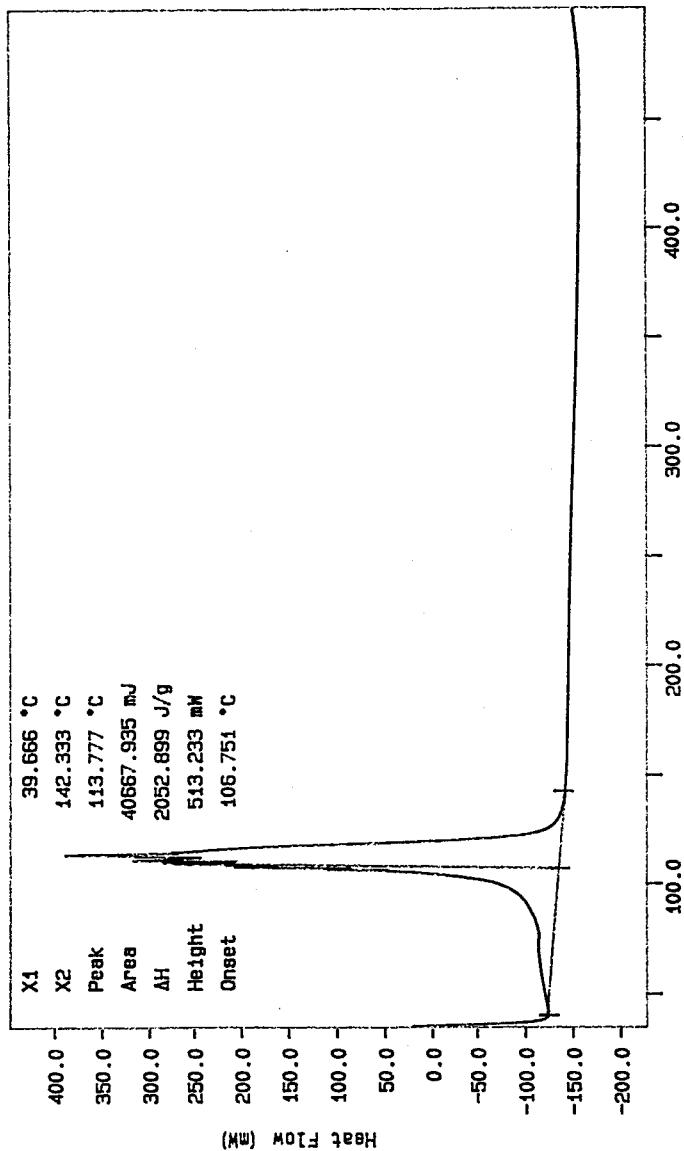
Curve 1: DSC

File Info: SAM011403 Sun Jan 14 05:11:34 1996

Sample Weight: 19.810 mg

SS96T000090 DUP

WHC-SD-WM-DP-166, REV. 1
WHC-SD-WM-DP-166, REV. 0



82-2

Exotherm down, N2 purge gas
Temp: 30.0 °C
Time: 00:00
AD PURINTON
PERKIN-ELMER
7 Series Thermal Analysis System
Sun Jan 14 06:20:31 1996

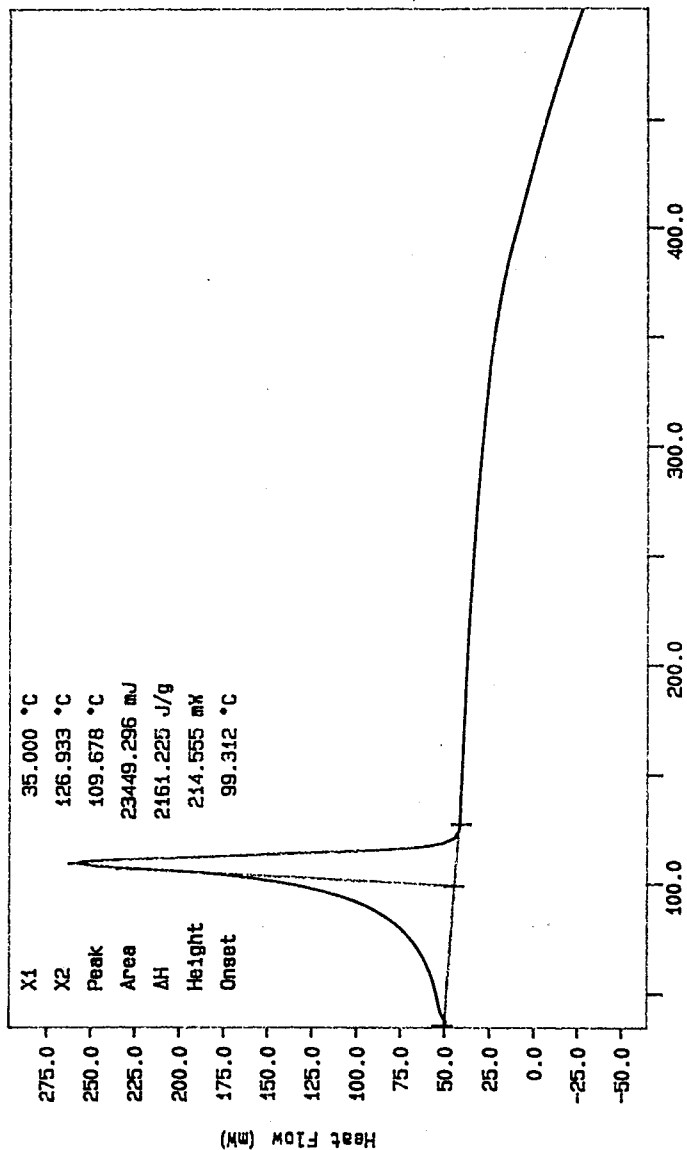
Curve 1: DSC

File info: SAM011408 Sun Jan 14 13:57:37 1996

Sample Weight: 10.850 mg

S96T000097

WHC-SD-WM-DP-166, REV. 1
WHC-SD-WM-DP-166, REV. 0



exotherm down, N2 purge gas
TEMP: 35.0 °C TIME: 0.0 min RATE: 10.0 °C/min
SM FULTON
PERKIN-ELMER
7 Series Thermal Analysis System
Sun Jan 14 14:03:32 1996

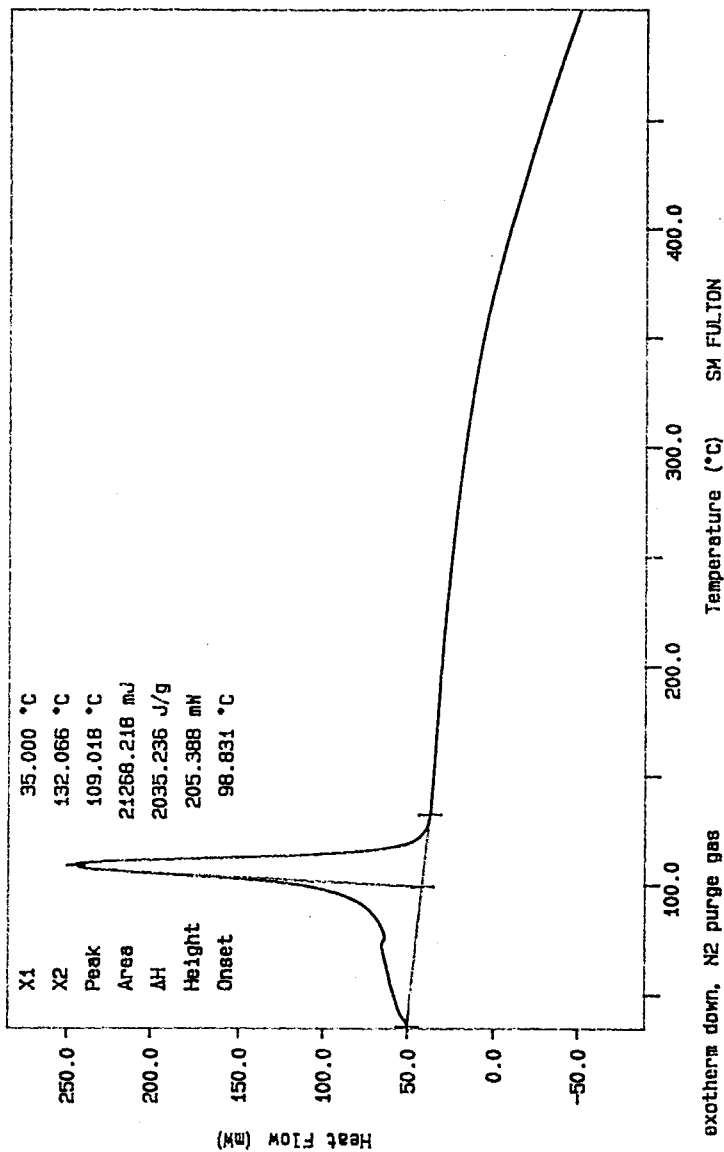
Curve 1: DSC

File info: SAM011409 Sun Jan 14 15:02:35 1996

Sample Weight: 10.450 mg

S96T000097 DUP

WHC-SD-WM-DP-166, REV. 1
WHC-SD-WM-DP-166, REV. 0



SM FULTON
PERKIN-ELMER
7 Series Thermal Analysis System
Sun Jan 14 15:00:26 1996

Exotherm down, N2 purge gas
Temp: 500.0 °C
Rate: 10.0 °C/min
Time: 0.0 min

LABCORE Data Entry Template for Worklist#

4861

Analyst: ADP Instrument: TGA0 3 Book # 75N8A

Method: LA-514-114 Rev/Mod C-1

WHC-SD-WM-DP-166, REV. 1

Worklist Comment: Please run AP-108 TGAs under N2. bdv

GROUP	PROJECT	S TYPE	SAMPLE#	R A	-----TEST-----	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 STD			TGA-03	LIQUID	<u>59.2</u>	<u>60.48</u>	<u>N/A</u>	%
96000010	AP-108 GRAB	2 SAMPLE	S96T000091	0	TGA-03	LIQUID	<u>N/A</u>	<u>99.59</u>		%
96000010	AP-108 GRAB	3 DUP	S96T000091	0	TGA-03	LIQUID	<u>99.59</u>	<u>99.47</u>	<u>N/A</u>	%
96000010	AP-108 GRAB	4 SAMPLE	S96T000090	0	TGA-03	LIQUID	<u>N/A</u>	<u>93.22</u>		%
96000010	AP-108 GRAB	5 DUP	S96T000090	0	TGA-03	LIQUID	<u>93.22</u>	<u>92.31</u>	<u>N/A</u>	%
96000011	AP-108 GRAB	6 SAMPLE	S96T000097	0	TGA-03	LIQUID	<u>N/A</u>	<u>93.43</u>		%
96000011	AP-108 GRAB	7 DUP	S96T000097	0	TGA-03	LIQUID	<u>93.43</u>	<u>93.19</u>	<u>N/A</u>	%

Final page for worklist #

4861

See attached for signatures
Analyst Signature ADP Date 1/15/96

RLH
Analyst Signature RLH Date 1-16-96

Verified by Blandina Valenzuela BDV 1/17/96

Data Entry Comments:

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

WHC-SD-WM-DP-166, REV. 0
LABCORE Data Entry Template for Worklist#

4861

Analyst: AP Instrument: TGA0 Book # 75N8A

Method: LA-560-112 Rev/Mod C-1 WHC-SD-WM-DP-166, REV. 1

Worklist Comment: Please run AP-108 TGAs under N2. bdv

GROUP	PROJECT	S TYPE	SAMPLE#	R A	-----TEST-----	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 STD			TGA-01	LIQUID			N/A	%
96000010	AP-108 GRAB	2 SAMPLE	S96T000090	0	TGA-01	LIQUID	N/A			%
96000010	AP-108 GRAB	3 DUP	S96T000090	0	TGA-01	LIQUID			N/A	%
96000010	AP-108 GRAB	4 SAMPLE	S96T000091	0	TGA-01	LIQUID	N/A			%
96000010	AP-108 GRAB	5 DUP	S96T000091	0	TGA-01	LIQUID			N/A	%
96000011	AP-108 GRAB	6 SAMPLE	S96T000097	0	TGA-01	LIQUID	N/A			%
96000011	AP-108 GRAB	7 DUP	S96T000097	0	TGA-01	LIQUID			N/A	%

Final page for worklist # **4861**

Anthony Perretho 1-13-96
Analyst Signature Date
Susie M. Jullon 1-14-96

Analyst Signature Date

Other instrument
was used.

1/15/96
BDV

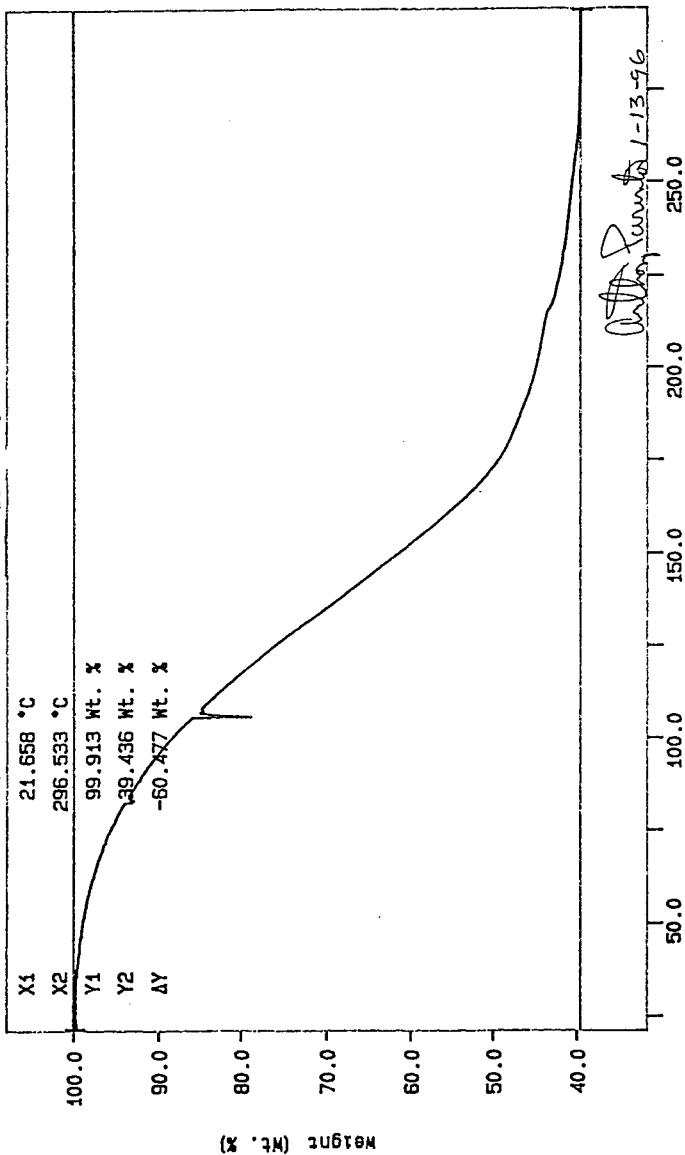
Data Entry Comments:

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

Curve 1: TGA
File Info: TER011302 Sat Jan 13 23:48:33 1996
Sample Weight: 27.195 mg

65N8-A Terliq

SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES TO



Antony J. J. 1-13-96

AD PURINTON
PERKIN-ELMER
7 Series Thermal Analysis System
Sun Jan 14 01:12:51 1996

N2 10C/MIN
TEMP: 350.0 °C
TIME: 0.0 min RATE: 10.0 C/min

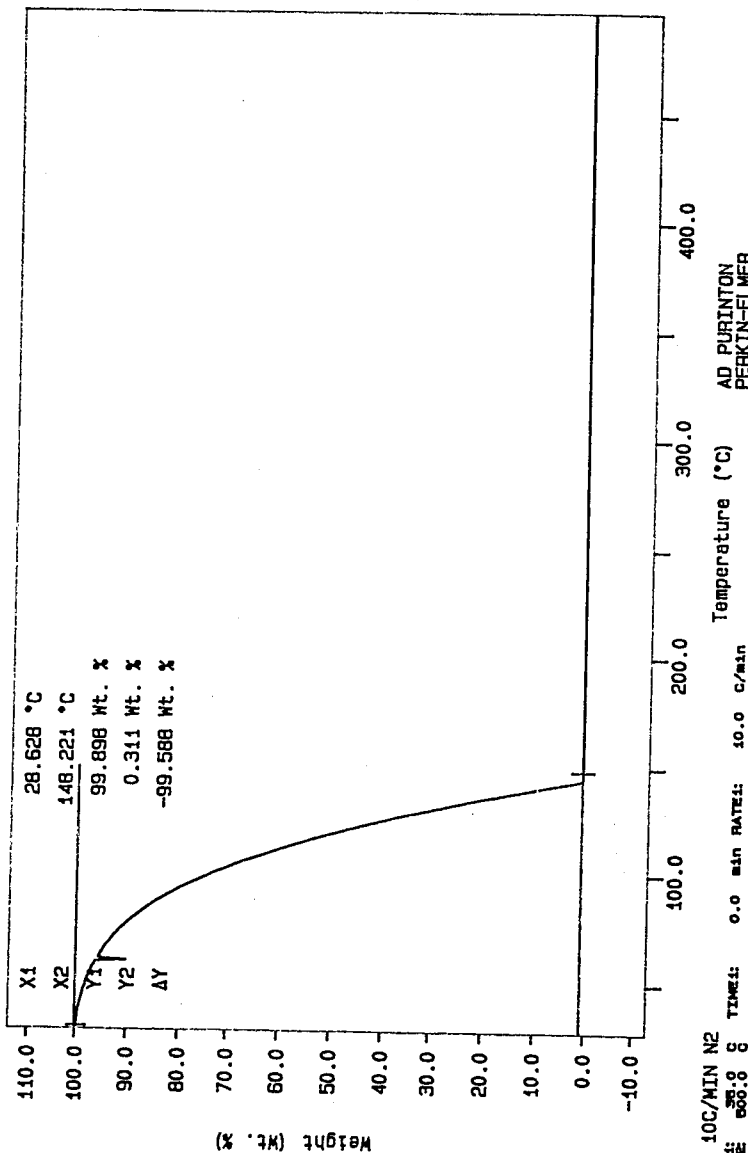
Curve 1: TGA

File Info: SAM011401 Sun Jan 14 02:11:00 1996

Sample Weight: 14.177 mg

S96T000091 SAM

WHC-SD-WM-DP-166, REV. /
WHC-SD-WM-DP-166, REV. 0



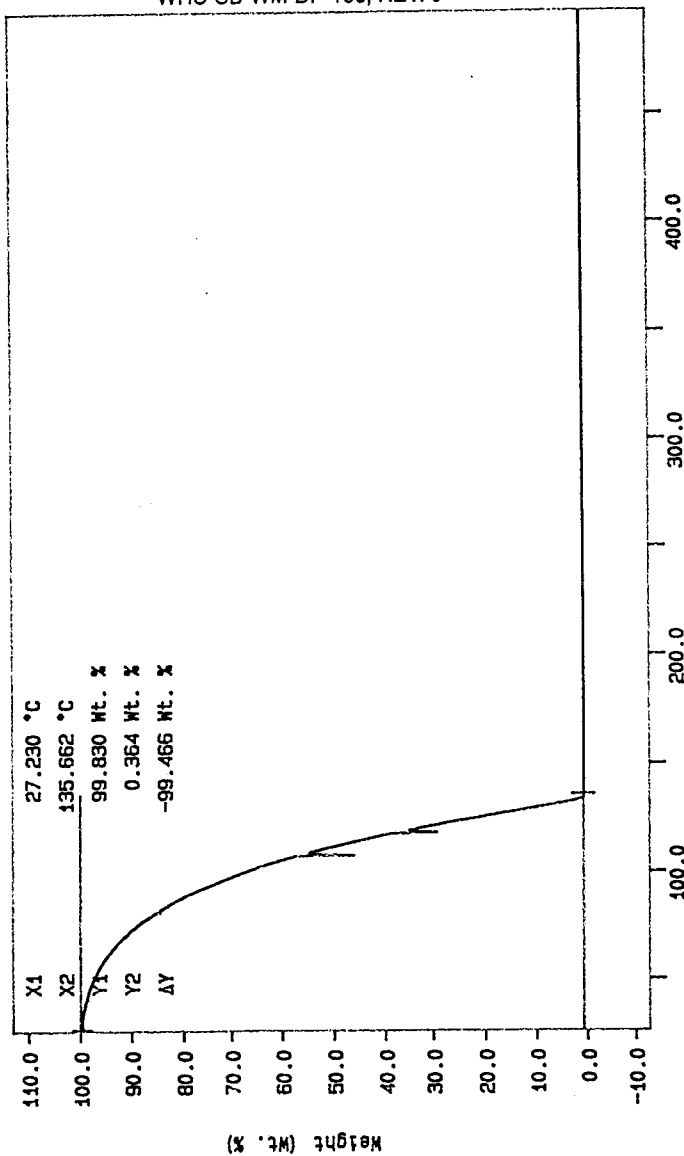
Curve 1: T6A

File Info: SAK011402 Sun Jan 14 03:26:34 1996

Sample Weight: 9.977 mg

S96T000091 DUP

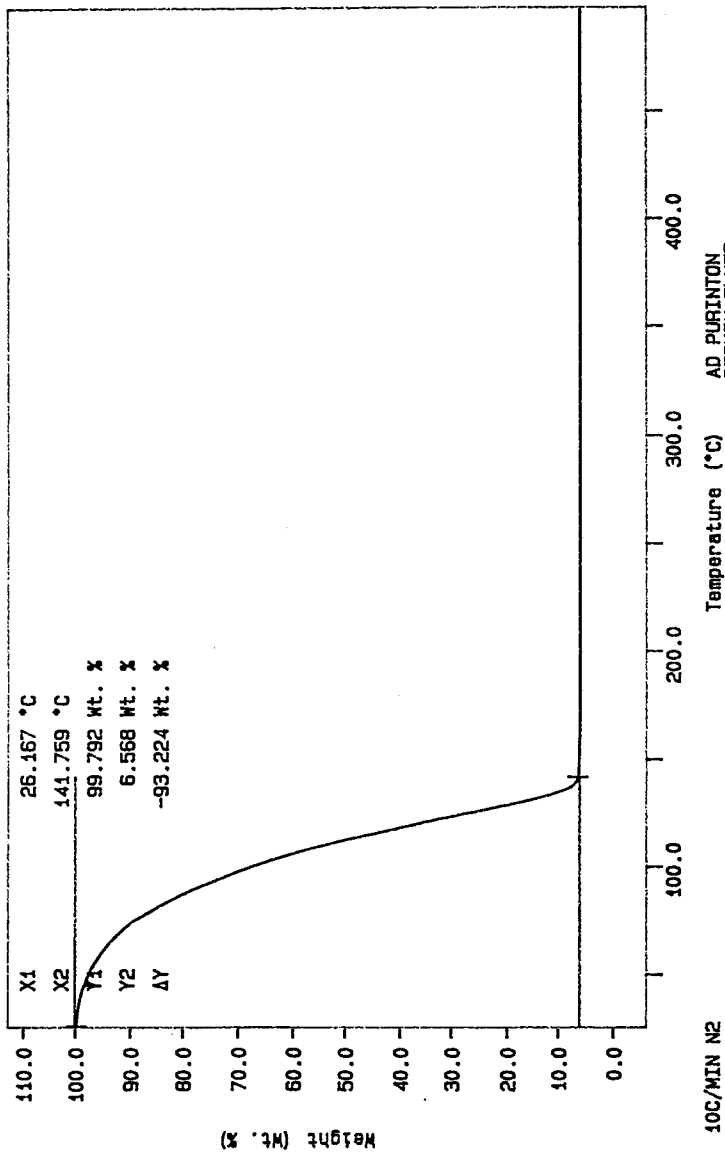
WHC-SD-WM-DP-166, REV. /
WHC-SD-WM-DP-166, REV. 0



AD PURINTON
PERKIN-ELMER
7 Series Thermal Analysis System
Sun Jan 14 04:28:21 1996

10C/MIN N2
TEMP: 50.0 °C
TIME: 500.0 s
0.0 min RATE: 10.0 C/min

Curve 1: TGA
File Info: SAM011403 Sun Jan 14 05:19:50 1996
Sample Weight: 10.302 mg
S96T000090 SAM



10C/MIN N2
TEMP: 55.0 °C
TIME: 000.0 s

10C/MIN N2
TEMP: 55.0 °C
TIME: 000.0 s

10C/MIN N2
TEMP: 55.0 °C
TIME: 000.0 s

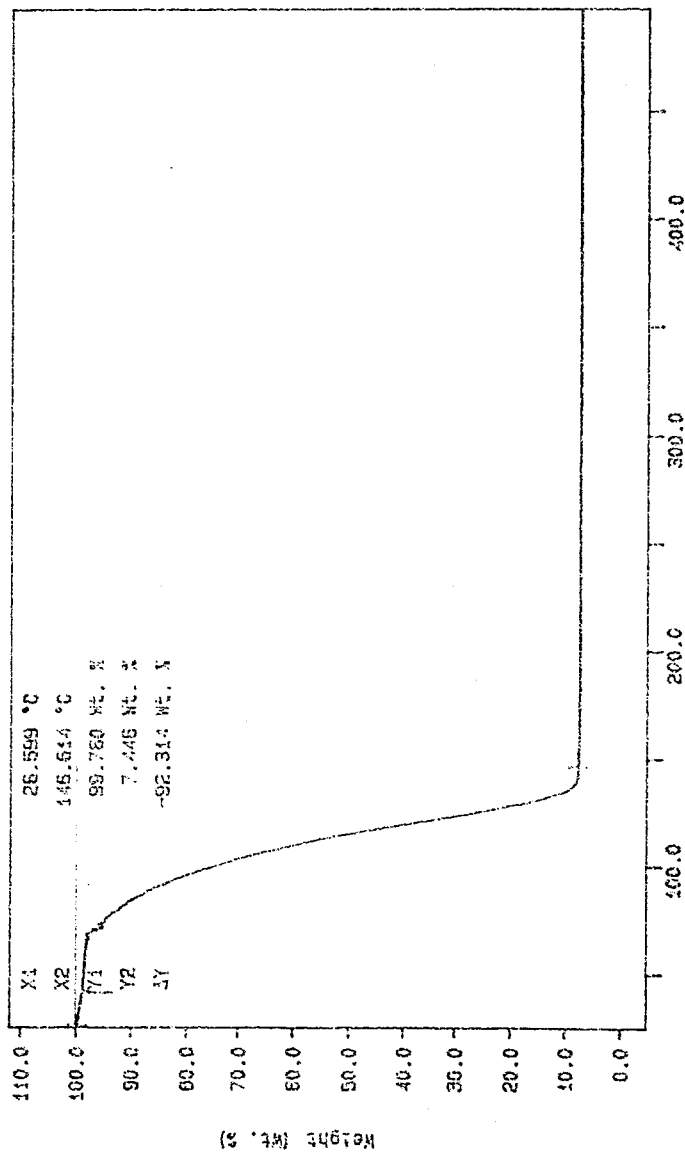
Curve 1: TGA

File Info: SAM011410 Sun Jan 14 13:45:52 1996

Sample Weight: 9.152 mg

SSBT00090 DUP

BEST AVAILABLE COPY



100%/MIN N2

TEMP: 88.5 °C

TIME: 00:00

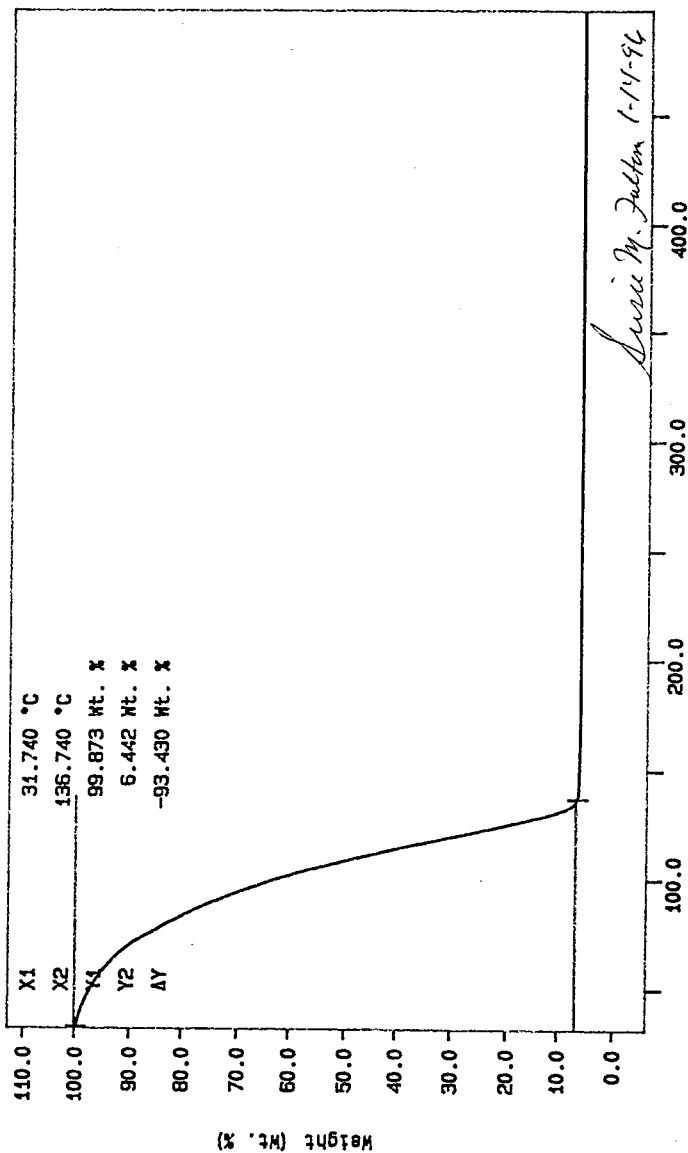
0.0 min RATE: 10.0 °C/min

Temperature (°C)

SM FULTON
PERKIN-ELMER
7 Series Thermal Analysis System

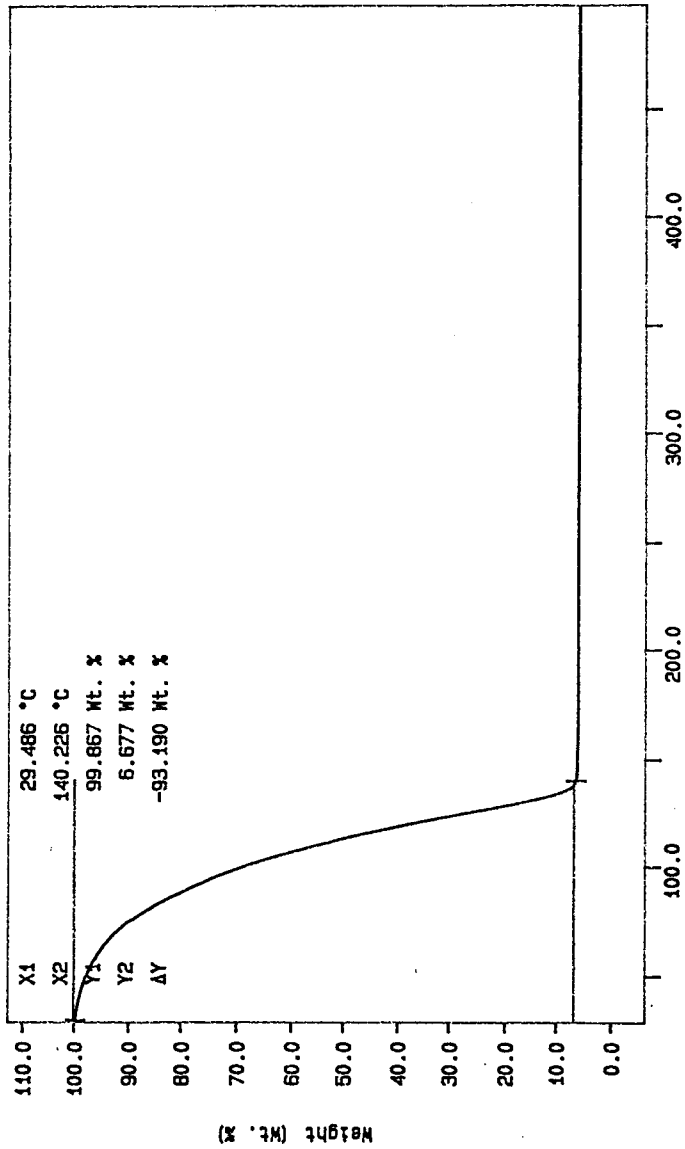
Mon Jan 15 13:52:53 1996

Curve 1: TGA
File Info: SAM011408 Sun Jan 14 13:59:48 1996
Sample Weight: 10.361 mg
S96T000097



100%/MIN N2
TEMP: 35.0 °C
TIME: 00:08
10.0 min RATE: 10.0 °C/min
SM FULTON
PERKIN-ELMER
7 Series Thermal Analysis System
Sun Jan 14 14:10:30 1996

Curve 1: TGA
 File Info: SAM011409 Sun Jan 14 15: 06: 40 1996
 Sample Weight: 10.186 mg
 SS6T000097 DUP



10C/MIN N2
 TEMPERATURE 850.0 °C
 TIME 11: 00: 00
 MIN RATE 10.0 C/min
 SM FULTON
 PERKIN-ELMER
 7 Series Thermal Analysis System
 Sun Jan 14 15: 50: 39 1996

