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Section 1 of 2

Document Information			
Document #	HNF-1685	Revision	0
Title	TANK 241S111 08/1999 COMPATIBILITY GRAB SAMPLES ANALYTICAL RESULTS FOR THE FINAL REPORT		
Date	12/01/1999		
Originator	STEEN FH,BELL KE	Originator Co.	WMH
Recipient		Recipient Co.	
References	EDT-628051		
Keywords			
Projects	TANK FARM		
Other Information	<i>Pages 1 thru 296</i> <i>Sample Handling</i> <i>Inorganic Analyses - DSC, TGA, pH, OH, SPG</i> <i>NH₃, IC, ICP, ICP/MS, TIC/TOC</i>		

Sta #4 (15)
DEC 1 1999

ENGINEERING DATA TRANSMITTAL

Page 1 of 1
1. EDT 628051

2. To: (Receiving Organization) Distribution	3. From: (Originating Organization) 222-S Laboratory	4. Related EDT No.: N/A
5. Proj./Prog./Dept./Div.: Tank 241-S-111 Grab/Waste Management/PPC/FDH	6. Design Authority/ Design Agent/Cog. Engr.: F. H. Steen / K. E. Bell	7. Purchase Order No.: N/A
8. Originator Remarks: This document is being released into the supporting document system for retrievability purposes.		9. Equip./Component No.: N/A
		10. System/Bldg./Facility: 241-S-111
11. Receiver Remarks: 11A. Design Baseline Document? ☐ Yes ☒ No For release.		12. Major Assm. Dwg. No.: N/A
		13. Permit/Permit Application No.: N/A
		14. Required Response Date: 09/29/99

15. DATA TRANSMITTED					(F)	(G)	(H)	(I)
(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	Approval Designator	Reason for Transmittal	Originator Disposition	Receiver Disposition
1	HNF-1685	N/A	0	Tank 241-S-111, August 1999 Compatibility Grab Samples, Analytical Results for the Final Report	Q	2	1	1

16. KEY		
Approval Designator (F)	Reason for Transmittal (G)	Disposition (H) & (I)
E, S, Q, D or N/A (see WHC-CM-3-5, Sec.12.7)	1. Approval 4. Review 2. Release 5. Post-Review 3. Information 6. Dist. (Receipt Acknow. Required)	1. Approved 4. Reviewed no/comment 2. Approved w/comment 5. Reviewed w/comment 3. Disapproved w/comment 6. Receipt acknowledge

17. SIGNATURE/DISTRIBUTION (See Approval Designator for required signatures)									
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	ECN NO.: N/A

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U.S. Department of Energy Contract DE-AC06-96RL13200

EDT/ECN: EDT-^{628051 (JCB 12/1/99)}~~628050~~ UC: 2070
Org Code: 31B00 Charge Code: 103429/EJ00
B&R Code: EW 3120074 Total Pages: 519 (JCB 12/1/99)

Key Words: S-111, Tank S-111, 241-S-111, S Farm, Characterization,
TWRS, Grab, Grab Samples, Analytical Results, Final Reports

Abstract: N/A

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Release Approval Date 12/1/99

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HNF-1685 REV. 0

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**TANK 241-S-111, AUGUST 1999 COMPATIBILITY
GRAB SAMPLES,
ANALYTICAL RESULTS FOR THE FINAL REPORT**

Project Coordinator: Franciska H. Steen / Kevin E. Bell

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

by

**222-S Laboratory
Fluor-Daniel Hanford Inc.
P.O. Box 1000
Richland, Washington**

HNF-1685 REV. 0

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222-S LABORATORY

TANK 241-S-111, AUGUST 1999 COMPATIBILITY GRAB SAMPLES,
ANALYTICAL RESULTS FOR THE FINAL REPORT

1.0 INTRODUCTION

This document is the format IV, final report for the tank 241-S-111 (S-111) grab samples taken in August 1999 to address waste compatibility concerns. Chemical, radiochemical, and physical analyses on the tank S-111 samples were performed as directed in *Compatibility Grab Sampling and Analysis Plan for Fiscal Year 1999* (Sasaki 1999a,b). Any deviations from the instructions provided in the tank sampling and analysis plan (TSAP) were discussed in this narrative. The notification limit for ^{137}Cs was exceeded on two samples. Results are discussed in Section 5.3.2. No other notification limits were exceeded.

2.0 SAMPLE RECEIVING AND APPEARANCE

Three grab samples were taken from riser 013 of tank S-111 in August 1999 by the River Protection Project per revision 0-C of the TSAP (Sasaki 1999c) and delivered to the 222-S Laboratory. No field or trip blank samples were delivered to the laboratory. Sampling and appearance information for each sample is provided in Table 1. Actual sampling depths were as identified in Sasaki 1999c. The intention was for all three grab samples to be tank supernate, however sample 11S-99-3 was almost entirely sludge.

Table 2 provides sample number information and the analytical disposition of each sample. The three grab samples were loaded into the 222-S Laboratory 11A hot cells where they were subsampled. Sample breakdown diagrams included as Attachment 1 show how each sample was subsampled.

Table 1. Sampling and Appearance Information for Tank S-111 Grab Samples.

Sample ID	Sample Date	Sample Time	Sample Volume (L)	Sample Depth (cm)	Sample Appearance
11S-99-1	8/03/99	8/03/99	202	< 1	Opaque, light-yellow liquid. No organic layer was observed.
11S-99-2	8/03/99	8/03/99	101	< 1	Opaque, light-yellow liquid. No organic layer was observed.
11S-99-3	8/03/99	8/03/99	12	95	Opaque, dark greenish-gray sludge. No organic layer was observed.

¹ Measured from the inside bottom of the tank to the mouth of the sample bottle.

Table 2. Tank S-111 Sample and Analysis Information.

Sample Number	Sample ID	Sample Description	Analysis Information
11S-99-1	S99T001370	Tank Supernate Parent	Appearance Information
11S-99-1	S99T001730	Tank Supernate Subsample	Inorganic
11S-99-1	S99T001731	Tank Supernate Subsample	Inorganic & Radiochemical
11S-99-2	S99T001371	Tank Supernate Parent	Appearance Information
11S-99-2	S99T001732	Tank Supernate Subsample	Inorganic
11S-99-2	S99T001734	Tank Supernate Subsample	Inorganic & Radiochemical
11S-99-3	S99T001372	Tank Supernate Parent	Appearance Information
11S-99-3	S99T001378	Centrifuged Solids	Bulk Density, Archive
11S-99-3	S99T001380	Centrifuged Solids	PCBs
11S-99-3	S99T001736	Centrifuged Solids	Direct Analyses
11S-99-3	S99T001737	Centrifuged Solids	Fusion-Digested Analyses
11S-99-3	S99T001738	Centrifuged Solids	Acid-Digested Analyses
11S-99-3	S99T001739	Centrifuged Solids	Water-Digested Analyses
11S-99-3	S99T001379	Interstitial Supernate ¹	Archive
11S-99-3	S99T001381	Interstitial Supernate ¹	PCBs
11S-99-3	S99T001733	Interstitial Supernate ¹	Inorganic
11S-99-3	S99T001735	Interstitial Supernate ¹	Inorganic & Radiochemical

¹Decanted supernate was added to the interstitial supernate to provide adequate sample for analysis and archiving.

3.0 SAMPLE HANDLING

Copies of the chain-of-custody forms accompanying the samples are provided as Attachment 2. All three samples were loaded into the 222-S 11-A hot cells where they were allowed to stand until they cleared. Samples 11S-99-1 and 11S-99-2 were neither centrifuged nor filtered before they were subsampled. Subsampling was performed using a pipette rather than by decantation so as not to disturb the trace of settled solids. The supernate was first decanted from sample 11S-99-3. Following centrifugation of the sludge, the interstitial liquid was collected in the jar containing the decanted supernate. Next, the centrifuged solids were subsampled for analysis.

4.0 ANALYSIS REQUIREMENTS

Analyses required by the TSAP (Sasaki 1999a,b) are presented in Table 3. Results of all requested analytes are reported in the data summary tables as Attachment 3. Some of the analytical methods reported results that were not specifically requested. Those analyte results were opportunistic and are reported in Appendix A. Quality control (QC) parameters for opportunistic results were not evaluated.

Table 3. Tank S-111 Required Analyses and Analytical Procedures Used.

Method	Analyte	Sample Portion ¹	Sample Prep.	Analytical Procedure
Fusion Digestion	N/A	CS	Fusion	LA-549-141, Rev. G-0
Acid Digestion	N/A	CS	Acid	LA-505-163, Rev. B-1
Water Digestion	N/A	CS	Water	LA-504-101, Rev. G-1
Visual	Organic Layer	Parent	Direct	LA-519-151, Rev. G-0
Visual	Volume % Settled Solids	Parent	Direct	LA-519-151, Rev. G-0
Visual	Volume % Centrifuged Solids	Parent	Direct	LA-519-132, Rev. E-1
Gravimetry/Visual	Bulk Density	CS	Direct	LA-519-132, Rev. E-1
Gravimetry	Specific Gravity	Sup	Direct	LA-510-112, Rev. E-1
DSC	Reaction Exotherm	Sup, CS	Direct	LA-514-114, Rev. D-3
DSC (dry-weight basis)	Reaction Exotherm	Sup, CS	Direct	LA-514-114, Rev. D-3
TGA	Percent Water	Sup, CS	Direct	LA-514-114, Rev. D-2
Hydrogen Ion Electrode	pH	Sup	Direct	LA-212-106, Rev. C-5
Hydrogen Ion Electrode	pH	CS	Direct	LA-212-105, Rev. C-3
Ion-Specific Electrode	Ammonia	Sup	Direct	LA-631-001, Rev. D-1
IC ³	Cl ⁻ , F ⁻ , NO ₂ ⁻ , NO ₃ ⁻ , SO ₄ ²⁻ , PO ₄ ³⁻	Sup, CS	Water ⁴	LA-533-105, Rev. F-1
ICP ³	Al, Cr, Fe, Mn, Na, Ni, Zr	Sup	Direct	LA-505-161, Rev. C-4
ICP ³	Al, Cr, Fe, Mn, Na, Ni, Zr	CS	Acid	LA-505-161, Rev. C-4
ICP ³	Al, Cr, Fe, Mn, Na, Zr	CS	Fusion	LA-505-161, Rev. C-4
Coulometry	Total Organic Carbon, Total Inorganic Carbon	Sup, CS	Direct	LA-342-100, Rev. F-3
Titration	Hydroxide	Sup, CS	Water ⁴	LA-211-102, Rev. D-2
ICP/MS	²³³ U, ²³⁴ U, ²³⁵ U, ²³⁶ U, ²³⁸ U	Sup, CS	Acid ⁴	LA-506-101, Rev. A-2
Alpha Counting	Total Alpha Activity	Sup, CS	Fusion ⁴	LA-508-101, Rev. G-1
Separation/Beta Counting	⁹⁰ Sr	Sup, CS	Fusion ⁴	LA-220-101, Rev. E-4
GEA ³	¹³⁷ Cs	Sup, CS	Fusion ⁴	LA-548-121, Rev. F-1
Separation/Alpha Energy Analysis	^{239/240} Pu, ²⁴¹ Am	Sup, CS	Fusion ⁴	LA-953-104, Rev. B-1

¹DSC=Differential Scanning Calorimetry, TGA=ThermoGravimetric Analysis, IC=Ion Chromatography, ICP=Inductively Coupled Plasma, MS=Mass Spectroscopy, GEA=Gamma Energy Analysis

²Sup=Tank Supernate, CS=Centrifuged Solids.

³Method provides opportunistic analyses.

⁴The supernate was analyzed directly.

All analyses except the screening for poly-chlorinated biphenyl's (PCBs) were performed at the 222-S Laboratory. Samples for PCB screening were extracted and prepared at the 222-S Laboratory. Analyses of the extractions were performed at the Waste Sampling and Characterization Facility in the 600 Area of the Hanford Site.

The second column in the data tables is labeled "A#". This indicates the type of sample preparation performed before analysis. A "D" in column 2 indicates that an acid dilution was performed. No letter designation in the column indicates that the sample was analyzed directly or following dilution with water. Analyses on samples fused with potassium hydroxide in a nickel crucible are marked with a "F". Analyses of acid-digested samples are marked with an "A". Analyses of water-digested samples are marked with a "W".

The QC criteria associated with an analysis varied depending on the analysis. All analyses were covered under the 222-S Laboratory quality assurance plan (Markel 1999). In addition, the desired QC parameters for the supernate and centrifuged solids analyses were identified respectively in Table 3-1 of revision 0-B of the TSAP (Sasaki 1999a) and Table 3-2 of revision 0 of the TSAP (Sasaki 1999b). Precision and accuracy requirements for all analyses except PCBs were delineated in Table 4-1 of Sasaki 1999b.

5.0 ANALYTICAL RESULTS DISCUSSION BY TEST

Each analysis was discussed in the Inorganic, PCB Screening, or Radiochemical section of this narrative. Analysis for acetone was not performed. The TSAP indicated that this analysis was not required on all samples. It was not clear if analysis for acetone was required on any of the S-111 samples. Acetone analysis will be performed at the customer's request.

5.1 INORGANIC ANALYSES

5.1.1 Ammonia by Ion-Specific Electrode (ISE)

Ammonia was measured on each supernate sample using an ammonia-specific electrode. The detection limit for ammonia was 100 µg/mL. No ammonia was detected sample 11S-99-1, but it was detected in samples 11S-99-2 and -3 where the mean concentrations were 165.5 and 122.5 µg/mL, respectively.

The relative percent difference (RPD) between the sample and duplicate analyses of sample 11S-99-1 was 22.4. This was above the TSAP limit of 20. The sample was not re-analyzed because the ammonia concentration was very close to the detection limit and the results were well below the 5,000 µg/mL notification limit. All remaining QC requirements were met.

5.1.2 Bulk Density

A bulk density measurement was performed on the centrifuged solids. Although the TSAP did not require this measurement to be performed in duplicate, a duplicate analysis was performed because the sample material was cohesive making it more difficult to obtain an accurate result. The sample and duplicate results were very similar at 1.68 and 1.71 g/mL. There was no standard or blank associated with this analysis.

5.1.3 Differential Scanning Calorimetry (DSC)

The three supernate samples and the one centrifuged solid sample were analyzed by DSC. Heat absorbed by the sample from a net endothermic reaction or process, or heat given up by the sample from a net exothermic reaction or process was measured as a function of temperature. The samples were heated from approximately 25 to 500° C. None of the samples exhibited any net exotherms, thus the 480 J/g notification limit was not exceeded. There were no QC failures.

5.1.4 Hydroxide

Hydroxide concentrations were determined by titration directly on the supernate samples and on a water digest of the solid sample. The mean hydroxide concentrations in the supernate samples were similar, ranging from 4.64×10^4 µg/mL in sample 11S-99-1 to 5.46×10^4 µg/mL in sample 11S-99-2. The concentration of hydroxide in the solid sample was 2.96×10^4 µg/g. Converting this concentration to µg/mL using the mean bulk density result (Section 5.1.2) gives a concentration of 5.03×10^4 µg/mL. Thus, the hydroxide concentrations in the centrifuged solid and in the supernate were very similar on a per-volume basis.

There were no QC failures associated with the hydroxide analyses.

5.1.5 Anions by Ion Chromatography (IC)

The concentrations of the anions chloride, fluoride, nitrite, nitrate, phosphate, and sulfate were measured by IC. The supernate samples were analyzed directly following dilution and the centrifuged solid sample was analyzed following water digestion. The results for bromide and oxalate were opportunistic and appear in Appendix A.

Nitrate then nitrite were the most abundant anions in the supernate and solid samples. Mean nitrate results on the supernate were between 1.76×10^5 (11S-99-2) and 2.14×10^5 µg/mL (11S-99-1). Nitrate in the solid sample averaged 1.10×10^5 µg/g, which was comparable to the supernate results on a per-volume basis. The corresponding nitrite concentrations were approximately half the nitrate concentrations in the same samples.

After nitrate and nitrite, chloride was the next most abundant anion in the supernate samples, while sulfate was the next most abundant anion in the sludge. Chloride in the supernate averaged between 5.87×10^3 and 8.17×10^3 $\mu\text{g/mL}$ and sulfate averaged between 2.92×10^3 and 4.93×10^3 $\mu\text{g/mL}$. At 4.28×10^3 $\mu\text{g/g}$, the chloride concentration in the solids was nearly the same as in the supernate per mL of sample. However, the sulfate concentration in the solids was 1.19×10^4 $\mu\text{g/g}$. This was significantly higher than the supernate concentrations.

There was also more phosphate and fluoride in the solids compared to the supernate. Compare the mean phosphate concentration of 6.71×10^3 $\mu\text{g/g}$ in the solid sample to the supernate average of approximately 1.9×10^3 $\mu\text{g/mL}$. Respective mean fluoride concentrations in the solid and supernate were 666.9 $\mu\text{g/g}$ and approximately 270 $\mu\text{g/mL}$.

Some of the QC requirements were not met. Chloride was detected in the preparation blank for sample S99T001739 (11S-99-3) at 0.0170 $\mu\text{g/g}$. This concentration was negligible compared to the sample results. The matrix spike recovery for nitrate in sample S99T001739 was 125.8%. This was just above the TSAP upper limit of 125%. This sample had been re-analyzed for nitrate due to a high RPD value. The matrix spike recovery was 107.1% in the initial analysis and the mean nitrate concentration was 1.05×10^5 $\mu\text{g/g}$. Compare this to the reported result of 1.10×10^5 $\mu\text{g/g}$.

One RPD value was outside of the TSAP limit of 20. Analysis for phosphate in sample 11S-99-1 had an associated RPD value of 42.4. The sample had been re-run due to a high RPD value. The initial analysis had an associated RPD value of 22.5 and a mean phosphate result of 2.09×10^3 $\mu\text{g/g}$. This was close to the reported result of 1.87×10^3 $\mu\text{g/mL}$.

5.1.6 Metals by Inductively Coupled Plasma (ICP)

Inductively coupled plasma together with atomic emission spectroscopy was used to determine the concentrations of aluminum (Al), chromium (Cr), iron (Fe), sodium (Na), nickel (Ni), manganese (Mn), and zirconium (Zr) in the supernate samples. Concentrations of the same metals were determined on an acid digest of the centrifuged solid sample. A fusion digest of the solid was performed for comparison. Concentrations of additional metals were determined opportunistically on each sample portion. These results are shown in Appendix A.

As expected, Na was the most abundant element found in the solid and liquid samples. The supernate concentrations were similar, varying from 2.10×10^5 (11S-99-3) to 2.32×10^5 $\mu\text{g/mL}$ (11S-99-1). Also as expected, there was not much difference between the Na concentrations in the acid and fusion digests. Mean concentrations were approximately 1.65×10^5 $\mu\text{g/g}$.

The next most plentiful metal in the solid and liquid samples was Al. Average concentrations ranged from 2.68×10^4 to 4.33×10^4 $\mu\text{g/mL}$ in supernate samples 11S-99-1 and 11S-99-2, respectively. There were slightly higher concentrations of Al in the digested solid samples, and the fusion digest had the highest concentration as expected.

Compared to Al, the supernate samples were roughly 10 times less concentrated in Cr. Average concentrations were between 2.73×10^3 (11S-99-3) and 4.30×10^3 $\mu\text{g/mL}$ (11S-99-1). The acid-and fusion-digested solid samples were less concentrated in Cr compared to Al by factors of 3.2 and 4.0, respectively.

None of the other metals was detected in the supernate. The corresponding detection limits for Fe, Mn, Ni, and Zr in the supernate were 30.1, 6.01, 12.0, and 6.01 $\mu\text{g/mL}$. These metals were detected in the acid-digested solid, but only Fe and Ni were also detected in the fusion digest. At 2.09×10^3 $\mu\text{g/g}$, Fe was nearly twice as concentrated in the fusion digest compared to the acid digest. The acid digest had an average of 96.9 $\mu\text{g/g}$ of Mn, 60.5 $\mu\text{g/g}$ of Ni, and 12.95 $\mu\text{g/g}$ of Zr. The fusion digest had a Ni concentration of 7.28×10^3 $\mu\text{g/g}$, however the fusion digestion was performed in a Ni crucible. The Ni concentration in the fusion-digested sample was almost certainly biased high and the results were not reported.

Matrix spikes were added to supernate sample 11S-99-3, and to the acid and fusion digests of the solids from sample 11S-99-3. The spikes on the digested samples were post-digestion spikes. In addition to matrix spikes, serial dilutions were performed on the acid- and fusion-digested samples and on supernate sample S99T001733 (11S-99-3) to assess the accuracy of the ICP method. The 5X serial dilution results in the raw data were denoted with a "L" suffix on the sample number. The serial dilution results should be within 10% of the initial dilution. Serial dilution results for the detected metals are shown in Table 4. As shown, the results indicate that the accuracy of these analyses were acceptable.

All standard, RPD, and matrix spike QC requirements were met. The metals Cr, Fe, Na, and Ni were detected in the acid digestion preparation blank. The smallest sample concentration to blank concentration ratio was found for Ni. This ratio was over 3,000, thus the metal concentrations in the preparation blank were considered negligible.

Table 4. Tank S-111 ICP Serial Dilution Results for Detected Analytes.

Sample No.	Analyte	Digestion	Sample Result ($\mu\text{g/mL}$)	Serial Dilution Result ($\mu\text{g/mL}$)	Percent Difference
S99T001738	Al	Acid	3.37×10^4	3.54×10^4	4.92
S99T001738	Cr	Acid	1.06×10^4	1.12×10^4	5.05
S99T001738	Fe	Acid	1.26×10^3	1.34×10^3	6.15
S99T001738	Mn	Acid	95.1	1.01×10^2	6.02
S99T001738	Na	Acid	1.67×10^5	1.62×10^5	3.04
S99T001738	Ni	Acid	58.2	55.4	4.93
S99T001737	Al	Fusion	4.91×10^4	5.05×10^4	2.81
S99T001737	Cr	Fusion	1.20×10^4	1.23×10^4	2.49
S99T001737	Na	Fusion	1.73×10^5	1.64×10^5	5.34
S99T001733	Al	Direct	3.93×10^4	4.01×10^4	2.02
S99T001733	Cr	Direct	2.74×10^3	2.80×10^3	2.17
S99T001733	Na	Direct	2.16×10^5	2.13×10^5	1.40

5.1.7 Percent Water by Thermogravimetric Analysis (TGA)

Thermogravimetric analysis was performed on all supernate samples and on the centrifuged solids. The percentage of water in a sample was determined through TGA by measuring the total weight loss of the sample between 25 and approximately 230° C. Additional information may be obtained by examining the raw data.

About half the mass of the supernate samples was water. The mean percent water values in the supernate samples were very similar. All were between 50.50 and 51.58%. The solid sample contained less moisture. The mean result was 43.96%. There were no QC failures.

5.1.8 pH

The pH of supernate sample 11S-99-1 was in excess of 13.5 pH units, the upper limit of the analytical procedure. Supernate samples 11S-99-2 and -3 had lower mean pH values of 13.45 and 13.41. The solid sample's pH was still lower at 13.21. All QC parameters were met.

5.1.9 Specific Gravity

Specific gravity measurements were taken of the three supernate samples. The mean results were almost identical, ranging from 1.432 on sample 11S-99-1 to 1.460 on sample 11S-99-3. These results were consistent with the relatively low water content of the samples. All QC parameters were met.

5.1.10 Total Inorganic Carbon (TIC)

Total inorganic carbon was measured on the supernate and solid samples by acid addition followed by coulometric titration of the resulting carbon dioxide. Levels of TIC in the supernate samples were between 3.38×10^3 (11S-99-3) and 5.60×10^3 $\mu\text{g/mL}$ (11S-99-1). The TIC concentration in the solid sample averaged 4.72×10^3 $\mu\text{g/g}$.

For TIC analyses, Total Inorganic Carbon Analysis Report worksheets are included for each sample in the raw data section. Due to programming limitations with the instrument software, the sample size listed on the worksheet is sometimes incorrect. The incorrect values are not used to calculate the TIC concentrations and have no bearing on the reported results. All raw data in the spreadsheets are correct.

Small amounts of TIC were found in the analytical blanks. All concentrations were less than 3.1 $\mu\text{g/mL}$ or 0.400 $\mu\text{g/g}$. The source of the TIC was most likely carbon dioxide absorbed from the atmosphere. The levels were considered negligible compared to the levels in the samples. A matrix spike was added to supernate and solid subsamples from 11S-99-3. The spike recoveries and all other QC requirements were acceptable.

5.1.11 Total Organic Carbon (TOC)

Total organic carbon was measured on the supernate and solid samples by persulfate oxidation followed by coulometric titration of the resulting carbon dioxide. The TOC concentration trend was opposite that for TIC. Sample 11S-99-1 was the least concentrated liquid sample at $1.33 \times 10^3 \mu\text{g/mL}$ and sample 11S-99-3 was the most concentrated at $1.61 \times 10^3 \mu\text{g/mL}$. There was considerably more TOC in the solid sample.

For TOC analyses, Total Organic Carbon Analysis Report worksheets are included for each sample in the raw data section. Due to programming limitations with the instrument software, the sample size listed on the worksheet is sometimes incorrect. The incorrect values are not used to calculate the TOC concentrations and have no bearing on the reported results. All raw data in the spreadsheets are correct.

The TSAP notification limit for TOC is $4.5 \times 10^4 \mu\text{g/g}$ on a dry-weight basis for solid and liquid samples. The highest dry-weight TOC result among the supernate samples was calculated by dividing the highest mean TOC concentration (in sample 11S-99-3) by the sample's specific gravity, then correcting to zero percent moisture using the percent water in the sample. This gave $2.23 \times 10^3 \mu\text{g/g}$ as the result, which was well below the notification limit. The highest dry-weight TOC result for the solid sample was calculated by correcting the TOC result for the percent water in the solid sample. This gave $1.44 \times 10^4 \mu\text{g/g}$, which more than three times below the notification limit.

Small amounts of TOC were detected in the analytical blanks. The source of the TOC was most likely the ion exchange resin used to deionize the analytical water. The highest result was $12.1 \mu\text{g/g}$ found in the blank associated with the solid sample (S99T001736). This was nearly seven times less than the sample amount, therefore no re-analyses were performed. The standard and spike recoveries were met.

5.1.12 Uranium Isotopics by ICP/Mass Spectroscopy (MS)

All supernate samples and an acid digest of the solid sample were analyzed for the isotopes ^{233}U , ^{234}U , ^{235}U , ^{236}U , and ^{238}U by ICP/MS. Only ^{238}U was detected in the supernate samples despite detection limits of $1.29 \mu\text{g/mL}$ or less. The isotopes ^{235}U and ^{238}U were detected in the solid sample. Mean supernate concentrations of ^{238}U were in the 1.276 to $1.946 \mu\text{g/mL}$ range. Much more ^{238}U was found in the solid sample, where the mean result was $373.9 \mu\text{g/g}$. The concentration of ^{235}U in the solid sample averaged $2.439 \mu\text{g/g}$ for a total uranium concentration of $376.3 \mu\text{g/g}$. This result compares well with the opportunistic ICP result of $332 \mu\text{g/g}$ shown in Appendix A.

Standards and spikes were only available for the ^{235}U and ^{238}U isotopes. A matrix spike was added to the supernate and solid subsamples of sample 11S-99-3. All matrix spike and standard recoveries, and all RPD results, were within the TSAP limits. No U was found in any of the blanks.

5.2 PCB SCREENING

5.2.1 Poly-Chlorinated Biphenyl's (PCBs)

The supernate and sludge from sample 11S-99-3 were analyzed for selected PCBs by gas chromatography following organic extraction of the samples. Analyses for PCBs were not required by the TSAP, however the required Request for Sample Analysis (RSA) form supplied by the customer indicated that the samples were suspected of containing PCBs. A copy of the RSA form is included as Attachment 4. Laboratory procedure requires that samples suspected of containing PCBs are analyzed for PCBs.

The results of the screening indicated that no regulated amount, i.e. less than 50 parts per million of any PCB for which the sample was analyzed, was present in the supernate or solid samples.

5.3 RADIOCHEMICAL ANALYSES

5.3.1 Americium-241

Supernate samples and a fusion-digested solid sample were analyzed for ^{241}Am activity by chemical separation followed by alpha counting. Small but detectable activities of ^{241}Am were present in all samples. Mean results on the liquids varied from 7.69×10^{-5} to $1.98 \times 10^{-4} \mu\text{Ci/mL}$. The digested solid sample had a higher activity at $5.53 \times 10^{-2} \mu\text{Ci/g}$. All reported results were corrected for the ^{243}Am tracer recovery and all QC parameters were met.

5.3.2 Gamma Energy Analysis (GEA)

The activity of ^{137}Cs was determined by GEA on the supernate samples and on a fusion-digested solid sample. The activities of ^{60}Co in the same samples were reported in Appendix A on an opportunistic basis. Measured activities in the supernate samples varied from 260.5 (11S-99-1) to and 367.5 $\mu\text{Ci/mL}$ (11S-99-3). The latter result was over the notification limit of $3.28 \times 10^5 \mu\text{Ci/L}$ specified in the TSAP (Sasaki 1999a,b). The result on sample 11S-99-2 was 363.5 $\mu\text{Ci/mL}$, and was also over the notification limit. The On-Call Process Engineer with the Process Control organization of the River Protection Project was notified of these results. The activity in the digested solid was 189.8 $\mu\text{Ci/g}$.

There was no spike associated with this analysis. The standard recovery and RPD values were well within the TSAP limits. The fusion preparation blank had a detectable, but negligible, level of ^{137}Cs that was more than 10,000 times lower than the activity in the sample.

5.3.3 Plutonium-239/240

Determined by chemical separation followed by alpha counting was the $^{239/240}\text{Pu}$ activity. No $^{239/240}\text{Pu}$ activity was detected in the three liquid samples. The highest minimum detectable activity was $4.01 \times 10^{-5} \mu\text{g/mL}$. The fusion-digested solid sample had a $^{239/240}\text{Pu}$ activity of $1.47 \times 10^{-2} \mu\text{Ci/g}$. The Notification Limit was $61.5 \mu\text{Ci/mL}$ for the supernate samples and $41 \mu\text{Ci/g}$ for the solid. All QC requirements were met and the reported results were corrected for the ^{236}Pu tracer recovery.

5.3.4 Strontium-89/90

Chemical separation followed by beta counting provided the activity of $^{89/90}\text{Sr}$ in each supernate sample and in the fusion-digested solid sample. Results on the supernate varied by a factor of about four. Sample 11S-99-1 had the lowest activity of $4.55 \times 10^{-2} \mu\text{g/mL}$ and sample 11S-99-3 had the highest activity of $0.191 \mu\text{g/mL}$. As was expected, the solid sample had a much higher activity at $27.9 \mu\text{g/g}$. All activities were corrected for carrier recoveries. No sample results exceeded the notification limit of $2.30 \times 10^5 \mu\text{Ci/L}$.

All standard recoveries and RPD values were well within the TSAP limits. A small amount of activity was found in the fusion preparation blank and in one of the analytical blanks. The activities in these blanks were negligible compared to the sample results.

5.3.5 Total Alpha Activity

No total alpha activity was found in the supernate samples. The mean total alpha result in the fusion-digested solid sample was $5.75 \times 10^{-2} \mu\text{Ci/g}$. This was reasonably close to sum of the $^{239/240}\text{Pu}$ and ^{241}Am activities, which was $7.00 \times 10^{-2} \mu\text{Ci/g}$, given the relative total alpha counting error of 31%.

The RPD value associated with the solid analysis was 32, which was over the TSAP limit of 20. The sample was not re-run because the results were very close to the minimum detectable activity and re-analysis would probably have not improved the precision. The minimum detectable activities and counting uncertainties were higher than usual. This was due to the high ^{137}Cs activity. Large dilutions were required to reduce the beta activity (from ^{137}Cs) below the counting room limit. All other QC requirements were met.

6.0 WASTE COMPATIBILITY CONCERNS

The waste compatibility corrosion rules did not apply to single-shell tanks such as S-111 at the time this report was written.

7.0 REFERENCES

Markel, L. P., 1999, *Quality Assurance Plan for 222-S Laboratories*, HNF-SD-CP-QAPP-016, Rev. 3C, Waste Management of Hanford, Inc., Richland, Washington, 99352.

Sasaki, L. M., 1999a, *Compatibility Grab Sampling and Analysis Plan for Fiscal Year 1999*, HNF-3528, Rev. 0-B, Lockheed Martin Hanford Corporation, Richland, WA 99352.

Sasaki, L. M., 1999b, *Compatibility Grab Sampling and Analysis Plan for Fiscal Year 1999*, HNF-3528, Rev. 0, Lockheed Martin Hanford Corporation, Richland, WA 99352.

Sasaki, L. M., 1999c, *Compatibility Grab Sampling and Analysis Plan for Fiscal Year 1999*, HNF-3528, Rev. 0-C, Lockheed Martin Hanford Corporation, Richland, WA 99352.

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S-111 SAMPLE BREAKDOWN

ATTACHMENT 1

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S-111 Grab Sample Breakdown

Sample 11S-99-1, Supernate for Inorganic/Radchem. Analysis
LABCORE group 99000304
Parent Sample S99T001370

S-111 Grab Sample Breakdown

Sample 11S-99-2, Supernate for Inorganic/Radchem. Analysis
 LABCORE group 99000304
 Parent Sample S99T001371

S-111 Grab Sample Breakdown

Sample 11S-99-3, Supernate & Centrifuged Solids for Inorganic/Radchem. Analysis

LABCORE group 99000304

Parent Sample S99T001372

Organic Volume
Volume % Settled Solids
Volume % Centrifuged Solids

Centrifuged Solids Interstitial/Decanted Supernate

S99T001378
Bulk Density
Archive

S99T001379
Archive

S99T001736

DSC
DSC (dry)
TGA
TIC/TOC
pH

S99T001380

PCB's

Fusion Digest
S99T001737

Am-241
GEA
ICP
Pu-239/240
Sr-90
Total Alpha

Water Digest
S99T001739

IC
Hydroxide

Acid Digest
S99T001738

ICP
U isotopics

S99T001733

IC ICP
pH TGA
DSC DSC (dry)
TIC/TOC
Specific Gravity
Hydroxide

S99T001735

Am-241
Pu-239/240
GEA
Sr-90
Ammonia
U isotopics
Total Alpha

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**CHAIN OF CUSTODY
ATTACHMENT 2**

HNF-1685 REV. 0

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CHAIN-OF-CUSTODY RECORD FOR CPO									
(1) Sample Number 115-99-1		(2) Supervisor/Sampler James S. S. S.		(9) Seal Intact Upon Release? ☒ Yes ☐ No					
(3) Tank S-111		(4) Riser 013		(5) Cask/Pig Serial No. B-24		(10) Seal Intact Upon Receipt? ☒ Yes ☐ No			
(6) Shipment Description:				(7) Sampling Data		(11) Seal Number AND Cask/Pig SERIAL Number consistent with this record? (Block 5 & 6b) ☒ Yes ☐ No			
A. Work Package Number WS-99-00159				Y N ☐ ☐		(12) Laboratory Comments:			
B. Cask/Pig Seal Number 12605				Amount 14					
C. Date Sample Collected 8-3-99				Concentration A					
D. Time Sample Collected 0310				X-Ray ☐					
				Partial Sample ☒					
				Retrieved Partial Sample Stroke Length _____					
(8) Field Comments: 500 m/ha Contact of Bottle WC Unconnected									
22									
(13) Relinquished By (Sign and PRINT) [Signature]		(14) Received By (Sign and PRINT) [Signature]		(15) Date/Time 8-3-99		(16) Receiver Comments			
(17) Relinquished By (Sign and PRINT) [Signature]		(18) Received By (Sign and PRINT) [Signature]		(19) Date/Time 1030		(20) Receiver Comments			
(21) Relinquished By (Sign and PRINT) [Signature]		(22) Received By (Sign and PRINT) [Signature]		(23) Date/Time 8-3-99		(24) Receiver Comments			
(25) Relinquished By (Sign and PRINT)		(26) Received By (Sign and PRINT)		(27) Date/Time		(28) Receiver Comments			

599T001370

Field Comments:
500 ml/hr Contact of Bottle WC disconnected

22

CHAIN-OF-CUSTODY RECORD FOR CPO

HNF-1685 REV. 0

SAAT001371

(1) Sample Number 115-99-2		(2) Supervisor/Sampler James Pickels		(9) Seal Intact Upon Release? ☒ Yes ☐ No
(3) Tank S-111	(4) Riser 013	(5) Cask/Pig Serial No. TF-4		(10) Seal Intact Upon Receipt? ☒ Yes ☐ No
(6) Shipment Description: A. Work Package Number WS-99-00159 B. Cask/Pig Seal Number 12606 C. Date Sample Collected 8-3-99 D. Time Sample Collected 0525				(11) Seal Number AND Cask/Pig SERIAL Number consistent with this record? (Block 5 & 6b) ☒ Yes ☐ No
(7) Sampling Data <div style="display: flex; justify-content: space-between;"> <div> <p>Lithium Bromide</p> <p>Amount 14</p> <p>Concentration A</p> <p>- X-Ray ☐</p> <p>- Partial Sample ☐</p> <p>- Retrieved Partial Sample Stroke Length</p> </div> <div> <p>Y</p> <p>N</p> <p>☐</p> <p>☐</p> </div> </div>				(12) Laboratory Comments:
(8) Field Comments: 1000 m.p/h on Contact of Bottle WC Undereccited				
(14) Relinquished By (Sign and PRINT) [Signature]		(14) Received By (Sign and PRINT) V. Matthews		(15) Date/Time 8-3-99
(17) Relinquished By (Sign and PRINT) V. Matthews		(17) Received By (Sign and PRINT) RL Chambers		(19) Date/Time 1030
(21) Relinquished By (Sign and PRINT)		(22) Received By (Sign and PRINT)		(23) Date/Time 8-3-99
(25) Relinquished By (Sign and PRINT)		(26) Received By (Sign and PRINT)		(27) Date/Time
				(28) Receiver Comments

CHAIN-OF-CUSTODY RECORD FOR CPO

(1) Sample Number 115-99-3	(2) Supervisor/Sampler JAMES SICKELS	(9) Seal Intact Upon Release? ☒ Yes ☐ No
(3) Tank S-111	(4) Riser 013	(10) Seal Intact Upon Receipt? ☒ Yes ☐ No
(5) Cask/Pig Serial No. TF-9	(6) Shipment Description: WS-99-00159	(11) Seal Number AND Cask/Pig SERIAL Number consistent with this record? (Block 5 & 6b) ☒ Yes ☐ No
(7) Sampling Data	(12) Laboratory Comments: 599T001372	
A. Work Package Number 12607 B. Cask/Pig Seal Number 8-3-99 C. Date Sample Collected 0340 D. Time Sample Collected	Y N ☐ ☐ Lithium Bromide Amount N Concentration - X-Ray ☐ - Partial Sample ☐ - Retrieved Partial Sample Stroke Length	

(8) Field Comments:
 1500 mph on contact of bottle w/c unreacted
 Sample is sludge (dark green) taken at depth
 on process Alamo.

(13) Relinquished By (Sign and PRINT) Robert P. Pagan	(14) Received By (Sign and PRINT) V. Matthews	(15) Date/Time 8-3-99	(16) Receiver Comments
(17) Relinquished By (Sign and PRINT) V. Matthews	(18) Received By (Sign and PRINT) Reichman / R. Chambers	(19) Date/Time 8-3-99	(20) Receiver Comments
(21) Relinquished By (Sign and PRINT)	(22) Received By (Sign and PRINT)	(23) Date/Time 1030 AM	(24) Receiver Comments
(25) Relinquished By (Sign and PRINT)	(26) Received By (Sign and PRINT)	(27) Date/Time	(28) Receiver Comments

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SAMPLE DATA SUMMARY

ATTACHMENT 3

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29-nov-1999 07:16:05
A-0002-1

TANK 241-S-111 -- DATA SUMMARY REPORT FOR PROJECT
S-111 GRAB

CORE NUMBER: n/a
SEGMENT #: 11S-99-1

SEGMENT PORTION: Supernate

Sample#	R A#	Analyte	Unit	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S99T001730		Organic Vol Present / hotcell	mL	n/a	n/a	0.00e+00	n/a	n/a	n/a	n/a	n/a	n/a
S99T001730		Volume % Settled Solids	%	n/a	n/a	<1	n/a	n/a	n/a	n/a	1.00e-01	n/a
S99T001730		DSC Exotherm Dry Calculated	Joules/g Dry	n/a	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a
S99T001730		DSC Exotherm on Perkin Elmer	Joules/g	103.9	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a
S99T001730		OH- by Pot. Titration	ug/mL	98.72	<2500.0	4.58e+04	4.59e+04	4.54e+04	2.37	n/a	2.50e+03	n/a
S99T001730		pH Direct	pH	7.96	n/a	>13.50	>13.50	n/a	n/a	n/a	1.00e-02	n/a
S99T001730		Specific Gravity	Sp. G.	99.35	n/a	1.428	1.436	1.432	0.56	n/a	1.00e-03	n/a
S99T001730		% Water by IGA on Perkin Elmer	%	99.23	n/a	51.61	51.55	51.58	0.12	n/a	n/a	n/a
S99T001730		TIC by Acid/Coulometry	ug/mL	100.3	1.800	5.63e+03	5.57e+03	5.60e+03	1.07	n/a	5.000	n/a
S99T001730		TOC by Persulfate/Coulometry	ug/mL	93.33	3.600	1.28e+03	1.38e+03	1.33e+03	7.52	n/a	40.00	n/a
S99T001730		Aluminum-ICP-Acid Dil.	ug/mL	99.00	<5.00e-02	2.68e+04	2.67e+04	2.68e+04	0.37	n/a	30.10	n/a
S99T001730		Chromium-ICP-Acid Dil.	ug/mL	100.0	<1.00e-02	4.32e+03	4.28e+03	4.30e+03	0.93	n/a	6.010	n/a
S99T001730		Iron-ICP-Acid Dil.	ug/mL	101.8	<5.00e-02	< 30.10	< 30.10	n/a	n/a	n/a	30.10	n/a
S99T001730		Manganese-ICP-Acid Dil.	ug/mL	94.40	<1.00e-02	< 6.010	<6.01e0	n/a	n/a	n/a	6.010	n/a
S99T001730		Sodium-ICP-Acid Dil.	ug/mL	99.00	<1.00e-01	2.33e+05	2.31e+05	2.32e+05	0.86	n/a	60.10	n/a
S99T001730		Nickel-ICP-Acid Dil.	ug/mL	99.80	<2.00e-02	< 12.00	<1.20e1	n/a	n/a	n/a	12.00	n/a
S99T001730		Zirconium-ICP-Acid Dil.	ug/mL	101.0	<1.00e-02	< 6.010	<6.01e0	n/a	n/a	n/a	6.010	n/a
S99T001730		Fluoride-IC-Dionex 4000/4500	ug/mL	99.38	<1.20e-02	2.43e+02	231.0	236.9	5.06	n/a	49.69	n/a
S99T001730		Chloride-IC-Dionex 4000/4500	ug/mL	98.11	<1.70e-02	5.78e+03	5.95e+03	5.87e+03	2.90	n/a	70.40	n/a
S99T001730		Nitrite-IC - Dionex 4000/4500	ug/mL	96.43	<1.08e-01	6.74e+04	6.86e+04	6.80e+04	1.76	n/a	447.2	n/a
S99T001730		Nitrate by IC-Dionex 4000/4500	ug/mL	106.1	<1.39e-01	2.15e+05	2.14e+05	2.14e+05	0.47	n/a	575.6	n/a
S99T001730		Phosphate-IC-Dionex 4000/4500	ug/mL	99.84	<1.20e-01	2.26e+03	1.47e+03	1.87e+03	42.4	n/a	254.5	n/a
S99T001730		Sulfate by IC-Dionex 4000/4500	ug/mL	98.99	<1.38e-01	4.89e+03	4.98e+03	4.93e+03	1.82	n/a	571.5	n/a
S99T001731		Ammonia by ISE-Std Additions	ug/mL	94.61	<100.0	<1.00e+02	104.0	n/a	n/a	n/a	100.0	n/a
S99T001731		Strontium-89/90 High Level	uCi/mL	97.10	<2.92e-04	4.73e-02	4.36e-02	4.55e-02	8.14	n/a	n/a	3.08E+00
S99T001731		Pu-239/240 by TRU-SPEC Resin	uCi/mL	99.21	<3.52e-05	<3.54e-05	<3.57E-5	n/a	n/a	n/a	n/a	1.00E+02
S99T001731		Uranium-233 by ICP/MS Acid Add	ug/mL	n/a	<1.20e-05	<9.67e-01	<9.67e-1	n/a	n/a	n/a	9.67e-01	n/a
S99T001731		Uranium-234 by ICP/MS Acid Add	ug/mL	n/a	<1.20e-05	<9.67e-01	<9.67e-1	n/a	n/a	n/a	9.67e-01	n/a
S99T001731		Uranium-235 by ICP/MS Acid Add	ug/mL	100.0	<1.20e-05	<9.67e-01	<9.67e-1	n/a	n/a	n/a	9.67e-01	n/a
S99T001731		Uranium-236 by ICP/MS Acid Add	ug/mL	n/a	<1.60e-05	< 1.290	<1.29e0	n/a	n/a	n/a	1.290	n/a
S99T001731		Uranium-238 by ICP/MS Acid Add	ug/mL	94.56	<1.20e-05	1.942	1.950	1.946	0.51	n/a	9.67e-01	n/a
S99T001731		Cesium-137 by GEA	uCi/mL	105.3	<1.50e-02	2.66e+02	255.0	260.5	4.22	n/a	n/a	0.130
S99T001731		Am-241 by Extraction	uCi/mL	101.9	<2.77e-05	8.02e-05	7.36e-05	7.69e-05	8.58	n/a	n/a	4.87E+00
S99T001731		Alpha in Liquid Samples	uCi/mL	100.4	<1.15e-02	<1.01e-02	<1.15E-2	n/a	n/a	n/a	1.80e-02	5.00E+02

CORE NUMBER: n/a
SEGMENT #: 11S-99-2

TANK 241-S-111 -- DATA SUMMARY REPORT FOR PROJECT
S-111 GRAB

SEGMENT PORTION: Supernate

Sample#	R A#	Analyte	Unit	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S99T001731		Organic Vol Present / hotcell	ml	n/a	n/a	0.00e+00	n/a	n/a	n/a	n/a	n/a	n/a
S99T001731		Volume % Settled Solids	%	n/a	n/a	<1	n/a	n/a	n/a	n/a	1.00e-01	n/a
S99T001732		DSC Exotherm Dry Calculated	Joules/g Dry	n/a	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a
S99T001732		DSC Exotherm on Perkin Elmer	Joules/g	103.9	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a
S99T001732		OH- by Pot. Titration	ug/ml	98.72	<2500.0	5.48e+04	5.43e+04	5.46e+04	0.92	n/a	2.50e+03	n/a
S99T001732		pH Direct	pH	7.96	n/a	13.46	13.44	13.45	0.15	n/a	1.00e-02	n/a
S99T001732		Specific Gravity	Sp.G.	99.35	n/a	1.440	1.452	1.446	0.55	n/a	1.00e-03	n/a
S99T001732		% Water by IGA on Perkin Elmer	%	99.23	n/a	51.23	50.46	50.84	1.52	n/a	n/a	n/a
S99T001732		TIC by Acid/Coulometry	ug/ml	100.3	1.800	3.52e+03	3.33e+03	3.42e+03	5.55	n/a	5.000	n/a
S99T001732		TOC by Persulfate/Coulometry	ug/ml	93.33	3.600	1.60e+03	1.49e+03	1.54e+03	7.12	n/a	40.00	n/a
S99T001732		D Aluminum-ICP-Acid Dil.	ug/ml	99.00	<5.00e-02	4.38e+04	4.28e+04	4.33e+04	2.31	n/a	30.10	n/a
S99T001732		D Chromium-ICP-Acid Dil.	ug/ml	100.0	<1.00e-02	3.08e+03	3.07e+03	3.08e+03	0.33	n/a	6.010	n/a
S99T001732		D Iron-ICP-Acid Dil.	ug/ml	101.8	<5.00e-02	< 30.10	<3.01e1	n/a	n/a	n/a	30.10	n/a
S99T001732		D Manganese-ICP-Acid Dil.	ug/ml	94.40	<1.00e-02	< 6.010	<6.01e0	n/a	n/a	n/a	6.010	n/a
S99T001732		D Sodium-ICP-Acid Dil.	ug/ml	99.00	<1.00e-01	2.32e+05	2.22e+05	2.27e+05	4.41	n/a	60.10	n/a
S99T001732		D Nickel-ICP-Acid Dil.	ug/ml	99.80	<2.00e-02	< 12.00	<1.20e1	n/a	n/a	n/a	12.00	n/a
S99T001732		D Zirconium-ICP-Acid Dil.	ug/ml	101.0	<1.00e-02	< 6.010	<6.01e0	n/a	n/a	n/a	6.010	n/a
S99T001732		Fluoride-IC-Dionex 4000/4500	ug/ml	99.38	<1.20e-02	2.66e+02	2.87.0	276.3	7.59	n/a	49.69	n/a
S99T001732		Chloride-IC-Dionex 4000/4500	ug/ml	98.11	<1.70e-02	7.81e+03	7.71e+03	7.76e+03	1.29	n/a	70.40	n/a
S99T001732		Nitrite-IC - Dionex 4000/4500	ug/ml	96.43	<1.08e-01	8.87e+04	8.83e+04	8.85e+04	0.45	n/a	447.2	n/a
S99T001732		Nitrate by IC-Dionex 4000/4500	ug/ml	106.1	<1.39e-01	1.75e+05	1.77e+05	1.76e+05	1.14	n/a	575.6	n/a
S99T001732		Phosphate-IC-Dionex 4000/4500	ug/ml	93.39	<1.20e-01	1.86e+03	1.88e+03	1.87e+03	1.07	n/a	496.9	n/a
S99T001732		Sulfate by IC-Dionex 4000/4500	ug/ml	98.99	<1.38e-01	2.67e+03	3.18e+03	2.92e+03	17.4	n/a	571.5	n/a
S99T001734		Ammonia by ISE-Std Additions	ug/ml	94.61	<100.0	1.84e+02	147.0	165.5	22.4	n/a	100.0	n/a
S99T001734		Strontium-89/90 High Level	uCi/ml	100.1	<1.00e-03	1.29e-01	1.48e-01	1.39e-01	13.7	n/a	n/a	1.85E+00
S99T001734		Pu-239/240 by TRU-SPEC Resin	uCi/ml	99.21	<3.52e-05	<4.01e-05	<3.56E-5	n/a	n/a	n/a	n/a	7.38E+00
S99T001734		D Uranium-233 by ICP/MS Acid Add	ug/ml	n/a	<1.20e-05	<9.67e-01	<9.67e-1	n/a	n/a	n/a	9.67e-01	n/a
S99T001734		D Uranium-234 by ICP/MS Acid Add	ug/ml	n/a	<1.20e-05	<9.67e-01	<9.67e-1	n/a	n/a	n/a	9.67e-01	n/a
S99T001734		D Uranium-235 by ICP/MS Acid Add	ug/ml	100.0	<1.20e-05	<9.67e-01	<9.67e-1	n/a	n/a	n/a	9.67e-01	n/a
S99T001734		D Uranium-236 by ICP/MS Acid Add	ug/ml	n/a	<1.60e-05	< 1.290	<1.29e0	n/a	n/a	n/a	1.290	n/a
S99T001734		D Uranium-238 by ICP/MS Acid Add	ug/ml	94.56	<1.20e-05	1.322	1.230	1.276	7.06	n/a	9.67e-01	n/a
S99T001734		Cesium-137 by GEA	uCi/ml	105.3	<1.50e-02	3.53e+02	374.0	363.5	5.78	n/a	n/a	0.120
S99T001734		Am-241 by Extraction	uCi/ml	101.9	<2.77e-05	1.92e-04	2.04e-04	1.98e-04	6.06	n/a	n/a	3.65E+00
S99T001734		Alpha in Liquid Samples	uCi/ml	100.4	<1.15e-02	<1.51e-02	<1.76E-2	n/a	n/a	n/a	3.60e-02	5.00E+02

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A-0002-1

TANK 241-S-111 -- DATA SUMMARY REPORT FOR PROJECT
S-111 GRAB

CORE NUMBER: n/a
SEGMENT #: 11S-99-3

SEGMENT PORTION: Centrifuged Solids

Sample#	R A#	Analyte	Unit	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S99T001736		DSC Exotherm Dry Calculated	Joules/g Dry	n/a	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a
S99T001736		DSC Exotherm on Perkin Elmer	Joules/g	104.2	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a
S99T001736		pH on Solid Samples	pH	7.96	n/a	13.19	13.23	13.21	0.30	n/a	1.00e-02	n/a
S99T001736		% Water by IGA on Perkin Elmer	%	99.23	n/a	44.84	43.08	43.96	4.01	n/a	n/a	n/a
S99T001736		TIC by Acid/Coulometry	ug/g	103.3	4.00e-01	4.73e+03	4.72e+03	4.72e+03	0.21	99.50	5.000	n/a
S99T001736		TOC by Persulfate/Coulometry	ug/g	93.36	12.10	8.39e+03	7.75e+03	8.07e+03	7.93	83.20	40.00	n/a
S99T001737	F	Strontium-89/90 High Level	uCi/g	101.4	2.30e-02	29.30	26.50	27.90	10.0	n/a	2.00e-02	8.90E-01
S99T001737	F	Pu-239/240 by TRU-SPEC Resin	uCi/g	104.8	<1.68e-03	1.52e-02	1.42e-02	1.47e-02	6.80	n/a	2.00e-03	2.77E+00
S99T001737	F	Aluminum - ICP-Fusion	ug/g	98.20	<5.00e-02	4.91e+04	4.65e+04	4.78e+04	5.44	105.0	984.0	n/a
S99T001737	F	Chromium - ICP-Fusion	ug/g	99.80	<1.00e-02	1.20e+04	1.11e+04	1.16e+04	7.79	103.0	197.0	n/a
S99T001737	F	Iron - ICP-Fusion	ug/g	101.4	<5.00e-02	2.00e+03	2.18e+03	2.09e+03	8.61	104.0	984.0	n/a
S99T001737	F	Manganese - ICP-Fusion	ug/g	93.80	<1.00e-02	<1.97e+02	<1.88e+02	n/a	n/a	96.00	197.0	n/a
S99T001737	F	Sodium - ICP-Fusion	ug/g	101.6	<1.00e-01	1.73e+05	1.72e+05	1.73e+05	0.58	98.50	1.97e+04	n/a
S99T001737	F	Zirconium - ICP-Fusion	ug/g	100.4	<1.00e-02	<1.97e+02	<1.88e+02	n/a	n/a	101.0	197.0	n/a
S99T001737	F	Cesium-137 by GEA	uCi/g	103.2	7.40e-02	1.96e+02	184.0	189.8	6.32	n/a	n/a	0.220
S99T001737	F	Alpha of Digested Solid	uCi/g	115.0	<1.15e-03	5.60e-02	5.47e-02	5.53e-02	2.35	n/a	4.00e-03	2.16E+00
S99T001738	A	Uranium-233 by ICP/MS AcidD159	ug/g	100.4	<9.04e-03	6.67e-02	4.83e-02	5.75e-02	32.0	79.80	1.60e-02	3.08E+01
S99T001738	A	Uranium-234 by ICP/MS AcidD159	ug/g	n/a	<2.41e-03	<4.75e-01	<4.58e-1	n/a	n/a	n/a	4.75e-01	n/a
S99T001738	A	Uranium-235 by ICP/MS AcidD159	ug/g	99.41	<2.41e-03	<4.75e-01	<4.58e-1	n/a	n/a	n/a	4.75e-01	n/a
S99T001738	A	Uranium-236 by ICP/MS AcidD159	ug/g	n/a	<3.22e-03	<6.33e-01	<6.11e-1	n/a	n/a	90.14	6.33e-01	n/a
S99T001738	A	Uranium-238 by ICP/MS AcidD159	ug/g	98.75	<2.41e-03	3.67e+02	381.0	373.9	3.74	92.50	4.75e-01	n/a
S99T001738	A	Aluminum - ICP-Acid Digest	ug/g	92.00	<5.00e-02	3.37e+04	3.58e+04	3.48e+04	6.04	104.0	19.70	n/a
S99T001738	A	Chromium - ICP-Acid Digest	ug/g	92.80	3.90e-02	1.06e+04	1.12e+04	1.09e+04	5.50	101.0	3.940	n/a
S99T001738	A	Iron - ICP-Acid Digest	ug/g	95.80	1.60e-01	1.26e+03	1.17e+03	1.22e+03	7.41	99.90	19.70	n/a
S99T001738	A	Manganese - ICP-Acid Digest	ug/g	87.00	<1.00e-02	95.10	98.70	96.90	3.72	99.70	3.940	n/a
S99T001738	A	Sodium - ICP-Acid Digest	ug/g	111.0	2.16e-01	1.67e+05	1.54e+05	1.61e+05	8.10	96.10	394.0	n/a
S99T001738	A	Nickel - ICP-Acid Digest	ug/g	90.00	2.00e-02	58.20	62.80	60.50	7.60	100.0	7.880	n/a
S99T001738	A	Zirconium - ICP-Acid Digest	ug/g	94.40	<1.00e-02	11.80	14.10	12.95	17.8	104.0	3.940	n/a
S99T001739	W	OH- by Pot. Titration	ug/g	102.6	<7993.0	2.86e+04	3.07e+04	2.96e+04	7.08	n/a	7.99e+03	n/a
S99T001739	W	Fluoride-IC-Dionex 4000/4500	ug/g	99.38	<1.20e-02	6.80e+02	654.0	666.9	3.90	112.0	48.34	n/a
S99T001739	W	Chloride-IC-Dionex 4000/4500	ug/g	96.33	1.70e-02	4.41e+03	4.35e+03	4.38e+03	1.37	97.44	329.4	n/a
S99T001739	W	Nitrite-IC - Dionex 4000/4500	ug/g	94.55	<1.08e-01	4.58e+04	4.72e+04	4.65e+04	3.01	100.9	2.09e+03	n/a
S99T001739	W	Nitrate by IC-Dionex 4000/4500	ug/g	110.6	<1.39e-01	1.21e+05	9.91e+04	1.10e+05	19.9	125.8	559.9	n/a
S99T001739	W	Phosphate-IC-Dionex 4000/4500	ug/g	96.69	<1.20e-01	7.04e+03	6.38e+03	6.71e+03	9.84	104.6	483.4	n/a
S99T001739	W	Sulfate by IC-Dionex 4000/4500	ug/g	100.6	<1.38e-01	1.17e+04	1.20e+04	1.19e+04	2.53	99.28	2.67e+03	n/a

HNF-1685 REV. 0

Centrifuged Solids (Grab Sample): Centrifuged Solids (Grab Sample)

Sample#	R A#	Analyte	Unit	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S99T001378		Bulk Density of Sample	g/mL	n/a	n/a	1.680	n/a	n/a	n/a	n/a	5.00e-01	n/a
Supernate: Supernate												
Sample#	R A#	Analyte	Unit	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S99T001372		Volume % Solids	%	n/a	n/a	48.90	n/a	n/a	n/a	n/a	n/a	n/a
S99T001372		Organic Vol Present / hotcell	mL	n/a	n/a	0.00e+00	n/a	n/a	n/a	n/a	n/a	n/a
S99T001372		Volume % Settled Solids	%	n/a	n/a	95.00	n/a	n/a	n/a	n/a	1.00e-01	n/a
S99T001733		DSC Exotherm Dry Calculated	Joules/g Dry	n/a	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a
S99T001733		DSC Exotherm on Perkin Elmer	Joules/g	103.7	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a
S99T001733		OH- by Pot. Titration	ug/mL	98.72	<2500.0	5.16e+04	5.23e+04	5.20e+04	1.35	n/a	2.50e+03	n/a
S99T001733		pH Direct	pH	7.96	n/a	13.40	13.43	13.41	0.22	n/a	1.00e-02	n/a
S99T001733		Specific Gravity	Sp.G.	99.35	n/a	1.461	1.459	1.460	0.14	n/a	1.00e-03	n/a
S99T001733		% Water by TGA on Perkin Elmer	%	98.62	n/a	50.68	50.32	50.50	0.71	n/a	n/a	n/a
S99T001733		TIC by Acid/Coulometry	ug/mL	92.36	3.100	3.35e+03	3.42e+03	3.38e+03	2.07	83.70	5.000	n/a
S99T001733		TOC by Persulfate/Coulometry	ug/mL	94.68	7.300	1.59e+03	1.63e+03	1.61e+03	2.48	87.60	40.00	n/a
S99T001733		D Aluminum-ICP-Acid Dil.	ug/mL	99.00	<5.00e-02	3.93e+04	3.90e+04	3.92e+04	0.77	108.0	30.10	n/a
S99T001733		D Chromium-ICP-Acid Dil.	ug/mL	100.0	<1.00e-02	2.74e+03	2.72e+03	2.73e+03	0.73	102.0	6.010	n/a
S99T001733		D Iron-ICP-Acid Dil.	ug/mL	101.8	<5.00e-02	< 30.10	<3.01e1	n/a	n/a	103.0	30.10	n/a
S99T001733		D Manganese-ICP-Acid Dil.	ug/mL	94.40	<1.00e-02	< 6.010	<6.01e0	n/a	n/a	94.40	6.010	n/a
S99T001733		D Sodium-ICP-Acid Dil.	ug/mL	99.00	<1.00e-01	2.16e+05	2.03e+05	2.10e+05	6.21	98.00	601.0	n/a
S99T001733		D Nickel-ICP-Acid Dil.	ug/mL	99.80	<2.00e-02	< 12.00	<1.20e1	n/a	n/a	102.0	12.00	n/a
S99T001733		D Zirconium-ICP-Acid Dil.	ug/mL	101.0	<1.00e-02	< 6.010	<6.01e0	n/a	n/a	101.0	6.010	n/a
S99T001733		Fluoride-IC-Dionex 4000/4500	ug/mL	99.38	<1.20e-02	2.80e+02	297.0	288.4	5.89	89.84	49.69	n/a
S99T001733		Chloride-IC-Dionex 4000/4500	ug/mL	98.11	<1.70e-02	8.21e+03	8.14e+03	8.17e+03	0.86	93.67	70.40	n/a
S99T001733		Nitrite-IC - Dionex 4000/4500	ug/mL	96.43	<1.08e-01	9.50e+04	9.31e+04	9.40e+04	2.02	88.53	447.2	n/a
S99T001733		Nitrate by IC-Dionex 4000/4500	ug/mL	106.1	<1.39e-01	1.87e+05	1.86e+05	1.87e+05	0.54	86.09	575.6	n/a
S99T001733		Phosphate-IC-Dionex 4000/4500	ug/mL	96.22	<1.20e-01	2.43e+03	2.28e+03	2.35e+03	6.37	97.17	133.3	n/a
S99T001733		Sulfate by IC-Dionex 4000/4500	ug/mL	98.99	<1.38e-01	2.89e+03	3.34e+03	3.12e+03	14.4	98.26	571.5	n/a
S99T001735		Ammonia by ISE-Std Additions	ug/mL	94.61	<100.0	1.29e+02	116.0	122.5	10.6	85.65	100.0	n/a
S99T001735		Strontium-89/90 High Level	uCi/mL	97.10	<2.92e-04	1.97e-01	1.85e-01	1.91e-01	6.28	n/a	n/a	1.47E+00
S99T001735		Pu-239/240 by TRU-SPEC Resin	uCi/mL	99.21	<3.52e-05	<3.76e-05	<3.56E-5	n/a	n/a	n/a	n/a	7.66E+00
S99T001735		D Uranium-233 by ICP/MS Acid Add	ug/mL	n/a	<1.20e-05	<9.67e-01	<9.67e-1	n/a	n/a	n/a	9.67e-01	n/a
S99T001735		D Uranium-234 by ICP/MS Acid Add	ug/mL	n/a	<1.20e-05	<9.67e-01	<9.67e-1	n/a	n/a	n/a	9.67e-01	n/a
S99T001735		D Uranium-235 by ICP/MS Acid Add	ug/mL	100.0	<1.20e-05	<9.67e-01	<9.67e-1	n/a	n/a	95.07	9.67e-01	n/a
S99T001735		D Uranium-236 by ICP/MS Acid Add	ug/mL	n/a	<1.60e-05	< 1.290	<1.29e0	n/a	n/a	n/a	1.290	n/a
S99T001735		D Uranium-238 by ICP/MS Acid Add	ug/mL	94.56	<1.20e-05	1.370	1.250	1.310	9.16	98.00	9.67e-01	n/a
S99T001735		Cesium-137 by GEA	uCi/mL	105.3	<1.50e-02	3.73e+02	362.0	367.5	2.99	n/a	n/a	0.110
S99T001735		Am-241 by Extraction	uCi/mL	101.9	<2.77e-05	1.88e-04	1.85e-04	1.86e-04	1.61	n/a	n/a	3.43E+00
S99T001735		Alpha in Liquid Samples	uCi/mL	100.4	<1.15e-02	<1.51e-02	<1.76E-2	n/a	n/a	83.37	3.60e-02	5.00E+02

HNF-1685 REV. 0

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REQUEST FOR SAMPLE ANALYSIS FORM

ATTACHMENT 4

HNF-1685 REV. 0

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REQUEST FOR SAMPLE ANALYSIS (RSA)						Group ID No. (For lab use only)			
Sample Origin		2. Date Sampled		4. Requestor's Name		6. CACN/COA		7. Cost Center	
241-S-111		07/28/99		Leela Sasaki		103384/EI00		74B20	
Customer/Project Code		3. Submitted By			5. Requestor's Phone/MSIN/FAX				
		CPO			373-1027 R2-12 373-4641				
8. Customer ID No.	9. Laboratory Sample No.	10. Volume of Sample	11. Matrix of Sample	12. Requested Analyses			13. Expected Range		
				See HNF-3528, Rev 0-C					
14. Does sample have a MSDS?									
☐ Yes HEHF assigned MSDS No. _____									
☒ No Description of process that produced waste/sample: _____									
Will radiochemistry results be used for unconditional release? ☐ Yes ☒ No									
15. Is this sample RCRA listed? ☒ Yes ☐ No									
Applicable Listed Waste Codes:					Applicable Characteristic Codes:				
☐ Yes ☐ No P Codes: (list) <u>RCRA Permit</u>					☐ Yes ☐ No D001: (how determined) _____ Ignitable				
☐ Yes ☐ No U Codes: (list) <u>DOE/RL-88-21</u>					☐ Yes ☐ No D002: (how determined) _____ Corrosive				
☐ Yes ☐ No K Codes: (list) _____					☐ Yes ☐ No D003: (how determined) _____ Reactive				
☐ Yes ☐ No F Codes: (list) _____					☐ Yes ☐ No Toxic: (list codes) _____				
PCB: Does this waste/sample contain PCBs?									
☐ Yes Over 500 ppm If YES, what is the source of the PCBs?									
☐ Yes Over 50 ppm ☐ Transformer, capacitor, or ballast									
☒ Yes PCBs are suspected ☐ Other, specify _____									
☐ No PCBs are suspected ☐ Unknown									
16. Sample Disposition						Sample(s) Dose Rate at Contact			
☒ Return to Customer									
☐ Samples found to contain PCBs will be returned to the customer									
☐ Dispose of per facility procedures with applied charges for analyses and disposal						HPT Signature			
17. QC Required ☐ Per 222-S Laboratory Quality Assurance Plan (HNF-SD-CP-QAPP-016)									
☒ Other (list reference document or attach) <u>See TSAP HNF-3528</u>									
18. Special Instructions (Special Storage Requirements, Reporting format, holding times, etc.)						19. Requested Turnaround Time			
See TSAP HNF-3528						☐ 2 Weeks ☐ 4 Weeks			
						☐ Other _____			
20. Sample Received By:						21. Chain of Custody			
Date _____ Time _____						☐ No ☐ Yes			
						Number: _____			

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SAMPLE HANDLING

HNF-1685 REV. 0

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08/03/99 13:34

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LABCORE Data Entry Template for Worklist# 30623

Analyst: dcj Instrument: NONE Book # _____Method: AdminDataEntry Rev/Mod N/A

Worklist Comment: S-111 FOR @ERKDWN1, SUSPECT PCBS, RLC

GROUP	PROJECT	S TYPE	SAMPLI#	R A	-----TEST-----	MATRIX	ACTUAL	FOUND	DL	UNIT
99000304	S-111 GRAB	1 SAMPLE	S99T011370	0	@BRKDOWN1 DOSE-01	LIQUID	N/A	<u>4343</u> ^{08/09/99}		mrad/hour
99000304	S-111 GRAB	1 SAMPLE	S99T011370	0	@BRKDOWN1 SEALNUM	LIQUID	N/A	<u>12605</u>		
99000304	S-111 GRAB	1 SAMPLE	S99T011370	0	@BRKDOWN1 ETCHNUM	LIQUID	N/A	<u>115-99-1</u>		
99000304	S-111 GRAB	1 SAMPLE	S99T011370	0	@BRKDOWN1 APPEAR01	LIQUID	N/A	<u>Cloudy</u> ^{opaque} _{RWS 8/10/99}		
99000304	S-111 GRAB	1 SAMPLE	S99T011370	0	@BRKDOWN1 SAMPANT1	LIQUID	N/A	<u>125</u>		g
99000304	S-111 GRAB	1 SAMPLE	S99T011370	0	@BRKDOWN1 STLSLD01	LIQUID	N/A	<u>Trace < 1</u> ^{NB 11/17/99} % <u>Black, fine</u>		
99000304	S-111 GRAB	1 SAMPLE	S99T011370	0	@BRKDOWN1 COLOR-01	LIQUID	N/A	<u>Lt. Yellow</u>		
99000304	S-111 GRAB	1 SAMPLE	S99T011370	0	@BRKDOWN1 ORGVOL01	LIQUID	N/A	<u>0</u>		ml
99000304	S-111 GRAB	1 SAMPLE	S99T011370	0	@BRKDOWN1 PHOTO-01	LIQUID	N/A	<u>Complete</u>		
99000304	S-111 GRAB	2 SAMPLE	S99T011371	0	@BRKDOWN1 DOSE-01	LIQUID	N/A	<u>3</u>		mrad/hour
99000304	S-111 GRAB	2 SAMPLE	S99T011371	0	@BRKDOWN1 SEALNUM	LIQUID	N/A	<u>12606</u>		
99000304	S-111 GRAB	2 SAMPLE	S99T011371	0	@BRKDOWN1 ETCHNUM	LIQUID	N/A	<u>115-99-2</u>		
99000304	S-111 GRAB	2 SAMPLE	S99T011371	0	@BRKDOWN1 APPEAR01	LIQUID	N/A	<u>Cloudy</u> ^{opaque} _{RWS 8/10/99}		
99000304	S-111 GRAB	2 SAMPLE	S99T011371	0	@BRKDOWN1 SAMPANT1	LIQUID	N/A	<u>125</u>		g
99000304	S-111 GRAB	2 SAMPLE	S99T011371	0	@BRKDOWN1 STLSLD01	LIQUID	N/A	<u>Trace < 1</u> ^{NB 11/17/99} % <u>Black, fine</u>		
99000304	S-111 GRAB	2 SAMPLE	S99T011371	0	@BRKDOWN1 COLOR-01	LIQUID	N/A	<u>Lt. Yellow</u>		
99000304	S-111 GRAB	2 SAMPLE	S99T011371	0	@BRKDOWN1 ORGVOL01	LIQUID	N/A	<u>0</u>		ml
99000304	S-111 GRAB	2 SAMPLE	S99T011371	0	@BRKDOWN1 PHOTO-01	LIQUID	N/A	<u>Complete</u>		

Data Entry Comments:

Faxed BC

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.

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LABCORE Data Entry Template for Worklist# 30623

GROUP	PROJECT	S TYPE	SAMPLE#	R A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
99000304	S-111 GRAB	3 SAMPLE	S99T011372	0	@BRKDOWN1 DOSE-01	LIQUID	N/A	5		mrad/hour
99000304	S-111 GRAB	3 SAMPLE	S99T011372	0	@BRKDOWN1 SEALNUM	LIQUID	N/A	12607		
99000304	S-111 GRAB	3 SAMPLE	S99T011372	0	@BRKDOWN1 ETCHNUM	LIQUID	N/A	115-99-3		
99000304	S-111 GRAB	3 SAMPLE	S99T011372	0	@BRKDOWN1 APPEAR01	LIQUID	N/A	Sludge opaque		08-10-99 dark gray sludge
99000304	S-111 GRAB	3 SAMPLE	S99T011372	0	@BRKDOWN1 SAMPAMT1	LIQUID	N/A	125		g
99000304	S-111 GRAB	3 SAMPLE	S99T011372	0	@BRKDOWN1 STLSLD01	LIQUID	N/A	95%		%
99000304	S-111 GRAB	3 SAMPLE	S99T011372	0	@BRKDOWN1 COLOR-01	LIQUID	N/A	dark gray		
99000304	S-111 GRAB	3 SAMPLE	S99T011372	0	@BRKDOWN1 ORGVOL01	LIQUID	N/A	0		ml
99000304	S-111 GRAB	3 SAMPLE	S99T011372	0	@BRKDOWN1 PHOTO-01	LIQUID	N/A	Complete		

Final page for worklist # 30623

D. J. R. Lutz 8-10-99
Analyst Signature Date

D. J. R. Lutz 8-10-99
Analyst Signature Date

Carl 8-11-99

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.

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LABCORE Data Entry Template for Worklist# 30624Analyst: Dr. Instrument: NONE Book # _____

Method: LO-161-172 Rev/Mod _____

Worklist Comment: S-111 FOR HCBRKDOWN, SUSPECT PCBS, RLC

GROUP	PROJECT	S TYPE	SAMPLE#	R A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
99000304	S-111 GRAB	1 SAMPLE	S99T01370	0	HCBRKDOWN	LIQUID	N/A	<u>Complete</u>		
99000304	S-111 GRAB	2 SAMPLE	S99T01371	0	HCBRKDOWN	LIQUID	N/A	<u>Complete</u>		
99000304	S-111 GRAB	3 SAMPLE	S99T01372	0	HCBRKDOWN	LIQUID	N/A	<u>Complete</u>		

Final page for worklist # 30624David R. Jackson 8-10-99
Analyst Signature DateDavid R. Jackson 8-10-99
Analyst Signature DateCalder 8-11-99

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.

HNF-1685 REV. 0

SAMPLE PREPARATION

HNF-1685 REV. 0

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10/25/99 10:41

Page: 1

LABCORE Data Entry Template for Worklist# 31558

Analyst: gll

Instrument: FUS01

Book # N/AMethod: LA-549-141 Rev/Mod G-1

Worklist Comment: S-111 FOR FUSION01, RLC

SUSPECT PCB

GROUP	PROJECT	S TYPE	SAMPLE#	R A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 BLNK-PREP			FUSION01	SOLID	<u>1</u>	<u>.250</u>	<u>N/A</u>	<u>g/L</u>
99000304	S-111 GRAB	2 SAMPLE	S99T001737 0 F <u>0.5203</u>		FUSION01 <u>.250</u>	SOLID	<u>N/A</u>	<u>2.0812</u>		<u>g/L</u>
99000304	S-111 GRAB	3 SAMPLE	S99T001737 0		DOSE-02	SOLID	<u>N/A</u>	<u>50</u>		<u>mrad/hour</u>
99000304	S-111 GRAB	4 DUP	S99T001737 0 F <u>0.5463</u>		FUSION01 <u>.250</u>	SOLID	<u>2.0812</u>	<u>2.1852</u>	<u>N/A</u>	<u>g/L</u>
99000304	S-111 GRAB	5 DUP	S99T001737 0		DOSE-02	SOLID	<u>50</u>	<u>35</u>	<u>N/A</u>	<u>mrad/hour</u>

Final page for worklist # 31558

Analyst Signature [Signature]Date 10-26-99Analyst Signature [Signature]Date 10/26/99

PARENT

S99T001736 → S99T001737

Data Entry Comments:

HPT: Event Grey
Added 20 mls of Astute.

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# 31560

Analyst: RLC Instrument: H2001 Book # NA

Method: LA-504-101 Rev/Mod G-2

Worklist Comment: S-111 FOR H2ODIG01, RLC

Suspect PCB's

GROUP	PROJECT	S TYPE	SAMPLE#	R A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 BLNK-PREP			H2ODIG01	SOLID	<u>1</u>	<u>.100</u>	<u>N/A</u>	g/L
99000304	S-111 GRAB	2 SAMPLE	S99T001739	0 W	H2ODIG01	SOLID	<u>N/A</u>	<u>5.213</u>		g/L
		<u>0.5213g → .100L</u>								
99000304	S-111 GRAB	3 SAMPLE	S99T001739	0	DOSE-02	SOLID	<u>N/A</u>	<u>10</u>		mrad/hour
99000304	S-111 GRAB	4 DUP	S99T001739	0 W	H2ODIG01	SOLID	<u>5.213</u>	<u>5.082</u>	<u>N/A</u>	g/L
		<u>0.5082g → .100L</u>								
99000304	S-111 GRAB	5 DUP	S99T001739	0	DOSE-02	SOLID	<u>10</u>	<u>10</u>	<u>N/A</u>	mrad/hour

Final page for worklist # 31560

RLC 10/26/99
Analyst Signature Date

Y. Wang 10/27/99
Analyst Signature Date

PARENT

S99T001736 — 1739

[Signature] 10/27/99
REVIEWER SIGNATURE DATE

Data Entry Comments: Cell #35

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.

HNF-1685 REV. 0

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LABCORE Data Entry Template for Worklist# 31559

Analyst: 142

Instrument: ACD01

Book # WHC-1A 2.5mls each into
WHC-2 50mls final volume
D.F = 20xMethod: LA-505-163 Rev/Mod B-1

Worklist Comment: S-111 FOR ACIDIG01, RLC

SUSPECT PCB's

GROUP	PROJECT	S TYPE	SAMPLE#	R A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 BLNK-PREP			ACIDIG01	SOLID	<u>1</u>	<u>.050</u>	N/A	g/L
		2 STD-PREP			ACIDIG01	SOLID	<u>20</u>	<u>20</u>	N/A	g/L
99000304	S-111 GRAB	3 SAMPLE	S99T001738	0 A	ACIDIG01	SOLID	N/A	<u>5.077</u>		g/L
99000304	S-111 GRAB	4 SAMPLE	S99T001738	0	DOSE-02	SOLID	N/A	<u>26</u>		mrads/hour
99000304	S-111 GRAB	5 DUP	S99T001738	0 A	ACIDIG01	SOLID	<u>5.078</u>	<u>5.266</u>	N/A	g/L
99000304	S-111 GRAB	6 DUP	S99T001738	0	DOSE-02	SOLID	<u>26</u>	<u>26</u>	N/A	mrads/hour

Final page for worklist # 31559

Analyst Signature

Date

Analyst Signature

Date

Parent
S99T001736 — 1738

Data Entry Comments:

Uploaded + Validated by:

Paul M. Pang

10/26/99

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.

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INORGANIC ANALYSIS

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LABCORE Completed Worklist Report for Worklist# 31608

Analyst: rwk

Instrument: DSC03

Book#: 12N14B

Method: LA-514-114 Rev/Mod 0-3

Worklist Comment: S-111 GRAB, DSC-03 Run under nitrogen. skm

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
1	STD		0		DSC-03	LIQUID	28.45	29.559	103.898 % Recovery	
2	SAMPLE	S99T001730	0		DSC-03	LIQUID	N/A	0		Joules/g
3	DUP	S99T001730	0		DSC-03	LIQUID	0	0	0.000 RPD	
4	SAMPLE	S99T001732	0		DSC-03	LIQUID	N/A	0		Joules/g
5	DUP	S99T001732	0		DSC-03	LIQUID	0	0	0.000 RPD	

Final page for worklist# 31608

Analyst Signature _____ Date _____

Mary Tracy 11/4/99
Analyst Signature Date

Brian Daulton 11-8-99
Reviewer Signature Date

worklistrpt Version 2.1 05/15/95
11/02/99 09:40

HNF-1685 REV. 0

Page: 1

LABCORE Data Entry Template for Worklist# 31608

Analyst: RM Instrument: DSC0 Book # 12114-6Method: LA-514-114 Rev/Mod 0-3

Worklist Comment: S-111 GRAB, DSC-03 Run under nitrogen. skm

GROUP	PROJECT	S TYPE	SAMPLE#	R A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 STD			DSC-03	LIQUID	<u>28.45</u>	<u>29.559</u>	<u>N/A</u>	Joules/g
99000304	S-111 GRAB	2 SAMPLE	S99T001730	0	DSC-03	LIQUID	<u>N/A</u>	<u>0</u>		Joules/g
99000304	S-111 GRAB	3 DUP	S99T001730	0	DSC-03	LIQUID		<u>0</u>	<u>N/A</u>	Joules/g
99000304	S-111 GRAB	4 SAMPLE	S99T001732	0	DSC-03	LIQUID	<u>N/A</u>	<u>0</u>		Joules/g
99000304	S-111 GRAB	5 DUP	S99T001732	0	DSC-03	LIQUID		<u>0</u>	<u>N/A</u>	Joules/g

Final page for worklist # 31608

Carl King 11/04/99
Analyst Signature DateMary Evans 11/04/99
Analyst Signature Date

Data Entry Comments:

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

HNF-1685 REV. 0

Curve 1: DSC
 File info: IND110202 Tue Nov 2 18:41:13 1999
 Sample Weight: 9.210 mg
 STD 12N14-B

SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
 COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 50 TO 54.

Curve 1: DSC
 File info: SAM10203 Tue Nov 2 22:08:16 1999
 Sample Weight: 16.340 mg
 S99T001730

RM KING
 PEAKIN-ELMER
 7 Series Thermal Analysis System

N2 100/min
 Temp: 35.0 °C
 Time: 0.0 min RATE: 10.0 °C/min

Curve 1: DSC
File info: SAM110207 Wed Nov 3 00:30:28 1999
Sample Weight: 14.590 mg
S99T001730 DLP

N2 10C/min
TEMP: 35.0 °C
TIME: 0.0 min RATE: 10.0 C/min
RM KING
PERKIN-ELMER
7 Series Thermal Analysis System

Curve 1: DSC
 File Info: SAM10201 Tue Nov 2 19:44:08 1999
 Sample Weight: 15.770 mg
 S99T001732

N2 100/min
 Temp: 30.0 °C
 Time: 0.0 min
 Rate: 10.0 °C/min
 RN KING
 PERKIN-ELMER
 7 Series Thermal Analysis System

Curve 1: DSC
 File info: SAM110202 Tue Nov 2 20:36:41 1999
 Sample Weight: 14.220 mg
 S99T001732 DUP

N2 10C/min
 TEMPI: 38.8 °C
 TIME: 0.0 min RATE: 10.0 C/min
 RW KING
 PERKIN-ELMER
 7 Series Thermal Analysis System

HNF-1685 REV. 0

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11/02/99 09:41

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LABCORE Data Entry Template for Worklist# 31609Analyst: AK Instrument: DSC0 Book # 12714-BMethod: LA-514-114 Rev/Mod 12-3

Worklist Comment: S-111 GRAB, DSC-03 Run under nitrogen. skm

GROUP	PROJECT	S TYPE	SAMPLE#	R A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 STD			DSC-03	LIQUID	<u>28.145</u>	<u>29.509</u>	<u>N/A</u>	Joules/g
99000304	S-111 GRAB	2 SAMPLE	S99T001733	0	DSC-03	LIQUID	<u>N/A</u>	<u>0</u>		Joules/g
99000304	S-111 GRAB	3 DUP	S99T001733	0	DSC-03	LIQUID		<u>0</u>	<u>N/A</u>	Joules/g

Final page for worklist # 31609AK 11/3/99
Analyst Signature DateCarol L. Quinn 11/5/99
Analyst Signature DateReviewed by
Brian Dault 11-11-99

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: DSC
File Info: IND110302 Wed Nov 3 18:50:32 1999
Sample Weight: 9.210 mg
STD 12N14-B

SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 56 TO 58.

N2, EXOTHERM DOWN
TEMP: 148.8 °C TIME: 0.0 min RATE: 10.0 °C/min
RM KING PERKIN-ELMER 7 Series Thermal Analysis System
Mod 100 7/10/99 15:23

Curve 1: DSC
 File info: SAM110304 Wed Nov 3 20:15:04 1999
 Sample Weight: 15.650 mg
 S99T001733

HNF-1685 REV. 0

N2 10C/min
 TEMPI 38.8 °C
 TIME: 00:08
 0.0 min RATE: 10.0 C/min
 RW KING
 PERKIN-ELMER
 7 Series Thermal Analysis System
 Wed Nov 3 20:15:04 1999

Curve 1: DSC
 File Info: SAM110305 Wed Nov 3 21:05:10 1999
 Sample Weight: 16.610 mg
 S99T001733 DUP

N2 100/min
 TEMPERATURE 35.8 °C
 TIME 0.0 min RATE 10.0 C/min
 RM KING
 PERKIN-ELMER
 7 Series Thermal Analysis System
 Model 700 500-07-143 1999

LABCORE Completed Worklist Report for Worklist# 31610

Analyst: rwk

Instrument: DSC03

Book#: 12N14B

Method: LA-514-114 Rev/Mod 0-3

Worklist Comment: S-111 GRAB, DSC-03 Run under nitrogen. skm

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
1	STD		0		DSC-03	SOLID	28.45	29.635	104.165 % Recovery	
2	SAMPLE	999T001736	0		DSC-03	SOLID	N/A	0	Joules/g	
3	DUP	999T001736	0		DSC-03	SOLID	0	0	0.000 RPD	

Final page for worklist# 31610

Analyst Signature _____ Date _____

Analyst Signature _____ Date _____
Reviewer Signature _____ Date 11-8-99

HNF-1685 REV. 0

worklistrpt Version 2.1 05/15/95

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11/02/99 09:42

LABCORE Data Entry Template for Worklist# 31610Analyst: RLA Instrument: DSC0 Book # 12114-8Method: LA-514-114 Rev/Mod 17-3

Worklist Comment: S-111 GRAB, DSC-03 Run under nitrogen. skm

GROUP	PROJECT	S TYPE	SAMPLE#	R A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 STD			DSC-03	SOLID	<u>28.45</u>	<u>29.635</u>	<u>N/A</u>	Joules/g
99000304	S-111 GRAB	2 SAMPLE	S99T001736	0	DSC-03	SOLID	<u>N/A</u>	<u>Ø</u>		Joules/g
99000304	S-111 GRAB	3 DUP	S99T001736	0	DSC-03	SOLID	<u>Ø</u>	<u>Ø</u>	<u>N/A</u>	Joules/g

Final page for worklist # 31610M. Kim
Analyst Signature11/3/99
DateMary Jones
Analyst Signature11/4/99
Date

Data Entry Comments:

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

Curve 1: DSC
 File Info: IND110202 Tue Nov 2 18:41:13 1999
 Sample Weight: 9.210 mg
 STD 12N14-B
 SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
 COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 61 TO 63

61

N2, EXOTHERM DOWN
 RATE: 10.0 °C/min
 TIME: 10.0 min
 RW KING
 PERKIN-ELMER
 7 Series Thermal Analysis System

Curve 1: DSC
 File Info: SAM10302 Wed Nov 3 01:57:53 1999
 Sample Weight: 28.010 mg
 S99T001736

N2 10C/min
 RATE: 25.0 °C
 TIME: 200.0 s
 0.0 min RATE: 10.0 C/min
 RM KING
 PERKIN-ELMER
 7 Series Thermal Analysis System

Curve 1: DSC
 File info: SAM110303 Wed Nov 3 02:50:16 1999
 Sample Weight: 25.840 mg
 999T001736 DUP

63

N2 100 ml/min
 Temp: 25.0 °C
 Time: 000.0 s
 Rate: 10.0 °C/min
 RM KING
 PERKIN-ELMER
 7 Series Thermal Analysis System

LABCORE Completed Worklist Report for Worklist# 31700

Analyst: mf ¹¹⁴ ^{11/29/99} Instrument: DSC0 Book#: _____

Method: LA-514-115 Rev/Mod D-2

Worklist Comment: S-111 GRAB DSC-02 LIQUID MF

Seq Type	Sample#	R A	Test	Matrix	Actual	Found	DL or Yield	Unit
1 SAMPLE	899T001730	0	DSC-02	LIQUID	N/A	0		Joules/g Dry
2 DUP	899T001730	0	DSC-02	LIQUID	0	0	0.000	RPD
3 SAMPLE	899T001732	0	DSC-02	LIQUID	N/A	0		Joules/g Dry
4 DUP	899T001732	0	DSC-02	LIQUID	0	0	0.000	RPD
5 SAMPLE	899T001733	0	DSC-02	LIQUID	N/A	0		Joules/g Dry
6 DUP	899T001733	0	DSC-02	LIQUID	0	0	0.000	RPD

Final page for worklist# 31700

Analyst Signature _____ Date _____

Mary J. Long 11/10/99
Analyst Signature Date

Brian D. Smith 11-10-99
Reviewer Signature Date

LABCORE Completed Worklist Report for Worklist# 31701

Analyst: mf

Instrument: DSC0

Book#: _____

Method: LA-514-113 Rev/Mod

114
11/29/99
XB
D2

Worklist Comment: S-111 GRAB DSC-02 SOLID MF

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
1	SAMPLE	899T001736	0		DSC-02	SOLID	N/A	0		Joules/g Dry
2	DUP	899T001736	0		DSC-02	SOLID	0	0	0.000	RPD

Final page for worklist# 31701

Analyst Signature

Date

Mary Jane
Analyst Signature

11/10/99
Date

Brian Dault
Reviewer Signature

11-11-99
Date

LABCORE Completed Worklist Report for Worklist# 31611

Analyst: rwk

Instrument: TGA03

Book#: 126N8A

Method: LA-514-114 Rev/Mod P-3

Worklist Comment: S-111 GRAB, TGA-03 Run under nitrogen. skm

Seq Type	Sample#	R A	Test	Matrix	Actual	Found	DL or Yield	Unit
1 STD		0	TGA-03	LIQUID	5.95e1	59.043	99.232 % Recovery	
2 SAMPLE	S99T001730	0	TGA-03	LIQUID	N/A	51.61	%	
3 DUP	S99T001730	0	TGA-03	LIQUID	51.61	51.55	0.116 RPD	
4 SAMPLE	S99T001732	0	TGA-03	LIQUID	N/A	51.23	%	
5 DUP	S99T001732	0	TGA-03	LIQUID	51.23	50.457	1.520 RPD	

Final page for worklist# 31611

Analyst Signature _____ Date _____

Mary Jane 11/4/99
Analyst Signature Date

Brian Dault 11-8-99
Reviewer Signature Date

worklistrpt Version 2.1 05/15/95
11/02/99 09:43

HNF-1685 REV. 0

Page: 1

LABCORE Data Entry Template for Worklist# 31611

Analyst: ML Instrument: TGA0 Book # 12618-AMethod: LA-514-114 Rev/Mod D-3

Worklist Comment: S-111 GRAB, TGA-03 Run under nitrogen. skm

GROUP	PROJECT	S TYPE	SAMPLE#	R A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 STD			TGA-03	LIQUID	<u>59.5</u>	<u>59.043</u>	<u>N/A</u>	%
99000304	S-111 GRAB	2 SAMPLE	S99T001730	0	TGA-03	LIQUID	<u>N/A</u>	<u>51.61</u>		%
99000304	S-111 GRAB	3 DUP	S99T001730	0	TGA-03	LIQUID	<u>51.61</u>	<u>51.55</u>	<u>N/A</u>	%
99000304	S-111 GRAB	4 SAMPLE	S99T001732	0	TGA-03	LIQUID	<u>N/A</u>	<u>51.23</u>		%
99000304	S-111 GRAB	5 DUP	S99T001732	0	TGA-03	LIQUID	<u>51.23</u>	<u>50.457</u>	<u>N/A</u>	%

Final page for worklist # 31611

ML

Analyst Signature

11/2/99

Date

Mary Jones

Analyst Signature

11/4/99

Date

Data Entry Comments:

The reported value for S99T001730 is the sum of two weight loss steps below 200°. JML

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: TER110201 Tue Nov 2 18:49:37 1999

Sample Weight: 12.405 mg

126N8-A

SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 68 TO 72

10C/MIN N2
TEMP: 35.0 °C
TIME: 300.0 s
0.0 min RATE: 10.0 C/min
RW KINS
PERKIN-ELMER
7 Series Thermal Analysis System

Curve 1: TGA

File info: SAM110201 Tue Nov 2 19:50:19 1999

Sample Weight: 14.889 mg

S99T001730

10C/MIN N2
TEMP: 35.0 °C
TIME: 550.0 s
0.0 MIN RATE: 10.0 °C/min
RW KING
PERKIN-ELMER
7 Series Thermal Analysis System

Curve 1: TGA

File info: SAM110202 Tue Nov 2 20:57:12 1999

Sample Weight: 17.182 mg

S99T001730 DUP

HNF-1685 REV. 0

RW KING
PERKIN-ELMER
7 Series Thermal Analysis System

10C/MIN N2

TEMP: 35.0 C TIME: 0.0 min RATE: 10.0 C/min

Curve 1: TGA
 File info: SAM10203 Tue Nov 2 22:04:03 1999
 Sample Weight: 13.669 mg
 S99T001732

71

100/MIN N2
 TEM: 35.8 °C
 TIME: 0.0 MIN RATE: 10.0 °C/min
 AM KING
 PERKIN-ELMER
 7 Series Thermal Analysis System

Curve 1: TGA
 File info: SAM10204 Tue Nov 2 23:05:56 1999
 Sample Weight: 13.188 mg
 S99T001732 DUP

HNF-1685 REV. 0

HNF-1685 REV. 0

worklistrpt Version 2.1 05/15/95

Page: 1

11/02/99 09:43

LABCORE Data Entry Template for Worklist# 31612

Analyst: NK Instrument: TGA0 Book # 12678-AMethod: LA-514-114 Rev/Mod D-3

Worklist Comment: S-111 GRAB, TGA-03 Run under nitrogen. skm

GROUP	PROJECT	S TYPE	SAMPLE#	R A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 STD			TGA-03	LIQUID		<u>58.683</u>	N/A	%
99000304	S-111 GRAB	2 SAMPLE	S99T001733	0	TGA-03	LIQUID	N/A	<u>50.675</u>		%
99000304	S-111 GRAB	3 DUP	S99T001733	0	TGA-03	LIQUID		<u>50.322</u>	N/A	%

Final page for worklist # 31612

NK
Analyst Signature11/3/99
10/16/99
DateC. J. O'Brien
Analyst Signature11/5/99
Date

Reviewed by

Brian Dank11-11-99

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: TGA10301 Wed Nov 3 18:59:33 1999
 Sample Weight: 16.039 mg
 126N8-A

SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
 COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 74 TO 76.

M. King

10C/MIN N2
 TEMP: 38.3 °C
 TIME: 0.0 min RATE: 10.0 °C/min
 RW KING
 PERKIN-ELMER
 7 Series Thermal Analysis System
 Wed Nov 3 18:59:33 1999

Curve 1: T6A
 File info: SAM110302 Wed Nov 3 20:17:59 1999
 Sample Weight: 11.441 mg
 S99T001733

10C/MIN N2
 TEMPERATURE 35.0 °C
 TIME 00:00
 RATE 0.0 MIN RATE 10.0 C/MIN
 AW KING
 PERKIN-ELMER
 7 Series Thermal Analysis System
 Model 7
 Serial 1611
 Date 11/18/99

Curve 1: TGA
 File info: SAK110303 Wed Nov 3 21:21:59 1999
 Sample Weight: 15.536 mg
 S99T001733 DUP

10C/MIN N2
 TEMP: 39.060 °C
 TIME: 0.0 min RATE: 10.0 C/min
 RM KINS
 PERKIN-ELMER
 7 Series Thermal Analysis System
 Wed Nov 3 21:21:59 1999

LABCORE Completed Worklist Report for Worklist# 31613

Analyst: rwk

Instrument: TGA03

Book#: 126N8A

Method: LA-514-114 Rev/Mod D-3

Worklist Comment: S-111 GRAB, TGA-03 Run under nitrogen. skm

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
1	STD		0		TGA-03	SOLID	5.95e1	59.043	99.232 % Recovery	
2	SAMPLE	S99T001736	0		TGA-03	SOLID	N/A	44.838	%	
3	DUP	S99T001736	0		TGA-03	SOLID	44.838	43.075	4.011 RPD	

Final page for worklist# 31613

Analyst Signature _____ Date _____

Mary Jones 11/4/99
Analyst Signature _____ Date _____

Brian Smith 11-8-99
Reviewer Signature _____ Date _____

worklistrpt Version 2.1 05/15/95
11/02/99 09:44

Page: 1

LABCORE Data Entry Template for Worklist# 31613Analyst: NK Instrument: TGA0 Book # 126178-AMethod: LA-514-114 Rev/Mod 0-3

Worklist Comment: S-111 GRAB, TGA-03 Run under nitrogen. skm

GROUP	PROJECT	S TYPE	SAMPLE#	R A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 STD			TGA-03	SOLID	<u>59.5</u>	<u>59.043</u>	<u>N/A</u>	%
99000304	S-111 GRAB	2 SAMPLE	S99T001736	0	TGA-03	SOLID	<u>N/A</u>	<u>44.838</u>		%
99000304	S-111 GRAB	3 DUP	S99T001736	0	TGA-03	SOLID	<u>44.838</u>	<u>43.075</u>	<u>N/A</u>	%

Final page for worklist # 31613

Mel King 11/3/99
Analyst Signature Date

Mary Frank 11/4/99
Analyst Signature Date

Data Entry Comments:

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

Curve 1: TGA
 File info: TER110201 Tue Nov 2 18:49:37 1999
 Sample Weight: 12.405 mg
 126N8-A

SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
 COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 79 TO 81

10C/MIN N2
 TEMPLE 38.8 C
 TGA#2 308.8 C
 TIME# 0.0 MIN RATE# 10.0 C/min
 Temperature (°C)
 RW KING
 PERKIN-ELMER
 7 Series Thermal Analysis System

Curve 1: TGA
 File info: SAM110205 Wed Nov 3 00:37:09 1999
 Sample Weight: 23.251 mg
 S99T001736

10C/MIN N2
 THERM 35.0 3 TIMES: 0.0 MIN RATES: 10.0 C/min
 RW KING
 PERKIN-ELMER
 7 Series Thermal Analysis System

Curve 1: TGA
 File info: SAM110301 Wed Nov 3 02:04:15 1999
 Sample Weight: 10.949 mg
 S99T001736 DUP

10C/MIN N2
 TEMPERATURE: 35.0 °C
 RATE: 10.0 C/min
 TIME: 0.0 min
 RM KING
 PERKIN-ELMER
 7 Series Thermal Analysis System

HNF-1685 REV. 0

worklistpr Version 2.1 05/15/95
08/10/99 09:10

Page: 1

LABCORE Data Entry Template for Worklist# 30687

Analyst: ABC Instrument: BA000 Book # N/AMethod: LA-519-132 Rev/Mod E-1

Worklist Comment: S-111 Volume % Centrifuged Solids

GROUP	PROJECT	S TYPE	SAMPLE#	R A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
99000304	S-111 GRAB	1 SAMPLE	S99T001372	0	VXSLD-01	LIQUID	N/A	48.9		%

Final page for worklist # 30687

Alan B Campbell 8/10/99
Analyst Signature Date

Analyst Signature Date
[Signature] 8/17/99

	Vol. liquid	Vol. Solid	Cum. Total
Cone #1		^{RNS} 8.5 8.5	38
Cone #2		18.5	32
Cone #3		21.5	40
Cone #4		21	32
Total		69.5	142

$$\frac{\text{Vol. Sol.}}{\text{Cum Total Vol.}} \times 100 = V\% \text{ Sld} = 48.9\%$$

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# 31619

Analyst: SLH Instrument: PH01 >7 Book # 18N19-G

Method: LA-212-106 Rev/Mod C-5

Worklist Comment: S-111 GRAB, pH-01 skm

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1	STDPH				PH-01	LIQUID	<u>8.00</u>	<u>7.96</u>	<u>N/A</u>	pH
99000304	S-111 GRAB	2	SAMPLE	S99T001730	0		PH-01	LIQUID	<u>N/A</u>	<u>13.58</u>		pH
99000304	S-111 GRAB	3	DUP	S99T001730	0		PH-01	LIQUID		<u>13.59</u>	<u>N/A</u>	pH
99000304	S-111 GRAB	4	SAMPLE	S99T001732	0		PH-01	LIQUID	<u>N/A</u>	<u>13.46</u>		pH
99000304	S-111 GRAB	5	DUP	S99T001732	0		PH-01	LIQUID		<u>13.44</u>	<u>N/A</u>	pH
99000304	S-111 GRAB	6	SAMPLE	S99T001733	0		PH-01	LIQUID	<u>N/A</u>	<u>13.40</u>		pH
99000304	S-111 GRAB	7	DUP	S99T001733	0		PH-01	LIQUID		<u>13.43</u>	<u>N/A</u>	pH

Final page for worklist # 31619

Andrew Hood Boatright
Analyst Signature Date
11-3-99

Mary Jane 11/4/99
Analyst Signature Date

Data Entry Comments:

Validated 11/5/99 James G. Lewis

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# 31620

Analyst: SLH Instrument: PH01 Book # 18N19-GMethod: LA-212-105 Rev/Mod C-3

Worklist Comment: S-111 GRAB, pH-02 skm

GROUP	PROJECT	S TYPE	SAMPLE#	R A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 STDPH			PH-02	SOLID		7.96	N/A	pH
99000304	S-111 GRAB	2 SAMPLE	S99T001736	0	PH-02	SOLID	N/A	13.19		pH
99000304	S-111 GRAB	3 DUP	S99T001736	0	PH-02	SOLID		1323	N/A	pH

Final page for worklist # 31620

Andrew Howard Boatright
Analyst Signature Date 11-3-99

Maya Frank 11/4/99
Analyst Signature Date

Data Entry Comments:

Validated 11/5/99 James L. Lingo

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

LABCORE Completed Worklist Report for Worklist# 31617

Analyst: slh

Instrument: PH01

Book#: 33N15A

Method: LA-211-102 Rev/Mod D-2

Worklist Comment: S-111 GRAB, OH-01 skm

Seq Type	Sample#	R A	Test	Matrix	Actual	Found	DL or Yield	Unit
1 BLNK		0	OH-01	LIQUID	1	<2500		ug/ml
2 STD		0	OH-01	LIQUID	1.56e4	1.54e4	98.718 % Recovery	
3 SAMPLE	899T001730	0	OH-01	LIQUID	N/A	4.58e4	2500 ug/ml 11/15/99	ug/ml
4 DUP	899T001730	0	OH-01	LIQUID	4.58e4	4.69e4	2.373 RPD 11/15/99	
5 SAMPLE	899T001732	0	OH-01	LIQUID	N/A	5.48e4	2500 ug/ml 11/15/99	ug/ml
6 DUP	899T001732	0	OH-01	LIQUID	5.48e4	5.43e4	0.917 RPD 11/15/99	
7 SAMPLE	899T001733	0	OH-01	LIQUID	N/A	5.16e4	2500 ug/ml 11/15/99	ug/ml
8 DUP	899T001733	0	OH-01	LIQUID	5.16e4	5.23e4	1.347 RPD	

Final page for worklist# 31617

Analyst Signature _____ Date _____

Mary Jones 11/15/99
Analyst Signature Date

[Signature] 11/15/99
Reviewer Signature Date

LABCORE Data Entry Template for Worklist# 31617

Analyst: SLH Instrument: PH01 Book # 33N15-A

Method: LA-211-102 Rev/Mod D-2

Worklist Comment: S-111 GRAB, OH-01 skm

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
99000304	S-111 GRAB	3 SAMPLE	S99T001730	0	OH-01	LIQUID	N/A			ug/mL
99000304	S-111 GRAB	4 DUP	S99T001730	0	OH-01	LIQUID			N/A	ug/mL
99000304	S-111 GRAB	5 SAMPLE	S99T001732	0	OH-01	LIQUID	N/A			ug/mL
99000304	S-111 GRAB	6 DUP	S99T001732	0	OH-01	LIQUID			N/A	ug/mL
99000304	S-111 GRAB	7 SAMPLE	S99T001733	0	OH-01	LIQUID	N/A			ug/mL
99000304	S-111 GRAB	8 DUP	S99T001733	0	OH-01	LIQUID			N/A	ug/mL

Final page for worklist # 31617

Pamela L. Hood Boatright
Analyst Signature Date
11-3-99

Mary Francis 11/9/99
Analyst Signature Date

Data Entry Comments:

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

SS=.050 μ

S99T001733 sam

date 99-11-03 time 16:29
 GET pH 12 # 112
 Id.#1 0000
 Id.#2 .1981
 pH(init) 12.25
 V/ml pH
 EP1 .766 10.60
 manual stop
 =====

date 99-11-03 time 16:31
 GET pH 12 # 112
 .10ml/div Δ pH=1/div
 start V .000 ml

SS=.050 μ l

S99T001733 dup

date 99-11-03 time 16:42
 GET pH 12 # 113
 Id.#1 0000
 Id.#2 .1981
 pH(init) 12.18
 V/ml pH
 EP1 .776 10.62
 manual stop
 =====

date 99-11-03 time 16:42
 GET pH 12 # 113
 .10ml/div Δ pH=1/div
 start V .000 ml

SS=.050 ml

899T00 1732 sam

date 99-11-03 time 15:57
 GET pH 12 # 108
 Id.#1 0000
 Id.#2 .1981
 pH(init) 12.25
 V/ml pH
 EP1 .814 10.70
 manual stop
 =====

date 99-11-03 time 15:57
 GET pH 12 # 108
 .10ml/div Δ pH=1/div
 start V .000 ml

SS=.050 ml

899T00 1732 dup

date 99-11-03 time 16:04
 GET pH 12 # 109
 Id.#1 0000
 Id.#2 .1981
 pH(init) 12.19
 V/ml pH
 EP1 .806 10.69
 manual stop
 =====

date 99-11-03 time 16:04
 GET pH 12 # 109
 .10ml/div Δ pH=1/div
 start V .000 ml

SS = .050 ml

S99T001730 sam

date 99-11-03 time 15:33
 GET pH 12 # 105
 Id.#1 0000
 Id.#2 .1981
 pH(init) 12.06
 V/ml pH
 EP1 .680 10.41
 manual stop
 =====

date 99-11-03 time 15:33
 GET pH 12 # 105
 .10ml/div Δ pH=1/div
 start V .000 ml

SS = .050 ml

S99T001730 dup

date 99-11-03 time 15:40
 GET pH 12 # 106
 Id.#1 0000
 Id.#2 .1981
 pH(init) 12.14
 V/ml pH
 EP1 .696 10.41
 manual stop
 =====

date 99-11-03 time 15:41
 GET pH 12 # 106
 .10ml/div Δ pH=1/div
 start V .000 ml

```

calibration data
date 99-11-03
pH(S) 1 7.00
pH(S) 2 10.00
t.cal. 23.0 °C
slope(rel) .988
U(as) 50.3 mV
electr. input 1
=====

```

Calibration
11-3-99

WL 31617
STD
SS .050 ml
33M15-A

```

date 99-11-03 time 14:49
GET pH 12 # 103
Id.#1 0000
Id.#2 .1981
pH(init) 11.65
V/ml pH
EP1 .229 9.85
EP2 .304 6.32
manual stop
=====

```

```

date 99-11-03 time 14:50
GET pH 12 # 103
.10ml/div ΔpH=1/div
start V .000 ml

```

WL 31617
BLK

```

date 99-11-03 time 14:33
GET pH 12 # 101
Id.#1 0000
Id.#2 .1981
pH(init) 5.65
V/ml pH
EP1 .006 4.55
stop volt.reached
=====

```

```

date 99-11-03 time 14:36
GET pH 12 # 101
.10ml/div ΔpH=1/div
start V .000 ml

```

OH (AUTO) : LA-211-102 (D-2)

		BLNK
	Sample Size (mL) SS	0.050
BLNK	Concentration of Titrant (Molarity)	0.1981
	Titrant volume at end-point in mL	0.006
31617	*** Enter Dilution Factor (DF) or 1 ***	1
OH-01	Concentration of Sample (MOLARITY)	2.38E-02
	Concentration of Sample in PPM	4.04E+02
LIQUID		
BLNK	Detection Limit =(125µg/SS)*DF	
PH01	Detection Limit (PPM)	2.50E+03
SLH	OH Molarity =((mL HNO3)*(M HNO3))/Sample Size in mL)*Dilution Factor	
11/03/99	OH in µg/mL = (OH MOLARITY)*(17.0g/mole)*(1000000µg/g)/(1000mL/L)	
03:45 PM		
		BLNK
	Concentration of Sample (MOLARITY)	2.38E-02
	Concentration of Sample in PPM	<2500
	The Result is < Detection Limit	

OH (AUTO) : LA-211-102 (D-2)

		STD
	Sample Size (mL) SS	0.050
STD	Concentration of Titrant (Molarity)	0.1981
	Titrant volume at end-point in mL	0.229
31617	*** Enter Dilution Factor (DF) or 1 ***	1
OH-01	Concentration of Sample (MOLARITY)	9.07E-01
	Concentration of Sample in PPM	1.54E+04
LIQUID		
STD		
PH01	Detection Limit (PPM)	
SLH	OH Molarity = ((mL HNO3)*(M HNO3))/Sample Size in mL)*Dilution Factor	
11/03/99	OH in µg/mL = (OH MOLARITY)*(17.0g/mole)*(1000000µg/g)/(1000mL/L)	
03:45 PM		
		STD
	Concentration of Sample (MOLARITY)	9.07E-01
	Concentration of Sample in PPM	1.54E+04

OH (AUTO) : LA-211-102 (D-2)

		SAMPLE
	Sample Size (mL) SS	0.050
SAMPLE	Concentration of Titrant (Molarity)	0.1981
	Titrant volume at end-point in mL	0.680
31617	*** Enter Dilution Factor (DF) or 1 ***	1
OH-01	Concentration of Sample (MOLARITY)	2.69E+00
	Concentration of Sample in PPM	4.58E+04
LIQUID		
S99T001730	Detection Limit =(125µg/SS)*DF	
PH01	Detection Limit (PPM)	2.50E+03
SLH	OH Molarity =((mL HNO3)*(M HNO3))/Sample Size in mL)*Dilution Factor	
11/03/99	OH in µg/mL = (OH MOLARITY)*(17.0g/mole)*(1000000µg/g)/(1000mL/L)	
03:45 PM		
		SAMPLE
	Concentration of Sample (MOLARITY)	2.69E+00
	Concentration of Sample in PPM	4.58E+04

OH (AUTO) : LA-211-102 (D-2)

		DUP
	Sample Size (mL) SS	0.050
DUP	Concentration of Titrant (Molarity)	0.1981
	Titrant volume at end-point in mL	0.696
31617	*** Enter Dilution Factor (DF) or 1 ***	1
OH-01	Concentration of Sample (MOLARITY)	2.76E+00
	Concentration of Sample in PPM	4.69E+04
LIQUID		
S99T001730	Detection Limit =(125µg/SS)*DF	
PH01	Detection Limit (PPM)	2.50E+03
SLH	OH Molarity =((mL HNO3)*(M HNO3))/Sample Size in mL)*Dilution Factor	
11/03/99	OH in µg/mL = (OH MOLARITY)*(17.0g/mole)*(1000000µg/g)/(1000mL/L)	
03:45 PM		DUP
	Concentration of Sample (MOLARITY)	2.76E+00
	Concentration of Sample in PPM	4.69E+04

OH (AUTO) : LA-211-102 (D-2)

		SAMPLE
	Sample Size (mL) SS	0.050
SAMPLE	Concentration of Titrant (Molarity)	0.1981
	Titrant volume at end-point in mL	0.814
31617	*** Enter Dilution Factor (DF) or 1 ***	1
OH-01	Concentration of Sample (MOLARITY)	3.23E+00
	Concentration of Sample in PPM	5.48E+04
LIQUID		
S99T001732	Detection Limit =(125µg/SS)*DF	
PH01	Detection Limit (PPM)	2.50E+03
SLH	OH Molarity =((mL HNO3)*(M HNO3))/Sample Size in mL)*Dilution Factor	
11/03/99	OH in µg/mL = (OH MOLARITY)*(17.0g/mole)*(1000000µg/g)/(1000mL/L)	
03:45 PM		
		SAMPLE
	Concentration of Sample (MOLARITY)	3.23E+00
	Concentration of Sample in PPM	5.48E+04

OH (AUTO) : LA-211-102 (D-2)

		DUP
	Sample Size (mL) SS	0.050
DUP	Concentration of Titrant (Molarity)	0.1981
	Titrant volume at end-point in mL	0.806
31617	*** Enter Dilution Factor (DF) or 1 ***	1
OH-01	Concentration of Sample (MOLARITY)	3.19E+00
	Concentration of Sample In PPM	5.43E+04
LIQUID		
S99T001732	Detection Limit =(125µg/SS)*DF	
PH01	Detection Limit (PPM)	2.50E+03
SLH	OH Molarity =((mL HNO3)*(M HNO3))/Sample Size in mL)*Dilution Factor	
11/03/99	OH in µg/mL = (OH MOLARITY)*(17.0g/mole)*(1000000µg/g)/(1000mL/L)	
03:45 PM		
		DUP
Concentration of Sample (MOLARITY)		3.19E+00
Concentration of Sample In PPM		5.43E+04

OH (AUTO) : LA-211-102 (D-2)

		SAMPLE
	Sample Size (mL) SS	0.050
SAMPLE	Concentration of Titrant (Molarity)	0.1981
	Titrant volume at end-point in mL	0.766
31617	*** Enter Dilution Factor (DF) or 1 ***	1
OH-01	Concentration of Sample (MOLARITY)	3.03E+00
	Concentration of Sample in PPM	5.16E+04
LIQUID		
S99T001733	Detection Limit =(125µg/SS)*DF	
PH01	Detection Limit (PPM)	2.50E+03
SLH	OH Molarity =((mL HNO3)*(M HNO3))/Sample Size in mL)*Dilution Factor	
11/03/99	OH in µg/mL = (OH MOLARITY)*(17.0g/mole)*(1000000µg/g)/(1000mL/L)	
03:45 PM		
		SAMPLE
	Concentration of Sample (MOLARITY)	3.03E+00
	Concentration of Sample in PPM	5.16E+04

OH (AUTO) : LA-211-102 (D-2)

		DUP
	Sample Size (mL) SS	0.050
DUP	Concentration of Titrant (Molarity)	0.1981
	Titrant volume at end-point in mL	0.776
31617	*** Enter Dilution Factor (DF) or 1 ***	1
OH-01	Concentration of Sample (MOLARITY)	3.07E+00
	Concentration of Sample in PPM	5.23E+04
LIQUID		
S99T001733	Detection Limit =(125µg/SS)*DF	
PH01	Detection Limit (PPM)	2.50E+03
SLH	OH Molarity =((mL HNO3)*(M HNO3))/Sample Size in mL)*Dilution Factor	
11/03/99	OH in µg/mL = (OH MOLARITY)*(17.0g/mole)*(1000000µg/g)/(1000mL/L)	
03:45 PM		DUP
	Concentration of Sample (MOLARITY)	3.07E+00
	Concentration of Sample in PPM	5.23E+04

LABCORE Completed Worklist Report for Worklist# 31618

Analyst: rwk

Instrument: PH01

Book#: 33N15A

Method: LA-211-102 Rev/Mod D-2

Worklist Comment: S-111 GRAB, OH-01 skm

Seq Type	Sample#	R A	Test	Matrix	Actual	Found	DL or Yield	Unit
1 BLNK-PREP	0		OH-01	SOLID	1	<7993		ug/g
2 STD	0		OH-01	SOLID	1.56e4	1.60e4	102.564 % Recovery	
3 SAMPLE	S99T001739	0 W	OH-01	SOLID	N/A	2.86e4	7990.000	ug/g
4 DUP	S99T001739	0 W	OH-01	SOLID	2.86e4	3.07e4	7.083 RPD	

Final page for worklist# 31618

Analyst Signature

Date

Analyst Signature

Date

Reviewer Signature

Date

11/02/99 09:57

LABCORE Data Entry Template for Worklist# 31618Analyst: NA Instrument: PH01 Book # 33415-AMethod: LA-211-102 Rev/Mod D-2

Worklist Comment: S-111 GRAB, OH-01 skm

GROUP	PROJECT	S TYPE	SAMPLE#	R A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 BLNK-PREP			OH-01	SOLID			N/A	ug/g
		2 STD			OH-01	SOLID			N/A	ug/g
99000304	S-111 GRAB	3 SAMPLE	S99T001739	0 W	OH-01	SOLID	N/A			ug/g
99000304	S-111 GRAB	4 DUP	S99T001739	0 W	OH-01	SOLID			N/A	ug/g

Final page for worklist # 31618

Vol. Kim 11/2/99
 Analyst Signature Date

Mary Jones 11/9/99
 Analyst Signature Date

Data Entry Comments:

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

calibration data
 date 99-11-02
 pH(S) 1 7.00
 pH(S) 2 10.00
 t.cal. 23.0 °C
 slope(rel) .981
 U(as) 50.2 mV
 electr. input 1
 =====

Id.#1 000

 1

std

Id.#1 000
 C00= .050ml

date 99-11-02 time 21:04
 GET pH 12 # 95
 Id.#1 000
 Id.#2 .1981
 pH(init) 11.77
 V/ml pH
 EP1 .338 6.92
 manual stop
 =====

date 99-11-02 time 21:05
 GET pH 12 # 95
 .10ml/div Δ pH=1/div
 start V .000 ml

BLK
 date 99-11-02 time 20:59
 GET pH 12 # 94
 Id.#1 000
 Id.#2 .1981
 pH(init) 6.95
 V/ml pH
 EP1 .006 5.30
 manual stop
 =====

date 99-11-02 time 20:59
 GET pH 12 # 94
 .10ml/div Δ pH=1/div
 start V .000 ml

YUP BLK
 Id.#1 0000
 C00= 3ml
 date 99-11-02 time 21:28
 GET pH 12 # 98
 Id.#1 0000
 Id.#2 .1981
 pH(init) 6.69
 V/ml pH
 EP1 .006 5.40
 manual stop
 =====

date 99-11-02 time 21:29
 GET pH 12 # 98
 .10ml/div Δ pH=1/div
 start V .000 ml

Id.#1 1739
 C00= 3ml *SAM*

date 99-11-02 time 21:20
 GET pH 12 # 96
 Id.#1 1739
 Id.#2 .1981
 pH(init) 11.55
 V/ml pH
 EP1 .133 10.18
 EP2 .272 7.69
 manual stop
 =====

date 99-11-02 time 21:21
 GET pH 12 # 96
 .10ml/div Δ pH=1/div
 start V .000 ml

Id.#1 1739-2
 C00= 3ml *PUP*

date 99-11-02 time 21:25
 GET pH 12 # 97
 Id.#1 1739-2
 Id.#2 .1981
 pH(init) 11.50
 V/ml pH
 EP1 .139 10.17
 manual stop
 =====

date 99-11-02 time 21:26
 GET pH 12 # 97
 .10ml/div Δ pH=1/div
 start V .000 ml

OH (AUTO) : LA-211-102 (D-2)

OH (AUTO) : LA-211-102 (D-2)		STD
	Sample Size (mL) SS	0.050
STD	Concentration of Titrant (Molarity)	0.1981
	Titrant volume at end-point in mL	0.238
31618	*** Enter Dilution Factor (DF) or 1 ***	1
OH-01	Concentration of Sample (MOLARITY)	9.43E-01
	Concentration of Sample in PPM	1.60E+04
LIQUID		
STD		
PH01	Detection Limit (PPM)	
RWK	OH Molarity = ((mL HNO3)*(M HNO3))/Sample Size in mL)*Dilution Factor	
11/02/99	OH in µg/mL = (OH MOLARITY)*(17.0g/mole)*(1000000µg/g)/(1000mL/L)	
09:30 PM		
		STD
	Concentration of Sample (MOLARITY)	9.43E-01
	Concentration of Sample in PPM	1.60E+04

OH (AUTO) : LA-211-102 (D-2)

		BLNK-PREP
	Sample Size (mL) SS	3.000
BLNK-PREP	Concentration of Titrant (Molarity)	0.1981
	Titrant volume at end-point in mL	0.006
31618	*** Enter Dilution Factor (DF) or 1 ***	1
	Enter Digest Factor (DDF) in g/L	5.213
OH-01	Concentration of Sample Prep (MOLARITY)	3.96E-04
	Concentration of Sample In PPM	1.29E+03
SOLID		
BLNK-PREP	Detection Limit=((125µg /SS)*DF)*1000/DDF	
PH01	Detection Limit (PPM)	7.99E+03
RWK	OH Molarity =((mL HNO3)*(M HNO3))/Sample Size in mL)*Dilution Factor	
11/02/99	OH in µg/g =(OH MOLARITY)*(17g/mole) *(1000000 µg/g)/DDF	
09:30 PM		BLNK-PREP
	Concentration of Sample In PPM	<7993
	The Result is < Detection Limit	

OH (AUTO) : LA-211-102 (D-2)

OH (AUTO) : LA-211-102 (D-2)		SAMPLE
	Sample Size (mL) SS	3.000
SAMPLE	Concentration of Titrant (Molarity)	0.1981
	Titrant volume at end-point in mL	0.133
31618	*** Enter Dilution Factor (DF) or 1 ***	1
	Enter Digest Factor (DDF) in g/L	5.213
OH-01	Concentration of Sample Prep (MOLARITY)	8.78E-03
	Concentration of Sample in PPM	2.86E+04
SOLID		
S99T001739	Detection Limit=((125µg /SS)*DF)*1000/DDF	
PH01	Detection Limit (PPM)	7.99E+03
RWK	OH Molarity =((mL HNO3)*(M HNO3))/Sample Size in mL)*Dilution Factor	
11/02/99	OH in µg/g =(OH MOLARITY)*(17g/mole) *(1000000 µg/g)/DDF	
09:30 PM		
		SAMPLE
	Concentration of Sample in PPM	2.86E+04

OH (AUTO) : LA-211-102 (D-2)

		DUP
	Sample Size (mL) SS	3.000
DUP	Concentration of Titrant (Molarity)	0.1981
	Titrant volume at end-point in mL	0.139
31618	*** Enter Dilution Factor (DF) or 1 ***	1
	Enter Digest Factor (DDF) In g/L	5.082
OH-01	Concentration of Sample Prep (MOLARITY)	9.18E-03
	Concentration of Sample in PPM	3.07E+04
SOLID		
S99T001739	Detection Limit=((125µg /SS)*DF)*1000/DDF	
PH01	Detection Limit (PPM)	8.20E+03
RWK	OH Molarity =((mL HNO3)*(M HNO3))/Sample Size in mL)*Dilution Factor	
11/02/99	OH in µg/g =(OH MOLARITY)*(17g/mole) *(1000000 µg/g)/DDF	
09:30 PM		
		DUP
	Concentration of Sample In PPM	3.07E+04

HNF-1685 REV. 0

LABCORE Completed Worklist Report for Worklist# 31614

Analyst: adp

Instrument: BA001

Book#: 134N16C

Method: LA-510-112 Rev/Mod E-1

Worklist Comment: S-111 GRAB, SPG-01 skm

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
1	STD		0		SPG-01	LIQUID	1.3779	1.3690	99.354 % Recovery	
2	SAMPLE	S99T001730	0		SPG-01	LIQUID	N/A	1.4280	1.00e-003	Sp.G.
3	DUP	S99T001730	0		SPG-01	LIQUID	1.4280	1.4360	0.559 RPD	
4	SAMPLE	S99T001732	0		SPG-01	LIQUID	N/A	1.440	1.00e-003	Sp.G.
5	DUP	S99T001732	0		SPG-01	LIQUID	1.4440	1.4520	0.552 RPD	
6	SAMPLE	S99T001733	0		SPG-01	LIQUID	N/A	1.4610	1.00e-003	Sp.G.
7	DUP	S99T001733	0		SPG-01	LIQUID	1.4610	1.4590	0.137 RPD	

Final page for worklist# 31614

Analyst Signature

Date

Analyst Signature

Date

Reviewer Signature

Date

LABCORE Data Entry Template for Worklist# 31614Analyst: ADP Instrument: BA001 Book # 134N16-CMethod: LA-510-112 Rev/Mod E-1

Worklist Comment: S-111 GRAB, SPG-01 skm

GROUP	PROJECT	S TYPE	SAMPLE#	R A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 STD			SPG-01	LIQUID	<u>1.3779</u>	<u>1.3690</u>	<u>N/A</u>	Sp.G.
99000304	S-111 GRAB	2 SAMPLE	S99T001730	0	SPG-01	LIQUID	<u>N/A</u>	<u>1.4280</u>		Sp.G.
99000304	S-111 GRAB	3 DUP	S99T001730	0	SPG-01	LIQUID	<u>1.4280</u>	<u>1.4360</u>	<u>N/A</u>	Sp.G.
99000304	S-111 GRAB	4 SAMPLE	S99T001732	0	SPG-01	LIQUID	<u>N/A</u>	<u>1.4440</u>		Sp.G.
99000304	S-111 GRAB	5 DUP	S99T001732	0	SPG-01	LIQUID	<u>1.444</u>	<u>1.4520</u>	<u>N/A</u>	Sp.G.
99000304	S-111 GRAB	6 SAMPLE	S99T001733	0	SPG-01	LIQUID	<u>N/A</u>	<u>1.4610</u>		Sp.G.
99000304	S-111 GRAB	7 DUP	S99T001733	0	SPG-01	LIQUID	<u>1.4610</u>	<u>1.4590</u>	<u>N/A</u>	Sp.G.

Final page for worklist # 31614

Anthony Peranton 11-3-99
Analyst Signature Date

Carol P. O'Brien 11/4/99
Analyst Signature Date

Data Entry Comments:

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

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

SPECIFIC GRAVITY : LA-510-112 (E-0) ^{ADP} 11/12/99

		STD	REPLICATE
STD	Gross Weight (W2)	1.9505	1.9324
	Tare Weight (W1)	1.8137	1.7954
31614	Weight of Solution (W2-W1)	0.1368	0.137
	Volume of Solution μL	100.0000	100.0000
SPG-01	Specific Gravity	1.3680	1.3700
	Specific Gravity (Average)	1.3690	
LIQUID			
STD			
BA001	Gross Weight (W2) = Wt. of vial + cap + cotton + solution		
	Tare Weight (W1) = Wt. of vial + cap + cotton		
ADP	Specific Gravity = $[(W2-W1) * 1000 \mu\text{L/mL}] / [\text{Vol. of Solution } \mu\text{L} * 1.000 \text{ g/mL}]$		
11/03/99	v RESULT v		
	Specific Gravity Average =	1.369	
01:30 PM			

Data Entry by:	Date:	11/04/99
Approved by: <i>NA</i>	Date:	

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

SPECIFIC GRAVITY : LA-510-112 (E-0) *11/04/99*

		SAM	REPLICATE
SAM	Gross Weight (W2)	1.9092	
	Tare Weight (W1)	1.7664	
31614	Weight of Solution (W2-W1)	0.1428	0
	Volume of Solution μ L	100.0000	
SPG-01	Specific Gravity	1.4280	NA
LIQUID			
S99T001730			
BA001	Gross Weight (W2) = Wt. of vial + cap + cotton + solution		
	Tare Weight (W1) = Wt. of vial + cap + cotton		
ADP	Specific Gravity = $[(W2-W1) * 1000 \mu\text{L/mL}] / [\text{Vol. of Solution } \mu\text{L} * 1.000 \text{ g/mL}]$		
11/03/99	v RESULT v		
	Specific Gravity =	1.428	
01:30 PM			

Data Entry by:	Date:	11/04/99
Approved by: <i>NA</i>	Date:	

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

SPECIFIC GRAVITY : LA-510-112 (E-0) ¹/₂ 11/4/99

		DUP	REPLICATE
DUP	Gross Weight (W2)	1.9467	
	Tare Weight (W1)	1.8031	
31614	Weight of Solution (W2-W1)	0.1436	0
	Volume of Solution μ L	100.0000	
SPG-01	Specific Gravity	1.4360	NA
LIQUID			
S99T001730			
	Gross Weight (W2) = Wt. of vial + cap + cotton + solution		
BA001	Tare Weight (W1) = Wt. of vial + cap + cotton		
ADP	Specific Gravity = $[(W2-W1) * 1000 \mu\text{L/mL}] / [\text{Vol. of Solution } \mu\text{L} * 1.000 \text{ g/mL}]$		
11/03/99	v RESULT v		
	Specific Gravity =	1.436	
01:30 PM			

Data Entry by:	Date:	11/04/99
Approved by: <i>NA</i>	Date:	

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

SPECIFIC GRAVITY : LA-510-112 (E-0)

		SAM	REPLICATE
SAM	Gross Weight (W2)	1.9292	
	Tare Weight (W1)	1.7848	
31614	Weight of Solution (W2-W1)	0.1444	0
	Volume of Solution μ L	100.0000	
SPG-01	Specific Gravity	1.4440	NA
LIQUID			
S99T001732			
BA001	Gross Weight (W2) = Wt. of vial + cap + cotton + solution		
	Tare Weight (W1) = Wt. of vial + cap + cotton		
ADP	Specific Gravity = $[(W2-W1) * 1000 \mu\text{L/mL}] / [\text{Vol. of Solution } \mu\text{L} * 1.000 \text{ g/mL}]$		
11/03/99	v RESULT v		
01:30 PM	Specific Gravity =	1.444	

Data Entry by:	Date:	11/04/99
Approved by: <i>NA</i>	Date:	

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

SPECIFIC GRAVITY : LA-510-112 (E-0) ⁶ _{11/11/99}

		DUP	REPLICATE
DUP	Gross Weight (W2)	1.9391	
	Tare Weight (W1)	1.7939	
31614	Weight of Solution (W2-W1)	0.1452	0
	Volume of Solution μ L	100.0000	
SPG-01	Specific Gravity	1.4520	NA
LIQUID			
S99T001732			
BA001	Gross Weight (W2) = Wt. of vial + cap + cotton + solution		
	Tare Weight (W1) = Wt. of vial + cap + cotton		
ADP	Specific Gravity = $[(W2-W1) * 1000 \mu\text{L/mL}] / [\text{Vol. of Solution } \mu\text{L} * 1.000 \text{ g/mL}]$		
11/03/99	v RESULT v		
	Specific Gravity =	1.452	
01:30 PM			

Data Entry by:	Date: 11/04/99
Approved by: <i>NA</i>	Date:

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

SPECIFIC GRAVITY : LA-510-112 (E-0) *had initial 11/16/99*

		SAM	REPLICATE
SAM	Gross Weight (W2)	1.8914	
	Tare Weight (W1)	1.7453	
31614	Weight of Solution (W2-W1)	0.1461	0
	Volume of Solution μ L	100.0000	
SPG-01	Specific Gravity	1.4610	NA
LIQUID			
S99T001733			
BA001	Gross Weight (W2) = Wt. of vial + cap + cotton + solution		
	Tare Weight (W1) = Wt. of vial + cap + cotton		
ADP	Specific Gravity = $[(W2-W1) * 1000 \mu\text{L/mL}] / [\text{Vol. of Solution } \mu\text{L} * 1.000 \text{ g/mL}]$		
11/03/99	v RESULT v		
	Specific Gravity =	1.461	
01:30 PM			

Data Entry by:	Date:	11/04/99
Approved by: <i>NA</i>	Date:	

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

SPECIFIC GRAVITY : LA-510-112 (E-0) *11/04/99*

		DUP	REPLICATE
DUP	Gross Weight (W2)	1.9227	
	Tare Weight (W1)	1.7768	
31614	Weight of Solution (W2-W1)	0.1459	0
	Volume of Solution μ L	100.0000	
SPG-01	Specific Gravity	1.4590	NA
LIQUID			
S99T001733			
BA001	Gross Weight (W2) = Wt. of vial + cap + cotton + solution		
	Tare Weight (W1) = Wt. of vial + cap + cotton		
ADP	Specific Gravity = $[(W2-W1) * 1000 \mu\text{L/mL}] / [\text{Vol. of Solution } \mu\text{L} * 1.000 \text{ g/mL}]$		
11/03/99	v RESULT v		
01:30 PM	Specific Gravity =	1.459	

Data Entry by:	Date: 11/04/99
Approved by: <i>NA</i>	Date:

LABCORE Completed Worklist Report for Worklist# 31616

Analyst: rwk

Instrument: NH301

Book#: 59N/9F

Method: LA-631-001 Rev/Mod D-1

Worklist Comment: S-111 GRAB, NH3-01 STD: 1.0mL skm

Seq Type	Sample#	R A	Test	Matrix	Actual	Found	DL or Yield	Unit
1 BLNK		0	NH3-01	LIQUID	1	<1.00E+2		ug/mL
2 STD		0	NH3-01	LIQUID	4.45E+02	4.21E+2	94.607 % Recovery	
3 SAMPLE	899T001731	0	NH3-01	LIQUID	N/A	<1.00E+02	100.000	ug/mL
4 DUP	899T001731	0	NH3-01	LIQUID	<1.00E+2	1.04E+2		RPD
5 SAMPLE	899T001734	0	NH3-01	LIQUID	N/A	1.84E+02	100.000	ug/mL
6 DUP	899T001734	0	NH3-01	LIQUID	1.84E+2	1.47E+2	22.356	RPD
7 SAMPLE	899T001735	0	NH3-01	LIQUID	N/A	1.29E+02	100.000	ug/mL
8 DUP	899T001735	0	NH3-01	LIQUID	1.29E+2	1.16E+2	10.612	RPD
9 SPK	899T001735	0	NH3-01	LIQUID	2.23E+02	1.91E+02	85.650 % Recovery	
10 STD		0	NH3-01	LIQUID	4.45E+02	4.64E+2	104.270 % Recovery	

Final page for worklist# 31616

Analyst Signature

Date

Carol J. Oprien 11/5/99
Analyst Signature Date

Jean Luge 11/5/99
Reviewer Signature Date

HNF-1685 REV. 0

worklistrpt Version 2.1 05/15/95

Page: 1

11/02/99 09:54

LABCORE Data Entry Template for Worklist# 31616Analyst: WIK Instrument: NH301 Book # 59119-FMethod: LA-631-001 Rev/Mod 10-1

Worklist Comment: S-111 GRAB, NH3-01 STD: 1.0mL skm

GROUP	PROJECT	S TYPE	SAMPLE#	R A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 BLNK			NH3-01	LIQUID			N/A	ug/mL
		2 STD			NH3-01	LIQUID			N/A	ug/mL
99000304	S-111 GRAB	3 SAMPLE	S99T001731	0	NH3-01	LIQUID	N/A			ug/mL
99000304	S-111 GRAB	4 DUP.	S99T001731	0	NH3-01	LIQUID			N/A	ug/mL
99000304	S-111 GRAB	5 SAMPLE	S99T001734	0	NH3-01	LIQUID	N/A			ug/mL
99000304	S-111 GRAB	6 DUP	S99T001734	0	NH3-01	LIQUID			N/A	ug/mL
99000304	S-111 GRAB	7 SAMPLE	S99T001735	0	NH3-01	LIQUID	N/A			ug/mL
99000304	S-111 GRAB	8 DUP	S99T001735	0	NH3-01	LIQUID			N/A	ug/mL
99000304	S-111 GRAB	9 SPK	S99T001735	0	NH3-01	LIQUID			N/A	ug/mL
		10 STD			NH3-01	LIQUID			N/A	ug/mL

Final page for worklist # 31616

WIK 11/4/99
Analyst Signature Date

Carol J. Quinn 11/5/99
Analyst Signature Date

Data Entry Comments:

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

DOUBLE KNOWN ADDITION SELECTED
AT 19:35, 11-04-99

SAMPLE VOL= 25.000 AT 19:42, 11-04-99
ENTERED

EMF=-16.7 mV AT 19:45, 11-04-99

EMF=-16.9 mV AT 19:45, 11-04-99

EMF=-16.9 mV AT 19:45, 11-04-99
ENTERED

STD CONCEN= 998 AT 19:45, 11-04-99
ENTERED

STD VOL= .25000 AT 19:45, 11-04-99
ENTERED

EMF=-37.3 mV AT 19:46, 11-04-99

EMF=-36.2 mV AT 19:47, 11-04-99

EMF=-36.0 mV AT 19:47, 11-04-99

EMF=-36.0 mV AT 19:47, 11-04-99
ENTERED

STD VOL= 2.5000 AT 19:48, 11-04-99
ENTERED

EMF=-79.7 mV AT 19:50, 11-04-99

EMF=-79.9 mV AT 19:50, 11-04-99

EMF=-80.2 mV AT 19:51, 11-04-99
ENTERED

1:NH3 SLOPE=-57.9 mV/DEC
AT 19:51, 11-04-99

1:NH3 CONCEN= 8.62

std
59119-F
.500mL

HNF-1685 REV. 0

SAMPLE VOL= 25.000 AT 19:27, 11-04-99
ENTERED

EMF= 66.4 mV AT 19:27, 11-04-99

EMF= 65.6 mV AT 19:27, 11-04-99

EMF= 65.6 mV AT 19:27, 11-04-99
ENTERED

STD CONCN= 998 AT 19:28, 11-04-99
ENTERED

STD VOL= .25000 AT 19:28, 11-04-99
ENTERED

EMF=-34.3 mV AT 19:29, 11-04-99

EMF=-33.1 mV AT 19:29, 11-04-99

EMF=-32.9 mV AT 19:30, 11-04-99

EMF=-32.9 mV AT 19:30, 11-04-99
ENTERED

STD VOL= 2.5000 AT 19:30, 11-04-99
ENTERED

EMF=-90.0 mV AT 19:32, 11-04-99

EMF=-90.2 mV AT 19:33, 11-04-99

EMF=-90.2 mV AT 19:33, 11-04-99
ENTERED

BLK

1:NH3 SLOPE=-57.7 mV/DEC
AT 19:33, 11-04-99

1:NH3 CONCN= .198

HNF-1685 REV. 0

DOUBLE KNOWN ADDITION SELECTED
AT 20:00. 11-04-99

SAMPLE VOL= 25.000 AT 20:14. 11-04-99
ENTERED

EMF= 63.5 mV AT 20:17. 11-04-99

EMF= 63.4 mV AT 20:17. 11-04-99
ENTERED

STD CONCEN= 998 AT 20:18. 11-04-99
ENTERED

STD VOL= .25000 AT 20:18. 11-04-99
ENTERED

EMF=-0.5 mV AT 20:20. 11-04-99

EMF=-0.3 mV AT 20:20. 11-04-99

EMF=-0.3 mV AT 20:20. 11-04-99
ENTERED

STD VOL= 2.5000 AT 20:21. 11-04-99
ENTERED

EMF=-57.1 mV AT 20:23. 11-04-99

EMF=-57.4 mV AT 20:23. 11-04-99

EMF=-57.4 mV AT 20:23. 11-04-99
ENTERED

1:NH3 SLOPE=-59.1 mV/DEC
AT 20:23. 11-04-99

1:NH3 CONCEN= .900

599T 1731
.250ML

HNF-1685 REV. 0

DOUBLE KNOWN ADDITION SELECTED
AT 20:25, 11-04-99

SAMPLE VOL= 25.000 AT 20:30, 11-04-99
ENTERED

EMF= 54.7 mV AT 20:32, 11-04-99

EMF= 54.7 mV AT 20:32, 11-04-99
ENTERED

STD CONCN= 998 AT 20:33, 11-04-99
ENTERED

STD VOL= .25000 AT 20:33, 11-04-99
ENTERED

EMF=-1.5 mV AT 20:35, 11-04-99

EMF=-1.2 mV AT 20:35, 11-04-99

EMF=-1.2 mV AT 20:35, 11-04-99
ENTERED

STD VOL= 2.5000 AT 20:36, 11-04-99
ENTERED

EMF=-57.0 mV AT 20:38, 11-04-99

EMF=-57.3 mV AT 20:38, 11-04-99

EMF=-57.3 mV AT 20:38, 11-04-99
ENTERED

1:NH3 SLOPE=-58.8 mV/DEC
AT 20:38, 11-04-99

1:NH3 CONCN= 1.24

1731 D4P
1250ML

HNF-1685 REV. 0

DOUBLE KNOWN ADDITION SELECTED
AT 20:40, 11-04-99

SAMPLE VOL= 25.000 AT 20:47, 11-04-99
ENTERED

EMF= 42.1 mV AT 20:49, 11-04-99

EMF= 42.1 mV AT 20:49, 11-04-99
ENTERED

STD CONCN= 998 AT 20:49, 11-04-99
ENTERED

STD VOL= .25000 AT 20:49, 11-04-99
ENTERED

EMF=-3.0 mV AT 20:50, 11-04-99

EMF=-3.0 mV AT 20:51, 11-04-99
ENTERED

STD VOL= 2.5000 AT 20:51, 11-04-99
ENTERED

EMF=-57.3 mV AT 20:53, 11-04-99

EMF=-57.6 mV AT 20:53, 11-04-99

EMF=-57.6 mV AT 20:53, 11-04-99
ENTERED

1:NH3 SLOPE=-58.9 mV/DEC
AT 20:54, 11-04-99

1:NH3 CONCN= 2.04

599T 1734
.250 mL

HNF-1685 REV. 0

DOUBLE KNOWN ADDITION SELECTED
AT 20:54, 11-04-99

SAMPLE VOL= 25.000 AT 21:08, 11-04-99
ENTERED

EMF= 51.7 mV AT 21:10, 11-04-99

EMF= 51.5 mV AT 21:11, 11-04-99

EMF= 51.5 mV AT 21:11, 11-04-99
ENTERED

STD CONCN= 998 AT 21:11, 11-04-99
ENTERED

STD VOL= .25000 AT 21:11, 11-04-99
ENTERED

EMF= 2.6 mV AT 21:12, 11-04-99

EMF= 2.7 mV AT 21:12, 11-04-99

EMF= 2.7 mV AT 21:12, 11-04-99
ENTERED

STD VOL= 2.5000 AT 21:12, 11-04-99
ENTERED

EMF=-51.6 mV AT 21:15, 11-04-99

EMF=-51.9 mV AT 21:15, 11-04-99

EMF=-51.9 mV AT 21:15, 11-04-99
ENTERED

1734 D4P
1250 mL

1:NH3 SLOPE=-58.1 mV/DEC
AT 21:15, 11-04-99

1:NH3 CONCN= 1.67

HNF-1685 REV. 0

DOUBLE KNOWN ADDITION SELECTED
AT 21:19, 11-04-99

SAMPLE VOL= 25.000 AT 21:23, 11-04-99
ENTERED

EMF= 55.1 mV AT 21:25, 11-04-99

EMF= 55.1 mV AT 21:25, 11-04-99
ENTERED

STD CONC= 998 AT 21:26, 11-04-99
ENTERED

STD VOL= .25000 AT 21:26, 11-04-99
ENTERED

EMF= 2.8 mV AT 21:28, 11-04-99

EMF= 3.1 mV AT 21:28, 11-04-99

EMF= 3.1 mV AT 21:28, 11-04-99
ENTERED

STD VOL= 2.5000 AT 21:29, 11-04-99
ENTERED

EMF=-52.4 mV AT 21:31, 11-04-99

EMF=-52.7 mV AT 21:31, 11-04-99

EMF=-52.7 mV AT 21:31, 11-04-99
ENTERED

1:NH3 SLOPE=-59.0 mV/DEC
AT 21:31, 11-04-99

1:NH3 CONC= 1.49

599T1735
.250 ML

HNF-1685 REV. 0

DOUBLE KNOWN ADDITION SELECTED
AT 21:32, 11-04-99

SAMPLE VOL= 25.000 AT 21:38, 11-04-99
ENTERED

EMF= 56.7 mV AT 21:40, 11-04-99

EMF= 56.6 mV AT 21:40, 11-04-99
ENTERED

STD CONCN= 998 AT 21:40, 11-04-99
ENTERED

STD VOL= .25000 AT 21:40, 11-04-99
ENTERED

EMF=-4.5 mV AT 21:41, 11-04-99

EMF= 2.3 mV AT 21:43, 11-04-99

EMF= 2.6 mV AT 21:44, 11-04-99

EMF= 2.6 mV AT 21:44, 11-04-99
ENTERED

STD VOL= 2.5000 AT 21:44, 11-04-99
ENTERED

EMF=-52.6 mV AT 21:46, 11-04-99

EMF=-52.8 mV AT 21:46, 11-04-99

EMF=-53.2 mV AT 21:47, 11-04-99

EMF=-53.4 mV AT 21:47, 11-04-99

EMF=-53.4 mV AT 21:47, 11-04-99
ENTERED

1:NH3 SLOPE=-58.9 mV/DEC
AT 21:48, 11-04-99

1:NH3 CONCN= 1.36

1735 DUP
.250mL

HNF-1685 REV. 0

DOUBLE KNOWN ADDITION SELECTED
AT 21:49, 11-04-99

SAMPLE VOL= 25.000 AT 21:55, 11-04-99
ENTERED

EMF= 7.8 mV AT 21:57, 11-04-99

EMF= 7.6 mV AT 21:58, 11-04-99

EMF= 7.5 mV AT 21:58, 11-04-99
ENTERED

STD CONC= 998 AT 21:58, 11-04-99
ENTERED

STD VOL= .25000 AT 21:58, 11-04-99
ENTERED

EMF=-12.7 mV AT 21:59, 11-04-99

EMF=-10.9 mV AT 22:00, 11-04-99

EMF=-10.7 mV AT 22:00, 11-04-99

EMF=-10.7 mV AT 22:00, 11-04-99
ENTERED

STD VOL= 2.5000 AT 22:00, 11-04-99
ENTERED

EMF=-53.7 mV AT 22:03, 11-04-99

EMF=-54.0 mV AT 22:03, 11-04-99

EMF=-54.0 mV AT 22:03, 11-04-99
ENTERED

1:NH3 SLOPE=-57.5 mV/DEC
AT 22:03, 11-04-99

1:NH3 CONC= 9.13

1735 SPK
.250ML
.500ML SPK.

HNF-1685 REV. 0

DOUBLE KNOWN ADDITION SELECTED
AT 22:25, 11-04-99

SAMPLE VOL= 25.000 AT 22:32, 11-04-99
ENTERED

EMF= 8.0 mV AT 22:34, 11-04-99

EMF= 7.9 mV AT 22:34, 11-04-99
ENTERED

STD CONC= 998 AT 22:35, 11-04-99
ENTERED

STD VOL= .25000 AT 22:35, 11-04-99
ENTERED

EMF=-10.1 mV AT 22:36, 11-04-99

EMF=-10.3 mV AT 22:36, 11-04-99

EMF=-10.3 mV AT 22:36, 11-04-99
ENTERED

STD VOL= 2.5000 AT 22:37, 11-04-99
ENTERED

EMF=-54.0 mV AT 22:39, 11-04-99

EMF=-54.2 mV AT 22:40, 11-04-99

EMF=-54.4 mV AT 22:40, 11-04-99

EMF=-54.4 mV AT 22:40, 11-04-99
ENTERED

1:NH3 SLOPE=-59.1 mV/DEC
AT 22:40, 11-04-99

1:NH3 CONC= 9.48

Ending std

54119-F. 500 mL

WORKBOOK PAGE: BLANK1

AMMONIA (NH3) : LA-631-001 (D-0) ^{1/2} _{11/05/99}

LIQUIDS/SOLIDS

			BLNK
	Instrument Data (µg/mL)	ID	0.000
BLNK	Blank Result from the Instrument (µg/mL)	BR	0.198
	Vol of Sample for Dilution (mL) or Vol of Sample Direct (mL)	VSAM	0.250
31616	Final Vol of Dilution (mL) or Vol of Sample Direct (mL)	FVOL	25.0
NH3-01			
LIQUID	Dilution Factor	DF	1.000
99004067			
0			
N/A	NH3 Concentration (µg/mL)	NH3 CONC	< 1.00E+02
BLNK	Detection Limit (µg/mL)	1.00E+02	
NH301	Detection Limit = 1.000µg * (FVOL/VSAM)		
CJO	NH3 Concentration (µg/mL) = (BR) * (FVOL / VSAM) * DDF		
MJL			
RWK			
11/05/99			
11/05/99			
04:00 AM			
	NH3 Concentration (µg/mL)		< 1.00E+02
S-111 GRAB			

Analyst:		RWK Date:	11/05/99
Signature of Chemist:	<i>NA</i>	MJL Date:	
SAMPLE.WB1 REV 1.0		631001ML	

WORKBOOK PAGE: STD2

AMMONIA (NH3) : LA-631-001 (D-0) *11/05/99*

LIQUIDS/SOLIDS

		STD
	Instrument Data (µg/mL) ID	8.620
STD	Blank Result from the Instrument (µg/mL) BR	0.198
	Vol of Sample for Dilution (mL) or Vol of Sample Direct (mL) VSAM	0.500
31616	Final Vol of Dilution (mL) or Vol of Sample Direct (mL) FVOL	25.0
	LCS Standard Book Number LCS	59N19F
NH3-01	LCS Standard Concentration (µg/mL) STD VAL	4.45E+02
LIQUID		
99004067		
0		
N/A	NH3 Concentration (µg/mL) NH3 CONC	4.21E+02
STD	Detection Limit (µg/mL) 5.00E+01	
NH301	Detection Limit = 1.000µg * (FVOL/VSAM)	
CJO	NH3 Concentration (µg/mL) = (ID-BR)*(FVOL /VSAM)	
MJL	QC ACTUAL = STD VAL	
	QC FOUND = (ID-BR) * (FVOL/VSAM)	
RWK		
11/05/99		
	QC ACTUAL (µg)	4.45E+02
11/05/99	QC FOUND (µg)	4.21E+02
04:00 AM		
S-111 GRAB		

Analyst:	RWK	Date: 11/05/99
Signature of Chemist:	<i>NA</i>	MJL Date:

SAMPLE.WB1 REV 1.0

631001ML

WORKBOOK PAGE: SAM3

AMMONIA (NH3) : LA-631-001 (D-0) *11/05/99*

LIQUIDS/SOLIDS

		SAMPLE
	Instrument Data (µg/mL) ID	0.900
SAMPLE	Blank Result from the Instrument (µg/mL) BR	0.198
	Vol of Sample for Dilution (mL) or Vol of Sample Direct (mL) VSAM	0.250
31616	Final Vol of Dilution (mL) or Vol of Sample Direct (mL) FVOL	25.0
NH3-01		
LIQUID	Dilution Factor DF	1.000
99004067		
0		
N/A	NH3 Concentration (µg/mL) NH3 CONC	< 1.00E+02
S99T001731	Detection Limit (µg/mL) 1.00E+02	
NH301	Detection Limit = 1.000µg * (FVOL/VSAM) * DF	
6-10	NH3 Concentration (µg/mL) = (ID-BR) * (FVOL / VSAM)*DF	
MJL		
RWK		
11/05/99		
11/05/99		
04:00 AM		
	NH3 Concentration (µg/mL)	< 1.00E+02
S-111 GRAB		

Analyst:	RWK	Date: 11/05/99
Signature of Chemist:	<i>MA</i>	MJL Date:

SAMPLE.WB1 REV 1.0

631001ML

WORKBOOK PAGE: DUP4

AMMONIA (NH3) : LA-631-001 (D-2) ^{1/2} _{11/04/99}

LIQUIDS/SOLIDS

		DUP
	Instrument Data (µg/mL) ID	1.240
DUP	Blank Result from the Instrument (µg/mL) BR	0.198
	Vol of Sample for Dilution (mL) or Vol of Sample Direct (mL) VSAM	0.250
31616	Final Vol of Dilution (mL) or Vol of Sample Direct (mL) FVOL	25.0
NH3-01		
LIQUID	Dilution Factor DF	1.000
99004067		
0		
N/A	NH3 Concentration (µg/mL) NH3 CONC	1.04E+02
S99T001731	Detection Limit (µg/mL) 1.00E+02	
NH3-01	Detection Limit = 1.000µg * (FVOL/VSAM) * DF	
CJG	NH3 Concentration (µg/mL) = (ID-BR) * (FVOL / VSAM)*DF	
MJL		
RWK		
11/05/99		
11/05/99		
04:00 AM		
S-111 GRAB	NH3 Concentration (µg/mL)	1.04E+02

Analyst:

RWK Date: 11/05/99

Signature of Chemist:

MJL Date:

SAMPLE.WB1 REV 1.0

631001ML

WORKBOOK PAGE: SAM5

AMMONIA (NH3) : LA-631-001 (D-0) *1*

LIQUIDS/SOLIDS

		SAMPLE
	Instrument Data (µg/mL) ID	2.040
SAMPLE	Blank Result from the Instrument (µg/mL) BR	0.198
	Vol of Sample for Dilution (mL) or Vol of Sample Direct (mL) VSAM	0.250
31616	Final Vol of Dilution (mL) or Vol of Sample Direct (mL) FVOL	25.0
NH3-01		
LIQUID	Dilution Factor DF	1.000
99004067		
0		
N/A	NH3 Concentration (µg/mL) NH3 CONC	1.84E+02
S99T001734	Detection Limit (µg/mL) 1.00E+02	
NH301	Detection Limit = 1.000µg * (FVOL/VSAM) * DF	
CS10	NH3 Concentration (µg/mL) = (ID-BR) * (FVOL / VSAM)*DF	
MJL		
RWK		
11/05/99		
11/05/99		
04:00 AM		
S-111 GRAB	NH3 Concentration (µg/mL)	1.84E+02

Analyst:

RWK Date: 11/05/99

Signature of Chemist:

MJL Date:

SAMPLE.WB1 REV 1.0

631001ML

WORKBOOK PAGE: DUP6

AMMONIA (NH3) : LA-631-001 (D-0) 11/94

LIQUIDS/SOLIDS

		DUP
	Instrument Data (µg/mL) ID	1.670
DUP	Blank Result from the Instrument (µg/mL) BR	0.198
	Vol of Sample for Dilution (mL) or Vol of Sample Direct (mL) VSAM	0.250
31616	Final Vol of Dilution (mL) or Vol of Sample Direct (mL) FVOL	25.0
NH3-01		
LIQUID	Dilution Factor DF	1.000
99004067		
0		
N/A	NH3 Concentration (µg/mL) NH3 CONC	1.47E+02
S99T001734	Detection Limit (µg/mL) 1.00E+02	
NH301	Detection Limit = 1.000µg * (FVOL/VSAM) * DF	
CJO	NH3 Concentration (µg/mL) = (ID-BR) * (FVOL / VSAM)*DF	
MJL		
RWK		
11/05/99		
11/05/99		
04:00 AM		
S-111 GRAB	NH3 Concentration (µg/mL)	1.47E+02

Analyst:

RWK Date: 11/05/99

Signature of Chemist:

MJL Date:

SAMPLE.WB1 REV 1.0

631001ML

WORKBOOK PAGE: SAM7

AMMONIA (NH3) : LA-631-001 (D-0) ¹ ~~11/05/99~~

LIQUIDS/SOLIDS

			SAMPLE
	Instrument Data (µg/mL)	ID	1.490
SAMPLE	Blank Result from the Instrument (µg/mL)	BR	0.198
	Vol of Sample for Dilution (mL) or Vol of Sample Direct (mL)	VSAM	0.250
31616	Final Vol of Dilution (mL) or Vol of Sample Direct (mL)	FVOL	25.0
NH3-01			
LIQUID	Dilution Factor	DF	1.000
99004067			
0			
N/A	NH3 Concentration (µg/mL)	NH3 CONC	1.29E+02
S99T001735	Detection Limit (µg/mL)	1.00E+02	
NH301	Detection Limit = 1.000µg * (FVOL/VSAM) * DF		
CJO	NH3 Concentration (µg/mL) = (ID-BR) * (FVOL / VSAM)*DF		
MJL			
RWK			
11/05/99			
11/05/99			
04:00 AM			
	NH3 Concentration (µg/mL)		1.29E+02
S-111 GRAB			

Analyst:

RWK Date: 11/05/99

Signature of Chemist:

MJL Date:

SAMPLE.WB1 REV 1.0

631001ML

WORKBOOK PAGE: DUP8

AMMONIA (NH3) : LA-631-001 (D-0) ¹ ~~2~~**LIQUIDS/SOLIDS**

		DUP
	Instrument Data (µg/mL) ID	1.360
DUP	Blank Result from the Instrument (µg/mL) BR	0.198
	Vol of Sample for Dilution (mL) or Vol of Sample Direct (mL) VSAM	0.250
31616	Final Vol of Dilution (mL) or Vol of Sample Direct (mL) FVOL	25.0
NH3-01		
LIQUID	Dilution Factor DF	1.000
99004067		
0		
N/A	NH3 Concentration (µg/mL) NH3 CONC	1.16E+02
S99T001735	Detection Limit (µg/mL) 1.00E+02	
NH3-01	Detection Limit = 1.000µg * (FVOL/VSAM) * DF	
C-10	NH3 Concentration (µg/mL) = (ID-BR) * (FVOL / VSAM)*DF	
MJL		
RWK		
11/05/99		
11/05/99		
04:00 AM		
S-111 GRAB	NH3 Concentration (µg/mL)	1.16E+02

Analyst:

RWK Date: 11/05/99

Signature of Chemist:

MJL Date:

SAMPLE.WB1 REV 1.0

631001ML

WORKBOOK PAGE: SPIKE9

AMMONIA (NH3) : LA-631-001 (D-0) *11/05/99*

LIQUIDS/SOLIDS

		SPK
	Instrument Data (µg/mL) ID	9.130
SPK	Blank Result from the Instrument (µg/mL) BR	0.198
	Vol of Sample for Dilution (mL) or Vol of Sample Direct (mL) VSAM	0.250
31616	Final Vol of Dilution (mL) or Vol of Sample Direct (mL) FVOL	25.0
	Spike Book Number SPK	59N19F
NH3-01	Spike Value (µg/mL) SPK VAL	4.45E+02
	Vol of Spike Standard Used (mL) VOL SPK	0.500
LIQUID		
99004067		
	Sample Instrument Data (µg/mL) SAM ID	1.49
0	Sample Volume of Sample (mL) SAM VSAM	0.250
	Sample Final Volume (mL) SAM FVOL	25.0
N/A		
S99T001735		
NH301		
CJO		
MJL	QC ACTUAL = SPK VAL * VOL SPK	
RWK	QC FOUND = (((ID-BR) * FVOL) - (SAM ID - BR) * SAM FVOL * (VSAM / SAM VSAM))	
11/05/99		
	QC ACTUAL (µg)	2.23E+02
11/05/99	QC FOUND (µg)	1.91E+02
04:00 AM		
S-111 GRAB		

Analyst:

RWK Date: 11/05/99

Signature of Chemist:

MJL Date:

SAMPLE.WB1 REV 1.0

631001ML

WORKBOOK PAGE: ST_END10

AMMONIA (NH3) : LA-631-001 (D-0) *1/10/99*

LIQUIDS/SOLIDS

		STD
	Instrument Data (µg/mL) ID	9.480
STD	Blank Result from the Instrument (µg/mL) BR	0.198
	Vol of Sample for Dilution (mL) or Vol of Sample Direct (mL) VSAM	0.500
31616	Final Vol of Dilution (mL) or Vol of Sample Direct (mL) FVOL	25.0
	LCS Standard Book Number LCS	59N19F
NH3-01	LCS Standard Concentration (µg/mL) STD VAL	4.45E+02
LIQUID		
99004067		
0		
N/A	NH3 Concentration (µg/mL) NH3 CONC	4.64E+02
END STD	Detection Limit (µg/mL) 5.00E+01	
NH3-01	Detection Limit = $1.000\mu\text{g} * (\text{FVOL}/\text{VSAM})$	
0.198	NH3 Concentration (µg/mL) = $(\text{ID}-\text{BR}) * (\text{FVOL} / \text{VSAM})$	
MJL	QC ACTUAL = STD VAL	
	QC FOUND = $(\text{ID}-\text{BR}) * (\text{FVOL}/\text{VSAM})$	
RWK		
11/05/99		
	QC ACTUAL (µg)	4.45E+02
11/05/99	QC FOUND (µg)	4.64E+02
04:00 AM		
S-111 GRAB		

Analyst:

RWK Date: 11/05/99

Signature of Chemist:

MJL Date:

SAMPLE.WB1 REV 1.0

631001ML

LABCORE Completed Worklist Report for Worklist# 31615

Analyst: krm

Instrument: IC45S1

Book#: 95N21E

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

Worklist Comment: S-111 GRAB, @IC-01 skm

Seq Type	Sample#	R A	Test	Matrix	Actual	Found	DL or Yield	Unit
1 CCB	0	0	01C-QC	F	QC	1	<1.20e-2	ug/mL
1 CCB	0	0	01C-QC	CL	QC	1	<1.70e-2	ug/mL
1 CCB	0	0	01C-QC	NO2	QC	1	<1.88e-1	ug/mL
1 CCB	0	0	01C-QC	BR	QC	1	<1.25e-1	ug/mL
1 CCB	0	0	01C-QC	NO3	QC	1	<1.39e-1	ug/mL
1 CCB	0	0	01C-QC	PO4	QC	1	<1.20e-1	ug/mL
1 CCB	0	0	01C-QC	SO4	QC	1	<1.38e-1	ug/mL
1 CCB	0	0	01C-QC	OXALATE2	QC	1	<1.05e-1	ug/mL
2 LCS-INST	0	0	01C-QC	F	QC	6.40e1	8.35e+01	99.375 % Recovery
2 LCS-INST	0	0	01C-QC	CL	QC	9.00e1	8.83e+01	98.111 % Recovery
2 LCS-INST	0	0	01C-QC	NO2	QC	5.32e2	5.13e+02	96.429 % Recovery
2 LCS-INST	0	0	01C-QC	BR	QC	6.25e2	6.41e+02	102.560 % Recovery
2 LCS-INST	0	0	01C-QC	NO3	QC	6.98e2	7.12e+02	101.887 % Recovery
2 LCS-INST	0	0	01C-QC	PO4	QC	6.35e2	5.93e+02	93.386 % Recovery
2 LCS-INST	0	0	01C-QC	SO4	QC	6.90e2	6.83e+02	98.986 % Recovery
2 LCS-INST	0	0	01C-QC	OXALATE2	QC	5.23e2	5.35e+02	102.294 % Recovery
3 CCV	0	0	01C-QC	F	QC	6.33e1	8.71e+01	105.669 % Recovery
3 CCV	0	0	01C-QC	CL	QC	8.75e1	9.16e+01	104.686 % Recovery
3 CCV	0	0	01C-QC	NO2	QC	5.34e2	5.87e+02	109.925 % Recovery
3 CCV	0	0	01C-QC	BR	QC	6.30e2	6.76e+02	107.302 % Recovery
3 CCV	0	0	01C-QC	NO3	QC	7.08e2	7.30e+02	104.286 % Recovery
3 CCV	0	0	01C-QC	PO4	QC	6.35e2	6.27e+02	98.740 % Recovery
3 CCV	0	0	01C-QC	SO4	QC	6.90e2	7.38e+02	106.797 % Recovery
3 CCV	0	0	01C-QC	OXALATE2	QC	5.17e2	5.50e+02	106.383 % Recovery
4 SAMPLE	S99T001730	0	01C-01	F-02	LIQUID	N/A	2.429e+02	49.630 ug/mL
4 SAMPLE	S99T001730	0	01C-01	CL-02	LIQUID	N/A	5.782e+03	70.400 ug/mL
4 SAMPLE	S99T001730	0	01C-01	NO2-02	LIQUID	N/A	4.743e+04	447.200 ug/mL
4 SAMPLE	S99T001730	0	01C-01	BR-02	LIQUID	N/A	5.176e+02	517.600 ug/mL
4 SAMPLE	S99T001730	0	01C-01	NO3-02	LIQUID	N/A	2.145e+05	575.400 ug/mL
4 SAMPLE	S99T001730	0	01C-01	PO4-02	LIQUID	N/A	1.854e+03	496.800 ug/mL
4 SAMPLE	S99T001730	0	01C-01	SO4-02	LIQUID	N/A	4.887e+03	571.300 ug/mL
4 SAMPLE	S99T001730	0	01C-01	OXALATE2	LIQUID	N/A	4.348e+02	434.800 ug/mL
5 DUP	S99T001730	0	01C-01	F-02	LIQUID	2.43e+02	2.31e+02	5.063 RPD
5 DUP	S99T001730	0	01C-01	CL-02	LIQUID	5.78e+03	5.95e+03	2.899 RPD
5 DUP	S99T001730	0	01C-01	NO2-02	LIQUID	4.74e+04	4.86e+04	1.785 RPD
5 DUP	S99T001730	0	01C-01	BR-02	LIQUID	<5.18e2	<5.18e2	RPD
5 DUP	S99T001730	0	01C-01	NO3-02	LIQUID	2.15e+05	2.14e+05	0.466 RPD
5 DUP	S99T001730	0	01C-01	PO4-02	LIQUID	1.85e+03	2.32e+03	22.542 RPD
5 DUP	S99T001730	0	01C-01	SO4-02	LIQUID	4.89e+03	4.98e+03	1.824 RPD
5 DUP	S99T001730	0	01C-01	OXALATE2	LIQUID	<4.35e2	<4.35e2	RPD
6 SAMPLE	S99T001732	0	01C-01	F-02	LIQUID	N/A	2.456e+02	49.630 ug/mL

7/8 11/23/99 PO4 was re-run

7/8 11/23/99 PO4 was re-run

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

LABCORE Completed Worklist Report for Worklist# 31615

Seq Type	Sample#	R A	Test	Matrix	Actual	Found	DL or Yield	Unit
6 SAMPLE	S99T001732	0	②IC-01 CL-02	LIQUID	N/A	7.807e+03	70.400	ug/mL
6 SAMPLE	S99T001732	0	②IC-01 NO2-02	LIQUID	N/A	8.866e+04	447.200	ug/mL
6 SAMPLE	S99T001732	0	②IC-01 BR-02	LIQUID	N/A	5.176e+02	517.600	ug/mL
6 SAMPLE	S99T001732	0	②IC-01 NO3-02	LIQUID	N/A	1.753e+05	575.600	ug/mL
6 SAMPLE	S99T001732	0	②IC-01 PO4-02	LIQUID	N/A	1.856e+03	496.900	ug/mL
6 SAMPLE	S99T001732	0	②IC-01 SO4-02	LIQUID	N/A	2.669e+03	571.500	ug/mL
6 SAMPLE	S99T001732	0	②IC-01 OXALATE2	LIQUID	N/A	4.348e+02	434.800	ug/mL
7 DUP	S99T001732	0	②IC-01 F-02	LIQUID	2.66e+02	2.87e+02	7.595	RPD
7 DUP	S99T001732	0	②IC-01 CL-02	LIQUID	7.81e+03	7.71e+03	1.289	RPD
7 DUP	S99T001732	0	②IC-01 NO2-02	LIQUID	8.87e+04	8.83e+04	0.452	RPD
7 DUP	S99T001732	0	②IC-01 BR-02	LIQUID	<5.18e2	<5.18e2		RPD
7 DUP	S99T001732	0	②IC-01 NO3-02	LIQUID	1.75e+05	1.77e+05	1.136	RPD
7 DUP	S99T001732	0	②IC-01 PO4-02	LIQUID	1.86e+03	1.88e+03	1.070	RPD
7 DUP	S99T001732	0	②IC-01 SO4-02	LIQUID	2.67e+03	3.18e+03	17.436	RPD
7 DUP	S99T001732	0	②IC-01 OXALATE2	LIQUID	<4.35e2	<4.35e2		RPD
8 SAMPLE	S99T001733	0	②IC-01 F-02	LIQUID	N/A	2.798e+02	49.690	ug/mL
8 SAMPLE	S99T001733	0	②IC-01 CL-02	LIQUID	N/A	8.209e+03	70.400	ug/mL
8 SAMPLE	S99T001733	0	②IC-01 NO2-02	LIQUID	N/A	9.499e+04	447.200	ug/mL
8 SAMPLE	S99T001733	0	②IC-01 BR-02	LIQUID	N/A	5.176e+02	517.600	ug/mL
8 SAMPLE	S99T001733	0	②IC-01 NO3-02	LIQUID	N/A	1.874e+05	575.600	ug/mL
8 SAMPLE	S99T001733	0	②IC-01 PO4-02	LIQUID	N/A	2.183e+03	496.900	ug/mL
8 SAMPLE	S99T001733	0	②IC-01 SO4-02	LIQUID	N/A	2.893e+03	571.500	ug/mL
8 SAMPLE	S99T001733	0	②IC-01 OXALATE2	LIQUID	N/A	4.348e+02	434.800	ug/mL
9 DUP	S99T001733	0	②IC-01 F-02	LIQUID	2.80e+02	2.97e+02	5.893	RPD
9 DUP	S99T001733	0	②IC-01 CL-02	LIQUID	8.21e+03	8.14e+03	0.856	RPD
9 DUP	S99T001733	0	②IC-01 NO2-02	LIQUID	9.50e+04	9.31e+04	2.020	RPD
9 DUP	S99T001733	0	②IC-01 BR-02	LIQUID	<5.18e2	<5.18e2		RPD
9 DUP	S99T001733	0	②IC-01 NO3-02	LIQUID	1.87e+05	1.86e+05	0.536	RPD
9 DUP	S99T001733	0	②IC-01 PO4-02	LIQUID	2.18e+03	1.83e+03	33.833	RPD
9 DUP	S99T001733	0	②IC-01 SO4-02	LIQUID	2.89e+03	3.34e+03	14.446	RPD
9 DUP	S99T001733	0	②IC-01 OXALATE2	LIQUID	<4.35e2	<4.35e2		RPD
10 SPK	S99T001733	0	②IC-01 F-02	LIQUID	6.40e1	5.75e+01	89.844	% Recovery
10 SPK	S99T001733	0	②IC-01 CL-02	LIQUID	9.08e1	8.43e+01	93.667	% Recovery
10 SPK	S99T001733	0	②IC-01 NO2-02	LIQUID	5.32e2	4.71e+02	88.534	% Recovery
10 SPK	S99T001733	0	②IC-01 BR-02	LIQUID	6.25e2	6.07e+02	97.120	% Recovery
10 SPK	S99T001733	0	②IC-01 NO3-02	LIQUID	6.90e2	5.94e+02	86.087	% Recovery
10 SPK	S99T001733	0	②IC-01 PO4-02	LIQUID	6.35e2	5.01e+02	94.846	% Recovery
10 SPK	S99T001733	0	②IC-01 SO4-02	LIQUID	6.90e2	6.78e+02	98.261	% Recovery
10 SPK	S99T001733	0	②IC-01 OXALATE2	LIQUID	5.23e2	5.20e+02	99.426	% Recovery

XB 11/23/99 PO4 was re-run

XB 11/23/99 PO4 was re-run

XB 11/23/99 PO4 was re-run

Final page for worklist# 31615

Analyst Signature Date

Analyst Signature Date

Reviewer Signature Date 11/8/99

11/02/99 09:47

HNF-1685 REV. 0

Page: 1

ws2

LABCORE Data Entry Template for Worklist# 31615

Analyst:

KRM Instrument: IC 4551

Book#

95121 E
94N21 EMethod: LA-533-105 Rev/Mod F-1

Worklist Comment: S-111 GRAB, @IC-01 skm

S Type	Sample#	R A	Test	Matrix	Group#	Project
1 CCB			@IC-QC	QC		
2 LCS-INST			@IC-QC	QC		
3 CCV			@IC-QC	QC		
4 SAMPLE	S99T001730 0		@IC-01	LIQUID	99000304	S-111 GRAB
Analytes Requested: BR-02 , CL-02 , F-02 , NO2-02 , NO3-02 , OXALATE2, PO4-02 , SO4-02						
5 DUP	S99T001730 0		@IC-01	LIQUID		
6 SAMPLE	S99T001732 0		@IC-01	LIQUID	99000304	S-111 GRAB
Analytes Requested: BR-02 , CL-02 , F-02 , NO2-02 , NO3-02 , OXALATE2, PO4-02 , SO4-02						
7 DUP	S99T001732 0		@IC-01	LIQUID		
8 SAMPLE	S99T001733 0		@IC-01	LIQUID	99000304	S-111 GRAB
Analytes Requested: BR-02 , CL-02 , F-02 , NO2-02 , NO3-02 , OXALATE2, PO4-02 , SO4-02						
9 DUP	S99T001733 0		@IC-01	LIQUID		
10 SPK	S99T001733 0		@IC-01	LIQUID		

Final page for worklist # 31615

11-5-99

Signature

Date

Data Entry Comments:

uploaded 11-8-99

John Hanelle

31615 NOV. CSV

Validated. PO4 Lashugh RPDav

2 samples but is very near detection
limit for detection run. 11/8/99

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

HNF-1685 REV. 0

```

=====
Sample Name: CCB                               Date: 11/05/1999 21:41:50
Data File  : C:\DX\DATA\99110511.D01
Method     : C:\DX\METHOD\ANIONSa.met
ACI Address: 1 System: 1 Inject#: 1           Detector: CDM-1
Analyst    : [Signature] Column: AG4A/AS4A anion column
=====

```

```

=====
Calibration Volume Dilution Points Rate Start Stop Area Reject
-----
External          1           1 3300 5Hz 0.00 11.00          50
=====

```

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

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

File: 99110511.D01 Sample: CCB

SIGNATURE ABOVE REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 138 TO 147.

HNF-1685 REV. 0

```

=====
Sample Name: LCS 95N21E                      Date: 11/05/1999 21:55:28
Data File  : C:\DX\DATA\99110511.D02
Method     : C:\DX\METHOD\ANIONSa.met
ACI Address: 1 System: 1 Inject#: 2           Detector: CDM-1
Analyst    :                               Column: AG4A/AS4A anion column
=====

```

```

=====
Calibration Volume Dilution Points Rate Start Stop Area Reject
-----
External          1          101  3300  5Hz   0.00 11.00          50
=====

```

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.93		0.000	19	67	2	
2	1.05	fluoride 99.1	63.590	1448	5827	2	0.00
3	1.57	chloride 98.1	88.291	1426	5630	1	-0.84
4	1.88	nitrite 96.4	512.780	4067	20738	1	-0.70
5	2.83	bromide 102.6	641.439	2932	17610	1	-1.17
6	3.21	nitrate 106.0	731.559	3737	25875	1	-1.63
7	4.56	phosphate 93.3	592.556	903	10803	1	0.00
8	5.97	sulfate 98.9	682.647	2331	32381	1	-1.75
9	7.79	oxalate 102.3	535.207	1060	20006	1	-2.05
Totals			3848.070	17923	138936		

File: 99110511.D02 Sample: LCS 95N21E

HNF-1685 REV. 0

```

=====
Sample Name: CCV 94N21E                      Date: 11/05/1999 22:09:06
Data File  : C:\DX\DATA\99110511.D03
Method     : C:\DX\METHOD\ANIONSa.met
ACI Address: 1 System: 1 Inject#: 3           Detector: CDM-1
Analyst    :                               Column: AG4A/AS4A anion column
=====

```

```

=====
Calibration Volume Dilution Points Rate Start Stop Area Reject
-----
External          1          101  3300  5Hz   0.00 11.00          50
=====

```

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.93		0.000	15	56	2	
2	1.05	fluoride 105.6	67.072	1540	6154	2	0.00
3	1.57	chloride 104.7	91.588	1452	5841	1	-0.84
4	1.88	nitrite 110.0	587.389	4501	23858	1	-0.70
5	2.83	bromide 107.3	676.279	3107	18605	1	-1.17
6	3.21	nitrate 104.3	730.114	3731	25823	1	-1.63
7	4.56	phosphate 98.8	627.183	969	11440	1	0.00
8	5.97	sulfate 105.6	730.015	2539	34690	1	-1.75
9	7.79	oxalate 106.4	550.130	1085	20574	1	-2.05
Totals			4059.770	18938	147040		

File: 99110511.D03 Sample: CCV 94N21E

HNF-1685 REV. 0

```

=====
Sample Name: S99T001730                      Date: 11/05/1999 22:22:44
Data File  : C:\DX\DATA\99110511.D04
Method     : C:\DX\METHOD\ANIONSa.met
ACI Address: 1 System: 1 Inject#: 4           Detector: CDM-1
Analyst    :                               Column: AG4A/AS4A anion column
=====

```

```

-----
Calibration Volume Dilution Points Rate Start Stop Area Reject
-----
External          1         4141   3300  5Hz   0.00 11.00      50
-----

```

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.93		0.000	109	711	2	
2	1.09	fluoride	242.934	127	485	2	3.16
3	1.17		0.000	221	1241	2	
4	1.57	chloride	5781.710	2214	9022	1	-0.84
5	1.89	nitrite	67425.736	13344	69275	1	-0.35
6	3.11	nitrate	214543.018	27985	217493	1	-4.90
7	4.56	phosphate	1853.763	84	869	1	0.00
8	5.97	sulfate	4886.977	351	5286	1	-1.75
Totals			294734.139	44434	304382		

File: 99110511.D04 Sample: S99T001730

HNF-1685 REV. 0

```

=====
Sample Name: S99T1730 DUP                      Date: 11/05/1999 22:36:23
Data File  : C:\DX\DATA\99110511.D05
Method     : C:\DX\METHOD\ANIONSa.met
ACI Address: 1 System: 1 Inject#: 5             Detector: CDM-1
Analyst    :                               Column: AG4A/AS4A anion column
=====

```

```

=====
Calibration Volume Dilution Points Rate Start Stop Area Reject
=====
External          1          4141  3300  5Hz   0.00 11.00          50
=====

```

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.93		0.000	100	648	2	
2	1.09	fluoride	231.086	119	459	2	3.16
3	1.17		0.000	212	1183	2	
4	1.57	chloride	5953.919	2220	9294	1	-0.84
5	1.89	nitrite	68645.881	13333	70588	1	-0.35
6	3.11	nitrate	214412.829	28147	217330	1	-4.69
7	4.56	phosphate	2317.836	86	1072	1	0.00
8	5.97	sulfate	4983.825	357	5399	1	-1.75
Totals			296545.376	44575	305972		

File: 99110511.D05 Sample: S99T1730 DUP

HNF-1685 REV. 0

```

=====
Sample Name: S99T001732                      Date: 11/05/1999 22:50:01
Data File  : C:\DX\DATA\99110511.D06
Method     : C:\DX\METHOD\ANIONSa.met
ACI Address: 1 System: 1 Inject#: 6           Detector: CDM-1
Analyst    :                               Column: AG4A/AS4A anion column
=====

```

```

-----
Calibration Volume Dilution Points Rate Start Stop Area Reject
-----
External          1         4141   3300  5Hz   0.00 11.00         50
-----

```

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.92		0.000	131	860	2	
2	1.09	fluoride	265.608	147	536	2	3.80
3	1.17		0.000	243	1471	2	
4	1.57	chloride	7807.354	2949	12226	1	-0.84
5	1.89	nitrite	88662.633	17378	92424	1	-0.35
6	3.13	nitrate	175342.183	22713	170792	1	-4.29
7	4.56	phosphate	1855.594	81	870	1	0.00
8	5.97	sulfate	2668.705	202	2720	1	-1.75
Totals			276602.076	43844	281900		

File: 99110511.D06 Sample: S99T001732

```

=====
Sample Name: S99T001732 DUP                      Date: 11/05/1999 23:03:39
Data File  : C:\DX\DATA\99110511.D07
Method     : C:\DX\METHOD\ANIONSa.met
ACI Address: 1 System: 1 Inject#: 7                Detector: CDM-1
Analyst    :                                     Column: AG4A/AS4A anion column
=====

```

```

=====
Calibration Volume Dilution Points Rate Start Stop Area Reject
-----
External          1         4141  3300  5Hz   0.00 11.00          50
=====

```

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.92		0.000	127	829	2	
2	1.09	fluoride	286.502	148	582	2	3.16
3	1.17		0.000	239	1324	2	
4	1.57	chloride	7706.793	2922	12066	1	-1.26
5	1.89	nitrite	88253.244	17485	91972	1	-0.35
6	3.13	nitrate	177317.632	22690	173044	1	-4.29
7	4.56	phosphate	1880.772	81	881	1	0.00
8	5.97	sulfate	3182.162	208	3313	1	-1.75
Totals			278627.104	43899	284012		

File: 99110511.D07 Sample: S99T001732 DUP

```

=====
Sample Name: S99T001733                      Date: 11/05/1999 23:17:18
Data File  : C:\DX\DATA\99110511.D08
Method     : C:\DX\METHOD\ANION$$.met
ACI Address: 1 System: 1 Inject#: 8           Detector: CDM-1
Analyst    :                               Column: AG4A/AS4A anion column
=====

```

```

-----
Calibration Volume Dilution Points Rate Start Stop Area Reject
-----
External          1          4141   3300  5Hz   0.00 11.00          50
-----

```

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.91		0.000	138	947	2	
2	1.09	fluoride	279.811	158	568	2	3.80
3	1.17		0.000	256	1501	2	
4	1.57	chloride	8207.962	3086	12862	1	-1.26
5	1.89	nitrite	94993.993	18408	99451	1	-0.35
6	3.12	nitrate	187402.860	23923	184696	1	-4.49
7	4.56	phosphate	2182.164	88	1013	1	0.00
8	5.97	sulfate	2892.684	216	2978	1	-1.75
Totals			295959.474	46273	304017		

File: 99110511.D08 Sample: S99T001733

```

=====
Sample Name: S99T001733 DUP                      Date: 11/05/1999 23:30:56
Data File  : C:\DX\DATA\99110511.D09
Method     : C:\DX\METHOD\ANIONSa.met
ACI Address: 1 System: 1 Inject#: 9                Detector: CDM-1
Analyst    :                               Column: AG4A/AS4A anion column
=====

```

```

-----
Calibration Volume Dilution Points Rate Start Stop Area Reject
-----
External          1       4141   3300  5Hz   0.00 11.00          50
-----

```

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.93		0.000	145	976	2	
2	1.09	fluoride	296.800	165	605	2	3.16
3	1.17		0.000	271	1598	2	
4	1.57	chloride	8138.321	3065	12752	1	-1.26
5	1.89	nitrite	93104.933	18470	97348	1	-0.35
6	3.12	nitrate	185736.899	23996	182753	1	-4.49
7	4.56	phosphate	1571.720	79	746	1	0.00
8	5.97	sulfate	3344.722	226	3501	1	-1.75
Totals			292193.395	46418	300279		

File: 99110511.D09 Sample: S99T001733 DUP

```

=====
Sample Name: S99T001733 SPK                      Date: 11/05/1999 23:44:34
Data File  : C:\DX\DATA\99110511.D10
Method     : C:\DX\METHOD\ANIONSa.met
ACI Address: 1 System: 1 Inject#: 10              Detector: CDM-1
Analyst    :                      Column: AG4A/AS4A anion column
=====

```

```

-----
Calibration Volume Dilution Points Rate Start Stop Area Reject
-----
External           1           4141  3300  5Hz   0.00 11.00          50
-----

```

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.93		0.000	102	503	2	
2	1.05	fluoride	2598.721	1427	5807	2	-0.63
3	1.17		0.000	291	1498	2	
4	1.57	chloride	11606.241	4468	18300	1	-1.26
5	1.89	nitrite	113977.224	22527	120883	1	-0.35
6	2.81	bromide	24488.789	2968	16353	1	-1.63
7	3.11	nitrate	211351.411	27498	213518	1	-4.69
8	4.53	phosphate	26418.557	972	11757	1	-0.58
9	5.92	sulfate	30237.168	2152	35055	1	-2.63
10	7.79	oxalate	20980.583	1022	19112	1	-2.05
Totals			441658.695	63427	442784		

File: 99110511.D10 Sample: S99T001733 SPK

LABCORE Completed Worklist Report for Worklist# 31627

Analyst: krm

Instrument: IC45S1

Book#: 95N21E

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

Worklist Comment: S-111 GRAB, @IC-01 skm

Seq Type	Sample#	R A	Test	Matrix	Actual	Found	DL or Yield	Unit
1 CCB	0	0	01C-QC F	QC	1	<4.97e1		ug/mL
1 CCB	0	0	01C-QC CL	QC	1	<7.04e1		ug/mL
1 CCB	0	0	01C-QC NO2	QC	1	<4.47e2		ug/mL
1 CCB	0	0	01C-QC BR	QC	1	<5.18e2		ug/mL
1 CCB	0	0	01C-QC NO3	QC	1	<5.76e2		ug/mL
1 CCB	0	0	01C-QC PO4	QC	1	<4.97e2		ug/mL
1 CCB	0	0	01C-QC SO4	QC	1	<5.71e2		ug/mL
1 CCB	0	0	01C-QC OKALATE2	QC	1	<4.35e2		ug/mL
2 LCS-INST	0	0	01C-QC F	QC	6.40e1	6.54e+01	102.188 % Recovery	
2 LCS-INST	0	0	01C-QC CL	QC	9.00e1	8.67e+01	96.333 % Recovery	
2 LCS-INST	0	0	01C-QC NO2	QC	5.32e2	5.03e+02	94.549 % Recovery	
2 LCS-INST	0	0	01C-QC BR	QC	6.25e2	6.25e+02	100.000 % Recovery	
2 LCS-INST	0	0	01C-QC NO3	QC	6.90e2	7.54e+02	109.275 % Recovery	
2 LCS-INST	0	0	01C-QC PO4	QC	6.35e2	6.19e+02	97.480 % Recovery	
2 LCS-INST	0	0	01C-QC SO4	QC	6.90e2	6.94e+02	100.580 % Recovery	
2 LCS-INST	0	0	01C-QC OKALATE2	QC	5.23e2	5.44e+02	104.015 % Recovery	
3 CCV	0	0	01C-QC F	QC	6.35e1	7.27e+01	114.488 % Recovery	
3 CCV	0	0	01C-QC CL	QC	8.75e1	9.07e+01	103.657 % Recovery	
3 CCV	0	0	01C-QC NO2	QC	5.34e2	5.75e+02	107.678 % Recovery	
3 CCV	0	0	01C-QC BR	QC	6.30e2	6.66e+02	105.714 % Recovery	
3 CCV	0	0	01C-QC NO3	QC	7.00e2	7.32e+02	104.571 % Recovery	
3 CCV	0	0	01C-QC PO4	QC	6.35e2	6.57e+02	103.465 % Recovery	
3 CCV	0	0	01C-QC SO4	QC	6.90e2	7.40e+02	107.246 % Recovery	
3 CCV	0	0	01C-QC OKALATE2	QC	5.17e2	5.60e+02	108.317 % Recovery	
4 BLNK-PREP	0	0	01C-01 F-02	SOLID	1	<1.20e-2		ug/g
4 BLNK-PREP	0	0	01C-01 CL-02	SOLID	1	1.70e-02	0.017	ug/g
4 BLNK-PREP	0	0	01C-01 NO2-02	SOLID	1	<1.08e-1		ug/g
4 BLNK-PREP	0	0	01C-01 BR-02	SOLID	1	<1.25e-1		ug/g
4 BLNK-PREP	0	0	01C-01 NO3-02	SOLID	1	<1.39e-1		ug/g
4 BLNK-PREP	0	0	01C-01 PO4-02	SOLID	1	<1.20e-1		ug/g
4 BLNK-PREP	0	0	01C-01 SO4-02	SOLID	1	<1.38e-1		ug/g
4 BLNK-PREP	0	0	01C-01 OKALATE2	SOLID	1	<1.05e-1		ug/g
5 SAMPLE	S99T001739	0 W	01C-01 CL-02	SOLID	N/A	4.406e+03	329.400	ug/g
5 SAMPLE	S99T001739	0 W	01C-01 NO2-02	SOLID	N/A	4.580e+04	2093.000	ug/g
5 SAMPLE	S99T001739	0 W	01C-01 BR-02	SOLID	N/A	2.422e+03	2422.000	ug/g
5 SAMPLE	S99T001739	0 W	01C-01 SO4-02	SOLID	N/A	1.174e+04	2673.000	ug/g
5 SAMPLE	S99T001739	0 W	01C-01 OKALATE2	SOLID	N/A	2.210e+04	2034.000	ug/g
6 DUP	S99T001739	0 W	01C-01 F-02	SOLID	5.31e+02	5.44e+02	2.422	RPD
6 DUP	S99T001739	0 W	01C-01 CL-02	SOLID	4.41e+03	4.35e+03	1.370	RPD
6 DUP	S99T001739	0 W	01C-01 NO2-02	SOLID	4.58e+04	4.72e+04	3.011	RPD
6 DUP	S99T001739	0 W	01C-01 BR-02	SOLID	<2.42e3	<2.48e3		RPD

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

LABCORE Completed Worklist Report for Worklist# 31627

Seq Type	Sample#	R A	Test	Matrix	Actual	Found	DL or Yield	Unit
6 DUP	S99T001739	0 W	IC-01	NO3-02	SOLID	1.16e+05	9.40e+04	20.852 RPD
6 DUP	S99T001739	0 W	IC-01	PO4-02	SOLID	7.63e+03	4.37e+03	54.213 RPD
6 DUP	S99T001739	0 W	IC-01	SO4-02	SOLID	1.17e+04	1.20e+04	2.532 RPD
6 DUP	S99T001739	0 W	IC-01	OXALATE2	SOLID	2.21e+04	2.32e+04	4.857 RPD
7 SPK	S99T001739	0 W	IC-01	CL-02	SOLID	9.00e1	8.77e+01	97.444 % Recovery
7 SPK	S99T001739	0 W	IC-01	NO2-02	SOLID	5.32e2	5.37e+02	100.940 % Recovery
7 SPK	S99T001739	0 W	IC-01	BR-02	SOLID	6.25e2	6.23e+02	99.680 % Recovery
7 SPK	S99T001739	0 W	IC-01	NO3-02	SOLID	6.90e2	7.38e+02	107.103 % Recovery
7 SPK	S99T001739	0 W	IC-01	PO4-02	SOLID	6.35e2	6.07e+02	95.591 % Recovery
7 SPK	S99T001739	0 W	IC-01	SO4-02	SOLID	6.90e2	6.85e+02	99.275 % Recovery
7 SPK	S99T001739	0 W	IC-01	OXALATE2	SOLID	5.23e2	5.27e+02	100.765 % Recovery

X/B 11/17/99 F⁻, NO₃⁻ and PO₄³⁻ were re-run w/ spike

X/B 11/17/99

X/B 11/17/99

X/B 11/17/99

Final page for worklist# 31627

Analyst Signature _____ Date _____

Analyst Signature _____ Date _____

11/8/99
Reviewer Signature _____ Date _____

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11/02/99 10:37

Page: 1

ws2

LABCORE Data Entry Template for Worklist# 31627

Analyst: KRM Instrument: IC 4551 Book# Q5N21E
94N21EMethod: LA-533-105 Rev/Mod F-1

Worklist Comment: S-111 GRAB, @IC-01 skm

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	CCB				@IC-QC	QC		
2	LCS-INST				@IC-QC	QC		
3	CCV				@IC-QC	QC		
4	BLNK-PREP				@IC-01	SOLID		
5	SAMPLE	S99T001739	0	W	@IC-01	SOLID	99000304	S-111 GRAB
Analytes Requested: BR-02 , CL-02 , F-02 , NO2-02 , NO3-02 , OXALATE2, PO4-02 , SO4-02								
6	DUP	S99T001739	0	W	@IC-01	SOLID		
7	SPK	S99T001739	0	W	@IC-01	SOLID		

Final page for worklist # 31627

Signature Date 11-5-99

Signature Date

Data Entry Comments:

uploaded 11-8-99
John Howell
31627NOV.CSV

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

F, NO₃ & PO₄ rejected
due to failed F^{CCV} std and high
RPD no test. Other analytes
Validated. JMH
11/8/99

=====

Sample Name: CCB	Date: 11/05/1999 23:58:13
Data File : C:\DX\DATA\99110511.D11	
Method : C:\DX\METHOD\ANIONSa.met	
ACI Address: 1 System: 1 Inject#: 11	Detector: CDM-1
Analyst: <i>[Signature]</i>	Column: AG4A/AS4A anion column

=====

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area	Reject
External	1	4141	3300	5Hz	0.00	11.00		50

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

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

SIGNATURE ABOVE REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 151 TO 157

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=====
Sample Name: LCS 95N21E                      Date: 11/06/1999 00:11:51
Data File  : C:\DX\DATA\99110511.D12
Method     : C:\DX\METHOD\ANIONSa.met
ACI Address: 1 System: 1 Inject#: 12          Detector: CDM-1
Analyst    :                               Column: AG4A/AS4A anion column
=====

```

```

-----
Calibration Volume Dilution Points Rate Start Stop Area Reject
-----
External          1          101    3300  5Hz   0.00 11.00          50
-----

```

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.94		0.000	15	54	2	
2	1.05	fluoride 107.1	65.376	1536	5994	2	-0.63
3	1.57	chloride 96.3	86.664	1445	5526	1	-0.84
4	1.89	nitrite 94.5	502.633	4128	20315	1	-0.35
5	2.82	bromide 99.9	624.628	2905	17131	1	-1.40
6	3.21	nitrate 109.3	754.321	3775	26704	1	-1.63
7	4.53	phosphate 97.5	618.969	909	11289	1	-0.58
8	5.97	sulfate 100.6	694.471	2376	32957	1	-1.75
9	7.79	oxalate 104.0	543.741	1097	20330	1	-2.05

```

-----
Totals          3890.801          18187          140300
-----

```

File: 99110511.D12 Sample: LCS 95N21E

```

=====
Sample Name: CCV 94N21E                      Date: 11/06/1999 00:25:29
Data File  : C:\DX\DATA\99110511.D13
Method     : C:\DX\METHOD\ANIONSa.met
ACI Address: 1 System: 1 Inject#: 13          Detector: CDM-1
Analyst    :                               Column: AG4A/AS4A anion column
=====

```

```

-----
Calibration Volume Dilution Points Rate Start Stop Area Reject
-----
External          1          101  3300 SHz  0.00 11.00          50
-----

```

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	1.05	fluoride <i>114.5</i>	72.715	1602	6685	1	-0.63
2	1.57	chloride <i>103.7</i>	90.731	1483	5786	1	-0.84
3	1.89	nitrite <i>107.7</i>	574.919	4570	23336	1	-0.35
4	2.83	bromide <i>105.7</i>	665.834	3132	18306	1	-1.17
5	3.21	nitrate <i>104.6</i>	732.271	3722	25901	1	-1.84
6	4.53	phosphate <i>103.5</i>	657.323	962	11996	1	-0.58
7	5.97	sulfate <i>107.2</i>	739.999	2544	35177	1	-1.75
8	7.79	oxalate <i>108.3</i>	559.889	1118	20945	1	-2.05
Totals			4093.683	19131	148133		

File: 99110511.D13 Sample: CCV 94N21E

HNF-1685 REV. 0

```

=====
Sample Name: PREP BLK                      Date: 11/06/1999 00:39:07
Data File  : C:\DX\DATA\99110511.D14
Method     : C:\DX\METHOD\ANIONSa.met
ACI Address: 1 System: 1 Inject#: 14        Detector: CDM-1
Analyst    :                               Column: AG4A/AS4A anion column
=====

```

```

-----
Calibration Volume Dilution Points Rate Start Stop Area Reject
-----
External          1          1 3300 5Hz 0.00 11.00          50
-----

```

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	1.33		0.000	14	59	1	
2	1.59	chloride	0.017	19	116	1	0.00
3	8.80		0.000	16	702	1	
Totals			0.017	49	878

HNF-1685 REV. 0

```

=====
Sample Name: S99T001739                      Date: 11/06/1999 00:52:45
Data File  : C:\DX\DATA\99110511.D15
Method     : C:\DX\METHOD\ANIONSa.met
ACI Address: 1 System: 1 Inject#: 15          Detector: CDM-1
Analyst    :                               Column: AG4A/AS4A anion column
=====

```

```

-----
Calibration Volume Dilution Points Rate Start Stop Area Reject
-----
External          1          101    3300   5Hz   0.00 11.00          50
-----

```

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	1.05	fluoride	2.770	57	197	1	0.00
2	1.58	chloride	22.967	378	1464	1	-0.42
3	1.89	nitrite	238.766	1891	9371	1	-0.35
4	3.21	nitrate	601.896	3011	21174	1	-1.63
5	4.56	phosphate	39.703	59	770	1	0.00
6	5.97	sulfate	61.182	176	2534	1	-1.75
7	7.79	oxalate	115.232	218	4048	1	-2.05
Totals			1082.516	5790	39558		

File: 99110511.D15 Sample: S99T001739

```

=====
Sample Name: S99T001739 DUP                      Date: 11/06/1999 01:06:23
Data File  : C:\DX\DATA\99110511.D16
Method     : C:\DX\METHOD\ANIONSa.met
ACI Address: 1 System: 1 Inject#: 16              Detector: CDM-1
Analyst    :                               Column: AG4A/AS4A anion column
=====

```

```

-----
Calibration Volume Dilution Points Rate Start Stop Area Reject
-----
External          1          101  3300  5Hz   0.00 11.00          50
-----

```

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
2	1.05	fluoride	2.766	53	197	1	0.00
3	1.38		0.000	18	86	1	
4	1.58	chloride	22.114	366	1410	1	-0.42
5	1.89	nitrite	239.902	1887	9417	1	-0.35
6	3.22	nitrate	477.798	2341	16705	1	-1.43
7	4.56	phosphate	22.200	48	457	1	0.00
8	5.97	sulfate	60.755	174	2514	1	-1.75
9	7.79	oxalate	118.126	223	4157	1	-2.05
Totals			943.661	5111	34943		

File: 99110511.D16 Sample: S99T001739 DUP

HNF-1685 REV. 0

Sample Name: S99T001739 SPK Date: 11/06/1999 01:20:01
Data File : C:\DX\DATA\99110511.D17
Method : C:\DX\METHOD\ANIONSa.met
ACI Address: 1 System: 1 Inject#: 17 Detector: CDM-1
Analyst : Column: AG4A/AS4A anion column

Calibration Volume Dilution Points Rate Start Stop Area Reject
External 1 101 3300 5Hz 0.00 11.00 50

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.93		0.000	17	68	2	
2	1.05	fluoride	68.079	1564	6249	2	-0.63
3	1.57	chloride	110.638	1822	7064	1	-0.84
4	1.89	nitrite	775.386	6363	31767	1	-0.35
5	2.82	bromide	622.616	2928	17074	1	-1.40
6	3.19	nitrate	1340.650	6833	48426	1	-2.45
7	4.53	phosphate	647.121	968	11808	1	-0.58
8	5.92	sulfate	746.484	2126	35494	1	-2.63
9	7.79	oxalate	642.683	1293	24098	1	-2.05
Totals			4953.655	23914	182046		

File: 99110511.D17 Sample: S99T001739 SPK

LABCORE Completed Worklist Report for Worklist# 31676

Analyst: vlm

Instrument: IC45S1

Book#: 95N21E

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

Worklist Comment: S-111 GRAB RERUN @IC-01 DF=41 OR 101

Seq Type	Sample#	R A	Test	Matrix	Actual	Found	DL or Yield	Unit
1 CCB	0		③IC-QC F	QC	1	<1.20e-2		ug/mL
1 CCB	0		③IC-QC CL	QC	1	<1.70e-2		ug/mL
1 CCB	0		③IC-QC NO2	QC	1	<1.08e-1		ug/mL
1 CCB	0		③IC-QC BR	QC	1	<1.25e-1		ug/mL
1 CCB	0		③IC-QC NO3	QC	1	<1.39e-1		ug/mL
1 CCB	0		③IC-QC PO4	QC	1	<1.20e-1		ug/mL
1 CCB	0		③IC-QC SO4	QC	1	<1.38e-1		ug/mL
1 CCB	0		③IC-QC OXALATE2	QC	1	<1.05e-1		ug/mL
2 LCS-INST	0		③IC-QC F	QC	6.48e1	6.35e+01	99.375 % Recovery	
2 LCS-INST	0		③IC-QC CL	QC	9.00e1	8.77e+01	97.444 % Recovery	
2 LCS-INST	0		③IC-QC NO2	QC	9.32e2	4.95e+02	85.526 % Recovery	
2 LCS-INST	0		③IC-QC BR	QC	6.25e2	6.17e+02	98.720 % Recovery	
2 LCS-INST	0		③IC-QC NO3	QC	6.90e2	7.63e+02	110.580 % Recovery	
2 LCS-INST	0		③IC-QC PO4	QC	6.35e2	6.14e+02	96.693 % Recovery	
2 LCS-INST	0		③IC-QC SO4	QC	6.90e2	6.62e+02	95.942 % Recovery	
2 LCS-INST	0		③IC-QC OXALATE2	QC	5.23e2	5.18e+02	99.044 % Recovery	
3 CCV	0		③IC-QC F	QC	6.35e1	6.96e+01	109.606 % Recovery	
3 CCV	0		③IC-QC CL	QC	8.75e1	8.69e+01	99.314 % Recovery	
3 CCV	0		③IC-QC NO2	QC	5.34e2	5.21e+02	97.566 % Recovery	
3 CCV	0		③IC-QC BR	QC	6.30e2	6.19e+02	98.254 % Recovery	
3 CCV	0		③IC-QC NO3	QC	7.00e2	6.78e+02	96.857 % Recovery	
3 CCV	0		③IC-QC PO4	QC	6.35e2	6.23e+02	98.110 % Recovery	
3 CCV	0		③IC-QC SO4	QC	6.90e2	6.71e+02	97.246 % Recovery	
3 CCV	0		③IC-QC OXALATE2	QC	5.17e2	5.09e+02	98.453 % Recovery	
4 BLNK-PREP	0		③IC-01 F-02	SOLID	1	<1.20e-2		ug/g
4 BLNK-PREP	0		③IC-01 CL-02	SOLID	1	1.80e-02	0.018	ug/g
4 BLNK-PREP	0		③IC-01 NO2-02	SOLID	1	<1.08e-1		ug/g
4 BLNK-PREP	0		③IC-01 BR-02	SOLID	1	<1.25e-1		ug/g
4 BLNK-PREP	0		③IC-01 NO3-02	SOLID	1	<1.39e-1		ug/g
4 BLNK-PREP	0		③IC-01 PO4-02	SOLID	1	<1.20e-1		ug/g
4 BLNK-PREP	0		③IC-01 SO4-02	SOLID	1	<1.38e-1		ug/g
4 BLNK-PREP	0		③IC-01 OXALATE2	SOLID	1	<1.05e-1		ug/g
5 SAMPLE	899T001739	0 W	③IC-01 F-02	SOLID	N/A	6.798e+02	48.340	ug/g
5 SAMPLE	899T001739	0 W	③IC-01 NO3-02	SOLID	N/A	1.210e+05	559.900	ug/g
5 SAMPLE	899T001739	0 W	③IC-01 PO4-02	SOLID	N/A	7.043e+03	483.400	ug/g
6 DUP	899T001739	0 W	③IC-01 F-02	SOLID	6.80e+02	6.54e+02	3.898	RPD
6 DUP	899T001739	0 W	③IC-01 CL-02	SOLID	?	4.59e+03		RPD
6 DUP	899T001739	0 W	③IC-01 NO2-02	SOLID	?	4.95e+04		RPD
6 DUP	899T001739	0 W	③IC-01 BR-02	SOLID	?	<5.17e2		RPD
6 DUP	899T001739	0 W	③IC-01 NO3-02	SOLID	1.21e+05	9.91e+04	19.900	RPD
6 DUP	899T001739	0 W	③IC-01 PO4-02	SOLID	7.04e+03	6.38e+03	3.836	RPD

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

LABCORE Completed Worklist Report for Worklist# 31676

Seq Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
6 DUP	S99T001739	0	W	IC-01	SO4-02	SOLID	?	1.19e+04	RPD
6 DUP	S99T001739	0	W	IC-01	OXALATE2	SOLID	?	2.40e+04	RPD
7 SPK	S99T001739	0	W	IC-01	F-02	SOLID	6.40e1	7.17e+01	112.031 % Recovery
7 SPK	S99T001739	0	W	IC-01	CL-02	SOLID	9.00e1	0.00e+00	0.000 % Recovery
7 SPK	S99T001739	0	W	IC-01	NO2-02	SOLID	5.32e2	0.00e+00	0.000 % Recovery
7 SPK	S99T001739	0	W	IC-01	BR-02	SOLID	6.25e2	0.00e+00	0.000 % Recovery
7 SPK	S99T001739	0	W	IC-01	NO3-02	SOLID	6.90e2	8.68e+02	125.797 % Recovery
7 SPK	S99T001739	0	W	IC-01	PO4-02	SOLID	6.35e2	6.64e+02	104.567 % Recovery
7 SPK	S99T001739	0	W	IC-01	SO4-02	SOLID	6.90e2	0.00e+00	0.000 % Recovery
7 SPK	S99T001739	0	W	IC-01	OXALATE2	SOLID	5.23e2	0.00e+00	0.000 % Recovery

Final page for worklist# 31676

Analyst Signature _____ Date _____

Analyst Signature _____ Date _____

John M. Lyle 11/15/99
Reviewer Signature _____ Date _____

HNF-1685 REV. 0

11/09/99 09:09

Page: 1

ws2

LABCORE Data Entry Template for Worklist# 31676

Analyst: VLM Instrument: IC ✓ Book# 94N21-E CCVMethod: LA-533-105 Rev/Mod F-1

Worklist Comment: S-111 GRAB RERUN @IC-01 DF=41 OR 101

S Type	Sample#	R A	Test	Matrix	Group#	Project
1 CCB			@IC-QC	QC		
2 LCS-INST			@IC-QC	QC		
3 CCV			@IC-QC	QC		
4 BLNK-PREP			@IC-01	SOLID		
5 SAMPLE	S99T001739	0 W	@IC-01	SOLID	99000304	S-111 GRAB
	Analytes Requested: F-02			, NO3-02		, PO4-02
6 DUP	S99T001739	0 W	@IC-01	SOLID		
7 SPK	S99T001739	0 W	@IC-01	SOLID		

Final page for worklist # 31676

Valerie Massie 11-11-99
Signature Date

Signature Date

Data Entry Comments:

Can't get the NO3 in on LCS OK
uploaded 11-15-99 John Howell 31676NOV.CSV Validated 11/15/99 J.M. Leye
S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

HNF-1685 REV. 0

=====

Sample Name: CCB	Date: 11/11/1999 13:55:37
Data File : C:\DX\DATA\99111101.D01	
Method : C:\DX\METHOD\ANIONS.MET	
ACI Address: 1 System: 1 Inject#: 1	Detector: CDM-1
Analyst: <i>Valerie L. Massie</i>	Column: AG4A/AS4A anion column

=====

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area	Reject
External	1	1	3300	5Hz	0.00	11.00		50

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

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

SIGNATURE ABOVE REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 161 TO 169.

HNF-1685 REV.0

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=====
Sample Name: 95N21-E LCS                      Date: 11/11/1999 14:08:19
Data File  : C:\DX\DATA\99111101.D02
Method     : C:\DX\METHOD\ANIONS.MET
ACI Address: 1 System: 1 Inject#: 2           Detector: CDM-1
Analyst    :                               Column: AG4A/AS4A anion column
=====

```

```

-----
Calibration Volume Dilution Points Rate Start Stop Area Reject
-----
External          1          101    3033   5Hz   0.00 10.11          50
-----

```

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.91		0.000	20	86	2	
2	1.05	fluoride	99.40 63.618	1490	5829	2	0.00
3	1.57	chloride	97.50 87.748	1377	5595	1	-0.84
4	1.87	nitrite	85.54 455.095	3509	18333	1	-1.06
5	2.80	bromide	98.71 616.963	2856	16913	1	-2.10
6	3.18	nitrate	110.61 763.216	3965	27028	1	-2.65
7	4.56	phosphate	96.72 614.195	945	11201	1	0.00
8	5.97	sulfate	95.97 662.162	2254	31384	1	-1.75
9	7.79	oxalate	99.09 518.239	1049	19360	1	-2.05
Totals			3781.237	17465	135730		

File: 99111101.D02 Sample: 95N21-E LCS

```

=====
Sample Name: 94N21-E CCV                      Date: 11/11/1999 14:21:41
Data File  : C:\DX\DATA\99111101.D03
Method     : C:\DX\METHOD\ANIONS.MET
ACI Address: 1 System: 1 Inject#: 3            Detector: CDM-1
Analyst    :                               Column: AG4A/AS4A anion column
=====

```

```

-----
Calibration Volume Dilution Points Rate Start Stop Area Reject
-----
External          1          101    3130  5Hz   0.00 10.43          50
-----

```

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	1.05	fluoride	69.647	1486	6396	1	-0.63
2	1.57	chloride	86.899	1369	5541	1	-1.26
3	1.87	nitrite	521.127	4065	21086	1	-1.06
4	2.79	bromide	619.268	2879	16978	1	-2.33
5	3.17	nitrate	677.679	3466	23918	1	-2.86
6	4.56	phosphate	522.971	941	11362	1	0.00
7	5.97	sulfate	670.529	2311	31791	1	-1.75
8	7.79	oxalate	508.500	1027	18989	1	-2.05
Totals			3776.619	17544	136062		

File: 99111101.D03 Sample: 94N21-E CCV

=====

Sample Name: PREP BLANK	Date: 11/11/1999 14:32:59
Data File : C:\DX\DATA\99111101.D04	
Method : C:\DX\METHOD\ANIONS.MET	
ACI Address: 1 System: 1 Inject#: 4	Detector: CDM-1
Analyst :	Column: AG4A/AS4A anion column

=====

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area	Reject
External	1	1	3040	5Hz	0.00	10.13		50

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
2	1.59	chloride	0.018	21	126	1	0.00
Totals			0.018	21	126

```

=====
Sample Name: S99T001739                      Date: 11/11/1999 15:01:21
Data File  : C:\DX\DATA\99111101.D06
Method     : C:\DX\METHOD\ANIONS.MET
ACI Address: 1 System: 1 Inject#: 6           Detector: CDM-1
Analyst    :                               Column: AG4A/AS4A anion column
=====

```

```

-----
Calibration Volume Dilution Points Rate Start Stop Area Reject
-----
External          1          21    2778   5Hz   0.00  9.26          50
-----

```

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.92		0.000	65	367	2	
2	1.05	fluoride	3.544	345	1504	2	0.00
3	1.17		0.000	160	909	2	
4	1.56	chloride	22.549	1701	6924	1	-1.68
5	1.87	nitrite	237.793	9370	47466	1	-1.06
6	3.11	nitrate	631.000	16102	115820	1	-4.90
7	4.56	phosphate	36.713	271	3229	1	0.00
8	5.97	sulfate	52.853	826	11717	1	-1.75
9	7.79	oxalate	114.737	1126	20638	1	-2.05
Totals			1099.188	29967	208575		

File: 99111101.D06 Sample: S99T001739

```

=====
Sample Name: S99T001739 DUP                      Date: 11/11/1999 15:14:24
Data File  : C:\DX\DATA\99111101.D07
Method     : C:\DX\METHOD\ANIONS.MET
ACI Address: 1 System: 1 Inject#: 7                Detector: CDM-1
Analyst    :                                     Column: AG4A/AS4A anion column
=====

```

```

=====
Calibration Volume Dilution Points Rate Start Stop Area Reject
-----
External          1          21    3300  5Hz   0.00 11.00          50
=====

```

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.93		0.000	68	382	2	
2	1.05	fluoride	3.326	316	1408	2	0.00
3	1.17		0.000	165	903	2	
4	1.56	chloride	23.321	1727	7163	1	-1.68
5	1.87	nitrite	251.794	9588	50366	1	-1.41
6	3.12	nitrate	503.796	12661	90602	1	-4.49
7	4.56	phosphate	32.424	261	2858	1	0.00
8	5.97	sulfate	60.255	884	13419	1	-1.75
9	7.79	oxalate	121.777	1165	21927	1	-2.05
Totals			996.693	26835	189028		

File: 99111101.D07 Sample: S99T001739 DUP

Data Reprocessed On 11/15/1999 09:03:58

```

=====
Sample Name: S99T001739 SPK                      Date: 11/11/1999 15:28:55
Data File  : E:\DATA\99111101.D08
Method     : C:\DX\METHOD\ANIONS.MET
ACI Address: 1   System: 1   Inject#: 8           Detector: CDM-1
Analyst    :                               Column: AG4A/AS4A anion column
=====

```

```

Calibration Volume Dilution Points Rate Start Stop Area Reject
-----
External          1          21    3300  5Hz   0.00 11.00          50

```

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.93		0.000	68	318	2	
2	1.05	fluoride	17.882	1709	7943	2	-0.63
3	1.56	chloride	40.882	3107	12630	1	-1.68
4	1.87	nitrite	336.726	13353	68171	1	-1.06
5	2.78	bromide	120.351	2842	15829	1	-2.80
6	3.09	nitrate	804.613	20691	152159	1	-0.11
7	4.56	phosphate	169.535	1254	14924	1	0.00
8	5.92	sulfate	187.491	2609	43102	1	-2.63
9	7.73	oxalate	222.373	2103	40384	1	-2.73
Totals			1899.852	47737	355460		

File: 99111101.D08 Sample: S99T001739 SPK

LABCORE Completed Worklist Report for Worklist# 31791

Analyst: rwk

Instrument: IC45S1

Book#: 101N21A

Method: LA-533-105 Rev/Mod F-2

Worklist Comment: S-111 GRAB RERUN FOR @IC-01 PO4 ONLY DF=2121

Seq Type	Sample#	R A	Test	Matrix	Actual	Found	DL or Yield	Unit
1 CCB	0	0	②IC-QC F	QC	1	<1.20e-2		ug/mL
1 CCB	0	0	②IC-QC CL	QC	1	<1.70e-2		ug/mL
1 CCB	0	0	②IC-QC NO2	QC	1	<1.08e-1		ug/mL
1 CCB	0	0	②IC-QC BR	QC	1	<1.25e-1		ug/mL
1 CCB	0	0	②IC-QC NO3	QC	1	<1.39e-1		ug/mL
1 CCB	0	0	②IC-QC PO4	QC	1	<1.20e-1		ug/mL
1 CCB	0	0	②IC-QC SO4	QC	1	<1.38e-1		ug/mL
1 CCB	0	0	②IC-QC OXALATE2	QC	1	<1.05e-1		ug/mL
2 LCS-INST	0	0	②IC-QC F	QC	64.0	6.61e+01	103.281 % Recovery	
2 LCS-INST	0	0	②IC-QC CL	QC	90.0	8.59e+01	95.444 % Recovery	
2 LCS-INST	0	0	②IC-QC NO2	QC	541	5.09e+02	94.085 % Recovery	
2 LCS-INST	0	0	②IC-QC BR	QC	625	6.28e+02	100.480 % Recovery	
2 LCS-INST	0	0	②IC-QC NO3	QC	690	6.99e+02	101.304 % Recovery	
2 LCS-INST	0	0	②IC-QC PO4	QC	635	6.34e+02	99.843 % Recovery	
2 LCS-INST	0	0	②IC-QC SO4	QC	690	6.84e+02	99.130 % Recovery	
2 LCS-INST	0	0	②IC-QC OXALATE2	QC	521	5.53e+02	106.142 % Recovery	
3 CCV	0	0	②IC-QC F	QC	64.0	6.32e+01	98.750 % Recovery	
3 CCV	0	0	②IC-QC CL	QC	90.0	8.64e+01	96.000 % Recovery	
3 CCV	0	0	②IC-QC NO2	QC	541	5.40e+02	99.815 % Recovery	
3 CCV	0	0	②IC-QC BR	QC	625	6.18e+02	98.880 % Recovery	
3 CCV	0	0	②IC-QC NO3	QC	690	6.81e+02	98.696 % Recovery	
3 CCV	0	0	②IC-QC PO4	QC	635	6.23e+02	98.110 % Recovery	
3 CCV	0	0	②IC-QC SO4	QC	690	6.89e+02	99.855 % Recovery	
3 CCV	0	0	②IC-QC OXALATE2	QC	521	5.26e+02	100.960 % Recovery	
4 SAMPLE	S99T001730	0	②IC-01 PO4-02	LIQUID	N/A	2.261e+03	254.500	ug/mL
5 DUP	S99T001730	0	②IC-01 F-02	LIQUID	?	2.24e+02		RPD
5 DUP	S99T001730	0	②IC-01 CL-02	LIQUID	?	5.73e+03		RPD
5 DUP	S99T001730	0	②IC-01 NO2-02	LIQUID	?	6.37e+04		RPD
5 DUP	S99T001730	0	②IC-01 BR-02	LIQUID	?	<2.65e2		RPD
5 DUP	S99T001730	0	②IC-01 NO3-02	LIQUID	?	<2.95e2		RPD
5 DUP	S99T001730	0	②IC-01 PO4-02	LIQUID	2.26e+03	1.47e+03	42.359	RPD
5 DUP	S99T001730	0	②IC-01 SO4-02	LIQUID	?	3.82e+03		RPD
5 DUP	S99T001730	0	②IC-01 OXALATE2	LIQUID	?	<2.23e2		RPD
7 DUP	S99T001733	0	②IC-01 F-02	LIQUID	?	2.47e+02		RPD
7 DUP	S99T001733	0	②IC-01 CL-02	LIQUID	?	8.03e+03		RPD
7 DUP	S99T001733	0	②IC-01 NO2-02	LIQUID	?	8.72e+04		RPD
7 DUP	S99T001733	0	②IC-01 BR-02	LIQUID	?	<1.28e3		RPD
7 DUP	S99T001733	0	②IC-01 NO3-02	LIQUID	?	1.70e+05		RPD
7 DUP	S99T001733	0	②IC-01 PO4-02	LIQUID	3.02e+03	1.79e+03	51.143	RPD
7 DUP	S99T001733	0	②IC-01 SO4-02	LIQUID	?	3.31e+03		RPD
7 DUP	S99T001733	0	②IC-01 OXALATE2	LIQUID	?	<1.07e3		RPD

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

LABCORE Completed Worklist Report for Worklist# 31791

Seq Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
8 SPK	S99T001733	0	0	IC-01	F-02	LIQUID	64.0	0.00e+00	0.000 % Recovery
8 SPK	S99T001733	0	0	IC-01	CL-02	LIQUID	90.0	0.00e+00	0.000 % Recovery
8 SPK	S99T001733	0	0	IC-01	NO2-02	LIQUID	541	0.00e+00	0.000 % Recovery
8 SPK	S99T001733	0	0	IC-01	BR-02	LIQUID	625	0.00e+00	0.000 % Recovery
8 SPK	S99T001733	0	0	IC-01	NO3-02	LIQUID	690	0.00e+00	0.000 % Recovery
8 SPK	S99T001733	0	0	IC-01	PO4-02	LIQUID	635	6.15e+02	96.850 % Recovery
8 SPK	S99T001733	0	0	IC-01	SO4-02	LIQUID	690	0.00e+00	0.000 % Recovery
8 SPK	S99T001733	0	0	IC-01	OXALATE2	LIQUID	521	0.00e+00	0.000 % Recovery

Final page for worklist# 31791

Analyst Signature _____ Date _____

Analyst Signature _____ Date _____

Janno M. Luyke
Reviewer Signature _____ Date _____

S99T001733 was rejected because it
was run at the wrong dilution.
JML

11/19/99 09:28
ws2

HNF-1685 REV. 0

Page: 1

LABCORE Data Entry Template for Worklist# 31791Analyst: MM Instrument: IC 4551 Book# 101n21-A
100n21-AMethod: LA-533-105 Rev/Mod F-2

Worklist Comment: S-111 GRAB RERUN FOR @IC-01 PO4 ONLY DF=2121

S Type	Sample#	R A	Test	Matrix	Group#	Project
1 CCB			@IC-QC	QC		
2 LCS-INST			@IC-QC	QC		
3 CCV			@IC-QC	QC		
4 SAMPLE	S99T001730 0		@IC-01	LIQUID	99000304	S-111 GRAB
	Analytes Requested: PO4-02					
5 DUP	S99T001730 0		@IC-01	LIQUID		
6 SAMPLE	S99T001733 0		@IC-01	LIQUID	99000304	S-111 GRAB
	Analytes Requested: PO4-02					
7 DUP	S99T001733 0		@IC-01	LIQUID		
8 SPK	S99T001733 0		@IC-01	LIQUID		

Final page for worklist # 31791Moh King 11/20/99
Signature Date_____
Signature Date

Data Entry Comments:

uploaded 11-22-99
John Howell31791 NOV. 20 C SV

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

HNF-1685 REV. 0

=====

Sample Name: CCB	Date: 11/19/1999 21:23:55
Data File : C:\DX\DATA\99111801.D01	
Method : C:\DX\METHOD\ANIONS.MET	
ACI Address: 1 System: 1 Inject#: 1	Detector: CDM-1
Analyst : <i>Not Done</i>	Column: AG4A/AS4A anion column

=====

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area	Reject
External	1	1	3300	5Hz	0.00	11.00		50

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	1.39		0.000	26	135	1	
Totals			0.000	26	135

SIGNATURE ABOVE REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 171 TO D42

HNF-1685 REV. 0

Sample Name: LCS 101N21-A Date: 11/19/1999 21:41:27
 Data File : C:\DX\DATA\99111801.D02
 Method : C:\DX\METHOD\ANIONS.MET
 ACI Address: 1 System: 1 Inject#: 2 Detector: CDM-1
 Analyst : *Not Kim* Column: AG4A/AS4A anion column

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area	Reject
External	1	101	3300	5Hz	0.00	11.00		50

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.91		0.000	19	72	2	
2	1.06	fluoride	66.056	1476	6058	2	0.63
3	1.39		0.000	21	97	1	
4	1.59	chloride	85.922	1415	5478	1	0.00
5	1.90	nitrite	509.136	4046	20586	1	0.35
6	2.86	bromide	628.367	2814	17237	1	0.00
7	3.25	nitrate	699.399	3534	24706	1	-0.41
8	4.56	phosphate	633.636	969	11559	1	0.00
9	5.97	sulfate	683.526	2256	32424	1	-1.75
10	7.79	oxalate	553.183	1013	20690	1	-2.05
11	10.13		0.000	16	668	1	
Totals			3859.225	17579	139577		

File: 99111801.D02 Sample: LCS 101N21-A

HNF-1685 REV. 0

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=====
Sample Name: CCV 100N21-A          Date: 11/19/1999 21:57:24
Data File  : C:\DX\DATA\99111801.D03
Method     : C:\DX\METHOD\ANIONS.MET
ACI Address: 1 System: 1 Inject#: 3      Detector: CDM-1
Analyst    : M. H. Kim           Column: AG4A/AS4A anion column
=====

```

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=====
Calibration Volume Dilution Points Rate Start Stop Area Reject
-----
External          1          101    3300   5Hz   0.00 11.00          50
=====

```

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.91		0.000	19	76	2	
2	1.06	fluoride	63.180	1483	5788	2	0.63
3	1.59	chloride	86.370	1389	5507	1	0.00
4	1.90	nitrite	539.625	4186	21859	1	0.35
5	2.85	bromide	618.488	2831	16956	1	-0.23
6	3.25	nitrate	681.033	3396	24039	1	-0.61
7	4.56	phosphate	622.677	969	11357	1	0.00
8	5.97	sulfate	688.668	2326	32674	1	-1.75
9	7.79	oxalate	525.717	1004	19644	1	-2.05
10	8.85		0.000	17	402	1	
Totals			3825.759	17619	138303		

File: 99111801.D03 Sample: CCV 100N21-A

HNF-1685 REV. 0

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=====
Sample Name: S99T001730                      Date: 11/20/1999 03:11:49
Data File  : C:\DX\DATA\99111811.D17
Method     : C:\DX\METHOD\ANIONS.MET
ACI Address: 1 System: 1 Inject#: 17          Detector: CDM-1
Analyst    :                               Column: AG4A/AS4A anion column
=====

```

```

=====
Calibration Volume Dilution Points Rate Start Stop Area Reject
-----
External          1          2121   3300  5Hz   0.00 11.00          50
=====

```

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.90		0.000	169	1086	2	
2	1.06	fluoride	198.867	203	810	2	0.63
3	1.14		0.000	376	2041	2	
4	1.51	chloride	5365.516	4007	16483	1	-4.62
5	1.83	nitrite	62330.683	24424	129758	1	-3.17
6	2.98		0.000	50907	427819	1	
7	4.51	phosphate	2261.096	174	1989	1	-1.17
8	5.92	sulfate	4537.114	659	9896	1	-2.63
9	7.84	oxalate	405.968	21	411	1	-1.38
Totals			75099.245	80941	590293		

File: 99111811.D17 Sample: S99T001730

HNF-1685 REV. 0

```

=====
Sample Name: S99T001730 DUP                      Date: 11/20/1999 03:23:58
Data File  : C:\DX\DATA\99111811.D18
Method     : C:\DX\METHOD\ANIONS.MET
ACI Address: 1 System: 1 Inject#: 18              Detector: CDM-1
Analyst    :                      Column: AG4A/AS4A anion column
=====

```

```

-----
Calibration Volume Dilution Points Rate Start Stop Area Reject
-----
External          1       2121   3300  5Hz   0.00 11.00       50
-----

```

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.91		0.000	217	1422	2	
2	1.09	fluoride	224.240	228	920	2	3.16
3	1.16		0.000	401	2190	2	
4	1.56	chloride	5727.831	4090	17618	1	-1.68
5	1.88	nitrite	63710.017	24528	132878	1	-0.70
6	3.03		0.000	51129	431245	1	
7	4.56	phosphate	1472.768	144	1316	1	0.00
8	4.96		0.000	77	1923	1	
9	5.97	sulfate	3817.898	653	8264	1	-1.75
Totals			74952.754	81468	597777		

File: 99111811.D18 Sample: S99T001730 DUP

HNF-1685 REV. 0

LABCORE Completed Worklist Report for Worklist# 31795

Analyst: vlm

Instrument: IC45S1

Book#: 101N21A

Method: LA-533-105 Rev/Mod F-2

Worklist Comment: Rerun #2 S-111 Grab for @IC-01 for PO4 at DF of 2121 or 1111

Seq Type	Sample#	R A	Test	Matrix	Actual	Found	DL or Yield	Unit
1 CCB	0	0	IC-QC F	QC	1	<1.20e-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	<1.08e-1		ug/mL
1 CCB	0	0	IC-QC BR	QC	1	<1.25e-1		ug/mL
1 CCB	0	0	IC-QC NO3	QC	1	<1.39e-1		ug/mL
1 CCB	0	0	IC-QC PO4	QC	1	<1.20e-1		ug/mL
1 CCB	0	0	IC-QC SO4	QC	1	<1.38e-1		ug/mL
1 CCB	0	0	IC-QC OXALATE2	QC	1	<1.05e-1		ug/mL
2 LCS-INST	0	0	IC-QC F	QC	64.0	6.35e+01	99.219 % Recovery	
2 LCS-INST	0	0	IC-QC CL	QC	90.0	8.60e+01	95.556 % Recovery	
2 LCS-INST	0	0	IC-QC NO2	QC	541	4.79e+02	88.540 % Recovery	
2 LCS-INST	0	0	IC-QC BR	QC	625	6.17e+02	98.720 % Recovery	
2 LCS-INST	0	0	IC-QC NO3	QC	690	7.38e+02	106.957 % Recovery	
2 LCS-INST	0	0	IC-QC PO4	QC	635	6.11e+02	96.220 % Recovery	
2 LCS-INST	0	0	IC-QC SO4	QC	690	6.77e+02	98.116 % Recovery	
2 LCS-INST	0	0	IC-QC OXALATE2	QC	521	5.34e+02	102.495 % Recovery	
3 CCV	0	0	IC-QC F	QC	64.0	6.30e+01	98.438 % Recovery	
3 CCV	0	0	IC-QC CL	QC	90.0	8.36e+01	92.889 % Recovery	
3 CCV	0	0	IC-QC NO2	QC	541	5.20e+02	96.118 % Recovery	
3 CCV	0	0	IC-QC BR	QC	625	6.30e+02	100.800 % Recovery	
3 CCV	0	0	IC-QC NO3	QC	690	6.93e+02	100.435 % Recovery	
3 CCV	0	0	IC-QC PO4	QC	635	6.18e+02	97.323 % Recovery	
3 CCV	0	0	IC-QC SO4	QC	690	6.93e+02	100.435 % Recovery	
3 CCV	0	0	IC-QC OXALATE2	QC	521	5.31e+02	101.919 % Recovery	
4 SAMPLE	S99T001733	0	IC-01 PO4-02	LIQUID	N/A	2.428e+03	133.300	ug/mL
5 DUP	S99T001733	0	IC-01 F-02	LIQUID	?	2.43e+02		RPD
5 DUP	S99T001733	0	IC-01 CL-02	LIQUID	?	7.83e+03		RPD
5 DUP	S99T001733	0	IC-01 NO2-02	LIQUID	?	7.73e+04		RPD
5 DUP	S99T001733	0	IC-01 BR-02	LIQUID	?	<1.39e2		RPD
5 DUP	S99T001733	0	IC-01 NO3-02	LIQUID	?	1.08e+05		RPD
5 DUP	S99T001733	0	IC-01 PO4-02	LIQUID	2.43e+03	2.28e+03	6.369	RPD
5 DUP	S99T001733	0	IC-01 SO4-02	LIQUID	?	2.73e+03		RPD
5 DUP	S99T001733	0	IC-01 OXALATE2	LIQUID	?	<1.17e2		RPD
6 SPK	S99T001733	0	IC-01 F-02	LIQUID	64.0	0.00e+00	0.000 % Recovery	
6 SPK	S99T001733	0	IC-01 CL-02	LIQUID	90.0	0.00e+00	0.000 % Recovery	
6 SPK	S99T001733	0	IC-01 NO2-02	LIQUID	541	0.00e+00	0.000 % Recovery	
6 SPK	S99T001733	0	IC-01 BR-02	LIQUID	625	0.00e+00	0.000 % Recovery	
6 SPK	S99T001733	0	IC-01 NO3-02	LIQUID	690	0.00e+00	0.000 % Recovery	
6 SPK	S99T001733	0	IC-01 PO4-02	LIQUID	635	6.17e+02	97.165 % Recovery	
6 SPK	S99T001733	0	IC-01 SO4-02	LIQUID	690	0.00e+00	0.000 % Recovery	
6 SPK	S99T001733	0	IC-01 OXALATE2	LIQUID	521	0.00e+00	0.000 % Recovery	

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

174.2

LABCORE Completed Worklist Report for Worklist# 31795

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

Final page for worklist# 31795

Analyst Signature _____ Date _____

Analyst Signature _____ Date _____

11/22/99
Reviewer Signature _____ Date _____

HNF-1685 REV. 0

Page: 1

11/22/99 09:45
ws2

LABCORE Data Entry Template for Worklist# 31795

Analyst: VL M Instrument: IC ✓4551 Book# 100N21A LCS
CCVMethod: LA-533-105 Rev/Mod F-2

Worklist Comment: Rerun #2 S-111 Grab for @IC-01 for PO4 at DF of 2121 or 1111

S Type	Sample#	R A	Test	Matrix	Group#	Project
1 CCB			@IC-QC	QC		
2 LCS-INST			@IC-QC	QC		
3 CCV			@IC-QC	QC		
4 SAMPLE	S99T001733 0		@IC-01	LIQUID	99000304	S-111 GRAB
	Analytes Requested: PO4-02					
5 DUP	S99T001733 0		@IC-01	LIQUID		
6 SPK	S99T001733 0		@IC-01	LIQUID		

Final page for worklist # 31795

VL Massie 11-22-99
Signature Date_____
Signature Date

Data Entry Comments:

uploaded 11-22-99 validated 11/22/99 JML
John Howell
31795NOV.CSV

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

HNF-1685 REV. 0

=====

Sample Name: CCB	Date: 11/22/1999 13:11:07
Data File : C:\DX\DATA\99112201.D01	
Method : C:\DX\METHOD\ANIONS.MET	
ACI Address: 1 System: 1 Inject#: 1	Detector: CDM-1
Analyst :	Column: AG4A/AS4A anion column

=====

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area	Reject
External	1	1	3300	5Hz	0.00	11.00		50

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

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

SIGNATURE ABOVE REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 174.5 TO 174.10

HNF-1685 REV. 0

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=====
Sample Name: 101N21-A LCS                      Date: 11/22/1999 13:23:17
Data File  : C:\DX\DATA\99112201.D02
Method     : C:\DX\METHOD\ANIONS.MET
ACI Address: 1 System: 1 Inject#: 2             Detector: CDM-1
Analyst    :                               Column: AG4A/AS4A anion column
=====

```

```

=====
Calibration Volume Dilution Points Rate Start Stop Area Reject
-----
External          1          101    2954  5Hz   0.00  9.84          50
=====

```

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.92		0.000	14	65	2	
2	1.05	fluoride	63.463	1486	5815	2	-0.63
3	1.57	chloride	86.022	1438	5485	1	-1.26
4	1.87	nitrite	478.617	3900	19313	1	-1.41
5	2.79	bromide	616.795	2942	16908	1	-2.56
6	3.16	nitrate	737.684	3820	26098	1	-3.27
7	4.45	phosphate	611.088	938	11144	1	-2.34
8	5.81	sulfate	677.376	2039	32124	1	-4.39
9	7.63	oxalate	533.731	1092	19949	1	-4.07
Totals			3804.776	17670	136901		

File: 99112201.D02 Sample: 101N21-A LCS

HNF-1685 REV. 0

Sample Name: 100N21-A CCV Date: 11/22/1999 13:37:29
 Data File : C:\DX\DATA\99112201.D03
 Method : C:\DX\METHOD\ANIONS.MET
 ACI Address: 1 System: 1 Inject#: 3 Detector: CDM-1
 Analyst : Column: AG4A/AS4A anion column

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area	Reject
External	1	101	3300	5Hz	0.00	11.00		50

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
2	1.05	fluoride	99.26 63.029	1449	5774	2	-0.63
3	1.56	chloride	95.51 83.571	1377	5328	1	-1.68
4	1.86	nitrite	94.55 520.038	4194	21041	1	-1.76
5	2.78	bromide	100.62 630.154	2962	17288	1	-2.80
6	3.16	nitrate	98.95 692.675	3565	24462	1	-3.27
7	4.45	phosphate	97.33 618.051	942	11272	1	-2.34
8	5.81	sulfate	100.50 693.439	2152	32907	1	-4.39
9	7.63	oxalate	102.76 531.271	1057	19856	1	-4.07
Totals			3832.228	17696	137927		

File: 99112201.D03 Sample: 100N21-A CCV

Data Reprocessed On 11/22/1999 14:53:42

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=====
Sample Name: S99T001733                      Date: 11/22/1999 13:53:56
Data File  : E:\DATA\99112201.D04
Method     : C:\DX\METHOD\ANIONS.MET
ACI Address: 1 System: 1 Inject#: 4          Detector: CDM-1
Analyst    :                               Column: AG4A/AS4A anion column
=====

```

```

-----
Calibration Volume Dilution Points Rate Start Stop Area Reject
-----
External          1          1111   3279   5Hz   0.00 10.93          50
-----

```

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.92		0.000	475	3085	2	
2	1.09	fluoride	250.808	564	2033	2	3.16
3	1.15		0.000	913	5920	2	
4	1.53	chloride	8003.778	10883	48761	1	-3.36
5	1.87	nitrite	75560.579	53989	343133	1	-1.06
6	2.95	nitrate	107441.061	78399	724959	1	0.00
7	4.45	phosphate	2428.174	329	4026	1	-2.34
8	5.81	sulfate	2673.227	714	11184	1	-4.39
Totals			196357.626	146266	1143101

Data Reprocessed On 11/22/1999 14:54:27

```

=====
Sample Name: S99T001733 DUP                      Date: 11/22/1999 14:07:41
Data File  : E:\DATA\99112201.D05
Method     : C:\DX\METHOD\ANIONS.MET
ACI Address: 1 System: 1 Inject#: 5                Detector: CDM-1
Analyst    :                               Column: AG4A/AS4A anion column
=====

```

```

-----
Calibration Volume Dilution Points Rate Start Stop Area Reject
-----

```

```

External          1          1111    2999   5Hz   0.00   9.99           50

```

```

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

```

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.92		0.000	449	2856	2	
2	1.09	fluoride	242.895	549	1967	2	3.16
3	1.16		0.000	912	5783	2	
4	1.53	chloride	7829.354	10638	47633	1	-3.78
5	1.87	nitrite	77345.469	54633	353712	1	-1.06
6	2.95	nitrate	107502.596	78159	721361	1	0.00
7	4.45	phosphate	2283.060	333	3788	1	-2.34
8	5.81	sulfate	2732.629	745	11441	1	-4.39
Totals			197936.004	146417	1148542

Data Reprocessed On 11/22/1999 14:56:04

```

=====
Sample Name: S99T001733 SPK                      Date: 11/22/1999 14:21:10
Data File  : E:\DATA\99112201.D06
Method     : C:\DX\METHOD\ANIONS.MET
ACI Address: 1 System: 1 Inject#: 6                Detector: CDM-1
Analyst    :                      Column: AG4A/AS4A anion column
=====

```

```

=====
Calibration Volume Dilution Points Rate Start Stop Area Reject
-----
External          1          1111    2936   5Hz   0.00   9.78          50
=====

```

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.92		0.000	385	2139	2	
2	1.06	fluoride	621.575	1117	5163	2	0.63
3	1.15		0.000	926	5544	2	
4	1.53	chloride	8719.149	11923	53420	1	-3.78
5	1.87	nitrite	79966.543	56963	369609	1	-1.06
6	2.74		0.000	2936	14490	1	
7	2.94	nitrate	106708.744	80442	754593	1	0.00
8	4.45	phosphate	8663.778	1252	14408	1	-2.34
9	5.81	sulfate	9371.159	2919	40655	1	-4.39
10	7.57	oxalate	5396.855	963	18309	1	-4.74
Totals			219447.802	159825	1278330

10/26/99 07:39
ws2

File # 910266

HNF-1685 REV. 0

Page: 1

LABCORE Data Entry Template for Worklist# 31565

Analyst: DK Sfto Instrument: ICP01 101677 Book# 80698B

Method: LA-505-151/161 Rev/Mod C-4
10.16.99

Ensure dose rate at 30cm
is ≤ 50 mrem/hr prior to
performing this analysis

Worklist Comment: ICP S-111 (DIRECT)

S Type	Sample#	R A	Test	Matrix	Group#	Project
1	ICV		•ICP-QC	QC		
2	ICB		•ICP-QC	QC		
3	LLS		•ICP-QC	QC		
4	ICSA		•ICP-QC	QC		
5	ICSAB		•ICP-QC	QC		
6	SAMPLE	S99T001730	0 D	•ICP-D01 LIQUID	99000304	S-111 GRAB
Analytes Requested: AG-D-01 , AL-D-01 , AS-D-01 , B-D-01 , BA-D-01 , BE-D-01 , BI-D-01 , CA-D-01 , CD-D-01 , CE-D-01 , CO-D-01 , CR-D-01 , CU-D-01 , FE-D-01 , K-D-01 , LA-D-01 , LI-D-01 , MG-D-01 , MN-D-01 , MO-D-01 , NA-D-01 , ND-D-01 , NI-D-01 , P-D-01 , PB-D-01 , S-D-01 , SB-D-01 , SE-D-01 , SI-D-01 , SM-D-01 , SR-D-01 , TI-D-01 , TL-D-01 , U-D-01 , V-D-01 , ZN-D-01 , ZR-D-01						
7	DUP	S99T001730	0 D	•ICP-D01 LIQUID		
8	SAMPLE	S99T001732	0 D	•ICP-D01 LIQUID	99000304	S-111 GRAB
Analytes Requested: AG-D-01 , AL-D-01 , AS-D-01 , B-D-01 , BA-D-01 , BE-D-01 , BI-D-01 , CA-D-01 , CD-D-01 , CE-D-01 , CO-D-01 , CR-D-01 , CU-D-01 , FE-D-01 , K-D-01 , LA-D-01 , LI-D-01 , MG-D-01 , MN-D-01 , MO-D-01 , NA-D-01 , ND-D-01 , NI-D-01 , P-D-01 , PB-D-01 , S-D-01 , SB-D-01 , SE-D-01 , SI-D-01 , SM-D-01 , SR-D-01 , TI-D-01 , TL-D-01 , U-D-01 , V-D-01 , ZN-D-01 , ZR-D-01						
9	DUP	S99T001732	0 D	•ICP-D01 LIQUID		
10	CCV		•ICP-QC	QC		
11	CCB		•ICP-QC	QC		
12	SERDIL	S99T001733	0 D	•ICP-D01 LIQUID		

Data Entry Comments:

Uploaded + Validated by:

Sail M. Pang

10/27/99

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

HNF-1685 REV. 0

10/26/99 07:39

ws2

Page: 2

LABCORE Data Entry Template for Worklist# 31565

S Type	Sample#	R A	Test	Matrix	Group#	Project
13 SAMPLE	S99T001733	0 D	●ICP-D01	LIQUID	99000304	S-111 GRAB
Analytes Requested: AG-D-01 , AL-D-01 , AS-D-01 , B-D-01 , BA-D-01 , BE-D-01 , BI-D-01 , CA-D-01 , CD-D-01 , CE-D-01 , CO-D-01 , CR-D-01 , CU-D-01 , FE-D-01 , K-D-01 , LA-D-01 , LI-D-01 , MG-D-01 , MN-D-01 , MO-D-01 , NA-D-01 , ND-D-01 , NI-D-01 , P-D-01 , PB-D-01 , S-D-01 , SB-D-01 , SE-D-01 , SI-D-01 , SM-D-01 , SR-D-01 , TI-D-01 , TL-D-01 , U-D-01 , V-D-01 , ZN-D-01 , ZR-D-01						
14 DUP	S99T001733	0 D	●ICP-D01	LIQUID		
15 SPK-POST	S99T001733	0 D	●ICP-D01	LIQUID		
16 ICSA			●ICP-QC	QC		
17 ICSAB			●ICP-QC	QC		
18 CCV			●ICP-QC	QC		
19 CCB			●ICP-QC	QC		

Final page for worklist # 31565

Signature	Date	
JK [Signature]	10-26-99	
S99T001730	015-15	DF 601
S99T001730-D	015-15	601
S99T001732	015-15	DF 601
S99T001732-D	015-15	601
S99T001733-L	015-15-19	DF 3005
S99T001733	015-15	601
S99T001733-D	015-15	601
S99T001733-Q	015-15	601
S99T001733-X	015-15-19	6010
S99T001733-QX	015-15-19	6010

Signature

Date

Data Entry Comments:

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

HNF-1685 REV. 0

Analysis Report

Summary

10/26/99 11:52:49 AM

page 1

#	Sample Name	File	Method	Date	Time	OpID	Type	Mode
1	ICV	91026A	ICP2	10/26/99	09:08	DKS	Q	CONC
2	ICB	91026A	ICP2	10/26/99	09:12	DKS	Q	CONC
3	LLS	91026A	ICP2	10/26/99	09:15	DKS	Q	CONC
4	ICSA	91026A	ICP2	10/26/99	09:18	DKS	Q	CONC
5	ICSAB	91026A	ICP2	10/26/99	09:21	DKS	Q	CONC
6	S99T001730	91026A	ICP2	10/26/99	09:30	DKS	S	CONC
7	S99T001730_D	91026A	ICP2	10/26/99	09:34	DKS	S	CONC
8	S99T001732	91026A	ICP2	10/26/99	09:37	DKS	S	CONC
9	S99T001732_D	91026A	ICP2	10/26/99	09:41	DKS	S	CONC
10	CCV	91026A	ICP2	10/26/99	09:45	DKS	Q	CONC
11	CCB	91026A	ICP2	10/26/99	09:49	DKS	Q	CONC
12	S99T001733_L	91026A	ICP2	10/26/99	09:53	DKS	S	CONC
13	S99T001733	91026A	ICP2	10/26/99	09:56	DKS	S	CONC
14	S99T001733	91026A	ICP2	10/26/99	10:01	DKS	S	CONC
15	S99T001733_D	91026A	ICP2	10/26/99	10:04	DKS	S	CONC
16	S99T001733_A	91026A	ICP2	10/26/99	10:07	DKS	S	CONC
17	S99T001733_X	91026A	ICP2	10/26/99	10:12	DKS	S	CONC
18	S99T001733_AX	91026A	ICP2	10/26/99	10:16	DKS	S	CONC
19	ICSA	91026A	ICP2	10/26/99	11:39	DKS	Q	CONC
20	ICSAB	91026A	ICP2	10/26/99	11:42	DKS	Q	CONC
21	CCV	91026A	ICP2	10/26/99	11:46	DKS	Q	CONC
22	CCB	91026A	ICP2	10/26/99	11:49	DKS	Q	CONC

DK *[Signature]*

10-26-99

Worklist # 31565

5-111

S99T001730

S99T001732

S99T001733

S99T001733

$$Al = 3.93 \mu g + 4 \frac{\mu g}{ml}$$

$$Post Spike: Al = \frac{(39914)}{601} - \frac{(39266)}{601} \times 100 = 107.8\%$$

$$Na = 2.16 \mu g + 5 \frac{\mu g}{ml}$$

$$Post Spike: Na = \frac{(274750)}{6010} - \frac{(215720)}{6010} \times 100 = 98.2\%$$

SIGNATURE ABOVE REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 177 TO 181.

HNF-1685 REV. 0

Analysis Report

Averages

10/26/99 11:52:49 AM

page 2

#	Sample Name	Ag	Al	As	B	Ba	Be
1	ICV	4.8412	4.9534	5.0142	5.1453	4.9550	4.8670
2	ICB	.00123	.00626	.00322	.00237	.00002	-.00003
3	LLS	.01953	.10838	.19907	.09597	.09826	.00987
4	ICSA	-.00219	249.10	-.06757	.00487	.00054	.00010
5	ICSAB	.94904	249.56	-.02923	-.00033	.46321	.45986
6	S99T001730	16.442	26829.	-34.795	77.243	.02483	.04141
7	S99T001730_D	14.649	26664.	-45.496	75.494	-.11676	.03155
8	S99T001732	15.117	43840.	-44.060	95.077	-.06774	.08605
9	S99T001732_D	14.307	42803.	-48.381	94.448	-.07787	.07510
10	CCV	4.7965	4.8759	5.0171	5.0746	4.8746	4.8503
11	CCB	.00089	.00686	.00786	-.00105	.00006	-.00007
12	S99T001733_L	14.559	40083.	-43.728	83.591	-.23719	.05966
13	S99T001733	5.2519	38998.	-1.5678	67.873	-.25793	.28473
14	S99T001733	14.140	39266.	-38.355	85.843	.00009	.09611
15	S99T001733_D	13.911	39031.	-37.648	85.206	-.01289	.03332
16	S99T001733_A	582.84	39914.	586.19	693.52	572.84	601.63
17	S99T001733_X	8.9872	40160.	-60.546	63.708	-.26246	-.42015
18	S99T001733_AX	58598.	99346.	60015.	60467.	60458.	59722.
19	ICSA	-.00379	247.32	-.03054	-.00056	.00043	.00024
20	ICSAB	.94750	248.93	-.01742	-.00452	.46123	.46277
21	CCV	4.8201	4.9176	5.0315	5.1138	4.9344	4.8994
22	CCB	-.00115	.00937	.00031	-.00318	-.00004	.00005

#	Sample Name	Bi	Ca	Cd	Ce	Co	Cr
1	ICV	5.0840	5.1249	5.0314	5.0721	5.0226	5.0036
2	ICB	.02454	.00316	-.00019	.00095	.00305	.00110
3	LLS	.20391	.23628	.00999	.20318	.04204	.02147
4	ICSA	.02129	259.82	-.00807	.01388	.00241	-.00024
5	ICSAB	.02760	258.77	.93602	.00954	.47004	.47491
6	S99T001730	2.8552	10.125	-.54925	-2.3270	2.9777	4317.6
7	S99T001730_D	-.12490	7.4096	-1.4579	-14.325	.54636	4275.6
8	S99T001732	13.127	8.2407	-1.0332	-7.2820	1.9075	3081.2
9	S99T001732_D	-12.172	6.4225	-.94564	-13.261	2.0028	3065.9
10	CCV	5.0592	5.1361	5.0306	4.9916	5.0077	4.9832
11	CCB	.00900	.00345	.00075	.00102	.00118	.00178
12	S99T001733_L	25.193	-1.5251	-.92472	-19.040	6.0524	2802.8
13	S99T001733	64.862	7.6063	2.0677	31.148	18.780	2227.2
14	S99T001733	18.879	9.8211	-.39245	-6.2607	2.2847	2741.5
15	S99T001733_D	12.001	9.6776	-.40286	-7.1023	2.1385	2721.5
16	S99T001733_A	618.26	645.87	627.37	603.01	604.49	3356.4
17	S99T001733_X	-6.9862	8.2525	-3.1175	-44.796	7.7786	2811.8
18	S99T001733_AX	60663.	59622.	60098.	60042.	60412.	62561.
19	ICSA	.02551	256.29	-.00886	.00844	.00259	-.00040
20	ICSAB	.03050	259.63	.93682	.00962	.46827	.47566
21	CCV	5.0551	5.1266	5.0208	5.0441	5.0076	5.0033
22	CCB	.00619	.00053	-.00030	-.00041	.00196	.00101

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#	Sample Name	Cu	Bu	Fe	K	La	Li
1	ICV	5.0683	.03422	5.0933	5.3266	5.1154	4.9818
2	ICB	.00222	.00036	.00118	.43551	.00035	.00009
3	LLS	.01989	.00154	.10453	Q.76200	.10163	.02098
4	ICSA	-.00160	.31204	99.087	.54637	-.00579	.00328
5	ICSAB	.48536	.31713	98.852	.28624	-.00773	.98301
6	S99T001730	-6.7824	-.30172	2.6273	1749.3	-.09806	.62179
7	S99T001730_D	-7.7410	-.74790	1.6177	1612.7	-1.4929	.28241
8	S99T001732	-2.9930	-.14841	.25320	1842.9	-.95518	.11304
9	S99T001732_D	-3.2159	1.4571	-.76566	1851.3	-1.4853	1.4697
10	CCV	4.9813	.03546	5.0639	5.0122	5.0478	4.8599
11	CCB	.00171	.00186	.00029	.21423	.00130	.00103
12	S99T001733_L	-1.4798	.92666	.08728	1829.5	-1.1862	.85210
13	S99T001733	8.6564	18.649	5.6709	2468.8	4.4436	6.9484
14	S99T001733	-2.1174	.53695	.33612	1815.8	-.42016	.73494
15	S99T001733_D	-2.2762	.81040	.18582	1727.3	-.48715	.84825
16	S99T001733_A	590.61	5.2695	617.38	2511.9	613.46	590.05
17	S99T001733_X	1.3924	5.8332	1.3343	3399.2	-5.5864	3.9598
18	S99T001733_AX	60215.	412.45	59768.	60475.	59902.	60101.
19	ICSA	-.00113	.31215	97.967	.50694	-.00713	.00291
20	ICSAB	.48424	.31566	98.986	.32541	-.00786	.98131
21	CCV	5.0454	.03512	5.0678	4.8919	5.1154	4.9870
22	CCB	.00167	.00087	.00081	.30500	-.00087	.00018

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#	Sample Name	Mg	Mn	Mo	Na	Nd	Ni
1	ICV	5.0398	4.7229	4.9721	4.9479	5.0712	4.9913
2	ICB	.00711	-.00004	-.00284	.01877	.00600	.00005
3	LLS	.19745	.01917	.10033	.21066	.20773	.03983
4	ICSA	257.92	-.00949	-.01020	192.97	.01930	-.00631
5	ICSAB	256.82	.42534	-.00923	193.83	.01914	.92584
6	S99T001730	-1.5217	-.14340	69.302	233280.	3.1848	-.10663
7	S99T001730_D	-16.759	-.18656	68.154	231380.	.11635	-2.8247
8	S99T001732	-7.7522	-.33952	84.731	231710.	2.2953	-.98522
9	S99T001732_D	-8.3467	-.04135	83.714	222280.	3.0302	.22995
10	CCV	4.9611	4.6959	4.9435	4.9754	5.0029	4.9892
11	CCB	.00901	.00031	.00037	.01910	.00543	-.00091
12	S99T001733_L	3.3880	-.49696	79.609	212550.	2.5501	-4.0261
13	S99T001733	38.151	1.5684	65.328	158818.	51.926	-7.3268
14	S99T001733	-2.4566	-.15947	74.501	204400.	4.5085	-3.0992
15	S99T001733_D	-2.7594	-.18019	75.157	203370.	4.6560	-2.0443
16	S99T001733_A	603.52	567.49	687.24	205370.	613.85	610.79
17	S99T001733_X	7.3547	.60990	77.769	215720.	2.4290	-34.993
18	S99T001733_AX	59844.	59700.	60286.	274750.	60023.	60017.
19	ICSA	254.52	-.00944	-.01139	191.81	.01728	-.01109
20	ICSAB	256.50	.42453	-.00996	192.81	.01987	.92562
21	CCV	4.9880	4.7078	4.9630	5.1399	5.0538	5.0035
22	CCB	.00118	.00026	-.00082	-.02441	.00598	-.00102

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#	Sample Name	P	Pb	S	Sb	Se	Si
1	ICV	5.0861	4.9187	4.9066	4.9874	4.9344	5.1139
2	ICB	-.00396	.00730	.00605	.00561	-.01584	.00115
3	LLS	.40495	.21174	.20567	.09656	.21137	.12378
4	ICSA	-.03362	.08021	-.02172	.00469	-.06608	-.00932
5	ICSAB	-.02835	1.0265	-.01508	.00734	-.05639	-.00484
6	S99T001730	887.31	16.413	1641.8	24.005	25.606	75.186
7	S99T001730_D	884.93	-.23140	1628.4	19.887	21.524	75.070
8	S99T001732	829.05	19.514	953.34	14.886	30.748	61.764
9	S99T001732_D	833.38	27.527	942.65	19.067	42.217	67.857
10	CCV	5.0523	4.9230	4.8471	4.9702	4.9013	5.0890
11	CCB	.00413	.01051	.01450	-.00188	.02622	.00558
12	S99T001733_L	736.71	6.4932	835.00	-6.7819	5.8659	83.138
13	S99T001733	611.68	115.15	870.15	16.702	80.354	80.784
14	S99T001733	748.06	27.588	831.19	20.229	36.134	60.175
15	S99T001733_D	737.52	26.173	829.56	13.338	36.785	60.591
16	S99T001733_A	1375.9	640.62	1447.7	628.11	671.03	706.86
17	S99T001733_X	778.76	61.374	883.68	-2.1419	97.507	136.06
18	S99T001733_AX	62102.	60022.	61943.	61101.	60426.	60237.
19	ICSA	-.02155	.08240	-.02890	.00430	-.05711	-.01382
20	ICSAB	-.03163	1.0405	-.02319	-.01051	-.05539	-.00648
21	CCV	5.0905	4.9037	4.8708	4.9935	4.9410	5.0921
22	CCB	.00312	.00740	.01041	.00334	.02328	.00052

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#	Sample Name	Sm	Sr	Th	Ti	Tl	U
1	ICV	5.0938	4.9155	.37190	5.1477	4.9721	9.9012
2	ICB	-.00205	.00000	.00434	.00085	.00243	-.01315
3	LLS	.20375	.02013	.01324	.02071	.41005	.49940
4	ICSA	-.00799	.00161	.11951	.00172	-.11412	.19992
5	ICSAB	-.01512	.00168	.12923	.00272	-.08128	.18320
6	S99T001730	-3.6487	-.00235	-30.211	1.6980	-3.6102	22.773
7	S99T001730_D	-7.4864	-.03846	-42.720	1.2333	-1.2232	14.399
8	S99T001732	-4.9724	-.03759	-30.542	1.1221	-3.5741	4.1796
9	S99T001732_D	8.6533	.14282	-35.534	.93167	-9.8297	53.336
10	CCV	5.0034	4.8538	.34876	5.0384	4.9594	9.7737
11	CCB	.01062	.00018	.00457	.00097	-.00514	.04719
12	S99T001733_L	-7.2096	-.18049	-17.533	2.4419	-57.591	-46.949
13	S99T001733	81.189	1.8967	64.839	7.6878	3.1841	336.24
14	S99T001733	.06294	.03438	-25.848	1.2198	-.89786	25.119
15	S99T001733_D	1.5003	.07137	-25.693	1.1396	-2.7259	24.488
16	S99T001733_A	617.21	595.24	20.815	606.95	597.75	1241.7
17	S99T001733_X	26.880	.73042	-109.61	2.0718	-51.555	91.050
18	S99T001733_AX	59961.	59904.	4577.7	60374.	59682.	120560.
19	ICSA	-.01350	.00164	.12271	.00284	-.08204	.18226
20	ICSAB	-.00809	.00174	.12944	.00287	-.07089	.18667
21	CCV	5.0875	4.9146	.37676	5.0913	4.9062	9.9020
22	CCB	.00226	.00009	-.00213	.00054	-.00001	.01265

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#	Sample Name	V	Y	Zn	Zr
1	ICV	5.0436	.01332	4.9907	5.0511
2	ICB	-.00067	.00000	-.00015	-.00051
3	ILS	.10047	.00049	.02046	.01909
4	ICSA	-.00677	.01107	-.00654	-.00484
5	ICSAB	.46650	.01053	.99700	-.00628
6	S99T001730	.29379	-.43487	.56592	2.1790
7	S99T001730_D	.04866	-.52580	-.22896	2.6395
8	S99T001732	.25044	-.28523	-1.4854	2.2118
9	S99T001732_D	2.4739	.63874	-1.2875	3.8596
10	CCV	5.0147	.01416	4.9803	5.0097
11	CCB	.00195	.00108	.00053	.00121
12	S99T001733_L	-.56740	-.68870	-.99845	.68443
13	S99T001733	14.196	5.7626	-1.1163	14.897
14	S99T001733	1.2745	.03656	-1.1001	2.2072
15	S99T001733_D	1.2745	.17856	-1.2894	2.4364
16	S99T001733_A	602.90	2.0707	611.94	609.54
17	S99T001733_X	7.6616	2.3235	.70706	12.821
18	S99T001733_AX	60689.	166.08	60214.	62217.
19	ICSA	-.00703	.01029	-.00608	-.00545
20	ICSAB	.46902	.01061	.99758	-.00569
21	CCV	5.0478	.01316	4.9756	5.0512
22	CCB	.00057	.00015	.00093	.00074

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K Lto
10-26-99

File # 910276

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ws2

LABCORE Data Entry Template for Worklist# 31566

Analyst: JK Seto Instrument: ICPOT 2/10-26-99 Book# 806485

Method: LA-505-151/161 Rev/Mod C-4

Worklist Comment: ICP S-111 (SOLID ACID DIGEST)

Ensure dose rate at 30cm
is ≤ 50 mrem/hr prior to
performing this analysis

S	Type	Sample#	R	A	Test	Matrix	Group#
1	ICV				ICP-QC	QC	
2	ICB				ICP-QC	QC	
3	ILS				ICP-QC	QC	
4	ICSA				ICP-QC	QC	
5	ICSAB				ICP-QC	QC	
6	PREPSTDJJA				ICP-A01	SOLID	
7	PREPBLKJJA				ICP-A01	SOLID	
8	SERDIL	S99T001738	0	A	ICP-A01	SOLID	
9	SAMPLE	S99T001738	0	A	ICP-A01	SOLID	99000304 S-111 GRAB
Analytes Requested: AG-A-01, AL-A-01, AS-A-01, B-A-01, BA-A-01, BE-A-01, BI-A-01, CA-A-01, CD-A-01, CE-A-01, CO-A-01, CR-A-01, CU-A-01, FE-A-01, K-A-01, LA-A-01, LI-A-01, MG-A-01, MN-A-01, MO-A-01, NA-A-01, ND-A-01, NI-A-01, P-A-01, PB-A-01, S-A-01, SB-A-01, SE-A-01, SI-A-01, SM-A-01, SR-A-01, TI-A-01, TL-A-01, U-A-01, V-A-01, ZN-A-01, ZR-A-01							
10	DUP	S99T001738	0	A	ICP-A01	SOLID	
11	SPK-PREDIG	S99T001738	0	A	ICP-A01	SOLID	10-27-99
12	SPK-POST	S99T001738	0	A	ICP-A01	SOLID	10/27/99
13	ICSA				ICP-QC	QC	
14	ICSAB				ICP-QC	QC	
15	CCV				ICP-QC	QC	

Data Entry Comments:

 uploaded 10-27-99
 JH Wall

Validated by:

 Sel M. Pang
 10/27/99

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

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ws2

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LABCORE Data Entry Template for Worklist# 31566

S Type	Sample#	R A	Test	Matrix	Group#	Project
16 CCB			ICP-QC	QC		

Final page for worklist # 31566

Signature	Date
Prep 5/6 TJG	Direct, DF 1
Prep 6/11 TJG	Direct 1
599T001738-L	4-4-2-8, DF 10
599T001738	4-4 2
599T001738-D	4-4 2
599T001738-5	10-27-99
599T001738-X	4-4-1-9 20
599T001738-QX	4-4-1-9 20

Signature	Date
-----------	------

Data Entry Comments:

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

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Analysis Report

Summary

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#	Sample Name	File	Method	Date	Time	OpID	Type	Mode
1	ICV	91027A	ICP2	10/27/99	08:02	DKS	Q	CONC
2	ICB	91027A	ICP2	10/27/99	08:06	DKS	Q	CONC
3	LLS	91027A	ICP2	10/27/99	08:09	DKS	Q	CONC
4	ICSA	91027A	ICP2	10/27/99	08:12	DKS	Q	CONC
5	ICSAB	91027A	ICP2	10/27/99	08:15	DKS	Q	CONC
6	PREPSTDITJA	91027A	ICP2	10/27/99	08:19	DKS	Q	CONC
7	PREPBLKTJA	91027A	ICP2	10/27/99	08:23	DKS	Q	CONC
8	S99T001738_L	91027A	ICP2	10/27/99	08:28	DKS	S	CONC
9	S99T001738	91027A	ICP2	10/27/99	08:32	DKS	S	CONC
10	S99T001738_D	91027A	ICP2	10/27/99	08:35	DKS	S	CONC
11	S99T001738_X	91027A	ICP2	10/27/99	08:39	DKS	S	CONC
12	S99T001738_AX	91027A	ICP2	10/27/99	08:42	DKS	S	CONC
13	ICSA	91027A	ICP2	10/27/99	08:58	DKS	Q	CONC
14	ICSAB	91027A	ICP2	10/27/99	09:01	DKS	Q	CONC
15	CCV	91027A	ICP2	10/27/99	09:04	DKS	Q	CONC
16	CCB	91027A	ICP2	10/27/99	09:08	DKS	Q	CONC

JK

10-27-99

Worklist # 31566

S-111

S99T001738

S99T001738

$$Al = \frac{171.00 \text{ ug}}{\text{ml}} \times \frac{1}{5.078 \frac{\text{g}}{\text{L}} \times \frac{1\text{L}}{1000 \text{ ml}}} = 3.37 \text{ e} + 4 \frac{\text{ug}}{\text{g}}$$

Post Spike:

$$Al = \frac{\left(\frac{379.15}{20}\right) - \left(\frac{171.00}{20}\right)}{10} \times 100 = 104.0\%$$

$$Na = \frac{\left(\frac{1037.7}{20}\right) - \left(\frac{845.51}{20}\right)}{10} \times 100 = 96.1\%$$

SIGNATURE ABOVE REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 184 TO 187.

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Analysis Report

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#	Sample Name	Ag	Al	As	B	Ba	Be
1	ICV	4.8463	4.9428	5.0404	5.0916	4.9580	4.9238
2	ICB	.00000	.00279	.00368	-.00078	-.00007	-.00005
3	LLS	.01814	.10395	.19737	.09562	.09717	.00992
4	ICSA	-.00122	247.53	-.02730	.00524	.00048	.00008
5	ICSAB	.94852	248.24	-.01858	.00527	.45953	.46300
6	PREPSTD TJA	.90731	4.5957	4.5047	5.1504	4.6262	4.6553
7	PREPBLKTJA	.00139	.02459	.00184	.00604	.00018	.00003
8	S99T001738_L	.05159	179.86	-.23362	.42057	.03587	.00026
9	S99T001738	.05816	171.00	-.06262	.41573	.03416	.00050
10	S99T001738_D	.05743	188.54	-.11522	.53788	.03277	.00074
11	S99T001738_X	.04903	183.63	-.18628	.41039	.03697	.00270
12	S99T001738_AX	194.44	379.15	200.29	198.42	200.78	201.08
13	ICSA	-.00190	248.97	-.01440	.00171	.00052	.00017
14	ICSAB	.95693	250.96	-.00529	.00360	.46867	.46665
15	CCV	4.8395	4.9262	5.0793	5.0811	4.9528	4.9370
16	CCB	-.00053	-.00363	.00430	-.00339	-.00015	.00014

#	Sample Name	Bi	Ca	Cd	Ce	Co	Cr
1	ICV	5.0541	5.1488	5.0560	5.0683	5.0443	5.0287
2	ICB	.01599	-.00436	.00083	-.00632	.00024	-.00009
3	LLS	.20773	.23517	.01042	.19410	.04260	.02010
4	ICSA	.02773	260.27	-.00760	.02037	.00271	-.00080
5	ICSAB	.01010	262.01	.94484	.01184	.46836	.47445
6	PREPSTD TJA	4.4654	4.6054	4.4654	4.7454	4.4999	4.6402
7	PREPBLKTJA	-.01052	.05934	.00159	.01108	.00209	Q.03904
8	S99T001738_L	.48896	1.9766	.07404	-.06341	.02849	56.706
9	S99T001738	.41643	1.8866	.06971	.01580	.01886	53.667
10	S99T001738_D	.45032	2.0327	.07630	.00259	.02686	58.988
11	S99T001738_X	.70646	1.9613	.07848	-.12757	.02338	58.067
12	S99T001738_AX	203.40	201.97	201.21	199.53	202.20	256.06
13	ICSA	-.00322	261.07	-.00730	.01078	.00178	-.00177
14	ICSAB	-.02805	261.52	.94428	-.00063	.46883	.47429
15	CCV	5.0481	5.1837	5.0729	5.0618	5.0517	5.0274
16	CCB	-.00238	-.00418	.00009	-.00960	.00067	-.00022

#	Sample Name	Cu	Eu	Fe	K	La	Li
1	ICV	5.0601	.03376	5.1159	4.6428	5.1245	4.9937
2	ICB	.00002	-.00014	-.00122	-.21391	-.00077	-.00046
3	LLS	.01767	.00168	.10371	.38901	.09916	.02088
4	ICSA	-.00215	.30958	98.897	.15684	-.00578	.00308
5	ICSAB	.47946	.31350	99.240	.20363	-.00709	.97022
6	PREPSTD TJA	4.6036	.02791	4.7856	4.3147	4.7644	4.6967
7	PREPBLKTJA	.00469	-.00383	Q.15996	.25128	.00119	-.00252
8	S99T001738_L	-.08902	.00605	6.7883	4.1761	.02880	.01960
9	S99T001738	-.08448	.00538	6.3740	5.8642	.03480	.01848
10	S99T001738_D	-.09225	.00582	6.1679	5.8857	.03465	.02166
11	S99T001738_X	-.09229	.02962	6.9698	6.8048	.01551	.03924
12	S99T001738_AX	199.19	1.3943	206.10	199.60	199.02	197.63
13	ICSA	-.00225	.31154	99.243	-.05324	-.00660	.00243

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Analysis Report

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#	Sample Name	Cu	Su	Fe	K	La	Li
14	ICSAB	.48866	.31708	99.708	-.08254	-.00926	.99086
15	CCV	5.0416	.03478	5.0955	5.0119	5.1086	4.9482
16	CCB	.00019	-.00071	-.00064	-.09234	-.00114	-.00074

#	Sample Name	Mg	Mn	Mo	Na	Nd	Ni
1	ICV	5.0158	4.7402	4.9814	5.0925	5.0636	4.9875
2	ICB	-.00512	.00006	-.00073	-.01146	-.00131	-.00102
3	LLS	.18369	.01926	.09976	.15489	.20294	.03874
4	ICSA	256.67	-.00935	-.00696	190.63	.01622	-.01210
5	ICSAB	256.84	.42757	-.01016	191.20	.01495	.92435
6	PREPSTD TJ A	4.4436	4.3541	4.5906	5.5487	4.8227	4.5033
7	PREPBLKTJA	.01932	.00256	.00403	Q.21568	.00702	Q.02027
8	S99T001738_L	.54294	.51180	.24180	823.78	.07156	.28132
9	S99T001738	.61026	.48298	.23526	776.98	.04611	.29545
10	S99T001738_D	.56121	.51952	.25065	810.01	.06767	.33070
11	S99T001738_X	.49520	.53245	.22048	845.51	.05269	.24993
12	S99T001738_AX	199.54	199.97	201.07	1037.7	199.00	200.49
13	ICSA	256.69	-.00960	-.00897	191.22	.01194	-.00915
14	ICSAB	257.99	.42744	-.00855	193.98	.01249	.92021
15	CCV	4.9935	4.7311	4.9909	5.0699	5.0336	4.9999
16	CCB	-.01208	.00000	-.00128	.00361	-.00130	-.00051

#	Sample Name	P	Pb	S	Sb	Se	Si
1	ICV	5.0887	4.9206	4.8612	5.0093	4.9254	5.1022
2	ICB	-.00650	-.00894	.00926	.00016	.00792	.00059
3	LLS	.39785	.19919	.20183	.09166	.20225	.12552
4	ICSA	-.02884	.06170	-.03209	-.00587	-.05971	-.00906
5	ICSAB	-.01799	1.0326	-.02369	.00453	-.05719	-.00384
6	PREPSTD TJ A	4.6220	4.3343	4.3669	4.4359	4.5065	6.3446
7	PREPBLKTJA	.02231	.01455	.04104	.00738	.01863	.03770
8	S99T001738_L	11.827	.19812	17.014	.31096	.21914	3.9617
9	S99T001738	11.322	.23803	16.184	.30975	.08238	3.7132
10	S99T001738_D	11.814	.28235	17.805	.33905	.08070	3.5793
11	S99T001738_X	12.109	.09878	17.466	.30069	.40336	4.4471
12	S99T001738_AX	215.91	200.68	219.86	202.99	200.76	204.50
13	ICSA	-.02757	.05038	-.02879	.00268	-.06243	-.01304
14	ICSAB	-.02480	1.0272	-.02998	.00202	-.06008	-.01203
15	CCV	5.0819	4.9285	4.8756	5.0119	4.9453	5.0937
16	CCB	.00373	-.00759	.00789	-.00281	.01141	-.00282

#	Sample Name	Sm	Sr	Th	Ti	Tl	U
1	ICV	5.1033	4.9216	.38854	5.1250	4.9199	9.9115
2	ICB	.00067	-.00006	.00044	-.00013	.00676	-.00840
3	LLS	.20375	.01993	.00543	.01994	.43813	.50264
4	ICSA	-.01217	.00142	.13987	.00208	-.06342	.15649
5	ICSAB	-.01202	.00157	.13449	.00247	-.06909	.16682
6	PREPSTD TJ A	4.7617	4.6506	.38392	4.8011	4.4077	9.5386
7	PREPBLKTJA	-.02576	-.00042	.02142	.00120	-.00182	-.11039

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#	Sample Name	Sm	Sr	Th	Ti	Tl	U
8	S99T001738_L	.01821	.02706	-.19867	.35186	.12676	1.6651
9	S99T001738	-.01959	.02584	-.20879	.35151	.04014	1.6322
10	S99T001738_D	-.00918	.02827	-.25290	.28610	.02206	1.8120
11	S99T001738_X	.25296	.03157	-.26321	.35145	.04762	2.6670
12	S99T001738_AX	199.38	199.06	15.854	201.61	200.01	401.79
13	ICSA	-.01920	.00139	.13621	.00221	-.04990	.12824
14	ICSAB	-.02408	.00156	.12000	.00160	-.04387	.11293
15	CCV	5.0917	4.9079	.41108	5.1085	4.9512	9.8880
16	CCB	-.00160	-.00012	.00070	-.00026	.00699	-.01326

#	Sample Name	V	Y	Zn	Zr
1	ICV	5.0536	.01292	4.9952	5.0630
2	ICB	-.00017	-.00007	-.00002	-.00022
3	LLS	.10079	.00065	.02111	.01982
4	ICSA	-.00723	.01093	-.00568	-.00652
5	ICSAB	.46743	.01109	1.0026	-.00605
6	PREPSTDITJA	4.6294	.00907	4.3642	4.7213
7	PREPBLKTJA	-.00440	-.00215	.00427	-.00489
8	S99T001738_L	.02879	.02680	.15000	.07540
9	S99T001738	.02799	.02383	.14814	.06012
10	S99T001738_D	.03273	.02595	.14751	.07410
11	S99T001738_X	.07225	.04603	.17191	.10127
12	S99T001738_AX	202.19	.57602	200.12	207.16
13	ICSA	-.00805	.01016	-.00648	-.00702
14	ICSAB	.46937	.00993	1.0023	-.00674
15	CCV	5.0576	.01332	4.9911	5.0537
16	CCB	-.00056	-.00023	-.00019	-.00063

JK LA

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File # 91027B

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LABCORE Data Entry Template for Worklist# 31567Analyst: JK Seto Instrument: ICP012-11/10-16-99 Book# 86848BMethod: LA-505-151/161 Rev/Mod C-4Ensure dose rate at 30cm
is ≤ 50 mrem/hr prior to
performing this analysisWorklist Comment: 10-16-99
ICP S-111 (FUSION)

S Type	Sample#	R A	Test	Matrix	Group#	Project
1	ICV		●ICP-QC	QC		
2	ICB		●ICP-QC	QC		
3	ILS		●ICP-QC	QC		
4	ICSA		●ICP-QC	QC		
5	ICSAB		●ICP-QC	QC		
6	PREPBLKTJA		●ICP-F01	SOLID		
7	SERDIL	S99T001737 0 F	●ICP-F01	SOLID		
8	SAMPLE	S99T001737 0 F	●ICP-F01	SOLID	99000304	S-111 GRAB
Analytes Requested: AG-F-01 , AL-F-01 , AS-F-01 , B-F-01 , BA-F-01 , BE-F-01 , BI-F-01 , CA-F-01 , CD-F-01 , CE-F-01 , CO-F-01 , CR-F-01 , CU-F-01 , FE-F-01 , LA-F-01 , LI-F-01 , MG-F-01 , MN-F-01 , MO-F-01 , NA-F-01 , ND-F-01 , NI-F-01 , P-F-01 , PB-F-01 , S-F-01 , SB-F-01 , SE-F-01 , SI-F-01 , SM-F-01 , SR-F-01 , TI-F-01 , TL-F-01 , U-F-01 , V-F-01 , ZN-F-01 , ZR-F-01						
9	DUP	S99T001737 0 F	●ICP-F01	SOLID		
10	SPE POST	S99T001737 0 F	●ICP-F01	SOLID		
11	ICSA		●ICP-QC	QC		
12	ICSAB		●ICP-QC	QC		
13	CCV		●ICP-QC	QC		
14	CCB		●ICP-QC	QC		

Data Entry Comments:

Uploading 10-27-99
John W. Wall

Validated by:

Sal R. Pong
10/27/99

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

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LABCORE Data Entry Template for Worklist# 31567

S Type	Sample#	R A Test	Matrix	Group#	Project
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Final page for worklist # 31567

Signature	Date	Signature	Date
JK [Signature]	10-27-99		
Prep [Signature]	25-10	JF	1
5997001737_L	25-10-28	JF	205
5997601737	25-10		41
5997601737_D	25-10		41
5997001737_G	25-10		41
5997001737-EXX	25-10-19		410
5997001737-QX	25-10-19		410

ME
10-26-99

Data Entry Comments:

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

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Summary

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#	Sample Name	File	Method	Date	Time	OpID	Type	Mode
1	ICV	91027B	ICP2	10/27/99	09:13	DKS	Q	CONC
2	ICB	91027B	ICP2	10/27/99	09:16	DKS	Q	CONC
3	LLS	91027B	ICP2	10/27/99	09:19	DKS	Q	CONC
4	ICSA	91027B	ICP2	10/27/99	09:21	DKS	Q	CONC
5	ICSAB	91027B	ICP2	10/27/99	09:24	DKS	Q	CONC
6	PREPHLETTJA	91027B	ICP2	10/27/99	09:28	DKS	Q	CONC
7	S99T001737_L	91027B	ICP2	10/27/99	09:32	DKS	S	CONC
8	S99T001737	91027B	ICP2	10/27/99	09:35	DKS	S	CONC
9	S99T001737_D	91027B	ICP2	10/27/99	09:39	DKS	S	CONC
10	S99T001737_A	91027B	ICP2	10/27/99	09:42	DKS	S	CONC
11	S99T001737_X	91027B	ICP2	10/27/99	09:45	DKS	S	CONC
12	S99T001737_AX	91027B	ICP2	10/27/99	09:49	DKS	S	CONC
13	ICSA	91027B	ICP2	10/27/99	10:05	DKS	Q	CONC
14	ICSAB	91027B	ICP2	10/27/99	10:08	DKS	Q	CONC
15	CCV	91027B	ICP2	10/27/99	10:11	DKS	Q	CONC
16	CCB	91027B	ICP2	10/27/99	10:15	DKS	Q	CONC

JK AD

10-27-99
Worklist # 31567

S-111

S99T001737

S 99T001737

$$Al = 102.20 \frac{\mu g}{ml} \times \frac{1}{2.0812 \frac{g}{L} \times \frac{1L}{1000ml}} = 4.912 \pm 4 \frac{\mu g}{g}$$

$$Post Spike: Al = \left(\frac{145.33}{41} \right) - \left(\frac{102.20}{41} \right) \times 100 = 105.2\%$$

$$Na = 359.86 \frac{\mu g}{ml} \times \frac{1}{2.0812 \frac{g}{L} \times \frac{1L}{1000ml}} = 1.732 \pm 5 \frac{\mu g}{g}$$

SIGNATURE ABOVE REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 190 TO 193.

Post Spike:

$$Na = \left(\frac{4401.2}{410} \right) - \left(\frac{359.86}{410} \right) \times 100 = 98.6\%$$

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#	Sample Name	Ag	Al	As	B	Ba	Be
1	ICV	4.8153	4.9131	5.0513	5.0428	4.9338	4.8953
2	ICB	.00052	.00631	-.00490	.00234	-.00002	.00012
3	LLS	.02046	.12375	.19427	.09900	.09762	.01011
4	ICSA	-.00148	245.62	.00239	.00411	.00053	.00016
5	ICSAB	.94092	245.18	-.01651	.00135	.45543	.46018
6	PREPBLKTJA	-.00021	.00564	.00014	-.00184	.00036	.00007
7	S99T001737_L	.30136	105.12	.67271	-.10587	.06346	.02179
8	S99T001737	.01121	102.20	.04469	.11912	.05274	.00301
9	S99T001737_D	.10041	101.54	.34612	.07587	.09518	.00451
10	S99T001737_A	37.895	145.33	42.581	40.968	39.904	41.454
11	S99T001737_X	-.23447	112.19	-1.6341	-.96462	.02563	.05830
12	S99T001737_AX	3550.9	4187.6	4127.9	4095.0	4172.1	4133.1
13	ICSA	-.00004	248.69	-.01756	-.00187	.00035	.00030
14	ICSAB	.94865	247.62	.00440	.00522	.46202	.46232
15	CCV	4.8387	4.9345	5.0916	5.0869	4.9777	4.9541
16	CCB	.00059	.01114	-.00253	-.00053	-.00009	.00015

#	Sample Name	Bi	Ca	Cd	Ce	Co	Cr
1	ICV	5.0383	5.1426	5.0269	5.0400	5.0028	4.9940
2	ICB	-.02543	-.00126	.00006	-.00540	.00000	-.00018
3	LLS	.21993	.24079	.01159	.21371	.04426	.02254
4	ICSA	.00793	260.38	-.00707	.01917	.00075	-.00178
5	ICSAB	.01062	260.31	.93873	.01217	.46670	.47128
6	PREPBLKTJA	.00184	.00094	.00058	-.00519	.00045	-.00007
7	S99T001737_L	-6.4576	2.1931	.28629	1.4348	.10600	25.508
8	S99T001737	-.97188	2.3080	.02873	-.08889	-.08695	25.025
9	S99T001737_D	-.34503	2.3961	.09593	.25541	.05161	24.318
10	S99T001737_A	42.651	45.500	43.406	41.509	41.846	67.336
11	S99T001737_X	-4.6526	.28803	.14507	-1.9416	-.39266	25.632
12	S99T001737_AX	4184.1	4087.1	4107.8	4128.5	4136.0	4127.4
13	ICSA	.01402	258.62	-.00769	.00450	-.00130	-.00235
14	ICSAB	.00866	258.95	.93247	.01763	.46527	.47112
15	CCV	5.0573	5.1642	5.0361	5.0822	5.0353	5.0263
16	CCB	.01708	-.00348	.00019	-.00665	-.00081	-.00066

#	Sample Name	Cu	Eu	Fe	K	La	Li
1	ICV	5.0212	.03380	5.0678	4.9505	5.0873	4.9180
2	ICB	.00056	-.00097	.00038	-.00179	.00038	-.00046
3	LLS	.02011	.00089	.10355	.50803	.10217	.02051
4	ICSA	-.00240	.30816	98.627	.20164	-.00533	.00308
5	ICSAB	.47428	.31085	98.493	.18663	-.00747	.95165
6	PREPBLKTJA	-.00020	.00037	.00197	Q280.52	-.00069	.00000
7	S99T001737_L	-.11958	.02843	4.1214	11196.	.16466	.09617
8	S99T001737	-.10336	.00697	4.1620	10998.	-.00407	.01932
9	S99T001737_D	.02814	-.03645	4.7532	11512.	.04954	-.02670
10	S99T001737_A	41.445	.23445	46.793	11280.	42.253	40.587
11	S99T001737_X	.24816	-.77768	4.1748	11800.	-.46226	-.49883
12	S99T001737_AX	4139.0	27.678	4102.7	15514.	4124.1	4072.9
13	ICSA	-.00194	.31732	98.694	.19094	-.00805	.00140

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#	Sample Name	Cu	Eu	Fe	K	La	Li
14	ICSA	.48163	.31650	98.383	.17972	-.00675	.96572
15	CCV	5.0674	.03449	5.0849	4.9153	5.1378	4.9116
16	CCB	-.00086	-.00234	-.00016	-.28227	-.00173	-.00206
#	Sample Name	Mg	Mn	Mo	Na	Nd	Ni
1	ICV	4.9817	4.6860	4.9421	5.0821	5.0168	4.9506
2	ICB	-.00347	-.00005	.00062	-.00689	.00076	-.00300
3	LLS	.20352	.01913	.10257	.20626	.20688	.03711
4	ICSA	254.50	-.00923	-.01043	188.01	.01241	-.01392
5	ICSA	253.65	.42288	-.01100	187.38	.01181	.92256
6	PREPBLKTJA	-.00487	.00094	-.00195	.04157	-.00185	Q.20955
7	S99T001737_L	1.2528	.29432	-.20592	342.15	-.19562	18.775
8	S99T001737	.29817	.29841	.09312	336.51	-.35597	19.936
9	S99T001737_D	1.0800	.28885	.06101	376.88	.14183	10.882
10	S99T001737_A	41.972	39.358	42.083	396.00	41.853	61.729
11	S99T001737_X	-3.7101	.18715	-.38569	359.86	.34326	17.908
12	S99T001737_AX	4090.4	4084.8	4110.8	4401.2	4104.9	4119.0
13	ICSA	255.03	-.00974	-.00991	191.50	.01142	-.01327
14	ICSA	254.08	.42203	-.01248	189.50	.01315	.91557
15	CCV	4.9966	4.7048	4.9842	5.0346	5.0367	4.9660
16	CCB	-.00900	-.00024	-.00175	-.01181	-.00392	-.00407
#	Sample Name	P	Pb	S	Sb	Se	Si
1	ICV	5.0849	4.9002	4.8416	4.9845	4.8956	5.0638
2	ICB	-.00102	-.00882	.01386	-.00370	.01523	-.00348
3	LLS	.41012	.20945	.20930	.09653	.20846	.11857
4	ICSA	-.02100	.05668	-.03465	-.00098	-.04117	-.00905
5	ICSA	-.02847	1.0210	-.02756	.00047	-.04162	-.00344
6	PREPBLKTJA	.00142	-.02171	-.00759	-.00676	.01140	.01624
7	S99T001737_L	3.4823	-2.7378	6.6165	.92113	1.0432	18.985
8	S99T001737	5.1294	-.86740	7.1028	.23037	.68022	16.660
9	S99T001737_D	5.0614	-.16379	7.2585	.13668	.32219	22.157
10	S99T001737_A	47.428	41.785	49.266	42.417	42.206	60.483
11	S99T001737_X	5.5992	-4.1641	9.2223	-1.6513	-.53268	20.642
12	S99T001737_AX	4174.7	4093.4	4160.2	4180.6	4112.2	4115.0
13	ICSA	-.03324	.04586	-.03617	-.00699	-.07538	-.01832
14	ICSA	-.02248	1.0137	-.03111	-.01093	-.06228	-.01221
15	CCV	5.0788	4.9047	4.8851	5.0053	4.9365	5.0869
16	CCB	-.00391	-.01603	.00130	-.00375	.00320	-.00891
#	Sample Name	Sm	Sr	Th	Ti	Tl	U
1	ICV	5.0701	4.8859	.41202	5.0923	4.9499	9.8331
2	ICB	-.00222	-.00012	.00680	-.00010	.01049	-.01904
3	LLS	.20126	.01987	.03026	.02073	.42336	.48433
4	ICSA	-.01239	.00141	.14369	.00156	-.06254	.13369
5	ICSA	-.00962	.00142	.13045	.00165	-.06083	.13302
6	PREPBLKTJA	.00610	.00003	.00370	-.00049	.01315	-.07410
7	S99T001737_L	1.2129	.02512	3.3234	.38270	2.2114	-.73801

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#	Sample Name	Sm	Sr	Th	Ti	Tl	U
8	S99T001737	.21850	.03025	.00607	.35794	.91247	-1.9178
9	S99T001737_D	-.28162	.03294	.60819	.51340	.62660	-4.0117
10	S99T001737_A	41.972	41.005	3.2627	42.652	41.338	79.942
11	S99T001737_X	-3.5326	-.04856	2.2279	.46611	2.0358	-19.519
12	S99T001737_AX	4153.8	4120.2	343.91	4175.4	4073.7	8285.6
13	ICSA	-.03017	.00142	.12036	.00147	-.04282	.08415
14	ICSAB	-.02372	.00147	.13780	.00236	-.04759	.10354
15	CCV	5.1303	4.9340	.42764	5.1497	4.9439	9.9300
16	CCB	-.01428	-.00027	.00435	-.00080	.01540	-.05920

#	Sample Name	V	Y	Zn	Zr
1	ICV	5.0228	.01311	4.9608	5.0244
2	ICB	-.00135	-.00046	.00005	-.00128
3	ILS	.09988	.00042	.02124	.01759
4	ICSA	-.00604	.01086	-.00637	-.00657
5	ICSAB	.46503	.01087	.99337	-.00591
6	PREPBLKTJA	.00032	.00026	.00252	-.00021
7	S99T001737_L	.05247	.04865	.13631	-.24707
8	S99T001737	.03432	.01692	.12439	.02595
9	S99T001737_D	-.04402	-.01441	.04836	-.06659
10	S99T001737_A	41.482	.09816	42.043	41.550
11	S99T001737_X	-.93517	-.37846	.13903	-.72149
12	S99T001737_AX	4153.1	10.885	4098.1	4271.0
13	ICSA	-.00894	.00939	-.00663	-.00743
14	ICSAB	.46480	.00970	.99045	-.00825
15	CCV	5.0584	.01275	4.9683	5.0651
16	CCB	-.00303	-.00131	.00062	-.00246

JK
10-27-99

LABCORE Completed Worklist Report for Worklist# 31568

Analyst: kjt

Instrument: ICPMS1

Book#: 42B55

Method: LA-506-101 Rev/Mod A-2

Worklist Comment: ICP/MS S-111 (DIRECT)

Seq Type	Sample#	R A	Test	Matrix	Actual	Found	DL or Yield	Unit
1 ICV	0	0	QMSU-QC U235	QC	0.000170	1.70e-04	100.000 % Recovery	
1 ICV	0	0	QMSU-QC U238	QC	0.023900	2.26e-02	94.561 % Recovery	
2 ICB	0	0	QMSU-QC U233	QC	1	<1.20e-5		ug/mL
2 ICB	0	0	QMSU-QC U234	QC	1	<1.20e-5		ug/mL
2 ICB	0	0	QMSU-QC U235	QC	1	<1.20e-5		ug/mL
2 ICB	0	0	QMSU-QC U236	QC	1	<1.60e-5		ug/mL
2 ICB	0	0	QMSU-QC U238	QC	1	<1.20e-5		ug/mL
3 SAMPLE	S99T001731	0 D	QMSU-D1 U233-D1	LIQUID	N/A	< 9.672e-01	0.967	ug/mL
3 SAMPLE	S99T001731	0 D	QMSU-D1 U234-D1	LIQUID	N/A	< 9.672e-01	0.967	ug/mL
3 SAMPLE	S99T001731	0 D	QMSU-D1 U235-D1	LIQUID	N/A	< 9.672e-01	0.967	ug/mL
3 SAMPLE	S99T001731	0 D	QMSU-D1 U236-D1	LIQUID	N/A	< 1.290e+00	1.290	ug/mL
3 SAMPLE	S99T001731	0 D	QMSU-D1 U238-D1	LIQUID	N/A	< 1.942e+00	0.967	ug/mL
4 DUP	S99T001731	0 D	QMSU-D1 U233-D1	LIQUID	<9.67e-1	<9.67e-1		RPD
4 DUP	S99T001731	0 D	QMSU-D1 U234-D1	LIQUID	<9.67e-1	<9.67e-1		RPD
4 DUP	S99T001731	0 D	QMSU-D1 U235-D1	LIQUID	<9.67e-1	<9.67e-1		RPD
4 DUP	S99T001731	0 D	QMSU-D1 U236-D1	LIQUID	<1.29e0	<1.29e0		RPD
4 DUP	S99T001731	0 D	QMSU-D1 U238-D1	LIQUID	1.94e+00	1.95e+00	0.514	RPD
5 SAMPLE	S99T001734	0 D	QMSU-D1 U233-D1	LIQUID	N/A	< 9.672e-01	0.967	ug/mL
5 SAMPLE	S99T001734	0 D	QMSU-D1 U234-D1	LIQUID	N/A	< 9.672e-01	0.967	ug/mL
5 SAMPLE	S99T001734	0 D	QMSU-D1 U235-D1	LIQUID	N/A	< 9.672e-01	0.967	ug/mL
5 SAMPLE	S99T001734	0 D	QMSU-D1 U236-D1	LIQUID	N/A	< 1.290e+00	1.290	ug/mL
5 SAMPLE	S99T001734	0 D	QMSU-D1 U238-D1	LIQUID	N/A	< 1.322e+00	0.967	ug/mL
6 DUP	S99T001734	0 D	QMSU-D1 U233-D1	LIQUID	<9.67e-1	<9.67e-1		RPD
6 DUP	S99T001734	0 D	QMSU-D1 U234-D1	LIQUID	<9.67e-1	<9.67e-1		RPD
6 DUP	S99T001734	0 D	QMSU-D1 U235-D1	LIQUID	<9.67e-1	<9.67e-1		RPD
6 DUP	S99T001734	0 D	QMSU-D1 U236-D1	LIQUID	<1.29e0	<1.29e0		RPD
6 DUP	S99T001734	0 D	QMSU-D1 U238-D1	LIQUID	1.32e+00	1.23e+00	7.059	RPD
7 SAMPLE	S99T001735	0 D	QMSU-D1 U233-D1	LIQUID	N/A	< 9.672e-01	0.967	ug/mL
7 SAMPLE	S99T001735	0 D	QMSU-D1 U234-D1	LIQUID	N/A	< 9.672e-01	0.967	ug/mL
7 SAMPLE	S99T001735	0 D	QMSU-D1 U235-D1	LIQUID	N/A	< 9.672e-01	0.967	ug/mL
7 SAMPLE	S99T001735	0 D	QMSU-D1 U236-D1	LIQUID	N/A	< 1.290e+00	1.290	ug/mL
7 SAMPLE	S99T001735	0 D	QMSU-D1 U238-D1	LIQUID	N/A	< 1.370e+00	0.967	ug/mL
8 DUP	S99T001735	0 D	QMSU-D1 U233-D1	LIQUID	<9.67e-1	<9.67e-1		RPD
8 DUP	S99T001735	0 D	QMSU-D1 U234-D1	LIQUID	<9.67e-1	<9.67e-1		RPD
8 DUP	S99T001735	0 D	QMSU-D1 U235-D1	LIQUID	<9.67e-1	<9.67e-1		RPD
8 DUP	S99T001735	0 D	QMSU-D1 U236-D1	LIQUID	<1.29e0	<1.29e0		RPD
8 DUP	S99T001735	0 D	QMSU-D1 U238-D1	LIQUID	1.37e+00	1.25e+00	9.160	RPD
9 SPK-POST	S99T001735	0 D	QMSU-D1 U235-D1	LIQUID	0.000142	1.35e-04	95.070 % Recovery	
9 SPK-POST	S99T001735	0 D	QMSU-D1 U238-D1	LIQUID	0.020	1.96e-02	98.000 % Recovery	
10 CCV	0	0	QMSU-QC U235	QC	0.000170	1.72e-04	101.176 % Recovery	
10 CCV	0	0	QMSU-QC U238	QC	0.023900	2.40e-02	100.418 % Recovery	

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

LABCORE Completed Worklist Report for Worklist# 31568

Seq	Type	Sample#	R A	Test	Matrix	Actual	Found	DL or Yield	Unit
11	CCB	0	0	QMSU-QC U233	QC	1	<1.20e-5		ug/mL
11	CCB	0	0	QMSU-QC U234	QC	1	<1.20e-5		ug/mL
11	CCB	0	0	QMSU-QC U235	QC	1	<1.20e-5		ug/mL
11	CCB	0	0	QMSU-QC U236	QC	1	<1.60e-5		ug/mL
11	CCB	0	0	QMSU-QC U238	QC	1	<1.20e-5		ug/mL

Final page for worklist# 31568

Analyst Signature Date

Analyst Signature Date

Paul M. Ray 10/26/99

Reviewer Signature Date

file 01026a.txt

HNF-1685 REV. 0

10/26/99 07:48

Page: 1

ws2

LABCORE Data Entry Template for Worklist# 31568Analyst: KST Instrument: ICPMS1 Poems Book# 42355Method: LA-506-101 Rev/Mod A-2

Worklist Comment: ICP/MS S-111 (DIRECT)

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	ICV				@MSU-QC	QC		
2	ICB				@MSU-QC	QC		
3	SAMPLE	S99T001731	0	D	@MSU-D1	LIQUID	99000304	S-111 GRAB
Analytes Requested: U233-D1 , U234-D1 , U235-D1 , U236-D1 , U238-D1								
4	DUP	S99T001731	0	D	@MSU-D1	LIQUID		
5	SAMPLE	S99T001734	0	D	@MSU-D1	LIQUID	99000304	S-111 GRAB
Analytes Requested: U233-D1 , U234-D1 , U235-D1 , U236-D1 , U238-D1								
6	DUP	S99T001734	0	D	@MSU-D1	LIQUID		
7	SAMPLE	S99T001735	0	D	@MSU-D1	LIQUID	99000304	S-111 GRAB
Analytes Requested: U233-D1 , U234-D1 , U235-D1 , U236-D1 , U238-D1								
8	DUP	S99T001735	0	D	@MSU-D1	LIQUID		
9	SPK-POST	S99T001735	0	D	@MSU-D1	LIQUID		
10	CCV				@MSU-QC	QC		
11	CCB				@MSU-QC	QC		

Final page for worklist # 31568

KS Poems
Signature Date

10-26-99

Uploaded & Validated by:
Sal M. Peng 10/26/99

Signature Date
05-10-025-10 8060125

Data Entry Comments:

S99T001731
S99T001731-d
S99T001731
S99T001734
S99T001734-d
S99T001734
S99T001735
S99T001735-d

S99T001735
S99T001735-a

Scans 0991731 0991734 0991735

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

Spike .02ml 10ppm Uranium

Analysis Report

10/26/99 13:25:33

page 1

Method: MS_TUNE

Sample Name: ms-tune

Operator: kjt

Comment:

Run Time: 10/26/99 13:24 Type: Unk

Mode: INT

Corr.Fact: 1.000000

Elem	In[115]	Ir[193]
Line	115/pulse	193/pulse
Units	Cts/S	Cts/S
Avg	98310.	34620.
Stddev	1453.	754.
%RSD	1.478	2.179
#1	96400.	33880.
#2	97660.	34590.
#3	98570.	34530.
#4	97820.	34940.
#5	98990.	34160.
#6	97530.	33910.
#7	97410.	33980.
#8	97750.	35180.
#9	101700.	36360.
#10	99210.	34690.

file u1026a.txt
 K5 thomdike 10-26-99

899T001731
 899T001731-d
 899T001731
 899T001734
 899T001734-d
 899T001734
 899T001735
 899T001735-d
 899T001735
 899T001735-a

80601 df .05-10 -.025-16

Scans 0991731, 0991734, 0991735

SIGNATURE ABOVE REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
 COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 197 TO 218.

Spl - .02ml of 10ppm Uranium

Analysis Report

HNF-1685 REV. 0

10/26/99 13:30:29

page 1

Method: MS_TUNE

Sample Name: ms-tune

Operator: kjt

Comment:

Run Time: 10/26/99 13:29 Type: Unk

Mode: INT

Corr.Fact: 1.000000

Elem	In[115]	Ir[193]
Line	115/pulse	193/pulse
Units	Cts/S	Cts/S
Avg	103700.	37150.
Stddev	823.	718.
%RSD	.7936	1.932
#1	104200.	36910.
#2	102600.	35760.
#3	103600.	36430.
#4	103600.	37750.
#5	102200.	37500.
#6	103700.	36540.
#7	103900.	37460.
#8	104000.	37710.
#9	105100.	38050.
#10	104100.	37360.

Analysis Report

HNF-1685 REV. 0

10/26/99 13:31:57

page 1

Method: MS_TUNE

Sample Name: ms-tune

Operator: kjt

Comment:

Run Time: 10/26/99 13:30 Type: Unk

Mode: INT

Corr.Fact: 1.000000

Elem	In[115]	Ir[193]
Line	115/pulse	193/pulse
Units	Cts/S	Cts/S
Avg	104100.	36830.
Stddev	1456.	723.
%RSD	1.399	1.963

#1	106800.	37710.
#2	103500.	35400.
#3	102900.	37340.
#4	105200.	36440.
#5	105000.	37880.
#6	103700.	36670.
#7	102500.	36860.
#8	103000.	36490.
#9	102600.	36430.
#10	105500.	37070.

Analysis Report

HNF-1685 REV. 0

10/26/99 13:34:59

page 1

Method: ISOU

Sample Name: BLANK

Operator:

Comment:

Run Time: 10/26/99 13:33 Type: Std

Mode: IR

Corr.Fact: 1.000000

Elem	U [233]	U [234]	U [235]	U [236]	U [238]
Line	233/pulse	234/pulse	235/pulse	236/pulse	238/pulse
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	8.892	8.881	8.344	8.799	9.030
Stddev	1.668	1.131	1.266	.800	.875
%RSD	18.76	12.73	15.18	9.089	9.692
#1	6.761	9.231	7.411	9.361	7.931
#2	10.04	7.500	8.517	7.500	8.263
#3	9.821	8.418	10.08	9.183	9.566
#4	10.40	8.691	6.847	8.559	9.481
#5	7.434	10.56	8.868	9.390	9.912

Int. Std.	Ir[193]
Line	193/pulse
Units	Cts/S
Avg	3.86660
Stddev	.0585
%RSD	1.5135

#1	3.8456
#2	3.9334
#3	3.9203
#4	3.7971
#5	3.8338

Method : ISOU

Standardzn Report

10/26/99 13:35:50

page 1

U_[233]	639.5340	8.8921	1.0000000	10/26/99 13:34:59
U_[234]	639.5499	8.8807	1.0000000	10/26/99 13:34:59
U_[235]	640.3050	8.3439	1.0000000	10/26/99 13:34:59
U_[236]	639.6653	8.7987	1.0000000	10/26/99 13:34:59
U_[238]	612.8763	9.0304	1.0000000	10/26/99 13:34:59

Analysis Report

HNF-1685 REV. 0

10/26/99 13:39:23

page 1

Method: ISOU

Sample Name: 100ppb U

Operator:

Comment:

Run Time: 10/26/99 13:38 Type: Std

Mode: IR

Corr.Fact: 1.000000

Elem	U [233]	U [234]	U [235]	U [236]	U [238]
Line	233/pulse	234/pulse	235/pulse	236/pulse	238/pulse
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	488.2	488.2	488.2	488.2	63920.
Stddev	18.3	18.3	18.3	18.3	4551.
%RSD	3.747	3.747	3.747	3.747	7.119
#1	501.2	501.2	501.2	501.2	67430.
#2	464.2	464.2	464.2	464.2	60600.
#3	510.3	510.3	510.3	510.3	69240.
#4	477.9	477.9	477.9	477.9	64010.
#5	487.5	487.5	487.5	487.5	58340.

Int. Std.

Line	Ir[193]
Units	193/pulse
	Cts/S
Avg	3.7620
Stddev	.0981
%RSD	2.6087

#1	3.6546
#2	3.8519
#3	3.6559
#4	3.8211
#5	3.8264

Method : ISOU

Standardzn Report

10/26/99 13:39:28

page 1

U_[233]	674.1594	8.8921	1.0000000	10/26/99 13:39:23
U_[234]	674.1753	8.8807	1.0000000	10/26/99 13:39:23
U_[235]	674.9304	8.3439	1.0000000	10/26/99 13:39:23
U_[236]	674.2907	8.7987	1.0000000	10/26/99 13:39:23
U_[238]	643.6647	9.0304	1.0000000	10/26/99 13:39:23

Analysis Report

HNF-1685 REV. 0

10/26/99 13:46:07

page 1

Method: ISOU Sample Name: blank

Operator: kjt

Comment: background

Run Time: 10/26/99 13:44 Type: Unk

Mode: CONC

Corr.Fact: 1.000000

Elem	U [233]	U [234]	U [235]	U [236]	U [238]
Line	233/pulse	234/pulse	235/pulse	236/pulse	238/pulse
Units	ppb	ppb	ppb	ppb	ppb
Avg	-.0017	-.0004	-.0006	-.0015	-.0003
Stddev	.0013	.0023	.0012	.0007	.0019
%RSD	79.80	576.3	190.3	48.88	596.5
#1	-.0003	.0011	.0001	-.0018	.0005
#2	-.0027	-.0007	-.0013	-.0011	-.0001
#3	-.0030	-.0032	-.0011	-.0021	-.0032
#4	-.0023	-.0018	-.0018	-.0021	.0020
#5	-.0001	.0026	.0011	-.0004	-.0008

Int. Std.	Ir[193]
Line	193/pulse
Units	Cts/S
Avg	3.7966
Stddev	.1212
%RSD	3.1922

#1	3.7524
#2	3.7359
#3	4.0126
#4	3.7288
#5	3.7532

Analysis Report

HNF-1685 REV. 0

10/26/99 13:48:16

page 1

Method: ISOU

Sample Name: ICV

Operator: kjt

Comment: iso_u lcs

Run Time: 10/26/99 13:47 Type: Unk

Mode: CONC

Corr.Fact: 1.000000

Elem	U [233]	U [234]	U [235]	U [236]	U [238]
Line	233/pulse	234/pulse	235/pulse	236/pulse	238/pulse
Units	ppb	ppb	ppb	ppb	ppb
Avg	-.0028	.0001	.1695	.0035	22.62
Stddev	.0011	.0011	.0090	.0026	1.02
%RSD	40.49	801.0	5.306	74.56	4.524
#1	-.0031	-.0004	.1626	-.0005	23.43
#2	-.0030	.0003	.1693	.0037	22.53
#3	-.0013	-.0015	.1668	.0037	21.10
#4	-.0021	.0012	.1849	.0039	23.69
#5	-.0043	.0011	.1639	.0069	22.34

Int. Std.	Ir[193]
Line	193/pulse
Units	Cts/S
Avg	3.7489
Stddev	.1167
%RSD	3.1117

#1	3.8409
#2	3.7975
#3	3.8089
#4	3.5489
#5	3.7489

Analysis Report

HNF-1685 REV. 0

10/26/99 13:54:36

page 1

Method: ISOU

Sample Name: ICB

Operator: kjt

Comment: 2% nitric

Run Time: 10/26/99 13:53 Type: Unk

Mode: CONC

Corr.Fact: 1.000000

Elem	U [233]	U [234]	U [235]	U [236]	U [238]
Line	233/pulse	234/pulse	235/pulse	236/pulse	238/pulse
Units	ppb	ppb	ppb	ppb	ppb
Avg	-.0005	-.0021	-.0002	-.0013	-.0005
Stddev	.0011	.0018	.0024	.0017	.0009
%RSD	215.6	87.01	1058.	133.7	193.7
#1	.0012	-.0012	.0007	-.0014	.0009
#2	-.0004	-.0037	-.0042	-.0003	.0000
#3	-.0015	-.0038	.0019	-.0042	-.0012
#4	-.0004	.0006	-.0004	-.0003	-.0006
#5	-.0015	-.0025	.0008	-.0002	-.0014

Int. Std.	Ir[193]
Line	193/pulse
Units	Cts/S
Avg	3.8757
Stddev	.0690
%RSD	1.7812

#1	3.9587
#2	3.8269
#3	3.9434
#4	3.8281
#5	3.8214

Analysis Report

HNF-1685 REV. 0

10/26/99 13:56:45

page 1

Method: ISOU

Sample Name: s99t001731

Operator: kjt

Comment: 80601 df

Run Time: 10/26/99 13:55 Type: Unk

Mode: CONC

Corr.Fact: 1.000000

Elem	U [233]	U [234]	U [235]	U [236]	U [238]
Line	233/pulse	234/pulse	235/pulse	236/pulse	238/pulse
Units	ppb	ppb	ppb	ppb	ppb
Avg	-.0017	.0001	.0003	-.0017	.0241
Stddev	.0017	.0014	.0020	.0016	.0045
%RSD	98.59	2324.	581.2	90.39	18.84
#1	-.0001	.0003	.0028	.0006	.0281
#2	-.0005	.0011	.0017	-.0029	.0290
#3	-.0040	.0008	.0001	-.0024	.0220
#4	-.0010	.0004	-.0006	-.0009	.0234
#5	-.0031	-.0023	-.0023	-.0031	.0179

Int. Std.	Ir[193]
Line	193/pulse
Units	Cts/S
Avg	3.8368
Stddev	.0601
%RSD	1.5659

#1	3.9135
#2	3.7915
#3	3.8120
#4	3.7794
#5	3.8876

Analysis Report

HNF-1685 REV. 0

10/26/99 13:58:56

page 1

Method: ISOU

Sample Name: s99t001731_d

Operator: kjt

Comment: 80601 df

Run Time: 10/26/99 13:57 Type: Unk

Mode: CONC

Corr.Fact: 1.000000

Elem	U [233]	U [234]	U [235]	U [236]	U [238]
Line	233/pulse	234/pulse	235/pulse	236/pulse	238/pulse
Units	ppb	ppb	ppb	ppb	ppb
Avg	-.0019	-.0015	-.0002	-.0006	.0248
Stddev	.0006	.0021	.0007	.0030	.0030
%RSD	30.26	139.7	407.2	488.6	12.25

#1	-.0017	-.0017	-.0009	-.0010	.0249
#2	-.0018	-.0015	.0000	.0009	.0231
#3	-.0021	-.0037	-.0009	-.0050	.0215
#4	-.0028	-.0024	.0005	-.0011	.0249
#5	-.0012	.0019	.0004	.0031	.0296

Int. Std.	Ir[193]
Line	193/pulse
Units	Cts/S
Avg	3.7085
Stddev	.1014
%RSD	2.7340

#1	3.6908
#2	3.7611
#3	3.7590
#4	3.7919
#5	3.5396

Analysis Report

HNF-1685 REV. 0

10/26/99 14:00:50

page 1

Method: ISOU

Sample Name: s99t001731

Operator: kjt

Comment: 80601 df

Run Time: 10/26/99 13:59 Type: Unk

Mode: CONC

Corr.Fact: 1.000000

Elem	U [233]	U [234]	U [235]	U [236]	U [238]
Line	233/pulse	234/pulse	235/pulse	236/pulse	238/pulse
Units	ppb	ppb	ppb	ppb	ppb
Avg	-.0020	-.0024	-.0007	-.0017	.0242
Stddev	.0027	.0012	.0020	.0014	.0025
%RSD	134.2	48.26	284.3	83.17	10.51
#1	-.0003	-.0033	-.0007	-.0019	.0236
#2	-.0063	-.0011	-.0028	.0000	.0223
#3	-.0028	-.0037	-.0025	-.0024	.0241
#4	-.0017	-.0029	.0016	-.0035	.0286
#5	.0008	-.0013	.0009	-.0006	.0225

Int. Std.	Ir[193]
Line	193/pulse
Units	Cts/S
Avg	3.8275
Stddev	.0665
%RSD	1.7372

#1	3.7380
#2	3.8701
#3	3.8120
#4	3.8116
#5	3.8057

Analysis Report

HNF-1685 REV. 0

10/26/99 14:07:10

page 1

Method: ISOU

Sample Name: s99t001734

Operator: kjt

Comment: 80601 df

Run Time: 10/26/99 14:05 Type: Unk

Mode: CONC

Corr.Fact: 1.000000

Elem	U [233]	U [234]	U [235]	U [236]	U [238]
Line	233/pulse	234/pulse	235/pulse	236/pulse	238/pulse
Units	ppb	ppb	ppb	ppb	ppb
Avg	-.0010	-.0002	-.0016	-.0014	.0164
Stddev	.0012	.0013	.0015	.0021	.0033
%RSD	119.5	858.6	92.89	149.3	20.14
#1	-.0007	.0000	-.0026	-.0016	.0193
#2	-.0021	-.0004	-.0020	-.0042	.0173
#3	.0009	-.0018	.0010	.0016	.0132
#4	-.0018	.0018	-.0019	-.0013	.0126
#5	-.0013	-.0004	-.0023	-.0015	.0195

Int. Std.	Ir[193]
Line	193/pulse
Units	Cts/S
Avg	3.9794
Stddev	.0597
%RSD	1.4993

#1	3.9343
#2	4.0175
#3	3.9922
#4	3.9036
#5	4.0491

Analysis Report

10/26/99 14:09:54

page 1

Method: ISOU

Sample Name: s99t001734_d

Operator: kjt

Comment: 80601 df

Run Time: 10/26/99 14:08 Type: Unk

Mode: CONC

Corr.Fact: 1.000000

Elem	U [233]	U [234]	U [235]	U [236]	U [238]
Line	233/pulse	234/pulse	235/pulse	236/pulse	238/pulse
Units	ppb	ppb	ppb	ppb	ppb
Avg	-.0017	-.0021	.0001	-.0018	.0149
Stddev	.0007	.0019	.0030	.0013	.0010
%RSD	45.10	90.82	4299.	74.32	6.979
#1	-.0012	-.0025	-.0004	-.0020	.0153
#2	-.0018	-.0038	.0052	.0005	.0138
#3	-.0009	.0010	-.0008	-.0023	.0139
#4	-.0016	-.0037	-.0015	-.0024	.0153
#5	-.0028	-.0017	-.0022	-.0029	.0163

Int. Std.	Ir[193]
Line	193/pulse
Units	Cts/S
Avg	4.0659
Stddev	.1068
%RSD	2.6268
#1	4.1538
#2	4.0412
#3	4.0878
#4	3.8945
#5	4.1521

Analysis Report

HNF-1685 REV. 0

10/26/99 14:11:24

page 1

Method: ISOU

Sample Name: s99t001734

Operator: kjt

Comment: 80601 df

Run Time: 10/26/99 14:10 Type: Unk

Mode: CONC

Corr.Fact: 1.000000

Elem	U [233]	U [234]	U [235]	U [236]	U [238]
Line	233/pulse	234/pulse	235/pulse	236/pulse	238/pulse
Units	ppb	ppb	ppb	ppb	ppb
Avg	-.0014	-.0017	.0006	-.0019	.0152
Stddev	.0005	.0007	.0023	.0019	.0016
%RSD	32.22	40.81	360.4	98.02	10.50
#1	-.0021	-.0028	.0005	-.0013	.0156
#2	-.0011	-.0009	.0045	-.0046	.0157
#3	-.0011	-.0015	-.0012	-.0021	.0144
#4	-.0011	-.0019	-.0007	-.0024	.0131
#5	-.0017	-.0017	.0000	.0006	.0173

Int. Std.	Ir[193]
Line	193/pulse
Units	Cts/S
Avg	4.0746
Stddev	.0336
%RSD	.82384

#1	4.0893
#2	4.0469
#3	4.0493
#4	4.1266
#5	4.0611

Analysis Report

HNF-1685 REV. 0

10/26/99 14:19:59

page 1

Method: ISOU

Sample Name: s99t001735

Operator: kjt

Comment: 80601 df

Run Time: 10/26/99 14:18 Type: Unk

Mode: CONC

Corr.Fact: 1.000000

Elem	U [233]	U [234]	U [235]	U [236]	U [238]
Line	233/pulse	234/pulse	235/pulse	236/pulse	238/pulse
Units	ppb	ppb	ppb	ppb	ppb
Avg	-.0011	-.0009	-.0013	-.0015	.0170
Stddev	.0008	.0015	.0019	.0020	.0034
%RSD	71.49	173.6	143.3	137.0	20.10
#1	-.0007	-.0012	.0004	.0003	.0187
#2	-.0005	-.0009	-.0026	-.0004	.0214
#3	-.0016	.0010	-.0024	-.0034	.0134
#4	-.0022	-.0002	-.0030	.0001	.0177
#5	-.0004	-.0030	.0011	-.0040	.0138

Int. Std.	Ir[193]
Line	193/pulse
Units	Cts/S
Avg	4.1200
Stddev	.1614
%RSD	3.9167

#1	3.8461
#2	4.1623
#3	4.2262
#4	4.1190
#5	4.2467

HNF-1685 REV. 0

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Analysis Report

HNF-1685 REV. 0

10/26/99 14:29:32

page 1

Method: ISOU

Sample Name: s99t001735_d

Operator: kjt

Comment: 80601 df

Run Time: 10/26/99 14:28 Type: Unk

Mode: CONC

Corr.Fact: 1.000000

Elem	U [233]	U [234]	U [235]	U [236]	U [238]
Line	233/pulse	234/pulse	235/pulse	236/pulse	238/pulse
Units	ppb	ppb	ppb	ppb	ppb
Avg	-.0026	-.0027	-.0013	-.0026	.0155
Stddev	.0009	.0006	.0023	.0017	.0026
%RSD	34.71	20.74	180.2	64.79	16.56
#1	-.0033	-.0018	-.0030	-.0026	.0155
#2	-.0029	-.0027	.0024	.0000	.0176
#3	-.0010	-.0027	-.0013	-.0036	.0175
#4	-.0032	-.0033	-.0034	-.0044	.0112
#5	-.0027	-.0030	-.0010	-.0022	.0157

Int. Std.	Ir[193]
Line	193/pulse
Units	Cts/S
Avg	4.2924
Stddev	.0624
%RSD	1.4537

#1	4.1833
#2	4.3288
#3	4.3357
#4	4.3024
#5	4.3118

Analysis Report **HNF-1685.REV.0**

10/26/99 14:33:01

page 1

Method: ISOU Sample Name: s99t001735_a Operator: kjt
 Comment: 80601 df
 Run Time: 10/26/99 14:31 Type: Unk Mode: CONC Corr.Fact: 1.000000

Elem	U [233]	U [234]	U [235]	U [236]	U [238]
Line	233/pulse	234/pulse	235/pulse	236/pulse	238/pulse
Units	ppb	ppb	ppb	ppb	ppb
Avg	-.0031	-.0016	.1353	.0014	19.57
Stddev	.0012	.0013	.0090	.0020	.62
%RSD	39.68	80.63	6.637	146.1	3.167
#1	-.0029	-.0038	.1269	.0003	18.90
#2	-.0034	-.0012	.1387	.0036	20.14
#3	-.0031	-.0015	.1381	.0034	19.81
#4	-.0013	-.0003	.1257	.0004	18.92
#5	-.0047	-.0013	.1471	-.0008	20.10

Int. Std.	Ir[193]
Line	193/pulse
Units	Cts/S
Avg	4.2824
Stddev	.1135
%RSD	2.6494

#1	4.3296
#2	4.1475
#3	4.3278
#4	4.4221
#5	4.1849

HNF-1685 REV. 0

Analysis Report

10/26/99 14:39:39

page 1

Method: ISOU

Sample Name: CCV

Operator: kjt

Comment: iso u lcs

Run Time: 10/26/99 14:38 Type: Unk

Mode: CONC

Corr.Fact: 1.000000

Elem	U [233]	U [234]	U [235]	U [236]	U [238]
Line	233/pulse	234/pulse	235/pulse	236/pulse	238/pulse
Units	ppb	ppb	ppb	ppb	ppb
Avg	-.0024	-.0003	.1724	.0016	24.03
Stddev	.0004	.0005	.0104	.0026	.71
%RSD	17.05	155.1	6.011	155.9	2.960
#1	-.0018	-.0004	.1850	.0004	24.61
#2	-.0029	-.0004	.1634	.0031	23.73
#3	-.0026	-.0001	.1733	-.0004	24.94
#4	-.0025	-.0010	.1797	-.0004	23.28
#5	-.0024	.0003	.1607	.0055	23.58

Int. Std.

Ir[193]

Line	193/pulse
Units	Cts/S
Avg	4.4060
Stddev	.0641
%RSD	1.4544

#1	4.3478
#2	4.4585
#3	4.3252
#4	4.4506
#5	4.4481

HNF-1685 REV. 0

Analysis Report

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page 1

Method: ISOU

Sample Name: CCB

Operator: kjt

Comment: 2% nitric

Run Time: 10/26/99 14:44 Type: Unk

Mode: CONC

Corr.Fact: 1.000000

Elem	U [233]	U [234]	U [235]	U [236]	U [238]
Line	233/pulse	234/pulse	235/pulse	236/pulse	238/pulse
Units	ppb	ppb	ppb	ppb	ppb
Avg	-.0021	-.0028	-.0017	-.0034	-.0021
Stddev	.0022	.0006	.0011	.0015	.0010
%RSD	106.6	22.37	63.22	43.48	46.39

#1	-.0049	-.0024	-.0027	-.0050	-.0017
#2	.0003	-.0033	-.0015	-.0032	-.0009
#3	-.0004	-.0036	-.0013	-.0021	-.0029
#4	-.0040	-.0022	-.0002	-.0047	-.0034
#5	-.0016	-.0024	-.0028	-.0018	-.0017

Int. Std.	Ir[193]
Line	193/pulse
Units	Cts/S
Avg	4.4659
Stddev	.0856
%RSD	1.9161

#1	4.5381
#2	4.5094
#3	4.3338
#4	4.5219
#5	4.4261

LABCORE Completed Worklist Report for Worklist# 31569

Analyst: kjt

Instrument: ICPMS1

Book#: 42B55Method: LA-506-101 Rev/Mod A-2

Worklist Comment: ICP/MS (SOLID ACID DIGEST) Iso-U

Seq Type	Sample#	R A	Test	Matrix	Actual	Found	DL or Yield	Unit
1	ICV	0	QMSU-QC U235	QC	0.000170	1.69e-04	99.412 % Recovery	
1	ICV	0	QMSU-QC U238	QC	0.023900	2.36e-02	98.745 % Recovery	
2	ICB	0	QMSU-QC U233	QC	1	<1.20e-5	ug/mL	
2	ICB	0	QMSU-QC U234	QC	1	<1.20e-5	ug/mL	
2	ICB	0	QMSU-QC U235	QC	1	<1.20e-5	ug/mL	
2	ICB	0	QMSU-QC U236	QC	1	<1.60e-5	ug/mL	
2	ICB	0	QMSU-QC U238	QC	1	<1.20e-5	ug/mL	
3	STD-PREP	0	QMSU-A1 U238-A1	SOLID	10.0	9.95e+00	99.500 % Recovery	
4	BLNK-PREP	0	QMSU-A1 U233-A1	SOLID	1	<2.41e-3	ug/g	
4	BLNK-PREP	0	QMSU-A1 U234-A1	SOLID	1	<2.41e-3	ug/g	
4	BLNK-PREP	0	QMSU-A1 U235-A1	SOLID	1	<2.41e-3	ug/g	
4	BLNK-PREP	0	QMSU-A1 U236-A1	SOLID	1	<3.22e-3	ug/g	
4	BLNK-PREP	0	QMSU-A1 U238-A1	SOLID	1	<2.41e-3	ug/g	
5	SAMPLE	S99T001738 0 A	QMSU-A1 U233-A1	SOLID	N/A	< 4.750e-01	0.475	ug/g
5	SAMPLE	S99T001738 0 A	QMSU-A1 U234-A1	SOLID	N/A	< 4.750e-01	0.475	ug/g
5	SAMPLE	S99T001738 0 A	QMSU-A1 U235-A1	SOLID	N/A	2.387e+00	0.475	ug/g
5	SAMPLE	S99T001738 0 A	QMSU-A1 U236-A1	SOLID	N/A	< 6.333e-01	0.633	ug/g
5	SAMPLE	S99T001738 0 A	QMSU-A1 U238-A1	SOLID	N/A	3.667e+02	0.475	ug/g
6	DUP	S99T001738 0 A	QMSU-A1 U233-A1	SOLID	<4.75e-1	<4.58e-1	RPD	
6	DUP	S99T001738 0 A	QMSU-A1 U234-A1	SOLID	<4.75e-1	<4.58e-1	RPD	
6	DUP	S99T001738 0 A	QMSU-A1 U235-A1	SOLID	2.39e+00	2.49e+00	4.098	RPD
6	DUP	S99T001738 0 A	QMSU-A1 U236-A1	SOLID	<6.33e-1	<6.11e-1	RPD	
6	DUP	S99T001738 0 A	QMSU-A1 U238-A1	SOLID	3.67e+02	3.81e+02	3.743	RPD
7	SPK-POST	S99T001738 0 A	QMSU-A1 U235-A1	SOLID	0.000142	1.28e-04	90.141 % Recovery	
7	SPK-POST	S99T001738 0 A	QMSU-A1 U238-A1	SOLID	0.020	1.85e-02	92.500 % Recovery	
8	CCV	0	QMSU-QC U235	QC	0.000170	1.69e-04	99.412 % Recovery	
8	CCV	0	QMSU-QC U238	QC	0.023900	2.37e-02	99.163 % Recovery	
9	CCB	0	QMSU-QC U233	QC	1	<1.20e-5	ug/mL	
9	CCB	0	QMSU-QC U234	QC	1	<1.20e-5	ug/mL	
9	CCB	0	QMSU-QC U235	QC	1	<1.20e-5	ug/mL	
9	CCB	0	QMSU-QC U236	QC	1	<1.60e-5	ug/mL	
9	CCB	0	QMSU-QC U238	QC	1	<1.20e-5	ug/mL	

Final page for worklist# 31569

Analyst Signature

Date

Analyst Signature

Date

Sam M. Ray 10/27/99

LABCORE Completed Worklist Report for Worklist# 31569

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

10/26/99 07:52

HNF-1685 REV. 0

File 016276.txt

Page: 1

ws2

LABCORE Data Entry Template for Worklist# 31569Analyst: KST Instrument: ICPMS1 Perme Book# 421355Method: LA-506-101 Rev/Mod A-2

Worklist Comment: ICP/MS (SOLID ACID DIGEST) Iso-U

S Type	Sample#	R A	Test	Matrix	Group#	Project
1 ICV			@MSU-QC	QC		
2 ICB			@MSU-QC	QC		
3 STD-PREP			@MSU-A1	SOLID		
4 BLNK-PREP			@MSU-A1	SOLID		
5 SAMPLE	S99T001738	0 A	@MSU-A1	SOLID	99000304	S-111 GRAB
Analytes Requested: U233-A1 , U234-A1 , U235-A1 , U236-A1 , U238-A1						
6 DUP	S99T001738	0 A	@MSU-A1	SOLID		
7 SPK-PREDIG	S99T001738	0 A	@MSU-A1	SOLID		
8 SPK-POST	S99T001738	0 A	@MSU-A1	SOLID		
9 CCV			@MSU-QC	QC		
10 CCB			@MSU-QC	QC		

not prepped KST

Final page for worklist # 31569

KS Thorndike 10-27-99
 Signature Date

 Signature Date

std-prep
 Blnk-Prep
 S99T001738
 S99T001738-d
 S99T001738-a

201 df .GS-10

Data Entry Comments:

Scans 031569 (prep-bulk) 0991738

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

Uploaded & Validated by:
Sam H. Perry
 10/27/99

Analysis Report

HNF-1685 REV. 0

10/27/99 13:26:06

002

page 1

Method: MS_TUNE

Sample Name: ms-tune

Operator: kjt

Comment:

Run Time: 10/27/99 13:24 Type: Unk

Mode: INT

Corr.Fact: 1.000000

Elem
Line
Units
Avg
Stddev
%RSD

In[115] 115/pulse Cts/S	Ir[193] 193/pulse Cts/S
105600. 1611. 1.525	40490. 803. 1.984
104700.	40360.
103400.	40230.
106100.	40110.
106700.	40580.
106000.	40170.
106000.	40490.
105100.	38920.
106000.	41890.
108800.	40680.
103300.	41500.

#1
#2
#3
#4
#5
#6
#7
#8
#9
#10

file 1027b.txt
Ks Thorneike 10-27-99

Std-prep

201 df

.05-10

bulk-prep

S99T001738

S99T001738-d

S99T001738-a

SIGNATURE ABOVE REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 222 TO 236.

Analysis Report

HNF-1685 REV. 0

10/27/99 13:29:19

page 1

Method: ISOU

Sample Name: BLANK

Operator:

Comment:

Run Time: 10/27/99 13:28 Type: Std

Mode: IR

Corr.Fact: 1.000000

Elem	U [233]	U [234]	U [235]	U [236]	U [238]
Line	233/pulse	234/pulse	235/pulse	236/pulse	238/pulse
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	9.669	10.26	10.52	10.52	11.09
Stddev	1.317	1.68	.40	1.65	.97
%RSD	13.63	16.38	3.759	15.67	8.705
#1	9.661	13.21	10.03	10.64	12.11
#2	8.197	9.053	10.28	7.952	11.01
#3	9.830	9.709	11.04	12.38	10.44
#4	11.72	9.889	10.74	10.26	9.889
#5	8.935	9.424	10.53	11.38	11.99

Int. Std.

Ir[193]

Line	193/pulse
Units	Cts/S
Avg	4.0953
Stddev	.0143
%RSD	.35021

#1	4.0886
#2	4.0871
#3	4.1200
#4	4.0954
#5	4.0852

Method : ISOU

Standardzn Report

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page 1

U_[233]	618.2186	9.6685	1.0000000	10/27/99 13:29:19
U_[234]	617.3917	10.2565	1.0000000	10/27/99 13:29:19
U_[235]	617.0162	10.5235	1.0000000	10/27/99 13:29:19
U_[236]	617.0189	10.5215	1.0000000	10/27/99 13:29:19
U_[238]	588.4286	11.0875	1.0000000	10/27/99 13:29:19

2 /
2 /
22 /
2 /
2

Analysis Report

10/27/99 13:31:27

page 1

Method: ISOU

Sample Name: 100ppb U

Operator:

Comment:

Run Time: 10/27/99 13:30 Type: Std

Mode: IR

Corr.Fact: 1.000000

Elem	U [233]	U [234]	U [235]	U [236]	U [238]
Line	233/pulse	234/pulse	235/pulse	236/pulse	238/pulse
Units	Cts/S	Cts/S	Cts/S	Cts/S	Cts/S
Avg	487.9	487.9	487.9	487.9	62940.
Stddev	22.3	22.3	22.3	22.3	2126.
%RSD	4.569	4.569	4.569	4.569	3.378
#1	466.1	466.1	466.1	466.1	60260.
#2	520.3	520.3	520.3	520.3	65370.
#3	472.5	472.5	472.5	472.5	61920.
#4	479.9	479.9	479.9	479.9	64830.
#5	500.5	500.5	500.5	500.5	62340.

Int. Std.

Line	Ir[193]
Line	193/pulse
Units	Cts/S
Avg	4.0044
Stddev	.0887
%RSD	2.2152
#1	4.1042
#2	3.8661
#3	4.0704
#4	3.9468
#5	4.0123

Method : ISOU

Standardzn Report

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page 1

U_[233]	672.5633	9.6685	1.0000000	10/27/99 13:31:27
U_[234]	671.7364	10.2565	1.0000000	10/27/99 13:31:27
U_[235]	671.3609	10.5235	1.0000000	10/27/99 13:31:27
U_[236]	671.3636	10.5215	1.0000000	10/27/99 13:31:27
U_[238]	633.7535	11.0875	1.0000000	10/27/99 13:31:27

Analysis Report

10/27/99 13:38:11

page 1

Method: ISOU Sample Name: blank

Operator: kjt

Comment: background

Run Time: 10/27/99 13:36 Type: Unk

Mode: CONC

Corr.Fact: 1.000000

Elem	U [233]	U [234]	U [235]	U [236]	U [238]
Line	233/pulse	234/pulse	235/pulse	236/pulse	238/pulse
Units	ppb	ppb	ppb	ppb	ppb
Avg	-.0012	-.0010	-.0010	-.0010	-.0018
Stddev	.0020	.0022	.0016	.0010	.0016
%RSD	167.0	223.6	164.5	103.3	88.84
#1	.0007	.0000	-.0011	.0003	-.0043
#2	.0010	-.0040	-.0035	-.0024	-.0012
#3	-.0035	.0013	.0009	-.0012	-.0009
#4	-.0019	.0002	-.0009	-.0005	-.0022
#5	-.0022	-.0024	-.0003	-.0010	-.0003

Int. Std.	Ir[193]
Line	193/pulse
Units	Cts/S
Avg	4.2028
Stddev	.0346
%RSD	.82411

#1	4.2376
#2	4.1532
#3	4.1812
#4	4.2217
#5	4.2203

Analysis Report

10/27/99 13:40:25

page 1

Method: ISOU Sample Name: ICV

Operator: kjt

Comment: iso u lcs

Run Time: 10/27/99 13:39 Type: Unk

Mode: CONC

Corr.Fact: 1.000000

Elem	U [233]	U [234]	U [235]	U [236]	U [238]
Line	233/pulse	234/pulse	235/pulse	236/pulse	238/pulse
Units	ppb	ppb	ppb	ppb	ppb
Avg	.0010	.0018	.1693	.0032	23.60
Stddev	.0009	.0016	.0065	.0014	.27
%RSD	92.33	90.00	3.813	43.74	1.147
#1	.0014	.0016	.1627	.0012	23.86
#2	.0003	.0044	.1797	.0028	23.41
#3	.0013	.0012	.1705	.0029	23.60
#4	.0023	-.0001	.1658	.0043	23.25
#5	-.0001	.0021	.1676	.0047	23.86

Int. Std.	Ir[193]
Line	193/pulse
Units	Cts/S
Avg	4.1434
Stddev	.0245
%RSD	.59089

#1	4.1534
#2	4.1596
#3	4.1242
#4	4.1112
#5	4.1685

Analysis Report

10/27/99 13:45:24

page 1

Method: ISOU

Sample Name: ICB

Operator: kjt

Comment: 2% nitric

Run Time: 10/27/99 13:44 Type: Unk

Mode: CONC

Corr.Fact: 1.000000

Elem	U [233]	U [234]	U [235]	U [236]	U [238]
Line	233/pulse	234/pulse	235/pulse	236/pulse	238/pulse
Units	ppb	ppb	ppb	ppb	ppb
Avg	-.0008	-.0012	-.0008	.0002	-.0020
Stddev	.0008	.0017	.0011	.0020	.0022
%RSD	105.7	138.1	132.4	1241.	110.5
#1	.0004	-.0027	-.0028	.0017	-.0034
#2	-.0017	-.0008	-.0001	-.0008	-.0001
#3	-.0006	-.0005	-.0004	-.0024	-.0044
#4	-.0006	-.0032	-.0008	.0027	-.0025
#5	-.0013	.0010	-.0001	-.0003	.0007

Int. Std.	Ir[193]
Line	193/pulse
Units	Cts/S
Avg	4.2061
Stddev	.1225
%RSD	2.9126

#1	4.2128
#2	4.2689
#3	4.3323
#4	4.0059
#5	4.2105

Analysis Report

10/27/99 13:47:28

page 1

Method: ISOU

Sample Name: std-prep

Operator: kjt

Comment: 201 df

Run Time: 10/27/99 13:46 Type: Unk

Mode: CONC

Corr.Fact: 1.000000

Elem	U [233]	U [234]	U [235]	U [236]	U [238]
Line	233/pulse	234/pulse	235/pulse	236/pulse	238/pulse
Units	ppb	ppb	ppb	ppb	ppb
Avg	.0012	.0002	.1310	.0097	49.51
Stddev	.0012	.0027	.0048	.0022	.69
%RSD	105.9	1109.	3.637	22.27	1.399
#1	-.0009	-.0018	.1312	.0129	50.00
#2	.0017	.0033	.1269	.0091	49.77
#3	.0010	.0003	.1307	.0104	49.74
#4	.0022	.0024	.1388	.0070	49.75
#5	.0018	-.0031	.1274	.0090	48.28

Int. Std.	Ir[193]
Line	193/pulse
Units	Cts/s
Avg	4.2252
Stddev	.0508
%RSD	1.2034

#1	4.2534
#2	4.2421
#3	4.1478
#4	4.2042
#5	4.2784

Analysis Report

10/27/99 13:52:09

page 1

Method: ISOU

Sample Name: blink-prep

Operator: kjt

Comment: 201 df

Run Time: 10/27/99 13:50 Type: Unk

Mode: CONC

Corr.Fact: 1.000000

Elem	U [233]	U [234]	U [235]	U [236]	U [238]
Line	233/pulse	234/pulse	235/pulse	236/pulse	238/pulse
Units	ppb	ppb	ppb	ppb	ppb
Avg	-.0006	-.0014	-.0015	-.0009	-.0010
Stddev	.0002	.0019	.0008	.0014	.0010
%RSD	33.30	135.2	54.42	152.8	99.94
#1	-.0006	.0001	-.0014	.0004	.0004
#2	-.0003	-.0017	-.0029	-.0017	-.0005
#3	-.0008	-.0046	-.0007	-.0029	-.0021
#4	-.0007	.0000	-.0013	.0003	-.0013
#5	-.0005	-.0009	-.0015	-.0006	-.0014

Int. Std.

Line	Ir[193]
Units	193/pulse
	Cts/S
Avg	4.3094
Stddev	.0510
%RSD	1.1831

#1	4.2677
#2	4.3215
#3	4.2663
#4	4.3906
#5	4.3008

Analysis Report

10/27/99 13:55:27

page 1

Method: ISOU

Sample Name: s99t001738

Operator: kjt

Comment: 201 df

Run Time: 10/27/99 13:54 Type: Unk

Mode: CONC

Corr.Fact: 1.000000

Elem	U [233]	U [234]	U [235]	U [236]	U [238]
Line	233/pulse	234/pulse	235/pulse	236/pulse	238/pulse
Units	ppb	ppb	ppb	ppb	ppb
Avg	.0023	-.0007	.0603	.0026	9.264
Stddev	.0015	.0022	.0061	.0024	.212
%RSD	64.87	304.0	10.17	89.91	2.289
#1	.0030	.0021	.0569	.0059	9.113
#2	.0002	-.0033	.0528	.0008	9.124
#3	.0034	-.0010	.0692	.0030	9.612
#4	.0038	.0009	.0619	.0034	9.323
#5	.0013	-.0024	.0605	-.0001	9.150

Int. Std.	Ir[193]
Line	193/pulse
Units	Cts/S
Avg	4.3041
Stddev	.0678
%RSD	1.5753

#1	4.2799
#2	4.2846
#3	4.2192
#4	4.3373
#5	4.3995

Analysis Report

HNF-1685 REV. 0

10/27/99 13:58:33

page 1

Method: ISOU

Sample Name: s99t001738_d

Operator: kjt

Comment: 201 df

Run Time: 10/27/99 13:57 Type: Unk

Mode: CONC

Corr.Fact: 1.000000

Elem	U [233]	U [234]	U [235]	U [236]	U [238]
Line	233/pulse	234/pulse	235/pulse	236/pulse	238/pulse
Units	ppb	ppb	ppb	ppb	ppb
Avg	.0007	-.0009	.0652	.0034	9.972
Stddev	.0011	.0009	.0028	.0024	.245
%RSD	146.8	102.8	4.250	69.96	2.457
#1	.0008	-.0001	.0642	.0024	9.955
#2	.0003	-.0016	.0609	.0041	9.919
#3	-.0005	-.0004	.0664	.0019	9.755
#4	.0006	-.0021	.0664	.0073	10.39
#5	.0025	-.0006	.0680	.0014	9.844

Int. Std.	Ir[193]
Line	193/pulse
Units	Cts/S
Avg	4.4343
Stddev	.0418
%RSD	.94222

#1	4.3984
#2	4.4178
#3	4.4438
#4	4.4089
#5	4.5028

Analysis Report

HNF-1685 REV. 0

10/27/99 14:01:58

page 1

Method: ISOU Sample Name: s99t001738_a Operator: kjt
 Comment: 201 df
 Run Time: 10/27/99 14:00 Type: Unk Mode: CONC Corr.Fact: 1.000000

Elem	U [233]	U [234]	U [235]	U [236]	U [238]
Line	233/pulse	234/pulse	235/pulse	236/pulse	238/pulse
Units	ppb	ppb	ppb	ppb	ppb
Avg	.0023	.0008	.1885	.0059	27.79
Stddev	.0014	.0025	.0058	.0029	.61
%RSD	62.48	309.5	3.080	48.42	2.211

#1	.0035	.0035	.1871	.0075	28.23
#2	.0028	.0026	.1801	.0061	26.99
#3	.0036	.0001	.1963	.0056	28.48
#4	.0013	-.0029	.1894	.0014	27.34
#5	.0003	.0007	.1894	.0091	27.90

Int. Std.	Ir[193]
Line	193/pulse
Units	Cts/S
Avg	4.3997
Stddev	.0741
%RSD	1.6833

#1	4.3710
#2	4.4120
#3	4.3034
#4	4.4044
#5	4.5077

HNF-1685 REV. 0

Analysis Report

10/27/99 14:08:22

page 1

Method: ISOU

Sample Name: CCV

Operator: kjt

Comment: iso_u lcs

Run Time: 10/27/99 14:07 Type: Unk

Mode: CONC

Corr.Fact: 1.000000

Elem	U [233]	U [234]	U [235]	U [236]	U [238]
Line	233/pulse	234/pulse	235/pulse	236/pulse	238/pulse
Units	ppb	ppb	ppb	ppb	ppb
Avg	-.0004	.0004	.1690	.0016	23.69
Stddev	.0025	.0019	.0048	.0023	.45
%RSD	608.6	466.2	2.817	145.3	1.920
#1	.0019	-.0005	.1628	.0012	23.60
#2	-.0032	.0006	.1699	.0007	23.10
#3	.0013	-.0009	.1663	.0053	23.44
#4	-.0032	-.0008	.1703	.0015	24.14
#5	.0012	.0036	.1755	-.0009	24.14

Int. Std.	Ir[193]
Line	193/pulse
Units	Cts/S
Avg	4.5721
Stddev	.0471
%RSD	1.0299

#1	4.5811
#2	4.5917
#3	4.6121
#4	4.5850
#5	4.4906

Analysis Report

HNF-1685 REV. 0

10/27/99 14:13:00

page 1

Method: ISOU

Sample Name: CCB

Operator: kjt

Comment: 2% nitric

Run Time: 10/27/99 14:11 Type: Unk

Mode: CONC

Corr.Fact: 1.000000

Elem	U [233]	U [234]	U [235]	U [236]	U [238]
Line	233/pulse	234/pulse	235/pulse	236/pulse	238/pulse
Units	ppb	ppb	ppb	ppb	ppb
Avg	-.0017	-.0018	-.0035	-.0026	-.0016
Stddev	.0019	.0015	.0019	.0018	.0011
%RSD	110.9	84.28	56.17	67.25	67.51
#1	.0014	-.0014	-.0021	-.0021	.0000
#2	-.0025	.0006	-.0025	-.0038	-.0030
#3	-.0035	-.0029	-.0020	-.0003	-.0017
#4	-.0018	-.0030	-.0066	-.0020	-.0018
#5	-.0020	-.0022	-.0040	-.0049	-.0014

Int. Std.	Ir[193]
Line	193/pulse
Units	Cts/S
Avg	4.8031
Stddev	.2075
%RSD	4.3192

#1	4.5610
#2	4.6337
#3	4.8036
#4	5.0223
#5	4.9949

LABCORE Completed Worklist Report for Worklist# 31562

Analyst: krm

Instrument: CARB2

Book#: _____

Method: LA-342-100 Rev/Mod F-3

Worklist Comment: S-111 FOR @TICTOC1, RLC

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
1	STD		0		@TICTOC1 TIC-02	LIQUID	6.02E+02	6.04E+2	100.332 % Recovery	
1	STD		0		@TICTOC1 TOC-02	LIQUID	3.00E+03	2.80E+3	93.333 % Recovery	
2	BLNK		0		@TICTOC1 TIC-02	LIQUID	1	1.80E+0	1.800	ug/mL
2	BLNK		0		@TICTOC1 TOC-02	LIQUID	1	3.60E+0	3.600	ug/mL
3	SAMPLE	S99T001730	0		@TICTOC1 TIC-02	LIQUID	N/A	5.63E+03	5.000	ug/mL
3	SAMPLE	S99T001730	0		@TICTOC1 TOC-02	LIQUID	N/A	1.28E+03	40.000	ug/mL
4	DUP	S99T001730	0		@TICTOC1 TIC-02	LIQUID	5.63E+3	5.57E+3	1.071	RPD
4	DUP	S99T001730	0		@TICTOC1 TOC-02	LIQUID	1.28E+3	1.38E+3	7.519	RPD
5	SAMPLE	S99T001732	0		@TICTOC1 TIC-02	LIQUID	N/A	3.52E+03	5.000	ug/mL
5	SAMPLE	S99T001732	0		@TICTOC1 TOC-02	LIQUID	N/A	1.60E+03	40.000	ug/mL
6	DUP	S99T001732	0		@TICTOC1 TIC-02	LIQUID	3.52E+3	3.33E+3	5.547	RPD
6	DUP	S99T001732	0		@TICTOC1 TOC-02	LIQUID	1.60E+3	1.49E+3	7.120	RPD

Final page for worklist# 31562

Analyst Signature _____ Date _____

Mary Franz 10/27/99
Analyst Signature Date

James G. Smith 10/27/99
Reviewer Signature Date

10/25/99 14:46
ws2

Page: 1

LABCORE Data Entry Template for Worklist# 31562

Analyst: KRM Instrument: CARB2 Book# 25N128
34N128
 Method: LA-342-100 Rev/Mod F-3
 Worklist Comment: S-111 FOR @TICTOC1, RLC

S Type	Sample#	R A	Test	Matrix	Group#	Project
1 STD			@TICTOC1	LIQUID		
2 BLNK			@TICTOC1	LIQUID		
3 SAMPLE	S99T001730 0		@TICTOC1	LIQUID	99000304	S-111 GRAB
	Analytes Requested: TIC-02 , TOC-02					
4 DUP	S99T001730 0		@TICTOC1	LIQUID		
5 SAMPLE	S99T001732 0		@TICTOC1	LIQUID	99000304	S-111 GRAB
	Analytes Requested: TIC-02 , TOC-02					
6 DUP	S99T001732 0		@TICTOC1	LIQUID		
7 SAMPLE	S99T001733 0		@TICTOC1	LIQUID	99000304	S-111 GRAB
	Analytes Requested: TIC-02 , TOC-02					
8 DUP	S99T001733 0		@TICTOC1	LIQUID		
9 SPK	S99T001733 0		@TICTOC1	LIQUID		

Final page for worklist # 31562

[Signature] 10-26-99
 Signature Date

[Signature] 10/27/99
 Signature Date

Data Entry Comments:

DID NOT RUN SAMPLER S99T001733 DUE
 TO LIQUID WASTE BEING FULL

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

HNF-1685 REV. 0

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0
<<< BLANK ANALYSIS >>>

Sample: BASE1

Date: 10/22/99

Time: 14:01:50

Sample Size = 1 uL
Dil Factor = 1
Blank ID # = BASE1
Blank Value = N/AAnalyst : KR MONTEITH
Min Readings = 22
Max Readings = 22
% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.30	0.00
2	1.01	0.70	57.14
3	1.51	1.70	58.82
4	2.00	2.60	34.62
5	2.50	3.20	18.75
6	3.00	3.70	13.51
7	3.50	4.00	7.50
8	4.00	4.30	6.98
9	4.50	4.70	8.51
10	5.00	5.00	6.00
11	5.50	5.30	5.66
12	6.00	5.60	5.36
13	6.50	5.90	5.08
14	7.00	6.20	4.84
15	7.50	6.60	6.06
16	8.00	6.80	2.94
17	8.50	7.10	4.23
18	9.00	7.40	4.05
19	9.50	7.70	3.90
20	10.00	8.00	3.75
21	10.50	8.20	2.44
22	11.00	8.60	4.65

BLANK VALUE = 8.6 micrograms carbon

BLANK FACTOR = 8.6 / 10.99799 = +7.8E-01 ug/min Carbon

Sample Run By

KR MONTEITH

00000

SIGNATURE ABOVE REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 239 TO 258.

HNF-1685 REV. 0

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
 TICTOC REV 2.0
 <<< BLANK ANALYSIS >>>

Sample: BASE1

Date: 10/22/99

Time: 15:38:06

Sample Size = 1 uL

Dil Factor = 1

Blank ID # = BASE1

Blank Value = N/A

Analyst : KR MONTEITH

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.20	0.00
2	1.01	0.50	60.00
3	1.50	5.20	90.38
4	2.00	14.90	65.10
5	2.50	22.00	32.27
6	3.00	24.50	10.20
7	3.50	26.20	6.49
8	4.00	27.40	4.38
9	4.50	28.40	3.52
10	5.00	29.20	2.74
11	5.50	29.80	2.01
12	6.00	30.50	2.30
13	6.50	31.00	1.61
14	7.00	31.70	2.21
15	7.50	32.00	0.94
16	8.00	32.50	1.54
17	8.50	33.00	1.52
18	9.00	33.20	0.60
19	9.50	33.60	1.19
20	10.00	34.00	1.18
21	10.50	34.30	0.87
22	11.00	34.70	1.15

BLANK VALUE = 34.7 micrograms carbon

BLANK FACTOR = 34.7 / 10.99701 = +3.16E+00 ug/min Carbon

<<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!>>>>

Sample Run By:

KR MONTEITH

00000

HNF-1685 REV. 0

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: STD1

Date: 10/22/99

Time: 15:56:51

Sample Size = 1000 uL

Dil Factor = 1

Blank ID # =

Blank Value = .78 ug/minute C

Analyst : KR MONTEITH

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.20	0.00
2	1.01	1.20	83.33
3	1.50	48.00	97.50
4	2.00	205.20	76.61
5	2.50	372.50	44.91
6	3.00	486.80	23.48
7	3.50	550.10	11.51
8	4.00	580.50	5.24
9	4.50	594.10	2.29
10	5.00	600.50	1.07
11	5.50	603.90	0.56
12	6.00	606.70	0.46
13	6.50	607.80	0.18
14	7.00	608.90	0.18
15	7.50	609.60	0.11
16	8.00	610.20	0.10
17	8.50	610.70	0.08
18	9.00	611.10	0.07
19	9.50	611.60	0.08
20	10.00	612.10	0.08
21	10.50	612.40	0.05
22	11.00	612.70	0.05

USER INPUT BLANK VALUE

BLANK VALUE = 8.577667 micrograms carbon

BLANK FACTOR = 8.577667 / 10.99701 = +7.8E-01 ug/min Carbon

SAMPLE RESULTS:

(612.7 - 8.578238) (1) / (1000) = +6.041E-01 g/L Carbon
 (612.7 - 8.578238) (1) / (1000) (12) = +5.034E-02 Molar Carbon

Sample Run By:

KR MONTEITH

00000

HNF-1685 REV. 0

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: STD1

Date: 10/22/99

Time: 16:10:37

Sample Size = 200 uL

Dil Factor = 1

Blank ID # =

Blank Value = 3.16 ug/minute C

Analyst : KR MONTEITH

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading ==	==== Analysis Time ==	==== Coulometer ==	==== % Difference ==
1	0.51	0.50	0.00
2	1.01	1.00	50.00
3	1.50	78.60	98.73
4	2.00	326.90	75.96
5	2.50	498.50	34.42
6	3.00	553.40	9.92
7	3.50	570.80	3.05
8	4.00	577.50	1.16
9	4.50	581.50	0.69
10	5.00	583.70	0.38
11	5.50	585.60	0.32
12	6.00	587.10	0.26
13	6.50	588.20	0.19
14	7.00	589.10	0.15
15	7.50	589.90	0.14
16	8.03	590.70	0.14
17	8.53	591.40	0.12
18	9.03	592.10	0.12
19	9.53	592.80	0.12
20	10.03	593.10	0.05
21	10.53	593.60	0.08
22	11.03	594.10	0.08

USER INPUT BLANK VALUE

BLANK VALUE = 34.75055 micrograms carbon

BLANK FACTOR = 34.75055 / 10.99701 = +3.2E+00 ug/min Carbon

SAMPLE RESULTS:

(594.1 - 34.8601) (1)/(200) = +2.796E+00 g/L Carbon
 (594.1 - 34.8601) (1)/(200) (12) = +2.330E-01 Molar Carbon
 <<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!>>>>

Sample Run By:

KR MONTEITH

00000

HNF-1685 REV. 0

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: BLK

Date: 10/22/99

Time: 16:27:23

Sample Size = 1 uL

Dil Factor = 1

Blank ID # =

Blank Value = .78 ug/minute C

Analyst : KR MONTEITH

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading ==	==== Analysis Time ==	==== Coulometer ==	==== % Difference ==
1	0.51	0.00	0.00
2	1.00	0.90	100.00
3	1.50	2.40	62.50
4	2.00	3.60	33.33
5	2.50	4.40	18.18
6	3.00	4.90	10.20
7	3.50	5.30	7.55
8	4.00	5.70	7.02
9	4.50	6.00	5.00
10	5.00	6.40	6.25
11	5.50	6.70	4.48
12	6.00	7.00	4.29
13	6.50	7.40	5.41
14	7.00	7.80	5.13
15	7.50	8.00	2.50
16	8.00	8.40	4.76
17	8.50	8.80	4.55
18	9.00	9.10	3.30
19	9.50	9.40	3.19
20	10.00	9.70	3.09
21	10.50	10.10	3.96
22	11.00	10.40	2.88

USER INPUT BLANK VALUE

BLANK VALUE = 8.577667 micrograms carbon

BLANK FACTOR = 8.577667 / 10.99701 = +7.8E-01 ug/min Carbon

SAMPLE RESULTS:

(10.4 - 8.578428) (1)/(1) = +1.82E+00 g/L Carbon
 (10.4 - 8.578428) (1)/(1) (12) = +1.52E-01 Molar Carbon

Sample Run By:

KR MONTEITH

00000

HNF-1685 REV. 0

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: BLK

Date: 10/22/99

Time: 16:41:04

Sample Size = 1 uL

Dil Factor = 1

Blank ID # =

Blank Value = 3.16 ug/minute C

Analyst : KR MONTEITH

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.30	0.00
2	1.01	0.60	50.00
3	1.51	3.40	82.35
4	2.00	11.30	69.91
5	2.50	17.90	36.87
6	3.00	20.80	13.94
7	3.50	22.50	7.56
8	4.00	23.60	4.66
9	4.50	24.50	3.67
10	5.00	25.50	3.92
11	5.50	26.30	3.04
12	6.00	27.10	2.95
13	6.50	27.60	1.81
14	7.00	28.10	1.78
15	7.50	28.70	2.09
16	8.00	29.10	1.37
17	8.50	29.50	1.36
18	9.00	29.80	1.01
19	9.50	30.20	1.32
20	10.00	30.50	0.98
21	10.50	30.80	0.97
22	11.00	31.10	0.96

USER INPUT BLANK VALUE

BLANK VALUE = 34.75055 micrograms carbon

BLANK FACTOR = 34.75055 / 10.99701 = +3.2E+00 ug/min Carbon

SAMPLE RESULTS:

(31.1 - 34.75306) (1)/(1) = < 5.00 E-3 g/L Carbon
 (31.1 - 34.75306) (1)/(1) (12) = < 4.17 E-4 Molar Carbon
 <<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!>>>>

Sample Run By:

KR MONTEITH

00000

HNF-1685 REV. 0

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: S99T1730

Date: 10/22/99

Time: 17:10:22

Sample Size = 1 uL

Dil Factor = 1

Blank ID # =

Blank Value = .78 ug/minute C

Analyst : KR MONTEITH

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading ==	==== Analysis Time ==	==== Coulometer ==	==== % Difference ==
1	0.51	0.60	0.00
2	1.01	0.80	25.00
3	1.51	7.10	88.73
4	2.01	83.00	91.45
5	2.50	224.80	63.08
6	3.00	358.80	37.35
7	3.50	452.80	20.76
8	4.00	506.50	10.60
9	4.50	534.00	5.15
10	5.00	547.60	2.48
11	5.50	554.70	1.28
12	6.00	558.70	0.72
13	6.50	561.60	0.52
14	7.00	563.50	0.34
15	7.50	565.00	0.27
16	8.00	566.40	0.25
17	8.50	567.30	0.16
18	9.00	568.40	0.19
19	9.50	569.30	0.16
20	10.00	570.50	0.21
21	10.50	571.30	0.14
22	11.00	572.00	0.12

USER INPUT BLANK VALUE

BLANK VALUE = 8.577667 micrograms carbon

BLANK FACTOR = 8.577667 / 10.99701 = +7.8E-01 ug/min Carbon

SAMPLE RESULTS:

(572 - 8.579047) (1)/(1) = +5.634E+02 g/L Carbon
 (572 - 8.579047) (1)/(1) (12) = +4.695E+01 Molar Carbon

Sample Run By:

KR MONTEITH

00000

HNF-1685 REV. 0

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: S99T1730

Date: 10/22/99

Time: 17:27:33

Sample Size = 1 uL

Dil Factor = 1

Blank ID # =

Blank Value = 3.16 ug/minute C

Analyst : KR MONTEITH

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading ==	Analysis Time ==	Coulometer ==	% Difference ==
1	0.51	0.90	0.00
2	1.01	1.80	50.00
3	1.51	17.90	89.94
4	2.00	75.30	76.23
5	2.50	123.50	39.03
6	3.00	140.60	12.16
7	3.50	146.90	4.29
8	4.00	150.20	2.20
9	4.50	152.50	1.51
10	5.00	154.10	1.04
11	5.50	155.30	0.77
12	6.00	156.20	0.58
13	6.50	157.40	0.76
14	7.00	158.10	0.44
15	7.50	158.80	0.44
16	8.00	159.70	0.56
17	8.50	160.20	0.31
18	9.00	160.80	0.37
19	9.50	161.30	0.31
20	10.00	161.80	0.31
21	10.50	162.30	0.31
22	11.00	162.70	0.25

USER INPUT BLANK VALUE

BLANK VALUE = 34.75055 micrograms carbon

BLANK FACTOR = 34.75055 / 10.99701 = +3.2E+00 ug/min Carbon

SAMPLE RESULTS:

(162.7 - 34.75653) (1)/(1) = +1.279E+02 g/L Carbon
 (162.7 - 34.75653) (1)/(1) (12) = +1.066E+01 Molar Carbon
 <<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!>>>>

Sample Run By:

KR MONTEITH

00000

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: S99T1730 DUP

Date: 10/22/99

Time: 17:57:49

Sample Size = 1 uL

Dil Factor = 1

Blank ID # =

Blank Value = .78 ug/minute C

Analyst : KR MONTEITH

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading ==	Analysis Time	Coulometer	% Difference
1	0.51	2.90	0.00
2	1.01	4.90	40.82
3	1.50	14.70	66.67
4	2.00	100.90	85.43
5	2.50	256.30	60.63
6	3.00	401.30	36.13
7	3.50	484.90	17.24
8	4.00	525.20	7.67
9	4.50	542.00	3.10
10	5.00	548.80	1.24
11	5.50	552.30	0.63
12	6.00	554.20	0.34
13	6.50	556.10	0.34
14	7.00	557.20	0.20
15	7.50	558.60	0.25
16	8.00	559.90	0.23
17	8.50	560.60	0.12
18	9.00	561.80	0.21
19	9.50	562.80	0.18
20	10.00	563.70	0.16
21	10.50	564.40	0.12
22	11.00	565.30	0.16

USER INPUT BLANK VALUE

BLANK VALUE = 8.577667 micrograms carbon

BLANK FACTOR = 8.577667 / 10.99701 = +7.8E-01 ug/min Carbon

SAMPLE RESULTS:

(565.3 - 8.578381) (1)/(1) = +5.567E+02 g/L Carbon
 (565.3 - 8.578381) (1)/(1) (12) = +4.639E+01 Molar Carbon

Sample Run By:

KR MONTEITH

00000

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: S99T1730 DUP

Date: 10/22/99

Time: 18:10:00

Sample Size = 1 uL

Dil Factor = 1

Blank ID # =

Blank Value = 3.16 ug/minute C

Analyst : KR MONTEITH

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading ==	==== Analysis Time ==	==== Coulometer ==	==== % Difference ==
1	0.51	0.80	0.00
2	1.01	1.70	52.94
3	1.50	20.70	91.79
4	2.00	76.30	72.87
5	2.50	126.90	39.87
6	3.00	147.80	14.14
7	3.50	156.20	5.38
8	4.00	159.60	2.13
9	4.50	161.90	1.42
10	5.00	163.00	0.67
11	5.50	164.30	0.79
12	6.00	166.00	1.02
13	6.50	167.10	0.66
14	7.00	167.90	0.48
15	7.50	168.80	0.53
16	8.00	169.60	0.47
17	8.50	170.40	0.47
18	9.00	170.80	0.23
19	9.50	171.40	0.35
20	10.00	171.90	0.29
21	10.50	172.40	0.29
22	11.00	172.90	0.29

USER INPUT BLANK VALUE

BLANK VALUE = 34.75055 micrograms carbon

BLANK FACTOR = 34.75055 / 10.99701 = +3.2E+00 ug/min Carbon

SAMPLE RESULTS:

(172.9 - 34.75306) (1)/(1) = +1.381E+02 g/L Carbon
 (172.9 - 34.75306) (1)/(1) (12) = +1.151E+01 Molar Carbon
 <<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!>>>>

Sample Run By:

KR MONTEITH

00000

HNF-1685 REV. 0

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: S99T1732

Date: 10/22/99

Time: 18:22:02

Sample Size = 1 uL

Dil Factor = 1

Blank ID # =

Blank Value = .78 ug/minute C

Analyst : KR MONTEITH

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading ==	==== Analysis Time ==	==== Coulometer ==	==== % Difference ==
1	0.51	0.70	0.00
2	1.01	1.10	36.36
3	1.50	8.40	86.90
4	2.00	60.90	86.21
5	2.50	161.50	62.29
6	3.00	252.20	35.96
7	3.50	305.80	17.53
8	4.00	330.60	7.50
9	4.50	340.70	2.96
10	5.00	345.60	1.42
11	5.50	348.40	0.80
12	6.00	350.30	0.54
13	6.50	351.60	0.37
14	7.00	353.00	0.40
15	7.50	354.20	0.34
16	8.00	355.30	0.31
17	8.50	356.30	0.28
18	9.00	357.40	0.31
19	9.50	358.10	0.20
20	10.00	359.00	0.25
21	10.50	359.70	0.19
22	11.00	360.80	0.30

USER INPUT BLANK VALUE

BLANK VALUE = 8.577667 micrograms carbon

BLANK FACTOR = 8.577667 / 10.99701 = +7.8E-01 ug/min Carbon

SAMPLE RESULTS:

(360.8 - 8.578381) (1)/(1) = +3.522E+02 g/L Carbon
 (360.8 - 8.578381) (1)/(1) (12) = +2.935E+01 Molar Carbon

Sample Run By:

KR MONTEITH

00000

HNF-1685 REV. 0

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: S99T1732

Date: 10/22/99

Time: 19:43:07

Sample Size = 1 uL

Dil Factor = 1

Blank ID # =

Blank Value = 3.16 ug/minute C

Analyst : KR MONTEITH

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading ==	== Analysis Time ==	== Coulometer ==	== % Difference ==
1	0.51	1.00	0.00
2	1.04	2.10	52.38
3	1.54	23.70	91.14
4	2.04	102.00	76.76
5	2.54	155.80	34.53
6	3.04	172.50	9.68
7	3.54	178.90	3.58
8	4.04	182.30	1.87
9	4.54	183.90	0.87
10	5.04	185.50	0.86
11	5.54	187.30	0.96
12	6.04	188.30	0.53
13	6.54	189.20	0.48
14	7.04	190.30	0.58
15	7.53	191.00	0.37
16	8.03	191.60	0.31
17	8.53	192.30	0.36
18	9.03	192.90	0.31
19	9.53	193.40	0.26
20	10.03	193.90	0.26
21	10.53	194.40	0.26
22	11.03	194.90	0.26

USER INPUT BLANK VALUE

BLANK VALUE = 34.75055 micrograms carbon

BLANK FACTOR = 34.75055 / 10.99701 = +3.2E+00 ug/min Carbon

SAMPLE RESULTS:

(194.9 - 34.863) (1)/(1) = +1.600E+02 g/L Carbon
 (194.9 - 34.863) (1)/(1)(12) = +1.334E+01 Molar Carbon
 <<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!>>>>

Sample Run By:

KR MONTEITH

00000

HNF-1685 REV. 0

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: S99T1732 DUP

Date: 10/22/99

Time: 19:57:59

Sample Size = 1 uL

Dil Factor = 1

Blank ID # =

Blank Value = .78 ug/minute C

Analyst : KR MONTEITH

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading ==	== Analysis Time ==	== Coulometer ==	== % Difference ==
1	0.51	0.40	0.00
2	1.01	0.80	50.00
3	1.51	2.40	66.67
4	2.00	24.00	90.00
5	2.50	97.60	75.41
6	3.00	194.50	49.82
7	3.50	264.10	26.35
8	4.00	300.60	12.14
9	4.50	317.50	5.32
10	5.00	324.90	2.28
11	5.50	328.70	1.16
12	6.00	331.00	0.69
13	6.50	332.60	0.48
14	7.00	334.10	0.45
15	7.50	335.40	0.39
16	8.00	336.40	0.30
17	8.50	337.60	0.36
18	9.00	338.40	0.24
19	9.50	339.20	0.24
20	10.00	340.10	0.26
21	10.50	340.90	0.23
22	11.00	341.80	0.26

USER INPUT BLANK VALUE

BLANK VALUE = 8.577667 micrograms carbon

BLANK FACTOR = 8.577667 / 10.99701 = +7.8E-01 ug/min Carbon

SAMPLE RESULTS:

(341.8 - 8.578286) (1)/(1) = +3.332E+02 g/L Carbon
 (341.8 - 8.578286) (1)/(1) (12) = +2.777E+01 Molar Carbon

Sample Run By:

KR MONTEITH

00000

HNF-1685 REV. 0

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: S99T1732 DUP

Date: 10/22/99

Time: 20:13:43

Sample Size = 1 uL

Dil Factor = 1

Blank ID # =

Blank Value = 3.16 ug/minute C

Analyst : KR MONTEITH

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading ==	Analysis Time	Coulometer	% Difference
1	0.51	1.00	0.00
2	1.01	1.80	44.44
3	1.50	22.20	91.89
4	2.00	91.00	75.60
5	2.50	143.20	36.45
6	3.00	159.70	10.33
7	3.50	166.20	3.91
8	4.00	169.50	1.95
9	4.50	172.20	1.57
10	5.00	174.20	1.15
11	5.50	175.60	0.80
12	6.00	176.70	0.62
13	6.50	177.60	0.51
14	7.00	178.70	0.62
15	7.50	179.20	0.28
16	8.00	180.00	0.44
17	8.50	180.60	0.33
18	9.00	181.20	0.33
19	9.50	181.70	0.28
20	10.00	182.40	0.38
21	10.50	183.00	0.33
22	11.00	183.30	0.16

USER INPUT BLANK VALUE

BLANK VALUE = 34.75055 micrograms carbon

BLANK FACTOR = 34.75055 / 10.99701 = +3.2E+00 ug/min Carbon

SAMPLE RESULTS:

(183.3 - 34.75344) (1)/(1) = +1.485E+02 g/L Carbon
 (183.3 - 34.75344) (1)/(1) (12) = +1.238E+01 Molar Carbon
 <<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!>>>>

Sample Run By:

KR MONTEITH

00000

WORKBOOK PAGE: STD1

TIC/TOC : LA-342-100 (F-3)

LIQUIDS

		TIC	TOC
	Sample Size in mL (SS)	1.0000	0.2000
STD	Dilution Factor (DF)	1	1
	Final Coulometer Reading in μg (C1)	612.7	594.1
31562	μg of Carbon from Baseline (C2)	8.6	34.7
	Standard Book Number	25N12E	34N12B
@TICTOC1	Standard Value ($\mu\text{g}/\text{ml}$)	602	3000
LIQUID	QC Actual in $\mu\text{g}/\text{mL}$ = Standard Value ($\mu\text{g}/\text{mL}$) QC Found in $\mu\text{g}/\text{mL}$ = $(C1 - C2) * DF / SS$ QC Found in $\mu\text{g}/\text{mL}$ for TIC = 5 if $C1 < C2$ QC Found in $\mu\text{g}/\text{mL}$ for TOC = 40 if $C1 < C2$ % Recovery = QC Found / QC Actual * 100		
99004012			
0			
N/A			
STD			
CARB2			
MF			
JFG			
KRM			
10/27/99			
10/26/99			
	Method Detection Limit in $\mu\text{g}/\text{mL}$	5	40
08:00 PM	QC Actual in $\mu\text{g}/\text{mL}$	6.02E+02	3.00E+03
	QC Found in $\mu\text{g}/\text{mL}$	6.04E+02	2.80E+03
S-111	Percent Standard Recovery	100.3	93.2

Data Entered By:	MF	Date:	10/27/99
Signature of Chemist:		Date:	10/27/99

STANDARD.WB1 REV 1.0

342100ML

WORKBOOK PAGE: BLANK2

TIC/TOC : LA-342-100 (F-3)

LIQUIDS

		TIC	TOC
	Sample Size in mL (SS)	0.0000	0.0000
BLNK	Dilution Factor (DF)	1	1
	µg of Carbon in Sample (C1)	10.4	31.1
31562	µg of Carbon from Baseline (C2)	8.6	34.7

@TICTOC1

LIQUID

99004012

µg of Carbon = |C1-C2|

0

N/A

BLNK

GARB2

VF

JFC

KRM

10/27/99

10/28/99

08:00 PM

S-111

Method Detection Limit in µg/mL

TIC

TOC

5

40

µg of Carbon

1.80E+00

3.60E+00

Data Entered By:

MF

Date: 10/27/99

Signature of Chemist:

Date: 10/27/99

BLANK.WB1 REV 1.0

342100ML

WORKBOOK PAGE: SAM3

TIC/TOC : LA-342-100 (F-3)

LIQUIDS

		TIC	TOC
	Sample Size in mL (SS)	0.1000	0.1000
SAMPLE	Dilution Factor (DF)	1	1
	µg of Carbon in Sample (C1)	572	162.7
31562	µg of Carbon from Baseline (C2)	8.6	34.7
@TICTOC1			
LIQUID			
99004012			
0	µg of Carbon/mL = (C1-C2) * DF / SS		
	µg of Carbon/mL for TIC = 5 if C1 < C2		
	µg of Carbon/mL for TOC = 40 if C1 < C2		
N/A			
S99T001730			
CARB2			
MF			
JFG			
KRM			
10/27/99			
10/28/99			
08:00 PM	Method Detection Limit in µg/mL	5	40
S-111	µg of Carbon/mL	5.63E+03	1.28E+03

Data Entered By:	MF	Date:	10/27/99
Signature of Chemist:		Date:	10/27/99

SAMPLE.WB1 REV 1.0

342100ML

255

WORKBOOK PAGE: DUP4

TIC/TOC : LA-342-100 (F-3)

LIQUIDS

		TIC	TOC
	Sample Size in mL (SS)	0.1000	0.1000
DUP	Dilution Factor (DF)	1	1
	µg of Carbon in Sample (C1)	565.3	172.9
31562	µg of Carbon from Baseline (C2)	8.6	34.7
	Known µg of C from Original Sample	5.63E+3	1.28E+3
@TICTOC1			
LIQUID			
99004012			
0	µg of Carbon/mL = (C1-C2) * DF / SS		
	µg of Carbon/mL for TIC = 5 if C1 < C2		
	µg of Carbon/mL for TOC = 40 if C1 < C2		
N/A			
S99T001730			
GARBE			
MF			
JFG			
KRM			
10/27/99			
10/28/99			
08:00 PM			
S-111			
	Method Detection Limit in µg/mL	5	40
	µg of Carbon/mL	5.57E+03	1.38E+03

Data Entered By:	MF	Date: 10/27/99
Signature of Chemist:		Date: 10/27/99

SAMPLE.WB1 REV 1.0

342100ML

256

WORKBOOK PAGE: SAM5

TIC/TOC : LA-342-100 (F-3)

LIQUIDS

		TIC	TOC
SAMPLE	Sample Size in mL (SS)	0.1000	0.1000
	Dilution Factor (DF)	1	1
	µg of Carbon in Sample (C1)	360.8	194.9
31562	µg of Carbon from Baseline (C2)	8.6	34.7
@TICTOC1			

LIQUID
99004012
0
N/A
S99T001732
CAREZ
MF
JFG
KRM
10/27/99
10/26/99
08:00 PM
S-111

$\mu\text{g of Carbon/mL} = (C1 - C2) \cdot DF / SS$
 $\mu\text{g of Carbon/mL for TIC} = 5 \text{ if } C1 < C2$
 $\mu\text{g of Carbon/mL for TOC} = 40 \text{ if } C1 < C2$

	TIC	TOC
Method Detection Limit in µg/mL	5	40
µg of Carbon/mL	3.52E+03	1.60E+03

Data Entered By:	MF	Date: 10/27/99
Signature of Chemist:		Date: 10/27/99

SAMPLE.WB1 REV 1.0

342100ML

257

WORKBOOK PAGE: DUP6

TIC/TOC : LA-342-100 (F-3)

LIQUIDS

		TIC	TOC
	Sample Size in mL (SS)	0.1000	0.1000
DUP	Dilution Factor (DF)	1	1
	µg of Carbon in Sample (C1)	341.8	183.3
31562	µg of Carbon from Baseline (C2)	8.6	34.7
	Known µg of C from Original Sample	3.52E+3	1.60E+3
@TICTOC1			

LIQUID
99004012
0
N/A
S99T001732
99004012
MF
JFB
KRM
10/27/99
10/27/99
09/03/99
S411

$\mu\text{g of Carbon/mL} = (C1 - C2) * DF / SS$
 $\mu\text{g of Carbon/mL for TIC} = 5 \text{ if } C1 < C2$
 $\mu\text{g of Carbon/mL for TOC} = 40 \text{ if } C1 < C2$

	TIC	TOC
Method Detection Limit in µg/mL	5	40
µg of Carbon/mL	3.33E+03	1.49E+03

Data Entered By:	MF	Date: 10/27/99
Signature of Chemist:		Date: 10/27/99

LABCORE Completed Worklist Report for Worklist# 31563

Analyst: slh

Instrument: CARB2

Book#: _____

Method: LA-342-100 Rev/Mod F-3

Worklist Comment: S-111 FOR @TICTOC1, RLC

Seq Type	Sample#	R A	Test	Matrix	Actual	Found	DL or Yield	Unit
1 STD	0		@TICTOC1 TIC-02	SOLID	6.02E+02	6.22E+2	103.322 % Recovery	
1 STD	0		@TICTOC1 TOC-02	SOLID	3.01E+03	2.81E+3	93.355 % Recovery	
2 BLNK-PREP	0		@TICTOC1 TIC-02	SOLID	1	4.00E-1	0.400 ug/g	
2 BLNK-PREP	0		@TICTOC1 TOC-02	SOLID	1	1.21E+1	12.100 ug/g	
3 SAMPLE	899T001736	0	@TICTOC1 TIC-02	SOLID	N/A	4.73E+03	5.000 ug/g	
3 SAMPLE	899T001736	0	@TICTOC1 TOC-02	SOLID	N/A	8.39E+03	40.000 ug/g	
4 DUP	899T001736	0	@TICTOC1 TIC-02	SOLID	4.73E+3	4.72E+3	0.212 RPD	
4 DUP	899T001736	0	@TICTOC1 TOC-02	SOLID	8.39E+3	7.75E+3	7.931 RPD	
5 SPK	899T001736	0	@TICTOC1 TIC-02	SOLID	1.00E+02	9.96E+01	99.600 % Recovery	
5 SPK	899T001736	0	@TICTOC1 TOC-02	SOLID	1.00E+02	8.32E+01	83.200 % Recovery	

Final page for worklist# 31563

Analyst Signature _____ Date _____

Mary Joang 11/1/99
 Analyst Signature _____ Date _____

James Grohs 11/1/99
 Reviewer Signature _____ Date _____

10/25/99 14:46
ws2

Page: 1

LABCORE Data Entry Template for Worklist# 31563

Analyst: SLH Instrument: CARB2 Book# TK 25N12-E
Method: LA-342-100 Rev/Mod F-3 TOC 34N12-C
Worklist Comment: S-111 FOR @TICTOC1, RLC

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				@TICTOC1	SOLID		
2	BLNK-PREP				@TICTOC1	SOLID		
3	SAMPLE	S99T001736 0			@TICTOC1	SOLID	99000304	S-111 GRAB
		Analytes Requested: TIC-02 , TOC-02						
4	DUP	S99T001736 0			@TICTOC1	SOLID		
5	SPK	S99T001736 0			@TICTOC1	SOLID		

Final page for worklist # 31563

Janet L. Hood Bontnyht
Signature Date
10-28-99

Mary Franz 11/1/99
Signature Date

Faxed
8/1/99

Data Entry Comments:

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

HNF-1685 REV. 0

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT

TICTOC REV 2.0

<<< BLANK ANALYSIS >>>

Sample: BASE 1

Date: 10/23/99

Time: 00:33:17

Sample Size = 1 uL

Dil Factor = 1

Blank ID # = BASE 1

Blank Value = N/A

Analyst : SL HOOD

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading ==	== Analysis Time ==	== Coulometer ==	== % Difference ==
1	0.51	0.40	0.00
2	1.01	0.80	50.00
3	1.50	1.20	33.33
4	2.00	1.70	29.41
5	2.50	2.40	29.17
6	3.00	3.00	20.00
7	3.50	3.60	16.67
8	4.00	4.10	12.20
9	4.50	4.70	12.77
10	5.00	5.10	7.84
11	5.50	5.60	8.93
12	6.00	6.20	9.68
13	6.50	6.50	4.62
14	7.00	7.20	9.72
15	7.50	7.30	1.37
16	8.00	7.70	5.19
17	8.50	8.20	6.10
18	9.00	8.70	5.75
19	9.50	8.90	2.25
20	10.00	9.50	6.32
21	10.50	9.70	2.06
22	11.00	10.00	3.00

BLANK VALUE = 10 micrograms carbon

BLANK FACTOR = 10 / 10.99783 =

+9.09E-01 ug/min Carbon

Sample Run By:

SL HOOD

00001

SIGNATURE ABOVE REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 261 TO 277.

10-27-99

HNF-1685 REV. 0

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT

TICTOC REV 2.0

<<< BLANK ANALYSIS >>>

Sample: BASE # *KB*

Date: 10/23/99

Time: 00:48:20

Sample Size = 1 uL

Dil Factor = 1

Blank ID # = BASE 2

Blank Value = N/A

Analyst : SL HOOD

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading ==	== Analysis Time ==	== Coulometer ==	== % Difference ==
1	0.51	0.50	0.00
2	1.00	0.80	37.50
3	1.50	1.20	33.33
4	2.00	2.00	40.00
5	2.50	3.80	47.37
6	3.00	8.10	53.09
7	3.50	13.00	37.69
8	4.00	16.90	23.08
9	4.50	20.60	17.96
10	5.00	23.70	13.08
11	5.50	25.80	8.14
12	6.00	27.10	4.80
13	6.50	28.20	3.90
14	7.00	29.10	3.09
15	7.50	30.00	3.00
16	8.00	30.70	2.28
17	8.50	31.20	1.60
18	9.00	31.80	1.89
19	9.50	32.30	1.55
20	10.00	32.70	1.22
21	10.50	33.00	0.91
22	11.00	33.00	0.00

BLANK VALUE = 33 micrograms carbon

BLANK FACTOR = 33 / 10.997 =

+3.00E+00 ug/min Carbon

<<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!>>>>

Sample Run By:

SL HOOD

00001

10-27-99

HNF-1685 REV. 0

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: STD 1

Date: 10/23/99

Time: 01:10:17

Sample Size = 1000 uL

Analyst : SL HOOD

Dil Factor = 1

Min Readings = 22

Blank ID # =

Max Readings = 22

Blank Value = .909 ug/minute C

% Difference = 10

Reading	Analysis Time	Coulometer	% Difference
1	0.51	0.20	0.00
2	1.01	0.50	60.00
3	1.50	0.60	16.67
4	2.00	57.00	98.95
5	2.50	113.40	49.74
6	3.00	198.90	42.99
7	3.50	295.60	32.71
8	4.00	389.10	24.03
9	4.50	465.30	16.38
10	5.00	521.00	10.69
11	5.50	559.60	6.90
12	6.00	585.20	4.37
13	6.50	601.60	2.73
14	7.00	611.60	1.64
15	7.50	618.40	1.10
16	8.00	622.50	0.66
17	8.50	625.30	0.45
18	9.00	627.20	0.30
19	9.50	628.80	0.25
20	10.00	630.00	0.19
21	10.50	630.90	0.14
22	11.00	631.80	0.14

USER INPUT BLANK VALUE

BLANK VALUE = 9.996274 micrograms carbon

BLANK FACTOR = 9.996274 / 10.997 = +9.1E-01 ug/min Carbon

SAMPLE RESULTS:

(631.8 - 9.997787) (1) / (1000)	=	+6.218E-01	g/L Carbon
(631.8 - 9.997787) (1) / (1000) (12)	=	+5.182E-02	Molar Carbon

Sample Run By:

SL HOOD

00001

HNF-1685 REV. 0

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: STD1

Date: 10/23/99

Time: 01:22:49

Sample Size = 200 uL

Dil Factor = 1

Blank ID # =

Blank Value = 3 ug/minute C

Analyst : SL HOOD

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading ==	==== Analysis Time ==	==== Coulometer ==	==== % Difference ==
1	0.51	0.30	0.00
2	1.01	0.90	66.67
3	1.51	1.50	40.00
4	2.00	6.10	75.41
5	2.50	37.00	83.51
6	3.00	127.90	71.07
7	3.50	251.80	49.21
8	4.00	361.90	30.42
9	4.50	444.20	18.53
10	5.00	499.20	11.02
11	5.50	534.20	6.55
12	6.00	555.40	3.82
13	6.50	568.70	2.34
14	7.00	577.10	1.46
15	7.50	582.40	0.91
16	8.00	586.10	0.63
17	8.50	588.20	0.36
18	9.00	590.00	0.31
19	9.50	591.70	0.29
20	10.00	592.60	0.15
21	10.50	593.50	0.15
22	11.00	594.20	0.12

USER INPUT BLANK VALUE :

BLANK VALUE = 32.991 micrograms carbon

BLANK FACTOR = 32.991 / 10.997 = +3.0E+00 ug/min Carbon

SAMPLE RESULTS:

(594.2 - 32.99403) (1)/(200) = +2.806E+00 g/L Carbon
 (594.2 - 32.99403) (1)/(200) (12) = +2.338E-01 Molar Carbon
 <<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!>>>>

Sample Run By:

SL HOOD

00001

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: BLK 1

Date: 10/23/99

Time: 01:38:27

Sample Size = 1 uL

Dil Factor = 1

Blank ID # =

Blank Value = .909 ug/minute C

Analyst : SL HOOD

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading ==	Analysis Time	Coulometer	% Difference ==
1	0.51	0.40	0.00
2	1.01	1.10	63.64
3	1.50	1.90	42.11
4	2.00	2.80	32.14
5	2.50	3.30	15.15
6	3.00	3.90	15.38
7	3.50	4.40	11.36
8	4.00	5.00	12.00
9	4.50	5.50	9.09
10	5.00	5.80	5.17
11	5.50	6.20	6.45
12	6.00	6.50	4.62
13	6.50	6.90	5.80
14	7.00	7.20	4.17
15	7.50	7.60	5.26
16	8.00	7.90	3.80
17	8.50	8.20	3.66
18	9.00	8.40	2.38
19	9.50	8.70	3.45
20	10.00	9.00	3.33
21	10.50	9.30	3.23
22	11.00	9.60	3.13

USER INPUT BLANK VALUE

BLANK VALUE = 9.996274 micrograms carbon

BLANK FACTOR = 9.996274 / 10.997 = +9.1E-01 ug/min Carbon

SAMPLE RESULTS:

(9.6 - 9.995519) (1)/(1) =

< 5.00 E-3 g/L Carbon

(9.6 - 9.995519) (1)/(1) (12) =

< 4.17 E-4 Molar Carbon

Sample Run By:

SL HOOD

00001

HNF-1685 REV. 0

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: BLK 1

Date: 10/23/99

Time: 01:53:48

Sample Size = 1 uL

Dil Factor = 1

Blank ID # =

Blank Value = 3 ug/minute C

Analyst : SL HOOD

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading ==	Analysis Time	==== Coulometer ==	% Difference ==
1	0.51	0.20	0.00
2	1.01	0.50	60.00
3	1.51	0.80	37.50
4	2.00	1.20	33.33
5	2.50	2.60	53.85
6	3.00	4.80	45.83
7	3.50	8.10	40.74
8	4.00	10.30	21.36
9	4.50	12.50	17.60
10	5.00	14.20	11.97
11	5.50	15.60	8.97
12	6.00	16.30	4.29
13	6.50	17.00	4.12
14	7.00	17.80	4.49
15	7.50	18.30	2.73
16	8.00	18.80	2.66
17	8.50	19.30	2.59
18	9.00	19.70	2.03
19	9.50	20.00	1.50
20	10.00	20.30	1.48
21	10.50	20.60	1.46
22	11.00	20.90	1.44

USER INPUT BLANK VALUE :

BLANK VALUE = 32.991 micrograms carbon

BLANK FACTOR = 32.991 / 10.997 = +3.0E+00 ug/min Carbon

SAMPLE RESULTS:

(20.9 - 32.98851) (1)/(1) = < 5.00 E-3 g/L Carbon

(20.9 - 32.98851) (1)/(1)(12) = < 4.17 E-4 Molar Carbon

<<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!>>>>

Sample Run By:

SL HOOD

00001

HNF-1685 REV. 0

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: S99T001736

Date: 10/23/99

Time: 04:06:35

Sample Size = 1 uL

Dil Factor = 1

Blank ID # =

Blank Value = .909 ug/minute C

Analyst : SL HOOD

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading ==	== Analysis Time ==	== Coulometer ==	== % Difference ==
1	0.51	0.20	0.00
2	1.01	0.40	50.00
3	1.50	0.60	33.33
4	2.00	1.30	53.85
5	2.51	3.20	59.38
6	3.01	13.30	75.94
7	3.50	36.30	63.36
8	4.00	67.90	46.54
9	4.50	96.10	29.34
10	5.00	116.70	17.65
11	5.50	130.70	10.71
12	6.00	139.20	6.11
13	6.50	145.20	4.13
14	7.00	148.60	2.29
15	7.50	151.10	1.65
16	8.00	152.70	1.05
17	8.50	154.00	0.84
18	9.00	155.00	0.65
19	9.50	155.80	0.51
20	10.00	156.40	0.38
21	10.50	157.20	0.51
22	11.00	157.70	0.32

USER INPUT BLANK VALUE

BLANK VALUE = 9.996274 micrograms carbon

BLANK FACTOR = 9.996274 / 10.997 = +9.1E-01 ug/min Carbon

SAMPLE RESULTS:

(157.7 - 9.997931) (1)/(1)	=	+1.477E+02	g/L Carbon
(157.7 - 9.997931) (1)/(1) (12)	=	+1.231E+01	Molar Carbon

Sample Run By:

SL HOOD

00001

85 = .0312g

HNF-1685 REV. 0

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: S99T001736

Date: 10/23/99

Time: 04:18:45

Sample Size = 1 uL

Dil Factor = 1

Blank ID # =

Blank Value = 3 ug/minute C

Analyst : SL HOOD

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading ==	== Analysis Time ==	== Coulometer ==	== % Difference ==
1	0.51	0.60	0.00
2	1.01	1.10	45.45
3	1.50	3.60	69.44
4	2.00	35.10	89.74
5	2.50	100.60	65.11
6	3.00	161.10	37.55
7	3.50	207.80	22.47
8	4.00	239.30	13.16
9	4.50	258.30	7.36
10	5.00	269.90	4.30
11	5.50	277.70	2.81
12	6.00	282.60	1.73
13	6.50	285.60	1.05
14	7.00	287.60	0.70
15	7.50	289.40	0.62
16	8.00	290.60	0.41
17	8.50	291.50	0.31
18	9.00	292.50	0.34
19	9.50	293.10	0.20
20	10.00	293.70	0.20
21	10.50	294.30	0.20
22	11.00	294.90	0.20

USER INPUT BLANK VALUE

BLANK VALUE = 32.991 micrograms carbon

BLANK FACTOR = 32.991 / 10.997 = +3.0E+00 ug/min Carbon

SAMPLE RESULTS:

(294.9 - 32.99098) (1)/(1) = +2.619E+02 g/L Carbon

(294.9 - 32.99098) (1)/(1)(12) = +2.183E+01 Molar Carbon

<<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!>>>>

Sample Run By:

SL HOOD

00001

SS = 03/23

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: S99T01736 DUP

Date: 10/23/99

Time: 04:34:29

Sample Size = 1 uL

Dil Factor = 1

Blank ID # =

Blank Value = .909 ug/minute C

Analyst : SL HOOD

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading ==	Analysis Time ==	Coulometer ==	% Difference ==
1	0.51	0.50	0.00
2	1.01	1.00	50.00
3	1.50	1.40	28.57
4	2.00	2.10	33.33
5	2.50	4.90	57.14
6	3.00	18.60	73.66
7	3.50	50.10	62.87
8	4.00	91.90	45.48
9	4.50	129.40	28.98
10	5.00	159.70	18.97
11	5.50	179.70	11.13
12	6.00	192.10	6.45
13	6.50	200.80	4.33
14	7.00	205.50	2.29
15	7.50	209.20	1.77
16	8.00	211.60	1.13
17	8.50	213.10	0.70
18	9.00	214.50	0.65
19	9.50	215.40	0.42
20	10.00	216.40	0.46
21	10.50	217.30	0.41
22	11.00	218.00	0.32

USER INPUT BLANK VALUE

BLANK VALUE = 9.996274 micrograms carbon

BLANK FACTOR = 9.996274 / 10.997 = +9.1E-01 ug/min Carbon

SAMPLE RESULTS:

(218 - 9.996253) (1) / (1)	=	+2.080E+02	g/L Carbon
(218 - 9.996253) (1) / (1) (12)	=	+1.733E+01	Molar Carbon

Sample Run By:

SL HOOD

00001

SS = .0441g

HNF-1685 REV. 0

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: S99T01736 DUP

Date: 10/23/99

Time: 04:48:28

Sample Size = 1 uL

Dil Factor = 1

Blank ID # =

Blank Value = 3 ug/minute C

Analyst : SL HOOD

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading ==	Analysis Time ==	Coulometer ==	% Difference ==
1	0.51	0.50	0.00
2	1.01	1.10	54.55
3	1.51	1.70	35.29
4	2.01	7.70	77.92
5	2.51	43.60	82.34
6	3.00	113.80	61.69
7	3.50	192.60	40.91
8	4.00	255.80	24.71
9	4.50	298.60	14.33
10	5.00	326.10	8.43
11	5.50	343.10	4.95
12	6.00	353.60	2.97
13	6.50	359.70	1.70
14	7.00	364.00	1.18
15	7.50	366.70	0.74
16	8.00	368.70	0.54
17	8.50	370.40	0.46
18	9.00	371.40	0.27
19	9.50	372.40	0.27
20	10.00	373.30	0.24
21	10.50	373.90	0.16
22	11.00	374.70	0.21

USER INPUT BLANK VALUE

BLANK VALUE = 32.991 micrograms carbon

BLANK FACTOR = 32.991 / 10.997 = +3.0E+00 ug/min Carbon

SAMPLE RESULTS:

(374.7 - 32.99359) (1)/(1) = +3.417E+02 g/L Carbon
 (374.7 - 32.99359) (1)/(1) (12) = +2.848E+01 Molar Carbon
 <<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!>>>>

Sample Run By:

SL HOOD

00001

SS = .044g

HNF-1685 REV. 0

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: S99T01736 SPK Date: 10/23/99 Time: 05:03:36

Sample Size = 1 uL

Dil Factor = 1

Blank ID # =

Blank Value = .909 ug/minute C

Analyst : SL HOOD

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading ==	Analysis Time ==	Coulometer ==	% Difference ==
1	0.51	0.40	0.00
2	1.01	0.90	55.56
3	1.50	1.50	40.00
4	2.00	4.90	69.39
5	2.50	31.60	84.49
6	3.00	100.10	68.43
7	3.50	195.50	48.80
8	4.00	295.40	33.82
9	4.50	375.00	21.23
10	5.00	431.30	13.05
11	5.50	468.60	7.96
12	6.00	491.30	4.62
13	6.50	505.50	2.81
14	7.00	514.00	1.65
15	7.50	519.20	1.00
16	8.00	522.70	0.67
17	8.50	525.20	0.48
18	9.00	526.90	0.32
19	9.50	528.40	0.28
20	10.00	529.80	0.26
21	10.50	530.70	0.17
22	11.00	531.80	0.21

USER INPUT BLANK VALUE

BLANK VALUE = 9.996274 micrograms carbon

BLANK FACTOR = 9.996274 / 10.997 = +9.1E-01 ug/min Carbon

SAMPLE RESULTS:

(531.8 - 9.996282) (1)/(1) =

+5.218E+02 g/L Carbon

(531.8 - 9.996282) (1)/(1) (12) =

+4.348E+01 Molar Carbon

Sample Run By:

SL HOOD

00001

271

SS = .0469g + .500ml spk

25N/2-E

HNF-1685 REV. 0

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: S99T01736 SPK Date: 10/23/99 Time: 05:29:18

Sample Size = 1 uL

Dil Factor = 1

Blank ID # =

Blank Value = 3 ug/minute C

Analyst : SL HOOD

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading ==	==== Analysis Time ==	==== Coulometer ==	==== % Difference ==
1	0.51	0.70	0.00
2	1.01	1.10	36.36
3	1.50	1.90	42.11
4	2.00	13.20	85.61
5	2.50	65.70	79.91
6	3.00	182.20	63.94
7	3.50	332.60	45.22
8	4.00	460.20	27.73
9	4.50	545.50	15.64
10	5.00	597.60	8.72
11	5.50	628.80	4.96
12	6.00	645.80	2.63
13	6.50	656.20	1.58
14	7.00	662.40	0.94
15	7.50	666.90	0.67
16	8.00	669.80	0.43
17	8.50	672.00	0.33
18	9.00	673.60	0.24
19	9.50	674.80	0.18
20	10.00	675.50	0.10
21	10.50	676.40	0.13
22	11.00	677.10	0.10

USER INPUT BLANK VALUE

BLANK VALUE = 32.991 micrograms carbon

BLANK FACTOR = 32.991 / 10.997 = +3.0E+00 ug/min Carbon

SAMPLE RESULTS:

(677.1 - 32.98856) (1)/(1) = +6.441E+02 g/L Carbon
 (677.1 - 32.98856) (1)/(1) (12) = +5.368E+01 Molar Carbon
 <<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!>>>>

Sample Run By:

SL HOOD

00001

SS = .0469g + .100 34N12-C 272

WORKBOOK PAGE: STD1

TIC/TOC : LA-342-100 (F-3)

LIQUIDS

		TIC	TOC
	Sample Size in mL (SS)	1.0000	0.2000
STD	Dilution Factor (DF)	1	1
	Final Coulometer Reading in μg (C1)	631.8	594.2
31563	μg of Carbon from Baseline (C2)	10	33
	Standard Book Number	25N12E	34N12C
@TICTOC1	Standard Value ($\mu\text{g}/\text{ml}$)	602	3009
LIQUID	QC Actual in $\mu\text{g}/\text{mL}$ = Standard Value ($\mu\text{g}/\text{mL}$) QC Found in $\mu\text{g}/\text{mL}$ = $(C1 - C2) * DF / SS$ QC Found in $\mu\text{g}/\text{mL}$ for TIC = 5 if $C1 < C2$ QC Found in $\mu\text{g}/\text{mL}$ for TOC = 40 if $C1 < C2$ % Recovery = QC Found / QC Actual * 100		
99004014			
0			
N/A			
STD			
CARB2			
MF			
JFG			
SLH			
11/01/99			
10/28/99			
	Method Detection Limit in $\mu\text{g}/\text{mL}$	5	40
01:00 AM	QC Actual in $\mu\text{g}/\text{mL}$	6.02E+02	3.01E+03
	QC Found in $\mu\text{g}/\text{mL}$	6.22E+02	2.81E+03
S-111	Percent Standard Recovery	103.3	93.3

Data Entered By:	MF	Date:	11/01/99
Signature of Chemist:	<i>NA</i>	Date:	

STANDARD.WB1 REV 1.0

342100ML

WORKBOOK PAGE: BLANK2

TIC/TOC : LA-342-100 (F-3)

SOLIDS

[illegible]

Data Entered By:	MF	Date:	11/01/99
Signature of Chemist:	<i>MA</i>	Date:	

BLANK.WB1 REV 1.0

342100ML

274

WORKBOOK PAGE: SAM3

TIC/TOC : LA-342-100 (F-3)

SOLIDS

[illegible]

Data Entered By:

MF

Date: 11/01/99

Signature of Chemist:

Date:

SAMPLE.WB1 REV 1.0

342100ML

275

WORKBOOK PAGE: DUP4

TIC/TOC : LA-342-100 (F-3)

SOLIDS

		TIC	TOC
DUP	Sample Size in g (SS)	0.0441	0.0441
	Dilution Factor (DF)	1	1
31563	µg of Carbon in Sample (C1)	218	374.7
	µg of Carbon from Baseline (C2)	40	33
@TICTOC1	Known µg of C from Original Sample	4.73E+3	8.39E+3

SOLID

99004014

0

N/A

S99T001736

$$\mu\text{g of Carbon/g} = (C1 - C2) * DF / SS$$

$$\mu\text{g of Carbon/g for TIC} = 5 \text{ if } C1 < C2$$

$$\mu\text{g of Carbon/g for TOC} = 40 \text{ if } C1 < C2$$

	TIC	TOC
Method Detection Limit in ug/g	5	40
µg of Carbon/g	4.72E+03	7.75E+03

Data Entered By:	MF	Date: 11/01/99
Signature of Chemist:	<i>NA</i>	Date:

WORKBOOK PAGE: SPIKE5

TIC/TOC : LA-342-100 (F-3)

SOLIDS

	Sample Vial Data	TIC	TOC
SPK	Sample Size in g (SS)	0.0469	0.0469
	Final Coulometer Reading in μg (C1)	157.7	283.3
31563	Spiked Vial Data		
	Sample Size in g (SPK SS)	0.0469	0.0469
@TIC/TOC1	Amount of Spike Std. in mL (SPK VOL)	0.500	0.100
	Final Coulometer Reading in μg (C2)	531.8	677.1
SOLID	Spike Book Number	25N12E	34N12C
	Spike Standard Value in $\mu\text{g/mL}$ (SPK CONC)	602	3009
99004014	$\mu\text{g C}$ in baseline (BL)	10	33

0

N/A

$$\text{Percent Spike Recovery} = ((C2 - BL) - (C1 - BL)) * (SPK SS) / SS / ((SPK CONC) * (SPK VOL)) * 100$$

S99T001736

QC Actual in $\mu\text{g/mL}$ = Spike Value ($\mu\text{g/mL}$)QC Found in $\mu\text{g/mL}$ = (Percent Spike Recovery) * (QC Actual) / 100

MF

JFC

SEH

11/01/99

10/21/99

01:00 AM

S-111

QC Actual in $\mu\text{g/mL}$ QC Found in $\mu\text{g/mL}$

Percent Spike Recovery

TIC

TOC

6.02E+02

3.01E+03

6.00E+02

2.50E+03

99.6

83.2

Data Entered By:

MF

Date:

11/01/99

Signature of Chemist:

Date:

SPIKE.WB1 REV 1.3

342100ML

277

LABCORE Completed Worklist Report for Worklist# 31574

Analyst: slh

Instrument: CARB2

Book#: _____

Method: LA-342-100 Rev/Mod F-3

Worklist Comment: S111 FOR @TICTOC1 RTS

Seq Type	Sample#	R A	Test	Matrix	Actual	Found	DL or Yield	Unit
1 BLNK	0		@TICTOC1 TIC-02	LIQUID	1	3.10E+0	3.100	ug/mL
1 BLNK	0		@TICTOC1 TOC-02	LIQUID	1	7.30E+0	7.300	ug/mL
2 STD	0		@TICTOC1 TIC-02	LIQUID	6.02E+02	5.56E+2	92.359	% Recovery
2 STD	0		@TICTOC1 TOC-02	LIQUID	3.01E+03	2.85E+3	94.684	% Recovery
3 SAMPLE	899T001733	0	@TICTOC1 TIC-02	LIQUID	N/A	3.35E+03	5.000	ug/mL
3 SAMPLE	899T001733	0	@TICTOC1 TOC-02	LIQUID	N/A	1.59E+03	40.000	ug/mL
4 DUP	899T001733	0	@TICTOC1 TIC-02	LIQUID	3.35E+3	3.42E+3	2.068	RPD
4 DUP	899T001733	0	@TICTOC1 TOC-02	LIQUID	1.59E+3	1.63E+3	2.484	RPD
5 SPK	899T001733	0	@TICTOC1 TIC-02	LIQUID	1.00E+02	8.37E+01	83.700	% Recovery
5 SPK	899T001733	0	@TICTOC1 TOC-02	LIQUID	1.00E+02	8.76E+01	87.600	% Recovery

Final page for worklist# 31574

Analyst Signature _____ Date _____

 11/1/99
 Analyst Signature _____ Date _____

 11/1/99
 Reviewer Signature _____ Date _____

10/27/99 14:05
ws2

HNF-1685 REV. 0

Page: 1

LABCORE Data Entry Template for Worklist# 31574

Analyst: SLH Instrument: CARB2 Book# TK 25N12-E
Method: LA-342-100 Rev/Mod F-3 TOC 34N12-C
Worklist Comment: S111 FOR @TICTOC1 RTS

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	BLNK				@TICTOC1	LIQUID		
2	STD				@TICTOC1	LIQUID		
3	SAMPLE	S99T001733 0			@TICTOC1	LIQUID	99000304	S-111 GRAB
Analytes Requested: TIC-02 , TOC-02								
4	DUP	S99T001733 0			@TICTOC1	LIQUID		
5	SPK	S99T001733 0			@TICTOC1	LIQUID		

Final page for worklist # 31574

Andrew Hood Boatright
Signature Date
10-28-99

Emily Frey 11/1/99
Signature Date

Fixed out
07/13

Data Entry Comments:

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

HNF-1685 REV. 0

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: BASE 2

Date: 10/27/99

Time: 20:13:03

Sample Size = 1 uL

Dil Factor = 1

Blank ID # = BASE 2

Blank Value = .8911465 ug/minute C

Analyst : SL HOOD

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading ==	==== Analysis Time ==	==== Coulometer ==	==== % Difference ==
1	0.51	0.30	0.00
2	1.01	0.70	57.14
3	1.50	1.30	46.15
4	2.00	1.80	27.78
5	2.50	2.50	28.00
6	3.00	3.20	21.88
7	3.50	3.90	17.95
8	4.00	4.40	11.36
9	4.50	4.90	10.20
10	5.00	5.40	9.26
11	5.50	5.80	6.90
12	6.00	6.20	6.45
13	6.50	6.60	6.06
14	7.00	7.00	5.71
15	7.50	7.30	4.11
16	8.00	7.80	6.41
17	8.50	8.10	3.70
18	9.00	8.50	4.71
19	9.50	8.80	3.41
20	10.00	9.20	4.35
21	10.50	9.50	3.16
22	11.00	9.90	4.04

BLANK VALUE = 9.8 micrograms carbon

BLANK FACTOR = 9.8 / 10.99707 =

+8.9E-01 ug/min Carbon

SAMPLE RESULTS:

(9.9 - 9.802394) (1)/(1) =

+9.8E-02 g/L Carbon

(9.9 - 9.802394) (1)/(1) (12) =

+8.1E-03 Molar Carbon

SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 280 TO 296.

Sample Run By:

SL HOOD

00002

10-27-99

HNF-1685 REV. 0

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT

TICTOC REV 2.0

<<< BLANK ANALYSIS >>>

Sample: BASE 2

Date: 10/27/99

Time: 20:28:06

Sample Size = 1 uL
Dil Factor = 1
Blank ID # = BASE 2
Blank Value = N/A

Analyst : SL HOOD
Min Readings = 22
Max Readings = 22
% Difference = 10

== Reading ==	== Analysis Time ==	== Coulometer ==	== % Difference ==
1	0.51	0.30	0.00
2	1.01	0.70	57.14
3	1.50	1.10	36.36
4	2.00	1.80	38.89
5	2.50	3.70	51.35
6	3.00	6.30	41.27
7	3.50	9.10	30.77
8	4.00	12.50	27.20
9	4.50	14.90	16.11
10	5.00	17.30	13.87
11	5.50	18.70	7.49
12	6.00	20.10	6.97
13	6.50	21.10	4.74
14	7.00	22.00	4.09
15	7.50	22.70	3.08
16	8.00	23.40	2.99
17	8.50	23.90	2.09
18	9.00	24.50	2.45
19	9.50	24.90	1.61
20	10.00	25.40	1.97
21	10.50	25.80	1.55
22	11.00	26.20	1.53

BLANK VALUE = 26.2 micrograms carbon

BLANK FACTOR = 26.2 / 10.99695 = +2.38E+00 ug/min Carbon

<<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!>>>>

Sample Run By:

SL HOOD

00002

10-27-99

HNF-1685 REV. 0

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: STDS 2

Date: 10/27/99

Time: 20:52:58

Sample Size = 1000 uL

Dil Factor = 1

Blank ID # =

Blank Value = .89 ug/minute C

Analyst : SL HOOD

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading ==	Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.70	0.00
2	1.00	1.30	46.15
3	1.50	2.00	35.00
4	2.00	6.50	69.23
5	2.50	30.20	78.48
6	3.00	88.90	66.03
7	3.50	176.00	49.49
8	4.00	273.30	35.60
9	4.50	361.30	24.36
10	5.00	428.80	15.74
11	5.50	476.90	10.09
12	6.00	509.70	6.44
13	6.50	531.10	4.03
14	7.00	543.80	2.34
15	7.50	551.60	1.41
16	8.00	556.10	0.81
17	8.50	559.40	0.59
18	9.00	561.40	0.36
19	9.50	563.10	0.30
20	10.00	564.30	0.21
21	10.50	565.30	0.18
22	11.00	566.20	0.16

USER INPUT BLANK VALUE

BLANK VALUE = 9.787284 micrograms carbon

BLANK FACTOR = 9.787284 / 10.99695 = +8.9E-01 ug/min Carbon

SAMPLE RESULTS:

(566.2 - 9.787284) (1) / (1000) = +5.564E-01 g/L Carbon
 (566.2 - 9.787284) (1) / (1000) (12) = +4.637E-02 Molar Carbon

Sample Run By:

SL HOOD

00002

HNF-1685 REV. 0

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: STD 2

Date: 10/27/99

Time: 21:05:06

Sample Size = 200 uL

Dil Factor = 1

Blank ID # =

Blank Value = 2.38 ug/minute C

Analyst : SL HOOD

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading ==	Analysis Time ==	Coulometer ==	% Difference ==
1	0.51	0.60	0.00
2	1.01	1.30	53.85
3	1.51	2.30	43.48
4	2.00	11.80	80.51
5	2.50	60.40	80.46
6	3.00	162.10	62.74
7	3.50	280.60	42.23
8	4.00	381.60	26.47
9	4.50	454.50	16.04
10	5.00	504.90	9.98
11	5.50	538.80	6.29
12	6.00	560.60	3.89
13	6.50	573.20	2.20
14	7.00	580.40	1.24
15	7.50	585.20	0.82
16	8.00	588.20	0.51
17	8.50	590.40	0.37
18	9.00	591.90	0.25
19	9.50	593.10	0.20
20	10.00	594.30	0.20
21	10.50	595.20	0.15
22	11.00	596.00	0.13

USER INPUT BLANK VALUE

BLANK VALUE = 26.17274 micrograms carbon

BLANK FACTOR = 26.17274 / 10.99695 = +2.4E+00 ug/min Carbon

SAMPLE RESULTS:

(596 - 26.17739) (1)/(200) = +2.849E+00 g/L Carbon
 (596 - 26.17739) (1)/(200) (12) = +2.374E-01 Molar Carbon
 <<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!>>>>

Sample Run By:

SL HOOD

00002

HNF-1685 REV. 0

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: BLK 2

Date: 10/27/99

Time: 21:18:13

Sample Size = 1 uL

Dil Factor = 1

Blank ID # =

Blank Value = ~~2.38~~ ug/minute C

Analyst : SL HOOD

Min Readings = 22

Max Readings = 22

% Difference = 10

SLHB .89 10-27-99
 == Reading == Analysis Time == Coulometer == % Difference ==

1	0.51	0.50	0.00
2	1.01	1.10	54.55
3	1.50	1.80	38.89
4	2.00	2.60	30.77
5	2.50	3.60	27.78
6	3.00	4.50	20.00
7	3.50	5.60	19.64
8	4.00	6.40	12.50
9	4.50	7.20	11.11
10	5.00	7.90	8.86
11	5.50	8.40	5.95
12	6.00	8.90	5.62
13	6.50	9.40	5.32
14	7.00	9.80	4.08
15	7.50	10.20	3.92
16	8.00	10.60	3.77
17	8.50	11.10	4.50
18	9.00	11.40	2.63
19	9.50	11.80	3.39
20	10.00	12.30	4.07
21	10.50	12.70	3.15
22	11.00	13.00	2.31

SLHB
 10-27-99
 USER INPUT BLANK VALUE 9.802394

BLANK VALUE = ~~26.17274~~ micrograms carbonBLANK FACTOR = ~~26.17274~~ / 10.99695 = ~~+2.4E+00~~ ug/min Carbon

9.802394
 SAMPLE RESULTS:

(13 - ~~26.1771~~) (1) / (1) = ~~5.00~~ E-3 g/L Carbon(13 - ~~26.1771~~) (1) / (1) (12) = ~~4.17~~ E-4 Molar Carbon

<<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!>>>>

Sample Run By:

SL HOOD

00002

Please Recalculate
 SLHB

284

HNF-1685 REV. 0

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: BLK 2

Date: 10/27/99

Time: 21:33:34

Sample Size = 1 uL

Dil Factor = 1

Blank ID # =

Blank Value = 2.38 ug/minute C

Analyst : SL HOOD

Min Readings = 22

Max Readings = 22

% Difference = 10

Reading	Analysis Time	Coulometer	% Difference
1	0.51	0.30	0.00
2	1.01	0.60	50.00
3	1.50	1.00	40.00
4	2.00	1.20	16.67
5	2.50	1.60	25.00
6	3.00	2.30	30.43
7	3.50	3.50	34.29
8	4.00	5.60	37.50
9	4.50	8.10	30.86
10	5.00	10.40	22.12
11	5.50	11.90	12.61
12	6.00	13.30	10.53
13	6.50	14.40	7.64
14	7.00	15.20	5.26
15	7.50	15.90	4.40
16	8.00	16.40	3.05
17	8.50	16.80	2.38
18	9.00	17.30	2.89
19	9.50	17.70	2.26
20	10.00	18.10	2.21
21	10.50	18.50	2.16
22	11.00	18.90	2.12

USER INPUT BLANK VALUE

BLANK VALUE = 26.17274 micrograms carbon

BLANK FACTOR = 26.17274 / 10.99695 = +2.4E+00 ug/min Carbon

SAMPLE RESULTS:

(18.9 - 26.17971) (1)/(1) = < 5.00 E-3 g/L Carbon
 (18.9 - 26.17971) (1)/(1) (12) = < 4.17 E-4 Molar Carbon
 <<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!>>>>

Sample Run By:

SL HOOD

00002

HNF-1685 REV. 0

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: S99T001733

Date: 10/27/99

Time: 23:49:01

Sample Size = 1 uL

Dil Factor = 1

Blank ID # =

Blank Value = .89 ug/minute C

Analyst : SL HOOD

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading ==	Analysis Time	Coulometer	% Difference ==
1	0.51	0.30	0.00
2	1.01	0.70	57.14
3	1.50	1.10	36.36
4	2.00	1.90	42.11
5	2.50	5.50	65.45
6	3.00	24.60	77.64
7	3.50	79.70	69.13
8	4.00	155.00	48.58
9	4.50	219.50	29.38
10	5.00	265.20	17.23
11	5.50	295.00	10.10
12	6.00	313.20	5.81
13	6.50	323.70	3.24
14	7.00	330.00	1.91
15	7.50	333.90	1.17
16	8.00	336.60	0.80
17	8.50	338.70	0.62
18	9.00	340.40	0.50
19	9.50	341.70	0.38
20	10.00	343.00	0.38
21	10.50	344.10	0.32
22	11.00	345.10	0.29

USER INPUT BLANK VALUE

BLANK VALUE = 9.787284 micrograms carbon

BLANK FACTOR = 9.787284 / 10.99695 = +8.9E-01 ug/min Carbon

SAMPLE RESULTS:

(345.1 - 9.789022) (1)/(1) = +3.353E+02 g/L Carbon
 (345.1 - 9.789022) (1)/(1) (12) = +2.794E+01 Molar Carbon

Sample Run By:

SL HOOD

00002

SS = .100ml
= .1426g

HNF-1685 REV.0

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: S99T001733

Date: 10/28/99

Time: 00:01:06

Sample Size = 1 uL

Dil Factor = 1

Blank ID # =

Blank Value = 2.38 ug/minute C

Analyst : SL HOOD

Min Readings = 22

Max Readings = 22

% Difference = 10

Reading	Analysis Time	Coulometer	% Difference
1	0.51	1.00	0.00
2	1.01	2.00	50.00
3	1.51	3.20	37.50
4	2.00	9.80	67.35
5	2.50	31.30	68.69
6	3.00	66.00	52.58
7	3.50	101.10	34.72
8	4.00	128.90	21.57
9	4.50	147.70	12.73
10	5.00	159.70	7.51
11	5.50	167.30	4.54
12	6.00	172.20	2.85
13	6.50	175.40	1.82
14	7.00	177.30	1.07
15	7.50	179.00	0.95
16	8.00	180.20	0.67
17	8.50	181.30	0.61
18	9.00	182.20	0.49
19	9.50	182.90	0.38
20	10.00	183.60	0.38
21	%-1429.50	184.30	0.38
22	%-1429.00	185.00	0.38

USER INPUT BLANK VALUE

BLANK VALUE = 26.17274 micrograms carbon

BLANK FACTOR = 26.17274 / 10.99695 = +2.4E+00 ug/min Carbon

SAMPLE RESULTS:

(185 --3401.021) (1)/(1) = +3.586E+03 g/L Carbon
 (185 --3401.021) (1)/(1) (12) = +2.988E+02 Molar Carbon
 <<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!>>>>

Sample Run By:

SL HOOD

00002

SS = .100ml
= .1426g

HNF-1685 REV. 0

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: S99T01733 DUP Date: 10/28/99 Time: 00:14:44

Sample Size = 1 uL

Dil Factor = 1

Blank ID # =

Blank Value = .89 ug/minute C

Analyst : SL HOOD

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading ==== Analysis Time ==== Coulometer ==== % Difference ==

1	0.51	0.60	0.00
2	1.01	1.20	50.00
3	1.50	1.80	33.33
4	2.00	2.70	33.33
5	2.50	8.50	68.24
6	3.00	31.50	73.02
7	3.50	80.00	60.63
8	4.00	147.90	45.91
9	4.50	213.50	30.73
10	5.00	263.20	18.88
11	5.50	296.50	11.23
12	6.00	317.40	6.58
13	6.50	329.60	3.70
14	7.00	336.50	2.05
15	7.50	340.80	1.26
16	8.00	343.80	0.87
17	8.50	345.70	0.55
18	9.00	347.60	0.55
19	9.50	349.00	0.40
20	10.00	350.30	0.37
21	10.50	351.50	0.34
22	11.00	352.40	0.26

USER INPUT BLANK VALUE

BLANK VALUE = 9.787284 micrograms carbon

BLANK FACTOR = 9.787284 / 10.99695 = +8.9E-01 ug/min Carbon

SAMPLE RESULTS:

(352.4 - 9.788961) (1)/(1) = +3.426E+02 g/L Carbon
(352.4 - 9.788961) (1)/(1) (12) = +2.855E+01 Molar Carbon

Sample Run By:

SL HOOD

00002

SS = .100 ml = .1430g

HNF-1685 REV. 0

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: S99T01733 DUP Date: 10/28/99 Time: 00:27:19

Sample Size = 1 uL
Dil Factor = 1
Blank ID # =
Blank Value = 2.38 ug/minute C

Analyst : SL HOOD
Min Readings = 22
Max Readings = 22
% Difference = 10

== Reading ==	Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.70	0.00
2	1.01	1.80	61.11
3	1.50	2.80	35.71
4	2.00	7.70	63.64
5	2.50	27.80	72.30
6	3.00	62.30	55.38
7	3.50	98.80	36.94
8	4.00	127.40	22.45
9	4.50	148.10	13.98
10	5.00	161.40	8.24
11	5.50	169.50	4.78
12	6.00	175.00	3.14
13	6.50	178.60	2.02
14	7.00	181.00	1.33
15	7.50	182.90	1.04
16	8.00	184.30	0.76
17	8.50	185.40	0.59
18	9.00	186.40	0.54
19	9.50	187.30	0.48
20	10.00	188.10	0.43
21	10.50	188.70	0.32
22	11.00	189.30	0.32

USER INPUT BLANK VALUE

BLANK VALUE = 26.17274 micrograms carbon

BLANK FACTOR = 26.17274 / 10.99695 = +2.4E+00 ug/min Carbon

SAMPLE RESULTS:

(189.3 - 26.17048) (1)/(1) = +1.631E+02 g/L Carbon
 (189.3 - 26.17048) (1)/(1) (12) = +1.359E+01 Molar Carbon
 <<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!>>>>

Sample Run By:

SL HOOD

00002

SS = .100ml = .1430g

HNF-1685 REV. 0

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: S99T01733 SPK Date: 10/28/99 Time: 00:43:51

Sample Size = 1 uL

Dil Factor = 1

Blank ID # =

Blank Value = .89 ug/minute C

Analyst : SL HOOD

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading ==	== Analysis Time ==	== Coulometer ==	== % Difference ==
1	0.51	0.60	0.00
2	1.01	1.20	50.00
3	1.51	1.80	33.33
4	2.00	2.90	37.93
5	2.50	12.40	76.61
6	3.00	55.50	77.66
7	3.50	141.80	60.86
8	4.00	252.70	43.89
9	4.50	357.70	29.35
10	5.00	436.80	18.11
11	5.50	492.70	11.35
12	6.00	531.10	7.23
13	6.50	555.70	4.43
14	7.00	570.60	2.61
15	7.50	579.00	1.45
16	8.00	584.30	0.91
17	8.50	588.00	0.63
18	9.00	590.40	0.41
19	9.50	592.50	0.35
20	10.00	594.30	0.30
21	10.50	595.60	0.22
22	11.00	596.90	0.22

USER INPUT BLANK VALUE

BLANK VALUE = 9.787284 micrograms carbon

BLANK FACTOR = 9.787284 / 10.99695 = +8.9E-01 ug/min Carbon

SAMPLE RESULTS:

(596.9 - 9.788961) (1)/(1)	=	+5.871E+02	g/L Carbon
(596.9 - 9.788961) (1)/(1) (12)	=	+4.893E+01	Molar Carbon

Sample Run By:

SL HOOD

00002

SS = .100ml = .1200g + .500ml spk 25N12-E
290

HNF-1685 REV. 0

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: S99T01733 SPK Date: 10/28/99 Time: 01:09:04

Sample Size = 1 uL

Dil Factor = 1

Blank ID # =

Blank Value = 2.38 ug/minute C

Analyst : SL HOOD

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading ==	Analysis Time	Coulometer	% Difference ==
1	0.51	1.00	0.00
2	1.01	2.10	52.38
3	1.51	3.10	32.26
4	2.00	4.80	35.42
5	2.50	14.80	67.57
6	3.00	54.50	72.84
7	3.50	131.10	58.43
8	4.00	219.00	40.14
9	4.50	291.30	24.82
10	5.00	345.20	15.61
11	5.50	382.50	9.75
12	6.00	407.30	6.09
13	6.50	422.10	3.51
14	7.00	430.80	2.02
15	7.50	436.10	1.22
16	8.00	439.60	0.80
17	8.50	442.20	0.59
18	9.00	444.00	0.41
19	9.50	445.50	0.34
20	10.00	446.50	0.22
21	10.50	447.70	0.27
22	11.00	448.50	0.18

USER INPUT BLANK VALUE

BLANK VALUE = 26.17274 micrograms carbon

BLANK FACTOR = 26.17274 / 10.99695 = +2.4E+00 ug/min Carbon

SAMPLE RESULTS:

(448.5 - 26.17523) (1)/(1) = +4.223E+02 g/L Carbon
 (448.5 - 26.17523) (1)/(1) (12) = +3.519E+01 Molar Carbon
 <<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!>>>>

Sample Run By:

SL HOOD

00002

SS = .100 ml = .1200g + .100 ml spk 34N12-C
 291

WORKBOOK PAGE: BLANK1

TIC/TOC : LA-342-100 (F-3)

LIQUIDS

		TIC	TOC
	Sample Size in mL (SS)	0.0000	0.0000
BLNK	Dilution Factor (DF)		
	µg of Carbon In Sample (C1)	13	18.9
31574	µg of Carbon from Baseline (C2)	9.9	26.2
@TICTOC1			
LIQUID			
99004024			
	µg of Carbon = C1-C2		
0			
N/A			
BLNK			
CARB2			
MF			
JFG			
SLH			
11/01/99			
10/28/99			
		TIC	TOC
	Method Detection Limit in µg/mL	5	40
01:00 AM			
	µg of Carbon	3.10E+00	7.30E+00
S-111			

Data Entered By:	MF	Date:	11/01/99
Signature of Chemist:	<i>James H. H. H.</i>	Date:	11/1/99

BLANK.WB1 REV 1.0

342100ML

TIC/TOC : LA-342-100 (F-3)

LIQUIDS

TIC/TOC : LA-342-100 (F-3)		LIQUIDS	
		TIC	TOC
	Sample Size in mL (SS)	1.0000	0.2000
STD	Dilution Factor (DF)	1	
	Final Coulometer Reading in μg (C1)	566.2	596
31574	μg of Carbon from Baseline (C2)	9.9	26.2
	Standard Book Number	25N12E	34N12C
@TIC/TOC1	Standard Value ($\mu\text{g}/\text{ml}$)	602	3009

LIQUID

99004024

0

N/A

STD

QC Actual in $\mu\text{g/mL}$ = Standard Value ($\mu\text{g/mL}$)

QC Found in $\mu\text{g/mL}$ = $(C1 - C2) * DF / SS$

QC Found In $\mu\text{g/mL}$ for TIC = 5 if C1 < C2

QC Found In $\mu\text{g/mL}$ for TOC = 40 if $C1 < C2$

% Recovery = QC Found / QC Actual • 100

		TIC	TOC
	Method Detection Limit in µg/mL	5	40
	QC Actual in µg/mL	6.02E+02	3.01E+03
	QC Found in µg/mL	5.56E+02	2.85E+03
	Percent Standard Recovery	92.4	94.7

Data Entered By:	MF	Date:	11/01/99
Signature of Chemist:		Date:	

WORKBOOK PAGE: SAM3

TIC/TOC : LA-342-100 (F-3)

LIQUIDS

		TIC	TOC
SAMPLE	Sample Size in mL (SS)	0.1000	0.1000
	Dilution Factor (DF)	1	1
	µg of Carbon in Sample (C1)	345.1	185
31574	µg of Carbon from Baseline (C2)	9.9	26.2
@TICTOC1			
LIQUID			
99004024			
0	µg of Carbon/mL = (C1-C2) * DF / SS		
	µg of Carbon/mL for TIC = 5 if C1 < C2		
N/A	µg of Carbon/mL for TOC = 40 if C1 < C2		
S99T001733			
02/01/99			
MF			
JFG			
SLH			
11/01/99			
10/28/99			
01:00 AM			
S-111			
	Method Detection Limit in µg/mL	5	40
	µg of Carbon/mL	3.35E+03	1.59E+03

Data Entered By:	MF	Date:	11/01/99
Signature of Chemist:		Date:	

WORKBOOK PAGE: DUP4

TIC/TOC : LA-342-100 (F-3)

LIQUIDS

		TIC	TOC
	Sample Size in mL (SS)	0.1000	0.1000
DUP	Dilution Factor (DF)	1	1
	µg of Carbon in Sample (C1)	352.4	189.3
31574	µg of Carbon from Baseline (C2)	9.9	26.2
	Known µg of C from Original Sample	3.35E+3	1.59E+3
@TICTOC1			

LIQUID

99004024

0

N/A

S99T001733

$\mu\text{g of Carbon/mL} = (C1 - C2) \cdot DF / SS$
 $\mu\text{g of Carbon/mL for TIC} = 5 \text{ if } C1 < C2$
 $\mu\text{g of Carbon/mL for TOC} = 40 \text{ if } C1 < C2$

Method Detection Limit in µg/mL

µg of Carbon/mL

TIC	TOC
5	40
3.42E+03	1.63E+03

Data Entered By:

MF

Date: 11/01/99

Signature of Chemist:

Date:

WORKBOOK PAGE: SPIKE5

TIC/TOC : LA-342-100 (F-3)**LIQUIDS**

	Sample Vial Data	TIC	TOC
SPK	Sample Volume in mL (SS)	0.1000	0.1000
	Final Coulometer Reading in µg (C1)	596.9	448.5
31574	Spiked Vial Data		
	Sample Volume in mL (SPK SS)	0.1000	0.1000
@TICTOC1	Amount of Spike Std. in mL (SPK VOL)	0.500	0.100
	Final Coulometer Reading in µg (C2)	596.9	448.5
LIQUID	Spike Book Number	25N12E	34N12C
	Spike Standard Value in µg/ml (SPK CONC)	602	3009
99004024	µg C in baseline (BL)	9.9	26.2

0

N/A

Percent Spike Recovery = ((C2-BL) - (C1-BL) * (SPK SS) / SS) / ((SPK CONC) * (SPK VOL)) * 100

S99T001733

QC Actual in µg/mL = Spike Value (µg/mL)

QC Found in µg/mL = (Percent Spike Recovery)*(QC Actual) / 100

	TIC	TOC
QC Actual in µg/mL	6.02E+02	3.01E+03
QC Found in µg/mL	5.04E+02	2.64E+03
Percent Spike Recovery	83.7	87.6

Data Entered By:	MF	Date:	11/01/99
Signature of Chemist:		Date:	

SPIKE.WB1 REV 1.3

342100ML

**This document was too large to scan
as a single document. It has
been divided into smaller sections.**

Section 2 of 2

Document Information			
Document #	HNF-1685	Revision	0
Title	TANK 241S111 08/1999 COMPATIBILITY GRAB SAMPLES ANALYTICAL RESULTS FOR THE FINAL REPORT		
Date	12/01/1999		
Originator	STEEN FH,BELL KE	Originator Co.	WMH
Recipient		Recipient Co.	
References	EDT-628051		
Keywords			
Projects	TANK FARM		
Other Information	<i>Pages 297 thru 501 Radiochemical Analyses - AT, GEA Sr90, Am241, Pu239, Organic Analysis - PCB</i>		

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This document consists of pages 1 to 501. Pages ii, 2, 16, 21, 26, 31, 33, 36, 40, 44, 45, 47, 214, 298, 496 and 564 were intentionally left blank.

This document contains page 38.1, 174.1 thru 174.10, and 562.1.

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HNF-1685 REV. 0

RADIOCHEMICAL ANALYSIS

HNF-1685 REV. 0

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LABCORE Completed Worklist Report for Worklist# 31547

Analyst: scl

Instrument: AB15

Book#: _____

Method: LA-508-101 Rev/Mod G-1

Worklist Comment: S-111 FOR @ALPHA01, RLC

Seq Type	Sample#	R A	Test	Matrix	Actual	Found	DL or Yield	Unit
1 STD	0		@ALPHA01 ALPHA01	LIQUID	2.28E-04	2.29E-4	100.439	% Recovery
1 STD	0		@ALPHA01 ALPHA01E	LIQUID	1.00	3.09E+00	3.090	% Ct. Error
2 BLNK	0		@ALPHA01 ALPHA01	LIQUID	1	<1.15E-2		uCi/mL
2 BLNK	0		@ALPHA01 ALPHA01E	LIQUID	1.00	5.00E+02	500.000	uCi/mL
3 BLNK/BKG	0		@ALPHA01 ALPHA01	LIQUID	1.00E+00	9.26E-01	0.926	BLNK/BKG
4 SAMPLE	S99T001731	0	@ALPHA01 ALPHA01	LIQUID	N/A	<1.01E-2	1.82E-002	uCi/mL
4 SAMPLE	S99T001731	0	@ALPHA01 ALPHA01E	LIQUID	N/A	5.00E+02		% Ct. Error
5 DUP	S99T001731	0	@ALPHA01 ALPHA01	LIQUID	<1.01E-2	<1.15E-2		RPD
5 DUP	S99T001731	0	@ALPHA01 ALPHA01E	LIQUID	1.00	5.00E+02	500.000	% Ct. Error
6 SAMPLE	S99T001734	0	@ALPHA01 ALPHA01	LIQUID	N/A	<1.51E-2	3.64E-002	uCi/mL
6 SAMPLE	S99T001734	0	@ALPHA01 ALPHA01E	LIQUID	N/A	5.00E+02		% Ct. Error
7 DUP	S99T001734	0	@ALPHA01 ALPHA01	LIQUID	<1.51E-2	<1.76E-2		RPD
7 DUP	S99T001734	0	@ALPHA01 ALPHA01E	LIQUID	1.00	5.00E+02	500.000	% Ct. Error
8 SAMPLE	S99T001735	0	@ALPHA01 ALPHA01	LIQUID	N/A	<1.51E-2	3.64E-002	uCi/mL
8 SAMPLE	S99T001735	0	@ALPHA01 ALPHA01E	LIQUID	N/A	5.00E+02		% Ct. Error
9 DUP	S99T001735	0	@ALPHA01 ALPHA01	LIQUID	<1.51E-2	<1.76E-2		RPD
9 DUP	S99T001735	0	@ALPHA01 ALPHA01E	LIQUID	1.00	5.00E+02	500.000	% Ct. Error
10 SPK	S99T001735	0	@ALPHA01 ALPHA01	LIQUID	5.05E-02	4.21E-02	83.366	% Recovery

Final page for worklist# 31547

Analyst Signature _____ Date _____

Analyst Signature _____ Date _____

Reviewer Signature _____ Date 27 Oct 99

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

10/25/99 10:03
ws2

Page: 1

LABCORE Data Entry Template for Worklist# 31547Analyst: S-L Instrument: AB00 15 Book# 52857Method: LA-508-101 Rev/Mod G-1

Worklist Comment: S-111 FOR @ALPHA01, RLC

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				@ALPHA01	LIQUID		
2	BLNK				@ALPHA01	LIQUID		
3	BLNK/BKG				@ALPHA01	LIQUID		
4	SAMPLE	S99T001731	0		@ALPHA01	LIQUID	99000304	S-111 GRAB
		Analytes Requested: ALPHA01 , ALPHA01E						
5	DUP	S99T001731	0		@ALPHA01	LIQUID		
6	SAMPLE	S99T001734	0		@ALPHA01	LIQUID	99000304	S-111 GRAB
		Analytes Requested: ALPHA01 , ALPHA01E						
7	DUP	S99T001734	0		@ALPHA01	LIQUID		
8	SAMPLE	S99T001735	0		@ALPHA01	LIQUID	99000304	S-111 GRAB
		Analytes Requested: ALPHA01 , ALPHA01E						
9	DUP	S99T001735	0		@ALPHA01	LIQUID		
10	SPK	S99T001735	0		@ALPHA01	LIQUID		

Final page for worklist # 31547

Sue Lari 10-26-99
Signature Date

Sharon L. Held 10-27-99
Signature Date
Sharon L. Held 102799

Data Entry Comments:

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

WORKBOOK PAGE: STD1 / *10/27/99*AT : LA-508-101 (G-~~1~~) LA-508-113 (B-0) STANDARD

		STANDARD	REPLICATE
	DETECTOR NUMBER	15	15
STD	DISH SIZE (1, 2, or 5) (MS)	2	2
	GROSS COUNTS (GC)	4049	4174
31547	COUNT TIME in MINUTES (CT)	30	30
	BACKGROUND in cpm (BKG)	0.27	0.27
AT	SAMPLE SIZE in mL (SS)	1.000	1.000
	DILUTION FACTOR (DF)	1	1
@ALPHA01	STANDARD BOOK NUMBER (Std BN)	52B57	52B57
	EFFICIENCY FACTOR (EFF)	0.2695	0.2695
LIQUID	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	134.697	138.863
	Standard Value in $\mu\text{Ci/mL}$	2.28E-04	
99003997	Concentration in $\mu\text{Ci/L}$ =	2.28E-01	
	Replicate Concentration in $\mu\text{Ci/L}$ =	2.32E-01	
0	AVERAGE CONCENTRATION in $\mu\text{Ci/L}$ =	2.2862E-01	

N/A	Rs (Sample Count Rate) = (TC / CT) - BKG
WL31547-STD	ALPHA TOTAL $\mu\text{Ci/L}$ = $R_s * 1000\text{mL/L} * DF / (EFF * SS * 2220000\text{dpm}/\mu\text{Ci})$
WB26872	ALPHA TOTAL $\mu\text{Ci/mL}$ = ALPHA TOTAL $\mu\text{Ci/L} / 1000\text{mL/L}$
	Relative Counting Error = $[(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100$
	Detection Levels and Less Than Values are determined from Procedure LA-508-002.

SAC	ALPHA TOTAL CONCENTRATION in $\mu\text{Ci/mL}$ =	2.29E-04	DETECTION LEVEL
SCL			
10/27/99	RELATIVE COUNTING ERROR =	3.1%	8.92E-07 $\mu\text{Ci/mL}$
10/26/99			
01:36 PM			
S-111 GRAB			

Analyst:	GLL	Date: 27-Oct-99
Signature of Chemist: <i>[Signature]</i>	SAC	Date: <i>27 Oct 99</i>
STANDARD.WB1 Rev. 1.0	508101ML	

WORKBOOK PAGE: BLANK2

AT : LA-508-101 (G-6) ¹ _{11/10/99} LIQUIDS

		BLNK	REPLICATE
	DETECTOR NUMBER	15	15
BLNK	DISH SIZE (1, 2, or 5) (MS)	2	2
	GROSS COUNTS (GC)	4	11
31547	COUNT TIME in MINUTES (CT)	30	30
	BACKGROUND in cpm (BKG)	0.27	0.27
AT	SAMPLE SIZE in mL (SS)	0.500	0.500
	DILUTION FACTOR (DF)	10201	10201
@ALPHA01	DIGEST DILUTION FACTOR (DDF)	1	1
	EFFICIENCY FACTOR (EFF)	0.2695	0.2695
LIQUID	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	0.221	0.337

99003997	Blank Concentration in $\mu\text{Ci/L}$	< 7.55E+00
	Replicate Concentration in $\mu\text{Ci/L}$	< 1.15E+01
0	Maximum Concentration in $\mu\text{Ci/L}$	< 1.1493E+01

N/A	Rs (Sample Count Rate) = (TC / CT) - BKG
	ALPHA TOTAL $\mu\text{Ci/L}$ = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/ μCi)
WL31547-BLNK	ALPHA TOTAL $\mu\text{Ci/mL}$ = ALPHA TOTAL $\mu\text{Ci/L}$ / 1000mL/L
	Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100
WB26872	Detection Levels and Less Than Values are determined from Procedure LA-508-002.

GLL		
SAC	ALPHA TOTAL in $\mu\text{Ci/mL}$ (Maximum) =	< 1.15E-02
SCL	LESS Than Value was Determined from Lc.	
10/27/99	RELATIVE COUNTING ERROR	500.0%
10/26/99		
01:35 PM		
S-111 GRAB		

Analyst:	SCL	Date: 27-Oct-99
Signature of Chemist:	SAC	Date: 27 Oct 99

BLANK.WB1 Rev. 1.0

508101ML

WORKBOOK PAGE: SAM4

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

		SAMPLE	REPLICATE
	DETECTOR NUMBER	15	15
SAMPLE	DISH SIZE (1, 2, or 5) (MS)	2	2
	GROSS COUNTS (GC)	6	10
31547	COUNT TIME in MINUTES (CT)	30	30
	BACKGROUND in cpm (BKG)	0.27	0.27
AT	SAMPLE SIZE in mL (SS)	0.500	0.500
	DILUTION FACTOR (DF)	10201	10201
@ALPHA01	DIGEST DILUTION FACTOR (DDF)	1	1
	EFFICIENCY FACTOR (EFF)	0.2695	0.2695
LIQUID	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	0.221	0.297

99003997	Blank Concentration in $\mu\text{Ci/L}$	< 7.55E+00
	Replicate Concentration in $\mu\text{Ci/L}$	< 1.01E+01
0	Maximum Concentration in $\mu\text{Ci/L}$	< 1.0139E+01

N/A	Rs (Sample Count Rate) = (TC / CT) - BKG
	ALPHA TOTAL $\mu\text{Ci/L}$ = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/ μCi)
S99T001731	ALPHA TOTAL $\mu\text{Ci/mL}$ = ALPHA TOTAL $\mu\text{Ci/L}$ / 1000mL/L
	Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100
WB28872	Detection Levels and Less Than Values are determined from Procedure LA-508-002.

GLL		
SAC	ALPHA TOTAL in $\mu\text{Ci/mL}$ (Maximum)	< 1.01E-02
SCL	LESS Than Value was Determined from Lc.	
10/27/99	RELATIVE COUNTING ERROR	500.0%
10/26/99		
01:35 PM		
S-111 GRAB		

Analyst:	SCL	Date: 27-Oct-99
Signature of Chemist:	SAC	Date: 27 Oct 99
SAMPLE.WB1 Rev. 1.0	508101ML	

WORKBOOK PAGE: DUP5

AT : LA-508-101 (G-0) **LIQUIDS**

		DUP	REPLICATE
	DETECTOR NUMBER	15	15
DUP	DISH SIZE (1, 2, or 5) (MS)	2	2
	GROSS COUNTS (GC)	11	1
31547	COUNT TIME in MINUTES (CT)	30	30
	BACKGROUND in cpm (BKG)	0.27	0.27
AT	SAMPLE SIZE in mL (SS)	0.500	0.500
	DILUTION FACTOR (DF)	10201	10201
@ALPHA01	DIGEST DILUTION FACTOR (DDF)	1	1
	EFFICIENCY FACTOR (EFF)	0.2695	0.2695
LIQUID	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	0.337	0.221

99003997	Blank Concentration in $\mu\text{Ci/L}$	< 1.15E+01
	Replicate Concentration in $\mu\text{Ci/L}$	< 7.55E+00
0	Maximum Concentration in $\mu\text{Ci/L}$	< 1.1493E+01

N/A	Rs (Sample Count Rate) = (TC / CT) - BKG
	ALPHA TOTAL $\mu\text{Ci/L}$ = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/ μCi)
S99T001731	ALPHA TOTAL $\mu\text{Ci/mL}$ = ALPHA TOTAL $\mu\text{Ci/L}$ / 1000mL/L
	Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100
WB26872	Detection Levels and Less Than Values are determined from Procedure LA-508-002.

GLL				
SAC	ALPHA TOTAL In $\mu\text{Ci/mL}$ (Maximum)	=	< 1.15E-02	DETECTION LEVEL
SCL	LESS THAN Value was Determined from Rmax.			
10/27/99	RELATIVE COUNTING ERROR		500.0%	1.82E-02 $\mu\text{Ci/mL}$
10/26/99				
01:35 PM				
S-111 GRAB				

Analyst:	SCL	Date: 27-Oct-99
Signature of Chemist:	SAC	Date: 27 Oct 99
SAMPLE.WB1 Rev. 1.0	508101ML	

WORKBOOK PAGE: SAM8

AT : LA-508-101 (G-0) 11/14/99 LIQUIDS

		SAMPLE	REPLICATE
	DETECTOR NUMBER	15	15
SAMPLE	DISH SIZE (1, 2, or 5) (MS)	2	2
	GROSS COUNTS (GC)	7	5
31547	COUNT TIME In MINUTES (CT)	30	30
	BACKGROUND In cpm (BKG)	0.27	0.27
AT	SAMPLE SIZE In mL (SS)	0.250	0.250
	DILUTION FACTOR (DF)	10201	10201
@ALPHA01	DIGEST DILUTION FACTOR (DDF)	1	1
	EFFICIENCY FACTOR (EFF)	0.2695	0.2695
LIQUID	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	0.221	0.221

99003997	Blank Concentration In $\mu\text{Ci/L}$	< 1.51E+01
	Replicate Concentration In $\mu\text{Ci/L}$	< 1.51E+01
0	Maximum Concentration In $\mu\text{Ci/L}$	< 1.5098E+01

N/A	Rs (Sample Count Rate) = (TC / CT) - BKG
	ALPHA TOTAL $\mu\text{Ci/L}$ = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/ μCi)
S99T001734	ALPHA TOTAL $\mu\text{Ci/mL}$ = ALPHA TOTAL $\mu\text{Ci/L}$ / 1000mL/L
	Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100
WB26872	Detection Levels and Less Than Values are determined from Procedure LA-508-002.

GLL			
SAC	ALPHA TOTAL In $\mu\text{Ci/mL}$ (Maximum)	< 1.51E-02	DETECTION LEVEL
SCL	LESS Than Value was Determined from Lc.		
10/27/99	RELATIVE COUNTING ERROR	500.0%	3.64E-02 $\mu\text{Ci/mL}$
10/28/99			
01:35 PM			
8-111 GRAB			

Analyst:	SCL	Date: 27-Oct-99
Signature of Chemist:	SAC	Date: 10/28/99
SAMPLE.WB1 Rev. 1.0	508101ML	

AT : LA-508-101 (G-7) ⁴⁹ _{10/26/99} LIQUIDS		DUP	REPLICATE
	DETECTOR NUMBER	15	15
DUP	DISH SIZE (1, 2, or 5) (MS)	2	2
	GROSS COUNTS (GC)	9	6
31547	COUNT TIME In MINUTES (CT)	30	30
	BACKGROUND In cpm (BKG)	0.27	0.27
AT	SAMPLE SIZE In mL (SS)	0.250	0.250
	DILUTION FACTOR (DF)	10201	10201
@ALPHA01	DIGEST DILUTION FACTOR (DDF)	1	1
	EFFICIENCY FACTOR (EFF)	0.2695	0.2695
LIQUID	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	0.257	0.221
99003997	Blank Concentration In $\mu\text{Ci/L}$	< 1.76E+01	
	Replicate Concentration In $\mu\text{Ci/L}$	< 1.51E+01	
0	Maximum Concentration In $\mu\text{Ci/L}$	< 1.7557E+01	
N/A	Rs (Sample Count Rate) = $(TC / CT) - BKG$		
	ALPHA TOTAL $\mu\text{Ci/L}$ = $Rs * 1000\text{mL/L} * DF * DDF / (EFF * SS * 2220000\text{dpm}/\mu\text{Ci})$		
S99T001734	ALPHA TOTAL $\mu\text{Ci/mL}$ = ALPHA TOTAL $\mu\text{Ci/L} / 1000\text{mL/L}$		
	Relative Counting Error = $[(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.9$		
WB26872	Detection Levels and Less Than Values are determined from Procedure LA-508-002.		
GLL			
SAC	ALPHA TOTAL In $\mu\text{Ci/mL}$ (Maximum) =	< 1.76E-02	
SCL	LESS THAN Value was Determined from Rmax.		
10/27/99	RELATIVE COUNTING ERROR		500.0%
10/26/99			
01:35 PM			
8-111 GRAB			

Analyst:	SCL	Date: 27-Oct-99
Signature of Chemist:	SAC	Date: 27-Oct-99
SAMPLE.WB1 Rev. 1.0 508101ML		

WORKBOOK PAGE: SAM8

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

		SAMPLE	REPLICATE
	DETECTOR NUMBER	15	15
SAMPLE	DISH SIZE (1, 2, or 6) (MS)	2	2
	GROSS COUNTS (GC)	3	4
31547	COUNT TIME in MINUTES (CT)	30	30
	BACKGROUND in cpm (BKG)	0.27	0.27
AT	SAMPLE SIZE in mL (SS)	0.250	0.250
	DILUTION FACTOR (DF)	10201	10201
@ALPHA01	DIGEST DILUTION FACTOR (DDF)	1	1
	EFFICIENCY FACTOR (EFF)	0.2695	0.2695
LIQUID	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	0.221	0.221

99003997	Blank Concentration in $\mu\text{Ci/L}$	< 1.51E+01
	Replicate Concentration in $\mu\text{Ci/L}$	< 1.51E+01
0	Maximum Concentration in $\mu\text{Ci/L}$	< 1.5098E+01

N/A	Rs (Sample Count Rate) = (TC / CT) - BKG
999T001735	ALPHA TOTAL $\mu\text{Ci/L}$ = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/ μCi)
WB26872	ALPHA TOTAL $\mu\text{Ci/mL}$ = ALPHA TOTAL $\mu\text{Ci/L}$ / 1000mL/L
	Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100
	Detection Levels and Less Than Values are determined from Procedure LA-508-002.

GLL		
SAC	ALPHA TOTAL in $\mu\text{Ci/mL}$ (Maximum) =	< 1.51E-02
SCL	LESS Than Value was Determined from Lc.	DETECTION LEVEL
10/27/99	RELATIVE COUNTING ERROR	500.0%
10/26/99		3.64E-02 $\mu\text{Ci/mL}$
01:35 PM		
S-111 GRAB		

Analyst:	SCL	Date: 27-Oct-99
Signature of Chemist:	SAC	Date: 27 Oct 99
SAMPLE.WB1 Rev. 1.0	508101ML	

WORKBOOK PAGE: DUP9

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

		DUP	REPLICATE
DUP	DETECTOR NUMBER	15	15
31547	DISH SIZE (1, 2, or 6) (MS)	2	2
AT	GROSS COUNTS (GC)	9	6
@ALPHA01	COUNT TIME in MINUTES (CT)	30	30
	BACKGROUND in cpm (BKG)	0.27	0.27
	SAMPLE SIZE in mL (SS)	0.250	0.250
	DILUTION FACTOR (DF)	10201	10201
	DIGEST DILUTION FACTOR (DDF)	1	1
	EFFICIENCY FACTOR (EFF)	0.2695	0.2695
LIQUID	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	0.257	0.221

99003997	Blank Concentration in $\mu\text{Ci/L}$	< 1.76E+01
0	Replicate Concentration in $\mu\text{Ci/L}$	< 1.51E+01
	Maximum Concentration in $\mu\text{Ci/L}$	< 1.7557E+01

N/A	Rs (Sample Count Rate) = (TC / CT) - BKG
999T001735	ALPHA TOTAL $\mu\text{Ci/L}$ = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/ μCi)
WB26872	ALPHA TOTAL $\mu\text{Ci/mL}$ = ALPHA TOTAL $\mu\text{Ci/L}$ / 1000mL/L
	Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100
	Detection Levels and Less Than Values are determined from Procedure LA-508-002.

GLL		
SAC	ALPHA TOTAL in $\mu\text{Ci/mL}$ (Maximum)	< 1.76E-02
SCL	LESS THAN Value was Determined from Rmax.	
10/27/99	RELATIVE COUNTING ERROR	500.0%
10/26/99		
01:35 PM		
S-111 GRAB		

Analyst:	SCL	Date: 27-Oct-99
Signature of Chemist:	SAC	Date: 27-Oct-99
SAMPLE.WB1 Rev. 1.0	508101ML	

WORKBOOK PAGE: SPK10

AT : LA-508-101 (G-9) ^{10/27/99} LA-508-113 (B-0) SPIKED SAMPLE

		SPIKE	REPLICATE
	DETECTOR NUMBER	15	15
SPK	DISH SIZE 1, 2, or 5 (MS)	2	2
	TOTAL COUNTS (TC)	76986	74082
31547	COUNT TIME in MINUTES (CT)	30	30
	BACKGROUND in cpm (BKG)	0.27	0.27
AT	SAMPLE VOLUME in mL (Spiked Vial) (SS)	0.250	0.250
	SAMPLE DILUTION FACTOR (Spiked Vial) (DF)	10201	10201
@ALPHA01	DIGEST DILUTION FACTOR (DDF)	1	1
	SPIKE VOLUME in mL (SVol)	0.100	0.100
LIQUID	SPIKE DILUTION FACTOR (SDF)	1	1
	SPIKE BOOK NUMBER (Spk BN)	19B59	19B59
99003997	SPIKE VALUE in $\mu\text{Ci/mL}$ (SVal)	5.0520E-02	5.0520E-02
	INSTRUMENT EFFICIENCY FACTOR (EFF)	0.2695	0.2695
0	SAMPLE + SPIKE $\mu\text{Ci/mL}$ (S+S)	1.75E+02	1.68E+02
	AVERAGE or MAXIMUM $\mu\text{Ci/mL}$ in SAMPLE	< 1.5098E-02	
N/A			
S99T001735	Rs (Sample Count Rate) = (TC / CT) - BKG		
WB26872	SAMPLE + SPIKE $\mu\text{Ci/mL}$ = Rs * DF * DDF / (EFF * SS * 2220000dpm/ μCi)		
	QC ACTUAL = SVal		
GLL	QC FOUND = (((S+S $\mu\text{Ci/mL}$ - SAMPLE $\mu\text{Ci/mL}$) * ((SDF/SVol)/(DF*DDF/SS))))		
	PERCENT SPIKE RECOVERY = (QC FOUND / QC ACTUAL) * 100		
SAC			
SCL			
10/27/99	NOTE: Original Sample result was a LESS THAN value. Zero (0) was subtracted from the spiked value for QC found calculation.		
10/28/99	QC ACTUAL	=	5.05E-02
	QC FOUND	=	4.21E-02
01:35 PM	AVG. PERCENT SPIKE RECOVERY	=	83.3%
S-111 GRAB			

Analyst:

GLL

Date: 27-Oct-99

Signature of Chemist:

SAC

Date: 27-Oct-99

SPIKE.WB1 Rev. 1.0

508101ML

LABCORE Completed Worklist Report for Worklist# 31548

Analyst: scl

Instrument: AB16

Book#: _____

Method: LA-508-101 Rev/Mod 6-1

Worklist Comment: S-111 FOR @ALPHA01, RLC

Seq Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
1 STD	0			@ALPHA01 ALPHA01	SOLID	2.28E-04	2.29E-4	100.433 % Recovery	
1 STD	0			@ALPHA01 ALPHA01E	SOLID	1.00	3.08E+00	3.080 % Ct. Error	
2 BLNK-PREP	0			@ALPHA01 ALPHA01	SOLID	1	<9.04E-3	uCi/g	
2 BLNK-PREP	0			@ALPHA01 ALPHA01E	SOLID	1.00	5.00E+02	500.000 uCi/g	
3 BLNK/BKG	0			@ALPHA01 ALPHA01	SOLID	1.00E+00	7.84E-01	0.784 BLNK/BKG	
4 SAMPLE	S99T001737	0	F	@ALPHA01 ALPHA01	SOLID	N/A	6.67E-02	1.57E-002 uCi/g	
4 SAMPLE	S99T001737	0	F	@ALPHA01 ALPHA01E	SOLID	N/A	3.08E+01	% Ct. Error	
5 DUP	S99T001737	0	F	@ALPHA01 ALPHA01	SOLID	6.67E-2	4.83E-2	32.000 RPD	
5 DUP	S99T001737	0	F	@ALPHA01 ALPHA01E	SOLID	1.00	3.53E+01	35.300 % Ct. Error	
6 SPK	S99T001737	0	F	@ALPHA01 ALPHA01	SOLID	5.05E-02	4.03E-02	79.802 % Recovery	

Final page for worklist# 31548

Analyst Signature _____ Date _____

Analyst Signature _____ Date _____

Reviewer Signature

27 Oct 99
Date

Result accepted. RPD is near the counting uncertainty.

10/25/99 10:04
ws2

Page: 1

LABCORE Data Entry Template for Worklist# 31548Analyst: S.L Instrument: AB00 Book# 5257Method: LA-508-101 Rev/Mod G1-1

Worklist Comment: S-111 FOR @ALPHA01, RLC

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				@ALPHA01	SOLID		
2	BLNK-PREP				@ALPHA01	SOLID		
3	BLNK/BKG				@ALPHA01	SOLID		
4	SAMPLE	S99T001737	0	F	@ALPHA01	SOLID	99000304	S-111 GRAB
		Analytes Requested: ALPHA01 , ALPHA01E						
5	DUP	S99T001737	0	F	@ALPHA01	SOLID		
6	SPK	S99T001737	0	F	@ALPHA01	SOLID		

Final page for worklist # 31548Sue Lani 10-26-99
Signature DateSue Lani 10/27/99
Signature DateAngela Platt 10/27/99
Signature Date

Data Entry Comments:

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

WORKBOOK PAGE: STD1

AT : LA-508-101 (G-0) LA-508-113 (B-0) STANDARD

	STANDARD	REPLICATE
STD	DETECTOR NUMBER	18
31648	DISH SIZE (1, 2, or 6) (MS)	2
AT	GROSS COUNTS (GC)	4165
ALPHA01	COUNT TIME in MINUTES (CT)	30
LIQUID	BACKGROUND in cpm (BKG)	0.17
99003998	SAMPLE SIZE in mL (SS)	1.000
0	DILUTION FACTOR (DF)	1
N/A	STANDARD BOOK NUMBER (Std BN)	52B57
WL31648	EFFICIENCY FACTOR (EFF)	0.2683
WB27006	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	138.330
SZC	Standard Value in $\mu\text{Ci/mL}$	2.28E-04
SAC	Concentration in $\mu\text{Ci/L}$ =	2.32E-01
SCL	Replicate Concentration in $\mu\text{Ci/L}$ =	2.27E-01
10/27/99	AVERAGE CONCENTRATION in $\mu\text{Ci/L}$ =	2.2942E-01

$$R_s (\text{Sample Count Rate}) = (TC / CT) - BKG$$

$$\text{ALPHA TOTAL } \mu\text{Ci/L} = R_s * 1000\text{mL/L} * DF / (EFF * SS * 2220000\text{dpm}/\mu\text{Ci})$$

$$\text{ALPHA TOTAL } \mu\text{Ci/mL} = \text{ALPHA TOTAL } \mu\text{Ci/L} / 1000\text{mL/L}$$

$$\text{Relative Counting Error} = [|(The Square Root of TC + BKG * CT) / (TC - BKG * CT)|] * 1.96 * 100$$

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

SAC	ALPHA TOTAL CONCENTRATION in $\mu\text{Ci/mL}$ =	2.29E-04	DETECTION LEVEL
SCL			
10/27/99	RELATIVE COUNTING ERROR =	3.1%	7.42E-07 $\mu\text{Ci/mL}$

Analyst:	SZC	Date: 27-Oct-99
Signature of Chemist:	SAC	Date: 27 Oct 99
STANDARD.WB1 Rev. 1.0	508101ML	

WORKBOOK PAGE: BLANK2

AT : LA-508-101 (G-0) *1/10/99* **SOLIDS**

		BLNK-PREP	REPLICATE
	DETECTOR NUMBER	16	16
BLNK-PREP	DISH SIZE (1, 2, or 5) (MS)	2	2
	GROSS COUNTS (GC)	7	1
31548	COUNT TIME in MINUTES (CT)	30	30
	BACKGROUND in cpm (BKG)	0.17	0.17
AT	SAMPLE SIZE in mL (SS)	0.250	0.250
	DILUTION FACTOR (DF)	11	11
@ALPHA01	DIGEST GRAMS of SOLIDS / L (Dg/L)	2.0812	2.0812
	EFFICIENCY FACTOR (EFF)	0.2683	0.2683
SOLID	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	0.255	0.176

99003998	Blank Concentration in $\mu\text{Ci/g}$	< 9.04E-03
	Replicate Concentration in $\mu\text{Ci/g}$	< 6.23E-03
0	Maximum Concentration in $\mu\text{Ci/g}$	< 9.0388E-03

N/A	Rs (Sample Count Rate) = (TC / CT) - BKG
	ALPHA TOTAL $\mu\text{Ci/g}$ = Rs * 1000mL/L * DF / (EFF * SS * Dg/L * 2220000dpm/ μCi)
WL31548	Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100
WB27606	Detection Levels and Less Than Values are determined from Procedure LA-508-002.

SZC				
SAC	ALPHA TOTAL in $\mu\text{Ci/g}$ (Maximum)	=	< 9.04E-03	DETECTION LEVEL
SCL	LESS THAN Value was Determined from Rmax.			
10/27/99	RELATIVE COUNTING ERROR		500.0%	1.57E-02 $\mu\text{Ci/g}$
10/28/99				
03:10 PM				
S-111 GRAB				

Analyst:	SCL	Date: 27-Oct-99
Signature of Chemist:	SAC	Date: 27 Oct 99
BLANK.WB1 Rev. 1.0	508101ML	

WORKBOOK PAGE: SAM4

AT : LA-508-101 (G-0) ¹ ^{11/11/99} SOLIDS

		SAMPLE	REPLICATE
	DETECTOR NUMBER	16	16
SAMPLE	DISH SIZE (1, 2, or 5) (MS)	2	2
	GROSS COUNTS (GC)	69	54
31548	COUNT TIME in MINUTES (CT)	30	30
	BACKGROUND in cpm (BKG)	0.17	0.17
AT	SAMPLE SIZE in mL (SS)	0.250	0.250
	DILUTION FACTOR (DF)	11	11
@ALPHA01	DIGEST GRAMS of SOLIDS / L (Dg/L)	2.0812	2.0812
	EFFICIENCY FACTOR (EFF)	0.2683	0.2683
SOLID	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	2.130	1.630

99003998	Blank Concentration in $\mu\text{Ci/g}$	7.56E-02
	Replicate Concentration in $\mu\text{Ci/g}$	5.79E-02
0	Average Concentration in $\mu\text{Ci/g}$	6.6730E-02

FUSION01	Rs (Sample Count Rate) = (TC / CT) - BKG
	ALPHA TOTAL $\mu\text{Ci/g}$ = Rs * 1000mL/L * DF / (EFF * SS * Dg/L * 2220000dpm/ μCi)
999T001737	Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100
WB27806	Detection Levels and Less Than Values are determined from Procedure LA-508-002.

SZC			
SAC	ALPHA TOTAL in $\mu\text{Ci/g}$ (Average)	=	6.67E-02
SCL			
10/27/99	RELATIVE COUNTING ERROR	30.8%	DETECTION LEVEL
10/28/99			1.57E-02 $\mu\text{Ci/g}$
03:10 PM			
8-111 GRAB			

Analyst:	SCL	Date: 27-Oct-99
Signature of Chemist:	SAC	Date: 27 Oct 99
SAMPLE.WB1 Rev. 1.	508101ML	

WORKBOOK PAGE: DUP5

AT : LA-508-101 (G-0) ^{11/11/99} SOLIDS

		DUP	REPLICATE
	DETECTOR NUMBER	16	16
DUP	DISH SIZE (1, 2, or 5) (MS)	2	2
	GROSS COUNTS (GC)	62	44
31548	COUNT TIME in MINUTES (CT)	30	30
	BACKGROUND in cpm (BKG)	0.17	0.17
AT	SAMPLE SIZE in mL (SS)	0.250	0.250
	DILUTION FACTOR (DF)	11	11
@ALPHA01	DIGEST GRAMS of SOLIDS / L (Dg/L)	2.1852	2.1852
	EFFICIENCY FACTOR (EFF)	0.2683	0.2683
SOLID	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	1.563	1.297

99003998	Blank Concentration in $\mu\text{Ci/g}$	5.28E-02
	Replicate Concentration in $\mu\text{Ci/g}$	4.38E-02
0	Average Concentration in $\mu\text{Ci/g}$	4.8342E-02

FUSION01	Rs (Sample Count Rate) = (TC / CT) - BKG
899T001737	ALPHA TOTAL $\mu\text{Ci/g}$ = $R_s * 1000\text{mL/L} * DF / (EFF * SS * Dg/L * 2220000\text{dpm}/\mu\text{Ci})$
WB2730	Relative Counting Error = $[(The\ Square\ Root\ of\ TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100$
679	Detection Levels and Less Than Values are determined from Procedure LA-508-002.

860	ALPHA TOTAL in $\mu\text{Ci/g}$ (Average)	=	4.83E-02	DETECTION LEVEL
861				
10/27/99	RELATIVE COUNTING ERROR		35.3%	1.49E-02 $\mu\text{Ci/g}$

10/28/99
09:10 PM
8/11 GRAB

Analyst:	SCL	Date: 27-Oct-99
Signature of Chemist:	<i>MCatt</i>	SAC Date: 27 Oct 99
SAMPLE.WB1 Rev. 1.	508101ML	

WORKBOOK PAGE: SPK8

AT : LA-508-101 (G-0) LA-508-113 (B-0) SPIKED SAMPLE

		SPIKE	REPLICATE
	DETECTOR NUMBER	16	16
SPK	DISH SIZE 1, 2, or 5 (MS)	2	2
	TOTAL COUNTS (TC)	72212	71815
31548	COUNT TIME in MINUTES (CT)	30	30
	BACKGROUND in cpm (BKG)	0.17	0.17
AT	SAMPLE VOLUME in mL (Spiked Vial) (SS)	0.250	0.250
	SAMPLE DILUTION FACTOR (Spiked Vial) (DF)	11	11
@ALPHA01	DIGEST GRAMS of SOLIDS / L (Dg/L)	2.0812	2.0812
	SPIKE VOLUME in mL (SVol)	0.100	0.100
SOLID	SPIKE DILUTION FACTOR (SDF)	1	1
	SPIKE BOOK NUMBER (Spk BN)	19B59	19B59
99003998	SPIKE VALUE in $\mu\text{Ci/mL}$ (SVal)	5.0520E-02	5.0520E-02
	INSTRUMENT EFFICIENCY FACTOR (EFF)	0.2683	0.2683
0	SAMPLE + SPIKE $\mu\text{Ci/g}$ (S+S)	8.54E+01	8.50E+01
	AVERAGE or MAXIMUM $\mu\text{Ci/g}$ in SAMPLE	6.6730E-02	
FUSION01			
999T001737	Rs (Sample Count Rate) = (TC / CT) - BKG		
	SAMPLE + SPIKE $\mu\text{Ci/g}$ = Rs * 1000mL/L * DF / (EFF * SS * Dg/L * 2220000dpm/ μCi)		
WB27806	QC ACTUAL = SVal		
	QC FOUND = (((S+S $\mu\text{Ci/g}$ - SAMPLE $\mu\text{Ci/g}$) * ((SDF/(SVol*1000))/(DF/SS/Dg/L))))		
SZC	PERCENT SPIKE RECOVERY = (QC FOUND / QC ACTUAL) * 100		
SAC			
SCL			
10/27/99			
10/28/99	QC ACTUAL	=	5.05E-02
	QC FOUND	=	4.03E-02
03:10 PM	AVG. PERCENT SPIKE RECOVERY	=	79.7%
S-111 GRAB			

Analyst:	SZC	Date: 27-Oct-99
Signature of Chemist:	SAC	Date: 27 Oct 99
SPIKE.WB1 Rev. 1.0	508101ML	

LABCORE Completed Worklist Report for Worklist# 31552

Analyst: aki

Instrument: GEA04

Book#: 46B57

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

Worklist Comment: S-111 FOR @GEA-01, RLC

Seq Type	Sample#	R A	Test	Matrix	Actual	Found	DL or Yield	Unit
1 STD	0	0	GEA-01 CO60-02 LIQUID		4.971e-03	5.57e-03	112.088 % Recovery	
1 STD	0	0	GEA-01 CO60-02H LIQUID		1	1.45	1.450 % Ct Error	
1 STD	0	0	GEA-01 CS13702 LIQUID		8.006e-03	8.43e-03	105.294 % Recovery	
1 STD	0	0	GEA-01 CS13702H LIQUID		1	1.35	1.350 % Ct Error	
2 BLNK	0	0	GEA-01 CO60-02 LIQUID		1	<5.80e-3		uCi/mL
2 BLNK	0	0	GEA-01 CS13702 LIQUID		1	<1.50e-2		uCi/mL
3 SAMPLE	S99T001731	0	GEA-01 CO60-02 LIQUID		N/A	1.047e-02	1.05e-002	uCi/mL
3 SAMPLE	S99T001731	0	GEA-01 CO60-02H LIQUID		N/A	n/a		% Ct. Error
3 SAMPLE	S99T001731	0	GEA-01 CS13702 LIQUID		N/A	2.660e+02		uCi/mL
3 SAMPLE	S99T001731	0	GEA-01 CS13702H LIQUID		N/A	0.130		% Ct. Error
4 DUP	S99T001731	0	GEA-01 CO60-02 LIQUID		<1.05e-2	<9.22e-3		RPD
4 DUP	S99T001731	0	GEA-01 CO60-02H LIQUID		1	n/a		% Ct Error
4 DUP	S99T001731	0	GEA-01 CS13702 LIQUID		2.86e+02	2.85e+02	4.223 RPD	
4 DUP	S99T001731	0	GEA-01 CS13702H LIQUID		1	0.140	0.140 % Ct Error	
5 SAMPLE	S99T001734	0	GEA-01 CO60-02 LIQUID		N/A	9.436e-03	9.43e-003	uCi/mL
5 SAMPLE	S99T001734	0	GEA-01 CO60-02H LIQUID		N/A	n/a		% Ct. Error
5 SAMPLE	S99T001734	0	GEA-01 CS13702 LIQUID		N/A	5.530e+02		uCi/mL
5 SAMPLE	S99T001734	0	GEA-01 CS13702H LIQUID		N/A	0.120		% Ct. Error
6 DUP	S99T001734	0	GEA-01 CO60-02 LIQUID		<9.43e-3	<1.01e-2		RPD
6 DUP	S99T001734	0	GEA-01 CO60-02H LIQUID		1	n/a		% Ct Error
6 DUP	S99T001734	0	GEA-01 CS13702 LIQUID		3.53e+02	3.74e+02	5.777 RPD	
6 DUP	S99T001734	0	GEA-01 CS13702H LIQUID		1	0.110	0.110 % Ct Error	
7 SAMPLE	S99T001735	0	GEA-01 CO60-02 LIQUID		N/A	9.729e-03	9.73e-003	uCi/mL
7 SAMPLE	S99T001735	0	GEA-01 CO60-02H LIQUID		N/A	n/a		% Ct. Error
7 SAMPLE	S99T001735	0	GEA-01 CS13702 LIQUID		N/A	3.730e+02		uCi/mL
7 SAMPLE	S99T001735	0	GEA-01 CS13702H LIQUID		N/A	0.110		% Ct. Error
8 DUP	S99T001735	0	GEA-01 CO60-02 LIQUID		<9.73e-3	<1.03e-2		RPD
8 DUP	S99T001735	0	GEA-01 CO60-02H LIQUID		1	n/a		% Ct Error
8 DUP	S99T001735	0	GEA-01 CS13702 LIQUID		3.73e+02	3.62e+02	2.993 RPD	
8 DUP	S99T001735	0	GEA-01 CS13702H LIQUID		1	0.110	0.110 % Ct Error	

Comments Section:

Comments for sample# S99T001731 and test @GEA-01 .
DL=0 => n/a.

Comments for sample# S99T001734 and test @GEA-01 .
DL=0 => n/a.

Comments for sample# S99T001735 and test @GEA-01 .

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

LABCORE Completed Worklist Report for Worklist# 31552

Seq Type	Sample# R A	Test	Matrix	Actual	Found	DL or Yield	Unit
DL=0 => n/a.							

Final page for worklist# 31552

Analyst Signature _____ Date _____

Analyst Signature _____ Date _____

10-27-99
Reviewer Signature Date

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

LABCORE Data Entry Template for Worklist# 31552

Analyst: AKL Instrument: GEA00 #4 Book# 46657Method: LA-548-121 Rev/Mod F-1

Worklist Comment: S-111 FOR @GEA-01, RLC

S Type	Sample#	R A	Test	Matrix	Group#	Project
1 STD			@GEA-01	LIQUID		
2 BLNK			@GEA-01	LIQUID		
3 SAMPLE	S99T001731 0		@GEA-01	LIQUID	99000304	S-111 GRAB
	Analytes Requested: CO60-02 , CO60-02E, CS13702 , CS13702E					
4 DUP	S99T001731 0		@GEA-01	LIQUID		
5 SAMPLE	S99T001734 0		@GEA-01	LIQUID	99000304	S-111 GRAB
	Analytes Requested: CO60-02 , CO60-02E, CS13702 , CS13702E					
6 DUP	S99T001734 0		@GEA-01	LIQUID		
7 SAMPLE	S99T001735 0		@GEA-01	LIQUID	99000304	S-111 GRAB
	Analytes Requested: CO60-02 , CO60-02E, CS13702 , CS13702E					
8 DUP	S99T001735 0		@GEA-01	LIQUID		

Final page for worklist # 31552

Alita Huron 10/25/99
Signature Date

M/263 10/27/99
Signature Date

Data Entry Comments:

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

 * 222-S Laboratory Counting Room 26-OCT-1999 12:03:17.24 *

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

Worklist #: 31552
 Sample ID: WL31552-STD
 Sample Size: 1.00000E-03 L
 Dilution Factor: 1.00000E+00

Removed by:

J. Cockmore

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

Detector ID: GEA4
 File Number: dka300:[spec.GEA4]4g4076.cnf
 Geometry: 41
 Count Time: 0 00:50:00.00 sec
 Real Time: 0 00:50:09.77 sec
 Dead Time: 0.3%

Verified by:

John Relyea 27 Oct 99

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

Sample Count Time: 26-OCT-1999 11:12:28.49
 Decayed to: 26-OCT-1999 11:12:28.49
 Standard Deviations: 2
 Analysis Library: ENVGEA
 Analyst: SLH2
 Background Subtract: DKA300:[SPEC.GEA4]4GBACK

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

Date of last energy calibration: 3-MAY-1999 14:24:16.68
 Date of last efficiency calibration: 3-MAY-1999 14:24:57.16

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/L
0	661.74*	25273	1.46	1323.33	1316	14	1.4		CS-137	8.43
0	1173.33	11654	1.85	2346.59	2338	18	2.0		CO-60	5.51
0	1332.58	10675	1.95	2665.16	2654	22	2.1		CO-60	5.63
0	1764.57*	21	1.46	3529.37	3523	14112.1			BI-214	9.061E-02

Summary of Nuclide Activity
Sample ID : WL31552-STD

Page : 2
Acquisition date : 26-OCT-1999 11:12:28

Total number of lines in spectrum 4
Number of unidentified lines 0
Number of lines tentatively identified by NID 4 100.00%

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean	Wtd Mean	Decay Corr	2-Sigma	Error	%Error	Flags
			Uncorrected	Decay Corr					
			uCi/L	uCi/L					
CO-60	5.27Y	1.00	5.566E+00	5.566E+00	0.080E+00	1.45			
CS-137	30.00Y	1.00	8.426E+00	8.426E+00	0.114E+00	1.35			
BI-214	28700.00D	1.00	9.061E-02	9.061E-02	10.16E-02	112.10			
Total Activity :			1.408E+01	1.408E+01					

JAR
27 Oct 99

Grand Total Activity : 1.408E+01 1.408E+01

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Minimum Detectable Activity Report
Sample ID : WL31552-STD

Page : 3
Acquisition date : 26-OCT-1999 11:12:28

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BE-7	1329.	477.59	3.5130E-01
NA-24	54.	1368.55	2.0206E-02
K-40	744.	1460.75	6.9043E-01
AR-41	113.	1293.60	3.1438E-02
SC-46	598.	1120.55	5.2877E-02
CR-51	1251.	320.08	2.4209E-01
MN-54	651.	834.83	4.2487E-02
CO-56	626.	846.76	4.2232E-02
CO-58	619.	810.78	4.0607E-02
FE-59	660.	1099.25	9.6547E-02
ZN-65	603.	1115.55	1.0423E-01
SE-75	1418.	264.66	3.7486E-02
KR-85	987.	514.00	7.7425E+00
SR-85	986.	514.01	3.4991E-02
Y-88	27.	1836.06	1.8269E-02
Y-91	224.	1204.67	1.1639E+01
NB-94	684.	871.09	4.5226E-02
ZRNB-95	521.	724.20	1.5176E-01
RU-103	1043.	497.08	3.6801E-02
RURH-106	687.	621.93	6.7477E-01
AG-108m	537.	722.94	3.7446E-02
CD-109	1125.	88.03	5.6365E-01
AG-110M	906.	657.76	4.2624E-02
SN-113	1254.	391.69	4.5942E-02
TE-123m	1308.	159.00	1.8168E-02
SB-124	691.	602.73	3.3364E-02
SB-125	1283.	427.89	1.0978E-01
TE-125m	1177.	109.27	5.5383E+00
I-129	1198.	39.60	2.0234E+01
I-131	1277.	364.48	3.4233E-02
XE-131m	1380.	163.93	8.0789E-01
BA-133	1205.	356.02	4.2536E-02
CS-134	663.	604.70	3.2846E-02
CS-136	633.	818.51	4.1323E-02
CS-138	57.	1435.86	4.5594E-02
CE-139	1352.	165.85	1.9684E-02
BA-140	786.	537.31	1.2843E-01
LA-140	39.	1596.21	2.0579E-02
CE-141	1344.	145.44	3.1547E-02
CE-144	1259.	133.51	1.3291E-01
CEPR-144	1259.	133.51	2.6554E-01
EU-152	1249.	121.78	5.2988E-02
EU-154	130.	1274.51	8.2274E-02
EU-155	1158.	86.54	6.5021E-02
HF-181	1151.	482.18	4.2449E-02
TA-182	1117.	67.75	1.0137E-01
HG-203	1334.	279.20	2.7359E-02
BI-207	695.	569.70	3.1776E-02
TL-208	1341.	277.36	3.5209E-01
PB-210	1032.	46.50	8.2555E+00
BI-212	504.	727.18	4.9802E-01

Minimum Detectable Activity Report (continued)

Page : 4

Sample ID : WL31552-STD

Acquisition date : 26-OCT-1999 11:12:28

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
PB-212	1593.	238.63	4.8907E-02
PB-214	1333.	351.92	1.3688E-01
RA-224	1544.	240.99	5.3492E-01
RA-226	1565.	186.10	5.0924E-01
AC-228	889.	911.21	2.0104E-01
TH-228	1172.	84.37	1.7862E+00
TH-229	1117.	88.47	8.1307E-02
U-232	1065.	57.78	4.1530E+01
PA-233	1282.	312.17	6.2536E-02
UTH-233	1500.	245.34	1.9245E+01
PA-234M	664.	1001.03	7.7487E+00
TH-234	1053.	63.29	1.4060E+00
U-235	1553.	185.71	3.0848E-02
NP-237	1159.	86.48	1.7237E-01
U-237	1211.	101.07	6.7504E-02
NP-238	678.	984.45	1.8142E-01
NP-239	1084.	106.12	6.7574E-02
PU-239	1244.	129.30	2.2990E+02
AM-241	1176.	59.54	2.0861E-01
AM-243	1186.	74.67	5.1743E-02

 * 222-S Laboratory Counting Room 26-OCT-1999 10:04:27.75 *

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

Worklist #: 31552
 Sample ID: WL31552-BLNK
 Sample Size: 1.00000E-04 L
 Dilution Factor: 1.01000E+02

Removed by:

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

Detector ID: GEA4
 File Number: DKA300:[SPEC.GEA4]4G4070.CNF
 Geometry: 41
 Count Time: 0 02:30:00.00 sec
 Real Time: 0 02:30:06.44 sec
 Dead Time: 0.1%

Verified by:

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

Sample Count Time: 25-OCT-1999 19:24:36.79
 Decayed to: 25-OCT-1999 19:24:36.79
 Standard Deviations: 2
 Analysis Library: ENVGEA
 Analyst: JFR
 Background Subtract: DKA300:[SPEC.GEA4]4GBACK

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

Date of last energy calibration: 3-MAY-1999 14:24:16.68
 Date of last efficiency calibration: 3-MAY-1999 14:24:57.16

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw %Err	Fit	Nuclides	Activity uCi/L
0	352.10*	161	1.45	704.07	699	12 89.5			
0	609.31*	105	1.36	1218.46	1212	13109.2		BI-214	20.9

Summary of Nuclide Activity
 Sample ID : WL31552-BLNK

Page : 2
 Acquisition date : 25-OCT-1999 19:24:36

Total number of lines in spectrum 2
 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
BI-214	26700.00D	1.00	2.088E+01	2.088E+01	2.280E+01	109.19	JK
Total Activity :			2.088E+01	2.088E+01			27 Oct 99

Grand Total Activity : 2.088E+01 2.088E+01

Flags: "K" = Keyline not found
 "E" = Manually edited

"M" = Manually accepted
 "A" = Nuclide specific abn. limit

Minimum Detectable Activity Report
Sample ID : WL31552-BLNK

Page : 3
Acquisition date : 25-OCT-1999 19:24:36

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BE-7	448.	477.59	6.9499E+01
NA-24	108.	1368.55	9.7961E+00
K-40	2190.	1460.75	3.9533E+02
AR-41	144.	1293.60	1.5767E+01
SC-46	417.	1120.55	1.4933E+01
CR-51	770.	320.08	6.4276E+01
MN-54	235.	834.83	8.7254E+00
CO-56	255.	846.76	9.1956E+00
CO-58	289.	810.78	9.4381E+00
FE-59	222.	1099.25	1.9152E+01
CO-60	128.	1332.50	9.8022E+00
ZN-65	205.	1115.55	2.0829E+01
SE-75	961.	264.66	1.0427E+01
KR-85	683.	514.00	2.1766E+03
SR-85	680.	514.01	9.8198E+00
Y-88	54.	1836.06	8.4775E+00
Y-91	234.	1204.67	4.0115E+03
NB-94	228.	871.09	8.9283E+00
ZRNB-95	279.	724.20	3.7726E+01
RU-103	456.	497.08	8.2726E+00
RURH-106	347.	621.93	1.6299E+02
AG-108m	264.	722.94	8.9231E+00
CD-109	961.	88.03	1.7564E+02
AG-110M	320.	657.76	8.6442E+00
SN-113	586.	391.69	1.0656E+01
TE-123m	1109.	159.00	5.6402E+00
SB-124	378.	602.73	8.3715E+00
SB-125	545.	427.89	2.4300E+01
TE-125m	926.	109.27	1.6581E+03
I-129	878.	39.60	5.8468E+03
I-131	638.	364.48	8.2244E+00
XE-131m	1021.	163.93	2.3497E+02
BA-133	631.	356.02	1.0428E+01
CS-134	382.	604.70	8.4523E+00
CS-136	246.	818.51	8.8019E+00
CS-137	795.	661.66	1.5021E+01
CS-138	88.	1435.86	3.8538E+01
CE-139	1036.	165.85	5.8168E+00
BA-140	397.	537.31	3.1027E+01
LA-140	65.	1596.21	8.8632E+00
CE-141	977.	145.44	9.0864E+00
CE-144	983.	133.51	3.9622E+01
CEPR-144	983.	133.51	7.9178E+01
EU-152	979.	121.78	1.5825E+01
EU-154	163.	1274.51	3.0862E+01
EU-155	1024.	86.54	2.0605E+01
HF-181	468.	482.18	9.2019E+00
TA-182	767.	67.75	2.8392E+01
HG-203	911.	279.20	7.6438E+00
BI-207	394.	569.70	8.1135E+00
TL-208	921.	277.36	9.8531E+01

Minimum Detectable Activity Report (continued)

Page : 4

Sample ID : WL31552-BLNK

Acquisition date : 25-OCT-1999 19:24:36

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
PB-210	835.	46.50	2.5118E+03
BI-212	360.	727.18	1.4245E+02
PB-212	1307.	238.63	1.4936E+01
PB-214	1211.	351.92	9.7578E+01
RA-224	1203.	240.99	1.6030E+02
RA-226	1256.	186.10	1.5388E+02
AC-228	479.	911.21	5.0044E+01
TH-228	1028.	84.37	5.6372E+02
TH-229	940.	88.47	2.5148E+01
U-232	706.	57.78	1.1433E+04
PA-233	834.	312.17	1.7061E+01
UTH-233	976.	245.34	5.2433E+03
PA-234M	204.	1001.03	1.4734E+03
TH-234	795.	63.29	4.1223E+02
U-235	1256.	185.71	9.3562E+00
NP-237	1032.	86.48	5.4803E+01
U-237	829.	101.07	1.8933E+01
NP-238	210.	984.45	3.4955E+01
NP-239	907.	106.12	2.1060E+01
PU-239	1004.	129.30	6.9661E+04
AM-241	752.	59.54	5.6412E+01
AM-243	1128.	74.67	1.6997E+01

 * 222-S Laboratory Counting Room 26-OCT-1999 10:12:34.25 *

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

Worklist #: 31552
 Sample ID: S99T001731-SAM
 Sample Size: 1.00000E-04 L
 Dilution Factor: 1.01000E+02

Removed by:

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

Detector ID: GEA4
 File Number: DKA300:[SPEC.GEA4]4G4071.CNF
 Geometry: 41
 Count Time: 0 02:30:00.00 sec
 Real Time: 0 02:34:59.96 sec
 Dead Time: 3.2%

Verified by:

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

Sample Count Time: 25-OCT-1999 22:08:55.43
 Decayed to: 25-OCT-1999 22:08:55.43
 Standard Deviations: 2
 Analysis Library: ENVGEA
 Analyst: JFR
 Background Subtract: DKA300:[SPEC.GEA4]4GBACK

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

Date of last energy calibration: 3-MAY-1999 14:24:16.68
 Date of last efficiency calibration: 3-MAY-1999 14:24:57.16

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/L
5	26.42	17578	0.99	52.76	50	12	3.2	6.20E+02		
.5	27.67*	15628	1.33	55.26	50	12	4.8			
0	185.69*	1079	1.51	371.28	369	6	74.8		U-235	60.3
									RA-226	991.
0	661.71*	2374509	1.48	1323.27	1315	16	0.1		CS-137	2.665E+05

Summary of Nuclide Activity
Sample ID : S99T001731-SAM

Page : 2
Acquisition date : 25-OCT-1999 22:08:55

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

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/L	Wtd Mean Decay Corr uCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CS-137	30.00Y	1.00	2.665E+05	2.665E+05	0.004E+05	0.13	
RA-226	1600.00Y*****	1.00	9.914E+02	9.914E+02	7.415E+02	74.79	87R
U-235	7.04E+08Y	1.00	6.028E+01	6.028E+01	4.508E+01	74.79	87R
Total Activity :			2.676E+05	2.676E+05			27oct99

Grand Total Activity : 2.676E+05 2.676E+05

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Minimum Detectable Activity Report
Sample ID : S99T001731-SAM

Page : 3
Acquisition date : 25-OCT-1999 22:08:55

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BE-7	75027.	477.59	8.7685E+02
NA-24	102.	1368.55	9.5551E+00
K-40	2124.	1460.75	3.8941E+02
AR-41	176.	1293.60	1.7627E+01
SC-46	473.	1120.55	1.5886E+01
CR-51	57418.	320.08	5.4503E+02
MN-54	563.	834.83	1.3320E+01
CO-56	501.	846.76	1.2760E+01
CO-58	529.	810.78	1.2660E+01
FE-59	277.	1099.25	2.1328E+01
CO-60	147.	1332.50	1.0472E+01
ZN-65	295.	1115.55	2.4798E+01
SE-75	60203.	264.66	8.1200E+01
KR-85	37225.	514.00	1.5762E+04
SR-85	37216.	514.01	7.1289E+01
Y-88	45.	1836.06	7.7920E+00
Y-91	253.	1204.67	4.1576E+03
NB-94	491.	871.09	1.2950E+01
ZRNB-95	737.	724.20	6.0580E+01
RU-103	45454.	497.08	8.0605E+01
RURH-106	15283.	621.93	1.0532E+03
AG-108m	726.	722.94	1.4606E+01
CD-109	46475.	88.03	1.2019E+03
AG-110M	43542.	657.76	9.7871E+01
SN-113	64634.	391.69	1.0954E+02
TE-123m	55137.	159.00	3.9187E+01
SB-124	15643.	602.73	5.2551E+01
SB-125	74647.	427.89	2.7800E+02
TE-125m	48494.	109.27	1.1803E+04
I-129	45125.	39.60	4.1229E+04
I-131	60641.	364.48	7.8582E+01
XE-131m	55641.	163.93	1.7083E+03
BA-133	59113.	356.02	9.8897E+01
CS-134	15681.	604.70	5.2848E+01
CS-136	509.	818.51	1.2528E+01
CS-138	107.	1435.86	4.3550E+01
CE-139	55665.	165.85	4.1977E+01
BA-140	26967.	537.31	2.4947E+02
LA-140	66.	1596.21	8.8875E+00
CE-141	54513.	145.44	6.6798E+01
CE-144	54000.	133.51	2.8904E+02
CEPR-144	53999.	133.51	5.7757E+02
EU-152	52233.	121.78	1.1379E+02
EU-154	203.	1274.51	3.4239E+01
EU-155	46922.	86.54	1.3739E+02
HF-181	59474.	482.18	1.0131E+02
TA-182	45311.	67.75	2.1427E+02
HG-203	59130.	279.20	6.0548E+01
BI-207	16943.	569.70	5.1917E+01
TL-208	58908.	277.36	7.7513E+02
PB-210	44383.	46.50	1.8008E+04

Minimum Detectable Activity Report (continued)

Page : 4

Sample ID : S99T001731-SAM

Acquisition date : 25-OCT-1999 22:08:55

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BI-212	800.	727.18	2.1021E+02
PB-212	65286.	238.63	1.0414E+02
BI-214	16230.	609.31	1.1793E+02
PB-214	59551.	351.92	6.9501E+02
RA-224	64575.	240.99	1.1583E+03
AC-228	671.	911.21	5.8963E+01
TH-228	46782.	84.37	3.7458E+03
TH-229	46401.	88.47	1.7389E+02
U-232	44409.	57.78	8.8961E+04
PA-233	56861.	312.17	1.3846E+02
UTH-233	63855.	245.34	4.1741E+04
PA-234M	357.	1001.03	1.9293E+03
TH-234	44887.	63.29	3.0440E+03
NP-237	46934.	86.48	3.6400E+02
U-237	47963.	101.07	1.4156E+02
NP-238	384.	984.45	4.6851E+01
NP-239	48107.	106.12	1.5091E+02
PU-239	53524.	129.30	5.0066E+05
AM-241	44226.	59.54	4.2467E+02
AM-243	46361.	74.67	1.0740E+02

 * 222-S Laboratory Counting Room 26-OCT-1999 10:24:02.72

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

Worklist #: 31552
 Sample ID: S991731-DUP
 Sample Size: 1.00000E-04 L
 Dilution Factor: 1.01000E+02

Removed by:

[Signature]

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

Detector ID: GEA4
 File Number: dka300:[spec.GEA4]4g4072.cnf
 Geometry: 41
 Count Time: 0 02:30:00.00 sec
 Real Time: 0 02:34:46.58 sec
 Dead Time: 3.1%

Verified by:

John Relyea 27oct99

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

Sample Count Time: 26-OCT-1999 00:49:06.01
 Decayed to: 26-OCT-1999 00:49:06.01
 Standard Deviations: 2
 Analysis Library: ENVGEA
 Analyst: MB
 Background Subtract: DKA300:[SPEC.GEA4]4GBACK

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

Date of last energy calibration: 3-MAY-1999 14:24:16.68
 Date of last efficiency calibration: 3-MAY-1999 14:24:57.16

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/L
5	26.44	17468	1.02	52.81	50	12	3.1	6.51E+02		
5	27.58*	15457	1.34	55.08	50	12	4.7			
5	28.87*	8423	1.34	57.67	50	12	9.0		I-129	2.122E+06
0	661.72*	2270272	1.47	1323.28	1315	16	0.1		CS-137	2.548E+05

Summary of Nuclide Activity
Sample ID : S991731-DUP

Page : 2
Acquisition date : 26-OCT-1999 00:49:06

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

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/L	Wtd Mean Decay Corr uCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
I-129	5.73E+09D	1.00	2.122E+06	2.122E+06	0.192E+06	9.04	JJR
CS-137	30.00Y	1.00	2.548E+05	2.548E+05	0.003E+05	0.14	27 Oct 99
Total Activity :			2.377E+06	2.377E+06			

Grand Total Activity : 2.377E+06 2.377E+06

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Minimum Detectable Activity Report
Sample ID : S991731-DUP

Page : 3
Acquisition date : 26-OCT-1999 00:49:06

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BE-7	71142.	477.59	8.5389E+02
NA-24	110.	1368.55	9.9166E+00
K-40	2135.	1460.75	3.9043E+02
AR-41	181.	1293.60	1.7825E+01
SC-46	431.	1120.55	1.5167E+01
CR-51	54901.	320.08	5.3298E+02
MN-54	509.	834.83	1.2687E+01
CO-56	481.	846.76	1.2506E+01
CO-58	490.	810.78	1.2198E+01
FE-59	299.	1099.25	2.2122E+01
CO-60	112.	1332.50	9.2162E+00
ZN-65	289.	1115.55	2.4571E+01
SE-75	57437.	264.66	7.9318E+01
KR-85	35497.	514.00	1.5393E+04
SR-85	35491.	514.01	6.9622E+01
Y-88	44.	1836.06	7.7277E+00
Y-91	260.	1204.67	4.2199E+03
NB-94	437.	871.09	1.2239E+01
ZRNB-95	697.	724.20	5.8924E+01
RU-103	43433.	497.08	7.8798E+01
RURH-106	14589.	621.93	1.0291E+03
AG-108m	710.	722.94	1.4445E+01
CD-109	44318.	88.03	1.1738E+03
AG-110M	40519.	657.76	9.4422E+01
SN-113	61372.	391.69	1.0674E+02
TE-123m	52498.	159.00	3.8240E+01
SB-124	14739.	602.73	5.1017E+01
SB-125	71619.	427.89	2.7231E+02
TE-125m	46807.	109.27	1.1596E+04
I-131	57639.	364.48	7.6617E+01
XE-131m	53427.	163.93	1.6741E+03
BA-133	56658.	356.02	9.6827E+01
CS-134	14752.	604.70	5.1266E+01
CS-136	516.	818.51	1.2618E+01
CS-138	96.	1435.86	4.1228E+01
CE-139	53674.	165.85	4.1221E+01
BA-140	25340.	537.31	2.4186E+02
LA-140	65.	1596.21	8.8458E+00
CE-141	52180.	145.44	6.5357E+01
CE-144	51701.	133.51	2.8284E+02
CEPR-144	51699.	133.51	5.6517E+02
EU-152	50357.	121.78	1.1173E+02
EU-154	184.	1274.51	3.2690E+01
EU-155	44554.	86.54	1.3388E+02
HF-181	56872.	482.18	9.9072E+01
TA-182	42865.	67.75	2.0843E+02
HG-203	56486.	279.20	5.9182E+01
BI-207	16443.	569.70	5.1149E+01
TL-208	56689.	277.36	7.6043E+02
PB-210	42627.	46.50	1.7649E+04
BI-212	739.	727.18	2.0212E+02

Minimum Detectable Activity Report (continued)

Page : 4

Sample ID : S991731-DUP

Acquisition date : 26-OCT-1999 00:49:06

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
PB-212	62578.	238.63	1.0197E+02
BI-214	15216.	609.31	1.1420E+02
PB-214	56662.	351.92	6.7708E+02
RA-224	61964.	240.99	1.1346E+03
RA-226	72405.	186.10	1.1519E+03
AC-228	628.	911.21	5.7098E+01
TH-228	44967.	84.37	3.6726E+03
TH-229	44234.	88.47	1.6980E+02
U-232	42354.	57.78	8.6883E+04
PA-233	55137.	312.17	1.3635E+02
UTH-233	60750.	245.34	4.0716E+04
PA-234M	385.	1001.03	2.0002E+03
TH-234	42703.	63.29	2.9692E+03
U-235	71591.	185.71	6.9639E+01
NP-237	44595.	86.48	3.5484E+02
U-237	45822.	101.07	1.3837E+02
NP-238	307.	984.45	4.2060E+01
NP-239	45818.	106.12	1.4728E+02
PU-239	51026.	129.30	4.8886E+05
AM-241	41812.	59.54	4.1295E+02
AM-243	44403.	74.67	1.0511E+02

 * 222-S Laboratory Counting Room 26-OCT-1999 09:18:11.20 *

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

Worklist #: 31552
 Sample ID: S99T1734-SAM
 Sample Size: 1.00000E-04 L
 Dilution Factor: 1.01000E+02

Removed by:

Shirley L. Udd

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

Detector ID: GEA4
 File Number: dka300:[spec.GEA4]4g4075.cnf
 Geometry: 41
 Count Time: 0 02:30:00.00 sec
 Real Time: 0 02:36:38.28 sec
 Dead Time: 4.2%

Verified by:

John Relyea 27 Oct 99

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

Sample Count Time: 26-OCT-1999 06:41:04.54
 Decayed to: 26-OCT-1999 06:41:04.54
 Standard Deviations: 2
 Analysis Library: ENVGEA
 Analyst: SLH2
 Background Subtract: DKA300:[SPEC.GEA4]4GBACK

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

Date of last energy calibration: 3-MAY-1999 14:24:16.68
 Date of last efficiency calibration: 3-MAY-1999 14:24:57.16

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/L
0	21.28	130	1.44	42.48	39	8	20.3			
6	26.41	22490	0.99	52.75	50	12	2.8	7.36E+02		
6	27.51*	22976	1.47	54.94	50	12	4.1			
6	28.82*	12803	1.48	57.56	50	12	7.6		I-129	3.226E+06
0	661.72*	3141899	1.48	1323.29	1315	16	0.1		CS-137	3.527E+05

Summary of Nuclide Activity
Sample ID : S99T1734-SAM

Page : 2
Acquisition date : 26-OCT-1999 06:41:04

Total number of lines in spectrum 5
Number of unidentified lines 3
Number of lines tentatively identified by NID 2 40.00%

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean	Wtd Mean	Decay Corr	2-Sigma	2-Sigma Error	%Error	Flags
			Uncorrected	Decay Corr					
			uCi/L	uCi/L					
I-129	5.73E+09D	1.00	3.226E+06	3.226E+06	0.246E+06	7.61			7.61 <i>GR 27047</i>
CS-137	30.00Y	1.00	3.527E+05	3.527E+05	0.004E+05	0.12			
Total Activity :			3.578E+06	3.578E+06					

Grand Total Activity : 3.578E+06 3.578E+06

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Minimum Detectable Activity Report
Sample ID : S99T1734-SAM

Page : 3
Acquisition date : 26-OCT-1999 06:41:04

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BE-7	99464.	477.59	1.0093E+03
NA-24	111.	1368.55	9.9737E+00
K-40	2108.	1460.75	3.8798E+02
AR-41	230.	1293.60	2.0114E+01
SC-46	500.	1120.55	1.6319E+01
CR-51	75505.	320.08	6.2482E+02
MN-54	751.	834.83	1.5341E+01
CO-56	724.	846.76	1.5274E+01
CO-58	760.	810.78	1.5114E+01
FE-59	360.	1099.25	2.4209E+01
CO-60	118.	1332.50	9.4301E+00
ZN-65	360.	1115.55	2.7294E+01
SE-75	79998.	264.66	9.3573E+01
KR-85	49021.	514.00	1.8081E+04
SR-85	49012.	514.01	8.1779E+01
Y-88	42.	1836.06	7.5762E+00
Y-91	285.	1204.67	4.4112E+03
NB-94	660.	871.09	1.4968E+01
ZRNB-95	1065.	724.20	7.2539E+01
RU-103	60030.	497.08	9.2600E+01
RURH-106	20608.	621.93	1.2222E+03
AG-108m	1027.	722.94	1.7305E+01
CD-109	60979.	88.03	1.3763E+03
AG-110M	55809.	657.76	1.1077E+02
SN-113	85615.	391.69	1.2603E+02
TE-123m	73493.	159.00	4.5227E+01
SB-124	20700.	602.73	6.0414E+01
SB-125	98825.	427.89	3.1978E+02
TE-125m	64326.	109.27	1.3589E+04
I-131	79526.	364.48	8.9968E+01
XE-131m	73528.	163.93	1.9632E+03
BA-133	78734.	356.02	1.1410E+02
CS-134	20775.	604.70	6.0792E+01
CS-136	719.	818.51	1.4833E+01
CS-138	94.	1435.86	4.1341E+01
CE-139	73771.	165.85	4.8308E+01
BA-140	35371.	537.31	2.8559E+02
LA-140	60.	1596.21	8.5270E+00
CE-141	71999.	145.44	7.6744E+01
CE-144	71440.	133.51	3.3235E+02
CEPR-144	71441.	133.51	6.6412E+02
EU-152	69305.	121.78	1.3103E+02
EU-154	231.	1274.51	3.6437E+01
EU-155	61274.	86.54	1.5695E+02
HF-181	78826.	482.18	1.1660E+02
TA-182	59519.	67.75	2.4550E+02
HG-203	77696.	279.20	6.9385E+01
BI-207	22768.	569.70	6.0146E+01
TL-208	78192.	277.36	8.9276E+02
PB-210	58603.	46.50	2.0686E+04
BI-212	1078.	727.18	2.4331E+02

Minimum Detectable Activity Report (continued)

Page : 4

Sample ID : S99T1734-SAM

Acquisition date : 26-OCT-1999 06:41:04

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
PB-212	86534.	238.63	1.1986E+02
BI-214	20980.	609.31	1.3401E+02
PB-214	78168.	351.92	8.0382E+02
RA-224	85350.	240.99	1.3313E+03
RA-226	99907.	186.10	1.3526E+03
AC-228	847.	911.21	6.6110E+01
TH-228	61461.	84.37	4.2920E+03
TH-229	60929.	88.47	1.9920E+02
U-232	58294.	57.78	1.0189E+05
PA-233	76061.	312.17	1.6009E+02
UTH-233	84290.	245.34	4.7943E+04
PA-234M	496.	1001.03	2.2632E+03
TH-234	58902.	63.29	3.4857E+03
U-235	98817.	185.71	8.1790E+01
NP-237	61301.	86.48	4.1586E+02
U-237	63253.	101.07	1.6252E+02
NP-238	448.	984.45	5.0493E+01
NP-239	63684.	106.12	1.7360E+02
PU-239	70668.	129.30	5.7509E+05
AM-241	58573.	59.54	4.8854E+02
AM-243	60479.	74.67	1.2262E+02

 * 222-S Laboratory Counting Room 26-OCT-1999 16:13:55.57 *

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

Worklist #: 31552
 Sample ID: S99T1734-DUP
 Sample Size: 1.00000E-04 L
 Dilution Factor: 1.01000E+02

Removed by:

RLH

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

Detector ID: GEA4
 File Number: dka300:[spec.GEA4]4g4078.cnf
 Geometry: 41
 Count Time: 0 02:30:00.00 sec
 Real Time: 0 02:37:02.90 sec
 Dead Time: 4.5%

Verified by:

John Ralysen 27 Oct 99

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

Sample Count Time: 26-OCT-1999 13:36:21.75
 Decayed to: 26-OCT-1999 13:36:21.75
 Standard Deviations: 2
 Analysis Library: ENVGEA
 Analyst: MB
 Background Subtract: DKA300:[SPEC.GEA4]4GBACK

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

Date of last energy calibration: 3-MAY-1999 14:24:16.68
 Date of last efficiency calibration: 3-MAY-1999 14:24:57.16

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/L
4	26.37	21711	0.90	52.66	50	11	2.6	6.94E+02		
4	27.30*	19226	1.21	54.53	50	11	4.1			
4	28.65*	12051	1.22	57.23	50	11	6.9		I-129	3.036E+06
0	185.97*	2264	1.61	371.82	369	7	47.9		U-235	126.
									RA-226	2.079E+03
0	661.73*	3333575	1.48	1323.30	1315	16	0.1		CS-137	3.742E+05
0	1322.47	208	2.57	2644.94	2639	13	35.0			

Summary of Nuclide Activity

Page : 2

Sample ID : S99T1734-DUP

Acquisition date : 26-OCT-1999 13:36:21

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

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean	Wtd Mean	Decay Corr	2-Sigma	2-Sigma Error	%Error	Flags
			Uncorrected	Decay Corr					
			uCi/L	uCi/L					
I-129	5.73E+09D	1.00	3.036E+06	3.036E+06	0.211E+06	6.95			
CS-137	30.00Y	1.00	3.742E+05	3.742E+05	0.004E+05	0.11			
RA-226	1600.00Y*****	1.00	2.079E+03	2.079E+03	0.995E+03	47.85			
U-235	7.04E+08Y	1.00	1.264E+02	1.264E+02	0.605E+02	47.85			
Total Activity :			3.412E+06	3.412E+06					

270 J99

Grand Total Activity : 3.412E+06 3.412E+06

Flags: "K" = Keyline not found

"E" = Manually edited

"M" = Manually accepted

"A" = Nuclide specific abn. limit

Minimum Detectable Activity Report
Sample ID : S99T1734-DUP

Page : 3
Acquisition date : 26-OCT-1999 13:36:21

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BE-7	105177.	477.59	1.0379E+03
NA-24	122.	1368.55	1.0402E+01
K-40	2150.	1460.75	3.9176E+02
AR-41	241.	1293.60	2.0577E+01
SC-46	531.	1120.55	1.6797E+01
CR-51	80426.	320.08	6.4483E+02
MN-54	725.	834.83	1.5071E+01
CO-56	721.	846.76	1.5239E+01
CO-58	808.	810.78	1.5577E+01
FE-59	396.	1099.25	2.5346E+01
CO-60	135.	1332.50	1.0059E+01
ZN-65	354.	1115.55	2.7081E+01
SE-75	84453.	264.66	9.6139E+01
KR-85	52170.	514.00	1.8651E+04
SR-85	52162.	514.01	8.4360E+01
Y-88	50.	1836.06	8.2060E+00
Y-91	295.	1204.67	4.4834E+03
NB-94	727.	871.09	1.5692E+01
ZRNB-95	1099.	724.20	7.3688E+01
RU-103	63758.	497.08	9.5426E+01
RURH-106	21658.	621.93	1.2529E+03
AG-108m	1101.	722.94	1.7913E+01
CD-109	64866.	88.03	1.4194E+03
AG-110M	59081.	657.76	1.1396E+02
SN-113	90465.	391.69	1.2955E+02
TE-123m	77378.	159.00	4.6404E+01
SB-124	21953.	602.73	6.2209E+01
SB-125	104937.	427.89	3.2950E+02
TE-125m	68481.	109.27	1.4020E+04
I-131	84708.	364.48	9.2848E+01
XE-131m	78029.	163.93	2.0223E+03
BA-133	83720.	356.02	1.1765E+02
CS-134	21985.	604.70	6.2531E+01
CS-136	806.	818.51	1.5692E+01
CS-138	108.	1435.86	4.4224E+01
CE-139	78409.	165.85	4.9801E+01
BA-140	37376.	537.31	2.9355E+02
LA-140	78.	1596.21	9.6353E+00
CE-141	76465.	145.44	7.9083E+01
CE-144	75851.	133.51	3.4244E+02
CEPR-144	75851.	133.51	6.8426E+02
EU-152	72925.	121.78	1.3440E+02
EU-154	255.	1274.51	3.8212E+01
EU-155	65271.	86.54	1.6197E+02
HF-181	84038.	482.18	1.2038E+02
TA-182	63204.	67.75	2.5297E+02
HG-203	82331.	279.20	7.1421E+01
BI-207	24157.	569.70	6.1947E+01
TL-208	82910.	277.36	9.1924E+02
PB-210	62586.	46.50	2.1376E+04
BI-212	1134.	727.18	2.4947E+02

Minimum Detectable Activity Report (continued)

Page : 4

Sample ID : S99T1734-DUP

Acquisition date : 26-OCT-1999 13:36:21

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
PB-212	91777.	238.63	1.2344E+02
BI-214	22739.	609.31	1.3949E+02
PB-214	82890.	351.92	8.2971E+02
RA-224	90509.	240.99	1.3709E+03
AC-228	862.	911.21	6.6663E+01
TH-228	65524.	84.37	4.4312E+03
TH-229	64862.	88.47	2.0551E+02
U-232	62060.	57.78	1.0512E+05
PA-233	80298.	312.17	1.6448E+02
UTH-233	89271.	245.34	4.9337E+04
PA-234M	512.	1001.03	2.2988E+03
TH-234	62314.	63.29	3.5850E+03
NP-237	65286.	86.48	4.2914E+02
U-237	67703.	101.07	1.6813E+02
NP-238	487.	984.45	5.2622E+01
NP-239	67322.	106.12	1.7849E+02
PU-239	74995.	129.30	5.9240E+05
AM-241	62093.	59.54	5.0297E+02
AM-243	64122.	74.67	1.2625E+02

 * 222-S Laboratory Counting Room 26-OCT-1999 19:01:41.88 *

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

Worklist #: 31552
 Sample ID: S99T1735-SAM
 Sample Size: 1.00000E-04 L
 Dilution Factor: 1.01000E+02

Removed by:

EM. Burch

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

Detector ID: GEA4
 File Number: dka300:[spec.GEA4]4g4079.cnf
 Geometry: 41
 Count Time: 0 02:30:00.00 sec
 Real Time: 0 02:37:01.41 sec
 Dead Time: 4.5%

Verified by:

John Ralston 27 Oct 99

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

Sample Count Time: 26-OCT-1999 16:24:09.23
 Decayed to: 26-OCT-1999 16:24:09.23
 Standard Deviations: 2
 Analysis Library: ENVGEA
 Analyst: SLH2
 Background Subtract: DKA300:[SPEC.GEA4]4GBACK

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

Date of last energy calibration: 3-MAY-1999 14:24:16.68
 Date of last efficiency calibration: 3-MAY-1999 14:24:57.16

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/L
4	26.35	20745	0.87	52.63	50	12	2.7	5.13E+02		
4	27.33*	22050	1.21	54.59	50	12	3.6			
4	28.46*	13278	1.22	56.84	50	12	6.2		I-129	3.345E+06
0	185.99*	3172	2.01	371.87	369	8	38.0		U-235	177.
									RA-226	2.914E+03
0	661.73*	3321413	1.48	1323.30	1315	16	0.1		CS-137	3.728E+05
0	910.91*	110	1.30	1821.70	1816	12	95.1			

Summary of Nuclide Activity
Sample ID : S99T1735-SAM

Page : 2
Acquisition date : 26-OCT-1999 16:24:09

Total number of lines in spectrum 6
Number of unidentified lines 2
Number of lines tentatively identified by NID 4 66.67%

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/L	Wtd Mean Decay Corr uCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
I-129	5.79E+09D	1.00	3.345E+06	3.345E+06	0.209E+06	6.25	JJR
CS-137	30.00Y	1.00	3.728E+05	3.728E+05	0.004E+05	0.11	
RA-226	1600.00Y*****	1.00	2.914E+03	2.914E+03	1.108E+03	38.03	JJR
U-235	7.04E+08Y	1.00	1.771E+02	1.771E+02	0.674E+02	38.03	JJR
Total Activity :			3.721E+06	3.721E+06			27 Oct 99

Grand Total Activity : 3.721E+06 3.721E+06

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

CS-137 is OK; didn't mean to put a line there. JJR

Minimum Detectable Activity Report
Sample ID : S99T1735-SAM

Page : 3
Acquisition date : 26-OCT-1999 16:24:09

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BE-7	104611.	477.59	1.0351E+03
NA-24	115.	1368.55	1.0121E+01
K-40	2201.	1460.75	3.9636E+02
AR-41	221.	1293.60	1.9762E+01
SC-46	538.	1120.55	1.6914E+01
CR-51	80490.	320.08	6.4508E+02
MN-54	793.	834.83	1.5750E+01
CO-56	810.	846.76	1.6135E+01
CO-58	805.	810.78	1.5545E+01
FE-59	399.	1099.25	2.5449E+01
CO-60	126.	1332.50	9.7293E+00
ZN-65	367.	1115.55	2.7582E+01
SE-75	84393.	264.66	9.6104E+01
KR-85	51665.	514.00	1.8560E+04
SR-85	51653.	514.01	8.3949E+01
Y-88	45.	1836.06	7.8210E+00
Y-91	324.	1204.67	4.6936E+03
NB-94	663.	871.09	1.4995E+01
ZRNB-95	1121.	724.20	7.4405E+01
RU-103	63693.	497.08	9.5377E+01
RURH-106	21674.	621.93	1.2533E+03
AG-108m	1123.	722.94	1.8082E+01
CD-109	64615.	88.03	1.4166E+03
AG-110M	58522.	657.76	1.1342E+02
SN-113	90105.	391.69	1.2929E+02
TE-123m	76837.	159.00	4.6242E+01
SB-124	21878.	602.73	6.2103E+01
SB-125	104747.	427.89	3.2920E+02
TE-125m	68179.	109.27	1.3989E+04
I-131	84490.	364.48	9.2729E+01
XE-131m	77895.	163.93	2.0206E+03
BA-133	82849.	356.02	1.1704E+02
CS-134	21686.	604.70	6.2106E+01
CS-136	823.	818.51	1.5853E+01
CS-138	110.	1435.86	4.4538E+01
CE-139	78085.	165.85	4.9698E+01
BA-140	37093.	537.31	2.9244E+02
LA-140	87.	1596.21	1.0146E+01
CE-141	76610.	145.44	7.9158E+01
CE-144	75752.	133.51	3.4222E+02
CEPR-144	75753.	133.51	6.8382E+02
EU-152	72763.	121.78	1.3425E+02
EU-154	243.	1274.51	3.7349E+01
EU-155	65028.	86.54	1.6167E+02
HF-181	83331.	482.18	1.1987E+02
TA-182	62674.	67.75	2.5191E+02
HG-203	83016.	279.20	7.1717E+01
BI-207	24048.	569.70	6.1808E+01
TL-208	82749.	277.36	9.1835E+02
PB-210	62426.	46.50	2.1349E+04
BI-212	1198.	727.18	2.5624E+02

Minimum Detectable Activity Report (continued)

Page : 4

Sample ID : S99T1735-SAM

Acquisition date : 26-OCT-1999 16:24:09

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
PB-212	91606.	238.63	1.2332E+02
BI-214	22250.	609.31	1.3799E+02
PB-214	82989.	351.92	8.3008E+02
RA-224	90498.	240.99	1.3709E+03
AC-228	835.	911.21	6.5638E+01
TH-228	64995.	84.37	4.4134E+03
TH-229	64609.	88.47	2.0511E+02
U-232	61916.	57.78	1.0500E+05
PA-233	80224.	312.17	1.6441E+02
UTH-233	88723.	245.34	4.9185E+04
PA-234M	484.	1001.03	2.2371E+03
TH-234	62409.	63.29	3.5878E+03
NP-237	65044.	86.48	4.2834E+02
U-237	66837.	101.07	1.6705E+02
NP-238	536.	984.45	5.5134E+01
NP-239	66961.	106.12	1.7801E+02
PU-239	74986.	129.30	5.9236E+05
AM-241	61684.	59.54	5.0132E+02
AM-243	64196.	74.67	1.2633E+02

 * 222-S Laboratory Counting Room 26-OCT-1999 21:41:58.36 *

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

Worklist #: 31552
 Sample ID: S99T1735-DUP
 Sample Size: 1.00000E-04 L
 Dilution Factor: 1.01000E+02

Removed by:

Em. Buelch

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

Detector ID: GEA4
 File Number: dka300:[spec.GEA4]4g4080.cnf
 Geometry: 41
 Count Time: 0 02:30:00.00 sec
 Real Time: 0 02:36:48.26 sec
 Dead Time: 4.3%

Verified by:

John Relyea 27 Oct 99

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

Sample Count Time: 26-OCT-1999 19:04:41.29
 Decayed to: 26-OCT-1999 19:04:41.29
 Standard Deviations: 2
 Analysis Library: ENVGEA
 Analyst: EMB
 Background Subtract: DKA300:[SPEC.GEA4]4GBACK

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

Date of last energy calibration: 3-MAY-1999 14:24:16.68
 Date of last efficiency calibration: 3-MAY-1999 14:24:57.16

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw %Err	Fit	Nuclides	Activity uCi/L
0	21.24	136	1.28	42.41	39	8 19.0			
4	26.30	18434	0.80	52.53	50	12 3.0	9.47E+02		
4	27.17*	20499	1.21	54.28	50	12 3.8			
4	28.26*	14106	1.22	56.44	50	12 5.8			
4	29.39*	6929	1.18	58.71	50	12 11.8		I-129	1.746E+06
0	661.73*	3221208	1.47	1323.31	1315	16 0.1		CS-137	3.616E+05

Summary of Nuclide Activity

Page : 2

Sample ID : S99T1735-DUP

Acquisition date : 26-OCT-1999 19:04:41

Total number of lines in spectrum 6
 Number of unidentified lines 4
 Number of lines tentatively identified by NID 2 33.33%

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/L	Wtd Mean Decay Corr uCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
I-129	5.73E+09D	1.00	1.746E+06	1.746E+06	0.207E+06	11.83	MA
CS-137	30.00Y	1.00	3.616E+05	3.616E+05	0.004E+05	0.11	270299
Total Activity :			2.107E+06	2.107E+06			

Grand Total Activity : 2.107E+06 2.107E+06

Flags: "K" = Keyline not found
 "E" = Manually edited

"M" = Manually accepted
 "A" = Nuclide specific abn. limit

Minimum Detectable Activity Report
Sample ID : S99T1735-DUP

Page : 3
Acquisition date : 26-OCT-1999 19:04:41

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BE-7	101728.	477.59	1.0207E+03
NA-24	118.	1368.55	1.0247E+01
K-40	2183.	1460.75	3.9472E+02
AR-41	228.	1293.60	2.0013E+01
SC-46	515.	1120.55	1.6553E+01
CR-51	77608.	320.08	6.3345E+02
MN-54	773.	834.83	1.5558E+01
CO-56	714.	846.76	1.5161E+01
CO-58	810.	810.78	1.5600E+01
FE-59	359.	1099.25	2.4169E+01
CO-60	142.	1332.50	1.0293E+01
ZN-65	383.	1115.55	2.8138E+01
SE-75	81712.	264.66	9.4569E+01
KR-85	49992.	514.00	1.8258E+04
SR-85	49983.	514.01	8.2584E+01
Y-88	40.	1836.06	7.3929E+00
Y-91	277.	1204.67	4.3467E+03
NB-94	652.	871.09	1.4880E+01
ZRNB-95	1069.	724.20	7.2691E+01
RU-103	61533.	497.08	9.3749E+01
RURH-106	21021.	621.93	1.2344E+03
AG-108m	1023.	722.94	1.7274E+01
CD-109	63432.	88.03	1.4036E+03
AG-110M	56469.	657.76	1.1142E+02
SN-113	87309.	391.69	1.2727E+02
TE-123m	75102.	159.00	4.5718E+01
SB-124	21161.	602.73	6.1082E+01
SB-125	101626.	427.89	3.2427E+02
TE-125m	65892.	109.27	1.3753E+04
I-131	81376.	364.48	9.1006E+01
XE-131m	75442.	163.93	1.9886E+03
BA-133	80511.	356.02	1.1538E+02
CS-134	21386.	604.70	6.1676E+01
CS-136	781.	818.51	1.5448E+01
CS-138	82.	1435.86	3.8693E+01
CE-139	75738.	165.85	4.8947E+01
BA-140	36195.	537.31	2.8889E+02
LA-140	79.	1596.21	9.6861E+00
CE-141	73804.	145.44	7.7698E+01
CE-144	72887.	133.51	3.3570E+02
CEPR-144	72886.	133.51	6.7079E+02
EU-152	71516.	121.78	1.3310E+02
EU-154	266.	1274.51	3.8978E+01
EU-155	63652.	86.54	1.5996E+02
HF-181	80727.	482.18	1.1799E+02
TA-182	60982.	67.75	2.4849E+02
HG-203	79777.	279.20	7.0306E+01
BI-207	23572.	569.70	6.1195E+01
TL-208	79731.	277.36	9.0148E+02
PB-210	59842.	46.50	2.0903E+04
BI-212	1137.	727.18	2.4972E+02

Minimum Detectable Activity Report (continued)

Page : 4

Sample ID : S99T1735-DUP

Acquisition date : 26-OCT-1999 19:04:41

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
PB-212	88657.	238.63	1.2132E+02
BI-214	21520.	609.31	1.3571E+02
PB-214	80220.	351.92	8.1509E+02
RA-224	88004.	240.99	1.3519E+03
RA-226	101827.	186.10	1.3655E+03
AC-228	838.	911.21	6.5749E+01
TH-228	63752.	84.37	4.3710E+03
TH-229	63429.	88.47	2.0324E+02
U-232	60110.	57.78	1.0346E+05
PA-233	77653.	312.17	1.6176E+02
UTH-233	85761.	245.34	4.8359E+04
PA-234M	453.	1001.03	2.1659E+03
TH-234	60559.	63.29	3.5343E+03
U-235	100475.	185.71	8.2472E+01
NP-237	63688.	86.48	4.2386E+02
U-237	64419.	101.07	1.6401E+02
NP-238	455.	984.45	5.0902E+01
NP-239	64744.	106.12	1.7504E+02
PU-239	72528.	129.30	5.8259E+05
AM-241	60082.	59.54	4.9478E+02
AM-243	62411.	74.67	1.2456E+02

LABCORE Completed Worklist Report for Worklist# 31624

Analyst: akf

Instrument: GEA02

Book#: 46B57

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

Worklist Comment: S-111 GRAB, @GEA-01 skm

Seq Type	Sample#	R A	Test	Matrix	Actual	Found	DL or Yield	Unit
1 STD	0	@GEA-01	CO60-02	SOLID	4.958e-03	5.45e-03	109.923	% Recovery
1 STD	0	@GEA-01	CO60-02E	SOLID	1	2.95	2.950	% Ct Error
1 STD	0	@GEA-01	CS13702	SOLID	8.002e-03	8.26e-03	103.224	% Recovery
1 STD	0	@GEA-01	CS13702E	SOLID	1	2.99	2.990	% Ct Error
2 BLNK-PREP	0	@GEA-01	CO60-02	SOLID	1	8.44e-3		uCi/g
2 BLNK-PREP	0	@GEA-01	CS13702	SOLID	1	7.45e-02	0.074	uCi/g
3 SAMPLE	S99T001737	0 F	@GEA-01	CO60-02	N/A	1.184e-02	1.18e-002	uCi/g
3 SAMPLE	S99T001737	0 F	@GEA-01	CO60-02E	N/A	n/a		% Ct. Error
3 SAMPLE	S99T001737	0 F	@GEA-01	CS13702	N/A	1.956e+02		uCi/g
3 SAMPLE	S99T001737	0 F	@GEA-01	CS13702E	N/A	0.220		% Ct. Error
4 DUP	S99T001737	0 F	@GEA-01	CO60-02	<1.18e-2	<1.11e-2		RPD
4 DUP	S99T001737	0 F	@GEA-01	CO60-02E	1	n/a		% Ct Error
4 DUP	S99T001737	0 F	@GEA-01	CS13702	1.96e+02	1.84e+02	6.316	RPD
4 DUP	S99T001737	0 F	@GEA-01	CS13702E	1.00	0.230	0.230	% Ct Error

Comments Section:

Comments for sample# S99T001737 and test @GEA-01 .
DL=0 => n/a.

Final page for worklist# 31624

Analyst Signature _____ Date _____

Analyst Signature _____ Date _____

Reviewer Signature _____ Date 11-3-99

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

11/02/99 10:25

Page: 1

ws2

LABCORE Data Entry Template for Worklist# 31624Analyst: AYL Instrument: GEA00 #2 Book# 46657Method: LA-548-121 Rev/Mod F

Worklist Comment: S-111 GRAB, @GEA-01 skm

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				@GEA-01	SOLID		
2	BLNK-PREP				@GEA-01	SOLID		
3	SAMPLE	S99T001737	0	F	@GEA-01	SOLID	99000304	S-111 GRAB
Analytes Requested: CO60-02 , CO60-02E, CS13702 , CS13702E								
4	DUP	S99T001737	0	F	@GEA-01	SOLID		

Final page for worklist # 31624

Alita Hansen 11/2/99
Signature Date

MCB 11/3/99
Signature Date

Data Entry Comments:

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

 * 222-S Laboratory Counting Room 2-NOV-1999 16:32:07.95 *

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

Worklist #: 31624
 Sample ID: WL31624-STD
 Sample Size: 1.00000E-03 L
 Dilution Factor: 1.00000E+00

Removed by:

Em Barber

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

Detector ID: GEA2
 File Number: dka300:[spec.GEA2]2g2083.cnf
 Geometry: 42
 Count Time: 0 00:50:00.00 sec
 Real Time: 0 00:50:23.46 sec
 Dead Time: 0.8%

Verified by:

John Relyea 3 Nov 99

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

Sample Count Time: 2-NOV-1999 15:41:12.98
 Decayed to: 2-NOV-1999 15:41:12.98
 Standard Deviations: 2
 Analysis Library: ENVGEA
 Analyst: EMB
 Background Subtract: DKA300:[SPEC.GEA2]2GBACK

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

Date of last energy calibration: 3-MAY-1999 14:49:30.70
 Date of last efficiency calibration: 3-MAY-1999 14:49:59.73

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/L
0	661.89*	5655	1.49	1323.66	1316	16	3.0		CS-137	8.26
0	1173.39	2797	1.88	2346.79	2337	18	4.2		CO-60	5.52
0	1332.62	2469	1.89	2665.33	2656	17	4.2		CO-60	5.39

Summary of Nuclide Activity

Page : 2

Sample ID : WL31624-STD

Acquisition date : 2-NOV-1999 15:41:12

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

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/L	Wtd Mean Decay Corr uCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CO-60	5.27Y	1.00	5.452E+00	5.452E+00	0.161E+00	2.95	
CS-137	30.00Y	1.00	8.260E+00	8.260E+00	0.247E+00	2.99	
Total Activity :			1.371E+01	1.371E+01			

Grand Total Activity : 1.371E+01 1.371E+01

Flags: "K" = Keyline not found
 "E" = Manually edited

"M" = Manually accepted
 "A" = Nuclide specific abn. limit

Minimum Detectable Activity Report
Sample ID : WL31624-STD

Page : 3
Acquisition date : 2-NOV-1999 15:41:12

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BE-7	298.	477.59	7.4424E-01
NA-24	7.	1368.55	3.3721E-02
K-40	115.	1460.75	1.1590E+00
AR-41	18.	1293.60	5.5937E-02
SC-46	139.	1120.55	1.0935E-01
CR-51	264.	320.08	4.9626E-01
MN-54	156.	834.83	9.1772E-02
CO-56	127.	846.76	8.4187E-02
CO-58	154.	810.78	8.9605E-02
FE-59	151.	1099.25	1.9840E-01
ZN-65	157.	1115.55	2.2776E-01
SE-75	342.	264.66	8.2170E-02
KR-85	225.	514.00	1.6601E+01
SR-85	225.	514.01	7.5011E-02
Y-88	5.	1836.06	3.8244E-02
Y-91	54.	1204.67	2.4717E+01
NB-94	148.	871.09	9.2778E-02
ZRNB-95	104.	724.20	3.0489E-01
RU-103	248.	497.08	8.0442E-02
RURH-106	144.	621.93	1.3924E+00
AG-108m	115.	722.94	7.7617E-02
CD-109	320.	88.03	1.4366E+00
AG-110M	220.	657.76	9.3910E-02
SN-113	284.	391.69	9.7590E-02
TE-123m	351.	159.00	4.4031E-02
SB-124	156.	602.73	7.1294E-02
SB-125	297.	427.89	2.3608E-01
TE-125m	332.	109.27	1.4311E+01
I-129	277.	39.60	1.4660E+01
I-131	317.	364.48	7.5911E-02
XE-131m	361.	163.93	1.9247E+00
BA-133	298.	356.02	9.4155E-02
CS-134	143.	604.70	6.8656E-02
CS-136	156.	818.51	9.0804E-02
CS-138	13.	1435.86	9.5874E-02
CE-139	381.	165.85	4.8582E-02
BA-140	182.	537.31	2.7828E-01
LA-140	6.	1596.21	3.8437E-02
CE-141	369.	145.44	7.8184E-02
CE-144	329.	133.51	3.2530E-01
CEPR-144	328.	133.51	6.4980E-01
EU-152	348.	121.78	1.3514E-01
EU-154	25.	1274.51	1.5938E-01
EU-155	302.	86.54	1.5817E-01
HF-181	262.	482.18	9.0819E-02
TA-182	256.	67.75	2.0541E-01
HG-203	349.	279.20	6.2259E-02
BI-207	141.	569.70	6.4679E-02
TL-208	327.	277.36	7.7416E-01
PB-210	262.	46.50	1.0000E+01
BI-212	128.	727.18	1.1214E+00

Minimum Detectable Activity Report (continued)

Page : 4

Sample ID : WL31624-STD

Acquisition date : 2-NOV-1999 15:41:12

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
PB-212	404.	238.63	1.1037E-01
BI-214	186.	609.31	1.7077E-01
PB-214	309.	351.92	2.9399E-01
RA-224	401.	240.99	1.2202E+00
RA-226	392.	186.10	1.1683E+00
AC-228	185.	911.21	4.0183E-01
TH-228	289.	84.37	4.2013E+00
TH-229	324.	88.47	2.0945E-01
U-232	260.	57.78	7.3485E+01
PA-233	304.	312.17	1.3552E-01
UTH-233	394.	245.34	4.4115E+01
PA-234M	157.	1001.03	1.6321E+01
TH-234	304.	63.29	3.0011E+00
U-235	380.	185.71	6.9944E-02
NP-237	300.	86.48	4.1794E-01
U-237	316.	101.07	1.6768E-01
NP-238	171.	984.45	3.9478E-01
NP-239	275.	106.12	1.6596E-01
PU-239	349.	129.30	5.8484E+02
AM-241	277.	59.54	3.7692E-01
AM-243	292.	74.67	1.1573E-01

 * 222-S Laboratory Counting Room 2-NOV-1999 19:05:22.44 *

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

Worklist #: 31624
 Sample ID: WL31624-BLK
 Sample Size: 1.00000E-03 L
 Dilution Factor: 1.00000E+00

Removed by:

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

Detector ID: GEA2
 File Number: dka300:[spec.GEA2]2g2084.cnf
 Geometry: 42
 Count Time: 0 02:30:00.00 sec
 Real Time: 0 02:30:36.91 sec
 Dead Time: 0.4%

Verified by:

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

Sample Count Time: 2-NOV-1999 16:34:14.47
 Decayed to: 2-NOV-1999 16:34:14.47
 Standard Deviations: 2
 Analysis Library: ENVGEA
 Analyst: EMB
 Background Subtract: DKA300:[SPEC.GEA2]2GBACK

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

Date of last energy calibration: 3-MAY-1999 14:49:30.70
 Date of last efficiency calibration: 3-MAY-1999 14:49:59.73

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw %Err	Fit	Nuclides	Activity uCi/L
0	33.47	80	1.38	66.86	65	9101.2			
0	352.37*	82	1.26	704.62	700	11 69.2			
0	609.63*	45	1.53	1219.13	1213	13 95.8		BI-214	3.889E-02
0	661.92*	319	1.53	1323.71	1317	13 18.9		CS-137	0.155

Summary of Nuclide Activity

Page : 2

Sample ID : WL31624-BLK

Acquisition date : 2-NOV-1999 16:34:14

Total number of lines in spectrum 4
 Number of unidentified lines 1
 Number of lines tentatively identified by NID 3 75.00%

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/L	Wtd Mean Decay Corr uCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CS-137	30.00Y	1.00	1.553E-01	1.553E-01	0.293E-01	18.90	
BI-214	28700.00D	1.00	3.889E-02	3.889E-02	3.726E-02	95.82	gtr
Total Activity :			1.942E-01	1.942E-01			3 Nov 99

Grand Total Activity : 1.942E-01 1.942E-01

Flags: "K" = Keyline not found
 "E" = Manually edited

"M" = Manually accepted
 "A" = Nuclide specific abn. limit

Minimum Detectable Activity Report
Sample ID : WL31624-BLK

Page : 3
Acquisition date : 2-NOV-1999 16:34:14

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BE-7	113.	477.59	1.5574E-01
NA-24	11.	1368.55	1.4042E-02
K-40	308.	1460.75	6.1946E-01
AR-41	30.	1293.60	3.1314E-02
SC-46	59.	1120.55	2.4439E-02
CR-51	174.	320.08	1.3549E-01
MN-54	44.	834.83	1.6838E-02
CO-56	47.	846.76	1.7597E-02
CO-58	48.	810.78	1.7333E-02
FE-59	32.	1099.25	3.2033E-02
CO-60	21.	1332.50	1.7557E-02
ZN-65	37.	1115.55	3.8598E-02
SE-75	171.	264.66	1.9602E-02
KR-85	132.	514.00	4.2889E+00
SR-85	132.	514.01	1.9378E-02
Y-88	15.	1836.06	2.0254E-02
Y-91	42.	1204.67	7.3812E+00
NB-94	40.	871.09	1.6732E-02
ZRNB-95	43.	724.20	6.7546E-02
RU-103	92.	497.08	1.6678E-02
RURH-106	61.	621.93	3.0840E-01
AG-108m	47.	722.94	1.7023E-02
CD-109	171.	88.03	3.5433E-01
AG-110M	58.	657.76	1.6673E-02
SN-113	127.	391.69	2.2102E-02
TE-123m	196.	159.00	1.1080E-02
SB-124	81.	602.73	1.7412E-02
SB-125	101.	427.89	4.7048E-02
TE-125m	202.	109.27	3.7514E+00
I-129	136.	39.60	3.4739E+00
I-131	122.	364.48	1.6022E-02
XE-131m	206.	163.93	4.9017E-01
BA-133	128.	356.02	2.0954E-02
CS-134	76.	604.70	1.7003E-02
CS-136	41.	818.51	1.6232E-02
CS-138	24.	1435.86	8.7285E-02
CE-139	222.	165.85	1.2465E-02
BA-140	93.	537.31	6.7325E-02
LA-140	13.	1596.21	1.7851E-02
CE-141	211.	145.44	1.9938E-02
CE-144	187.	133.51	8.2539E-02
CEPR-144	187.	133.51	1.6497E-01
EU-152	213.	121.78	3.5543E-02
EU-154	27.	1274.51	5.4486E-02
EU-155	177.	86.54	4.0812E-02
HF-181	72.	482.18	1.6341E-02
TA-182	180.	67.75	5.7868E-02
HG-203	178.	279.20	1.5015E-02
BI-207	77.	569.70	1.6187E-02
TL-208	171.	277.36	1.8884E-01
PB-210	156.	46.50	2.6046E+00

Minimum Detectable Activity Report (continued)

Page : 4

Sample ID : WL31624-BLK

Acquisition date : 2-NOV-1999 16:34:14

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BI-212	54.	727.18	2.4921E-01
PB-212	235.	238.63	2.8311E-02
PB-214	241.	351.92	1.9339E-01
RA-224	199.	240.99	2.9148E-01
RA-226	241.	186.10	3.0793E-01
AC-228	100.	911.21	9.9990E-02
TH-228	196.	84.37	1.1622E+00
TH-229	168.	88.47	5.0861E-02
U-232	165.	57.78	1.9711E+01
PA-233	130.	312.17	3.0059E-02
UTH-233	181.	245.34	1.0109E+01
PA-234M	39.	1001.03	2.8205E+00
TH-234	163.	63.29	7.4024E-01
U-235	247.	185.71	1.8952E-02
NP-237	177.	86.48	1.0809E-01
U-237	195.	101.07	4.4511E-02
NP-238	29.	984.45	5.8226E-02
NP-239	189.	106.12	4.6688E-02
PU-239	208.	129.30	1.5176E+02
AM-241	164.	59.54	9.7677E-02
AM-243	222.	74.67	3.3795E-02

 * 222-S Laboratory Counting Room 2-NOV-1999 21:53:00.51 *

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

Worklist #: 31624
 Sample ID: S99T001737-SAM
 Sample Size: 1.00000E-03 L
 Dilution Factor: 1.00000E+00

Removed by:

W. Raymond

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

Detector ID: GEA2
 File Number: dka300:[spec.GEA2]2g2085.cnf
 Geometry: 42
 Count Time: 0 02:30:00.00 sec
 Real Time: 0 02:34:33.48 sec
 Dead Time: 2.9%

Verified by:

John Relyea 3 NOV 99

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

Sample Count Time: 2-NOV-1999 19:17:56.01
 Decayed to: 2-NOV-1999 19:17:56.01
 Standard Deviations: 2
 Analysis Library: ENVGEA
 Analyst: VR
 Background Subtract: DKA300:[SPEC.GEA2]2GBACK

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

Date of last energy calibration: 3-MAY-1999 14:49:30.70
 Date of last efficiency calibration: 3-MAY-1999 14:49:59.73

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/L
0	661.83*	836446	1.48	1323.54	1316	16	0.2		CS-137	407.
0	723.72	46	1.24	1447.33	1442	101	05.6		ZRNB-95	9.427E-02
									EU-154	0.104
0	1274.94	96	1.56	2549.94	2541	17	28.4		EU-154	0.195
0	1461.02*	39	1.94	2922.19	2913	191	19.0		K-40	0.287

Summary of Nuclide Activity
Sample ID : S99T001737-SAM

Page : 2
Acquisition date : 2-NOV-1999 19:17:56

Total number of lines in spectrum 4
Number of unidentified lines 0
Number of lines tentatively identified by NID 4 100.00%

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean	Wtd Mean	Decay Corr	2-Sigma	2-Sigma Error	%Error	Flags
			Uncorrected	Decay Corr					
			uCi/L	uCi/L					
K-40	1.28E+09Y	1.00	2.874E-01	2.874E-01	3.421E-01	119.04			JAR
ZRNB-95	64.02D	1.00	9.421E-02	9.427E-02	9.959E-02	105.65			JAR 3/10/99
CS-137	30.00Y	1.00	4.072E+02	4.072E+02	0.009E+02	0.22			
EU-154	8.59Y	1.00	1.763E-01	1.763E-01	0.494E-01	28.03			
Total Activity :			4.078E+02	4.078E+02					

Grand Total Activity : 4.078E+02 4.078E+02

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Minimum Detectable Activity Report
Sample ID : S99T001737-SAM

Page : 3
Acquisition date : 2-NOV-1999 19:17:56

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BE-7	25845.	477.59	2.2449E+00
NA-24	25.	1368.55	2.0387E-02
AR-41	22.	1293.60	2.7235E-02
SC-46	92.	1120.55	2.9990E-02
CR-51	20649.	320.08	1.4189E+00
MN-54	56.	834.83	1.8839E-02
CO-56	50.	846.76	1.8118E-02
CO-58	68.	810.78	2.0337E-02
FE-59	38.	1099.25	3.4531E-02
CO-60	45.	1332.50	2.4638E-02
ZN-65	45.	1115.55	4.2157E-02
SE-75	23137.	264.66	2.1927E-01
KR-85	12948.	514.00	4.0592E+01
SR-85	12946.	514.01	1.8360E-01
Y-88	13.	1836.06	1.8949E-02
Y-91	36.	1204.67	6.8369E+00
NB-94	69.	871.09	2.1543E-02
RU-103	15701.	497.08	2.0680E-01
RURH-106	5372.	621.93	2.7233E+00
AG-108m	203.	722.94	3.3941E-02
CD-109	19010.	88.03	3.5890E+00
AG-110M	14612.	657.76	2.4647E-01
SN-113	22675.	391.69	2.8217E-01
TE-123m	22883.	159.00	1.1541E-01
SB-124	5685.	602.73	1.3825E-01
SB-125	26594.	427.89	7.2263E-01
TE-125m	20359.	109.27	3.6349E+01
I-129	17255.	39.60	3.7447E+01
I-131	21328.	364.48	2.0247E-01
XE-131m	22799.	163.93	4.9785E+00
BA-133	21026.	356.02	2.5618E-01
CS-134	5686.	604.70	1.3887E-01
CS-136	67.	818.51	2.0353E-02
CS-138	24.	1435.86	8.8994E-02
CE-139	22799.	165.85	1.2212E-01
BA-140	9562.	537.31	6.4885E-01
LA-140	17.	1596.21	1.9672E-02
CE-141	23163.	145.44	2.0146E-01
CE-144	22640.	133.51	8.7547E-01
CEPR-144	22641.	133.51	1.7494E+00
EU-152	22301.	121.78	3.5115E-01
EU-155	19143.	86.54	4.0810E-01
HF-181	20584.	482.18	2.6004E-01
TA-182	17621.	67.75	5.5114E-01
HG-203	22100.	279.20	1.6097E-01
BI-207	6280.	569.70	1.3805E-01
TL-208	21979.	277.36	2.0594E+00
PB-210	17388.	46.50	2.6412E+01
BI-212	131.	727.18	3.7803E-01
PB-212	25775.	238.63	2.8650E-01
BI-214	5559.	609.31	3.0116E-01

Minimum Detectable Activity Report (continued)

Page : 4

Sample ID : S99T001737-SAM

Acquisition date : 2-NOV-1999 19:17:56

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
PB-214	20973.	351.92	1.7865E+00
RA-224	25434.	240.99	3.1806E+00
RA-226	28929.	186.10	3.2612E+00
AC-228	91.	911.21	9.5631E-02
TH-228	18937.	84.37	1.1009E+01
TH-229	19007.	88.47	5.2019E-01
U-232	17311.	57.78	1.9386E+02
PA-233	21018.	312.17	3.6546E-01
UTH-233	25097.	245.34	1.1439E+02
PA-234M	52.	1001.03	3.2408E+00
TH-234	17587.	63.29	7.3946E+00
U-235	28623.	185.71	1.9728E-01
NP-237	19158.	86.48	1.0813E+00
U-237	19693.	101.07	4.3086E-01
NP-238	46.	984.45	7.2040E-02
NP-239	20513.	106.12	4.6853E-01
PU-239	22733.	129.30	1.5318E+03
AM-241	17629.	59.54	9.7229E-01
AM-243	18301.	74.67	2.9668E-01

 * 222-S Laboratory Counting Room 3-NOV-1999 00:56:01.99 *

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

Worklist #: 31624
 Sample ID: S99T001737-DUP
 Sample Size: 1.00000E-03 L
 Dilution Factor: 1.00000E+00

Removed by:

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

Detector ID: GEA2
 File Number: dka300:[spec.GEA2]2g2086.cnf
 Geometry: 42
 Count Time: 0 02:30:00.00 sec
 Real Time: 0 02:34:28.83 sec
 Dead Time: 2.9%

Verified by:

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

Sample Count Time: 2-NOV-1999 22:21:01.70
 Decayed to: 2-NOV-1999 22:21:01.70
 Standard Deviations: 2
 Analysis Library: ENVGEA
 Analyst: VR
 Background Subtract: DKA300:[SPEC.GEA2]2GBACK

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

Date of last energy calibration: 3-MAY-1999 14:49:30.70
 Date of last efficiency calibration: 3-MAY-1999 14:49:59.73

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/L
0	661.82*	822626	1.47	1323.51	1316	16	0.2		CS-137	401.
0	722.94	132	1.53	1445.76	1439	12	39.3		ZRNB-95	0.268
									EU-154	0.295
0	1274.61	82	1.40	2549.27	2542	15	33.7		EU-154	0.166
0	1764.57*	19	1.73	3529.51	3523	14	91.2		BI-214	0.113

Summary of Nuclide Activity
Sample ID : S99T001737-DUP

Page : 2
Acquisition date : 2-NOV-1999 22:21:01

Total number of lines in spectrum 4
Number of unidentified lines 0
Number of lines tentatively identified by NID 4 100.00%

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
ZRNB-95	64.02D	1.00	2.675E-01	2.677E-01	1.051E-01	39.27	JFR
CS-137	30.00Y	1.00	4.005E+02	4.005E+02	0.009E+02	0.23	
EU-154	8.59Y	1.00	1.906E-01	1.906E-01	0.504E-01	26.45	
BI-214	28700.00D	1.00	1.126E-01	1.126E-01	1.027E-01	91.17	JFR
Total Activity :			4.011E+02	4.011E+02			3 NOV 99

Grand Total Activity : 4.011E+02 4.011E+02

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Minimum Detectable Activity Report
Sample ID : S99T001737-DUP

Page : 3
Acquisition date : 2-NOV-1999 22:21:01

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BE-7	25377.	477.59	2.2245E+00
NA-24	14.	1368.55	1.5654E-02
K-40	326.	1460.75	6.3683E-01
AR-41	30.	1293.60	3.1446E-02
SC-46	75.	1120.55	2.7184E-02
CR-51	20418.	320.08	1.4109E+00
MN-54	71.	834.83	2.1064E-02
CO-56	63.	846.76	2.0199E-02
CO-58	58.	810.78	1.8799E-02
FE-59	38.	1099.25	3.4600E-02
CO-60	43.	1332.50	2.4254E-02
ZN-65	41.	1115.55	4.0397E-02
SE-75	22596.	264.66	2.1670E-01
KR-85	12665.	514.00	4.0149E+01
SR-85	12662.	514.01	1.8159E-01
Y-88	10.	1836.06	1.6995E-02
Y-91	44.	1204.67	7.4997E+00
NB-94	90.	871.09	2.4346E-02
RU-103	15655.	497.08	2.0650E-01
RURH-106	5318.	621.93	2.7096E+00
AG-108m	230.	722.94	3.6082E-02
CD-109	18719.	88.03	3.5616E+00
AG-110M	14382.	657.76	2.4453E-01
SN-113	22390.	391.69	2.8039E-01
TE-123m	22494.	159.00	1.1442E-01
SB-124	5493.	602.73	1.3591E-01
SB-125	25594.	427.89	7.0896E-01
TE-125m	19945.	109.27	3.5978E+01
I-129	17031.	39.60	3.7203E+01
I-131	21268.	364.48	2.0218E-01
XE-131m	22239.	163.93	4.9172E+00
BA-133	20763.	356.02	2.5458E-01
CS-134	5540.	604.70	1.3708E-01
CS-136	62.	818.51	1.9632E-02
CS-138	11.	1435.86	6.2801E-02
CE-139	22065.	165.85	1.2014E-01
BA-140	9304.	537.31	6.4009E-01
LA-140	23.	1596.21	2.2794E-02
CE-141	22397.	145.44	1.9812E-01
CE-144	22341.	133.51	8.6968E-01
CEPR-144	22340.	133.51	1.7378E+00
EU-152	21994.	121.78	3.4873E-01
EU-155	18652.	86.54	4.0285E-01
HF-181	20209.	482.18	2.5768E-01
TA-182	17139.	67.75	5.4359E-01
HG-203	21531.	279.20	1.5889E-01
BI-207	6114.	569.70	1.3623E-01
TL-208	21882.	277.36	2.0548E+00
PB-210	16780.	46.50	2.5948E+01
BI-212	135.	727.18	3.8282E-01
PB-212	25372.	238.63	2.8426E-01

Minimum Detectable Activity Report (continued)

Page : 4

Sample ID : S99T001737-DUP

Acquisition date : 2-NOV-1999 22:21:01

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
PB-214	20809.	351.92	1.7787E+00
RA-224	25047.	240.99	3.1564E+00
RA-226	28383.	186.10	3.2304E+00
AC-228	67.	911.21	8.2911E-02
TH-228	18685.	84.37	1.0936E+01
TH-229	18758.	88.47	5.1678E-01
U-232	16977.	57.78	1.9198E+02
PA-233	20324.	312.17	3.5940E-01
UTH-233	24749.	245.34	1.1359E+02
PA-234M	49.	1001.03	3.1537E+00
TH-234	16842.	63.29	7.2371E+00
U-235	28054.	185.71	1.9532E-01
NP-237	18657.	86.48	1.0672E+00
U-237	19241.	101.07	4.2591E-01
NP-238	54.	984.45	7.7312E-02
NP-239	19746.	106.12	4.5971E-01
PU-239	22004.	129.30	1.5072E+03
AM-241	16859.	59.54	9.5090E-01
AM-243	17868.	74.67	2.9316E-01

LABCORE Completed Worklist Report for Worklist# 31603

Analyst: crj

Instrument: AB10

Book#: _____

Method: LA-220-101 Rev/Mod E-4

Worklist Comment: Rerun of 31549, S-111 szc

Seq Type	Sample#	R A	Test	Matrix	Actual	Found	DL or Yield	Unit
1 STD	0	0	0SR90-01 SR90-01 LIQUID		8.28E-04	8.04E-4	97.101 % Recovery	
1 STD	0	0	0SR90-01 SR90-01C LIQUID		100	9.42E+01	94.200 % Recovery	
1 STD	0	0	0SR90-01 SR90-01E LIQUID		1.00	2.33E+00	2.330 % Ct. Error	
2 BLNK	0	0	0SR90-01 SR90-01 LIQUID		1	<2.92E-4		uCi/mL
2 BLNK	0	0	0SR90-01 SR90-01C LIQUID		100	9.36E+01	93.600 % Recovery	
2 BLNK	0	0	0SR90-01 SR90-01E LIQUID		1.00	2.68E+02	268.000	uCi/mL
3 BLNK/BKG	0	0	0SR90-01 SR90-01 LIQUID		1	1.13E+00	1.138	BLNK/BKG
4 SAMPLE	S99T001731	0	0SR90-01 SR90-01 LIQUID		N/A	4.73E-02	3.72E-004	uCi/mL
4 SAMPLE	S99T001731	0	0SR90-01 SR90-01C LIQUID		N/A	9.36E+01		% Recovery
4 SAMPLE	S99T001731	0	0SR90-01 SR90-01E LIQUID		N/A	3.08E+00		% Ct. Error
5 DUP	S99T001731	0	0SR90-01 SR90-01 LIQUID		4.73E-2	4.36E-2		RPD
5 DUP	S99T001731	0	0SR90-01 SR90-01C LIQUID		100	9.41E+01	94.100 % Recovery	
5 DUP	S99T001731	0	0SR90-01 SR90-01E LIQUID		1.00	3.20E+00	3.200 % Ct. Err	
4 SAMPLE	S99T001734	0	0SR90-01 SR90-01 LIQUID		N/A	1.83E-01	3.67E-004	uCi/mL
4 SAMPLE	S99T001734	0	0SR90-01 SR90-01C LIQUID		N/A	9.44E+01		% Recovery
4 SAMPLE	S99T001734	0	0SR90-01 SR90-01E LIQUID		N/A	1.53E+00		% Ct. Error
5 DUP	S99T001734	0	0SR90-01 SR90-01 LIQUID		1.83E-1	1.61E-1		RPD
5 DUP	S99T001734	0	0SR90-01 SR90-01C LIQUID		100	9.38E+01	93.800 % Recovery	
5 DUP	S99T001734	0	0SR90-01 SR90-01E LIQUID		1.00	1.00E+00	1.000 % Ct. Err	
8 SAMPLE	S99T001735	0	0SR90-01 SR90-01 LIQUID		N/A	1.97E-01	3.64E-004	uCi/mL
8 SAMPLE	S99T001735	0	0SR90-01 SR90-01C LIQUID		N/A	9.46E+01		% Recovery
8 SAMPLE	S99T001735	0	0SR90-01 SR90-01E LIQUID		N/A	1.47E+00		% Ct. Error
9 DUP	S99T001735	0	0SR90-01 SR90-01 LIQUID		1.97E-1	1.85E-1		RPD
9 DUP	S99T001735	0	0SR90-01 SR90-01C LIQUID		100	9.46E+01	94.600 % Recovery	
9 DUP	S99T001735	0	0SR90-01 SR90-01E LIQUID		1.00	1.52E+00	1.520 % Ct. Err	

X/B
11/17/99
Sample was re-run

Final page for worklist# 31603

Analyst Signature _____ Date _____

Analyst Signature _____ Date _____

CRJ
Reviewer Signature _____ Date 3/7/99

Rerun S99T001734, High RPD.

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

LABCORE Data Entry Template for Worklist# 31603

Analyst: CRJ Instrument: AB00 Book# 46B57

Method: LA-220-101 Rev/Mod E-4

Worklist Comment: Rerun of 31549, S-111 szc

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	S99T001731 0		@SR90-01	LIQUID	99000304	S-111 GRAB
Analytes Requested: SR90-01 , SR90-01C, SR90-01E						
5 DUP	S99T001731 0		@SR90-01	LIQUID		
6 SAMPLE	S99T001734 0		@SR90-01	LIQUID	99000304	S-111 GRAB
Analytes Requested: SR90-01 , SR90-01C, SR90-01E						
7 DUP	S99T001734 0		@SR90-01	LIQUID		
8 SAMPLE	S99T001735 0		@SR90-01	LIQUID	99000304	S-111 GRAB
Analytes Requested: SR90-01 , SR90-01C, SR90-01E						
9 DUP	S99T001735 0		@SR90-01	LIQUID		

Final page for worklist # 31603

[Signature] 11/2/99
Signature Date

[Signature] 11-3-99
Signature Date
[Signature] 11-3-99

Data Entry Comments:

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

WORKBOOK PAGE: STD1

Sr-89/90 : LA-220-101 (E-3), 102 (INACTIVE), 104 (E-5) LIQUIDS

				STANDARD
	DETECTOR NUMBER	10	CARRIER ADDED In mL (CVA)	1.000
STD	TOTAL COUNTS (TC)	7289	GROSS WEIGHT (W2)	7.5420
	COUNT TIME In MINUTES (CT)	10	TARE WEIGHT (W1)	7.4478
31603	BACKGROUND In cpm (BKG)	7.1	NET WEIGHT (W3)	0.0942
	SAMPLE VOLUME In mL (SS)	1.000	DELTA TIME (HOURS) (DT)	5.10
@SR90-01	DILUTION FACTOR (DF)	1		
	DIGEST DILUTION FACTOR DDF	1		
LIQUID	SAMPLE COUNT RATE (Rs)	721.80	SR-90 EFFICIENCY FACTO (C1)	0.4051
	CRITICAL LEVEL (Lc)	1.61	Y-90 EFFICIENCY FACTOR (C2)	0.4503
99004054	TIME OF SEPARATION (ST)	09:29	Rmax	N/A
	DATE OF SEPARATION (SD)	11/02/99	DETECTION LIMIT (Ld)	3.30
0	TIME OF COUNT (TOC)	14:35	Sr-89/90 CONC. In $\mu\text{Ci/L}$	8.0413E-01
	DATE OF COUNT (DOC)	11/02/99		
N/A	STANDARD BOOK #	46B57		
	STANDARD VALUE In $\mu\text{Ci/mL}$	8.2773E-04		

WL31603-STD	
WB28870	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)
GLL	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
SAC	RS * DF * DDF * 1000 / ((C1 + C2 * (1 - e to the power of ((-natural log 2) / 64.2 * DT))) * SS * REC * 2220000)
CRJ	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2 - W1) / (CVA * 0.1000))
	Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)) * 1.96
	Percent Carrier Recovery = (Net Weight / Expected weight) * 100
	NOTE: Expected weight = CVA * 0.1
	Detection Levels and Less Than Values are determined from Procedure LA-508-002.
11/03/99	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100
11/02/99	Sr-89/90 CONCENTRATION 8.04E-04 $\mu\text{Ci/mL}$
11:15 AM	RELATIVE COUNTING ERROR 2.3%
S-111 GRAB	PERCENT CARRIER RECOVERY 94.2%

DETECTION
LEVEL

3.68E-06
 $\mu\text{Ci/L}$

Analyst:	CRJ	Date:	03-Nov-99
Signature of Chemist:	SAC	Date:	3 Nov 99

STANDARD.WB1 REV 2.0

22010NML

HNF-1685 REV. 0

WORKBOOK PAGE: BLANK2

LA-220-101 / E-3 Sr-89/90 : LA-220-101 (E-3), 102 (INACTIVE), 104 (E-5)

					BLNK
	DETECTOR NUMBER		10	CARRIER ADDED in mL (CVA)	1.000
BLNK	TOTAL COUNTS (TC)	80	GROSS WEIGHT (W2)		7.5160
	COUNT TIME in MINUTES (CT)	10	TARE WEIGHT (W1)		7.4224
31603	BACKGROUND in cpm (BKG)	7.1	NET WEIGHT (W3)		0.0936
	SAMPLE VOLUME in mL (SS)	1.000	DELTA TIME (HOURS) (DT)		5.27
@SR90-01	DILUTION FACTOR (DF)	101			
	DIGEST DILUTION FACTOR (DDF)	1			
LIQUID	SAMPLE COUNT RATE (Rs)	0.90	SR-90 EFFICIENCY FACTOR (C1)		0.4051
	CRITICAL LEVEL (Lc)	1.61	Y-90 EFFICIENCY FACTOR (C2)		0.4503
99004054	TIME OF SEPARATION (ST)	09:29	Rmax		2.58
	DATE OF SEPARATION (SD)	11/02/99	DETECTION LIMIT (Ld)		3.30
0	TIME OF COUNT (TOC)	14:45	Sr-89/90 CONC in µCi/L	<	2.9164E-01
	DATE OF COUNT (DOC)	11/02/99			
N/A					
WL31603-BLNK					

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

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

 $RS * DF * DDF / ((C1 + C2 * (1 - e^{(-\text{natural log } 2) / (64.2 * DT))}) * SS * REC * 2220000)$

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

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

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

NOTE: Expected weight = CVA * 0.1

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

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

11/03/99					
11/02/99	Sr-89/90 CONCENTRATION	< 2.92E-04	µCi/mL		DETECTION LEVEL
	LESS THAN Value was Determined from Rmax.				
11:15 AM	RELATIVE COUNTING ERROR	267.6%			3.73E-04
					µCi/mL
S-111 GRAB	PERCENT CARRIER RECOVERY	93.6%			

Analyst:	CRJ	Date:	03-Nov-99
Signature of Chemist:	SAC	Date:	3/1/99

BLANK.WB1 REV 2.0

22010NML

WORKBOOK PAGE: SAM4 *4 Nov 99*
 Sr-89/90 : LA-220-101 (E-3), 102 (INACTIVE), 104 (E-5)

					SAMPLE
	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA) 1.000
SAMPLE	TOTAL COUNTS	(TC)	4285	GROSS WEIGHT	(W2) 7.5346
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1) 7.4410
31603	BACKGROUND in cpm	(BKG)	7.1	NET WEIGHT	(W3) 0.0936
	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT) 5.52
@SR90-01	DILUTION FACTOR	DF	101		
	DIGEST DILUTION FACTOR	(DDF)	1		
LIQUID	SAMPLE COUNT RATE	(Rs)	419.40	SR-90 EFFICIENCY FACTOR	(C1) 0.4051
	CRITICAL LEVEL	(Lc)	1.61	Y-90 EFFICIENCY FACTOR	(C2) 0.4503
99004054	TIME OF SEPARATION	(ST)	09:29	Rmax	N/A
	DATE OF SEPARATION	(SD)	11/02/99	DETECTION LIMIT	(Ld) 3.30
0	TIME OF COUNT	(TOC)	15:00	Sr-89/90 CONC in $\mu\text{Ci/L}$	4.7283E+01
	DATE OF COUNT	(DOC)	11/02/99		
N/A					
S99T001731					
	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 $RS \geq 0$ or Replace RS with Lc if $RS < 0$				
	$RS * DF * DDF / ((C1 + C2 * (1 - e \text{ to the power of } ((-\text{natural log } 2) / 64.2 * DT))) * SS * REC * 2220000)$				
GLL	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery $((W2 - W1) / (CVA * 0.1000))$				
	Relative Counting Error = (The Square Root of $(TC + BKG * CT) / (TC - BKG * CT)$) * 1.96				
SAC	Percent Carrier Recovery = (Net Weight / Expected weight) * 100				
	NOTE: Expected weight = $CVA * 0.1$				
CRJ	Detection Levels and Less Than Values are determined from Procedure LA-508-002.				
	Delta Time (hours) = $((DOC - SD) * 24) + (TOC - ST) / 100$				
11/03/99					
11/02/99	Sr-89/90 CONCENTRATION		4.73E-02	$\mu\text{Ci/mL}$	DETECTION LEVEL 3.72E-04 $\mu\text{Ci/mL}$
11:15 AM	RELATIVE COUNTING ERROR		3.1%		
S-111 GRAB	PERCENT CARRIER RECOVERY		93.6%		

Analyst:	CRJ	Date:	03-Nov-99
Signature of Chemist:	<i>SAC</i>	Date:	3 Nov 99
SAMPLE.WB1 REV 2.0	22010NML		

WORKBOOK PAGE: DUP5 4/10/99

Sr-89/90 : LA-220-101 (E-5), 102 (INACTIVE), 104 (E-5)

Sr-89/90 : LA-220-101 (E-3), 102 (INACTIVE), 104 (E-5)						DUP	
	DETECTOR NUMBER		10	CARRIER ADDED In mL	(CVA)	1.000	
DUP	TOTAL COUNTS	(TC)	3968	GROSS WEIGHT	(W2)	7.5450	
	COUNT TIME In MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.4509	
31603	BACKGROUND In cpm	(BKG)	7.1	NET WEIGHT	(W3)	0.0941	
	SAMPLE VOLUME In mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)	5.68	
@SR90-01	DILUTION FACTOR	DF	101				
	DIGEST DILUTION FACTOR	(DDF)	1				
LIQUID	SAMPLE COUNT RATE	(Rs)	389.70	SR-90 EFFICIENCY FACTOR	(C1)	0.4051	
	CRITICAL LEVEL	(Lc)	1.61	Y-90 EFFICIENCY FACTOR	(C2)	0.4503	
99004054	TIME OF SEPARATION	(ST)	09:29	Rmax		N/A	
	DATE OF SEPARATION	(SD)	11/02/99	DETECTION LIMIT	(Ld)	3.30	
0	TIME OF COUNT	(TOC)	15:10	Sr-89/90 CONC In µCi/L 4.3624E+01			
	DATE OF COUNT	(DOC)	11/02/99				
N/A							
S99T001731							
	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						
	RS*DF*DDF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)						
GLL	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))						
	Relative Counting Error = (The Square Root of (TC + BKG * CT) / (TC - BKG * CT))*1.96						
SAC	Percent Carrier Recovery = (Net Weight / Expected weight) * 100						
	NOTE: Expected weight = CVA * 0.1						
CRJ	Detection Levels and Less Than Values are determined from Procedure LA-508-002.						
	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100						
11/03/99							
11/02/99	Sr-89/90 CONCENTRATION	4.36E-02				DETECTION LEVEL 3.70E-04 µCi/mL	
		µCi/mL					
11:15 AM	RELATIVE COUNTING ERROR	3.2%					
S-111 GRAB	PERCENT CARRIER RECOVERY	94.1%					

Analyst:	CRJ	Date:	03-Nov-99
Signature of Chemist:		SAC	Date: 3 Nov 99

SAMPLE.WB1 REV 2.0

22010NML

WORKBOOK PAGE: SAM8 *11/03/99*

Sr-89/90 : LA-220-101 (E-3), 102 (INACTIVE), 104 (E-5)

					SAMPLE
	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA) 1.000
SAMPLE	TOTAL COUNTS	(TC)	17943	GROSS WEIGHT	(W2) 7.5397
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1) 7.4451
31603	BACKGROUND in cpm	(BKG)	7.1	NET WEIGHT	(W3) 0.0946
	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT) 6.52
@SR90-01	DILUTION FACTOR	DF	101		
	DIGEST DILUTION FACTOR	(DDF)	1		
LIQUID	SAMPLE COUNT RATE	(Rs)	1787.20	SR-90 EFFICIENCY FACTOR	(C1) 0.4051
	CRITICAL LEVEL	(Lc)	1.61	Y-90 EFFICIENCY FACTOR	(C2) 0.4503
99004054	TIME OF SEPARATION	(ST)	09:24	Rmax	N/A
	DATE OF SEPARATION	(SD)	11/02/99	DETECTION LIMIT	(Ld) 3.30
0	TIME OF COUNT	(TOC)	15:55	Sr-89/90 CONC in $\mu\text{Ci/L}$ 1.9727E+02	
	DATE OF COUNT	(DOC)	11/02/99		
N/A					
S99T001735					

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

Sr-89/90 CONC in $\mu\text{Ci/L}$ Replace RS with RMAX if $RS \leq Lc$ and $RS \geq 0$ or Replace RS with Lc if $RS < 0$ $RS * DF * DDF / ((C1 + C2 * (1 - e \text{ to the power of } ((-\text{natural log } 2) / 64.2 * DT))) * SS * REC * 2220000)$ NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery $((W2 - W1) / (CVA * 0.1000))$ Relative Counting Error = (The Square Root of $(TC + BKG * CT) / (TC - BKG * CT)$) * 1.96

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

NOTE: Expected weight = $CVA * 0.1$

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

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

11/03/99					
11/02/99	Sr-89/90 CONCENTRATION	1.97E-01	$\mu\text{Ci/mL}$	DETECTION LEVEL	
11:15 AM	RELATIVE COUNTING ERROR	1.5%		3.64E-04	
S-111 GRAB	PERCENT CARRIER RECOVERY	94.6%		$\mu\text{Ci/mL}$	

Analyst:	CRJ	Date:	03-Nov-99
Signature of Chemist:	<i>SAC</i>	Date:	3 Nov 99
SAMPLE.WB1 REV 2.0	22010NML		

WORKBOOK PAGE: DUP9 4/1/99

Sr-89/90 : LA-220-101 (E-5), 102 (INACTIVE), 104 (E-5)

					DUP
	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA) 1.000
DUP	TOTAL COUNTS	(TC)	16853	GROSS WEIGHT	(W2) 7.5408
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1) 7.4462
31603	BACKGROUND in cpm	(BKG)	7.1	NET WEIGHT	(W3) 0.0946
	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT) 6.68
@SR90-01	DILUTION FACTOR	DF	101		
	DIGEST DILUTION FACTOR	(DDF)	1		
LIQUID	SAMPLE COUNT RATE	(Rs)	1678.20	SR-90 EFFICIENCY FACTOR	(C1) 0.4051
	CRITICAL LEVEL	(Lc)	1.61	Y-90 EFFICIENCY FACTOR	(C2) 0.4503
99004054	TIME OF SEPARATION	(ST)	09:24	Rmax	N/A
	DATE OF SEPARATION	(SD)	11/02/99	DETECTION LIMIT	(Ld) 3.30
0	TIME OF COUNT	(TOC)	16:05	Sr-89/90 CONC in $\mu\text{Ci/L}$	1.8492E+02
	DATE OF COUNT	(DOC)	11/02/99		
N/A					

S99T001735

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 $RS \geq 0$ or Replace RS with Lc if $RS < 0$ $RS * DF * DDF / ((C1 + C2 * (1 - e \text{ to the power of } ((-\text{natural log } 2) / 64.2 * DT))) * SS * REC * 2220000)$

GLL

NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery $((W2 - W1) / (CVA * 0.1000))$ Relative Counting Error = (The Square Root of $(TC + BKG * CT) / (TC - BKG * CT) * 1.96$

SAC

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

NOTE: Expected weight = $CVA * 0.1$

CRJ

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

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

11/03/99

				DETECTION LEVEL
11/02/99	Sr-89/90 CONCENTRATION	1.85E-01	$\mu\text{Ci/mL}$	
11:15 AM	RELATIVE COUNTING ERROR	1.5%		3.64E-04 $\mu\text{Ci/mL}$
S-111 GRAB	PERCENT CARRIER RECOVERY	94.6%		

Analyst:

CRJ

Date:

03-Nov-99

Signature of Chemist:

SAC

Date:

3 Nov 99

SAMPLE.WB1 REV 2.0

22010NML

377

LABCORE Completed Worklist Report for Worklist# 31625

Analyst: scl

Instrument: AB10

Book#: _____

Method: LA-220-101 Rev/Mod E-4

Worklist Comment: S-111 GRAB, @SR90-01, STD:1.0mL, SS by Ludlum. skm

Seq Type	Sample#	R A	Test	Matrix	Actual	Found	DL or Yield	Unit
1 STD	0		SR90-01 SR90-01	SOLID	8.28E-04	8.40E-4	101.449 %	Recovery
1 STD	0		SR90-01 SR90-01C	SOLID	100	9.09E+01	90.900 %	Recovery
1 STD	0		SR90-01 SR90-01E	SOLID	1.00	2.29E+00	2.290 %	Ct. Error
2 BLNK-PREP	0		SR90-01 SR90-01	SOLID	1	2.28E-2	0.023	uCi/g
2 BLNK-PREP	0		SR90-01 SR90-01C	SOLID	100	8.76E+01	87.600 %	Recovery
2 BLNK-PREP	0		SR90-01 SR90-01E	SOLID	1.00	7.07E+01	70.700	uCi/g
3 BLNK/BKG	0		SR90-01 SR90-01	SOLID	1	1.46E+00	1.460	BLNK/BKG
4 SAMPLE	S99T001737	0 F	SR90-01 SR90-01	SOLID	N/A	2.93E+01	2.22e-002	uCi/g
4 SAMPLE	S99T001737	0 F	SR90-01 SR90-01C	SOLID	N/A	8.08E+01		% Recovery
4 SAMPLE	S99T001737	0 F	SR90-01 SR90-01E	SOLID	N/A	8.90E-01		% Ct. Error
5 DUP	S99T001737	0 F	SR90-01 SR90-01	SOLID	2.93E+1	2.65E+1	10.036	RPD
5 DUP	S99T001737	0 F	SR90-01 SR90-01C	SOLID	100	9.26E+01	92.600 %	Recovery
5 DUP	S99T001737	0 F	SR90-01 SR90-01E	SOLID	1.00	8.52E-01	0.852	% Cnt Err

Final page for worklist# 31625

Analyst Signature

Date

Analyst Signature

Date

Reviewer Signature

Date

11/02/99 10:26
ws2

HNF-1685 REV. 0

Page: 1

LABCORE Data Entry Template for Worklist# 31625

Analyst: S.L. Instrument: AB00 #10 Book# 46 B57

Method: LA-220-101 Rev/Mod E-4

Worklist Comment: S-111 GRAB, @SR90-01, STD:1.0mL, SS by Ludlum. skm

S Type	Sample#	R A	Test	Matrix	Group#	Project
1 STD			@SR90-01	SOLID		
2 BLNK-PREP			@SR90-01	SOLID		
3 BLNK/BKG			@SR90-01	SOLID		
4 SAMPLE	S99T001737	0 F	@SR90-01	SOLID	99000304	S-111 GRAB
Analytes Requested: SR90-01 , SR90-01C, SR90-01E						
5 DUP	S99T001737	0 F	@SR90-01	SOLID		

Final page for worklist # 31625

Sue Lai 11-3-99
Signature Date

Im Buche 11-4-99
Signature Date
A7 LPLT 11-4-99

Data Entry Comments:

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

WORKBOOK PAGE: STD1

Sr-89/90 : LA-220-101 (E-3), 102 (INACTIVE), 104 (E-5) LIQUIDS

	DETECTOR NUMBER	10	CARRIER ADDED in mL (CVA)	1.000
STD	TOTAL COUNTS (TC)	7593	GROSS WEIGHT (W2)	7.3906
	COUNT TIME in MINUTES (CT)	10	TARE WEIGHT (W1)	7.2997
31625	BACKGROUND in cpm (BKG)	8.9	NET WEIGHT (W3)	0.0909
	SAMPLE VOLUME in mL (SS)	1.000	DELTA TIME (HOURS) (DT)	8.05
@SR90-01	DILUTION FACTOR (DF)	1		
	DIGEST DILUTION FACTOR DDF	1		
LIQUID	SAMPLE COUNT RATE (Rs)	750.40	SR-90 EFFICIENCY FACTO (C1)	0.4051
	CRITICAL LEVEL (Lc)	1.80	Y-90 EFFICIENCY FACTOR (C2)	0.4503
99004078	TIME OF SEPARATION (ST)	10:30	Rmax	N/A
	DATE OF SEPARATION (SD)	11/03/99	DETECTION LIMIT (Ld)	3.69
0	TIME OF COUNT (TOC)	18:33	Sr-89/90 CONC. in µCi/L	8.4019E-01
	DATE OF COUNT (DOC)	11/03/99		
N/A	STANDARD BOOK #	46B57		
	STANDARD VALUE in µCi/mL	8.2768E-04		
WL31625-STD				
WB26870	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)			
	Sr-89/90 CONC in µCi/mL REPLACE RS WITH RMAX IF RS<=Lc AND RS>=0 OR REPLACE RS WITH Lc IF RS<0			
EMB	RS*DF*DDF*1000/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)			
	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))			
SAC	Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)			
	Percent Carrier Recovery = (Net Weight / Expected weight) * 100			
SCL	NOTE: Expected weight = CVA * 0.1			
	Detection Levels and Less Than Values are determined from Procedure LA-508-002.			
11/04/99	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100			
11/03/99	Sr-89/90 CONCENTRATION	8.40E-04	µCi/mL	DETECTION LEVEL 4.13E-06 µCi/L
01:25 PM	RELATIVE COUNTING ERROR	2.3%		
S-111 GRAB	PERCENT CARRIER RECOVERY	90.9%		

Analyst:	SCL	Date:	04-Nov-99
Signature of Chemist:	SAC	Date:	4/7/99

STANDARD.WB1 REV 2.0

22010NML

LA-220-101 / E-3 4
 WORKBOOK PAGE: BLANK2

LA-220-101 / E-3 4 Sr-89/90 : LA-220-101 (E-3), 102 (INACTIVE), 104 (E-5)

	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA)	1.000
BLNK-PREP	TOTAL COUNTS	(TC)	130	GROSS WEIGHT	(W2)	7.3823
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.2947
31625	BACKGROUND in cpm	(BKG)	8.9	NET WEIGHT	(W3)	0.0876
	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)	8.33
@SR90-01	DILUTION FACTOR	DF	1			
	DIGEST FACTOR (g/L)	(D g/L)	2.0812			
SOLID	SAMPLE COUNT RATE	(Rs)	4.10	SR-90 EFFICIENCY FACTOR	(C1)	0.4051
	CRITICAL LEVEL	(Lc)	1.80	Y-90 EFFICIENCY FACTOR	(C2)	0.4503
99004078	TIME OF SEPARATION	(ST)	10:30	Rmax		N/A
	DATE OF SEPARATION	(SD)	11/03/99	DETECTION LIMIT	(Ld)	3.69
0	TIME OF COUNT	(TOC)	18:50	Sr-89/90 CONC in µCi/g		2.2823E-02
	DATE OF COUNT	(DOC)	11/03/99			
N/A						

WL31625 BLNK-PREP

	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)				
WB26870	Sr-89/90 CONC in µCi/g Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0				
	RS*1000*DF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*(Dg/L)*REC*2220000)				
EMB	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))				
	Relative Counting Error = (The Square Root of (TC + BKG * CT) / (TC - BKG * CT))*1.96				
SAC	Percent Carrier Recovery = (Net Weight / Expected weight) * 100				
	NOTE: Expected weight = CVA * 0.1				
SCL	Detection Levels and Less Than Values are determined from Procedure LA-508-002.				
	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100				
11/04/99					
11/03/99	Sr-89/90 CONCENTRATION	2.28E-02	µCi/g	DETECTION LEVEL 2.05E-02 µCi/g	
01:25 PM	RELATIVE COUNTING ERROR	70.7%			
S-111 GRAB	PERCENT CARRIER RECOVERY	87.6%			

Analyst:	SCL	Date:	04-Nov-99
Signature of Chemist:		SAC	Date: 4/7/99

BLANK.WB1 REV 2.0

22010NML

WORKBOOK PAGE: SAM4

Sr-89/90 : LA-220-101 (E-3), 102 (INACTIVE), 104 (E-5)

				SAMPLE	
	DETECTOR NUMBER		10	CARRIER ADDED In mL	(CVA) 1.000
SAMPLE	TOTAL COUNTS	(TC)	48766	GROSS WEIGHT	(W2) 7.4040
	COUNT TIME In MINUTES	(CT)	10	TARE WEIGHT	(W1) 7.3232
31625	BACKGROUND In cpm	(BKG)	8.9	NET WEIGHT	(W3) 0.0808
	SAMPLE VOLUME In mL	(SS)	0.100	DELTA TIME (HOURS)	(DT) 8.50
@SR90-01	DILUTION FACTOR	DF	1		
	DIGEST FACTOR (g/L)	(D g/L)	2.0812		
SOLID	SAMPLE COUNT RATE	(Rs)	4867.70	SR-90 EFFICIENCY FACTOR	(C1) 0.4051
	CRITICAL LEVEL	(Lc)	1.80	Y-90 EFFICIENCY FACTOR	(C2) 0.4503
99004078	TIME OF SEPARATION	(ST)	10:30	Rmax	N/A
	DATE OF SEPARATION	(SD)	11/03/99	DETECTION LIMIT	(Ld) 3.69
0	TIME OF COUNT	(TOC)	19:00	Sr-89/90 CONC In $\mu\text{Ci/g}$	2.9329E+01
	DATE OF COUNT	(DOC)	11/03/99		
FUSION01					
S99T001737					

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

Sr-89/90 CONC in $\mu\text{Ci/g}$ Replace RS with RMAX if $RS \leq Lc$ and $RS > 0$ or Replace RS with Lc if $RS < 0$ $RS * 1000 * DF / ((C1 + C2 * (1 - e \text{ to the power of } ((-\text{natural log } 2) / 64.2 * DT))) * SS * (Dg/L) * REC * 2220000)$ NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery $((W2 - W1) / (CVA * 0.1000))$ Relative Counting Error = $(\text{The Square Root of } (TC + BKG * CT) / (TC - BKG * CT)) * 1.98$ Percent Carrier Recovery = $(\text{Net Weight} / \text{Expected weight}) * 100$ NOTE: Expected weight = $CVA * 0.1$

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

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

11/04/99				DETECTION LEVEL 2.22E-02 μCi/g
11/03/99	Sr-89/90 CONCENTRATION	2.93E+01	μCi/g	
01:25 PM	RELATIVE COUNTING ERROR	0.9%		
8-111 GRAB	PERCENT CARRIER RECOVERY	80.8%		

Analyst:

SCL

Date:

04-Nov-99

Signature of Chemist:

SAC

Date:

7 Nov 99

SAMPLE.WB1 REV 2.0

22010NML

WORKBOOK PAGE: DUP5

Sr-89/90 : LA-220-101 (E-3), 102 (INACTIVE), 104 (E-5)

DUP	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA)	1.000
DUP	TOTAL COUNTS	(TC)	53219	GROSS WEIGHT	(W2)	7.4064
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.3138
31625	BACKGROUND in cpm	(BKG)	8.9	NET WEIGHT	(W3)	0.0926
	SAMPLE VOLUME in mL	(SS)	0.100	DELTA TIME (HOURS)	(DT)	8.80
@SR90-01	DILUTION FACTOR	DF	1			
	DIGEST FACTOR (g/L)	(D g/L)	2.1852			
SOLID	SAMPLE COUNT RATE	(Rs)	5313.00	SR-90 EFFICIENCY FACTOR	(C1)	0.4051
	CRITICAL LEVEL	(Lc)	1.80	Y-90 EFFICIENCY FACTOR	(C2)	0.4503
99004078	TIME OF SEPARATION	(ST)	10:30	Rmax		N/A
	DATE OF SEPARATION	(SD)	11/03/99	DETECTION LIMIT	(Ld)	3.69
0	TIME OF COUNT	(TOC)	19:18	Sr-89/90 CONC in $\mu\text{Ci/g}$		2.6524E+01
	DATE OF COUNT	(DOC)	11/03/99			
FUSION01						
S99T001737						
	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)					
WB26870	Sr-89/90 CONC in $\mu\text{Ci/g}$ Replace RS with RMAX if $RS \leq Lc$ and $RS \geq 0$ or Replace RS with Lc if $RS < 0$					
	$RS * 1000 * DF / ((C1 + C2 * (1 - e \text{ to the power of } ((-\text{natural log } 2) / 64.2 * DT))) * SS * (Dg/L) * REC * 2220000)$					
EMB	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery $((W2 - W1) / (CVA * 0.1000))$					
	Relative Counting Error = (The Square Root of $(TC + BKG * CT) / (TC - BKG * CT)$) * 1.96					
SAC	Percent Carrier Recovery = (Net Weight / Expected weight) * 100					
	NOTE: Expected weight = $CVA * 0.1$					
SCL	Detection Levels and Less Than Values are determined from Procedure LA-508-002.					
	Delta Time (hours) = $((DOC - SD) * 24) + (TOC - ST) / 100$					
11/04/99						
11/03/99	Sr-89/90 CONCENTRATION		2.65E+01	$\mu\text{Ci/g}$		DETECTION LEVEL 1.84E-02 $\mu\text{Ci/g}$
01:25 PM	RELATIVE COUNTING ERROR		0.9%			
S-111 GRAB	PERCENT CARRIER RECOVERY		92.6%			

Analyst:

SCL

Date:

04-Nov-99

Signature of Chemist:

SAC

Date:

SAMPLE.WB1 REV 2.0

22010NML

LABCORE Completed Worklist Report for Worklist# 31640

Analyst: crj

Instrument: AB10

Book#: _____

Method: LA-220-101 Rev/Mod E-4

Worklist Comment: S-111 GRAB, @SR90-01, STD: 1.0mL, SS by Ludlum. skm

Seq Type	Sample#	R A	Test	Matrix	Actual	Found	DL or Yield	Unit
1 STD	0	0	SR90-01 SR90-01 LIQUID		8.28E-04	8.29E-4	100.121 % Recovery	
1 STD	0	0	SR90-01 SR90-01C LIQUID		100	9.43E+01	94.300 % Recovery	
1 STD	0	0	SR90-01 SR90-01E LIQUID		1.00	1.28E+00	2.280 % Ct. Error	
2 BLNK	0	0	SR90-01 SR90-01 LIQUID		1	5.66E-4	5.660e-004 uCi/mL	
2 BLNK	0	0	SR90-01 SR90-01C LIQUID		100	9.28E+01	92.800 % Recovery	
2 BLNK	0	0	SR90-01 SR90-01E LIQUID		1.00	5.35E+01	53.500 uCi/mL	
3 BLNK/BKG	0	0	SR90-01 SR90-01 LIQUID		1	1.74E+00	1.740 BLNK/BKG	
4 SAMPLE	S99T001734	0	SR90-01 SR90-01 LIQUID		N/A	1.29E-01	3.65e-004 uCi/mL	
4 SAMPLE	S99T001734	0	SR90-01 SR90-01C LIQUID		N/A	9.28E+01	% Recovery	
4 SAMPLE	S99T001734	0	SR90-01 SR90-01E LIQUID		N/A	1.85E+00	% Ct. Error	
5 DUP	S99T001734	0	SR90-01 SR90-01 LIQUID		1.29E-1	1.48E-1	13.718 RPD	
5 DUP	S99T001734	0	SR90-01 SR90-01C LIQUID		100	9.32E+01	93.200 % Recovery	
5 DUP	S99T001734	0	SR90-01 SR90-01E LIQUID		1.00	1.72E+00	1.720 % Ct. Err	

Final page for worklist# 31640

Analyst Signature _____ Date _____

Analyst Signature _____ Date _____

Reviewer Signature

8/7/99
Date

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

11/03/99 14:29
ws2

Page: 1

LABCORE Data Entry Template for Worklist# 31640Analyst: CRJ Instrument: AB00 10 Book# 46 B57Method: LA-220-101 Rev/Mod E-4

Worklist Comment: S-111 GRAB, @SR90-01, STD: 1.0mL, SS by Ludlum. skm

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	S99T001734 0		@SR90-01	LIQUID	99000304	S-111 GRAB
Analytes Requested: SR90-01 , SR90-01C, SR90-01E						
5 DUP	S99T001734 0		@SR90-01	LIQUID		

Final page for worklist # 31640

[Signature] 11/4/99
Signature Date

[Signature] 11/5/99
Signature Date
[Signature] 11/6/99

Data Entry Comments:

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

WORKBOOK PAGE: STD1

Sr-89/90 : LA-220-101 (E-3), 102 (INACTIVE), 104 (E-5) LIQUIDS

	DETECTOR NUMBER	10	CARRIER ADDED (n mL) (CVA)	STANDARD
STD	TOTAL COUNTS (TC)	7570	GROSS WEIGHT (W2)	1.000
	COUNT TIME in MINUTES (CT)	10	TARE WEIGHT (W1)	7.5345
31640	BACKGROUND in cpm (BKG)	6.8	NET WEIGHT (W3)	7.4402
	SAMPLE VOLUME in mL (SS)	1.000	DELTA TIME (HOURS) (DT)	0.0943
@SR90-01	DILUTION FACTOR (DF)	1		5.75
	DIGEST DILUTION FACTOR DDF	1		
LIQUID	SAMPLE COUNT RATE (Rs)	750.20	SR-90 EFFICIENCY FACTO (C1)	
	CRITICAL LEVEL (Lc)	1.57	Y-90 EFFICIENCY FACTOR (C2)	0.4051
99004099	TIME OF SEPARATION (ST)	10:15	Rmax	0.4503
	DATE OF SEPARATION (SD)	11/04/99	DETECTION LIMIT (Ld)	N/A
0	TIME OF COUNT (TOC)	16:00	Sr-89/90 CONC. in µCi/L	3.23
	DATE OF COUNT (DOC)	11/04/99		
N/A	STANDARD BOOK #	46B57		
	STANDARD VALUE in µCi/mL	8.2763E-04		
WL31640-STD				
WB26870	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)			
	Sr-89/90 CONC in µCi/mL REPLACE RS WITH RMAX IF RS<=Lc AND RS>=0 OR REPLACE RS WITH Lc IF RS<0			
NEW	RS*DF*DDF*1000/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)			
	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))			
SAC	Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)			
	Percent Carrier Recovery = (Net Weight / Expected weight) * 100			
CRJ	NOTE: Expected weight = CVA * 0.1			
	Detection Levels and Less Than Values are determined from Procedure LA-508-002.			
11/05/99	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100			
11/04/99	Sr-89/90 CONCENTRATION	8.29E-04	µCi/mL	DETECTION LEVEL 3.57E-06 µCi/L
02:05 PM	RELATIVE COUNTING ERROR	2.3%		
8-111 GRAB	PERCENT CARRIER RECOVERY	94.3%		

Analyst:	CRJ	Date:	05-Nov-99
Signature of Chemist:	<i>daCath</i>	Date:	8/12/99

STANDARD.WB1 REV 2.0

22010NML

AD 11/16/99
 WORKBOOK PAGE: BLANK2

LA-220-101 / E-34 Sr-89/90 : LA-220-101 (E-3), 102 (INACTIVE), 104 (E-5)

					BLNK
	DETECTOR NUMBER		10	CARRIER ADDED in mL (CVA)	1.000
BLNK	TOTAL COUNTS (TC)		118	GROSS WEIGHT (W2)	7.5209
	COUNT TIME in MINUTES (CT)		10	TARE WEIGHT (W1)	7.4281
31640	BACKGROUND in cpm (BKG)		6.8	NET WEIGHT (W3)	0.0928
	SAMPLE VOLUME in mL (SS)		1.000	DELTA TIME (HOURS) (DT)	5.92
@SR90-01	DILUTION FACTOR (DF)		101		
	DIGEST DILUTION FACTOR (DDF)		1		
LIQUID	SAMPLE COUNT RATE (Rs)		5.00	SR-90 EFFICIENCY FACTOR (C1)	0.4051
	CRITICAL LEVEL (Lc)		1.57	Y-90 EFFICIENCY FACTOR (C2)	0.4503
99004099	TIME OF SEPARATION (ST)		10:15	Rmax	N/A
	DATE OF SEPARATION (SD)		11/04/99	DETECTION LIMIT (Ld)	3.23
0	TIME OF COUNT (TOC)		16:10	Sr-89/90 CONC in µCi/L	5.6616E-01
	DATE OF COUNT (DOC)		11/04/99		
N/A					

WL31640-BLK	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				
	RS*DF*DDF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)				
NEW	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))				
	Relative Counting Error = (The Square Root of (TC + BKG * CT) / (TC - BKG * CT))*1.96				
SAC	Percent Carrier Recovery = (Net Weight / Expected weight) * 100				
	NOTE: Expected weight = CVA * 0.1				
CRJ	Detection Levels and Less Than Values are determined from Procedure LA-508-002.				
	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100				
11/05/99					
11/04/99	Sr-89/90 CONCENTRATION		5.66E-04	µCi/mL	DETECTION LEVEL 3.66E-04 µCi/mL
02:05 PM	RELATIVE COUNTING ERROR		53.5%		
S-111 GRAB	PERCENT CARRIER RECOVERY		92.8%		

Analyst:	CRJ	Date:	05-Nov-99
Signature of Chemist:	SAC	Date:	8 Nov 99

BLANK.WB1 REV 2.0

22010NML

WORKBOOK PAGE: SAM4

Sr-89/90 : LA-220-101 (E-3), 102 (INACTIVE), 104 (E-6)

					SAMPLE
	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA) 1.000
SAMPLE	TOTAL COUNTS	(TC)	11486	GROSS WEIGHT	(W2) 7.5442
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1) 7.4514
31640	BACKGROUND in cpm	(BKG)	6.8	NET WEIGHT	(W3) 0.0928
	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT) 6.17
@SR90-01	DILUTION FACTOR	DF	101		
	DIGEST DILUTION FACTOR	(DDF)	1		
LIQUID	SAMPLE COUNT RATE	(Rs)	1141.80	SR-90 EFFICIENCY FACTOR	(C1) 0.4051
	CRITICAL LEVEL	(Lc)	1.57	Y-90 EFFICIENCY FACTOR	(C2) 0.4503
99004099	TIME OF SEPARATION	(ST)	10:15	Rmax	N/A
	DATE OF SEPARATION	(SD)	11/04/99	DETECTION LIMIT	(Ld) 3.23
0	TIME OF COUNT	(TOC)	16:25	Sr-89/90 CONC in $\mu\text{Ci/L}$	1.2895E+02
	DATE OF COUNT	(DOC)	11/04/99		
N/A					

S99T001734					
	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 $\geq$ 0 or Replace RS with Lc if RS $<$ 0				
	$RS * DF * DDF / ((C1 + C2 * (1 - e \text{ to the power of } ((-\text{natural log } 2) / 64.2 * DT))) * SS * REC * 2220000)$				
NEW	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery $((W2 - W1) / (CVA * 0.1000))$				
	Relative Counting Error = (The Square Root of $(TC + BKG * CT) / (TC - BKG * CT) * 1.96$				
SAC	Percent Carrier Recovery = (Net Weight / Expected weight) * 100				
	NOTE: Expected weight = CVA * 0.1				
CRJ	Detection Levels and Less Than Values are determined from Procedure LA-508-002.				
	Delta Time (hours) = $((DOC - SD) * 24) + (TOC - ST) / 100$				
11/05/99					DETECTION LEVEL 3.65E-04 $\mu\text{Ci/mL}$
11/04/99	Sr-89/90 CONCENTRATION	1.29E-01	$\mu\text{Ci/mL}$		
02:05 PM	RELATIVE COUNTING ERROR	1.8%			
8-111 GRAB	PERCENT CARRIER RECOVERY	92.8%			

Analyst:	CRJ	Date:	05-Nov-99
Signature of Chemist:	SAC	Date:	8/11/99

SAMPLE.WB1 REV 2.0

22010NML

WORKBOOK PAGE: DUP5 *4* *AD 11/11/99*
 Sr-89/90 : LA-220-101 (E-3), 102 (INACTIVE), 104 (E-5)

					DUP
	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA) 1.000
DUP	TOTAL COUNTS	(TC)	13241	GROSS WEIGHT	(W2) 7.5398
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1) 7.4466
31640	BACKGROUND in cpm	(BKG)	6.8	NET WEIGHT	(W3) 0.0932
	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT) 6.33
@SR90-01	DILUTION FACTOR	DF	101		
	DIGEST DILUTION FACTOR	(DDF)	1		
LIQUID	SAMPLE COUNT RATE	(Rs)	1317.30	SR-90 EFFICIENCY FACTOR	(C1) 0.4051
	CRITICAL LEVEL	(Lc)	1.57	Y-90 EFFICIENCY FACTOR	(C2) 0.4503
99004099	TIME OF SEPARATION	(ST)	10:15	Rmax	N/A
	DATE OF SEPARATION	(SD)	11/04/99	DETECTION LIMIT	(Ld) 3.23
0	TIME OF COUNT	(TOC)	16:35	Sr-89/90 CONC in $\mu\text{Ci/L}$	1.4787E+02
	DATE OF COUNT	(DOC)	11/04/99		
N/A					
S99T001734					

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

Sr-89/90 CONC in $\mu\text{Ci/L}$ Replace RS with RMAX if $RS \leq Lc$ and $RS \geq 0$ or Replace RS with Lc if $RS < 0$

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

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

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

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

NOTE: Expected weight = $CVA * 0.1$

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

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

11/05/99					
11/04/99	Sr-89/90 CONCENTRATION	1.48E-01	$\mu\text{Ci/mL}$		DETECTION LEVEL
02:05 PM	RELATIVE COUNTING ERROR	1.7%			3.63E-04
S-111 GRAB	PERCENT CARRIER RECOVERY	93.2%			$\mu\text{Ci/mL}$

Analyst:	CRJ	Date:	05-Nov-99
Signature of Chemist:	<i>[Signature]</i> SAC	Date:	8 Nov 99
SAMPLE.WB1 REV 2.0	22010NML		

LABCORE Completed Worklist Report for Worklist# 31550

Analyst: ak1

Instrument: AB19

Book#: _____

Method: LA-953-104 Rev/Mod bl

Worklist Comment: S-111 FOR @AM24101, RLC

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
1	STD	0	0	0	AM24101 AM24101 LIQUID		1.07E-04	1.09E-4	101.889	% Recovery
1	STD	0	0	0	AM24101 AM24101E LIQUID		1.0	1.76E+00	1.760	% Ct Error
1	STD	0	0	0	AM24101 AM24101T LIQUID		100.	1.00E+02	100.000	% Recovery
2	BLNK	0	0	0	AM24101 AM24101 LIQUID		1	<2.77E-5		uCi/mL
2	BLNK	0	0	0	AM24101 AM24101E LIQUID		1.0	1.00E+02	100.000	% Ct Error
2	BLNK	0	0	0	AM24101 AM24101T LIQUID		100.0	9.48E+01	94.800	% Recovery
3	SAMPLE	899T001731	0	0	AM24101 AM24101 LIQUID	N/A		8.02E-05	2.97E-005	uCi/mL
3	SAMPLE	899T001731	0	0	AM24101 AM24101E LIQUID	N/A		4.87E+00		% Ct. Error
3	SAMPLE	899T001731	0	0	AM24101 AM24101T LIQUID	N/A		9.31E+01		% Recovery
4	DUP	899T001731	0	0	AM24101 AM24101 LIQUID		8.02E-5	7.36E-5	8.583	RPD
4	DUP	899T001731	0	0	AM24101 AM24101E LIQUID		1.0	5.03E+00	5.030	% Ct Error
4	DUP	899T001731	0	0	AM24101 AM24101T LIQUID		100.0	9.89E+01	98.900	% Recovery
5	SAMPLE	899T001734	0	0	AM24101 AM24101 LIQUID	N/A		1.92E-04	1.94E-005	uCi/mL
5	SAMPLE	899T001734	0	0	AM24101 AM24101E LIQUID	N/A		3.65E+00		% Ct. Error
5	SAMPLE	899T001734	0	0	AM24101 AM24101T LIQUID	N/A		1.01E+02		% Recovery
6	DUP	899T001734	0	0	AM24101 AM24101 LIQUID		1.92E-4	2.04E-4	6.061	RPD
6	DUP	899T001734	0	0	AM24101 AM24101E LIQUID		1.0	3.30E+00	3.300	% Ct Error
6	DUP	899T001734	0	0	AM24101 AM24101T LIQUID		100.0	9.64E+01	96.400	% Recovery
7	SAMPLE	899T001735	0	0	AM24101 AM24101 LIQUID	N/A		1.88E-04	1.49E-005	uCi/mL
7	SAMPLE	899T001735	0	0	AM24101 AM24101E LIQUID	N/A		3.43E+00		% Ct. Error
7	SAMPLE	899T001735	0	0	AM24101 AM24101T LIQUID	N/A		1.07E+02		% Recovery
8	DUP	899T001735	0	0	AM24101 AM24101 LIQUID		1.88E-4	1.85E-4	1.609	RPD
8	DUP	899T001735	0	0	AM24101 AM24101E LIQUID		1.0	3.54E+00	3.540	% Ct Error
8	DUP	899T001735	0	0	AM24101 AM24101T LIQUID		100.0	9.55E+01	95.500	% Recovery

Final page for worklist# 31550

Analyst Signature _____ Date _____

Analyst Signature _____ Date _____

John P. Ryan 11/1/99
Reviewer Signature Date

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

10/25/99 10:05
ws2

Page: 1

LABCORE Data Entry Template for Worklist# 31550Analyst: ALL Instrument: AM01 _____ Book# 4657Method: LA-953-104 Rev/Mod B1

Worklist Comment: S-111 FOR @AM24101, RLC

S Type	Sample#	R A	Test	Matrix	Group#	Project
1 STD			@AM24101	LIQUID		
2 BLNK			@AM24101	LIQUID		
3 SAMPLE	S99T001731 0		@AM24101	LIQUID	99000304	S-111 GRAB
Analytes Requested: AM24101 , AM24101E, AM24101T						
4 DUP	S99T001731 0		@AM24101	LIQUID		
5 SAMPLE	S99T001734 0		@AM24101	LIQUID	99000304	S-111 GRAB
Analytes Requested: AM24101 , AM24101E, AM24101T						
6 DUP	S99T001734 0		@AM24101	LIQUID		
7 SAMPLE	S99T001735 0		@AM24101	LIQUID	99000304	S-111 GRAB
Analytes Requested: AM24101 , AM24101E, AM24101T						
8 DUP	S99T001735 0		@AM24101	LIQUID		

Final page for worklist # 31550

Alta Hansen 10/27/99
Signature Date

McB... 10/28/99
Signature Date
Sybil Z. Chom 10/28/99

Data Entry Comments:

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

222-S Analytical Laboratory
 G E N E R A L A L P H A E N E R G Y A N A L Y S I S
 Rev. 2.10

DATA REDUCTION REPORT

SAMPLE
 WL31550-STD
 File ID: 2a2091.CNF

Counted on: 10/27/99 @21:22
 Detector: AEA2
 Geometry number: 1
 Count time: 28807. Sec

PEAK ANALYSIS

Peak ID	Peak height		Peak center		FWHM		Tau	
	Initial	Final	Initial	Final	Initial	Final	Initial	Final
1	1328.3	1328.3	299.084	299.084	14.000	7.549	7.000	2.367
2	1288.0	1288.0	253.045	253.002	12.000	5.423	6.000	1.619

PEAK RESULTS

Peak Error Limit: 30%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Pu238	0.523	5.487	5.473	0.014	0.03	53.33	1.2	332.1	0.150E-03
	Am241		5.479	5.473	0.006				254.4	0.115E-03
2	Am243	0.487	5.266	5.261	0.005	0.02	49.61	1.3	224.7	0.101E-03
Totals:		1.010	<--valid peaks only-->				102.94			

DETECTOR CALIBRATION

Energy(MEV) = 4.097 + (0.0046)*Channel
 Energy range (MeV): 4.097 TO 6.452
 Efficiency = 0.2230 CPM/DPM
 (Data reduction compression factor: 1.)

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	48943.0	100.000
Smoothed	48943.0	100.000
Composite fit	49421.8	100.978
Residuals	-478.8	-0.978

Analyzed by: _____

EMB

Spectrum 2a2091.CNF

1 Legend: Raw = Modeled Peaks = 1,2,..., etc Display Max.: 9675.0

```

2
 2
.. 2
..... 2
..... 2
..... 2.....
1.....2.....
..1.....2...
.....1
..... 1
.....1
.....1.....
..... 1
.....1
..

```

Raw Data Dump for AEA Spectrum: 2a2091.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	1.	3.	1.	1.
21	0.	0.	1.	2.	1.	0.	0.	0.	0.	1.
31	1.	2.	1.	0.	1.	0.	4.	1.	0.	1.
41	0.	1.	0.	2.	1.	0.	0.	1.	1.	0.
51	0.	0.	0.	1.	0.	3.	0.	2.	0.	0.
61	0.	1.	0.	1.	0.	0.	1.	1.	1.	1.
71	1.	4.	1.	1.	1.	4.	1.	0.	0.	1.
81	0.	1.	2.	0.	1.	1.	0.	0.	0.	2.
91	3.	1.	2.	2.	3.	0.	1.	1.	2.	0.
101	1.	4.	1.	0.	2.	1.	0.	1.	1.	1.
111	1.	1.	0.	4.	2.	1.	1.	1.	1.	1.
121	1.	2.	1.	0.	1.	3.	2.	1.	2.	1.
131	1.	3.	0.	1.	1.	1.	1.	1.	2.	1.
141	3.	1.	1.	4.	3.	3.	0.	1.	5.	4.
151	0.	0.	0.	2.	0.	2.	3.	1.	2.	2.
161	0.	4.	4.	2.	2.	3.	0.	3.	2.	1.
171	2.	1.	3.	1.	2.	2.	1.	1.	3.	7.
181	5.	3.	1.	3.	2.	1.	4.	3.	2.	3.
191	2.	4.	4.	4.	4.	0.	4.	4.	4.	7.
201	5.	11.	6.	5.	5.	6.	12.	9.	8.	7.
211	15.	10.	14.	16.	12.	28.	23.	31.	33.	47.
221	31.	41.	43.	69.	91.	72.	102.	101.	115.	140.
231	175.	181.	201.	239.	265.	354.	341.	395.	456.	517.
241	613.	647.	712.	806.	932.	1061.	1036.	1141.	1173.	1211.
251	1255.	1373.	1413.	1424.	1335.	1107.	757.	458.	246.	168.
261	129.	136.	121.	103.	114.	108.	98.	99.	89.	94.
271	80.	107.	116.	110.	121.	140.	174.	170.	198.	214.
281	309.	324.	345.	389.	439.	501.	597.	643.	775.	834.
291	906.	1052.	1112.	1170.	1200.	1299.	1290.	1386.	1408.	1390.
301	1415.	1136.	826.	544.	388.	288.	234.	198.	185.	149.
311	103.	74.	40.	37.	12.	2.	2.	3.	0.	0.
321	0.	0.	1.	2.	1.	0.	1.	0.	0.	2.
331	1.	2.	1.	0.	0.	0.	0.	0.	1.	1.
341	1.	0.	1.	0.	1.	1.	1.	0.	2.	1.
351	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
361	0.	1.	1.	0.	0.	1.	0.	0.	0.	0.
371	0.	0.	0.	0.	0.	2.	1.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
401	0.	0.	0.	0.	1.	1.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	1.	0.	0.	0.	1.	2.	0.	0.	1.
431	0.	0.	0.	0.	2.	0.	0.	0.	0.	0.
441	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
471	1.	0.	0.	0.	0.	0.	2.	0.	0.	1.
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.								

222-S Analytical Laboratory
 G E N E R A L A L P H A E N E R G Y A N A L Y S I S
 Rev. 2.10

DATA REDUCTION REPORT

SAMPLE
 WL31550-BLK
 File ID: 3a3031.CNF

Counted on: 10/27/99 @21:23
 Detector: AEA3
 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	733.1	733.1	252.829	252.829	14.000	6.647	7.000	2.921

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	0.971	5.266	5.253	0.0130.03	24.15	1.8	105.3	0.474E-04	
Totals:		0.971	<--valid peaks only-->			24.15				

DETECTOR CALIBRATION

Energy (MEV) = 4.090 + (0.0046)*Channel
 Energy range (MeV): 4.090 TO 6.445
 Efficiency = 0.2317 CPM/DPM
 (Data reduction compression factor: 1.)

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	11944.0	100.000
Smoothed	11944.0	100.000
Composite fit	11592.5	97.057
Residuals	351.5	2.943

Analyzed by: _____

EMB

Spectrum 3a3031.CNF

1 Legend: Raw = Modeled Peaks = 1,2,..., etc

Display Max.:

5335.9

1
...1
..... 1
.....1...
.....1.
.....1
1...

Raw Data Dump for AEA Spectrum: 3a3031.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
21	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
31	0.	0.	1.	1.	0.	1.	0.	0.	0.	0.
41	0.	1.	0.	0.	2.	0.	1.	0.	0.	0.
51	0.	0.	0.	0.	0.	0.	0.	1.	0.	1.
61	1.	0.	1.	0.	0.	1.	0.	0.	0.	0.
71	1.	0.	1.	2.	0.	1.	1.	0.	2.	0.
81	0.	0.	0.	0.	1.	0.	0.	0.	0.	1.
91	0.	1.	0.	0.	1.	0.	0.	0.	0.	0.
101	1.	2.	1.	0.	1.	0.	0.	0.	0.	0.
111	0.	0.	0.	0.	0.	1.	0.	0.	0.	1.
121	1.	0.	0.	0.	0.	0.	0.	1.	1.	1.
131	0.	0.	1.	0.	0.	1.	1.	0.	1.	0.
141	0.	2.	0.	0.	4.	0.	0.	0.	1.	0.
151	0.	0.	2.	0.	2.	0.	1.	1.	0.	0.
161	2.	0.	0.	1.	0.	1.	1.	1.	0.	0.
171	1.	2.	0.	1.	0.	0.	1.	0.	1.	1.
181	1.	1.	1.	1.	1.	1.	1.	1.	1.	2.
191	1.	0.	2.	2.	1.	1.	0.	0.	2.	0.
201	1.	1.	3.	0.	0.	1.	1.	5.	1.	1.
211	6.	2.	4.	3.	4.	3.	7.	12.	10.	10.
221	9.	11.	23.	17.	22.	20.	26.	26.	31.	45.
231	49.	46.	75.	65.	91.	113.	122.	150.	175.	196.
241	224.	263.	321.	374.	406.	434.	517.	571.	612.	671.
251	777.	805.	809.	775.	685.	652.	414.	295.	148.	81.
261	86.	59.	63.	50.	53.	52.	40.	44.	19.	21.
271	12.	7.	4.	3.	0.	0.	1.	0.	1.	1.
281	3.	1.	2.	2.	0.	1.	0.	0.	8.	2.
291	4.	6.	3.	3.	3.	7.	5.	5.	10.	5.
301	2.	4.	3.	2.	0.	0.	2.	2.	0.	1.
311	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
321	0.	0.	0.	0.	0.	0.	2.	0.	1.	0.
331	0.	0.	0.	1.	1.	1.	0.	0.	0.	1.
341	0.	0.	0.	1.	1.	2.	1.	1.	1.	0.
351	0.	0.	0.	0.	0.	2.	0.	0.	1.	2.
361	1.	0.	0.	0.	0.	0.	0.	0.	0.	2.
371	0.	0.	2.	0.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
431	0.	0.	0.	0.	0.	1.	0.	0.	0.	1.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	1.	0.	1.
471	0.	0.	1.	0.	0.	0.	0.	1.	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.								

222-S Analytical Laboratory
G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 2.10

DATA REDUCTION REPORT

SAMPLE
S99T1731-SAM
File ID: 4a4126.CNF

Counted on: 10/27/99 @21:24
Detector: AEA4
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	111.5	111.5	297.723	297.723	12.000	6.649	6.000	2.572
2	734.3	734.3	252.105	252.102	12.000	5.286	6.000	1.972

PEAK RESULTS

Peak Error Limit: 30%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Pu238	0.136	5.487	5.465	0.022	0.03	3.90	4.5	2.6	0.119E-05
	Am241		5.479	5.465	0.014				2.0	0.908E-06
2	Am243	0.863	5.266	5.255	0.011	0.02	24.73	1.8	12.1	0.547E-05
Totals:		0.999	<--valid peaks only-->				28.63			

DETECTOR CALIBRATION

Energy (MEV) = 4.095 + (0.0046)*Channel
Energy range (MeV): 4.095 TO 6.450
Efficiency = 2.0574 CPM/DPM
(Data reduction compression factor: 1.)

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	13759.0	100.000
Smoothed	13759.0	100.000
Composite fit	13743.3	99.886
Residuals	15.7	0.114

Analyzed by: _____

EMB

Spectrum 4a4126.CNF

1 Legend: Raw = Modeled Peaks = 1,2,..., etc

Display Max.: 5148.9

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Raw Data Dump for AEA Spectrum: 4a4126.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.	1.	0.	1.	0.	0.	0.	0.
31	0.	0.	0.	1.	0.	0.	0.	1.	0.	0.
41	0.	0.	1.	0.	1.	0.	0.	0.	0.	2.
51	0.	0.	0.	0.	0.	0.	0.	1.	0.	1.
61	0.	0.	1.	0.	0.	0.	0.	1.	0.	0.
71	0.	0.	0.	0.	0.	0.	0.	0.	1.	1.
81	0.	0.	1.	0.	1.	0.	0.	0.	0.	0.
91	1.	0.	1.	1.	0.	0.	0.	0.	1.	0.
101	0.	1.	0.	0.	0.	0.	0.	0.	1.	0.
111	1.	0.	3.	0.	0.	0.	0.	1.	0.	2.
121	0.	0.	2.	0.	0.	0.	0.	1.	0.	4.
131	1.	0.	0.	0.	0.	1.	0.	0.	1.	1.
141	0.	0.	2.	0.	0.	0.	1.	0.	2.	1.
151	0.	1.	1.	3.	0.	0.	3.	2.	0.	0.
161	1.	1.	0.	1.	0.	0.	0.	0.	1.	0.
171	2.	0.	0.	1.	1.	1.	1.	0.	1.	1.
181	0.	0.	0.	1.	1.	1.	2.	2.	0.	2.
191	1.	1.	1.	2.	4.	2.	1.	0.	4.	2.
201	0.	0.	0.	1.	2.	2.	2.	1.	3.	4.
211	1.	9.	5.	4.	5.	3.	7.	4.	7.	9.
221	15.	12.	21.	21.	27.	42.	30.	43.	48.	59.
231	57.	78.	97.	111.	121.	129.	164.	200.	239.	255.
241	295.	355.	375.	427.	518.	508.	554.	578.	679.	743.
251	728.	809.	834.	736.	598.	355.	225.	115.	83.	76.
261	56.	50.	51.	36.	43.	39.	27.	23.	24.	14.
271	11.	10.	6.	5.	8.	12.	11.	12.	9.	13.
281	13.	23.	22.	32.	38.	37.	44.	61.	56.	69.
291	78.	92.	90.	101.	99.	97.	113.	136.	115.	89.
301	92.	54.	34.	27.	21.	15.	13.	20.	9.	8.
311	6.	3.	6.	2.	3.	0.	0.	0.	0.	0.
321	1.	1.	1.	1.	0.	2.	0.	1.	0.	1.
331	0.	0.	0.	0.	0.	1.	2.	1.	2.	0.
341	0.	0.	0.	0.	0.	0.	1.	1.	2.	1.
351	0.	1.	1.	3.	4.	0.	0.	2.	2.	3.
361	1.	2.	1.	0.	2.	3.	3.	3.	0.	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.	1.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	1.	0.	1.	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.	1.	1.	0.	0.	0.	0.
471	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

222-S Analytical Laboratory
G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 2.10

DATA REDUCTION REPORT

SAMPLE
S99T1731-DUP
File ID: 5a5547.CNF

Counted on: 10/27/99 @21:25
Detector: AEA5
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	93.8	93.8	297.175	297.175	12.000	6.759	6.000	2.176
2	682.4	682.4	250.868	250.860	14.000	6.660	7.000	2.356

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	Th228	0.126	5.400	5.454	-0.054	0.03	3.62	4.7	198.4	0.894E-04
	Am241		5.479	5.454	0.025				149.8	0.675E-04
2	Am243	0.871	5.266	5.241	0.025	0.03	24.96	1.8	980.9	0.442E-03
Totals:		0.997	--valid peaks only--				28.58			

DETECTOR CALIBRATION

Energy (MEV) = $4.087 + (0.0046) * \text{Channel}$
 Energy range (MeV): 4.087 TO 6.443
 Efficiency = 0.0257 CPM/DPM
 (Data reduction compression factor: 1.)

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	13755.0	100.000
Smoothed	13755.0	100.000
Composite fit	13717.0	99.724
Residuals	38.0	0.276

Analyzed by: _____

EMB

Spectrum 5a5547.CNF

1 Legend: Raw = Modeled Peaks = 1,2,..., etc Display Max.: 4721.9

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Raw Data Dump for AEA Spectrum: 5a5547.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
21	0.	0.	0.	1.	0.	0.	0.	1.	1.	0.
31	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
41	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
51	1.	0.	0.	0.	1.	2.	0.	1.	0.	0.
61	1.	0.	0.	1.	1.	0.	0.	1.	0.	0.
71	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
81	2.	1.	0.	0.	2.	0.	0.	0.	1.	0.
91	1.	0.	0.	1.	0.	1.	0.	0.	0.	0.
101	0.	0.	1.	0.	0.	2.	0.	1.	1.	0.
111	0.	0.	0.	0.	0.	0.	1.	1.	0.	0.
121	0.	0.	1.	0.	0.	0.	1.	1.	0.	0.
131	1.	0.	3.	0.	1.	2.	0.	0.	0.	3.
141	0.	1.	3.	1.	1.	1.	1.	0.	3.	0.
151	0.	1.	1.	1.	0.	1.	1.	0.	2.	2.
161	1.	0.	0.	2.	0.	0.	0.	0.	0.	0.
171	1.	0.	3.	2.	0.	1.	1.	2.	0.	2.
181	1.	1.	1.	0.	1.	0.	0.	3.	2.	1.
191	2.	0.	3.	5.	0.	2.	2.	0.	0.	0.
201	3.	3.	3.	3.	2.	3.	1.	4.	1.	4.
211	4.	5.	10.	12.	9.	9.	10.	13.	9.	25.
221	15.	31.	29.	24.	40.	39.	52.	64.	60.	94.
231	99.	92.	106.	151.	149.	195.	218.	264.	254.	359.
241	371.	360.	453.	433.	520.	569.	627.	638.	722.	722.
251	736.	716.	684.	585.	440.	265.	163.	78.	70.	49.
261	51.	41.	41.	40.	39.	29.	23.	15.	15.	12.
271	6.	6.	8.	13.	11.	11.	15.	16.	18.	17.
281	16.	25.	32.	39.	44.	43.	39.	50.	57.	68.
291	68.	90.	90.	99.	81.	95.	84.	113.	93.	76.
301	53.	28.	35.	22.	15.	12.	14.	9.	4.	5.
311	3.	3.	0.	1.	1.	0.	0.	0.	0.	0.
321	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
331	1.	0.	1.	2.	0.	2.	0.	0.	1.	2.
341	0.	0.	4.	1.	0.	1.	0.	3.	1.	0.
351	0.	1.	1.	0.	1.	2.	1.	2.	1.	4.
361	1.	0.	0.	2.	0.	0.	1.	1.	2.	0.
371	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	1.	0.	1.	0.	0.
401	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
411	0.	0.	0.	1.	0.	1.	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.	1.	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.								

222-S Analytical Laboratory
 G E N E R A L A L P H A E N E R G Y A N A L Y S I S
 Rev. 2.10

DATA REDUCTION REPORT

SAMPLE
 S99T1734-SAM
 File ID: 6a6541.CNF

Counted on: 10/27/99 @21:25
 Detector: AEA6
 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	214.0	214.0	298.513	298.513	14.000	9.179	7.000	3.455
2	600.8	600.8	252.706	252.693	14.000	6.769	7.000	2.426

PEAK RESULTS

Peak Error Limit: 30%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Am241	0.271	5.479	5.464	0.015	0.04	8.26	3.1	40.8	0.184E-04
	Pu238		5.487	5.464	0.023				53.3	0.240E-04
2	Am243	0.719	5.266	5.253	0.013	0.03	21.90	1.9	102.9	0.463E-04
Totals:		0.991	<--valid peaks only-->				30.16			

DETECTOR CALIBRATION

Energy (MEV) = 4.091 + (0.0046)*Channel
 Energy range (MeV): 4.091 TO 6.446
 Efficiency = 0.2151 CPM/DPM
 (Data reduction compression factor: 1.)

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	14616.0	100.000
Smoothed	14616.0	100.000
Composite fit	14480.4	99.072
Residuals	135.6	0.928

Analyzed by: _____

EMB

Spectrum 6a6541.CNF

1 Legend: Raw = Modeled Peaks = 1,2,..., etc Display Max.: 4447.1

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Raw Data Dump for AEA Spectrum: 6a6541.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.	0.	0.	0.	0.
31	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
41	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
51	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
61	0.	1.	0.	2.	1.	0.	0.	0.	0.	0.
71	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
81	0.	0.	1.	1.	1.	0.	1.	0.	0.	2.
91	0.	1.	0.	0.	0.	0.	1.	1.	0.	1.
101	1.	1.	0.	0.	1.	1.	0.	0.	1.	1.
111	0.	0.	0.	0.	1.	0.	2.	2.	0.	0.
121	0.	0.	0.	0.	1.	0.	0.	1.	0.	1.
131	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
141	0.	0.	0.	0.	1.	0.	1.	1.	0.	0.
151	0.	0.	0.	2.	0.	0.	1.	1.	2.	0.
161	2.	2.	2.	0.	2.	0.	0.	0.	0.	1.
171	0.	0.	0.	0.	1.	2.	0.	1.	4.	4.
181	2.	1.	1.	1.	2.	1.	1.	0.	2.	3.
191	3.	2.	0.	3.	2.	1.	2.	5.	4.	1.
201	1.	4.	3.	4.	1.	1.	3.	4.	4.	5.
211	3.	12.	3.	8.	6.	10.	16.	13.	8.	12.
221	25.	18.	17.	26.	26.	36.	30.	46.	51.	55.
231	75.	76.	85.	101.	108.	147.	120.	177.	209.	202.
241	236.	287.	288.	316.	392.	443.	447.	479.	553.	578.
251	648.	629.	658.	612.	606.	504.	324.	225.	119.	88.
261	71.	65.	50.	54.	42.	45.	35.	34.	20.	30.
271	26.	14.	15.	16.	26.	19.	12.	27.	26.	31.
281	51.	45.	56.	74.	53.	78.	86.	85.	106.	125.
291	145.	166.	148.	172.	196.	199.	218.	225.	243.	221.
301	191.	143.	134.	113.	74.	64.	53.	36.	28.	30.
311	14.	16.	9.	4.	6.	3.	3.	1.	0.	0.
321	0.	1.	0.	0.	0.	1.	0.	0.	0.	0.
331	0.	0.	0.	2.	2.	2.	0.	0.	0.	0.
341	0.	0.	0.	0.	1.	0.	0.	1.	2.	3.
351	1.	0.	1.	1.	0.	1.	2.	1.	2.	3.
361	1.	2.	4.	1.	1.	1.	3.	3.	0.	0.
371	1.	0.	2.	0.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	1.	0.	0.	0.	0.	0.	1.	0.
411	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
421	0.	0.	1.	0.	2.	0.	0.	0.	0.	2.
431	0.	0.	0.	0.	1.	0.	0.	1.	1.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	1.	0.	0.	0.	0.	0.	0.	1.	0.
481	0.	0.	1.	0.	1.	0.	0.	0.	1.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

222-S Analytical Laboratory
 G E N E R A L A L P H A E N E R G Y A N A L Y S I S
 Rev. 2.10

DATA REDUCTION REPORT

SAMPLE
 S99T1734-DUP
 File ID: 7a7583.CNF

Counted on: 10/27/99 @21:26
 Detector: AEA7
 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	239.0	239.0	299.054	299.054	16.000	9.609	8.000	2.950
2	623.3	623.3	253.700	253.670	12.000	6.392	6.000	1.807

PEAK RESULTS

Peak Error Limit: 30%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp. Obs. Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Am241	0.293	5.479 5.472 0.007	0.04	10.28	2.8	45.7	0.206E-04
	Pu238		5.487 5.472 0.015				59.7	0.269E-04
2	Am243	0.730	5.266 5.264 0.002	0.03	25.63	1.8	108.2	0.488E-04
Totals:		1.023	<--valid peaks only-->		35.91			

DETECTOR CALIBRATION

Energy(MEV) = 4.097 + (0.0046)*Channel
 Energy range (MeV): 4.097 TO 6.452
 Efficiency = 0.2392 CPM/DPM
 (Data reduction compression factor: 1.)

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	16847.0	100.000
Smoothed	16847.0	100.000
Composite fit	17236.8	102.314
Residuals	-389.8	-2.314

Analyzed by: _____

EMB

Spectrum 7a7583.CNF

1 Legend: Raw = Modeled Peaks = 1,2,..., etc Display Max.: 4677.4

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1.....2.
21....
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Raw Data Dump for AEA Spectrum: 7a7583.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
21	0.	1.	0.	0.	0.	0.	1.	0.	0.	0.
31	0.	0.	0.	0.	1.	0.	0.	1.	0.	0.
41	0.	0.	0.	0.	0.	1.	1.	0.	0.	0.
51	0.	1.	0.	0.	0.	1.	0.	0.	1.	0.
61	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
71	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
81	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
91	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
101	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
111	1.	0.	0.	1.	1.	0.	0.	0.	0.	0.
121	1.	1.	0.	0.	1.	0.	0.	0.	3.	1.
131	0.	0.	0.	1.	1.	1.	3.	2.	1.	0.
141	0.	1.	0.	1.	0.	1.	1.	1.	0.	0.
151	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
161	1.	0.	1.	2.	1.	1.	1.	1.	1.	1.
171	1.	0.	1.	0.	2.	1.	0.	0.	1.	0.
181	0.	0.	3.	4.	0.	1.	2.	0.	0.	1.
191	1.	0.	0.	1.	1.	2.	1.	2.	3.	2.
201	4.	2.	0.	6.	1.	2.	4.	5.	2.	3.
211	7.	8.	3.	7.	5.	11.	11.	7.	13.	15.
221	16.	21.	26.	26.	39.	32.	51.	59.	62.	87.
231	74.	97.	110.	113.	145.	150.	168.	216.	238.	240.
241	306.	281.	359.	404.	418.	417.	522.	533.	518.	564.
251	620.	641.	660.	657.	678.	631.	494.	339.	230.	123.
261	76.	75.	66.	54.	43.	51.	55.	41.	37.	29.
271	23.	37.	28.	25.	31.	25.	31.	46.	37.	54.
281	53.	64.	67.	86.	69.	93.	114.	110.	136.	152.
291	174.	176.	195.	213.	214.	221.	259.	240.	264.	236.
301	228.	253.	183.	137.	85.	86.	65.	39.	31.	25.
311	22.	19.	13.	12.	6.	3.	0.	0.	0.	0.
321	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
331	1.	2.	0.	2.	1.	0.	0.	1.	0.	0.
341	2.	2.	1.	1.	1.	1.	3.	0.	1.	2.
351	1.	0.	1.	2.	1.	5.	0.	2.	1.	2.
361	1.	2.	2.	3.	2.	2.	1.	0.	3.	3.
371	2.	0.	0.	0.	0.	1.	1.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
401	0.	0.	0.	0.	1.	0.	0.	1.	0.	0.
411	0.	1.	0.	0.	0.	0.	0.	0.	0.	1.
421	0.	1.	0.	2.	1.	1.	1.	0.	0.	0.
431	0.	0.	0.	0.	0.	0.	0.	1.	1.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	1.	0.	1.	0.	0.	0.	0.	1.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	1.	0.	1.	0.	1.	0.	0.	0.	0.	0.
481	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

222-S Analytical Laboratory
G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 2.10

DATA REDUCTION REPORT

SAMPLE
S99T1735-SAM
File ID: 8a8575.CNF

Counted on: 10/27/99 @21:26
Detector: AEA8
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	267.2	267.2	301.332	301.332	12.000	6.515	6.000	2.511
2	754.1	754.1	254.995	254.986	12.000	5.561	6.000	2.140

PEAK RESULTS

Peak Error Limit: 30%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Pu238	0.269	5.487	5.473	0.014	0.03	9.31	2.9	59.9	0.270E-04
	Am241		5.479	5.473	0.006				45.9	0.207E-04
2	Am243	0.730	5.266	5.260	0.006	0.03	25.28	1.8	118.4	0.533E-04
Totals:		0.998	<--valid peaks only-->				34.59			

DETECTOR CALIBRATION

Energy(MEV) = 4.087 + (0.0046)*Channel
Energy range (MeV): 4.087 TO 6.442
Efficiency = 0.2157 CPM/DPM
(Data reduction compression factor: 1.)

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	16631.0	100.000
Smoothed	16631.0	100.000
Composite fit	16604.1	99.838
Residuals	26.9	0.162

Analyzed by: _____

EMB

Spectrum 8a8575.CNF

1 Legend: Raw = Modeled Peaks = 1,2,..., etc Display Max.: 5231.8

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2
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Raw Data Dump for AEA Spectrum: 8a8575.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
21	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
31	0.	0.	0.	0.	1.	1.	0.	1.	0.	0.
41	0.	0.	1.	0.	0.	0.	0.	1.	0.	0.
51	1.	0.	0.	0.	0.	1.	0.	0.	0.	0.
61	0.	0.	0.	1.	0.	0.	0.	0.	0.	1.
71	0.	0.	0.	0.	1.	0.	0.	1.	0.	0.
81	1.	1.	0.	1.	0.	0.	0.	0.	0.	1.
91	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
101	0.	0.	0.	0.	1.	0.	0.	0.	2.	0.
111	1.	0.	1.	0.	0.	0.	2.	0.	0.	3.
121	0.	1.	0.	0.	1.	0.	1.	0.	0.	0.
131	0.	1.	0.	1.	0.	0.	0.	0.	0.	1.
141	0.	0.	0.	0.	1.	1.	1.	2.	0.	0.
151	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
161	0.	1.	1.	1.	0.	0.	0.	0.	0.	0.
171	0.	1.	1.	1.	0.	0.	0.	1.	0.	0.
181	2.	0.	1.	0.	0.	0.	0.	0.	0.	0.
191	1.	2.	2.	0.	1.	1.	1.	1.	2.	1.
201	0.	0.	0.	1.	4.	1.	1.	2.	4.	1.
211	0.	1.	2.	3.	6.	4.	5.	4.	3.	7.
221	7.	10.	16.	14.	15.	14.	16.	22.	29.	34.
231	33.	56.	50.	47.	68.	73.	108.	116.	126.	156.
241	191.	241.	271.	309.	348.	390.	513.	518.	565.	539.
251	657.	705.	725.	816.	826.	835.	735.	626.	393.	217.
261	116.	85.	78.	71.	56.	53.	52.	40.	35.	35.
271	43.	29.	17.	13.	15.	6.	14.	16.	12.	14.
281	20.	33.	37.	47.	43.	56.	75.	76.	91.	91.
291	131.	158.	155.	162.	190.	201.	220.	248.	224.	269.
301	284.	331.	242.	233.	162.	104.	73.	65.	51.	36.
311	22.	36.	18.	9.	10.	16.	4.	2.	1.	1.
321	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
331	0.	2.	0.	0.	1.	0.	1.	0.	0.	1.
341	0.	0.	1.	0.	0.	2.	0.	0.	1.	1.
351	0.	0.	2.	1.	0.	2.	2.	2.	0.	2.
361	2.	1.	3.	3.	2.	4.	0.	2.	6.	1.
371	2.	2.	1.	0.	1.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	2.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
411	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
431	1.	2.	1.	1.	0.	0.	1.	0.	1.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	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.								

222-S Analytical Laboratory
G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 2.10

DATA REDUCTION REPORT

SAMPLE
S99T1735-DUP
File ID: 9a9455.CNF

Counted on: 10/27/99 @21:27
Detector: AEA9
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	254.1	254.1	296.692	296.692	14.000	7.629	7.000	3.377
2	741.2	741.2	250.775	250.770	12.000	5.021	6.000	1.975

PEAK RESULTS

Peak Error Limit: 30%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Pu238	0.265	5.487	5.473	0.014	0.04	8.68	3.0	52.2	0.235E-04
	Am241		5.479	5.473	0.006				40.0	0.180E-04
2	Am243	0.731	5.266	5.262	0.004	0.02	23.98	1.8	104.8	0.472E-04
Totals:		0.996	<--valid peaks only-->				32.66			

DETECTOR CALIBRATION

Energy (MEV) = 4.108 + (0.0046)*Channel
Energy range (MeV): 4.108 TO 6.463
Efficiency = 0.2311 CPM/DPM
(Data reduction compression factor: 1.)

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	15742.0	100.000
Smoothed	15742.0	100.000
Composite fit	15677.9	99.593
Residuals	64.1	0.407

Analyzed by: _____

EMB

4711.6

114

Raw Data Dump for AEA Spectrum: 9a9455.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	1.	1.	0.	0.	0.
21	0.	0.	0.	0.	1.	0.	0.	0.	1.	0.
31	0.	0.	0.	0.	1.	0.	0.	0.	0.	1.
41	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
51	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
61	0.	0.	1.	0.	0.	2.	0.	1.	0.	0.
71	1.	0.	0.	1.	0.	0.	0.	0.	0.	0.
81	2.	0.	1.	0.	0.	0.	1.	1.	0.	0.
91	1.	1.	1.	0.	1.	0.	0.	1.	2.	0.
101	0.	1.	0.	0.	1.	1.	0.	0.	0.	1.
111	0.	2.	0.	1.	0.	0.	0.	2.	1.	0.
121	0.	1.	1.	1.	0.	0.	0.	2.	1.	2.
131	0.	0.	1.	0.	0.	3.	0.	0.	0.	1.
141	1.	0.	1.	0.	0.	1.	1.	0.	0.	0.
151	2.	0.	1.	0.	2.	0.	0.	0.	0.	0.
161	1.	1.	0.	2.	2.	0.	1.	1.	1.	0.
171	0.	1.	1.	2.	0.	2.	0.	0.	0.	0.
181	1.	0.	1.	0.	1.	0.	2.	1.	0.	1.
191	0.	0.	0.	0.	2.	0.	2.	1.	0.	2.
201	0.	1.	0.	0.	3.	1.	3.	1.	5.	4.
211	1.	4.	2.	7.	11.	9.	6.	9.	10.	8.
221	15.	17.	22.	22.	21.	32.	36.	35.	43.	49.
231	69.	86.	88.	129.	119.	152.	186.	249.	258.	287.
241	333.	424.	446.	517.	531.	556.	626.	709.	699.	760.
251	832.	838.	699.	468.	284.	181.	94.	75.	63.	51.
261	60.	64.	38.	40.	39.	29.	28.	23.	12.	16.
271	8.	10.	10.	9.	14.	19.	21.	14.	30.	43.
281	41.	62.	62.	78.	79.	104.	108.	131.	133.	179.
291	180.	194.	214.	233.	260.	289.	283.	264.	235.	201.
301	150.	97.	64.	52.	50.	30.	29.	41.	16.	16.
311	12.	3.	3.	0.	1.	0.	0.	0.	0.	0.
321	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.
331	0.	1.	0.	0.	1.	0.	0.	1.	1.	0.
341	0.	0.	0.	0.	0.	0.	0.	2.	1.	0.
351	3.	2.	2.	0.	2.	0.	1.	3.	2.	1.
361	1.	0.	1.	2.	3.	0.	1.	2.	4.	2.
371	1.	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.	1.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	2.	0.	1.
431	0.	1.	0.	1.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

WORKBOOK PAGE: STD1

Am 241 and Cm 243/244: LA-953-103 (VOID) or LA-953-104(B-0) ^{10/28/99} LIQUID

				STD
	Date Counted	OCT-27-99	Am 241 AEA Frac. (C241)	0.623
STD	Sample Volume in mL (SS)	1.000	Am 243 AEA Frac. (C243)	0.487
	Sample D.F. (DF)	1	Cm 243/244 AEA Frac. (Cm)	0
31550	Tracer Volume in mL (SPKV)	0.200	Total AT Counts	4713
	Digest D.F. (DDF)		AT Count Time (min) (TC)	30
AM24101	Tracer Book No.	10B59	Background in cpm (Bkg)	0.07
	Am-243 Tracer Value (dpm/mL)	1130	Am 241 cpm	53.33
LIQUID	Detector Number	19	Am 243 cpm	49.61
	Detector Efficiency (DetEff)	0.3379	Cm 243/244 cpm	0
99003999	Standard Book No	46B57	AEA Count Time (min)	480
	Standard Value in $\mu\text{Ci/mL}$	1.070E-04	Am 241 $\mu\text{Ci/L}$ =	1.0933E-01
0			Cm 243/244 $\mu\text{Ci/L}$ =	< 1.0462E-02
N/A				

$$\text{Am-241 } \mu\text{Ci/L} = (\text{C241} * \text{Am-243 Tracer Value} * \text{SPKV} * \text{DF} * \text{DDF} * (1000\text{mL/L})) / (\text{C243} * \text{SS} * (2220000\text{dpm}/\mu\text{Ci}))$$

$$\text{Cm-243/244 } \mu\text{Ci/L} = (\text{Cm} * \text{Am-243 Tracer Value} * \text{SPKV} * \text{DF} * \text{DDF} * (1000\text{mL/L})) / (\text{C243} * \text{SS} * (2220000\text{dpm}/\mu\text{Ci}))$$

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

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

Am 241 $\mu\text{Ci/mL}$ =	1.09E-04
Relative Counting Error =	1.8%

DETECTION
LEVELS
in $\mu\text{Ci/mL}$

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

$$\text{Cm 243/244 } \mu\text{Ci/mL} < 1.05\text{E-05}$$

$$\text{Relative Counting Error} = 100.0\%$$

$$\text{Am 243 Tracer Recovery} = 100.1\%$$

Am 241
1.05E-05
Cm 243/244
1.05E-05

Analyst:	AKL	Date:	10/28/99
Signature of Chemist:	JFR	Date:	11/01/99
STANDARD.WB1 REV 1.2	953103ML		

WORKBOOK PAGE: BLANK2

Am 241 and Cm 243/244: LA-953-103 (VOID) or LA-953-104(B-0) ^{10/28/99} ~~11/10/99~~

			LIQUID / SO	BLNK
	Date Counted	OCT-27-99	Am 241 AEA Frac. (C241)	0
BLNK	Sample Volume in mL (SS)	0.100	Am 243 AEA Frac. (C243)	0.971
	Sample D.F. (DF)	1	Cm 243/244 AEA Frac. (Cm)	0
31550	Tracer Volume in mL (SPKV)	0.100	Total AT Counts	1120
	Digest D.F. (DDF)		AT Count Time (min) (TC)	30
@AM24101	Tracer Book No.	10B59	Background In cpm (Bkg)	0.07
	Am-243 Tracer Value (dpm/mL)	1130	Am 241 cpm	0
LIQUID	Detector Number	19	Am 243 cpm	24.15
	Detector Efficiency (DetEff)	0.3379	Cm 243/244 cpm	0
99003999			AEA Count Time (min)	480
			Am 241 $\mu\text{Ci/L}$ =	< 2.7659E-02
0			Cm 243/244 $\mu\text{Ci/L}$ =	< 2.7659E-02
N/A				

Am-241 $\mu\text{Ci/L}$ = (C241 * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/ μCi))Cm-243/244 $\mu\text{Ci/L}$ = (Cm * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/ μCi))

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

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

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

Am 241 $\mu\text{Ci/mL}$ =	< 2.77E-05
Relative Counting Error =	100.0%

DETECTION LEVELS In $\mu\text{Ci/mL}$

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

Cm 243/244 $\mu\text{Ci/mL}$	< 2.77E-05
Relative Counting Error =	100.0%
Am 243 Tracer Recovery =	94.8%

Am 241 2.77E-05
Cm 243/244 2.77E-05

Analyst:	AKL	Date:	10/28/99
Signature of Chemist:	JFR	Date:	11/10/99

BLANK.WB1 REV 1.2

953103ML

WORKBOOK PAGE: SAM3

Am 241 and Cm 243/244: LA-953-103 (VOID) or LA-953-104(B-9) ¹ ~~11/11/99~~ LIQUID / SO

				SAMPLE
	Date Counted	OCT-27-99	Am 241 AEA Frac. (C241)	0.136
SAMPLE	Sample Volume in mL (SS)	0.100	Am 243 AEA Frac. (C243)	0.863
	Sample D.F. (DF)	1	Cm 243/244 AEA Frac. (Cm)	0
31550	Tracer Volume in mL (SPKV)	0.100	Total AT Counts	1318
	Digest D.F. (DDF)		AT Count Time (min) (TC)	30
AM24101	Tracer Book No.	10B59	Background in cpm (Bkg)	0.07
	Am-243 Tracer Value (dpm/mL)	1130	Am 241 cpm	3.9
LIQUID	Detector Number	19	Am 243 cpm	24.73
	Detector Efficiency (DetEff)	0.3379	Cm 243/244 cpm	0
99003999			AEA Count Time (min)	480
			Am 241 $\mu\text{Ci/L}$ =	8.0215E-02
0			Cm 243/244 $\mu\text{Ci/L}$ =	< 2.9747E-02
N/A				

$$\text{Am-241 } \mu\text{Ci/L} = (\text{C241} \cdot \text{Am-243 Tracer Value} \cdot \text{SPKV} \cdot \text{DF} \cdot \text{DDF} \cdot (1000\text{mL/L})) / (\text{C243} \cdot \text{SS} \cdot (2220000\text{dpm}/\mu\text{Ci}))$$

$$\text{Cm-243/244 } \mu\text{Ci/L} = (\text{Cm} \cdot \text{Am-243 Tracer Value} \cdot \text{SPKV} \cdot \text{DF} \cdot \text{DDF} \cdot (1000\text{mL/L})) / (\text{C243} \cdot \text{SS} \cdot (2220000\text{dpm}/\mu\text{Ci}))$$

$$\text{Relative Counting Error} = \text{Square Root of } [(1/(\text{Am-243 cpm} \cdot \text{min})) + (1/(\text{Am-241 or Cm-243/244 cpm} \cdot \text{min}))] \cdot 1.96 \cdot 100$$

$$\text{Am 243 Tracer Recovery} = (\text{Total AT Counts} / \text{TC} - \text{Bkg}) \cdot (1/\text{DetEff}) \cdot \text{C243} \cdot 100 / \text{Am-243 Tracer Value} \cdot \text{SPKV}$$
Am 241 $\mu\text{Ci/mL}$ = 8.02E-05

Relative Counting Error = 4.9%

DETECTION
LEVELS
In $\mu\text{Ci/mL}$

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

Cm 243/244 $\mu\text{Ci/mL}$ < 2.97E-05

Relative Counting Error = 100.0%

Am 243 Tracer Recovery = 99.1%

Am 241
2.97E-05
Cm 243/244
2.97E-05

Analyst:	AKL	Date:	10/28/99
Signature of Chemist:	JFR	Date:	1 NOV 99
SAMPLE.WB1 REV 1.2	953103ML		

WORKBOOK PAGE: DUP4

Am 241 and Cm 243/244: LA-953-103 (VOID) or LA-953-104(B-0) LIQUID / SO				DUP
	Date Counted	OCT-27-99	Am 241 AEA Frac. (C241)	0.128
DUP	Sample Volume In mL (SS)	0.100	Am 243 AEA Frac. (C243)	0.871
	Sample D.F. (DF)	1	Cm 243/244 AEA Frac. (Cm)	0
31550	Tracer Volume In mL (SPKV)	0.100	Total AT Counts	1303
	Digest D.F. (DDF)		AT Count Time (min) (TC)	30
AM24101	Tracer Book No.	10B59	Background in cpm (Bkg)	0.07
	Am-243 Tracer Value (dpm/mL)	1130	Am 241 cpm	3.62
LIQUID	Detector Number	19	Am 243 cpm	24.96
	Detector Efficiency (DetEff)	0.3379	Cm 243/244 cpm	0
99003999			AEA Count Time (min)	480
0			Am 241 $\mu\text{Ci/L}$ =	7.3634E-02
			Cm 243/244 $\mu\text{Ci/L}$ =	< 2.9539E-02

$$\text{Am-241 } \mu\text{Ci/L} = (\text{C241} * \text{Am-243 Tracer Value} * \text{SPKV} * \text{DF} * \text{DDF} * (1000\text{mL/L})) / (\text{C243} * \text{SS} * (2220000\text{dpm}/\mu\text{Ci}))$$

$$\text{Cm-243/244 } \mu\text{Ci/L} = (\text{Cm} * \text{Am-243 Tracer Value} * \text{SPKV} * \text{DF} * \text{DDF} * (1000\text{mL/L})) / (\text{C243} * \text{SS} * (2220000\text{dpm}/\mu\text{Ci}))$$

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

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

Am 241 $\mu\text{Ci/mL}$ =	7.36E-05	DETECTION LEVELS in $\mu\text{Ci/mL}$
Relative Counting Error =	5.0%	
NOTE: Cm-243/244 Result is a LESS THAN Value.		Am 241
Cm 243/244 $\mu\text{Ci/mL}$	< 2.95E-05	2.95E-05
Relative Counting Error =	100.0%	Cm 243/244
Am 243 Tracer Recovery =	98.9%	2.95E-05

Analyst:	AKL	Date:	10/28/99
Signature of Chemist:	JFR	Date:	11/2/99
SAMPLE.WB1 REV 1.2 953103ML			

WORKBOOK PAGE: SAM5

Am 241 and Cm 243/244: LA-953-103 (VOID) or LA-953-104(B-0) ¹ _{11/14/99}

LIQUID / SO

				SAMPLE
	Date Counted	OCT-27-99	Am 241 AEA Frac. (C241)	0.271
SAMPLE	Sample Volume in mL (SS)	0.100	Am 243 AEA Frac. (C243)	0.719
	Sample D.F. (DF)	1	Cm 243/244 AEA Frac. (Cm)	0
31550	Tracer Volume in mL (SPKV)	0.100	Total AT Counts	1613
	Digest D.F. (DDF)		AT Count Time (min) (TC)	30
AM24101	Tracer Book No.	10B59	Background in cpm (Bkg)	0.07
	Am-243 Tracer Value (dpm/mL)	1130	Am 241 cpm	8.26
LIQUID	Detector Number	19	Am 243 cpm	21.9
	Detector Efficiency (DetEff)	0.3379	Cm 243/244 cpm	0
99003999			AEA Count Time (min)	480
			Am 241 $\mu\text{Ci/L}$ =	1.9185E-01
0			Cm 243/244 $\mu\text{Ci/L}$ =	< 3.5397E-02
N/A				

$$\text{Am-241 } \mu\text{Ci/L} = (\text{C241} * \text{Am-243 Tracer Value} * \text{SPKV} * \text{DF} * \text{DDF} * (1000\text{mL/L})) / (\text{C243} * \text{SS} * (2220000\text{dpm}/\mu\text{Ci}))$$

$$\text{Cm-243/244 } \mu\text{Ci/L} = (\text{Cm} * \text{Am-243 Tracer Value} * \text{SPKV} * \text{DF} * \text{DDF} * (1000\text{mL/L})) / (\text{C243} * \text{SS} * (2220000\text{dpm}/\mu\text{Ci}))$$

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

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

Am 241 $\mu\text{Ci/mL}$ =	1.92E-04	DETECTION LEVELS in $\mu\text{Ci/mL}$
Relative Counting Error =	3.7%	
NOTE: Cm-243/244 Result is a LESS THAN Value.		Am 241
Cm 243/244 $\mu\text{Ci/mL}$	< 3.54E-05	3.54E-05
Relative Counting Error =	100.0%	Cm 243/244
Am 243 Tracer Recovery =	101.1%	3.54E-05

Analyst:	AKL	Date:	10/28/99
Signature of Chemist:	<i>John Ralston</i>	Date:	11/10/99
SAMPLE.WB1 REV 1.2	653103ML		

WORKBOOK PAGE: DUP6

Am 241 and Cm 243/244: LA-953-103 (VOID) or LA-953-104(B-0) LIQUID / SO DUP

	Date Counted	OCT-27-99	Am 241 AEA Frac. (C241)	0.293
DUP	Sample Volume in mL (SS)	0.100	Am 243 AEA Frac. (C243)	0.73
	Sample D.F. (DF)	1	Cm 243/244 AEA Frac. (Cm)	0
31550	Tracer Volume in mL (SPKV)	0.100	Total AT Counts	1514
	Digest D.F. (DDF)		AT Count Time (min) (TC)	30
AM24101	Tracer Book No.	10B59	Background in cpm (Bkg)	0.07
	Am-243 Tracer Value (dpm/mL)	1130	Am 241 cpm	10.28
LIQUID	Detector Number	19	Am 243 cpm	25.63
	Detector Efficiency (DetEff)	0.3379	Cm 243/244 cpm	0
99003999			AEA Count Time (min)	480
			Am 241 $\mu\text{Ci/L}$ =	2.0430E-01
0			Cm 243/244 $\mu\text{Ci/L}$ =	< 3.6184E-02
N/A				

$$\text{Am-241 } \mu\text{Ci/L} = (\text{C241} * \text{Am-243 Tracer Value} * \text{SPKV} * \text{DF} * \text{DDF} * (1000\text{mL/L})) / (\text{C243} * \text{SS} * (2220000\text{dpm}/\mu\text{Ci}))$$

$$\text{Cm-243/244 } \mu\text{Ci/L} = (\text{Cm} * \text{Am-243 Tracer Value} * \text{SPKV} * \text{DF} * \text{DDF} * (1000\text{mL/L})) / (\text{C243} * \text{SS} * (2220000\text{dpm}/\mu\text{Ci}))$$

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

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

Am 241 $\mu\text{Ci/mL}$ =	2.04E-04	DETECTION LEVELS in $\mu\text{Ci/mL}$
Relative Counting Error =	3.3%	
NOTE: Cm-243/244 Result is a LESS THAN Value.		Am 241
Cm 243/244 $\mu\text{Ci/mL}$	< 3.62E-05	3.62E-05
Relative Counting Error =	100.0%	Cm 243/244
Am 243 Tracer Recovery =	96.4%	3.62E-05

Analyst:	AKL	Date:	10/28/99
Signature of Chemist:	JFR	Date:	11/01/99
SAMPLE.WB1 REV 1.2	953/03ML		

WORKBOOK PAGE: SAM7

Am 241 and Cm 243/244: LA-953-103 (VOID) or LA-953-104(B-0) LIQUID / SO

				SAMPLE
	Date Counted	OCT-27-99	Am 241 AEA Frac. (C241)	0.269
SAMPLE	Sample Volume in mL (SS)	0.100	Am 243 AEA Frac. (C243)	0.73
	Sample D.F. (DF)	1	Cm 243/244 AEA Frac. (Cm)	0
31550	Tracer Volume in mL (SPKV)	0.100	Total AT Counts	1688
	Digest D.F. (DDF)		AT Count Time (min) (TC)	30
AM24101	Tracer Book No.	10B59	Background in cpm (Bkg)	0.07
	Am-243 Tracer Value (dpm/mL)	1130	Am 241 cpm	9.31
LIQUID	Detector Number	19	Am 243 cpm	25.28
	Detector Efficiency (DetEff)	0.3379	Cm 243/244 cpm	0
99003999			AEA Count Time (min)	480
0			Am 241 $\mu\text{Ci/L}$ =	1.8757E-01
			Cm 243/244 $\mu\text{Ci/L}$ =	< 3.4864E-02

$$\text{Am-241 } \mu\text{Ci/L} = (\text{C241} * \text{Am-243 Tracer Value} * \text{SPKV} * \text{DF} * \text{DDF} * (1000\text{mL/L})) / (\text{C243} * \text{SS} * (2220000\text{dpm}/\mu\text{Ci}))$$

$$\text{Cm-243/244 } \mu\text{Ci/L} = (\text{Cm} * \text{Am-243 Tracer Value} * \text{SPKV} * \text{DF} * \text{DDF} * (1000\text{mL/L})) / (\text{C243} * \text{SS} * (2220000\text{dpm}/\mu\text{Ci}))$$

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

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

Am 241 $\mu\text{Ci/mL}$	=	1.88E-04	DETECTION LEVELS in $\mu\text{Ci/mL}$
Relative Counting Error	=	3.4%	
NOTE: Cm-243/244 Result is a LESS THAN Value.			Am 241
Cm 243/244 $\mu\text{Ci/mL}$	=	< 3.49E-05	3.49E-05
Relative Counting Error	=	100.0%	Cm 243/244
Am 243 Tracer Recovery	=	107.4%	3.49E-05

Analyst:	AKL	Date:	10/28/99
Signature of Chemist:	JFR	Date:	11 NOV 99

SAMPLE.WB1 REV 1.2

953103ML

WORKBOOK PAGE: DUP8

Am 241 and Cm 243/244: LA-953-103 (VOID) or LA-953-104(B-0)

LIQUID / SO

DUP

	Date Counted	001-27-99	Am 241 AEA Frac. (C241)	0.288
DUP	Sample Volume in mL (SS)	0.100	Am 243 AEA Frac. (C243)	0.731
	Sample D.F. (DF)		Cm 243/244 AEA Frac. (Cm)	0
31550	Tracer Volume in mL (SPKV)	0.100	Total AT Counts	1498
	Digest D.F. (DDF)		AT Count Time (min) (TC)	30
AM24101	Tracer Book No.	10834	Background in cpm (Bkg)	0.07
	Am-243 Tracer Value (dpm/mL)	1130	Am 241 cpm	8.68
LIQUID	Detector Number	19	Am 243 cpm	23.96
	Detector Efficiency (DetEff)	0.3379	Cm 243/244 cpm	0
99003999			AEA Count Time (min)	480
0			Am 241 $\mu\text{Ci/L}$ =	1.8452E-01
N/A			Cm 243/244 $\mu\text{Ci/L}$ =	< 3.6471E-02

$$\text{Am-241 } \mu\text{Ci/L} = (\text{C241} * \text{Am-243 Tracer Value} * \text{SPKV} * \text{DF} * \text{DDF} * (1000\text{mL/L})) / (\text{C243} * \text{SS} * (2220000\text{dpm}/\mu\text{Ci}))$$

$$\text{Cm-243/244 } \mu\text{Ci/L} = (\text{Cm} * \text{Am-243 Tracer Value} * \text{SPKV} * \text{DF} * \text{DDF} * (1000\text{mL/L})) / (\text{C243} * \text{SS} * (2220000\text{dpm}/\mu\text{Ci}))$$

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

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

Am 241 $\mu\text{Ci/mL}$ =	1.86E-04	DETECTION LEVELS in $\mu\text{Ci/mL}$
Relative Counting Error =	3.5%	
NOTE: Cm-243/244 Result is a LESS THAN Value.		Am 241
Cm 243/244 $\mu\text{Ci/mL}$	< 3.65E-05	3.65E-05
Relative Counting Error =	100.0%	Cm 243/244
Am 243 Tracer Recovery =	95.5%	3.65E-05

Analyst:	AKL	Date:	10/28/99
Signature of Chemist:	JFR	Date:	11/01/99

SAMPLE.WB1 REV 1.2

953103ML

LABCORE Completed Worklist Report for Worklist# 31551

Analyst: akl

Instrument: AB14

Book#: _____

Method: LA-953-104 Rev/Mod B1

Worklist Comment: S-111 FOR @AM24101, RLC

Seq Type	Sample#	R A	Test	Matrix	Actual	Found	DL or Yield	Unit
1 STD	0		@AM24101 AM24101 SOLID		1.07E-04	1.23E-4	114.953 % Recovery	
1 STD	0		@AM24101 AM24101E SOLID		1.0	1.73E+00	1.730 % Ct Error	
1 STD	0		@AM24101 AM24101T SOLID		100.	9.01E+01	90.100 % Recovery	
2 BLNK-PREP	0		@AM24101 AM24101 SOLID		1	<1.15E-3		uCi/g
2 BLNK-PREP	0		@AM24101 AM24101E SOLID		1.0	1.00E+02	100.000 % Ct Error	
2 BLNK-PREP	0		@AM24101 AM24101T SOLID		100.	1.07E+02	107.000 % Recovery	
3 SAMPLE	899T001737	0 F	@AM24101 AM24101 SOLID		N/A	5.50E-02	4.02E-003	uCi/g
3 SAMPLE	899T001737	0 F	@AM24101 AM24101E SOLID		N/A	2.16E+00		% Ct. Error
3 SAMPLE	899T001737	0 F	@AM24101 AM24101T SOLID		N/A	1.04E+02		% Recovery
4 DUP	899T001737	0 F	@AM24101 AM24101 SOLID		5.60E-2	5.47E-2	2.349 RPD	
4 DUP	899T001737	0 F	@AM24101 AM24101E SOLID		1.0	2.30E+00	2.300 % Ct Error	
4 DUP	899T001737	0 F	@AM24101 AM24101T SOLID		100.0	8.33E+01	83.300 % Recovery	

Final page for worklist# 31551

Analyst Signature

Date

Analyst Signature

Date

Reviewer Signature

Date

10/25/99 10:06
ws2

Page: 1

LABCORE Data Entry Template for Worklist# 31551Analyst: AKC Instrument: AM01 Book# 46B57Method: LA-953-104 Rev/Mod B-1

Worklist Comment: S-111 FOR @AM24101, RLC

Suspect PCB

S Type	Sample#	R A	Test	Matrix	Group#	Project
1 STD			@AM24101	SOLID		
2 BLNK-PREP			@AM24101	SOLID		
3 SAMPLE	S99T001737	0 F	@AM24101	SOLID	99000304	S-111 GRAB
	Analytes Requested: AM24101 , AM24101E, AM24101T					
4 DUP	S99T001737	0 F	@AM24101	SOLID		

Final page for worklist # 31551Alita Hansen 10/26/99
Signature DateJames Z. Cochrane 11/1/99
Signature Date
Hyatt 11/1/99

Data Entry Comments:

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

222-S Analytical Laboratory
 G E N E R A L A L P H A E N E R G Y A N A L Y S I S
 Rev. 2.10

DATA REDUCTION REPORT

SAMPLE
 WL31551-STD-AM
 File ID: 3a3033.CNF

Counted on: 10/28/99 @13:39
 Detector: AEA3
 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	877.3	877.3	298.594	298.594	14.000	8.744	7.000	1.295
2	775.4	775.4	252.552	252.287	12.000	5.710	6.000	0.858

PEAK RESULTS

Peak Error Limit: 30%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Am241	0.591	5.479	5.464	0.015	0.04	58.77	1.2	280.5	0.126E-03
	Pu238		5.487	5.464	0.023				366.2	0.165E-03
2	Am243	0.491	5.266	5.251	0.015	0.03	48.87	1.4	221.4	0.997E-04
Totals:		1.083	<--valid peaks only-->				107.63			

DETECTOR CALIBRATION

Energy(MEV) = 4.090 + (0.0046)*Channel
 Energy range (MeV): 4.090 TO 6.445
 Efficiency = 0.2229 CPM/DPM
 (Data reduction compression factor: 1.)

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	47726.0	100.000
Smoothed	47726.0	100.000
Composite fit	51664.5	108.252
Residuals	-3938.5	-8.252

Analyzed by: _____

SLH2

Spectrum 3a3033.CNF

1 Legend: Raw = Modeled Peaks = 1,2,..., etc

Display Max.:

6900.8

```

2
2
 2
  2
   2
    2
1   2
1.. 2
.1.... 2
..1..... 2
...1..... 2
....1..... 2.....
.....1..... 2.....
.....1..... 2.....
.....2.....
..... 1
..... 1
.....1...
.....1....
.....1
..

```

Raw Data Dump for AEA Spectrum: 3a3033.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	1.	3.	1.	1.
21	2.	1.	0.	0.	2.	1.	2.	2.	2.	2.
31	0.	1.	0.	2.	2.	3.	1.	1.	0.	2.
41	1.	1.	2.	0.	1.	0.	0.	1.	0.	0.
51	1.	0.	3.	2.	1.	3.	1.	0.	3.	1.
61	1.	2.	2.	0.	2.	1.	1.	1.	1.	3.
71	1.	2.	1.	2.	0.	3.	0.	3.	2.	1.
81	1.	0.	1.	0.	2.	2.	2.	2.	1.	2.
91	0.	1.	0.	2.	1.	1.	4.	1.	0.	2.
101	1.	1.	1.	1.	1.	3.	0.	2.	0.	0.
111	3.	1.	4.	1.	1.	0.	4.	2.	0.	2.
121	2.	2.	0.	1.	0.	0.	2.	2.	1.	0.
131	3.	3.	2.	1.	5.	1.	3.	1.	1.	2.
141	4.	2.	4.	1.	2.	1.	1.	1.	3.	2.
151	3.	1.	3.	2.	2.	1.	0.	0.	6.	2.
161	1.	3.	6.	3.	3.	6.	3.	3.	6.	4.
171	4.	2.	4.	2.	6.	4.	5.	3.	9.	6.
181	3.	7.	9.	10.	10.	6.	16.	3.	11.	10.
191	13.	17.	21.	13.	28.	19.	29.	24.	28.	22.
201	25.	31.	47.	43.	48.	43.	53.	56.	67.	51.
211	90.	77.	82.	98.	98.	93.	123.	118.	122.	140.
221	164.	192.	195.	200.	231.	224.	266.	286.	323.	343.
231	326.	384.	398.	447.	475.	516.	525.	563.	570.	661.
241	645.	671.	670.	746.	796.	801.	864.	847.	890.	826.
251	957.	891.	952.	986.	867.	768.	592.	402.	276.	218.
261	208.	169.	181.	159.	175.	194.	223.	214.	187.	220.
271	219.	249.	250.	299.	340.	316.	333.	389.	400.	429.
281	493.	507.	512.	562.	594.	636.	656.	638.	720.	774.
291	747.	796.	842.	843.	827.	844.	899.	909.	880.	916.
301	907.	773.	567.	390.	251.	204.	176.	127.	116.	98.
311	71.	68.	34.	29.	16.	7.	2.	2.	1.	2.
321	1.	1.	0.	1.	3.	0.	1.	1.	2.	1.
331	0.	0.	0.	1.	1.	0.	0.	2.	1.	1.
341	1.	0.	3.	1.	2.	5.	3.	0.	3.	1.
351	2.	1.	3.	0.	1.	1.	0.	1.	0.	3.
361	1.	2.	2.	1.	2.	2.	0.	0.	0.	1.
371	0.	1.	0.	0.	0.	0.	0.	0.	1.	1.
381	0.	1.	0.	0.	0.	2.	0.	0.	1.	0.
391	0.	0.	1.	0.	0.	1.	0.	1.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	2.
411	0.	0.	0.	0.	0.	1.	0.	1.	2.	1.
421	0.	0.	0.	0.	1.	0.	0.	0.	1.	0.
431	1.	0.	1.	0.	0.	0.	0.	0.	0.	1.
441	0.	1.	0.	0.	1.	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.	1.	1.	0.	0.	0.	1.
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.								

222-S Analytical Laboratory
 G E N E R A L A L P H A E N E R G Y A N A L Y S I S
 Rev. 2.10

DATA REDUCTION REPORT

SAMPLE
 WL31551-BLNK-AM
 File ID: 4a4128.CNF

Counted on: 10/28/99 @13:39
 Detector: AEA4
 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	538.6	538.6	251.203	251.203	12.000	7.181	6.000	1.609

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	1.059	5.266	5.246	0.0200.03	26.21	1.7	120.6	0.543E-04	
Totals:		1.059	<--valid peaks only-->			26.21				

DETECTOR CALIBRATION

Energy (MEV) = 4.091 + (0.0046)*Channel
 Energy range (MeV): 4.091 TO 6.446
 Efficiency = 0.2196 CPM/DPM
 (Data reduction compression factor: 1.)

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	11878.0	100.000
Smoothed	11878.0	100.000
Composite fit	12583.2	105.937
Residuals	-705.2	-5.937

Analyzed by: _____

SLH2

[illegible]

Raw Data Dump for AEA Spectrum: 4a4128.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	1.	2.	0.	1.
21	2.	0.	0.	2.	1.	0.	0.	0.	1.	0.
31	0.	0.	3.	0.	0.	0.	0.	1.	0.	0.
41	1.	0.	0.	0.	0.	0.	0.	1.	0.	0.
51	0.	0.	0.	1.	2.	1.	2.	1.	1.	0.
61	0.	0.	0.	0.	0.	0.	0.	1.	1.	0.
71	0.	0.	0.	1.	0.	0.	2.	0.	0.	1.
81	3.	0.	1.	0.	2.	0.	0.	0.	0.	1.
91	0.	0.	2.	1.	0.	0.	0.	1.	0.	0.
101	0.	0.	2.	0.	0.	1.	0.	1.	2.	1.
111	2.	0.	0.	1.	1.	0.	2.	1.	3.	0.
121	1.	0.	1.	0.	0.	0.	1.	0.	1.	3.
131	0.	1.	0.	1.	0.	0.	2.	1.	1.	1.
141	0.	0.	2.	1.	1.	2.	1.	1.	0.	0.
151	0.	1.	0.	0.	1.	2.	2.	1.	2.	1.
161	1.	1.	1.	1.	1.	0.	0.	0.	0.	2.
171	0.	1.	0.	0.	0.	1.	1.	1.	1.	2.
181	4.	1.	0.	2.	1.	3.	0.	0.	1.	0.
191	2.	2.	1.	1.	1.	1.	1.	4.	2.	5.
201	7.	2.	5.	7.	3.	9.	6.	10.	9.	11.
211	10.	11.	24.	25.	25.	30.	26.	30.	42.	48.
221	38.	58.	55.	59.	77.	84.	107.	103.	116.	137.
231	121.	152.	171.	221.	219.	247.	248.	295.	285.	315.
241	377.	377.	398.	464.	419.	461.	502.	507.	543.	554.
251	558.	576.	538.	522.	407.	295.	143.	90.	61.	61.
261	55.	45.	33.	31.	46.	28.	21.	12.	13.	11.
271	4.	5.	4.	3.	0.	1.	0.	2.	1.	5.
281	3.	1.	6.	3.	0.	2.	3.	5.	2.	2.
291	3.	5.	4.	6.	8.	10.	6.	0.	8.	1.
301	4.	1.	1.	1.	0.	1.	1.	0.	0.	1.
311	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
321	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
331	0.	0.	1.	0.	1.	0.	0.	2.	0.	0.
341	1.	2.	0.	0.	0.	0.	1.	1.	0.	1.
351	0.	1.	2.	2.	1.	1.	1.	0.	0.	1.
361	1.	3.	0.	0.	0.	0.	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.	2.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	1.	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.	1.	0.	1.	0.	0.	0.	0.	0.
481	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

222-S Analytical Laboratory
 G E N E R A L A L P H A E N E R G Y A N A L Y S I S
 Rev. 2.10

DATA REDUCTION REPORT

SAMPLE
 S99T1737-SAM-AM
 File ID: 5a5549.CNF

Counted on: 10/28/99 @13:40
 Detector: AEA5
 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	1545.9	1545.9	296.831	296.831	14.000	7.256	7.000	2.695
2	691.8	691.8	251.282	251.229	10.000	4.818	5.000	1.581

PEAK RESULTS

Peak Error Limit: 30%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Am241	0.696	5.479	5.461	0.018	0.03	56.35	1.2	251.4	0.113E-03
	Pu238		5.487	5.461	0.026				328.2	0.148E-03
2	Am243	0.304	5.266	5.252	0.014	0.02	24.59	1.9	104.1	0.469E-04
Totals:		1.000	---valid peaks only---				80.94			

DETECTOR CALIBRATION

Energy(MEV) = 4.096 + (0.0046)*Channel
 Energy range (MeV): 4.096 TO 6.451
 Efficiency = 0.2385 CPM/DPM
 (Data reduction compression factor: 1.)

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	38858.0	100.000
Smoothed	38858.0	100.000
Composite fit	38852.2	99.985
Residuals	5.8	0.015

Analyzed by: _____

SLH2

1 Legend: Raw = Modeled Peaks = 1,2,..., etc Display Max.: 9784.0

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Raw Data Dump for AEA Spectrum: 5a5549.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	1.	0.	1.	0.
21	0.	0.	1.	1.	1.	2.	1.	0.	2.	0.
31	1.	3.	1.	1.	1.	0.	0.	1.	0.	1.
41	0.	1.	0.	0.	2.	0.	1.	2.	1.	0.
51	0.	1.	0.	2.	1.	0.	1.	0.	0.	2.
61	1.	0.	2.	0.	1.	3.	0.	1.	0.	0.
71	1.	2.	0.	2.	1.	1.	1.	1.	1.	1.
81	1.	0.	1.	0.	1.	3.	2.	0.	0.	2.
91	0.	2.	0.	1.	2.	1.	4.	0.	1.	1.
101	2.	1.	0.	0.	1.	0.	1.	1.	2.	2.
111	0.	0.	1.	0.	0.	1.	0.	0.	0.	2.
121	1.	1.	0.	0.	2.	0.	3.	1.	4.	1.
131	1.	2.	2.	2.	0.	2.	1.	2.	0.	0.
141	2.	0.	1.	3.	1.	2.	2.	0.	2.	1.
151	1.	1.	2.	2.	2.	2.	2.	0.	3.	1.
161	1.	2.	1.	2.	0.	3.	1.	1.	3.	4.
171	1.	0.	4.	2.	3.	2.	0.	2.	1.	2.
181	0.	3.	0.	1.	2.	1.	0.	1.	2.	3.
191	2.	1.	1.	2.	3.	1.	6.	3.	1.	3.
201	1.	0.	3.	7.	6.	7.	5.	5.	8.	6.
211	5.	5.	9.	13.	9.	11.	15.	11.	16.	16.
221	18.	18.	21.	32.	25.	35.	43.	50.	76.	58.
231	73.	120.	132.	150.	142.	177.	193.	232.	254.	299.
241	349.	397.	464.	479.	522.	536.	591.	679.	661.	742.
251	766.	776.	756.	617.	438.	207.	120.	88.	70.	74.
261	68.	75.	73.	52.	62.	75.	61.	52.	66.	72.
271	63.	90.	100.	102.	124.	157.	182.	217.	260.	312.
281	348.	381.	475.	509.	580.	695.	810.	895.	981.	1091.
291	1191.	1305.	1383.	1431.	1509.	1648.	1697.	1647.	1484.	1264.
301	836.	547.	416.	315.	269.	209.	190.	141.	104.	64.
311	38.	36.	20.	5.	0.	2.	1.	2.	1.	1.
321	2.	0.	0.	0.	0.	0.	2.	1.	0.	1.
331	0.	0.	0.	3.	1.	0.	0.	3.	0.	1.
341	0.	0.	1.	0.	0.	5.	0.	0.	2.	2.
351	1.	3.	5.	5.	5.	5.	7.	8.	8.	7.
361	7.	7.	7.	7.	13.	5.	10.	4.	4.	3.
371	2.	1.	0.	0.	1.	0.	0.	0.	0.	1.
381	0.	0.	0.	0.	1.	0.	0.	3.	1.	0.
391	0.	1.	1.	0.	0.	1.	2.	0.	0.	1.
401	0.	1.	1.	0.	0.	0.	0.	2.	0.	0.
411	1.	0.	1.	1.	1.	1.	1.	3.	1.	0.
421	1.	1.	4.	1.	3.	3.	2.	2.	2.	7.
431	2.	2.	5.	4.	1.	0.	0.	0.	0.	0.
441	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	1.	0.	0.	0.	0.	0.	0.	0.	1.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
471	0.	0.	0.	0.	2.	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.								

222-S Analytical Laboratory
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 Rev. 2.10

DATA REDUCTION REPORT

SAMPLE
 S99T1737-DUP-AM
 File ID: 6a6543.CNF

Counted on: 10/28/99 @13:40
 Detector: AEA6
 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	1166.1	1166.1	298.529	298.529	14.000	8.021	7.000	2.246
2	500.8	500.8	252.674	252.482	12.000	5.139	6.000	1.276

PEAK RESULTS

Peak Error Limit: 30%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Am241	0.709	5.479	5.465	0.014	0.04	50.54	1.3	242.5	0.109E-03
	Pu238		5.487	5.465	0.022				316.6	0.143E-03
2	Am243	0.302	5.266	5.253	0.013	0.02	21.53	2.1	98.1	0.442E-04
Totals:		1.012	<--valid peaks only-->				72.07			

DETECTOR CALIBRATION

Energy (MEV) = 4.092 + (0.0046)*Channel
 Energy range (MeV): 4.092 TO 6.447
 Efficiency = 0.2217 CPM/DPM
 (Data reduction compression factor: 1.)

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	34201.0	100.000
Smoothed	34201.0	100.000
Composite fit	34594.4	101.150
Residuals	-393.4	-1.150

Analyzed by: _____

SLH2

Spectrum 6a6543.CNF

1 Legend: Raw = Modeled Peaks = 1,2,..., etc

Display Max.: 7902.2

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Raw Data Dump for AEA Spectrum: 6a6543.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.	1.	1.	1.	1.	0.	0.	1.	0.	0.
31	0.	0.	0.	1.	1.	0.	0.	1.	0.	0.
41	0.	1.	0.	0.	0.	1.	0.	1.	1.	0.
51	0.	0.	1.	1.	0.	2.	0.	0.	0.	1.
61	0.	1.	2.	0.	1.	0.	0.	1.	1.	0.
71	0.	0.	2.	2.	2.	1.	0.	2.	0.	0.
81	0.	0.	2.	0.	0.	0.	0.	3.	2.	1.
91	1.	0.	2.	0.	3.	0.	2.	0.	1.	2.
101	2.	1.	1.	0.	1.	0.	0.	2.	1.	1.
111	0.	0.	0.	1.	2.	1.	0.	1.	0.	1.
121	0.	1.	1.	1.	0.	2.	1.	0.	2.	0.
131	2.	1.	2.	0.	1.	0.	0.	2.	1.	2.
141	6.	0.	0.	0.	6.	0.	0.	2.	4.	3.
151	2.	2.	0.	1.	2.	0.	0.	1.	2.	0.
161	0.	1.	3.	1.	3.	2.	1.	1.	1.	3.
171	1.	0.	0.	3.	0.	3.	1.	1.	1.	1.
181	1.	3.	1.	1.	0.	2.	0.	0.	3.	3.
191	3.	1.	4.	2.	5.	2.	1.	8.	2.	4.
201	1.	6.	3.	5.	1.	10.	2.	1.	5.	7.
211	7.	11.	6.	17.	12.	20.	16.	19.	22.	20.
221	26.	36.	29.	32.	44.	56.	54.	80.	80.	105.
231	88.	119.	142.	131.	164.	160.	189.	216.	241.	267.
241	295.	341.	352.	389.	431.	457.	411.	450.	497.	492.
251	545.	553.	599.	539.	518.	473.	294.	139.	109.	97.
261	75.	68.	67.	75.	78.	65.	68.	82.	102.	99.
271	110.	126.	119.	143.	157.	166.	230.	240.	298.	287.
281	330.	346.	402.	455.	517.	553.	595.	624.	774.	821.
291	825.	929.	957.	1029.	1020.	1077.	1198.	1220.	1290.	1184.
301	1100.	903.	677.	453.	307.	240.	221.	183.	148.	100.
311	81.	63.	54.	22.	14.	8.	2.	0.	2.	3.
321	0.	3.	1.	2.	1.	1.	0.	0.	0.	2.
331	1.	3.	2.	0.	1.	3.	0.	1.	1.	1.
341	3.	2.	2.	3.	5.	1.	2.	4.	0.	4.
351	6.	5.	2.	5.	5.	2.	4.	2.	9.	3.
361	5.	4.	3.	3.	1.	3.	7.	6.	4.	5.
371	7.	1.	0.	0.	0.	0.	1.	1.	0.	1.
381	0.	0.	0.	1.	1.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	1.	1.	0.	0.	0.	1.
411	3.	1.	0.	0.	0.	1.	1.	0.	2.	3.
421	1.	2.	0.	0.	2.	0.	1.	3.	2.	4.
431	0.	3.	0.	1.	4.	1.	4.	1.	1.	0.
441	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	1.	1.	0.	0.	0.	0.	0.	1.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	1.	0.	0.	0.	0.	0.	0.	0.	1.	0.
481	0.	0.	1.	0.	0.	1.	0.	0.	1.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

WORKBOOK PAGE: STD1

Am 241 and Cm 243/244: LA-953-103 (VOID) or LA-953-104(B-5) LIQUID

				STD
	Date Counted	OCT-28-99	Am 241 AEA Frac. (C241)	0.591
STD	Sample Volume in mL (SS)	1.000	Am 243 AEA Frac. (C243)	0.491
	Sample D.F. (DF)	1	Cm 243/244 AEA Frac. (Cm)	0
31551	Tracer Volume in mL (SPKV)	0.200	Total AT Counts	3476
	Digest D.F. (DDF)		AT Count Time (min) (TC)	30
AM24101	Tracer Book No.	10B59	Background in cpm (Bkg)	0.47
	Am-243 Tracer Value (dpm/mL)	1130	Am 241 cpm	58.77
LIQUID	Detector Number	14	Am 243 cpm	48.87
	Detector Efficiency (DetEff)	0.2781	Cm 243/244 cpm	0
99004000	Standard Book No	48B57	AEA Count Time (min)	480
	Standard Value in $\mu\text{Ci/mL}$	1.070E-04	Am 241 $\mu\text{Ci/L}$ =	1.2254E-01
0			Cm 243/244 $\mu\text{Ci/L}$ =	< 1.1499E-02
N/A				

$$\text{Am-241 } \mu\text{Ci/L} = (\text{C241} * \text{Am-243 Tracer Value} * \text{SPKV} * \text{DF} * \text{DDF} * (1000\text{mL/L})) / (\text{C243} * \text{SS} * (2220000\text{dpm}/\mu\text{Ci}))$$

$$\text{Cm-243/244 } \mu\text{Ci/L} = (\text{Cm} * \text{Am-243 Tracer Value} * \text{SPKV} * \text{DF} * \text{DDF} * (1000\text{mL/L})) / (\text{C243} * \text{SS} * (2220000\text{dpm}/\mu\text{Ci}))$$

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

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

Am 241 $\mu\text{Ci/mL}$ =	1.23E-04	DETECTION LEVELS In $\mu\text{Ci/mL}$
Relative Counting Error =	1.7%	
NOTE: Cm-243/244 Result is a LESS THAN Value.		Am 241
Cm 243/244 $\mu\text{Ci/mL}$	< 1.15E-05	1.15E-05
Relative Counting Error =	100.0%	Cm 243/244
Am 243 Tracer Recovery =	90.1%	1.15E-05

Analyst:	AKL	Date:	11/01/99
Signature of Chemist:	JFR	Date:	11/24/99

STANDARD.WB1 REV 1.2

953103ML

WORKBOOK PAGE: BLANK2

Am 241 and Cm 243/244: LA-953-103 (VOID) or LA-953-104(B-0) ¹ _{11/11/99} LIQUID / SO

BLNK-PREP	Date Counted	OCT-28-99	Am 241 AEA Frac. (C241)	BLNK-PREP
	Sample Volume in mL (SS)	1.000	Am 243 AEA Frac. (C243)	1.059
	Sample D.F. (DF)	1	Cm 243/244 AEA Frac. (Cm)	0
31551	Tracer Volume in mL (SPKV)	0.100	Total AT Counts	965
	Digest Grams of Solids/L (Dg/L)		AT Count Time (min) (TC)	30
AM24101	Tracer Book No.	10569	Background in cpm (Bkg)	0.47
	Am-243 Tracer Value (dpm/mL)	1130	Am 241 cpm	0
SOLID	Detector Number	14	Am 243 cpm	26.21
	Detector Efficiency (DetEff)	0.2781	Cm 243/244 cpm	0
99004000			AEA Count Time (min)	480
0			Am 241 $\mu\text{Ci/g}$ =	< 1.1547E-03
			Cm 243/244 $\mu\text{Ci/g}$ =	< 1.1547E-03

Am-241 $\mu\text{Ci/g}$ = (C241) (Am-243 Tracer Value) (SPKV) (1000mL/L) (DF) / [(C243) (SS) (D g/L) (2220000dpm/ μCi)]Cm-243/244 $\mu\text{Ci/g}$ = (Cm) (Am-243 Tracer Value) (SPKV) (1000mL/L) (DF) / [(C243) (SS) (D g/L) (2220000dpm/ μCi)]

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

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

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

Am241 $\mu\text{Ci/g}$	=	< 1.15E-03
Relative Counting Error	=	100.0%

DETECTION LEVELS In $\mu\text{Ci/g}$
Am 241
1.15E-03
Cm 243/244
1.15E-03

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

Cm 243/244 $\mu\text{Ci/g}$	=	< 1.15E-03
Relative Counting Error	=	100.0%
Am 243 Tracer Recovery	=	106.8%

Analyst:	AKL	Date:	11/01/99
Signature of Chemist:	JFR	Date:	11/01/99

BLANK.WB1 REV 1.2

953103ML

WORKBOOK PAGE: SAM3

Am 241 and Cm 243/244: LA-953-103 (VOID) or LA-953-104(B-9) *11/1/99*

LIQUID / SO

				SAMPLE
	Date Counted	OCT-28-98	Am 241 AEA Frac. (C241)	0.696
SAMPLE	Sample Volume in mL (SS)	1.000	Am 243 AEA Frac. (C243)	0.304
	Sample D.F. (DF)	1	Cm 243/244 AEA Frac. (Cm)	0
31551	Tracer Volume in mL (SPKV)	0.100	Total AT Counts	3226
	Digest Grams of Solids/L (Dg/L)		AT Count Time (min) (TC)	30
@AM24101	Tracer Book No.	10B59	Background in cpm (Bkg)	0.47
	Am-243 Tracer Value (dpm/mL)	1130	Am 241 cpm	56.36
SOLID	Detector Number	14	Am 243 cpm	24.59
	Detector Efficiency (DetEff)	0.2781	Cm 243/244 cpm	0
99004000			AEA Count Time (min)	480
			Am 241 $\mu\text{Ci/g}$ =	5.5995E-02
0			Cm 243/244 $\mu\text{Ci/g}$ =	< 4.0226E-03

FUSION01

899T001737

Am-241 $\mu\text{Ci/g}$ = (C241) (Am-243 Tracer Value) (SPKV) (1000mL/L) (DF) / [(C243) (SS) (D g/L) (2220000dpm/ μCi)]Cm-243/244 $\mu\text{Ci/g}$ = (Cm) (Am-243 Tracer Value) (SPKV) (1000mL/L) (DF) / [(C243) (SS) (D g/L) (2220000dpm/ μCi)]Relative Counting Error = Square Root of $[(1/(\text{Am-243 cpm} * \text{min})) + (1/(\text{Am-241 or Cm-243/244 cpm} * \text{min}))] * 1.96 * 100$

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

Am241 $\mu\text{Ci/g}$ =	5.60E-02	DETECTION LEVELS in $\mu\text{Ci/g}$
Relative Counting Error =	2.2%	
NOTE: Cm-243/244 Result is a LESS THAN Value.		Am 241
Cm 243/244 $\mu\text{Ci/g}$	< 4.02E-03	4.02E-03
Relative Counting Error =	100.0%	Cm 243/244
Am 243 Tracer Recovery =	103.6%	4.02E-03

Analyst:	AKL	Date:	11/01/99
Signature of Chemist:	<i>John Relyea</i>	Date:	11/1/99
SAMPLE.WB1 REV 1.2	953103ML		

WORKBOOK PAGE: DUP4

Am 241 and Cm 243/244: LA-953-103 (VOID) or LA-953-104(B-D) 1/2

LIQUID / SO

DUP

	Date Counted	OCT-29-99	Am 241 AEA Frac. (C241)	0.709
DUP	Sample Volume in mL (SS)	1.000	Am 243 AEA Frac. (C243)	0.302
	Sample D.F. (DF)	1	Cm 243/244 AEA Frac. (Cm)	0
31551	Tracer Volume in mL (SPKV)	0.100	Total AT Counts	2616
	Digest Grams of Solids/L (Dg/L)		AT Count Time (min) (TC)	30
AM24101	Tracer Book No.	10559	Background in cpm (Bkg)	0.47
	Am-243 Tracer Value (dpm/mL)	1130	Am 241 cpm	50.84
SOLID	Detector Number	14	Am 243 cpm	21.53
	Detector Efficiency (DetEff)	0.2781	Cm 243/244 cpm	0
99004000			AEA Count Time (min)	480
			Am 241 $\mu\text{Ci/g}$ =	5.4686E-02
0			Cm 243/244 $\mu\text{Ci/g}$ =	< 4.6270E-03

FUSION01

899T001737

Am-241 $\mu\text{Ci/g}$ = (C241) (Am-243 Tracer Value) (SPKV) (1000mL/L) (DF) / [(C243) (SS) (D g/L) (2220000dpm/ μCi)]Cm-243/244 $\mu\text{Ci/g}$ = (Cm) (Am-243 Tracer Value) (SPKV) (1000mL/L) (DF) / [(C243) (SS) (D g/L) (2220000dpm/ μCi)]

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

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

Am241 $\mu\text{Ci/g}$ =	5.47E-02	DETECTION LEVELS in $\mu\text{Ci/g}$
Relative Counting Error =	2.3%	
NOTE: Cm-243/244 Result is a LESS THAN Value.		Am 241
Cm 243/244 $\mu\text{Ci/g}$	< 4.63E-03	4.63E-03
Relative Counting Error =	100.0%	Cm 243/244
Am 243 Tracer Recovery =	83.3%	4.63E-03

Analyst:	AKL	Date:	11/01/99
Signature of Chemist:	JFR	Date:	11/01/99
SAMPLE.WB1 REV 1.2	993103ML		

LABCORE Completed Worklist Report for Worklist# 31553

Analyst: ak1

Instrument: AB20

Book#: _____

Method: LA-953-104 Rev/Mod 8-1

Worklist Comment: S-111 FOR @PU23901, RLC; spike removed - jfr

Seq Type	Sample#	R A	Test	Matrix	Actual	Found	DL or Yld	Unit
1 STD	0		@PU23901 PU23901 LIQUID		1.26E-04	1.25E-4	99.206 % Recovery	
1 STD	0		@PU23901 PU23901T LIQUID		100	9.36E+01	93.600 % Recovery	
1 STD	0		@PU23901 PU23901E LIQUID		1.00	1.68E+00	1.680 % Ct Error	
2 BLNK	0		@PU23901 PU23901 LIQUID		1	<3.52E-5		uCi/mL
2 BLNK	0		@PU23901 PU23901T LIQUID		100	9.93E+01	99.300 % Recovery	
2 BLNK	0		@PU23901 PU23901E LIQUID		1.00	1.00E+02	100.000	uCi/mL
3 SAMPLE	S99T001731	0	@PU23901 PU23901 LIQUID		N/A	3.94E-05	3.94E-005	uCi/mL
3 SAMPLE	S99T001731	0	@PU23901 PU23901T LIQUID		N/A	9.93E+01		% Recovery
3 SAMPLE	S99T001731	0	@PU23901 PU23901E LIQUID		N/A	1.00E+02		% Ct Error
4 DUP	S99T001731	0	@PU23901 PU23901 LIQUID		<3.54E-5	<3.57E-5		RPD
4 DUP	S99T001731	0	@PU23901 PU23901T LIQUID		100	9.75E+01	97.600 % Recovery	
4 DUP	S99T001731	0	@PU23901 PU23901E LIQUID		1.00	1.00E+02	100.000	% Ct Error
5 SAMPLE	S99T001734	0	@PU23901 PU23901 LIQUID		N/A	4.01E-05	4.01E-005	uCi/mL
5 SAMPLE	S99T001734	0	@PU23901 PU23901T LIQUID		N/A	9.07E+01		% Recovery
5 SAMPLE	S99T001734	0	@PU23901 PU23901E LIQUID		N/A	7.38E+00		% Ct Error
6 DUP	S99T001734	0	@PU23901 PU23901 LIQUID		<4.01E-5	<3.56E-5		RPD
6 DUP	S99T001734	0	@PU23901 PU23901T LIQUID		100	1.00E+02	100.000 % Recovery	
6 DUP	S99T001734	0	@PU23901 PU23901E LIQUID		1.00	7.27E+00	7.270	% Ct Error
7 SAMPLE	S99T001735	0	@PU23901 PU23901 LIQUID		N/A	3.74E-05	3.74E-005	uCi/mL
7 SAMPLE	S99T001735	0	@PU23901 PU23901T LIQUID		N/A	9.54E+01		% Recovery
7 SAMPLE	S99T001735	0	@PU23901 PU23901E LIQUID		N/A	7.66E+00		% Ct Error
8 DUP	S99T001735	0	@PU23901 PU23901 LIQUID		<3.76E-5	<3.56E-5		RPD
8 DUP	S99T001735	0	@PU23901 PU23901T LIQUID		100	1.01E+02	101.000 % Recovery	
8 DUP	S99T001735	0	@PU23901 PU23901E LIQUID		1.00	7.38E+00	7.380	% Ct Error

Final page for worklist# 31553

Analyst Signature _____ Date _____

Analyst Signature _____ Date _____

John Relyea
Reviewer Signature _____ Date 11/26/99

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

LABCORE Data Entry Template for Worklist# 31553

Analyst: _____ Instrument: PU01 20 Book# 46B57

Method: LA-953-104 Rev/Mod _____

Worklist Comment: S-111 FOR @PU23901, RLC; spike removed - jfr

S Type	Sample#	R A	Test	Matrix	Group#	Project
1 STD			@PU23901	LIQUID		
2 BLNK			@PU23901	LIQUID		
3 SAMPLE	S99T001731 0		@PU23901	LIQUID	99000304	S-111 GRAB
Analytes Requested: PU23901 , PU23901E, PU23901T						
4 DUP	S99T001731 0		@PU23901	LIQUID		
5 SAMPLE	S99T001734 0		@PU23901	LIQUID	99000304	S-111 GRAB
Analytes Requested: PU23901 , PU23901E, PU23901T						
6 DUP	S99T001734 0		@PU23901	LIQUID		
7 SAMPLE	S99T001735 0		@PU23901	LIQUID	99000304	S-111 GRAB
Analytes Requested: PU23901 , PU23901E, PU23901T						
8 DUP	S99T001735 0		@PU23901	LIQUID		

Final page for worklist # 31553

Signature _____ Date _____
See Original with Pg.
JC 10/28/99

Signature _____ Date _____
Sharon L. Huddle - 10/28/99

Data Entry Comments:

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

LABCORE Data Entry Template for Worklist# 31553

Analyst: ALL Instrument: PU01 Book# 46657Method: LA-953-104 Rev/Mod 61

Worklist Comment: S-111 FOR @PU23901, RLC

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				@PU23901	LIQUID		
2	BLNK				@PU23901	LIQUID		
3	SAMPLE	S99T001731	0		@PU23901	LIQUID	99000304	S-111 GRAB
Analytes Requested: PU23901 , PU23901E, PU23901T								
4	DUP	S99T001731	0		@PU23901	LIQUID		
5	SAMPLE	S99T001734	0		@PU23901	LIQUID	99000304	S-111 GRAB
Analytes Requested: PU23901 , PU23901E, PU23901T								
6	DUP	S99T001734	0		@PU23901	LIQUID		
7	SAMPLE	S99T001735	0		@PU23901	LIQUID	99000304	S-111 GRAB
Analytes Requested: PU23901 , PU23901E, PU23901T								
8	DUP	S99T001735	0		@PU23901	LIQUID		
9	SPK	S99T001735	0		@PU23901	LIQUID		

JAR elyza 28oct99

Final page for worklist # 31553

Alta Huron 10/27/99

Signature

Date

Signature

Date

Data Entry Comments:

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

222-S Analytical Laboratory
G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 2.10

DATA REDUCTION REPORT

SAMPLE
WL31553-STD
File ID: 10a1097.CNF

Counted on: 10/27/99 @21:53
Detector: AEA10
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	2002.1	2002.1	363.207	363.207	12.000	3.407	6.000	1.552
2?	11.1	11.1	305.207	304.828	14.000	6.703	7.000	1.331
3	2487.1	2487.1	229.641	229.641	10.000	3.430	5.000	2.127
4?	13.3	13.3	185.630	185.044	28.000	72.840	14.000	19.343

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	0.472	5.755	5.762	-0.0070	0.02	54.71	1.2	26.6	0.120E-04
	Cm243		5.779	5.762	0.017				35.7	0.161E-04
2		????		5.493			0.58	13.4		
3	Pu239	0.505	5.147	5.148	-0.0010	0.02	58.52	1.2	27.8	0.125E-04
	Pu240		5.144	5.148	-0.004				27.8	0.125E-04
4		????		4.942			1.18	57.4		
Totals:		0.978	<--valid peaks only-->				113.24			

DETECTOR CALIBRATION

Energy (MEV) = 4.091 + (0.0046)*Channel
Energy range (MeV): 4.091 TO 6.446
Efficiency = 2.1018 CPM/DPM
(Data reduction compression factor: 1.)

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	55601.0	100.000
Smoothed	55601.0	100.000
Composite fit	55202.5	99.283
Residuals	398.5	0.717

Analyzed by:

EMB

Spectrum 10a1097.CNF

1 Legend: Raw = Modeled Peaks = 1,2,..., etc Display Max.: 16193.8

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Raw Data Dump for AEA Spectrum: 10a1097.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	1.	1.	0.	1.	0.
21	1.	1.	0.	1.	0.	0.	0.	0.	1.	0.
31	1.	0.	1.	0.	1.	0.	0.	0.	0.	0.
41	0.	1.	1.	2.	0.	1.	0.	1.	0.	1.
51	0.	3.	2.	1.	1.	0.	0.	0.	1.	0.
61	0.	0.	0.	2.	0.	1.	0.	1.	1.	1.
71	0.	3.	0.	0.	1.	0.	1.	0.	1.	0.
81	1.	1.	0.	1.	1.	0.	1.	1.	0.	1.
91	0.	0.	1.	0.	2.	1.	1.	0.	0.	1.
101	2.	1.	1.	1.	1.	0.	3.	2.	2.	1.
111	1.	4.	1.	0.	1.	0.	0.	1.	0.	2.
121	2.	1.	0.	2.	0.	1.	0.	1.	2.	0.
131	4.	1.	2.	1.	2.	0.	3.	4.	2.	1.
141	3.	1.	2.	1.	1.	3.	0.	2.	0.	3.
151	3.	2.	3.	4.	3.	2.	1.	2.	4.	1.
161	5.	4.	2.	4.	9.	7.	8.	3.	4.	4.
171	2.	6.	5.	4.	5.	2.	7.	11.	1.	10.
181	10.	7.	16.	8.	18.	20.	8.	12.	10.	9.
191	23.	15.	13.	18.	22.	35.	18.	20.	31.	35.
201	27.	39.	47.	74.	67.	64.	81.	91.	76.	116.
211	117.	164.	187.	217.	269.	364.	436.	507.	581.	662.
221	798.	799.	931.	1102.	1371.	1789.	2108.	2621.	2785.	3051.
231	2721.	2058.	1328.	586.	193.	61.	11.	5.	1.	3.
241	0.	4.	2.	1.	0.	2.	1.	1.	2.	1.
251	5.	2.	2.	5.	7.	10.	8.	5.	1.	2.
261	1.	2.	1.	2.	2.	3.	2.	2.	2.	3.
271	1.	4.	2.	1.	2.	3.	5.	2.	1.	1.
281	2.	1.	5.	4.	3.	5.	9.	8.	7.	7.
291	6.	4.	5.	5.	7.	9.	7.	11.	10.	10.
301	10.	15.	7.	12.	16.	12.	13.	6.	11.	11.
311	3.	7.	8.	5.	6.	7.	11.	3.	9.	10.
321	14.	10.	15.	10.	17.	17.	22.	17.	16.	39.
331	31.	38.	43.	37.	42.	52.	49.	60.	55.	84.
341	93.	110.	98.	125.	184.	180.	241.	318.	350.	456.
351	603.	708.	965.	963.	1026.	972.	937.	999.	1271.	1483.
361	1893.	2119.	2346.	2429.	2015.	1395.	738.	279.	95.	14.
371	2.	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.	1.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
421	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
471	0.	0.	0.	0.	0.	0.	0.	2.	1.	3.
481	1.	0.	0.	1.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

222-S Analytical Laboratory
 G E N E R A L A L P H A E N E R G Y A N A L Y S I S
 Rev. 2.10

DATA REDUCTION REPORT

SAMPLE
 WL31553-BLK
 File ID: 11a1163.CNF

Counted on: 10/27/99 @21:54
 Detector: AEA11
 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	2156.4	2156.4	363.573	363.573	10.000	2.939	5.000	1.614

PEAK RESULTS

Peak Error Limit: 30%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Pu236	0.999	5.755	5.749	0.0060	0.01	51.57	1.2	2063.6	0.930E-03
Totals:		0.999	<--valid peaks only-->				51.57			

DETECTOR CALIBRATION

Energy (MEV) = 4.077 + (0.0046)*Channel
 Energy range (MeV): 4.077 TO 6.432
 Efficiency = 0.0255 CPM/DPM
 (Data reduction compression factor: 1.)

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	24789.0	100.000
Smoothed	24789.0	100.000
Composite fit	24755.7	99.866
Residuals	33.3	0.134

Analyzed by: _____

EMB

Spectrum 11a1163.CNF

1 Legend: Raw = Modeled Peaks = 1,2,..., etc

Display Max.: 13293.5

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.....1
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.....1...

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Raw Data Dump for AEA Spectrum: 11a1163.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
21	1.	1.	0.	0.	0.	0.	1.	0.	1.	0.
31	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
41	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
51	1.	0.	0.	0.	0.	0.	0.	1.	0.	1.
61	0.	0.	0.	0.	2.	1.	0.	0.	1.	0.
71	0.	1.	0.	0.	0.	1.	0.	0.	0.	0.
81	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
91	0.	0.	0.	0.	2.	0.	0.	1.	0.	0.
101	1.	1.	1.	0.	0.	2.	0.	0.	1.	0.
111	1.	1.	0.	0.	0.	0.	0.	1.	1.	0.
121	0.	0.	0.	2.	0.	2.	2.	0.	0.	2.
131	0.	0.	1.	0.	1.	1.	0.	0.	1.	0.
141	0.	0.	1.	1.	0.	1.	1.	1.	1.	0.
151	0.	0.	1.	3.	0.	1.	0.	0.	1.	0.
161	2.	0.	0.	0.	0.	0.	1.	1.	1.	0.
171	0.	0.	1.	0.	0.	0.	1.	1.	1.	0.
181	1.	1.	0.	0.	1.	2.	0.	0.	0.	0.
191	2.	0.	1.	1.	0.	1.	0.	0.	1.	3.
201	1.	2.	2.	1.	0.	1.	0.	2.	0.	0.
211	0.	1.	0.	0.	1.	3.	1.	1.	3.	2.
221	2.	2.	0.	1.	1.	1.	0.	1.	7.	1.
231	2.	5.	2.	0.	0.	0.	0.	1.	1.	1.
241	0.	0.	1.	2.	1.	1.	1.	0.	0.	3.
251	2.	2.	1.	0.	1.	3.	3.	4.	4.	10.
261	2.	1.	2.	2.	0.	4.	0.	1.	3.	1.
271	3.	4.	2.	2.	2.	5.	2.	2.	1.	1.
281	3.	0.	1.	4.	2.	2.	6.	4.	6.	5.
291	3.	3.	1.	0.	7.	1.	4.	1.	3.	2.
301	2.	2.	6.	4.	3.	4.	0.	0.	2.	3.
311	1.	4.	1.	0.	3.	0.	4.	2.	2.	1.
321	2.	2.	0.	8.	5.	7.	8.	6.	10.	3.
331	10.	3.	6.	8.	13.	12.	11.	11.	14.	23.
341	28.	33.	40.	42.	59.	78.	115.	180.	211.	339.
351	444.	643.	787.	895.	968.	909.	860.	922.	1045.	1284.
361	1702.	2157.	2625.	2683.	2407.	1664.	791.	320.	72.	10.
371	2.	0.	0.	1.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	0.	1.	2.	0.	1.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

222-S Analytical Laboratory
 G E N E R A L A L P H A E N E R G Y A N A L Y S I S
 Rev. 2.10

DATA REDUCTION REPORT

SAMPLE
 S99T1731-SAM
 File ID: 12a1233.CNF

Counted on: 10/27/99 @21:54
 Detector: AEA12
 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	2217.8	2217.8	357.636	357.636	10.000	2.598	5.000	1.387
2?	12.0	12.0	225.234	225.234	12.000	3.871	6.000	4.283

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	<i>Pu-236</i>	0.993		5.735	0.01	52.27	1.2	243.7	0.110E-03
2	<i>ORA</i>	????		5.126		0.25	18.0		
Totals:		0.993	<--valid peaks only-->			52.27			

DETECTOR CALIBRATION

Energy (MEV) = 4.089 + (0.0046)*Channel
 Energy range (MeV): 4.089 TO 6.445
 Efficiency = 0.2145 CPM/DPM
 (Data reduction compression factor: 1.)

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	25276.0	100.000
Smoothed	25276.0	100.000
Composite fit	25210.3	99.740
Residuals	65.7	0.260

Analyzed by: _____

EMB

Spectrum 12a1233.CNF

1 Legend: Raw = Modeled Peaks = 1,2,..., etc

Display Max.: 13781.6

2
2

1
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Raw Data Dump for AEA Spectrum: 12a1233.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
21	1.	0.	0.	1.	0.	1.	0.	0.	0.	0.
31	1.	0.	0.	0.	0.	0.	0.	0.	0.	1.
41	0.	0.	1.	0.	0.	0.	0.	0.	1.	0.
51	0.	0.	1.	2.	0.	0.	0.	0.	0.	0.
61	1.	0.	1.	0.	0.	0.	0.	1.	0.	0.
71	0.	0.	0.	0.	1.	0.	0.	1.	0.	0.
81	0.	2.	1.	0.	0.	0.	0.	1.	0.	0.
91	1.	0.	2.	0.	0.	0.	0.	0.	2.	1.
101	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
111	0.	0.	0.	0.	0.	0.	2.	0.	0.	0.
121	1.	1.	0.	1.	1.	1.	0.	0.	0.	3.
131	2.	1.	0.	0.	1.	0.	0.	0.	0.	0.
141	1.	1.	2.	1.	0.	0.	2.	0.	1.	0.
151	1.	0.	0.	1.	0.	1.	0.	1.	0.	0.
161	0.	0.	1.	0.	0.	1.	0.	1.	0.	0.
171	1.	0.	0.	0.	0.	1.	0.	0.	0.	1.
181	0.	1.	0.	0.	1.	0.	0.	0.	1.	0.
191	1.	0.	0.	0.	1.	0.	1.	1.	0.	1.
201	0.	0.	1.	1.	3.	0.	0.	1.	3.	1.
211	3.	0.	0.	1.	0.	0.	2.	1.	4.	4.
221	9.	10.	8.	11.	19.	11.	9.	10.	5.	2.
231	3.	0.	2.	1.	2.	1.	1.	3.	1.	1.
241	1.	0.	0.	2.	2.	4.	0.	1.	3.	1.
251	9.	4.	6.	2.	2.	1.	1.	1.	0.	2.
261	2.	2.	0.	2.	0.	1.	2.	2.	1.	1.
271	2.	2.	2.	2.	1.	3.	5.	5.	1.	4.
281	6.	2.	6.	7.	2.	1.	4.	4.	3.	4.
291	1.	5.	4.	5.	7.	3.	9.	2.	6.	6.
301	5.	2.	3.	2.	1.	3.	6.	2.	3.	2.
311	1.	7.	3.	6.	4.	5.	4.	5.	6.	6.
321	5.	12.	7.	5.	4.	12.	13.	10.	19.	11.
331	26.	14.	21.	27.	38.	42.	42.	65.	90.	120.
341	141.	184.	263.	359.	469.	666.	825.	959.	1074.	942.
351	843.	845.	1016.	1323.	1644.	2062.	2668.	2827.	2539.	1685.
361	722.	158.	20.	2.	1.	1.	0.	1.	0.	0.
371	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	0.	0.	0.	0.	1.	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.	0.	0.	0.	0.	1.	0.	0.	0.	0.
471	0.	2.	0.	2.	2.	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.								

222-S Analytical Laboratory
 G E N E R A L A L P H A E N E R G Y A N A L Y S I S
 Rev. 2.10

DATA REDUCTION REPORT

SAMPLE
 S99T1731-DUP
 File ID: 13a1318.CNF

Counted on: 10/27/99 @21:55
 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	1930.1	1930.1	362.719	362.719	10.000	2.987	5.000	1.521

PEAK RESULTS

Peak Error Limit: 30%

Peak ID	Isotope	AEA Frac	Peak Centroid Exp.	Obs.	Diff.	FWHM	Count Rate c/m	%err @95	d/m	Activity uCi/ea
1	Pu236	1.004	5.755	5.751	0.004	0.01	48.18	1.3	199.3	0.898E-04
Totals:		1.004	<--valid peaks only-->				48.18			

DETECTOR CALIBRATION

Energy (MEV) = 4.083 + (0.0046)*Channel
 Energy range (MeV): 4.083 TO 6.438
 Efficiency = 0.2467 CPM/DPM
 (Data reduction compression factor: 1.)

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	23049.0	100.000
Smoothed	23050.0	100.004
Composite fit	23131.1	100.356
Residuals	-82.1	-0.356

Analyzed by: _____

EMB

Spectrum 13a1318.CNF

1 Legend: Raw = Modeled Peaks = 1,2,..., etc

Display Max.: 11155.4

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1
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Raw Data Dump for AEA Spectrum: 13a1318.CNF

1	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	1.	1.	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.	1.	1.	0.	1.	0.	1.
51	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
61	0.	0.	0.	0.	0.	2.	0.	0.	0.	0.
71	0.	0.	0.	0.	1.	1.	0.	0.	0.	1.
81	0.	1.	0.	0.	1.	0.	0.	0.	0.	1.
91	2.	0.	0.	0.	0.	0.	0.	0.	0.	0.
101	0.	0.	0.	0.	1.	1.	0.	1.	2.	2.
111	0.	0.	1.	0.	1.	0.	1.	0.	0.	1.
121	0.	0.	1.	0.	3.	0.	1.	0.	0.	0.
131	0.	1.	0.	1.	0.	0.	0.	1.	0.	0.
141	0.	0.	0.	0.	0.	1.	0.	0.	2.	1.
151	1.	0.	1.	1.	0.	2.	2.	3.	0.	0.
161	1.	0.	0.	1.	0.	1.	0.	0.	0.	2.
171	1.	1.	2.	1.	1.	0.	1.	1.	2.	0.
181	0.	0.	1.	1.	0.	0.	2.	1.	0.	1.
191	2.	1.	0.	1.	0.	0.	1.	0.	1.	0.
201	1.	1.	0.	1.	3.	1.	1.	0.	0.	1.
211	0.	1.	0.	1.	0.	1.	5.	2.	1.	2.
221	3.	2.	5.	4.	5.	3.	9.	5.	15.	8.
231	7.	7.	4.	7.	1.	2.	2.	1.	1.	1.
241	1.	0.	0.	2.	1.	1.	0.	2.	3.	3.
251	0.	3.	3.	3.	1.	2.	1.	3.	0.	1.
261	0.	2.	2.	1.	0.	3.	1.	1.	3.	1.
271	0.	1.	2.	1.	0.	0.	0.	3.	2.	2.
281	2.	1.	5.	5.	0.	3.	7.	3.	3.	6.
291	3.	2.	5.	2.	2.	5.	0.	1.	2.	4.
301	3.	8.	2.	4.	7.	3.	3.	0.	1.	2.
311	1.	2.	1.	0.	1.	0.	2.	3.	1.	2.
321	2.	5.	1.	4.	2.	5.	5.	9.	11.	5.
331	8.	9.	15.	10.	8.	14.	17.	18.	20.	24.
341	34.	46.	50.	68.	102.	125.	186.	237.	334.	432.
351	575.	742.	861.	874.	866.	825.	864.	1010.	1208.	1495.
361	1846.	2243.	2362.	2227.	1618.	846.	331.	69.	23.	3.
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.	1.	0.	0.	0.
481	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

222-S Analytical Laboratory
 G E N E R A L A L P H A E N E R G Y A N A L Y S I S
 Rev. 2.10

DATA REDUCTION REPORT

SAMPLE
 S99T1734-SAM
 File ID: 14a1408.CNF

Counted on: 10/27/99 @21:55
 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	2334.0	2334.0	361.521	361.521	10.000	2.701	5.000	1.397
2	60.0	60.0	229.019	229.019	12.000	3.815	6.000	2.163

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	0.973	5.755	5.755	0.0000	0.01	56.46	1.2	240.1	0.108E-03	
2	Pu239	0.026	5.147	5.145	0.0020	0.02	1.51	7.3	6.3	0.284E-05	
	Pu240		5.144	5.145	-0.001				6.3	0.284E-05	

Totals:		0.999	<--valid peaks only-->				57.97				

DETECTOR CALIBRATION

Energy (MEV) = 4.092 + (0.0046)*Channel
 Energy range (MeV): 4.092 TO 6.447
 Efficiency = 0.2399 CPM/DPM
 (Data reduction compression factor: 1.)

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	27869.0	100.000
Smoothed	27869.0	100.000
Composite fit	27828.4	99.854
Residuals	40.6	0.146

Analyzed by: _____

EMB

Spectrum 14a1408.CNF

1 Legend: Raw = Modeled Peaks = 1,2,..., etc

Display Max.: 11214.0

2
.2
2

1
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1....

Raw Data Dump for AEA Spectrum: 14a1408.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	1.	2.	2.	1.
21	0.	0.	0.	0.	0.	0.	0.	1.	0.	1.
31	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
41	0.	0.	0.	0.	1.	0.	1.	0.	1.	0.
51	0.	0.	0.	0.	0.	0.	0.	1.	1.	0.
61	0.	0.	0.	0.	0.	0.	1.	0.	2.	0.
71	0.	1.	0.	1.	0.	1.	0.	1.	1.	2.
81	3.	0.	0.	1.	0.	0.	2.	1.	0.	1.
91	0.	1.	0.	1.	0.	1.	1.	0.	1.	0.
101	0.	0.	0.	0.	1.	1.	1.	1.	1.	0.
111	0.	0.	1.	1.	2.	2.	1.	2.	0.	0.
121	0.	1.	0.	1.	1.	2.	1.	0.	0.	1.
131	3.	0.	2.	1.	0.	0.	1.	1.	1.	1.
141	0.	0.	2.	2.	0.	1.	2.	1.	1.	0.
151	2.	0.	1.	0.	2.	1.	1.	1.	0.	1.
161	0.	0.	0.	0.	1.	1.	0.	4.	2.	0.
171	0.	1.	1.	0.	1.	1.	1.	0.	0.	0.
181	0.	2.	0.	0.	1.	0.	1.	0.	0.	0.
191	2.	1.	1.	1.	1.	5.	0.	1.	0.	0.
201	3.	2.	0.	0.	3.	0.	1.	2.	3.	2.
211	3.	6.	7.	8.	8.	13.	12.	10.	14.	17.
221	25.	23.	27.	48.	46.	46.	56.	69.	68.	71.
231	59.	39.	19.	7.	7.	1.	2.	3.	0.	1.
241	2.	0.	2.	0.	3.	1.	1.	2.	1.	3.
251	2.	8.	8.	3.	5.	4.	3.	2.	0.	2.
261	1.	2.	0.	2.	2.	5.	3.	0.	2.	4.
271	1.	1.	1.	1.	3.	4.	3.	1.	0.	4.
281	1.	4.	7.	5.	9.	2.	7.	6.	8.	7.
291	4.	10.	4.	4.	4.	4.	8.	5.	5.	11.
301	8.	10.	12.	6.	5.	5.	3.	0.	2.	3.
311	2.	2.	2.	2.	2.	5.	3.	3.	1.	2.
321	6.	7.	4.	5.	5.	4.	11.	11.	15.	10.
331	15.	15.	15.	22.	31.	27.	21.	47.	34.	49.
341	65.	76.	86.	139.	168.	240.	292.	423.	561.	697.
351	898.	1028.	1066.	1029.	904.	1000.	1277.	1416.	1856.	2302.
361	2645.	2996.	2632.	1622.	741.	192.	20.	6.	0.	0.
371	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
431	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
471	0.	0.	0.	0.	1.	1.	1.	0.	0.	0.
481	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

222-S Analytical Laboratory
 G E N E R A L A L P H A E N E R G Y A N A L Y S I S
 Rev. 2.10

DATA REDUCTION REPORT

SAMPLE
 S99T1734-DUP
 File ID: 15a1573.CNF

Counted on: 10/27/99 @21:56
 Detector: AEA15
 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	2063.3	2063.3	364.017	364.017	10.000	3.332	5.000	1.633
2	68.9	68.9	230.928	230.928	10.000	3.572	5.000	2.489

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	0.982	5.755	5.748	0.007	0.02	53.94	1.2	232.4	0.105E-03
2	Pu239	0.028	5.147	5.136	0.011	0.02	1.56	7.2	6.6	0.298E-05
	Pu240		5.144	5.136	0.008				6.6	0.298E-05
Totals:		1.010	<--valid peaks only-->				55.50			

DETECTOR CALIBRATION

Energy(MEV) = 4.074 + (0.0046)*Channel
 Energy range (MeV): 4.074 TO 6.429
 Efficiency = 0.2368 CPM/DPM
 (Data reduction compression factor: 1.)

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	26377.0	100.000
Smoothed	26377.0	100.000
Composite fit	26643.1	101.009
Residuals	-266.1	-1.009

Analyzed by: _____

EMB

Spectrum 15a1573.CNF

1 Legend: Raw = Modeled Peaks = 1,2,..., etc

Display Max.: 13365.2

2
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2

1
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Raw Data Dump for AEA Spectrum: 15a1573.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
21	0.	1.	0.	0.	1.	0.	0.	0.	0.	0.
31	0.	0.	0.	0.	0.	1.	0.	0.	0.	1.
41	0.	0.	0.	0.	0.	1.	1.	0.	0.	0.
51	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
61	0.	0.	0.	0.	1.	0.	0.	0.	0.	1.
71	0.	0.	0.	0.	0.	0.	0.	2.	0.	0.
81	1.	0.	1.	0.	1.	0.	1.	0.	1.	0.
91	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
101	0.	1.	0.	0.	0.	1.	1.	2.	1.	0.
111	0.	0.	1.	0.	0.	0.	1.	0.	1.	0.
121	1.	0.	0.	0.	1.	0.	0.	0.	1.	0.
131	1.	1.	0.	0.	0.	1.	0.	0.	0.	0.
141	0.	0.	1.	1.	1.	0.	0.	0.	1.	1.
151	0.	2.	1.	0.	1.	1.	1.	0.	1.	0.
161	1.	0.	0.	1.	0.	1.	0.	1.	0.	0.
171	0.	0.	1.	0.	0.	0.	1.	2.	0.	1.
181	0.	1.	1.	0.	2.	0.	0.	0.	1.	0.
191	0.	1.	2.	1.	1.	2.	0.	0.	0.	1.
201	1.	0.	2.	1.	0.	0.	1.	2.	4.	2.
211	2.	5.	1.	8.	6.	9.	5.	7.	11.	16.
221	11.	13.	24.	20.	34.	34.	38.	58.	71.	67.
231	85.	87.	52.	42.	25.	10.	6.	3.	2.	1.
241	0.	0.	0.	1.	0.	1.	2.	1.	0.	3.
251	2.	1.	4.	1.	4.	7.	5.	4.	2.	2.
261	2.	1.	1.	1.	1.	2.	0.	0.	3.	3.
271	2.	3.	4.	2.	0.	0.	1.	0.	0.	0.
281	3.	2.	3.	3.	1.	2.	3.	8.	6.	6.
291	8.	5.	7.	3.	0.	5.	8.	5.	5.	9.
301	7.	9.	8.	8.	5.	9.	15.	4.	7.	2.
311	3.	4.	2.	0.	2.	1.	0.	1.	2.	2.
321	4.	6.	5.	3.	4.	9.	6.	7.	10.	8.
331	9.	13.	15.	11.	9.	11.	17.	26.	33.	21.
341	27.	41.	52.	62.	83.	90.	137.	184.	249.	317.
351	464.	590.	818.	907.	984.	943.	918.	925.	1122.	1282.
361	1579.	1869.	2365.	2474.	2406.	1947.	1275.	627.	239.	63.
371	17.	3.	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.	1.	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.	1.	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.	1.
471	1.	0.	0.	0.	0.	0.	0.	0.	0.	1.
481	0.	1.	0.	1.	0.	1.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

222-S Analytical Laboratory
 G E N E R A L A L P H A E N E R G Y A N A L Y S I S
 Rev. 2.10

DATA REDUCTION REPORT

SAMPLE
 S99T1735-SAM
 File ID: 16a1675.CNF

Counted on: 10/27/99 @21:56
 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	2204.4	2204.4	362.700	362.700	10.000	2.799	5.000	1.469
2	62.2	62.2	230.015	230.015	10.000	2.876	5.000	1.764

PEAK RESULTS

Peak Error Limit: 30%

Peak ID	Isotope	AEA Frac	Peak Centroid	Count	%err	Activity	
			Exp. Obs. Diff. FWHM	Rate c/m	@95	d/m uCi/ea	
1	Pu236	0.974	5.755 5.759 -.004	0.01	53.35	1.2	25.3 0.114E-04
2	Pu239	0.026	5.147 5.149 -.002	0.01	1.40	7.6	0.7 0.293E-06
	Pu240		5.144 5.149 -.005				0.7 0.293E-06

Totals:		1.000	<--valid peaks only-->			54.75	

DETECTOR CALIBRATION

Energy(MEV) = 4.090 + (0.0046)*Channel
 Energy range (MeV): 4.090 TO 6.446
 Efficiency = 2.1529 CPM/DPM
 (Data reduction compression factor: 1.)

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	26289.0	100.000
Smoothed	26289.0	100.000
Composite fit	26282.0	99.973
Residuals	7.0	0.027

Analyzed by: _____

EMB

Spectrum 16a1675.CNF

1 Legend: Raw = Modeled Peaks = 1,2,..., etc

Display Max.: 12496.1

2
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2

1
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Raw Data Dump for AEA Spectrum: 16a1675.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.	1.	0.	1.	0.	0.	1.	1.
41	0.	0.	0.	0.	1.	0.	0.	0.	1.	2.
51	0.	0.	0.	0.	0.	0.	1.	0.	1.	0.
61	0.	2.	0.	0.	2.	0.	0.	0.	0.	1.
71	0.	0.	0.	1.	0.	0.	0.	1.	0.	1.
81	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
91	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
101	0.	0.	2.	0.	0.	1.	0.	1.	0.	0.
111	1.	0.	1.	0.	1.	2.	1.	0.	1.	0.
121	4.	0.	1.	0.	2.	3.	0.	0.	1.	0.
131	0.	0.	0.	0.	3.	0.	1.	1.	0.	2.
141	0.	1.	1.	0.	1.	2.	1.	3.	0.	3.
151	0.	1.	1.	1.	1.	0.	0.	2.	0.	2.
161	0.	3.	2.	0.	0.	0.	0.	1.	0.	0.
171	0.	2.	0.	2.	0.	1.	1.	0.	0.	0.
181	2.	0.	0.	1.	1.	1.	0.	0.	0.	1.
191	1.	0.	1.	0.	2.	1.	1.	0.	0.	0.
201	2.	0.	0.	2.	4.	2.	1.	0.	2.	4.
211	4.	2.	2.	5.	5.	6.	9.	9.	16.	11.
221	22.	19.	20.	29.	26.	55.	49.	61.	57.	73.
231	80.	65.	15.	15.	4.	5.	1.	0.	0.	1.
241	1.	2.	1.	1.	2.	2.	0.	2.	0.	2.
251	1.	2.	0.	6.	4.	4.	2.	5.	0.	2.
261	2.	1.	2.	2.	1.	4.	0.	2.	2.	6.
271	2.	3.	1.	2.	3.	3.	3.	1.	2.	1.
281	1.	1.	4.	3.	1.	7.	7.	6.	8.	3.
291	4.	8.	7.	5.	3.	2.	3.	3.	7.	8.
301	7.	11.	10.	7.	9.	10.	4.	4.	0.	4.
311	4.	0.	2.	4.	2.	1.	3.	2.	3.	3.
321	2.	7.	1.	3.	3.	5.	12.	13.	9.	14.
331	20.	9.	8.	16.	18.	18.	9.	29.	18.	35.
341	35.	54.	55.	87.	103.	137.	190.	281.	311.	458.
351	686.	805.	964.	1000.	996.	893.	933.	1030.	1363.	1664.
361	2165.	2473.	2782.	2501.	1820.	894.	259.	53.	2.	1.
371	1.	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.	1.	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.	1.	0.	0.	0.	0.	0.
471	1.	0.	0.	0.	2.	0.	1.	0.	0.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

222-S Analytical Laboratory
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 Rev. 2.10

DATA REDUCTION REPORT

SAMPLE
 S99T1735-DUP
 File ID: 17a1716.CNF

Counted on: 10/27/99 @21:57
 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	2277.2	2277.2	363.012	363.012	10.000	3.003	5.000	1.547
2?	9.5	9.5	303.707	303.585	8.000	3.308	4.000	1.008
3	66.0	66.0	229.550	229.550	10.000	3.625	5.000	2.495

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	0.982	5.755	5.756	-.0010	10.01	56.57	1.2	2220.3	0.100E-02	
2		????		5.483			0.33	16.5			
3	Pu239	0.026	5.147	5.142	0.0050	0.02	1.51	7.3	58.2	0.262E-04	
	Pu240		5.144	5.142	0.002				58.2	0.262E-04	

Totals:		1.008	<--valid peaks only-->				58.09				

DETECTOR CALIBRATION

Energy (MEV) = $4.086 + (0.0046) \cdot \text{Channel}$
 Energy range (MeV): 4.086 TO 6.441
 Efficiency = 0.0260 CPM/DPM
 (Data reduction compression factor: 1.)

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	27664.0	100.000
Smoothed	27664.3	100.001
Composite fit	28044.1	101.374
Residuals	-380.1	-1.374

Analyzed by: _____

EMB

Spectrum 17a1716.CNF

1 Legend: Raw = Modeled Peaks = 1,2,..., etc Display Max.: 13529.2

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3

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1
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Raw Data Dump for AEA Spectrum: 17a1716.CNF

1	0.	0.	0.	1.	0.	0.	1.	0.	0.	0.
11	0.	0.	0.	1.	1.	0.	0.	1.	0.	0.
21	0.	0.	0.	0.	0.	0.	0.	0.	0.	2.
31	0.	0.	1.	0.	1.	0.	0.	0.	1.	0.
41	1.	1.	1.	0.	0.	0.	1.	0.	0.	1.
51	1.	1.	0.	1.	0.	0.	0.	0.	2.	0.
61	2.	0.	0.	0.	1.	0.	1.	0.	0.	1.
71	1.	1.	1.	0.	0.	1.	0.	0.	0.	0.
81	1.	0.	0.	1.	1.	0.	0.	1.	0.	0.
91	0.	3.	1.	1.	2.	2.	0.	1.	1.	1.
101	0.	1.	1.	1.	0.	0.	0.	1.	0.	0.
111	1.	1.	0.	0.	1.	0.	1.	1.	0.	0.
121	0.	0.	1.	1.	1.	0.	1.	0.	0.	0.
131	0.	0.	0.	2.	1.	0.	0.	0.	1.	1.
141	0.	2.	0.	2.	1.	0.	1.	2.	3.	2.
151	1.	1.	4.	0.	0.	0.	1.	1.	2.	0.
161	0.	0.	3.	1.	0.	0.	0.	0.	0.	0.
171	1.	0.	1.	1.	0.	0.	0.	0.	0.	0.
181	0.	0.	0.	2.	0.	0.	0.	1.	0.	0.
191	2.	0.	1.	0.	0.	1.	1.	2.	1.	1.
201	0.	0.	0.	0.	0.	2.	1.	2.	4.	2.
211	2.	4.	1.	6.	6.	8.	13.	10.	10.	18.
221	12.	18.	23.	25.	47.	65.	54.	67.	76.	77.
231	78.	46.	39.	13.	3.	4.	0.	0.	1.	1.
241	2.	0.	0.	1.	1.	1.	3.	1.	1.	2.
251	0.	1.	1.	3.	5.	4.	4.	0.	1.	2.
261	2.	0.	2.	1.	0.	1.	3.	4.	1.	4.
271	2.	2.	1.	0.	0.	0.	0.	2.	3.	3.
281	4.	3.	2.	0.	9.	2.	3.	3.	7.	3.
291	2.	4.	3.	3.	8.	6.	4.	7.	3.	11.
301	6.	13.	11.	7.	15.	8.	7.	1.	2.	2.
311	2.	3.	2.	0.	2.	1.	1.	1.	4.	4.
321	1.	4.	2.	1.	5.	2.	3.	6.	9.	6.
331	8.	10.	8.	7.	13.	12.	11.	14.	27.	27.
341	34.	37.	49.	62.	83.	130.	168.	243.	369.	451.
351	618.	828.	968.	1081.	1024.	956.	968.	1071.	1318.	1672.
361	2119.	2499.	2782.	2734.	2100.	1286.	555.	143.	40.	4.
371	1.	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.	1.	0.	0.	0.	0.	0.
431	0.	1.	1.	0.	0.	0.	0.	1.	0.	0.
441	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	1.	0.	1.	0.	1.	1.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

WORKBOOK PAGE: STD1

Pu 238 and 239/240 : LA-943-128 (VOID) or LA-953-104(B-9)

LIQUID

STD

	DATE COUNTED		08/30/99	PU 238 AEA FRAC (C238)	0.472
STD	SAMPLE VOLUME in mL	SS	1.000	PU 238 AEA FRAC (C238)	0.000
	SAMPLE DILUTION FACTOR	DF	1.000	PU 239 AEA FRAC (C239)	0.505
31553	TRACER VOLUME in mL	SPKV	0.100	TOTAL AT COUNTS	5148
	DIGEST DILUTION FACTOR	DDF		AT COUNT TIME (MIN)	30
@PU23801	TRACER BOOK NO		11353	BACKGROUND in cpm (Bkg)	0.030
	DETECTOR NUMBER		20	PU 238 cpm	54.710
LIQUID	EFFICIENCY FACTOR	EFF	0.335	PU 238 cpm	0.000
	TRACER PREPARATION DATE		08/30/99	PU 239 cpm	55.520
99004002	TRACER PREPARATION VALUE (dpm/mL)		2687.000	AEA COUNT TIME	480
	PU-238 DECAY CORR'D VALUE (dpm/mL)		2585.204	Pu 238/240 μ Ci/L	1.2459E-01
0	PU-238 TRACER VALUE (dpm/mL)		0.000		
	STANDARD BOOK NO		46B57		
N/A	STANDARD VALUE in μ Ci/mL		1.260E-04		

Decay Time = Date Counted - Tracer Preparation Date

Pu-238 Decay Corr'd Value = Pu-238 Preparation Value * [e to the power of $((-\ln 2) * \text{Decay Time} / 1040.95))$

Pu 238 Tracer Recovery = (Total AT Counts / TC - Bkg) * 1/EFF * C238 * 100 / Pu-238 Decay Corr'd Value * SPKV

Pu 239/240 μ Ci/L = (C239)(Pu 238 Decay Corr'd Value)(SPKV)(1000mL/L)(DF)(DDF) / [(C238)(SS)(2220000 dpm/ μ Ci)]

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

Pu 238 μ Ci/L = [(Pu 238 dpm)(DF)(DDF)(1000mL/L)] / [(Pu-238 Tracer Recovery / 100)(2220000 dpm/ μ Ci)(D g/L)(SS)]Relative Counting Error = Square Root of $[(1 / (\text{Pu 238 cpm} * \text{min})) + (1 / (\text{Pu 238 or 239/240 cpm} * \text{min}))] * 1.96 * 100$

Pu 239/240 μ Ci/mL = 1.25E-04
 Relative Counting Error = 1.7%

DETECTION
LEVELS
in μ Ci/mL
Pu 239/240
7.91E-06

Pu 238 Tracer Recovery = 93.6%

Analyst:	AKL	Date:	28-Oct-99
Signature of Chemist:	JFR	Date:	1/10/99

STANDARD.WB1 REV 1.0

943128ML

WORKBOOK PAGE: BLANK2

Pu 238 and 239/240 : LA-943-128 (VOID) or LA-953-104(B-0) ¹ _{11/11/99} LI

	DATE COUNTED		OCT-27-99	PU 238 AEA FRAC (C236)	0.999
BLNK	SAMPLE VOLUME in mL	SS	0.100	PU 238 AEA FRAC (C238)	0.000
	SAMPLE DILUTION FACTOR	DF	1.000	PU 239 AEA FRAC (C239)	0.000
31553	TRACER VOLUME in mL	SPKV	0.100	TOTAL AT COUNTS	2580
	DIGEST DILUTION FACTOR	DDF		AT COUNT TIME (MIN)	30
@PU23901	TRACER BOOK NO		18859	BACKGROUND in cp (Bkg)	0.030
	DETECTOR NUMBER		20	PU 238 cpm	51.570
LIQUID	EFFICIENCY FACTOR	EFF	0.3347	PU 238 cpm	0.000
	TRACER PREPARATION DATE		08/30/99	PU 239 cpm	0.000
99004002	TRACER PREPARATION VALUE (dpm/mL)		2687.00	AEA COUNT TIME	480
	PU-238 DECAY CORR'D VALUE (dpm/mL)		2585.20	Pu 239/240 μ Ci/L =	< 3.523E-02
0	PU-238 TRACER VALUE (dpm/m)		0.00		

N/A

WL11853

Decay Time = Date Counted - Tracer Preparation Date

Pu-238 Decay Corr'd Value = Pu-238 Preparation Value * [e to the power of $\{(-\ln 2 * \text{Decay Time}) / 1040.95\}$]

Pu 236 Tracer Recovery = (Total AT Counts / TC - Bkg) * C236 * 100 / (Pu-238 Decay Corr'd Value * SPKV * EFF)

Pu 239/240 μ Ci/L = (C239) * (Pu 238 Decay Corr'd Value) * (SPKV) * (1000 mL/L) * (DF) * (DDF) / [(C236) * (SS) * (D g/L) * (2220000 dpm/ μ Ci)]

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

Pu 238 μ Ci/L = [(Pu 238 dpm) * (DF) * (DDF) * (1000 mL/L)] / [(Pu-238 Tracer Recovery / 100) * (2220000 dpm/ μ Ci) * (D g/L) * (SS)]Relative Counting Error = Square Root of $\{[1 / (\text{Pu 238 cpm} * \text{min})] + [1 / (\text{Pu 238 or 239/240 cpm} * \text{min})]\} * 1.96 * 100$ Pu 239/240 μ Ci/mL < 3.52E-05

Relative Counting Error = 100.0%

DETECTION

LEVELS
in μ Ci/mL

NOTE: Pu 238 Result is a LESS THAN Value.

Pu 238 μ Ci/mL < 3.52E-05

Relative Counting Error = 100.0%

Pu 238 Tracer Recovery = 99.3%

Pu 239/240

3.52E-05

Pu 238

3.52E-05

Analyst:

AKL

Date: 28-Oct-99

Signature of Chemist:

JFR

Date: 1 Nov 99

BLANK.WB1 REV 1.0

943128ML

WORKBOOK PAGE: SAM3

Pu 238 and 239/240 : LA-943-128 (VOID) or LA-953-104(B-0))

LIQUID /

SAMPLE

	DATE COUNTED		OCT-27-99	PU 238 AEA FRAC (C238)	0.993
SAMPLE	SAMPLE VOLUME in mL	SS	0.100	PU 238 AEA FRAC (C238)	0.000
	SAMPLE DILUTION FACTOR	DF	1.000	PU 239 AEA FRAC (C239)	0.000
31553	TRACER VOLUME in mL	SPKV	0.100	TOTAL AT COUNTS	2598
	DIGEST DILUTION FACTOR	DDF		AT COUNT TIME (MIN)	30
PU23901	TRACER BOOK NO		10000	BACKGROUND in cpm (Bkg)	0.030
	DETECTOR NUMBER		20	PU 238 cpm	52.270
LIQUID	EFFICIENCY FACTOR	EFF	0.335	PU 238 cpm	0.000
	TRACER PREPARATION DATE		08/30/99	PU 239 cpm	0.000
99004002	TRACER PREPARATION VALUE (dpm/mL)		2687.000	AEA COUNT TIME	480
	PU-238 DECAY CORR'D VALUE (dpm/mL)		2585.204	Pu 239/240 μ Ci/L =	< 3.5412E-02
0	PU-238 TRACER VALUE (dpm/mL)		0.000		

N/A

S99T001731

Decay Time = Date Counted - Tracer Preparation Date

Pu-238 Decay Corr'd Value = Pu-238 Preparation Value * [e to the power of $\{(-\ln 2 * \text{Decay Time})/1040.95\}$]

Pu 238 Tracer Recovery = (Total AT Counts / TC - Bkg) * C238 * 100 / (Pu-238 Decay Corr'd Value * SPKV * EFF)

Pu 239/240 μ Ci/L = (C239) (Pu 238 Decay Corr'd Value) (SPKV) (1000 mL/L) (DF) (DDF) / [(C238) (SS) (D g/L) (2220000 dpm/ μ Ci)]

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

Pu 238 μ Ci/L = [(Pu 238 dpm) (DF) (DDF) (1000 mL/L)] / [(Pu-238 Tracer Recovery / 100) (2220000 dpm/ μ Ci) (D g/L) (SS)]Relative Counting Error = Square Root of $\{[1 / (\text{Pu 238 cpm} * \text{min})] + [1 / (\text{Pu 238 or 239/240 cpm} * \text{min})]\} * 1.96 * 100$ Pu 239/240 μ Ci/mL < 3.54E-05

Relative Counting Error = 100.0%

DETECTION

LEVELS

In μ Ci/mL

NOTE: Pu 238 Result is a LESS THAN Value.

Pu 238 μ Ci/mL < 3.54E-05

Relative Counting Error = 100.0%

Pu 238 Tracer Recovery = 99.3%

Pu 239/240

3.54E-05

Pu 238

3.54E-05

Analyst:

AKL

Date: 28-Oct-99

Signature of Chemist:

JFR

Date: 1 NOV 99

SAMPLE.WB1 REV 1.0

943/28ML

WORKBOOK PAGE: DUP4

Pu 238 and 239/240 : LA-943-128 (VOID) or LA-953-104(B-P) ~~10/28/99~~ LIQUID /

	DATE COUNTED	OCT-27-99	PU 238 AEA FRAC (C236)	DUP
DUP	SAMPLE VOLUME in mL SS	0.100	PU 238 AEA FRAC (C238)	1.004
	SAMPLE DILUTION FACTOR DF	1.000	PU 239 AEA FRAC (C239)	0.000
31553	TRACER VOLUME in mL SPKV	0.100	TOTAL AT COUNTS	2524
	DIGEST DILUTION FACTOR DDF		AT COUNT TIME (MIN)	30
PU23801	TRACER BOOK NO	18559	BACKGROUND in cpm (Bkg)	0.030
	DETECTOR NUMBER	20	PU 238 cpm	48.180
LIQUID	EFFICIENCY FACTOR EFF	0.335	PU 238 cpm	0.000
	TRACER PREPARATION DATE	08/30/99	PU 239 cpm	0.000
99004002	TRACER PREPARATION VALUE (dpm/mL)	2687.000	AEA COUNT TIME	480
	PU-238 DECAY CORR'D VALUE (dpm/mL)	2585.204	Pu 239/240 μ Ci/L =	3.5656E-02
0	PU-238 TRACER VALUE (dpm/mL)	0.000		

N/A

Decay Time = Date Counted - Tracer Preparation Date

899T001731

Pu-238 Decay Corr'd Value = Pu-238 Preparation Value * [e to the power of {(-ln2 * Decay Time/1040.95)}]

Pu 238 Tracer Recovery = (Total AT Counts / TC - Bkg) * C236 * 100 / (Pu-238 Decay Corr'd Value * SPKV * EFF)

Pu 239/240 μ Ci/L = (C239)(Pu 238 Decay Corr'd Value)(SPKV)(1000mL/L)(DF)(DDF) / [(C236)(SS)(D g/L)(2220000 dpm/ μ Ci)]

Pu 238 dpm = [(Total AT Counts / TC) - Bkg * 1/EFF * C236] - (Pu-238 Tracer Value * SPKV * Pu 238 Tracer Recovery / 100)

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

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

Pu 239/240 μ Ci/mL < 3.57E-05

Relative Counting Error = 100.0%

DETECTION

LEVELS

in μ Ci/mL

NOTE: Pu 238 Result is a LESS THAN Value.

Pu 239/240

Pu 238 μ Ci/mL < 3.57E-05

3.57E-05

Relative Counting Error = 100.0%

Pu 238

Pu 238 Tracer Recovery = 97.6%

3.57E-05

Analyst:	AKL	Date:	28-Oct-99
Signature of Chemist:	JFR	Date:	11 Nov 99

SAMPLE.WB1 REV 1.0

943/28ML

WORKBOOK PAGE: SAM5

Pu 238 and 239/240 : LA-943-128 (VOID) or LA-953-104(B-1) *11/11/99*

LIQUID /

DATE COUNTED				LIQUID /		SAMPLE
			OCT-07-99	PU 238 AEA FRAC	(C238)	0.973
SAMPLE	SAMPLE VOLUME in mL	SS	0.100	PU 238 AEA FRAC	(C238)	0.000
	SAMPLE DILUTION FACTOR	DF	1.000	PU 239 AEA FRAC	(C239)	0.026
31553	TRACER VOLUME in mL	SPKV	0.100	TOTAL AT COUNTS		2453
	DIGEST DILUTION FACTOR	DDF		AT COUNT TIME (MIN)		30
@PU23901	TRACER BOOK NO		15550	BACKGROUND in cpm (Bkg)		0.030
	DETECTOR NUMBER		20	PU 238 cpm		56.460
LIQUID	EFFICIENCY FACTOR	EFF	0.335	PU 238 cpm		0.000
	TRACER PREPARATION DATE		08/30/99	PU 239 cpm		1.510
99004002	TRACER PREPARATION VALUE (dpm/mL)		2687.000	AEA COUNT TIME		480
	PU-238 DECAY CORR'D VALUE (dpm/mL)		2619.863	Pu 239/240 μ Ci/L =		< 4.0118E-02
0	PU-238 TRACER VALUE (dpm/mL)		0.000			

N/A

Decay Time = Date Counted - Tracer Preparation Date

S99T001734

Pu-238 Decay Corr'd Value = Pu-238 Preparation Value * [e to the power of {(-ln2 * Decay Time/1040.95)}]

Pu 238 Tracer Recovery = (Total AT Counts / TC - Bkg) * C238 * 100 / (Pu-238 Decay Corr'd Value * SPKV * EFF)

Pu 239/240 μ Ci/L = (C239)(Pu 238 Decay Corr'd Value)(SPKV)(1000mL/L)(DF)(DDF) / [(C238)(SS)(D g/L)(2220000 dpm/ μ Ci)]

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

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

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

Pu 239/240 μ Ci/mL < 4.01E-05

Relative Counting Error = 7.4%

DETECTION

LEVELS

in μ Ci/mL

Pu 239/240

4.01E-05

Pu 238

4.01E-05

NOTE: Pu 238 Result is a LESS THAN Value.

Pu 238 μ Ci/mL < 4.01E-05

Relative Counting Error = 100.0%

Pu 238 Tracer Recovery = 90.7%

Analyst:

Signature of Chemist:

AKL

Date: 28-Oct-99

JFR

Date: 1 Nov 99

SAMPLE.WB1 REV 1.0

943128ML

WORKBOOK PAGE: DUP6

Pu 238 and 239/240 : LA-943-128 (VOID) or LA-953-104(B-9) ¹ ~~11/11/99~~ LIQUID /

				DUP
	DATE COUNTED	OCT-27-99	PU 238 AEA FRAC (C238)	0.882
DUP	SAMPLE VOLUME in mL	SS 0.100	PU 238 AEA FRAC (C238)	0.000
	SAMPLE DILUTION FACTOR	DF 1.000	PU 239 AEA FRAC (C239)	0.028
31553	TRACER VOLUME in mL	SPKV 0.100	TOTAL AT COUNTS	2664
	DIGEST DILUTION FACTOR	DDF	AT COUNT TIME (MIN)	30
@PU23901	TRACER BOOK NO	10550	BACKGROUND in cpm (Bkg)	0.030
	DETECTOR NUMBER	20	PU 238 cpm	53.940
LIQUID	EFFICIENCY FACTOR	EFF 0.335	PU 238 cpm	0.000
	TRACER PREPARATION DATE	08/30/99	PU 239 cpm	1.660
99004002	TRACER PREPARATION VALUE (dpm/mL)	2687.000	AEA COUNT TIME	480
	PU-238 DECAY CORR'D VALUE (dpm/mL)	2585.204	Pu 239/240 μ Ci/L =	< 3.5576E-02
0	PU-238 TRACER VALUE (dpm/mL)	0.000		

N/A

Decay Time = Date Counted - Tracer Preparation Date

899T001734

Pu-238 Decay Corr'd Value = Pu-238 Preparation Value * [e to the power of ((-ln2 * Decay Time)/1040.95)]

Pu 238 Tracer Recovery = (Total AT Counts / TC - Bkg) * C238 * 100 / (Pu-238 Decay Corr'd Value * SPKV * EFF)

Pu 239/240 μ Ci/L = (C239)(Pu 238 Decay Corr'd Value)(SPKV)(1000mL/L)(DF)(DDF) / [(C238)(SS)(D g/L)(2220000 dpm/ μ Ci)]

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

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

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

Pu 239/240 μ Ci/mL < 3.56E-05

Relative Counting Error = 7.3%

DETECTION
LEVELS
in μ Ci/mL

NOTE: Pu 238 Result is a LESS THAN Value.

Pu 238 μ Ci/mL < 3.56E-05

Relative Counting Error = 100.0%

Pu 238 Tracer Recovery = 100.4%

Pu 239/240
3.56E-05
Pu 238
3.56E-05

Analyst:	AKL	Date:	28-Oct-99
Signature of Chemist:	JFR	Date:	11/20/99

SAMPLE.WB1 REV 1.0

943/28ML

WORKBOOK PAGE: SAM7

Pu 238 and 239/240 : LA-943-128 (VOID) or LA-953-104(B-6) *1/2*

LIQUID /

				SAMPLE
	DATE COUNTED		OCT-27-99	Pu 238 AEA FRAC (C238)
SAMPLE	SAMPLE VOLUME in mL	SS	0.100	Pu 238 AEA FRAC (C238)
	SAMPLE DILUTION FACTOR	DF	1.000	Pu 239 AEA FRAC (C239)
31553	TRACER VOLUME in mL	SPKV	0.100	TOTAL AT COUNTS
	DIGEST DILUTION FACTOR	DDF		AT COUNT TIME (MIN)
@PU23901	TRACER BOOK NO		10000	BACKGROUND in cpm (Bkg)
	DETECTOR NUMBER		20	Pu 238 cpm
LIQUID	EFFICIENCY FACTOR	EFF	0.335	Pu 238 cpm
	TRACER PREPARATION DATE		08/30/99	Pu 238 cpm
99004002	TRACER PREPARATION VALUE (dpm/mL)		2687.000	AEA COUNT TIME
	PU-238 DECAY CORR'D VALUE (dpm/mL)		2585.204	Pu 239/240 μ Ci/L =
0	PU-238 TRACER VALUE (dpm/mL)		0.000	< 3.7588E-02

N/A

Decay Time = Date Counted - Tracer Preparation Date

899T001735

Pu-238 Decay Corr'd Value = Pu-238 Preparation Value * [e to the power of $\{(-\ln 2 * \text{Decay Time}) / 1040.95\}$]

Pu 238 Tracer Recovery = (Total AT Counts / TC - Bkg) * C238 * 100 / (Pu-238 Decay Corr'd Value * SPKV * EFF)

Pu 239/240 μ Ci/L = (C239)(Pu 238 Decay Corr'd Value)(SPKV)(1000mL/L)(DF)(DDF) / [(C238)(SS)(D g/L)(2220000 dpm/ μ Ci)]

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

Pu 238 μ Ci/L = [(Pu 238 dpm)(DF)(DDF)(1000mL/L)] / [(Pu-238 Tracer Recovery / 100)(2220000 dpm/ μ Ci)(D g/L)(SS)]Relative Counting Error = Square Root of $\{[1 / (\text{Pu 238 cpm} * \text{min})] + [1 / (\text{Pu 238 or 239/240 cpm} * \text{min})]\} * 1.96 * 100$ Pu 239/240 μ Ci/mL < 3.76E-05

Relative Counting Error = 7.7%

DETECTION
LEVELS
in μ Ci/mL

NOTE: Pu 238 Result is a LESS THAN Value.

Pu 238 μ Ci/mL < 3.76E-05

Relative Counting Error = 100.0%

Pu 238 Tracer Recovery = 95.4%

Pu 239/240
3.76E-05
Pu 238
3.76E-05

Analyst:	AKL	Date:	28-Oct-99
Signature of Chemist:	<i>John Relyea</i>	Date:	1/16/99
SAMPLE.WB1 REV 1.0	946128ML		

WORKBOOK PAGE: DUP8

Pu 238 and 239/240 : LA-943-128 (VOID) or LA-953-104(B-0)) *11/11/99* LIQUID /

	DATE COUNTED		DCT-37-99	Pu 238 AEA FRAC (C238)	DUP
DUP	SAMPLE VOLUME in mL	SS	0.100	Pu 238 AEA FRAC (C238)	0.982
	SAMPLE DILUTION FACTOR	DF	1.000	Pu 239 AEA FRAC (C239)	0.000
31553	TRACER VOLUME in mL	SPKV	0.100	TOTAL AT COUNTS	0.026
	DIGEST DILUTION FACTOR	DDF		AT COUNT TIME (MIN)	2676
PU23901	TRACER BOOK NO		15559	BACKGROUND in cpm (Bkg)	30
	DETECTOR NUMBER		20	Pu 238 cpm	0.030
LIQUID	EFFICIENCY FACTOR	EFF	0.335	Pu 238 cpm	66.670
	TRACER PREPARATION DATE		08/30/99	Pu 239 cpm	0.000
99004002	TRACER PREPARATION VALUE (dpm/mL)		2687.000	AEA COUNT TIME	1.510
	PU-238 DECAY CORR'D VALUE (dpm/mL)		2585.204	Pu 239/240 μ Ci/L =	480
0	PU-238 TRACER VALUE (dpm/mL)		0.000		3.5576E-02

N/A

Decay Time = Date Counted - Tracer Preparation Date

899T001735

Pu-238 Decay Corr'd Value = Pu-238 Preparation Value * [e to the power of ((-ln2 * Decay Time/1040.95))]

Pu 238 Tracer Recovery = (Total AT Counts / TC - Bkg) * C238 * 100 / (Pu-238 Decay Corr'd Value * SPKV * EFF)

Pu 239/240 μ Ci/L = (C239)(Pu 238 Decay Corr'd Value)(SPKV)(1000mL/L)(DF)(DDF) / [(C238)(SS)(D g/L)(2220000 dpm/ μ Ci)]

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

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

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

Pu 239/240 μ Ci/mL < 3.56E-05

Relative Counting Error = 7.4%

DETECTION
LEVELS
in μ Ci/mL

NOTE: Pu 238 Result is a LESS THAN Value.

Pu 238 μ Ci/mL < 3.56E-05

Relative Counting Error = 100.0%

Pu 238 Tracer Recovery = 101.2%

Pu 239/240
3.56E-05
Pu 238
3.56E-05

Analyst:	AKL	Date:	28-Oct-99
Signature of Chemist:	<i>John Redyca</i>	Date:	1 Nov 99

SAMPLE.WB1 REV 1.0

943128ML

HNF-1685 REV. 0

LABCORE Completed Worklist Report for Worklist# 31626

Analyst: ak1

Instrument: AB20

Book#: _____

Method: LA-953-104 Rev/Mod B-1

Worklist Comment: S-111 GRAB, @PU23901, STD:1.0mL, SS by Ludlum. skm

Seq Type	Sample#	R A	Test	Matrix	Actual	Found	DL or Yield	Unit
1 STD	0		@PU23901 PU23901	SOLID	1.32E-04	1.32E-4	104.752 % Recovery	
1 STD	0		@PU23901 PU23901T	SOLID	100	9.27E+01	92.700 % Recovery	
1 STD	0		@PU23901 PU23901E	SOLID	1	1.68E+00	1.680 % Ct Error	
2 BLNK-PREP	0		@PU23901 PU23901	SOLID	1	<1.68E-3		uCi/g
2 BLNK-PREP	0		@PU23901 PU23901T	SOLID	100	1.02E+02	102.000 % Recovery	
2 BLNK-PREP	0		@PU23901 PU23901E	SOLID	1	1.00E+02	100.000	uCi/g
3 SAMPLE	S99T001737	0 F	@PU23901 PU23901	SOLID	N/A	1.82E-02	2.31E-003	uCi/g
3 SAMPLE	S99T001737	0 F	@PU23901 PU23901T	SOLID	N/A	9.53E+01		% Recovery
3 SAMPLE	S99T001737	0 F	@PU23901 PU23901E	SOLID	N/A	2.77E+00		% Ct. Error
4 DUP	S99T001737	0 F	@PU23901 PU23901	SOLID	1.52E-2	1.42E-2	6.803	RPD
4 DUP	S99T001737	0 F	@PU23901 PU23901T	SOLID	100	1.00E+02	100.000 % Recovery	
4 DUP	S99T001737	0 F	@PU23901 PU23901E	SOLID	1.00	2.68E+00	2.680	% Ct Error

Final page for worklist# 31626

Analyst Signature _____ Date _____

Analyst Signature _____ Date _____

Reviewer Signature _____ Date 4 Nov 99

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

LABCORE Data Entry Template for Worklist# 31626

Analyst: AKL Instrument: PU01 20 Book# 46657

Method: LA-953-104 Rev/Mod B1

Worklist Comment: S-111 GRAB, @PU23901, STD:1.0mL, SS by Ludlum. skm

S Type	Sample#	R A	Test	Matrix	Group#	Project
1 STD			@PU23901	SOLID		
2 BLNK-PREP			@PU23901	SOLID		
3 SAMPLE	S99T001737	0 F	@PU23901	SOLID	99000304	S-111 GRAB
Analytes Requested: PU23901 , PU23901E, PU23901T						
4 DUP	S99T001737	0 F	@PU23901	SOLID		

Final page for worklist # 31626

Alta Humen 11/3/99
Signature Date

Shera Z. Chan 11/4/99
Signature Date
Em Buch 11-4-99

Data Entry Comments:

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

222-S Analytical Laboratory
 G E N E R A L A L P H A E N E R G Y A N A L Y S I S
 Rev. 2.10

DATA REDUCTION REPORT

SAMPLE
 WL31626-STD-PU
 File ID: 2a2097.CNF

Counted on: 11/ 3/99 @19:19
 Detector: AEA2
 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	2293.4	2293.4	362.020	362.020	10.000	2.688	5.000	1.489
2?	14.5	14.5	302.241	302.204	10.000	5.726	5.000	1.416
3	2962.5	2962.5	228.692	228.692	10.000	2.924	5.000	2.273

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	0.456	5.755	5.755	0.0000	0.01	53.43	1.2	249.8	0.113E-03	
2		????		5.480			0.64	11.5			
3	Pu239	0.518	5.147	5.142	0.0050	0.01	60.68	1.1	278.0	0.125E-03	
	Pu240		5.144	5.142	0.002				278.0	0.125E-03	

Totals:		0.974	<--valid peaks only-->				114.11				

DETECTOR CALIBRATION

Energy(MEV) = 4.090 + (0.0046)*Channel
 Energy range (MeV): 4.090 TO 6.445
 Efficiency = 0.2183 CPM/DPM
 (Data reduction compression factor: 1.)

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	56225.0	100.000
Smoothed	56225.0	100.000
Composite fit	55088.8	97.979
Residuals	1136.2	2.021

Analyzed by: _____

VR

Spectrum 2a2097.CNF

1 Legend: Raw = Modeled Peaks = 1,2,..., etc Display Max.: 18838.8

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..3.
.....3
.....3
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.....3

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2
2
2
2
2
2

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1..

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Raw Data Dump for AEA Spectrum: 2a2097.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	2.	0.	0.
21	1.	1.	1.	1.	3.	1.	1.	1.	2.	1.
31	0.	0.	0.	1.	1.	2.	0.	1.	0.	1.
41	2.	2.	2.	2.	0.	1.	1.	1.	1.	2.
51	1.	1.	3.	0.	1.	1.	1.	3.	0.	0.
61	1.	1.	0.	0.	1.	4.	1.	2.	0.	0.
71	0.	2.	1.	1.	1.	1.	2.	1.	0.	2.
81	1.	2.	3.	1.	1.	0.	0.	2.	2.	1.
91	3.	0.	1.	1.	1.	1.	1.	0.	1.	1.
101	1.	0.	3.	1.	1.	2.	3.	0.	1.	0.
111	2.	2.	3.	0.	2.	4.	6.	1.	2.	1.
121	1.	3.	4.	1.	0.	2.	3.	5.	0.	3.
131	1.	4.	2.	4.	0.	5.	1.	1.	3.	3.
141	0.	2.	3.	5.	3.	2.	3.	3.	1.	5.
151	4.	5.	3.	2.	1.	0.	5.	5.	0.	2.
161	0.	2.	3.	2.	4.	0.	4.	3.	6.	1.
171	1.	5.	5.	6.	9.	3.	6.	3.	2.	7.
181	5.	9.	7.	6.	5.	9.	6.	10.	9.	4.
191	9.	11.	11.	13.	9.	12.	7.	9.	19.	21.
201	17.	25.	13.	16.	31.	32.	28.	41.	61.	56.
211	92.	97.	150.	191.	249.	347.	445.	560.	608.	627.
221	746.	879.	985.	1424.	1840.	2385.	3013.	3496.	3677.	3422.
231	2377.	1278.	413.	118.	24.	6.	3.	3.	3.	1.
241	2.	2.	4.	5.	4.	4.	3.	4.	5.	3.
251	1.	2.	3.	2.	1.	2.	5.	1.	5.	2.
261	1.	1.	1.	3.	1.	3.	2.	0.	1.	3.
271	6.	2.	1.	3.	1.	4.	3.	2.	2.	3.
281	3.	7.	3.	8.	8.	5.	7.	6.	8.	10.
291	3.	12.	3.	9.	10.	9.	8.	6.	11.	7.
301	19.	16.	23.	9.	10.	9.	5.	3.	5.	7.
311	2.	3.	4.	4.	3.	3.	6.	4.	2.	8.
321	3.	8.	10.	6.	13.	6.	12.	17.	16.	14.
331	13.	12.	18.	20.	18.	21.	25.	22.	39.	32.
341	48.	53.	56.	78.	106.	159.	203.	291.	409.	618.
351	790.	984.	989.	981.	881.	780.	989.	1203.	1520.	2043.
361	2540.	2914.	2768.	2088.	1136.	408.	97.	17.	3.	10.
371	6.	5.	1.	2.	3.	1.	2.	1.	3.	3.
381	1.	1.	0.	0.	0.	1.	1.	1.	2.	1.
391	1.	2.	2.	0.	2.	1.	1.	1.	1.	2.
401	1.	0.	1.	2.	1.	0.	0.	0.	1.	0.
411	0.	1.	0.	0.	1.	0.	0.	0.	0.	1.
421	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
431	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	1.	0.	0.	0.	1.	0.
461	0.	0.	1.	0.	1.	0.	2.	0.	0.	2.
471	0.	2.	0.	0.	0.	0.	0.	1.	0.	0.
481	1.	0.	1.	1.	0.	0.	0.	1.	0.	1.
491	1.	1.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

222-S Analytical Laboratory
 G E N E R A L A L P H A E N E R G Y A N A L Y S I S
 Rev. 2.10

DATA REDUCTION REPORT

SAMPLE
 WL31626-BLK-PU
 File ID: 3a3037.CNF

Counted on: 11/ 3/99 @19:20
 Detector: AEA3
 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	2083.5	2083.5	362.876	362.876	10.000	3.072	5.000	1.594

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	0.993	5.755	5.757	-.0020	0.01	51.85	1.2	227.7	0.103E-03
Totals:		0.993	--valid peaks only-->				51.85			

DETECTOR CALIBRATION

Energy(MEV) = 4.087 + (0.0046)*Channel
 Energy range (MeV): 4.087 TO 6.443
 Efficiency = 0.2323 CPM/DPM
 (Data reduction compression factor: 1.)

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	25066.0	100.000
Smoothed	25065.9	100.000
Composite fit	24891.4	99.303
Residuals	174.6	0.697

Analyzed by: _____

VR

Spectrum 3a3037.CNF

1 Legend: Raw = Modeled Peaks = 1,2,..., etc

Display Max.: 12300.3

1
.
1
.....1
.....1
.....1
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...1...

Raw Data Dump for AEA Spectrum: 3a3037.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	1.	0.	1.	0.
21	1.	0.	2.	0.	1.	0.	0.	0.	1.	0.
31	0.	0.	0.	1.	2.	0.	0.	0.	2.	0.
41	0.	0.	0.	1.	1.	0.	0.	0.	0.	0.
51	0.	2.	0.	0.	0.	1.	0.	0.	0.	0.
61	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
71	0.	0.	0.	1.	1.	0.	1.	0.	0.	2.
81	0.	2.	2.	0.	0.	0.	0.	0.	0.	1.
91	1.	2.	0.	2.	0.	0.	0.	1.	0.	0.
101	2.	0.	1.	0.	1.	3.	0.	0.	0.	0.
111	2.	2.	1.	2.	1.	1.	1.	1.	0.	0.
121	1.	0.	0.	0.	1.	0.	1.	1.	1.	0.
131	0.	1.	0.	2.	0.	4.	1.	0.	2.	2.
141	0.	3.	0.	1.	0.	0.	0.	0.	0.	2.
151	0.	0.	0.	1.	0.	0.	0.	0.	1.	0.
161	2.	2.	3.	1.	1.	1.	0.	1.	1.	1.
171	1.	0.	2.	0.	0.	4.	3.	2.	2.	1.
181	2.	4.	0.	0.	3.	1.	0.	1.	2.	3.
191	0.	1.	0.	3.	0.	1.	0.	1.	1.	0.
201	1.	2.	2.	0.	2.	1.	2.	0.	0.	1.
211	4.	4.	0.	3.	0.	2.	2.	1.	2.	3.
221	0.	0.	3.	2.	2.	4.	3.	4.	3.	1.
231	0.	1.	4.	3.	1.	3.	0.	1.	2.	2.
241	0.	4.	0.	1.	2.	1.	0.	1.	1.	2.
251	4.	1.	1.	0.	3.	5.	1.	1.	0.	0.
261	3.	3.	3.	2.	1.	1.	0.	3.	1.	5.
271	0.	1.	3.	3.	1.	5.	2.	2.	2.	3.
281	1.	2.	2.	9.	11.	9.	4.	7.	15.	6.
291	3.	6.	5.	6.	4.	1.	0.	2.	2.	10.
301	3.	1.	7.	8.	9.	5.	4.	4.	5.	3.
311	5.	6.	4.	2.	0.	6.	7.	4.	4.	3.
321	7.	7.	3.	5.	4.	9.	7.	15.	8.	8.
331	15.	16.	19.	17.	14.	14.	26.	17.	25.	23.
341	41.	46.	78.	86.	98.	122.	184.	260.	349.	435.
351	592.	741.	881.	932.	930.	894.	891.	1021.	1234.	1544.
361	1944.	2412.	2566.	2407.	1852.	1097.	461.	150.	28.	11.
371	1.	1.	1.	2.	1.	0.	0.	2.	0.	0.
381	1.	0.	2.	1.	2.	1.	1.	1.	0.	0.
391	3.	1.	1.	0.	0.	1.	1.	1.	0.	0.
401	0.	0.	0.	0.	0.	0.	1.	0.	1.	1.
411	0.	0.	1.	0.	0.	1.	0.	0.	1.	0.
421	0.	0.	0.	2.	2.	2.	0.	1.	1.	1.
431	0.	1.	0.	1.	0.	0.	0.	0.	0.	1.
441	1.	0.	0.	1.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	0.	0.	0.	0.	1.	1.	0.	0.	0.	1.
481	0.	0.	0.	1.	0.	1.	0.	0.	1.	0.
491	1.	0.	0.	0.	0.	0.	0.	0.	1.	0.
511	0.	0.								

222-S Analytical Laboratory
 G E N E R A L A L P H A E N E R G Y A N A L Y S I S
 Rev. 2.10

DATA REDUCTION REPORT

SAMPLE
 S99T001737-SAM-P
 File ID: 4a4132.CNF

Counted on: 11/ 3/99 @19:21
 Detector: AEA4
 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	2085.6	2085.6	360.744	360.744	10.000	2.714	5.000	1.493
2	55.6	55.6	302.355	302.345	8.000	2.879	4.000	1.342
3	597.1	597.1	228.161	228.161	12.000	3.520	6.000	2.546

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	0.759	5.755	5.745	0.010	0.01	48.87	1.3	226.2	0.102E-03
2	Pu238	0.022	5.487	5.476	0.011	0.01	1.44	7.5	9.1	0.410E-05
	Am241		5.479	5.476	0.003				7.0	0.314E-05
3	Pu239	0.207	5.147	5.135	0.012	0.02	13.32	2.5	60.4	0.272E-04
	Pu240		5.144	5.135	0.009				60.4	0.272E-04
Totals:		0.988	<--valid peaks only-->				63.63			

DETECTOR CALIBRATION

Energy(MEV) = 4.086 + (0.0046)*Channel
 Energy range (MeV): 4.086 TO 6.441
 Efficiency = 0.2204 CPM/DPM
 (Data reduction compression factor: 1.)

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	30914.0	100.000
Smoothed	30914.0	100.000
Composite fit	30545.4	98.808
Residuals	368.6	1.192

Analyzed by: _____

VR

Spectrum 4a4132.CNF

1 Legend: Raw = Modeled Peaks = 1,2,..., etc Display Max.: 9826.5

.3
.....3
.....3
...3.

2
.2
2

1
.. 1
.....1...
..... 1
.....1
...

Raw Data Dump for AEA Spectrum: 4a4132.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	1.	1.	1.	2.
21	0.	1.	0.	2.	1.	2.	0.	1.	5.	0.
31	0.	1.	1.	0.	0.	2.	1.	1.	2.	0.
41	0.	1.	4.	3.	1.	1.	1.	0.	1.	3.
51	0.	2.	0.	2.	0.	2.	0.	2.	1.	0.
61	2.	3.	0.	2.	0.	1.	3.	1.	2.	1.
71	0.	1.	1.	1.	1.	1.	0.	2.	0.	0.
81	0.	0.	1.	0.	0.	0.	3.	1.	2.	3.
91	0.	0.	1.	4.	1.	1.	0.	2.	1.	0.
101	1.	1.	1.	5.	2.	3.	1.	0.	2.	1.
111	2.	1.	1.	2.	3.	2.	1.	1.	6.	2.
121	1.	1.	1.	1.	4.	1.	0.	1.	4.	2.
131	1.	3.	2.	4.	1.	2.	1.	0.	3.	2.
141	2.	5.	4.	3.	2.	3.	4.	6.	5.	5.
151	1.	4.	2.	0.	2.	1.	1.	5.	1.	3.
161	2.	5.	2.	3.	5.	4.	2.	3.	4.	0.
171	4.	2.	3.	2.	2.	2.	5.	1.	0.	4.
181	4.	1.	2.	3.	3.	1.	2.	1.	3.	3.
191	3.	5.	3.	6.	2.	3.	4.	3.	4.	3.
201	4.	5.	8.	8.	5.	10.	13.	11.	5.	15.
211	17.	24.	33.	49.	68.	77.	106.	138.	147.	162.
221	211.	223.	295.	343.	424.	584.	620.	752.	706.	558.
231	388.	242.	117.	42.	14.	3.	2.	2.	1.	1.
241	1.	0.	0.	2.	1.	1.	4.	0.	2.	2.
251	0.	4.	3.	4.	1.	1.	0.	2.	3.	2.
261	2.	1.	2.	3.	2.	1.	3.	2.	4.	2.
271	2.	3.	1.	2.	3.	4.	1.	6.	1.	0.
281	7.	5.	7.	3.	9.	14.	5.	16.	12.	14.
291	14.	21.	20.	22.	26.	29.	27.	36.	41.	39.
301	56.	57.	82.	50.	34.	19.	5.	7.	0.	2.
311	5.	3.	6.	4.	4.	7.	5.	3.	2.	6.
321	2.	4.	8.	7.	9.	8.	14.	14.	8.	15.
331	13.	15.	9.	19.	15.	18.	16.	26.	34.	40.
341	45.	66.	76.	105.	152.	208.	322.	419.	593.	719.
351	887.	970.	885.	752.	819.	933.	1148.	1573.	2014.	2445.
361	2553.	2523.	1704.	798.	241.	39.	7.	2.	1.	3.
371	2.	2.	1.	2.	0.	1.	0.	0.	1.	1.
381	1.	0.	1.	0.	1.	0.	2.	1.	1.	0.
391	0.	0.	2.	1.	1.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
411	1.	0.	1.	0.	0.	0.	1.	0.	0.	0.
421	1.	0.	1.	1.	0.	0.	0.	0.	0.	0.
431	0.	1.	0.	0.	0.	0.	0.	0.	0.	1.
441	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	1.	0.	0.	1.	0.	0.	1.	1.
461	0.	0.	0.	0.	0.	1.	0.	0.	1.	1.
471	0.	0.	0.	2.	0.	3.	0.	0.	0.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
491	0.	0.	0.	0.	0.	1.	0.	0.	1.	0.
511	0.	0.								

222-S Analytical Laboratory
G E N E R A L A L P H A E N E R G Y A N A L Y S I S
Rev. 2.10

DATA REDUCTION REPORT

SAMPLE
S99T001737-DUP-P
File ID: 5a5553.CNF

Counted on: 11/ 3/99 @19:22
Detector: AEA5
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	2174.8	2174.8	359.551	359.551	10.000	2.849	5.000	1.495
2	57.2	57.2	301.411	301.394	10.000	3.111	5.000	1.414
3	621.7	621.7	227.469	227.469	12.000	3.727	6.000	2.672

PEAK RESULTS

Peak Error Limit: 30%

Peak ID	Isotope	AEA Frac	Peak Centroid	Count Rate	%err	d/m	Activity
			Exp. Obs. Diff. FWHM	c/m	@95		uCi/ea
1	Pu236	0.770	5.755 5.745 0.01	52.83	1.2	224.6	0.101E-03
2	Pu238	0.022	5.487 5.477 0.01	1.54	7.3	8.9	0.400E-05
	Am241		5.479 5.477 0.002			6.8	0.307E-05
3	Pu239	0.206	5.147 5.137 0.01	14.17	2.4	59.0	0.266E-04
	Pu240		5.144 5.137 0.007			59.0	0.266E-04
Totals:		0.999	<--valid peaks only-->		68.54		

DETECTOR CALIBRATION

Energy (MEV) = 4.091 + (0.0046)*Channel
Energy range (MeV): 4.091 TO 6.446
Efficiency = 0.2400 CPM/DPM
(Data reduction compression factor: 1.)

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	32941.0	100.000
Smoothed	32940.9	100.000
Composite fit	32902.5	99.883
Residuals	38.5	0.117

Analyzed by: _____

VR

Spectrum 5a5553.CNF

1 Legend: Raw = Modeled Peaks = 1,2,..., etc

Display Max.: 12161.9

.3
3
3
 .3.

2
 2
 .2
 2

1
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1....
 1
1.
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Raw Data Dump for AEA Spectrum: 5a5553.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	1.	0.	1.
21	0.	2.	2.	1.	1.	0.	1.	1.	0.	0.
31	0.	0.	1.	0.	0.	1.	0.	0.	0.	1.
41	2.	0.	1.	0.	1.	1.	0.	1.	0.	0.
51	0.	0.	0.	2.	0.	0.	1.	0.	1.	0.
61	1.	0.	1.	1.	1.	0.	0.	1.	0.	1.
71	0.	0.	0.	0.	2.	0.	0.	2.	1.	0.
81	1.	0.	1.	0.	0.	0.	0.	0.	1.	2.
91	0.	1.	1.	0.	0.	1.	1.	1.	0.	1.
101	1.	2.	0.	1.	0.	0.	1.	1.	1.	1.
111	2.	1.	1.	0.	0.	2.	0.	1.	3.	1.
121	0.	0.	1.	3.	3.	3.	1.	0.	0.	1.
131	4.	1.	2.	0.	3.	0.	1.	1.	2.	1.
141	5.	3.	1.	4.	3.	4.	2.	4.	5.	1.
151	4.	5.	3.	5.	3.	1.	0.	1.	3.	0.
161	0.	1.	0.	0.	1.	3.	1.	0.	2.	2.
171	0.	1.	0.	1.	2.	0.	3.	1.	3.	2.
181	1.	1.	1.	1.	1.	0.	1.	2.	1.	1.
191	1.	2.	2.	1.	4.	0.	3.	7.	2.	4.
201	2.	6.	3.	5.	8.	11.	8.	11.	18.	25.
211	33.	45.	31.	51.	84.	114.	123.	151.	174.	184.
221	248.	297.	343.	442.	546.	667.	773.	731.	674.	474.
231	302.	149.	82.	28.	10.	3.	1.	0.	1.	2.
241	3.	1.	0.	0.	1.	2.	3.	5.	3.	1.
251	2.	0.	2.	3.	0.	3.	3.	1.	1.	2.
261	4.	2.	0.	3.	0.	2.	3.	2.	1.	3.
271	3.	2.	2.	1.	4.	4.	0.	6.	2.	3.
281	3.	7.	9.	8.	9.	8.	14.	12.	15.	14.
291	24.	17.	34.	21.	31.	31.	39.	35.	50.	63.
301	70.	65.	68.	48.	11.	8.	5.	4.	2.	2.
311	2.	3.	2.	3.	5.	2.	4.	2.	3.	4.
321	4.	6.	2.	3.	11.	12.	16.	15.	6.	12.
331	11.	8.	15.	18.	11.	20.	27.	43.	41.	75.
341	70.	115.	142.	194.	242.	338.	557.	601.	814.	1018.
351	1017.	929.	846.	927.	1107.	1394.	1733.	2201.	2534.	2688.
361	2497.	1619.	769.	216.	50.	10.	1.	0.	2.	2.
371	1.	2.	1.	0.	0.	1.	0.	1.	0.	3.
381	0.	1.	1.	2.	0.	0.	1.	0.	0.	0.
391	1.	0.	0.	1.	1.	0.	1.	0.	0.	1.
401	1.	0.	0.	1.	0.	1.	1.	1.	0.	1.
411	0.	1.	0.	1.	1.	2.	0.	0.	0.	0.
421	0.	0.	0.	0.	1.	0.	0.	0.	0.	1.
431	0.	1.	0.	0.	0.	0.	0.	0.	1.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	1.	0.	0.	0.	1.	0.
471	0.	1.	1.	0.	0.	0.	0.	0.	0.	0.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
491	0.	0.	0.	0.	0.	0.	1.	1.	0.	0.
511	0.	0.								

WORKBOOK PAGE: STD1

Pu 238 and 239/240 : LA-943-128 (VOID) or LA-953-104(B-0) LIQUID

STD	DATE COUNTED	NOV-03-99	Pu 238 AEA FRAC (C238)	STD	0.456
	SAMPLE VOLUME in mL	SS	1.000	Pu 238 AEA FRAC (C238)	0.000
	SAMPLE DILUTION FACTOR	DF	1.000	Pu 239 AEA FRAC (C239)	0.518
31628	TRACER VOLUME in mL	SPKV	0.100	TOTAL AT COUNTS	5255
	DIGEST DILUTION FACTOR	DDF	1.000	AT COUNT TIME (MIN)	30
PU23901	TRACER BOOK NO	18B59	BACKGROUND in cpm (Bkg)		0.130
	DETECTOR NUMBER	20	Pu 238 cpm		53.430
LIQUID	EFFICIENCY FACTOR	EFF	0.335	Pu 238 cpm	0.000
	TRACER PREPARATION DATE	08/30/99	Pu 239 cpm		60.680
99004079	TRACER PREPARATION VALUE (dpm/mL)	2687.000	AEA COUNT TIME		480
	PU-238 DECAY CORR'D VALUE (dpm/mL)	2573.182	Pu 239/240 μ Ci/L		1.3167E-01
0	PU-238 TRACER VALUE (dpm/mL)	0.000			
	STANDARD BOOK NO	46B57			
N/A	STANDARD VALUE in μ Ci/mL	1.260E-04			

WL3118	Decay Time = Date Counted - Tracer Preparation Date
WC1610	Pu-238 Decay Corr'd Value = Pu-238 Preparation Value * [e to the power of {(-ln2 * Decay Time/1040.95)}]
82C	Pu 238 Tracer Recovery = (Total AT Counts / TC - Bkg) * 1/EFF * C238 * 100 / Pu-238 Decay Corr'd Value * SPKV
JFR	Pu 239/240 μ Ci/L = (C239)(Pu 238 Decay Corr'd Value)(SPKV)(1000mL/L)(DF)(DDF) / [(C238)(SS)(2220000 dpm/ μ Ci)]
AKL	Pu 238 dpm = [(Total AT Counts / TC) - Bkg * 1/EFF * C238] - (Pu-238 Tracer Value * SPKV * Pu 238 Tracer Recovery / 100)
	Pu 238 μ Ci/L = [(Pu 238 dpm)(DF)(DDF)(1000mL/L)] / [(Pu-238 Tracer Recovery / 100)(2220000 dpm/ μ Ci)(D g/L)(SS)]
	Relative Counting Error = Square Root of [(1/(Pu 238 cpm * min)) + (1 / (Pu 238 or 239/240 cpm * min))] * 1.96 * 100

11/04/99	Pu 239/240 μ Ci/mL	1.32E-04	DETECTION LEVELS in μ Ci/mL Pu 239/240 8.23E-06
11/03/99	Relative Counting Error	= 1.7%	
02/10/99			
8-111 GRAB	Pu 238 Tracer Recovery	= 92.7%	

Analyst:	AKL	Date:	04-Nov-99
Signature of Chemist:	<i>John Rehyen</i>	Date:	4 Nov 99
STANDARD.WB1 REV 1.0	943128ML		

WORKBOOK PAGE: BLANK2

Pu 238 and 239/240 : LA-943-128 (VOID) or LA-953-104(B-0) LI BLNK-PREP

	DATE COUNTED	NOV-03-99	PU 236 AEA FRAC (C236)	0.993
BLNK-PREP	SAMPLE VOLUME in mL SS	1.000	PU 238 AEA FRAC (C238)	0.000
	SAMPLE DILUTION FACTOR DF	1.000	PU 239 AEA FRAC (C239)	0.000
31626	TRACER VOLUME in mL SPKV	0.100	TOTAL AT COUNTS	2655
	DIGEST GRAMS of SOLIDS/ Dg/L		AT COUNT TIME (MIN)	30
PU23901	TRACER BOOK NO	18B59	BACKGROUND in cp (Bkg)	0.130
	DETECTOR NUMBER	20	PU 236 cpm	51.850
SOLID	EFFICIENCY FACTOR EFF	0.3347	PU 238 cpm	0.000
	TRACER PREPARATION DATE	08/30/99	PU 239 cpm	0.000
99004079	TRACER PREPARATION VALUE (dpm/mL)	2687.00	AEA COUNT TIME	480
	PU-236 DECAY CORR'D VALUE (dpm/mL)	2573.18	Pu 239/240 $\mu\text{Ci/g}$ =	< 1.683E-03
0	PU-238 TRACER VALUE (dpm/m)	0.00		

N/A

Decay Time = Date Counted - Tracer Preparation Date

WL31626

Pu-236 Decay Corr'd Value = Pu-236 Preparation Value * [e to the power of $\{(-\ln 2 * \text{Decay Time}/1040.95)\}$]

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

Pu 239/240 $\mu\text{Ci/g}$ = (C239) * (Pu 236 Decay Corr'd Value) * (SPKV) * (1000 mL/L) * (DF) / [(C236) * (SS) * (D g/L) * (2220000 dpm/ μCi)]

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

Pu 238 $\mu\text{Ci/g}$ = [(Pu 238 dpm) * (DF) * (1000 mL/L)] / [(Pu-236 Tracer Recovery / 100) * (2220000 dpm/ μCi) * (D g/L) * (SS)]Relative Counting Error = Square Root of $\{[1 / (\text{Pu 236 cpm} * \text{min})] + [1 / (\text{Pu 238 or 239/240 cpm} * \text{min})]\} * 1.96 * 100$ Pu 239/240 $\mu\text{Ci/g}$ < 1.68E-03

Relative Counting Error = 100.0%

DETECTION
LEVELS
in $\mu\text{Ci/g}$

NOTE: Pu 238 Result is a LESS THAN Value.

Pu 238 $\mu\text{Ci/g}$ < 1.68E-03

Relative Counting Error = 100.0%

Pu 236 Tracer Recovery = 101.9%

Pu 239/240
1.68E-03
Pu 238
1.68E-03

Analyst:	AKL	Date:	04-Nov-99
Signature of Chemist:	JFR	Date:	4/16/99

BLANK.WB1 REV 1.0

943128ML

WORKBOOK PAGE: SAM3

Pu 238 and 239/240 : LA-943-128 (VOID) or LA-953-104(B-0)

LIQUID /

				SAMPLE
	DATE COUNTED	NOV-03-99	PU 238 AEA FRAC (C238)	0.759
SAMPLE	SAMPLE VOLUME in mL	SS 1.000	PU 238 AEA FRAC (C238)	0.022
	SAMPLE DILUTION FACTOR	DF 1.000	PU 239 AEA FRAC (C239)	0.207
31626	TRACER VOLUME in mL	SPKV 0.100	TOTAL AT COUNTS	3247
	DIGEST GRAMS of SOLIDS/L	Dg/L	AT COUNT TIME (MIN)	30
@PU23901	TRACER BOOK NO	18B89	BACKGROUND in cpm (Bkg)	0.130
	DETECTOR NUMBER	20	PU 238 cpm	48.870
SOLID	EFFICIENCY FACTOR	EFF 0.335	PU 238 cpm	1.440
	TRACER PREPARATION DATE	08/30/99	PU 239 cpm	13.320
99004079	TRACER PREPARATION VALUE (dpm/mL)	2687.000	AEA COUNT TIME	480
	PU-238 DECAY CORR'D VALUE (dpm/mL)	2573.182	Pu 239/240 μ Ci/g	1.5189E-02
0	PU-238 TRACER VALUE (dpm/mL)	0.000		

FUSION01

899T001737

Decay Time = Date Counted - Tracer Preparation Date

Pu-238 Decay Corr'd Value = Pu-238 Preparation Value * [e to the power of {(-ln2 * Decay Time/1040.95)}]

Pu 238 Tracer Recovery = (Total AT Counts / TC - Bkg) * C238 * 100 / (Pu-238 Decay Corr'd Value * SPKV * EFF)

Pu 239/240 μ Ci/g = (C239) * (Pu 238 Decay Corr'd Value) * (SPKV) * (1000mL/L) * (DF) / [(C238) * (SS) * (D g/L) * (2220000 dpm/ μ Ci)]

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

Pu 238 μ Ci/g = [(Pu 238 dpm) * (DF) * (1000mL/L)] / [(Pu-238 Tracer Recovery / 100) * (2220000 dpm/ μ Ci) * (D g/L) * (SS)]

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

Pu 239/240 μ Ci/g 1.52E-02

Relative Counting Error = 2.8%

DETECTION

LEVELS

In μ Ci/g

Pu 239/240

2.31E-03

Pu 238

2.31E-03

NOTE: Pu 238 Result is a LESS THAN Value.

Pu 238 μ Ci/g < 2.31E-03

Relative Counting Error = 7.6%

Pu 238 Tracer Recovery = 95.3%

Analyst:

AKL

Date:

04-Nov-99

Signature of Chemist:

JFR

Date:

4/10/99

SAMPLE.WB1 REV 1.0

943128ML

WORKBOOK PAGE: DUP4

Pu 238 and 239/240 : LA-943-128 (VOID) or LA-953-104(B-0) LIQUID /				DUP
	DATE COUNTED	NOV-03-99	PU 238 AEA FRAC (C238)	0.770
DUP	SAMPLE VOLUME in mL	SS 1.000	PU 238 AEA FRAC (C238)	0.023
	SAMPLE DILUTION FACTOR	DF 1.000	PU 239 AEA FRAC (C239)	0.206
31626	TRACER VOLUME in mL	SPKV 0.199	TOTAL AT COUNTS	3367
	DIGEST GRAMS of SOLIDS/L	Dg/L	AT COUNT TIME (MIN)	30
PU23901	TRACER BOOK NO	1886	BACKGROUND in cpm (Bkg)	0.130
	DETECTOR NUMBER	20	PU 238 cpm	52.830
SOLID	EFFICIENCY FACTOR	EFF 0.335	PU 238 cpm	1.540
	TRACER PREPARATION DATE	08/30/99	PU 239 cpm	14.170
99004079	TRACER PREPARATION VALUE (dpm/mL)	2687.000	AEA COUNT TIME	480
	PU-238 DECAY CORR'D VALUE (dpm/mL)	2573.182	Pu 239/240 μ Ci/g	1.4191E-02
0	PU-238 TRACER VALUE (dpm/mL)	0.000		

FUSION01

Decay Time = Date Counted - Tracer Preparation Date

899T001737

Pu-238 Decay Corr'd Value = Pu-238 Preparation Value * [e to the power of $\{-\ln 2 * \text{Decay Time} / 1040.95\}$]

Pu 238 Tracer Recovery = (Total AT Counts / TC - Bkg) * C238 * 100 / (Pu-238 Decay Corr'd Value * SPKV * EFF)

Pu 239/240 μ Ci/g = (C239) * (Pu 238 Decay Corr'd Value) * (SPKV) * (1000 mL/L) * (DF) / [(C238) * (SS) * (D g/L) * (2220000 dpm/ μ Ci)]

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

Pu 238 μ Ci/g = [(Pu 238 dpm) * (DF) * (1000 mL/L)] / [(Pu-238 Tracer Recovery / 100) * (2220000 dpm/ μ Ci) * (D g/L) * (SS)]Relative Counting Error = Square Root of $\{[1 / (\text{Pu 238 cpm} * \text{min})] + [1 / (\text{Pu 238 or 239/240 cpm} * \text{min})]\} * 1.96 * 100$ Pu 239/240 μ Ci/g 1.42E-02

Relative Counting Error = 2.7%

DETECTION

LEVELS

in μ Ci/g

NOTE: Pu 238 Result is a LESS THAN Value.

Pu 238 μ Ci/g < 2.07E-03

Relative Counting Error = 7.3%

Pu 238 Tracer Recovery = 100.2%

Pu 239/240

2.07E-03

Pu 238

2.07E-03

Analyst:	AKL	Date:	04-Nov-99
Signature of Chemist:	JFR	Date:	7 Nov 99

SAMPLE.WB1 REV 1.0

943128ML

HNF-1685 REV. 0

OPPORTUNISTIC ANALYTES

APPENDIX A

HNF-1685 REV. 0

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TANK 241-S-111 -- OPPORTUNISTIC ANALYSIS REPORT FOR PROJECT
S-111 GRAB

CORE NUMBER: n/a
SEGMENT #: 11S-99-1

SEGMENT PORTION: Supernate

Sample#	R	Analyte	Unit	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count	Err%
S99T001730	D	Silver-ICP-Acid Dil.	ug/mL	96.80	<1.00e-02	16.40	14.60	15.50	11.6	n/a	6.010	n/a	n/a
S99T001730	D	Arsenic-ICP-Acid Dil.	ug/mL	100.2	<1.00e-01	< 60.10	<6.01e1	n/a	n/a	n/a	60.10	n/a	n/a
S99T001730	D	Boron-ICP-Acid Dil.	ug/mL	103.0	<5.00e-02	77.20	75.50	76.35	2.23	n/a	30.10	n/a	n/a
S99T001730	D	Barium-ICP-Acid Dil.	ug/mL	99.20	<5.00e-02	< 30.10	<3.01e1	n/a	n/a	n/a	30.10	n/a	n/a
S99T001730	D	Beryllium-ICP-Acid Dil.	ug/mL	97.40	<5.00e-03	< 3.010	<3.01e0	n/a	n/a	n/a	3.010	n/a	n/a
S99T001730	D	Bismuth-ICP-Acid Dil.	ug/mL	101.6	<1.00e-01	< 60.10	<6.01e1	n/a	n/a	n/a	60.10	n/a	n/a
S99T001730	D	Calcium-ICP-Acid Dil.	ug/mL	102.4	<1.00e-01	< 3.010	<3.01e0	n/a	n/a	n/a	3.010	n/a	n/a
S99T001730	D	Cadmium-ICP-Acid Dil.	ug/mL	100.6	<5.00e-03	< 3.010	<3.01e0	n/a	n/a	n/a	3.010	n/a	n/a
S99T001730	D	Cerium-ICP-Acid Dil.	ug/mL	101.4	<1.00e-01	< 60.10	<6.01e1	n/a	n/a	n/a	60.10	n/a	n/a
S99T001730	D	Cobalt-ICP-Acid Dil.	ug/mL	100.4	<2.00e-02	< 12.00	<1.20e1	n/a	n/a	n/a	12.00	n/a	n/a
S99T001730	D	Copper-ICP-Acid Dil.	ug/mL	101.4	<1.00e-02	< 6.010	<6.01e0	n/a	n/a	n/a	6.010	n/a	n/a
S99T001730	D	Potassium-ICP-Acid Dil.	ug/mL	106.6	<5.00e-01	1.75e+03	1.61e+03	1.68e+03	8.33	n/a	301.0	n/a	n/a
S99T001730	D	Lanthanum-ICP-Acid Dil.	ug/mL	102.4	<5.00e-02	< 30.10	<3.01e1	n/a	n/a	n/a	30.10	n/a	n/a
S99T001730	D	Lithium-ICP-Acid Dil.	ug/mL	99.60	<1.00e-02	< 6.010	<6.01e1	n/a	n/a	n/a	60.10	n/a	n/a
S99T001730	D	Magnesium-ICP-Acid Dil.	ug/mL	100.8	<1.00e-01	< 60.10	<6.01e1	68.75	1.60	n/a	30.10	n/a	n/a
S99T001730	D	Molybdenum-ICP-Acid Dil.	ug/mL	99.40	<5.00e-02	69.30	68.20	68.75	1.60	n/a	60.10	n/a	n/a
S99T001730	D	Neodymium-ICP-Acid Dil.	ug/mL	101.4	<1.00e-01	< 60.10	<6.01e1	886.0	0.23	n/a	120.0	n/a	n/a
S99T001730	D	Phosphorus-ICP-Acid Dil.	ug/mL	101.8	<2.00e-01	8.87e+02	885.0	886.0	0.23	n/a	60.10	n/a	n/a
S99T001730	D	Lead-ICP-Acid Dil.	ug/mL	98.40	<1.00e-01	< 60.10	<6.01e1	n/a	n/a	n/a	60.10	n/a	n/a
S99T001730	D	Sulfur-ICP-Acid Dil.	ug/mL	98.20	<1.00e-01	1.64e+03	1.63e+03	1.64e+03	0.61	n/a	36.10	n/a	n/a
S99T001730	D	Antimony-ICP-Acid Dil.	ug/mL	99.80	<6.00e-02	< 36.10	<3.61e1	n/a	n/a	n/a	60.10	n/a	n/a
S99T001730	D	Selenium-ICP-Acid Dil.	ug/mL	98.60	<1.00e-01	< 60.10	<6.01e1	n/a	n/a	n/a	30.10	n/a	n/a
S99T001730	D	Silicon-ICP-Acid Dil.	ug/mL	102.2	<5.00e-02	75.20	75.10	75.15	0.13	n/a	60.10	n/a	n/a
S99T001730	D	Samarium-ICP-Acid Dil.	ug/mL	101.8	<1.00e-01	< 60.10	<6.01e1	n/a	n/a	n/a	6.010	n/a	n/a
S99T001730	D	Strontium-ICP-Acid Dil.	ug/mL	98.40	<1.00e-02	< 6.010	<6.01e0	n/a	n/a	n/a	6.010	n/a	n/a
S99T001730	D	Titanium-ICP-Acid Dil.	ug/mL	103.0	<1.00e-02	< 6.010	<6.01e0	n/a	n/a	n/a	120.0	n/a	n/a
S99T001730	D	Thallium-ICP-Acid Dil.	ug/mL	99.40	<2.00e-01	<1.20e+02	<1.20e2	n/a	n/a	n/a	301.0	n/a	n/a
S99T001730	D	Uranium-ICP-Acid Dil.	ug/mL	99.00	<5.00e-01	<3.01e+02	<3.01e2	n/a	n/a	n/a	30.10	n/a	n/a
S99T001730	D	Vanadium-ICP-Acid Dil.	ug/mL	100.8	<5.00e-02	< 30.10	<3.01e1	n/a	n/a	n/a	6.010	n/a	n/a
S99T001730	D	Zinc-ICP-Acid Dil.	ug/mL	99.80	<1.00e-02	< 6.010	<6.01e0	n/a	n/a	n/a	517.6	n/a	n/a
S99T001730	D	Bromide by Ion Chromatograph	ug/mL	102.6	<1.25e-01	<5.18e+02	<5.18e2	n/a	n/a	n/a	434.8	n/a	n/a
S99T001730		Oxalate-IC-Dionex 4000/450	ug/mL	102.3	<1.05e-01	<4.35e+02	<4.35e2	n/a	n/a	n/a	1.00e-02	n/a	n/a
S99T001731		Cobalt-60 by GEA	uCi/mL	112.0	<9.80e-03	<1.05e-02	<9.22e-3	n/a	n/a	n/a	1.00e-02	n/a	n/a

CORE NUMBER: n/a
SEGMENT #: 11S-99-2

TANK 241-S-111 -- OPPORTUNISTIC ANALYSIS REPORT FOR PROJECT
S-111 GRAB

SEGMENT PORTION: Supernate

Sample#	R A#	Analyte	Unit	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S99T001732	D	Silver-ICP-Acid Dil.	ug/mL	96.80	<1.00e-02	15.10	14.30	14.70	5.44	n/a	6.010	n/a
S99T001732	D	Arsenic-ICP-Acid Dil.	ug/mL	100.2	<1.00e-01	< 60.10	<6.01e1	n/a	n/a	n/a	60.10	n/a
S99T001732	D	Boron-ICP-Acid Dil.	ug/mL	103.0	<5.00e-02	95.10	94.40	94.75	0.74	n/a	30.10	n/a
S99T001732	D	Barium-ICP-Acid Dil.	ug/mL	99.20	<5.00e-02	< 30.10	<3.01e1	n/a	n/a	n/a	30.10	n/a
S99T001732	D	Beryllium-ICP-Acid Dil.	ug/mL	97.40	<5.00e-03	< 3.010	<3.01e0	n/a	n/a	n/a	3.010	n/a
S99T001732	D	Bismuth-ICP-Acid Dil.	ug/mL	101.6	<1.00e-01	< 60.10	<6.01e1	n/a	n/a	n/a	60.10	n/a
S99T001732	D	Calcium-ICP-Acid Dil.	ug/mL	102.4	<1.00e-01	< 60.10	<6.01e1	n/a	n/a	n/a	60.10	n/a
S99T001732	D	Cadmium-ICP-Acid Dil.	ug/mL	100.6	<5.00e-03	< 3.010	<3.01e0	n/a	n/a	n/a	3.010	n/a
S99T001732	D	Cerium-ICP-Acid Dil.	ug/mL	101.4	<1.00e-01	< 60.10	<6.01e1	n/a	n/a	n/a	60.10	n/a
S99T001732	D	Cobalt-ICP-Acid Dil.	ug/mL	100.4	<2.00e-02	< 12.00	<1.20e1	n/a	n/a	n/a	12.00	n/a
S99T001732	D	Copper-ICP-Acid Dil.	ug/mL	101.4	<1.00e-02	< 6.010	<6.01e0	n/a	n/a	n/a	6.010	n/a
S99T001732	D	Potassium-ICP-Acid Dil.	ug/mL	106.6	<5.00e-01	1.84e+03	1.85e+03	1.84e+03	0.54	n/a	301.0	n/a
S99T001732	D	Lanthanum-ICP-Acid Dil.	ug/mL	102.4	<5.00e-02	< 30.10	<3.01e1	n/a	n/a	n/a	30.10	n/a
S99T001732	D	Lithium-ICP-Acid Dil.	ug/mL	99.60	<1.00e-02	< 6.010	<6.01e0	n/a	n/a	n/a	6.010	n/a
S99T001732	D	Magnesium-ICP-Acid Dil.	ug/mL	100.8	<1.00e-01	< 60.10	<6.01e1	84.20	1.19	n/a	60.10	n/a
S99T001732	D	Molybdenum-ICP-Acid Dil.	ug/mL	99.40	<5.00e-01	< 60.10	<6.01e1	n/a	n/a	n/a	60.10	n/a
S99T001732	D	Neodymium-ICP-Acid Dil.	ug/mL	101.4	<1.00e-01	< 60.10	<6.01e1	n/a	n/a	n/a	60.10	n/a
S99T001732	D	Phosphorus-ICP-Acid Dil.	ug/mL	101.8	<2.00e-01	8.29e+02	833.0	831.0	0.48	n/a	120.0	n/a
S99T001732	D	Lead-ICP-Acid Dil.	ug/mL	98.40	<1.00e-01	< 60.10	<6.01e1	948.0	1.05	n/a	60.10	n/a
S99T001732	D	Sulfur-ICP-Acid Dil.	ug/mL	98.20	<1.00e-01	9.53e+02	943.0	n/a	n/a	n/a	36.10	n/a
S99T001732	D	Antimony-ICP-Acid Dil.	ug/mL	99.80	<6.00e-02	< 36.10	<3.61e1	n/a	n/a	n/a	60.10	n/a
S99T001732	D	Selenium-ICP-Acid Dil.	ug/mL	98.60	<1.00e-01	< 60.10	<6.01e1	n/a	n/a	n/a	60.10	n/a
S99T001732	D	Silicon-ICP-Acid Dil.	ug/mL	102.2	<5.00e-02	61.80	67.90	64.85	9.41	n/a	30.10	n/a
S99T001732	D	Samarium-ICP-Acid Dil.	ug/mL	101.8	<1.00e-01	< 60.10	<6.01e1	n/a	n/a	n/a	60.10	n/a
S99T001732	D	Strontium-ICP-Acid Dil.	ug/mL	98.40	<1.00e-02	< 6.010	<6.01e0	n/a	n/a	n/a	6.010	n/a
S99T001732	D	Titanium-ICP-Acid Dil.	ug/mL	103.0	<1.00e-02	< 6.010	<6.01e0	n/a	n/a	n/a	6.010	n/a
S99T001732	D	Uranium-ICP-Acid Dil.	ug/mL	99.00	<5.00e-01	<1.20e+02	<1.20e2	n/a	n/a	n/a	301.0	n/a
S99T001732	D	Vanadium-ICP-Acid Dil.	ug/mL	100.8	<5.00e-02	< 30.10	<3.01e1	n/a	n/a	n/a	30.10	n/a
S99T001732	D	Zinc-ICP-Acid Dil.	ug/mL	99.80	<1.00e-02	< 6.010	<6.01e0	n/a	n/a	n/a	6.010	n/a
S99T001732		Bromide by Ion Chromatograph	ug/mL	102.6	<1.25e-01	<5.18e+02	<5.18e2	n/a	n/a	n/a	517.6	n/a
S99T001732		Oxalate-IC-Dionex 4000/450	ug/mL	102.3	<1.05e-01	<4.35e+02	<4.35e2	n/a	n/a	n/a	434.8	n/a
S99T001734		Cobalt-60 by GEA	uCi/mL	112.0	<9.80e-03	<9.43e-03	<1.01e-2	n/a	n/a	n/a	9.00e-03	n/a

TANK 241-S-111 -- OPPORTUNISTIC ANALYSIS REPORT FOR PROJECT
S-111 GRAB

CORE NUMBER: n/a
SEGMENT #: 11S-99-3

SEGMENT PORTION: Centrifuged Solids

Sample#	RA#	Analyte	Unit	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S99T001737	F	Silver - ICP-Fusion	ug/g	96.40	<1.00e-02	<1.97e+02	<1.88e2	n/a	n/a	92.40	197.0	n/a
S99T001737	F	Arsenic - ICP-Fusion	ug/g	101.0	<1.00e-01	<1.97e+03	<1.88e3	n/a	n/a	104.0	1.97e+03	n/a
S99T001737	F	Boron - ICP-Fusion	ug/g	100.8	<5.00e-02	<9.85e+02	<9.38e2	n/a	n/a	99.90	984.0	n/a
S99T001737	F	Barium - ICP-Fusion	ug/g	98.60	<5.00e-02	<9.85e+02	<9.38e2	n/a	n/a	97.30	984.0	n/a
S99T001737	F	Beryllium - ICP-Fusion	ug/g	98.00	<5.00e-03	<9.85e+02	<9.38e2	n/a	n/a	101.0	98.40	n/a
S99T001737	F	Bismuth - ICP-Fusion	ug/g	100.8	<1.00e-01	<1.97e+03	<1.88e3	n/a	n/a	104.0	1.97e+03	n/a
S99T001737	F	Calcium - ICP-Fusion	ug/g	102.8	<1.00e-01	<1.97e+03	<1.88e3	n/a	n/a	111.0	1.97e+03	n/a
S99T001737	F	Cadmium - ICP-Fusion	ug/g	100.6	<5.00e-03	<9.85e+02	<9.38e2	n/a	n/a	106.0	98.40	n/a
S99T001737	F	Cerium - ICP-Fusion	ug/g	100.8	<1.00e-01	<1.97e+03	<1.88e3	n/a	n/a	101.0	1.97e+03	n/a
S99T001737	F	Cobalt - ICP-Fusion	ug/g	100.0	<2.00e-02	<3.94e+02	<3.75e2	n/a	n/a	102.0	394.0	n/a
S99T001737	F	Copper - ICP-Fusion	ug/g	100.4	<1.00e-02	<1.97e+02	<1.88e2	n/a	n/a	101.0	197.0	n/a
S99T001737	F	Lanthanum - ICP-Fusion	ug/g	101.8	<5.00e-02	<9.85e+02	<9.38e2	n/a	n/a	103.0	984.0	n/a
S99T001737	F	Lithium - ICP-Fusion	ug/g	98.40	<1.00e-01	<1.97e+02	<1.88e2	n/a	n/a	99.00	197.0	n/a
S99T001737	F	Magnesium - ICP-Fusion	ug/g	99.60	<1.00e-01	<1.97e+03	<1.88e3	n/a	n/a	102.0	1.97e+03	n/a
S99T001737	F	Molybdenum - ICP-Fusion	ug/g	98.80	<5.00e-02	<9.85e+02	<9.38e2	n/a	n/a	103.0	984.0	n/a
S99T001737	F	Neodymium - ICP-Fusion	ug/g	100.4	<1.00e-01	<1.97e+03	<1.88e3	n/a	n/a	102.0	1.97e+03	n/a
S99T001737	F	Phosphorus - ICP-Fusion	ug/g	101.6	<2.00e-01	<3.94e+03	<3.75e3	n/a	n/a	116.0	3.94e+03	n/a
S99T001737	F	Lead - ICP-Fusion	ug/g	98.00	<1.00e-01	<1.97e+03	<1.88e3	n/a	n/a	102.0	1.97e+03	n/a
S99T001737	F	Sulfur - ICP-Fusion	ug/g	96.80	<1.00e-01	<3.41e+03	<3.32e+03	3.36e+03	2.67	103.0	1.97e+03	n/a
S99T001737	F	Antimony - ICP-Fusion	ug/g	99.60	<6.00e-02	<1.18e+03	<1.13e3	n/a	n/a	103.0	1.18e+03	n/a
S99T001737	F	Selenium - ICP-Fusion	ug/g	98.00	<1.00e-01	<1.97e+03	<1.88e3	n/a	n/a	103.0	1.97e+03	n/a
S99T001737	F	Silicon - ICP-Fusion	ug/g	101.2	<5.00e-02	<8.00e+03	<1.01e+04	9.05e+03	23.2	107.0	984.0	n/a
S99T001737	F	Samarium - ICP-Fusion	ug/g	101.4	<1.00e-01	<1.97e+03	<1.88e3	n/a	n/a	102.0	1.97e+03	n/a
S99T001737	F	Strontium - ICP-Fusion	ug/g	97.80	<1.00e-02	<1.97e+02	<1.88e2	n/a	n/a	100.0	197.0	n/a
S99T001737	F	Titanium - ICP-Fusion	ug/g	101.8	<1.00e-02	<1.97e+02	<1.88e2	n/a	n/a	104.0	197.0	n/a
S99T001737	F	Thallium - ICP-Fusion	ug/g	99.00	<2.00e-01	<3.94e+03	<3.75e3	n/a	n/a	101.0	3.94e+03	n/a
S99T001737	F	Uranium - ICP-Fusion	ug/g	98.30	<5.00e-01	<9.85e+03	<9.38e3	n/a	n/a	97.50	9.84e+03	n/a
S99T001737	F	Vanadium - ICP-Fusion	ug/g	100.4	<5.00e-02	<9.85e+02	<9.38e2	n/a	n/a	101.0	984.0	n/a
S99T001737	F	Zinc - ICP-Fusion	ug/g	99.20	<1.00e-02	<1.97e+02	<1.88e2	n/a	n/a	103.0	197.0	n/a
S99T001737	F	Cobalt-60 by GEA	uc/g	109.9	<8.44e-03	<1.18e-02	<1.11e-2	n/a	n/a	n/a	1.20e-02	n/a
S99T001738	A	Silver - ICP-Acid Digest	ug/g	90.70	<1.00e-02	<1.15e+02	<1.15e+02	11.20	5.36	97.20	3.940	n/a
S99T001738	A	Arsenic - ICP-Acid Digest	ug/g	90.00	<1.00e-01	<39.40	<3.80e1	n/a	n/a	100.0	39.40	n/a
S99T001738	A	Boron - ICP-Acid Digest	ug/g	103.0	<5.00e-02	<81.90	<1.90e1	91.95	21.9	99.00	19.70	n/a
S99T001738	A	Barium - ICP-Acid Digest	ug/g	92.60	<5.00e-03	<19.70	<1.90e1	n/a	n/a	100.0	19.70	n/a
S99T001738	A	Beryllium - ICP-Acid Digest	ug/g	93.20	<5.00e-02	<1.970	<1.90e1	n/a	n/a	101.0	1.970	n/a
S99T001738	A	Bismuth - ICP-Acid Digest	ug/g	89.40	<1.00e-01	<82.00	<85.50	83.75	4.18	101.0	39.40	n/a
S99T001738	A	Calcium - ICP-Acid Digest	ug/g	92.20	<1.00e-01	<3.72e+02	<386.0	379.0	3.69	100.0	39.40	n/a
S99T001738	A	Cadmium - ICP-Acid Digest	ug/g	89.40	<5.00e-03	<13.70	<14.50	14.10	5.67	101.0	1.970	n/a
S99T001738	A	Cerium - ICP-Acid Digest	ug/g	95.00	<1.00e-01	<39.40	<3.80e1	n/a	n/a	99.80	39.40	n/a
S99T001738	A	Cobalt - ICP-Acid Digest	ug/g	90.00	<2.00e-02	<7.880	<7.60e0	n/a	n/a	101.0	7.880	n/a
S99T001738	A	Copper - ICP-Acid Digest	ug/g	92.00	<1.00e-02	<3.940	<3.80e0	n/a	n/a	99.60	3.940	n/a
S99T001738	A	Potassium - ICP-Acid Digest	ug/g	86.20	<5.00e-01	<1.15e+03	<1.12e+03	1.14e+03	2.64	96.90	197.0	n/a
S99T001738	A	Lanthanum - ICP-Acid Digest	ug/g	95.20	<5.00e-02	<19.70	<1.90e1	n/a	n/a	99.50	19.70	n/a
S99T001738	A	Lithium - ICP-Acid Digest	ug/g	94.00	<1.00e-02	<3.940	<4.110	n/a	n/a	98.80	3.940	n/a

Sample#	R	A#	Analyte	Unit	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S99T001738	A		Magnesium - ICP-Acid Digest	ug/g	88.80	<1.00e-01	1.20e+02	107.0	113.5	11.5	99.50	39.40	n/a
S99T001738	A		Molybdenum - ICP-Acid Digest	ug/g	91.80	<5.00e-02	46.30	47.60	46.95	2.77	100.0	19.70	n/a
S99T001738	A		Neodymium - ICP-Acid Digest	ug/g	96.40	<1.00e-01	< 39.40	<3.80e1	n/a	n/a	99.50	39.40	n/a
S99T001738	A		Phosphorus - ICP-Acid Digest	ug/g	92.40	<2.00e-01	2.23e+03	2.24e+03	2.24e+03	0.45	102.0	78.80	n/a
S99T001738	A		Lead - ICP-Acid Digest	ug/g	86.60	<1.00e-01	46.90	53.60	50.25	13.3	100.0	39.40	n/a
S99T001738	A		Sulfur - ICP-Acid Digest	ug/g	87.40	<1.00e-01	3.19e+03	3.38e+03	3.28e+03	5.78	102.0	39.40	n/a
S99T001738	A		Antimony - ICP-Acid Digest	ug/g	88.80	<6.00e-02	61.00	64.40	62.70	5.42	101.0	23.60	n/a
S99T001738	A		Selenium - ICP-Acid Digest	ug/g	90.20	<1.00e-01	< 39.40	<3.80e1	n/a	n/a	100.0	39.40	n/a
S99T001738	A		Samarium - ICP-Acid Digest	ug/g	126.8	<5.00e-02	7.31e+02	680.0	705.5	7.23	100.0	19.70	n/a
S99T001738	A		Strontium - ICP-Acid Digest	ug/g	95.20	<1.00e-01	< 39.40	<3.80e1	n/a	n/a	99.70	39.40	n/a
S99T001738	A		Titanium - ICP-Acid Digest	ug/g	93.00	<1.00e-02	5.090	5.370	5.230	5.35	99.50	3.940	n/a
S99T001738	A		Thallium - ICP-Acid Digest	ug/g	96.00	<1.00e-02	69.20	54.30	61.75	24.1	101.0	3.940	n/a
S99T001738	A		Uranium - ICP-Acid Digest	ug/g	88.20	<2.00e-01	< 78.80	<7.60e1	n/a	n/a	100.0	78.80	n/a
S99T001738	A		Vanadium - ICP-Acid Digest	ug/g	95.40	<5.00e-01	3.21e+02	344.0	332.5	6.92	100.0	197.0	n/a
S99T001738	A		Zinc - ICP-Acid Digest	ug/g	92.60	<5.00e-02	< 19.70	<1.90e1	n/a	n/a	101.0	19.70	n/a
S99T001739	W		Bromide by Ion Chromatograph	ug/g	87.20	<1.00e-02	29.20	28.00	28.60	4.20	100.0	3.940	n/a
S99T001739	W		Oxalate-IC-Dionex 4000/4500	ug/g	100.0	<1.25e-01	<2.42e+03	<2.48e3	n/a	n/a	99.68	2.42e+03	n/a
S99T001739	W			ug/g	104.0	<1.05e-01	2.21e+04	2.32e+04	2.26e+04	4.86	100.8	2.03e+03	n/a

Supernate: Supernate

Sample#	R	A#	Analyte	Unit	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S99T001733	D		Silver-ICP-Acid Dil.	ug/mL	96.80	<1.00e-02	14.10	13.90	14.00	1.43	94.60	6.010	n/a
S99T001733	D		Arsenic-ICP-Acid Dil.	ug/mL	100.2	<1.00e-01	< 60.10	<6.01e1	n/a	n/a	97.50	60.10	n/a
S99T001733	D		Boron-ICP-Acid Dil.	ug/mL	103.0	<5.00e-02	85.80	85.20	85.50	0.70	101.0	30.10	n/a
S99T001733	D		Barium-ICP-Acid Dil.	ug/mL	99.20	<5.00e-02	< 30.10	<3.01e1	n/a	n/a	95.30	30.10	n/a
S99T001733	D		Beryllium-ICP-Acid Dil.	ug/mL	97.40	<5.00e-03	< 3.010	<3.01e0	n/a	n/a	100.0	3.010	n/a
S99T001733	D		Bismuth-ICP-Acid Dil.	ug/mL	101.6	<1.00e-01	< 60.10	<6.01e1	n/a	n/a	103.0	60.10	n/a
S99T001733	D		Calcium-ICP-Acid Dil.	ug/mL	102.4	<1.00e-01	< 60.10	<6.01e1	n/a	n/a	107.0	60.10	n/a
S99T001733	D		Cadmium-ICP-Acid Dil.	ug/mL	100.6	<5.00e-03	< 3.010	<3.01e0	n/a	n/a	104.0	3.010	n/a
S99T001733	D		Cerium-ICP-Acid Dil.	ug/mL	101.4	<1.00e-01	< 60.10	<6.01e1	n/a	n/a	100.0	60.10	n/a
S99T001733	D		Cobalt-ICP-Acid Dil.	ug/mL	100.4	<2.00e-02	< 12.00	<1.20e1	n/a	n/a	101.0	12.00	n/a
S99T001733	D		Copper-ICP-Acid Dil.	ug/mL	101.4	<1.00e-02	< 6.010	<6.01e0	n/a	n/a	98.30	6.010	n/a
S99T001733	D		Potassium-ICP-Acid Dil.	ug/mL	106.6	<5.00e-01	1.82e+03	1.73e+03	1.78e+03	5.07	116.0	301.0	n/a
S99T001733	D		Lanthanum-ICP-Acid Dil.	ug/mL	102.4	<5.00e-02	< 30.10	<3.01e1	n/a	n/a	102.0	30.10	n/a
S99T001733	D		Lithium-ICP-Acid Dil.	ug/mL	99.60	<1.00e-02	< 6.010	<6.01e0	n/a	n/a	98.20	6.010	n/a
S99T001733	D		Magnesium-ICP-Acid Dil.	ug/mL	100.8	<1.00e-01	< 60.10	<6.01e1	n/a	n/a	100.0	60.10	n/a
S99T001733	D		Molybdenum-ICP-Acid Dil.	ug/mL	99.40	<5.00e-02	74.50	75.20	74.85	0.94	102.0	30.10	n/a
S99T001733	D		Neodymium-ICP-Acid Dil.	ug/mL	101.4	<1.00e-01	< 60.10	<6.01e1	n/a	n/a	102.0	60.10	n/a
S99T001733	D		Phosphorus-ICP-Acid Dil.	ug/mL	101.8	<2.00e-01	7.48e+02	738.0	743.0	1.35	104.0	120.0	n/a
S99T001733	D		Lead-ICP-Acid Dil.	ug/mL	98.40	<1.00e-01	< 60.10	<6.01e1	n/a	n/a	107.0	60.10	n/a
S99T001733	D		Sulfur-ICP-Acid Dil.	ug/mL	98.20	<1.00e-01	8.31e+02	830.0	830.5	0.12	103.0	60.10	n/a
S99T001733	D		Antimony-ICP-Acid Dil.	ug/mL	99.80	<6.00e-02	< 36.10	<3.61e1	n/a	n/a	105.0	36.10	n/a
S99T001733	D		Selenium-ICP-Acid Dil.	ug/mL	98.60	<1.00e-01	< 60.10	<6.01e1	n/a	n/a	112.0	60.10	n/a
S99T001733	D		Silicon-ICP-Acid Dil.	ug/mL	102.2	<5.00e-02	60.20	60.60	60.40	0.66	108.0	30.10	n/a
S99T001733	D		Samarium-ICP-Acid Dil.	ug/mL	101.8	<1.00e-01	< 60.10	<6.01e1	n/a	n/a	103.0	60.10	n/a
S99T001733	D		Strontium-ICP-Acid Dil.	ug/mL	98.40	<1.00e-02	< 6.010	<6.01e0	n/a	n/a	99.00	6.010	n/a
S99T001733	D		Titanium-ICP-Acid Dil.	ug/mL	103.0	<1.00e-02	< 6.010	<6.01e0	n/a	n/a	101.0	6.010	n/a
S99T001733	D		Thallium-ICP-Acid Dil.	ug/mL	99.40	<2.00e-01	<1.20e+02	<1.20e2	n/a	n/a	99.50	120.0	n/a
S99T001733	D		Uranium-ICP-Acid Dil.	ug/mL	99.00	<5.00e-01	<3.01e+02	<3.01e2	n/a	n/a	103.5	301.0	n/a
S99T001733	D		Vanadium-ICP-Acid Dil.	ug/mL	100.8	<5.00e-02	< 30.10	<3.01e1	n/a	n/a	100.0	30.10	n/a

Sample#	R	A#	Analyte	Unit	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S99T001733	D		Zinc-ICP-Acid Dil.	ug/mL	99.80	<1.00e-02	< 6.010	<6.01e0	n/a	n/a	102.0	6.010	n/a
S99T001733			Bromide by Ion Chromatograph	ug/mL	102.6	<1.25e-01	<5.18e+02	<5.18e2	n/a	n/a	97.12	517.6	n/a
S99T001733			Oxalate-IC-Dionex 4000/450	ug/mL	102.3	<1.05e-01	<4.35e+02	<4.35e2	n/a	n/a	99.43	434.8	n/a
S99T001735			Cobalt-60 by GEA	uCi/mL	112.0	<9.80e-03	<9.73e-03	<1.03e-2	n/a	n/a	n/a	1.00e-02	n/a