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Tank 241-S-109, Grab Samples, 9S-99-1, 9S-99-2 and 9S-99-3 Analytical Results for the Final Report

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222-S LABORATORY

TANK 241-S-109, GRAB SAMPLES 9S-99-1, 9S-99-2 AND 9S-99-3 ANALYTICAL RESULTS FOR THE FINAL REPORT

Project Coordinator: Franciska H. Steen

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

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NARRATIVE

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222-S LABORATORY

TANK 241-S-109 GRAB SAMPLES, 9S-99-1, 9S-99-2 and 9S-99-3 ANALYTICAL RESULTS FOR THE FINAL REPORT

This document is the final report for tank 241-S-109 grab samples. Three grab samples were collected from riser 13 on July 28, 1999 and received by the 222-S laboratory on July 28, 1999. Analyses were performed in accordance with the *Compatibility Grab Sampling and Analysis Plan for Fiscal Year 1999* (TSAP) (Sasaki, 1999) and the *Data Quality Objectives for Tank Farms Waste Compatibility Program* (DQO) (Fowler 1995, Mulkey and Miller 1998). The analytical results are presented in the data summary report (Table 1).

None of the subsamples submitted for differential scanning calorimetry (DSC), total organic carbon (TOC) and plutonium 239 (Pu239) analyses exceeded the notification limits as stated in TSAP (Sasaki, 1999).

Appearance and Sample Handling

The sample breakdown diagrams (Attachment 1) are provided as a cross-reference for relating the tank farm customer identification numbers with the 222-S Laboratory sample numbers and the portion of sample analyzed. Table 2 provides the appearance information.

9S-99-1
This sample was collected at a depth of 400 inches. Visual observation indicated that the sample was an opaque light olive-green liquid, trace solids. No organic layer was observed.

Two 10-gram liquid samples were submitted to the laboratory for analysis of inorganic analytes and radionuclides.

9S-99-2
This sample was collected at a depth of 469 inches. Visual observation indicated that the sample was an opaque light olive-green liquid, trace solids. No organic layer was observed.

Two 10-gram liquid samples were submitted to the laboratory for analysis of inorganic analytes and radionuclides.

9S-99-3
This sample was collected at a depth of 528 inches. Visual observation indicated that the sample was an opaque light olive-green liquid, trace solids. No organic layer was observed.

Two 10-gram liquid samples were submitted to the laboratory for analysis of inorganic analytes and radionuclides.

Table 2: Appearance Information for Tank 241-S-109Grab Samples

Sample Number	Date Sampled	Date Received	Sampling Depth (in.)	% Settled Solids	Sample Description
9S-99-1	07/28/99	07/28/99	400	Trace	Opaque light olive-green liquid, trace solids; no organic layer was observed.
9S-99-2	07/28/99	07/28/99	469	Trace	Opaque light olive-green liquid, trace solids; no organic layer was observed.
9S-99-3	07/28/99	07/28/99	528	Trace	Opaque light olive-green liquid, trace solids; no organic layer was observed.

Analytical Results Summary

The data summary report (Table 1) included in this report compiles the analytical results that comply with the applicable DQO.

Differential Scanning Calorimetry (DSC)

The DSC analysis was performed in duplicate on direct subsamples. The exothermic energy based on the dry weight of the subsample was calculated for all subsamples. The average of the TGA results for each subsample was used in the dry weight correction for that subsample. More information may be obtained by examining the raw data.

For the samples that did not exhibit exothermic energy, the calculation for the RPD is indeterminate because of the division by zero. Due to the way the database performs calculations, zero divided by zero is reported as "0.0". The standard recoveries were within the required limits of 80% - 120% and Relative Percent Differences (RPDs) were less than 20%.

TGA - Thermogravimetric Analysis

The TGA analysis was performed in duplicate on direct subsamples. Typically the TGA results are determined by summing the weight loss steps which occur below 200°C. However, for tank 241-S-109 Grab Samples, 100% of the thermograms showed weight loss beyond 200°C. The results for all of the samples were the sum of two weight loss steps. More information may be obtained by examining the raw data.

The standard recoveries were within the required limits of 80% - 120% and the RPDs were less than 20%.

Specific Gravity (Sp.G.)

Specific gravity analysis was performed in duplicate on direct liquid subsamples. The results ranged from 1.482 to 1.524. The standard recoveries were within the control limits of the laboratory and the RPDs were less than 20%.

OH - Hydroxide

The OH analysis was performed in duplicate on direct subsamples of liquid as indicated by a blank in the A# column in Table 1. The standard recoveries were within the required limits of 80% - 120% and the RPDs were less than 20%.

pH

The pH analysis was performed in duplicate on direct subsamples as indicated by a blank in the aliquot class (A#) column in Table 1.

Results for pH that are greater than 12.5 are suspect and should be considered estimates because the highest calibration buffer available is 12.5 and pH electrode performance degrades at a high pH. The standard values were within the required limits (±0.1 pH unit) and the RPDs were less than 20%.

NH_3 - Ammonia

The NH_3 analysis was performed on a direct aliquots of the liquid subsamples as indicated by a blank in the A# column in Table 1.

A standard recovery outside of the required range (80% - 120%) was reported for one liquid sample, 9S-99-1 (S99T001343). The standard recovery was within the laboratory statistical control limits determined by historical data (77.97% - 130.04%). The spike recovery was within the required limits of 75%-125% and the RPDs were less than 20%.

IC - Ion Chromatography

The IC analyses were performed in duplicate on direct liquid subsamples as indicated by a blank in the A# column in Table 1.

The required analytes were fluoride (F^-), chloride (Cl^-), nitrate (NO_3^-), nitrite (NO_2^-), phosphate (PO_4^{-3}) and sulfate (SO_4^{-2}). The results for bromide (Br^-) and oxalate are considered "opportunistic" and are provided in Appendix A. There are no customer defined QC parameters for Br^- and oxalate and any anomalies in those results are not discussed.

The standard recoveries were within the required limits of 80% - 120%, the spike recoveries were within the required limits of 75% - 125% and the RPDs were less than 20%.

ICP - Inductively Coupled Plasma Spectrophotometry

The liquid subsamples were prepared for analysis by an acid adjustment of the direct subsample. This is indicated by a "D" in the A# column in Table 1.

The required analytes were aluminum (Al), chromium (Cr), iron (Fe), manganese (Mn), sodium (Na), nickel (Ni) and zirconium (Zr). All other analyte results are presented in Appendix A. These results are considered "opportunistic" and do not have customer defined QC parameters. Therefore, any anomalies in those results are not discussed in this report.

All spike recoveries were within the required limits of 75% - 125%. The spiked sample aliquots were prepared by performing a ten-fold dilution in addition to that required to keep analyte concentrations in the sample within the linear range of the instrument. To provide a meaningful spike analysis, a 10 ppm concentration of spike standard was added to the diluted aliquot (post spike). *More information may be obtained by examining the raw data.*

The RPDs were less than 20% and the standard recoveries were within the required limits of 80% - 120%.

Inductively Coupled Plasma/Mass Spectroscopy (ICP/MS) - Uranium

The liquid subsamples were prepared for analysis by an acid adjustment of the direct subsample as indicated by a "D" in the A# column in Table 1.

The standard recoveries for U235 and U238 were within the required limits of 80%-120%, the spike recoveries for U235 and U238 were within the required limits of 75%-125% and the RPDs were less than 20%.

TIC/TOC - Total Inorganic/Organic Carbon

The TIC/TOC analysis was performed on direct sample aliquots using the persulfate oxidation method. None of the subsamples submitted for the TOC analysis exceeded the notification limit of 30,000μgC/mL for liquid.

For the TIC/TOC analysis, an Analysis Report worksheet is included for each sample as raw data. Due to programming limitations with the instrument software, the sample size listed on the worksheet is incorrect. This value is not used in the final calculations and has no bearing on the results in Table 1.

A high RPD (>20%) was reported for one subsample, 9S-99-1 (S99T001343). A triplicate analysis was performed. The results are presented in Table 3. The RPDs were attributed to sample inhomogeneity and no further analyses were requested. More information may be obtained by examining the raw data.

Table 3: S-109 Grab Sample Triplicate TIC/TOC Results

Sample ID	Analyte	Sample Result (μg/mL)	Duplicate Result (μg/mL)	Triplicate Result (μg/mL)
9S-99-1 (S99T001343) Liquid	TIC	1.60E+03	1.14E+03	1.73E+03
	TOC	1.00E+03	7.22E+03	1.07E+03

The blank is considered a reagent blank. The value was within the acceptance limits and all results were corrected for the concentration found in the blank.

The standard recoveries were within the required limits of 80%-120% and the spike recoveries were within the required limits of 75% - 125%.

Radionuclide Analyses

Total Alpha (AT)

The total alpha (AT) analysis was performed in duplicate on direct subsamples for the liquids as indicated by a blank in the A# column in Table 1.

All AT results were below the total alpha activity notification limit of 61.5 μCi/mL.

The standard recoveries were within the required limits of 70%-130% and the spike recoveries were within the required limits of 75% - 125%. The RPDs were less than 20%.

GEA - Gamma Energy Analysis

The gamma energy (GEA) analysis was performed in duplicate on direct subsamples for the liquids as indicated by a blank in the A# column in Table 1. The solid subsamples were prepared for analysis by performing a fusion digest as indicated by an "F" in the A# column in Table 1.

The required isotope was ^{137}Cs. The results for ^{60}Co are presented in Appendix A. These results are considered "opportunistic" and do not have customer defined QC parameters. Therefore, any anomalies in those results are not discussed in this report.

Minimum detectable activity (MDA) limits for GEA analytes are not currently available. The latest GEA software does not report a MDA. If an analyte is reported as "less than", the value reported is the detection limit.

The standard recoveries were within the required limits of 80%-120% and the RPDs were less than 20%.

^{90}Sr - Strontium 90

^{90}Sr analysis was performed in duplicate on direct subsamples as indicated by a blank in the A# column in Table 1.

A small amount of ^{90}Sr contamination was found in the method blanks. The levels of contamination are inconsequential when compared to the results for the samples. These contaminants do not impact sample data quality.

The standard recoveries were within the required limits of 80%-120% and the RPDs were less than 20%.

^{241}Am - Americium 241

^{241}Am analysis was performed in duplicate on direct subsamples for the liquids as indicated by a blank in the A# column in Table 1.

The standard recoveries were within the required limits of 80%-120% and the RPDs were less than 20%.

$^{239/240}$Pu - Plutonium 239/240

$^{239/240}$Pu analysis was performed in duplicate on direct subsamples for the liquids as indicated by a blank in the A# column in Table 1.

All $^{239/240}$Pu results were below the plutonium activity notification limit of 61.5 μCi/mL.

The standard recoveries were within the required limits of 70%-130% and the RPDs were less than 20%.

Compatibility Program Concerns

DSC - Differential Scanning Calorimetry - Energetics Decision Rule

For waste compatibility energetics decision concerns, the exotherm/endotherm ratio of the liquid samples is evaluated. This ratio must be less than one (1). The grab samples from Tank 241-S-109 did not exhibit exotherms (the results were zero), therefore, the calculated ratio will also be zero (less than one).

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

The Corrosion Decision Rule does not apply to the samples from this tank since this rule applies to double shell tanks and 241-S-109 is a single shell tank. However, the calculations were performed and included in this report for informational purposes only. These calculations are presented in Attachment 2.

Procedures

Table 4 lists the analytical procedures used for performing the sample analyses. Abbreviations for analyses are defined in the table notes.

Table 4. Analytical Procedures

Analysis	Sample Portion	Preparation Procedure +	Analysis Procedure
DSC	Liquid	N/A	LA-514-114 Rev. D-2 LA-514-114 Rev. D-3
TGA	Liquid	N/A	LA-514-114 Rev. D-2
Sp.G.	Liquid	N/A	LA-510-112 Rev. E-0
NH3	Liquid	N/A	LA-631-001 Rev. D-0
IC	Liquid	N/A	LA-533-105 Rev. F-1
ICP	Liquid	LA-504-101 Rev. E-0	LA-505-161 Rev. C-4
ICP/MS	Liquid	LA-504-101 Rev. E-0	LA-506-101 Rev. A-1

Analysis	Sample Portion	Preparation Procedure +	Analysis Procedure
TICTOC	Liquid	N/A	LA-342-100 Rev. F-3
PH	Liquid	N/A	LA-212-106 Rev. C-5
OH	Liquid	N/A	LA-211-102 Rev. D-1
Alpha	Liquid	N/A	LA-508-101 Rev. G-0 LA-508-101 Rev. G-1
GEA	Liquid	N/A	LA-548-121 Rev. F-0
^{239}Pu	Liquid	N/A	LA-953-104 Rev. B-1
^{241}Am	Liquid	N/A	LA-953-104 Rev. B-1
^{90}Sr	Liquid	N/A	LA-220-101 Rev. E-4

Abbreviations:

N/A	= not applicable (these are direct samples)
DSC	= differential scanning calorimetry
TGA	= thermogravimetric analysis
Sp.G.	= specific gravity
OH	=hydroxide
IC	= ion chromatography
ICP	= inductively coupled plasma
ICP/MS	= inductively coupled plasma/mass spectroscopy
TOC	= total organic carbon
TIC	= total inorganic carbon
GEA	= gamma energy analysis
^{90}Sr	= strontium 90
^{239}Pu	= plutonium 239
^{241}Am	= americium 241

References

Mulkey, C. H., and M. S. Miller, 1998, *Data Quality Objectives for Tank Farms WasteCompatibility Program,* HNF-SD-WM-DQO-001, Rev. 2A, Lockheed Martin Hanford Corporation for Fluor Daniel Hanford, Inc., Richland, WA 99352.

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

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

S-109 SAMPLE BREAKDOWN

(ATTACHMENT 1)

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S-109 GRAB SAMPLE BREAKDOWN

Attachment 1

9S-99-1

S99T001340

S99T001343

DSC
TGA
SPG
PH
OH
ICP
TICTOC
NH3

S99T001346

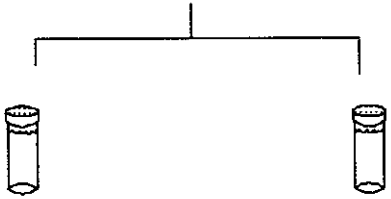
PU239
AM241
GEA
SR90
ICP/MS-U
ALPHA
IC-ANIONS

S-109 GRAB SAMPLE BREAKDOWN

Attachment 1

9S-99-2

S99T001341



S99T001344

DSC
TGA
SPG
PH
OH
IC-ANIONS
ICP
ALPHA

S99T001347

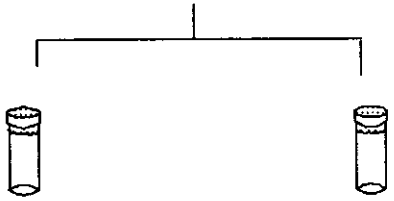
PU239
AM241
GEA
SR90
ICP/MS-U
NH3
TICTOC

S-109 GRAB SAMPLE BREAKDOWN

Attachment 1

9S-99-3

S99T001342



S99T001345

DSC
TGA
SPG
PH
OH
IC-ANIONS
ICP
TICTOC

S99T001348

PU239
AM241
GEA
SR90
ICP/MS-U
ALPHA
NH3

SAMPLE DATA SUMMARY

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Table 1. Data Summary Report.
S-109 GRAB

RISER: 13
SEGMENT #: 9S-99-1

SEGMENT PORTION: Supernate

Sample#	R	A#	Analyte	Unit	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S99T001343			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
S99T001343			DSC Exotherm on Perkin Elmer	Joules/g	105.7	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a
S99T001343			Ammonia by ISE-Std Additions	ug/mL	79.55	<500.0	1.52e+03	1.55e+03	1.54e+03	1.95	79.10	500.0	n/a
S99T001343			OH- by Pot. Titration	ug/mL	100.6	n/a	8.57e+04	8.73e+04	8.65e+04	1.85	n/a	5.00e+03	n/a
S99T001343			pH Direct	pH	n/a	n/a	13.08	13.06	13.07	0.15	n/a	1.00e-02	n/a
S99T001343			Specific Gravity	Sp.G.	99.43	n/a	1.524	1.489	1.506	2.32	n/a	1.00e-03	n/a
S99T001343			% Water by TGA on Perkin Elmer	%	101.6	n/a	52.22	52.55	52.38	0.63	n/a	n/a	n/a
S99T001343			TIC by Acid/Coulometry	ug/mL	96.18	1.100	1.60e+03	1.14e+03	1.37e+03	33.6	n/a	5.000	n/a
S99T001343			TOC by Persulfate/Coulometry	ug/mL	97.33	18.70	1.00e+03	722.0	861.0	32.3	n/a	40.00	n/a
S99T001343		D	Aluminium-ICP-Acid Dil.	ug/mL	97.20	<5.00e-02	4.14e+04	4.27e+04	4.20e+04	3.09	98.10	301.0	n/a
S99T001343		D	Chromium-ICP-Acid Dil.	ug/mL	100.0	<1.00e-02	9.91e+03	1.03e+04	1.01e+04	3.86	99.00	60.10	n/a
S99T001343		D	Iron-ICP-Acid Dil.	ug/mL	101.4	<5.00e-02	< 30.10	<3.01e1	n/a	n/a	101.0	30.10	n/a
S99T001343		D	Manganese-ICP-Acid Dil.	ug/mL	94.00	<1.00e-02	< 6.010	<6.01e0	n/a	n/a	89.70	6.010	n/a
S99T001343		D	Sodium-ICP-Acid Dil.	ug/mL	100.2	<1.00e-01	2.30e+05	2.32e+05	2.31e+05	0.87	99.10	601.0	n/a
S99T001343		D	Nickel-ICP-Acid Dil.	ug/mL	100.0	<2.00e-02	< 12.00	<1.20e1	n/a	n/a	98.90	12.00	n/a
S99T001343		D	Zirconium-ICP-Acid Dil.	ug/mL	99.60	<1.00e-02	< 6.010	<6.01e0	n/a	n/a	100.0	6.010	n/a
S99T001346			Strontium-89/90 High Level	uCi/mL	104.2	1.99e-04	3.12e-01	2.99e-01	3.05e-01	4.26	n/a	3.70e-04	1.14E+00
S99T001346			Pu-239/240 by TRU-SPEC Resin	uCi/mL	103.2	<3.71e-05	<3.34e-05	<3.56E-5	n/a	n/a	n/a	3.34e-05	8.05E+00
S99T001346		D	Uranium-233 by ICP/MS Acid Add	ug/mL	n/a	<1.20e-05	<4.86e-01	<4.86e-1	n/a	n/a	n/a	4.86e-01	n/a
S99T001346		D	Uranium-234 by ICP/MS Acid Add	ug/mL	n/a	<1.20e-05	<4.86e-01	<4.86e-1	n/a	n/a	n/a	4.86e-01	n/a
S99T001346		D	Uranium-235 by ICP/MS Acid Add	ug/mL	101.2	<1.20e-05	<4.86e-01	<4.86e-1	n/a	n/a	96.48	4.86e-01	n/a
S99T001346		D	Uranium-236 by ICP/MS Acid Add	ug/mL	n/a	<1.60e-05	<6.48e-01	<6.48e-1	n/a	n/a	n/a	6.48e-01	n/a
S99T001346		D	Uranium-238 by ICP/MS Acid Add	ug/mL	100.0	<1.20e-05	1.401	1.320	1.361	5.88	95.50	4.86e-01	n/a
S99T001346			Fluoride-IC-Dionex 4000/4500	ug/mL	96.25	<1.20e-02	<1.22e+02	<1.22e2	n/a	n/a	106.4	122.4	n/a
S99T001346			Chloride-IC-Dionex 4000/4500	ug/mL	101.7	<1.70e-02	9.20e+03	9.22e+03	9.21e+03	0.22	107.0	173.4	n/a
S99T001346			Nitrite-IC - Dionex 4000/4500	ug/mL	91.68	<1.08e-01	8.34e+04	8.32e+04	8.33e+04	0.24	105.1	1.10e+03	n/a
S99T001346			Nitrate by IC-Dionex 4000/4500	ug/mL	104.9	<1.39e-01	1.31e+05	1.39e+05	1.35e+05	5.93	114.6	1.42e+03	n/a
S99T001346			Phosphate-IC-Dionex 4000/4500	ug/mL	98.27	<1.20e-01	1.24e+03	<1.22e3	n/a	n/a	97.32	1.22e+03	n/a
S99T001346			Sulfate by IC-Dionex 4000/4500	ug/mL	96.96	<1.38e-01	1.64e+03	1.49e+03	1.57e+03	9.58	97.10	1.41e+03	n/a
S99T001346			Cesium-137 by GEA	uCi/mL	105.5	4.00e-03	3.30e+02	328.0	329.0	0.61	n/a	n/a	0.110
S99T001346			Am-241 by Extraction	uCi/mL	101.9	<2.53e-05	2.54e-04	2.66e-04	2.60e-04	4.62	n/a	3.93e-05	3.12E+00
S99T001346			Alpha in Liquid Samples	uCi/mL	93.20	<1.30e-02	<1.30e-02	<1.30E-2	n/a	n/a	n/a	1.80e-02	5.00E+02

Table 1. Data Summary Report.
S-109 GRAB

RISER: 13
SEGMENT #: 9S-99-2

SEGMENT PORTION: Supernate

Sample#	R	A#	Analyte	Unit	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S99T001344			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
S99T001344			DSC Exotherm on Perkin Elmer	Joules/g	105.7	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a
S99T001344			OH- by Pot. Titration	ug/mL	100.6	n/a	8.96e+04	8.74e+04	8.85e+04	2.49	n/a	5.00e+03	n/a
S99T001344			pH Direct	pH	n/a	n/a	12.97	12.97	12.97	0.00	n/a	1.00e-02	n/a
S99T001344			Specific Gravity	Sp.G.	99.43	n/a	1.488	1.482	1.485	0.40	n/a	1.00e-03	n/a
S99T001344			% Water by TGA on Perkin Elmer	%	101.6	n/a	53.17	53.16	53.16	0.02	n/a	n/a	n/a
S99T001344		D	Aluminium-ICP-Acid Dil.	ug/mL	97.20	<5.00e-02	4.25e+04	3.92e+04	4.08e+04	8.08	n/a	30.10	n/a
S99T001344		D	Chromium-ICP-Acid Dil.	ug/mL	100.0	<1.00e-02	9.73e+03	8.98e+03	9.36e+03	8.02	n/a	6.010	n/a
S99T001344		D	Iron-ICP-Acid Dil.	ug/mL	101.4	<5.00e-02	< 30.10	<3.01e1	n/a	n/a	n/a	30.10	n/a
S99T001344		D	Manganese-ICP-Acid Dil.	ug/mL	94.00	<1.00e-02	< 6.010	<6.01e0	n/a	n/a	n/a	6.010	n/a
S99T001344		D	Sodium-ICP-Acid Dil.	ug/mL	100.2	<1.00e-01	2.22e+05	2.05e+05	2.14e+05	7.96	n/a	60.10	n/a
S99T001344		D	Nickel-ICP-Acid Dil.	ug/mL	100.0	<2.00e-02	< 12.00	<1.20e1	n/a	n/a	n/a	12.00	n/a
S99T001344		D	Zirconium-ICP-Acid Dil.	ug/mL	99.60	<1.00e-02	< 6.010	<6.01e0	n/a	n/a	n/a	6.010	n/a
S99T001344			Fluoride-IC-Dionex 4000/4500	ug/mL	107.0	<1.20e-02	< 49.69	<4.97e1	n/a	n/a	n/a	49.69	n/a
S99T001344			Chloride-IC-Dionex 4000/4500	ug/mL	97.39	<1.70e-02	1.02e+04	1.03e+04	1.02e+04	0.98	n/a	70.40	n/a
S99T001344			Nitrite-IC - Dionex 4000/4500	ug/mL	94.89	<1.08e-01	8.87e+04	8.88e+04	8.88e+04	0.11	n/a	447.2	n/a
S99T001344			Nitrate by IC-Dionex 4000/4500	ug/mL	91.61	<1.39e-01	1.39e+05	1.32e+05	1.36e+05	5.17	n/a	575.6	n/a
S99T001344			Phosphate-IC-Dionex 4000/4500	ug/mL	100.7	<1.20e-01	1.35e+03	1.56e+03	1.46e+03	14.4	n/a	496.9	n/a
S99T001344			Sulfate by IC-Dionex 4000/4500	ug/mL	100.8	<1.38e-01	1.59e+03	1.61e+03	1.60e+03	1.25	n/a	292.7	n/a
S99T001344			Alpha in Liquid Samples	uCi/mL	107.0	<2.02e-02	1.45e-02	<2.30E-2	n/a	n/a	98.22	3.00e-02	1.33E+02
S99T001347			Ammonia by ISE-Std Additions	ug/mL	95.35	<50.00	1.62e+02	142.0	152.0	13.2	n/a	50.00	n/a
S99T001347			TIC by Acid/Coulometry	ug/mL	98.67	4.00e-01	2.22e+03	2.18e+03	2.20e+03	1.82	103.0	5.000	n/a
S99T001347			TOC by Persulfate/Coulometry	ug/mL	95.00	2.00e-01	1.15e+03	1.16e+03	1.16e+03	0.87	97.00	40.00	n/a
S99T001347			Strontium-89/90 High Level	uCi/mL	104.2	1.99e-04	2.50e-01	2.45e-01	2.47e-01	2.02	n/a	3.72e-04	1.28E+00
S99T001347			Pu-239/240 by TRU-SPEC Resin	uCi/mL	103.2	<3.71e-05	<3.56e-05	<3.68E-5	n/a	n/a	n/a	3.56e-05	7.57E+00
S99T001347		D	Uranium-233 by ICP/MS Acid Add	ug/mL	n/a	<1.20e-05	<4.86e-01	<4.86e-1	n/a	n/a	n/a	4.86e-01	n/a
S99T001347		D	Uranium-234 by ICP/MS Acid Add	ug/mL	n/a	<1.20e-05	<4.86e-01	<4.86e-1	n/a	n/a	n/a	4.86e-01	n/a
S99T001347		D	Uranium-235 by ICP/MS Acid Add	ug/mL	101.2	<1.20e-05	<4.86e-01	<4.86e-1	n/a	n/a	n/a	4.86e-01	n/a
S99T001347		D	Uranium-236 by ICP/MS Acid Add	ug/mL	n/a	<1.60e-05	<6.48e-01	<6.48e-1	n/a	n/a	n/a	6.48e-01	n/a
S99T001347		D	Uranium-238 by ICP/MS Acid Add	ug/mL	100.0	<1.20e-05	1.264	1.310	1.287	3.89	n/a	4.86e-01	n/a
S99T001347			Cesium-137 by GEA	uCi/mL	105.5	4.00e-03	3.17e+02	318.0	317.5	0.31	n/a	n/a	0.110
S99T001347			Am-241 by Extraction	uCi/mL	101.9	<2.53e-05	2.40e-04	2.11e-04	2.26e-04	12.9	n/a	3.89e-05	3.23E+00

Table 1. Data Summary Report.
S-109 GRAB

RISER: 13
SEGMENT #: 9S-99-3

SEGMENT PORTION: Supernate

Sample#	R	A#	Analyte	Unit	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S99T001345			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
S99T001345			DSC Exotherm on Perkin Elmer	Joules/g	105.7	n/a	0.00e+00	0.00e+00	0.00e+00	0.00	n/a	n/a	n/a
S99T001345			OH- by Pot. Titration	ug/mL	100.6	n/a	7.15e+04	6.98e+04	7.06e+04	2.41	n/a	5.00e+03	n/a
S99T001345			pH Direct	pH	n/a	n/a	12.98	12.97	12.98	0.08	n/a	1.00e-02	n/a
S99T001345			Specific Gravity	Sp.G.	99.43	n/a	1.494	1.488	1.491	0.40	n/a	1.00e-03	n/a
S99T001345			% Water by TGA on Perkin Elmer	%	101.6	n/a	53.81	53.73	53.77	0.15	n/a	n/a	n/a
S99T001345			TIC by Acid/Coulometry	ug/mL	100.2	2.700	2.41e+03	2.44e+03	2.42e+03	1.24	n/a	5.000	n/a
S99T001345			TOC by Persulfate/Coulometry	ug/mL	93.33	12.20	1.28e+03	1.42e+03	1.35e+03	10.4	n/a	40.00	n/a
S99T001345		D	Aluminium-ICP-Acid Dil.	ug/mL	97.20	<5.00e-02	5.78e+04	5.13e+04	5.46e+04	11.9	n/a	30.10	n/a
S99T001345		D	Chromium-ICP-Acid Dil.	ug/mL	100.0	<1.00e-02	7.80e+03	6.98e+03	7.39e+03	11.1	n/a	6.010	n/a
S99T001345		D	Iron-ICP-Acid Dil.	ug/mL	101.4	<5.00e-02	< 30.10	<3.01e1	n/a	n/a	n/a	30.10	n/a
S99T001345		D	Manganese-ICP-Acid Dil.	ug/mL	94.00	<1.00e-02	< 6.010	<6.01e0	n/a	n/a	n/a	6.010	n/a
S99T001345		D	Sodium-ICP-Acid Dil.	ug/mL	100.2	<1.00e-01	2.28e+05	2.02e+05	2.15e+05	12.1	n/a	60.10	n/a
S99T001345		D	Nickel-ICP-Acid Dil.	ug/mL	100.0	<2.00e-02	< 12.00	<1.20e1	n/a	n/a	n/a	12.00	n/a
S99T001345		D	Zirconium-ICP-Acid Dil.	ug/mL	99.60	<1.00e-02	< 6.010	<6.01e0	n/a	n/a	n/a	6.010	n/a
S99T001345			Fluoride-IC-Dionex 4000/4500	ug/mL	107.0	<1.20e-02	< 49.69	<4.97e1	n/a	n/a	n/a	49.69	n/a
S99T001345			Chloride-IC-Dionex 4000/4500	ug/mL	97.39	<1.70e-02	8.90e+03	9.00e+03	8.95e+03	1.12	n/a	70.40	n/a
S99T001345			Nitrite-IC - Dionex 4000/4500	ug/mL	94.89	<1.08e-01	8.14e+04	8.37e+04	8.25e+04	2.79	n/a	447.2	n/a
S99T001345			Nitrate by IC-Dionex 4000/4500	ug/mL	91.61	<1.39e-01	1.25e+05	1.24e+05	1.24e+05	0.80	n/a	575.6	n/a
S99T001345			Phosphate-IC-Dionex 4000/4500	ug/mL	98.71	<1.20e-01	1.71e+03	1.86e+03	1.78e+03	8.40	n/a	254.5	n/a
S99T001345			Sulfate by IC-Dionex 4000/4500	ug/mL	100.8	<1.38e-01	2.08e+03	2.08e+03	2.08e+03	0.00	n/a	292.7	n/a
S99T001348			Ammonia by ISE-Std Additions	ug/mL	95.35	<50.00	3.95e+02	334.0	364.5	16.7	n/a	100.0	n/a
S99T001348			Strontium-89/90 High Level	uCi/mL	104.2	1.99e-04	2.73e-01	2.40e-01	2.57e-01	12.9	n/a	3.70e-04	1.22E+00
S99T001348			Pu-239/240 by TRU-SPEC Resin	uCi/mL	103.2	<3.71e-05	9.06e-05	8.97e-05	9.01e-05	1.00	n/a	3.80e-05	4.51E+00
S99T001348		D	Uranium-233 by ICP/MS Acid Add	ug/mL	n/a	<1.20e-05	<4.86e-01	<4.86e-1	n/a	n/a	n/a	4.86e-01	n/a
S99T001348		D	Uranium-234 by ICP/MS Acid Add	ug/mL	n/a	<1.20e-05	<4.86e-01	<4.86e-1	n/a	n/a	n/a	4.86e-01	n/a
S99T001348		D	Uranium-235 by ICP/MS Acid Add	ug/mL	101.2	<1.20e-05	<4.86e-01	<4.86e-1	n/a	n/a	n/a	4.86e-01	n/a
S99T001348		D	Uranium-236 by ICP/MS Acid Add	ug/mL	n/a	<1.60e-05	<6.48e-01	<6.48e-1	n/a	n/a	n/a	6.48e-01	n/a
S99T001348		D	Uranium-238 by ICP/MS Acid Add	ug/mL	100.0	<1.20e-05	2.110	1.980	2.045	6.36	n/a	4.86e-01	n/a
S99T001348			Cesium-137 by GEA	uCi/mL	105.5	4.00e-03	3.00e+02	298.0	299.0	0.67	n/a	n/a	0.110
S99T001348			Am-241 by Extraction	uCi/mL	101.9	<2.53e-05	3.21e-04	3.24e-04	3.22e-04	0.93	n/a	4.01e-05	2.87E+00
S99T001348			Alpha in Liquid Samples	uCi/mL	93.20	<1.30e-02	<7.18e-03	<7.18E-3	n/a	n/a	n/a	1.80e-02	5.00E+02

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WASTE COMPATIBILITY CORROSION RULES

(ATTACHMENT 2)

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Attachment 3. Waste Compatibility Corrosion Rules for 241-S-109 Grab Samples

Sample ID	Analyte	Result (ug/mL)	Result (M)	Is $[NO_3]$...	Is [OH]...	Is $[NO_2]$...	Is [OH] + $[NO_2]$...
				<=1.0 M?	0.010 M <= [OH] <= 8.0 M?	0.011 M <= $[NO_2]$ <= 5.5 M	$[NO_3]/([OH] + [NO_2])$ < 2.5?
9S-99-1 Supernate Sample	NO_3	1.31E+05	2.113				
	OH	8.57E+04	5.041				
	NO_2	8.34E+04	1.813	1.0 M < $[NO_3]$ <= 3.0 M?	0.1 M * $[NO_3]$ <= [OH] < 10 M?		>= 0.4 * $[NO_3]$?
				YES	YES		YES
				3.0 M < $[NO_3]$ <= 5.5 M?	0.3 <= [OH] < 10 M?		>= 1.2 M?

Sample ID	Analyte	Result (ug/mL)	Result (M)	Is $[NO_3]$...	Is [OH]...	Is $[NO_2]$...	Is [OH] + $[NO_2]$...
				<= 1.0 M?	0.010 M <= [OH] <= 8.0 M?	0.011 M <= $[NO_2]$ <= 5.5 M	$[NO_3]/([OH] + [NO_2])$ < 2.5?
9S-99-1 Supernate Duplicate	NO_3	1.39E+05	2.242				
	OH	8.73E+04	5.135				
	NO_2	8.32E+04	1.809	1.0 M < $[NO_3]$ <= 3.0 M?	0.1 M * $[NO_3]$ <= [OH] < 10 M?		>= 0.4 * $[NO_3]$?
				YES	YES		YES
				3.0 M < $[NO_3]$ <= 5.5 M?	0.3 <= [OH] < 10 M?		>= 1.2 M?

Attachment 3. Waste Compatibility Corrosion Rules for 241-S-109 Grab Samples

Sample ID	Analyte	Result (ug/mL)	Result (M)	Is $[NO_3]$...	Is $[OH]$...	Is $[NO_2]$...	Is $[OH] + [NO_2]$...
				<=1.0 M?	0.010 M <= [OH] <= 8.0 M?	0.011 M <= $[NO_2]$ <= 5.5 M	$[NO_3]/([OH] + [NO_2])$ < 2.5?
9S-99-2 Supernate Sample	NO_3	1.39E+05	2.242				
	OH	8.96E+04	5.271				
	NO_2	8.87E+04	1.928	1.0 M < $[NO_3]$ <= 3.0 M?	0.1 M * $[NO_3]$ <= [OH] < 10 M?		>= 0.4 * $[NO_3]$?
				YES	YES		YES
				3.0 M < $[NO_3]$ <= 5.5 M?	0.3 <= [OH] < 10 M?		>= 1.2 M?

Sample ID	Analyte	Result (ug/mL)	Result (M)	Is $[NO_3]$...	Is $[OH]$...	Is $[NO_2]$...	Is $[OH] + [NO_2]$...
				<= 1.0 M?	0.010 M <= [OH] <= 8.0 M?	0.011 M <= $[NO_2]$ <= 5.5 M	$[NO_3]/([OH] + [NO_2])$ < 2.5?
9S-99-2 Supernate Duplicate	NO_3	1.32E+05	2.129				
	OH	8.74E+04	5.141				
	NO_2	8.88E+04	1.930	1.0 M < $[NO_3]$ <= 3.0 M?	0.1 M * $[NO_3]$ <= [OH] < 10 M?		>= 0.4 * $[NO_3]$?
				YES	YES		YES
				3.0 M < $[NO_3]$ <= 5.5 M?	0.3 <= [OH] < 10 M?		>= 1.2 M?

Attachment 3. Waste Compatibility Corrosion Rules for 241-S-109 Grab Samples

Sample ID	Analyte	Result (ug/mL)	Result (M)	Is $[NO_3]$...	Is [OH]...	Is $[NO_2]$...	Is [OH] + $[NO_2]$...
				<=1.0 M?	0.010 M <= [OH] <= 8.0 M?	0.011 M <= $[NO_2]$ <= 5.5 M	$[NO_3]/([OH] + [NO_2]) < 2.5$?
9S-99-3 Supernate Sample	NO_3	1.25E+05	2.016				
	OH	7.15E+04	4.206				
	NO_2	8.14E+04	1.770	1.0 M < $[NO_3]$ <= 3.0 M?	0.1 M * $[NO_3]$ <= [OH] < 10 M?		>= 0.4 * $[NO_3]$?
				YES	YES		YES
				3.0 M < $[NO_3]$ <= 5.5 M?	0.3 <= [OH] < 10 M?		>= 1.2 M?

Sample ID	Analyte	Result (ug/mL)	Result (M)	Is $[NO_3]$...	Is [OH]...	Is $[NO_2]$...	Is [OH] + $[NO_2]$...
				<= 1.0 M?	0.010 M <= [OH] <= 8.0 M?	0.011 M <= $[NO_2]$ <= 5.5 M	$[NO_3]/([OH] + [NO_2]) < 2.5$?
9S-99-3 Supernate Duplicate	NO_3	1.24E+05	2.000				
	OH	6.98E+04	4.106				
	NO_2	8.37E+04	1.820	1.0 M < $[NO_3]$ <= 3.0 M?	0.1 M * $[NO_3]$ <= [OH] < 10 M?		>= 0.4 * $[NO_3]$?
				YES	YES		YES
				3.0 M < $[NO_3]$ <= 5.5 M?	0.3 <= [OH] < 10 M?		>= 1.2 M?

CHAIN OF CUSTODY

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CHAIN-OF-CUSTODY RECORD FOR CPO

Sample Number: 95-99-1

(2) Supervisor/Sampler: Robert J Frazvik

(9) Seal Intact Upon Release? ☒ Yes ☐ No

Tank: S-109

(4) Riser: 13

(5) Cask/Pig Serial No.: B-23

(10) Seal Intact Upon Receipt? ☒ Yes ☐ No

) Shipment Description:

A. Work Package Number: WS-99-00371/0

B. Cask/Pig Seal Number: 12602

C. Date Sample Collected: 7-28-98

D. Time Sample Collected: 0321h

(7) Sampling Data

	Y	N
- Lithium Bromide	☒	☐
Amount		
Concentration		
- X-Ray	☐	☐
- Partial Sample	☒	☐
- Retrieved Partial Sample Stroke Length		

DAR 7-28-99

(11) Seal Number AND Cask/Pig SERIAL Number consistent with this record? (Block 5 & 6b) ☒ Yes ☐ No

(12) Laboratory Comments:

SAAT001340

) Field Comments:

(13) Relinquished By (Sign and PRINT)	(14) Received By (Sign and PRINT)	(15) Date/Time	(16) Receiver Comments
Robert J Frazvik	V. Matthews V. Matthews	8:40 am 7-28-99	
(17) Relinquished By (Sign and PRINT)	(18) Received By (Sign and PRINT)	(19) Date/Time	(20) Receiver Comments
V. Matthews V. Matthews V. Matthews V. Matthews 7-28-99 VM	R L Chambers R L Chambers	1020 7-28-99	
(21) Relinquished By (Sign and PRINT)	(22) Received By (Sign and PRINT)	(23) Date/Time	(24) Receiver Comments
(25) Relinquished By (Sign and PRINT)	(26) Received By (Sign and PRINT)	(27) Date/Time	(28) Receiver Comments

HNF-1679 REV. 0

CHAIN-OF-CUSTODY RECORD FOR CPO

(1) Sample Number: 9S-99-2

(2) Supervisor/Sampler: Robert J Praznik

(3) Tank: S-109

(4) Riser: 13

(5) Cask/Pig Serial No.: B-I4

(6) Shipment Description:

A. Work Package Number: WS-99-00371/0

B. Cask/Pig Seal Number: 12603

C. Date Sample Collected: 7-28-99

D. Time Sample Collected: 0328hr

(7) Sampling Data

	Y	N
- Lithium Bromide	☐	☒
Amount		
Concentration		
- X-Ray	☐	☐
- Partial Sample	☐	☐
- Retrieved Partial Sample Stroke Length		

7-28-99

(8) Field Comments:

(9) Seal Intact Upon Release? ☒ Yes ☐ No

(10) Seal Intact Upon Receipt? ☒ Yes ☐ No

(11) Seal Number AND Cask/Pig SERIAL Number consistent with this record? (Block 5 & 6b) ☒ Yes ☐ No

(12) Laboratory Comments:

S99T001341

(13) Relinquished By (Sign and PRINT)	(14) Received By (Sign and PRINT)	(15) Date/Time	(16) Receiver Comments
Robert J Praznik	V. Matthews	8:30 AM 7-28-99	
(17) Relinquished By (Sign and PRINT)	(18) Received By (Sign and PRINT)	(19) Date/Time	(20) Receiver Comments
V. Matthews	R L Chambers / R L Chambers	915 7-28-99	
(21) Relinquished By (Sign and PRINT)	(22) Received By (Sign and PRINT)	(23) Date/Time	(24) Receiver Comments
(25) Relinquished By (Sign and PRINT)	(26) Received By (Sign and PRINT)	(27) Date/Time	(28) Receiver Comments

HNF-1679 REV. 0

CHAIN-OF-CUSTODY RECORD FOR CPO

(1) Sample Number: 95-99-3	(2) Supervisor/Sampler: Robert J Prazniik	(9) Seal Intact Upon Release? ☒ Yes ☐ No
(3) Tank: S-109 / (4) Riser: 13	(5) Cask/Pig Serial No.: G-6	(10) Seal Intact Upon Receipt? ☒ Yes ☐ No
(6) Shipment Description:	(7) Sampling Data (Y / N)	(11) Seal Number AND Cask/Pig SERIAL Number consistent with this record? (Block 5 & 6b) ☒ Yes ☐ No
A. Work Package Number: WS99-037/0	- Lithium Bromide ☐ ☐	(12) Laboratory Comments:
B. Cask/Pig Seal Number: 12604	Amount:	
C. Date Sample Collected: 7-28-99	Concentration: N/A	
D. Time Sample Collected: 0334h	- X-Ray ☐ ☐	
	- Partial Sample 7-28-99 ☐ ☐	
	- Retrieved Partial Sample Stroke Length:	

S99T001342

(8) Field Comments:

(13) Relinquished By (Sign and PRINT)	(14) Received By (Sign and PRINT)	(15) Date/Time	(16) Receiver Comments
Robert J Prazniik	V. Matthews	8:30AM 7-28-99	
(17) Relinquished By (Sign and PRINT)	(18) Received By (Sign and PRINT)	(19) Date/Time	(20) Receiver Comments
V. Matthews	R L Chambers	915 7-28-99	
(21) Relinquished By (Sign and PRINT)	(22) Received By (Sign and PRINT)	(23) Date/Time	(24) Receiver Comments
(25) Relinquished By (Sign and PRINT)	(26) Received By (Sign and PRINT)	(27) Date/Time	(28) Receiver Comments

HNF-1679 REV. 0

SAMPLE HANDLING

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LABCORE Data Entry Template for Worklist# 30534

Analyst: drj **Instrument:** NONE _____ **Book #** _____

Method: AdminDataEntry Rev/Mod _____

Worklist Comment: S-109 FOR @BRKDWN1, RLC

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	-------TEST------	MATRIX	ACTUAL	FOUND	DL	UNIT
99000300	S-109 GRAB	1	SAMPLE	S99T001340	0		@BRKDWN1 DOSERATE	LIQUID	N/A	N/A		mrad/hour
99000300	S-109 GRAB	1	SAMPLE	S99T001340	0		@BRKDWN1 SEALNUM	LIQUID	N/A	12602		
99000300	S-109 GRAB	1	SAMPLE	S99T001340	0		@BRKDWN1 ETCHNUM	LIQUID	N/A	95-99-1		
99000300	S-109 GRAB	1	SAMPLE	S99T001340	0		@BRKDWN1 APPEAR02	LIQUID	N/A	Opaque		
99000300	S-109 GRAB	1	SAMPLE	S99T001340	0		@BRKDWN1 SAMPAMT2	LIQUID	N/A	125		mL
99000300	S-109 GRAB	1	SAMPLE	S99T001340	0		@BRKDWN1 STLSLD01	LIQUID	N/A	Trace		% Black
99000300	S-109 GRAB	1	SAMPLE	S99T001340	0		@BRKDWN1 COLOR-01	LIQUID	N/A	Olive Green		
99000300	S-109 GRAB	1	SAMPLE	S99T001340	0		@BRKDWN1 ORGVOL02	LIQUID	N/A	0		mL
99000300	S-109 GRAB	2	SAMPLE	S99T001341	0		@BRKDWN1 DOSERATE	LIQUID	N/A	N/A		mrad/hour
99000300	S-109 GRAB	2	SAMPLE	S99T001341	0		@BRKDWN1 SEALNUM	LIQUID	N/A	12603		
99000300	S-109 GRAB	2	SAMPLE	S99T001341	0		@BRKDWN1 ETCHNUM	LIQUID	N/A	95-99-2		
99000300	S-109 GRAB	2	SAMPLE	S99T001341	0		@BRKDWN1 APPEAR02	LIQUID	N/A	Opaque		
99000300	S-109 GRAB	2	SAMPLE	S99T001341	0		@BRKDWN1 SAMPAMT2	LIQUID	N/A	125		mL
99000300	S-109 GRAB	2	SAMPLE	S99T001341	0		@BRKDWN1 STLSLD01	LIQUID	N/A	Trace		% Black
99000300	S-109 GRAB	2	SAMPLE	S99T001341	0		@BRKDWN1 COLOR-01	LIQUID	N/A	Olive green		
99000300	S-109 GRAB	2	SAMPLE	S99T001341	0		@BRKDWN1 ORGVOL02	LIQUID	N/A	0		mL
99000300	S-109 GRAB	3	SAMPLE	S99T001342	0		@BRKDWN1 DOSERATE	LIQUID	N/A	N/A		mrad/hour
99000300	S-109 GRAB	3	SAMPLE	S99T001342	0		@BRKDWN1 SEALNUM	LIQUID	N/A	12604		

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# 30534

GROUP	PROJECT	S	TYPE	SAMPL #	R	A	-------TEST------	MATRIX	ACTUAL	FOUND	DL	UNIT	
99000300	S-109 GRAB	3	SAMPLE	S99T01342	0		@BRKDWN1 ETCHNUM	LIQUID	N/A	95.99.3			
99000300	S-109 GRAB	3	SAMPLE	S99T01342	0		@BRKDWN1 APPEAR02	LIQUID	N/A	Opaque			
99000300	S-109 GRAB	3	SAMPLE	S99T01342	0		@BRKDWN1 SAMPAMT2	LIQUID	N/A	125		mL	
99000300	S-109 GRAB	3	SAMPLE	S99T01342	0		@BRKDWN1 STLSLD01	LIQUID	N/A	Trace		%	Black
99000300	S-109 GRAB	3	SAMPLE	S99T01342	0		@BRKDWN1 COLOR-01	LIQUID	N/A	Olive green			
99000300	S-109 GRAB	3	SAMPLE	S99T01342	0		@BRKDWN1 ORGVOL02	LIQUID	N/A	0		mL	

Final page for worklist # 30534

Analyst Signature 7-28-99 Date

Analyst Signature 7-28-99 Date

Approved RW Schroeder 7/28/99

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.

INORGANIC ANALYSIS

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worklistrpt Version 2.1 05/15/95
08/05/99 13:15

LABCORE Data Entry Template for Worklist# 30668

Analyst: DK **Instrument:** DSC0 3 **Book #** 12914-B

Method: LA-514-114 Rev/Mod D-2

Worklist Comment: S109 FOR DSC-03 RTS

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1	STD				DSC-03	LIQUID	28.45	30.065	N/A	Joules/g
99000300	S-109 GRAB	2	SAMPLE	S99T001343	0		DSC-03	LIQUID	N/A	0		Joules/g
99000300	S-109 GRAB	3	DUP	S99T001343	0		DSC-03	LIQUID	0	0	N/A	Joules/g
99000300	S-109 GRAB	4	SAMPLE	S99T001344	0		DSC-03	LIQUID	N/A	0		Joules/g
99000300	S-109 GRAB	5	DUP	S99T001344	0		DSC-03	LIQUID	0	0	N/A	Joules/g
99000300	S-109 GRAB	6	SAMPLE	S99T001345	0		DSC-03	LIQUID	N/A	0		Joules/g
99000300	S-109 GRAB	7	DUP	S99T001345	0		DSC-03	LIQUID	0	0	N/A	Joules/g

Final page for worklist # 30668

Analyst Signature 8/6/99 Date

Analyst Signature 8/9/99 Date

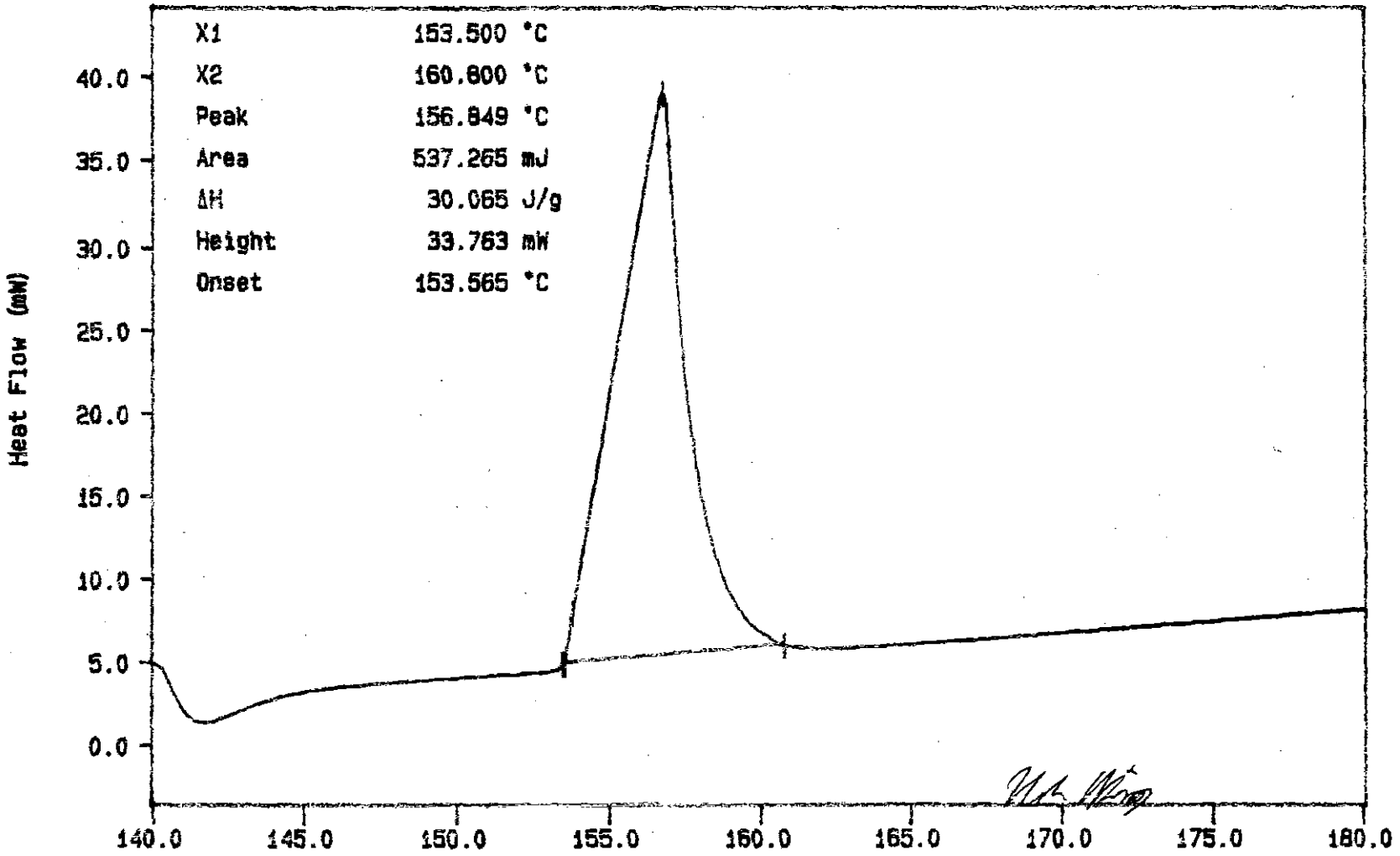
REVIEWER SIGNATURE 8/11/99 DATE

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: IND060601 Fri Aug 6 07:48:19 1999
Sample Weight: 17.870 mg
STD 12N14-B

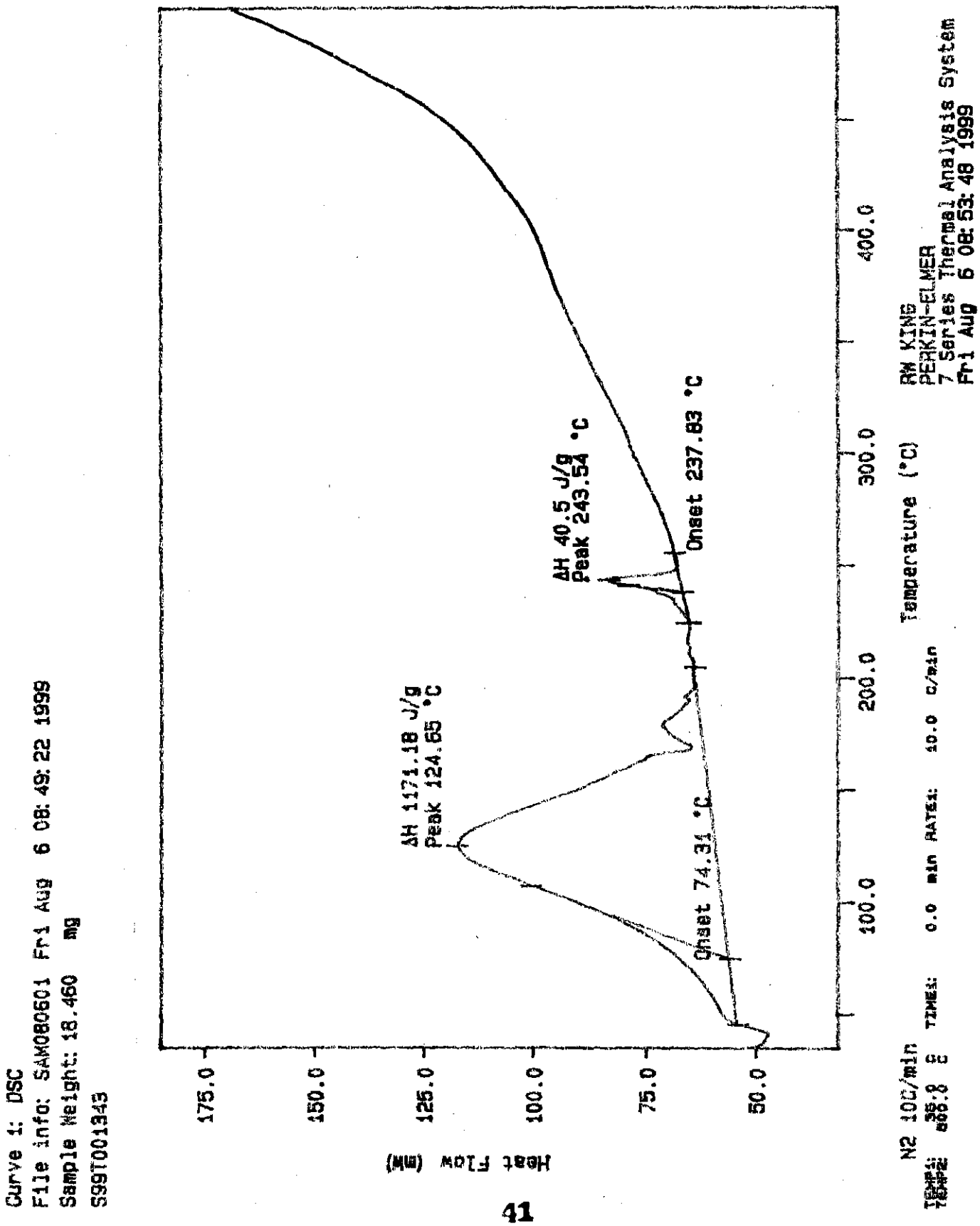
SIGNATURE BELOW DENOTES THAT I HAVE TECHNOLOGIST CHECKED THAT CURVE CONTAINS PAGES 40 TO 46.



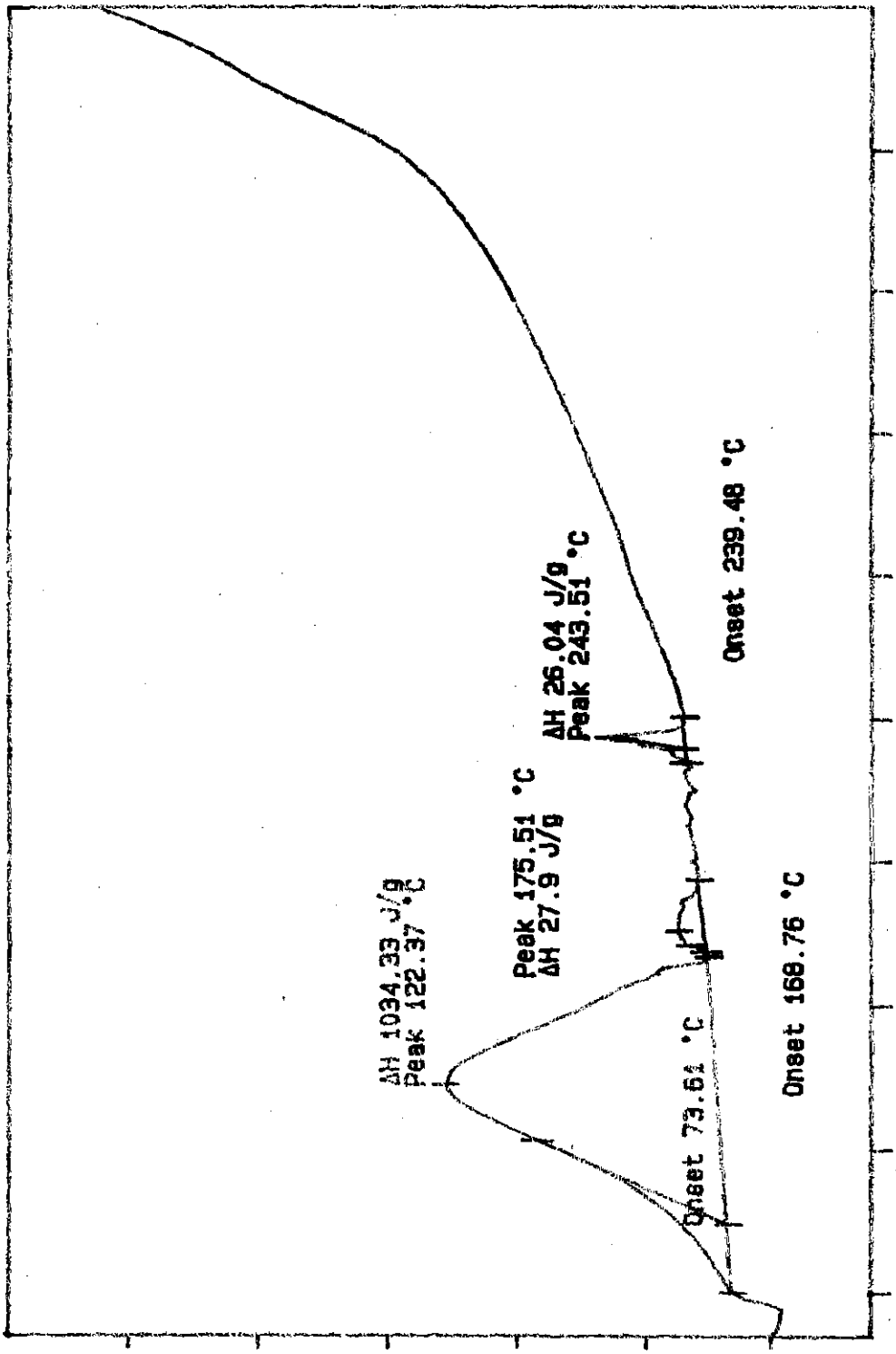
N2, EXOTHERM DOWN
TEMP1: 140.0 C TIME1: 0.0 min RATE1: 10.0 C/min
TEMP2: 180.0 C

RW KING
PERKIN-ELMER
7 Series Thermal Analysis System
Fri Aug 6 07:52:26 1999

08/06/99 15:07 FAX 002

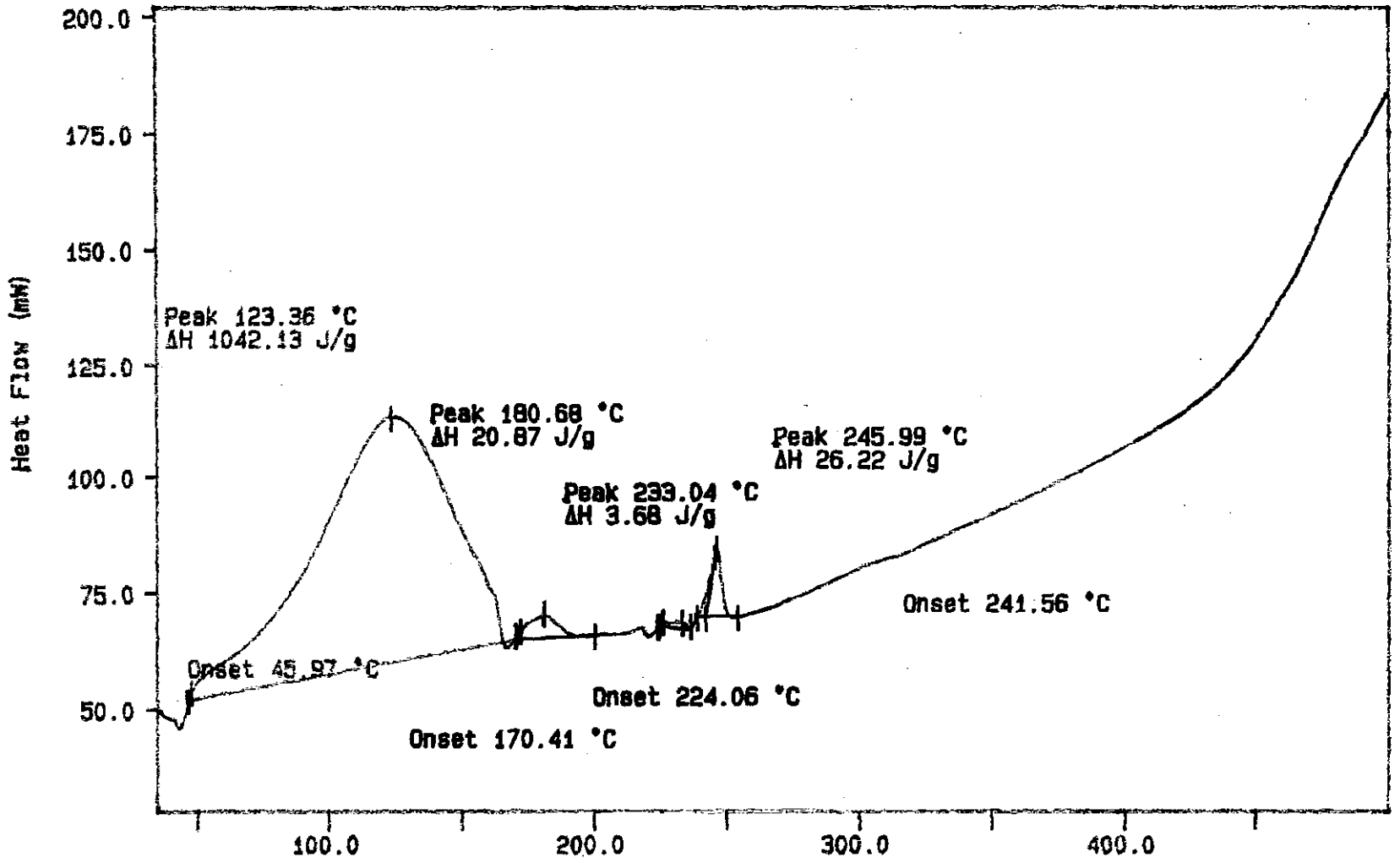


08/06/99 15:07 FAX
003



08/06/99 15:08 FAX
004

Curve 1: DSC
File info: SAM080603 Fri Aug 6 10:42:20 1999
Sample Weight: 18.200 mg
S99T001344

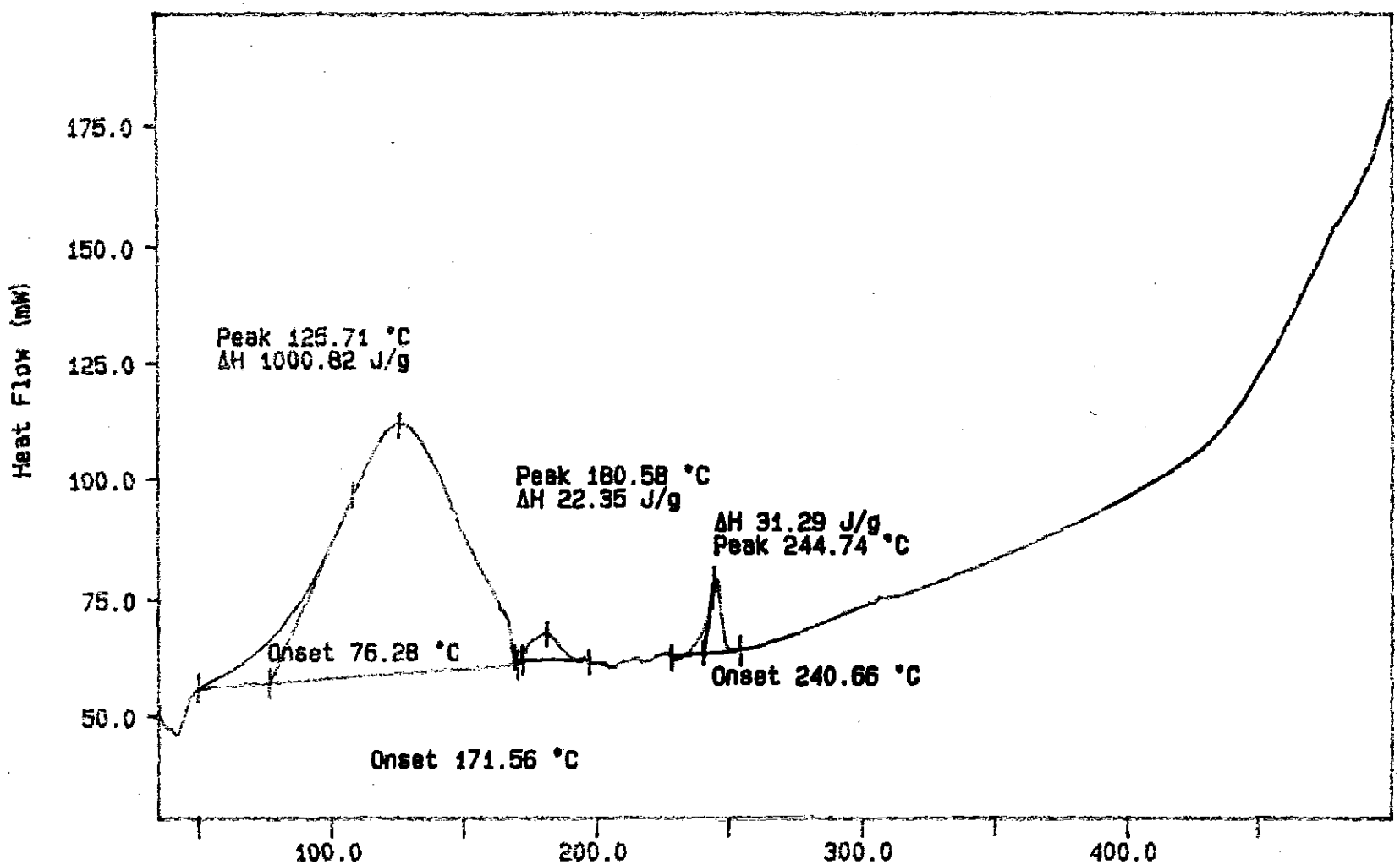


N2 10C/min
TEMP1: 35.0 C TIME1: 0.0 min RATE1: 10.0 C/min
TEMP2: 500.0 C

RW KING
PERKIN-ELMER
7 Series Thermal Analysis System
Fri Aug 6 11:08:02 1999

08/06/99 15:08 FAX 005

Curve 1: DSC
File info: SAM080604 Fri Aug 6 12:04:13 1999
Sample Weight: 18.090 mg
S99T001344 DUP

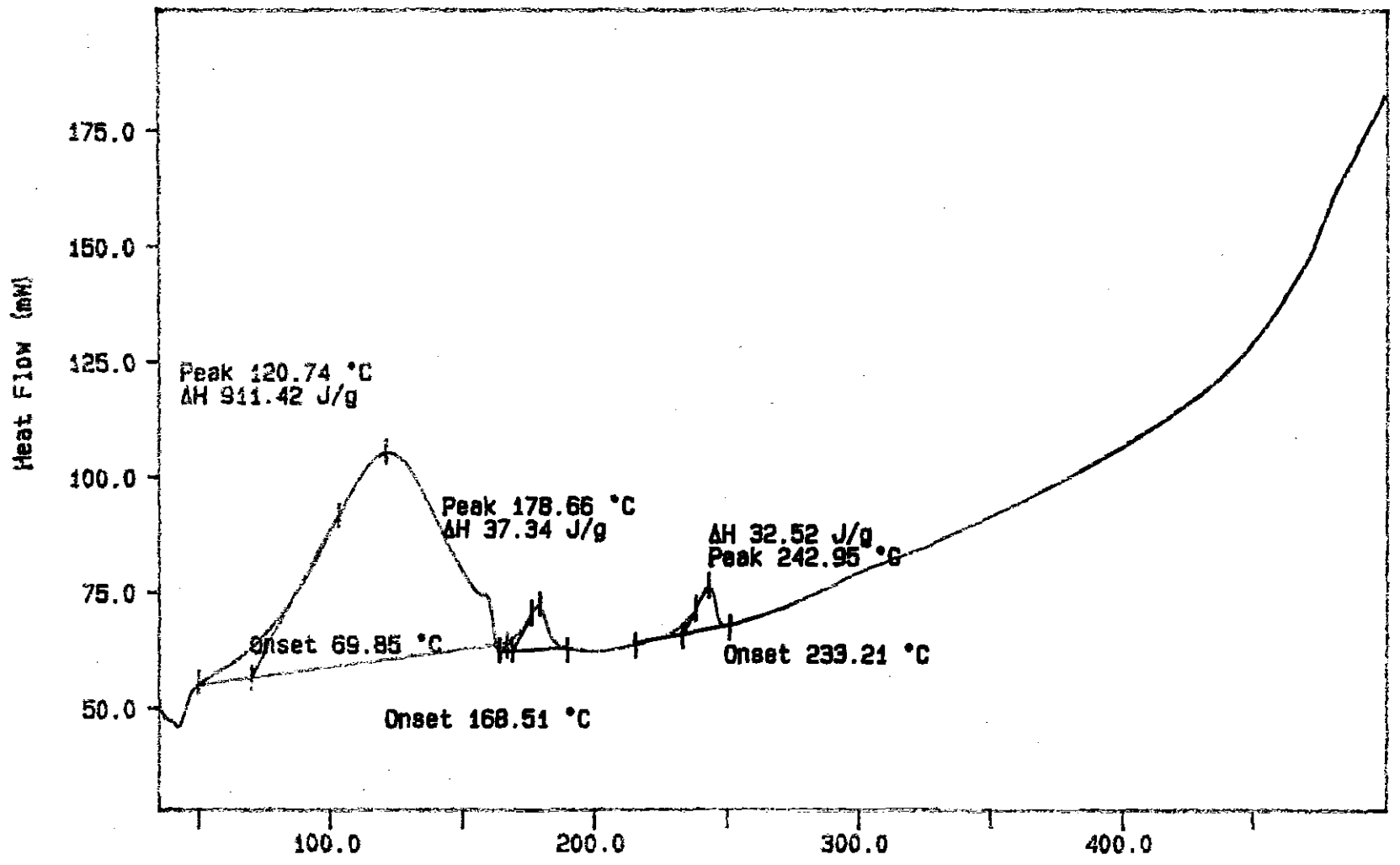


N2 10C/min
TEMP1: 35.0 C TIME1: 0.0 min RATE1: 10.0 C/min
TEMP2: 500.0 C

RW KING
PERKIN-ELMER
7 Series Thermal Analysis System
Fri Aug 6 12:23:05 1999

08/06/99 15:12 FAX 006/008

Curve 1: DSC
File info: SAM080605 Fri Aug 6 13:13:28 1999
Sample Weight: 16.200 mg
S99T001345

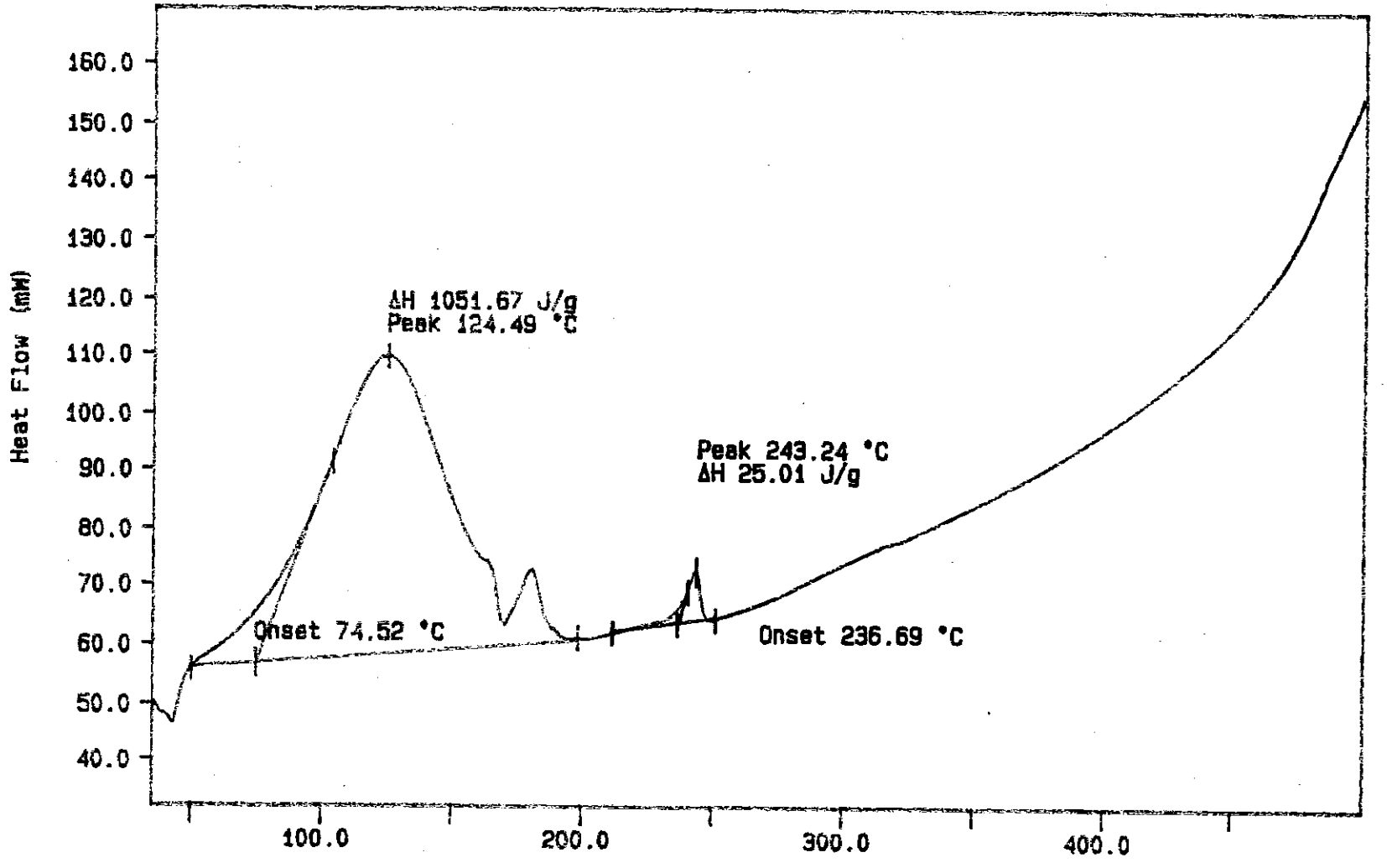


N2 10C/min
TEMP1: 35.0 C TIME1: 0.0 min RATE1: 10.0 C/min
TEMP2: 500.0 C

RW KING
PERKIN-ELMER
7 Series Thermal Analysis System
Fri Aug 6 13:25:51 1999

08/06/99 15:12 FAX 007/008

Curve 1: DSC
File info: SAM080606 Fri Aug 6 14:16:17 1999
Sample Weight: 17.640 mg
S99T0C1345 DUP



N2 10C/min
TEMP1: 35.0 C TIME1: 0.0 min RATE1: 10.0 C/min
TEMP2: 500.0 C

RW KING
PERKIN-ELMER
7 Series Thermal Analysis System
Fri Aug 6 14:28:56 1999

08/06/99 15:12 FAX 008/008

LABCORE Completed Worklist Report for Worklist# 31165

Analyst: mf **Instrument:** DSC0 **Book#:** _____

Method: LA-514-~~113~~ 114 Rev/Mod D-2 11/22/99

Worklist Comment: S 109 FOR DRY DSC02 MF

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
1	SAMPLE	S99T001343	0		DSC-02	LIQUID	N/A	0		Joules/g Dry
2	DUP	S99T001343	0		DSC-02	LIQUID	0	0	0.000	RPD
3	SAMPLE	S99T001344	0		DSC-02	LIQUID	N/A	0		Joules/g Dry
4	DUP	S99T001344	0		DSC-02	LIQUID	0	0	0.000	RPD
5	SAMPLE	S99T001345	0		DSC-02	LIQUID	N/A	0		Joules/g Dry
6	DUP	S99T001345	0		DSC-02	LIQUID	0	0	0.000	RPD

Final page for worklist# 31165

Analyst Signature Date

Mary Thomas 9/20/99
Analyst Signature Date

R J Lumsden 9-20-99
Reviewer Signature Date

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

worklistrpt Version 2.1 05/15/95
08/05/99 13:15

LABCORE Data Entry Template for Worklist# 30669

Analyst: RK **Instrument:** TGA0 3 **Book #** 117NB-A

Method: LA-514-114 Rev/Mod D-2

Worklist Comment: S109 FOR TGA-03 RTS

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	TEST	MATRIX	[illegible]	FOUND	DL	UNIT
		1	STD				TGA-03	LIQUID	59.40	60.360	N/A	%
99000300	S-109 GRAB	2	SAMPLE	S99T001343	0		TGA-03	LIQUID	N/A	52.22		%
99000300	S-109 GRAB	3	DUP	S99T001343	0		TGA-03	LIQUID	52.22	52.55	N/A	%
99000300	S-109 GRAB	4	SAMPLE	S99T001344	0		TGA-03	LIQUID	N/A	53.17		%
99000300	S-109 GRAB	5	DUP	S99T001344	0		TGA-03	LIQUID	53.17	53.16	N/A	%
99000300	S-109 GRAB	6	SAMPLE	S99T001345	0		TGA-03	LIQUID	N/A	53.81		%
99000300	S-109 GRAB	7	DUP	S99T001345	0		TGA-03	LIQUID	53.81	53.73	N/A	%

Final page for worklist # 30669

Analyst Signature Date 8/6/99

Analyst Signature Date 8/9/99

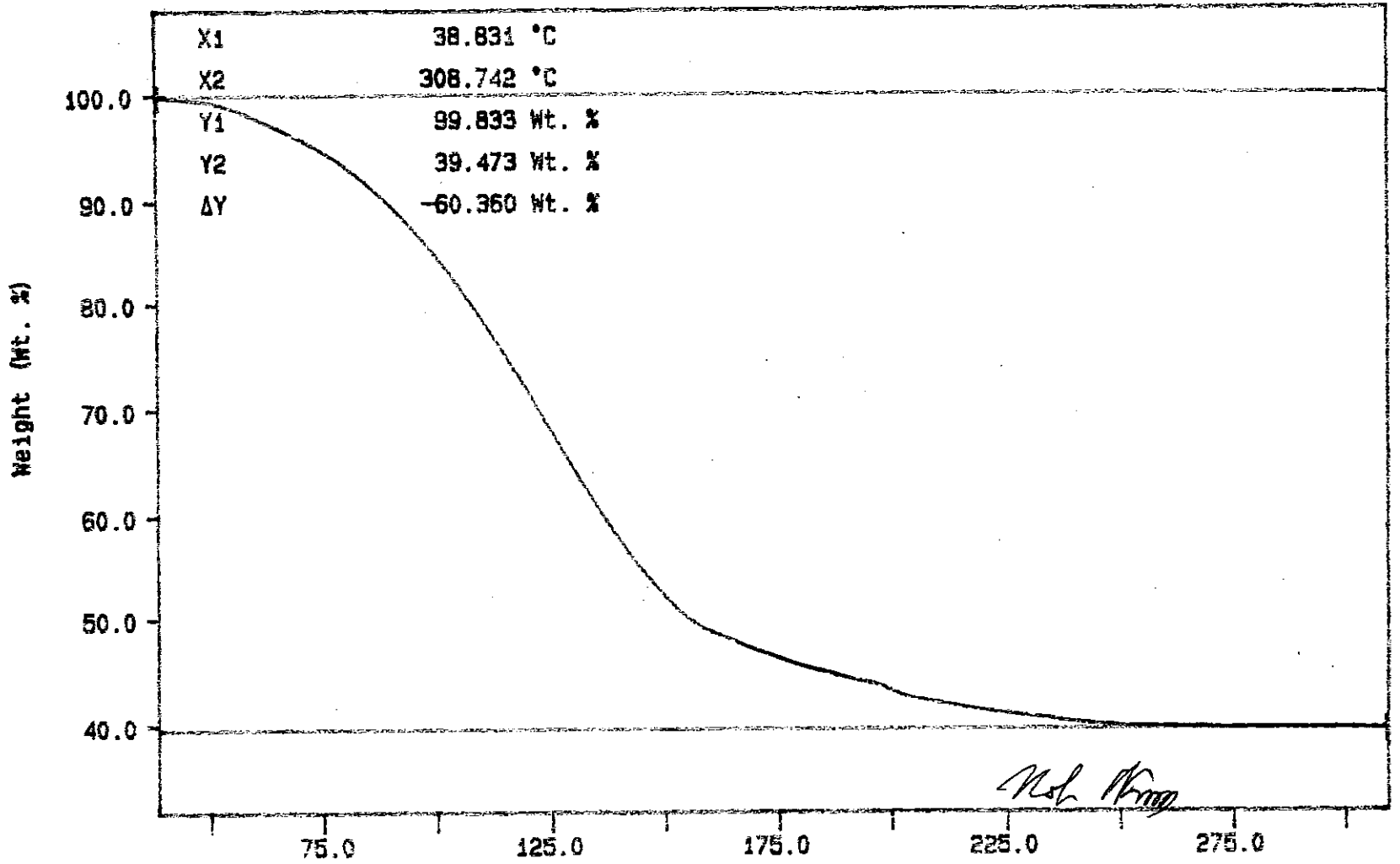
REVIEWER SIGNATURE DATE 8/11/99

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.

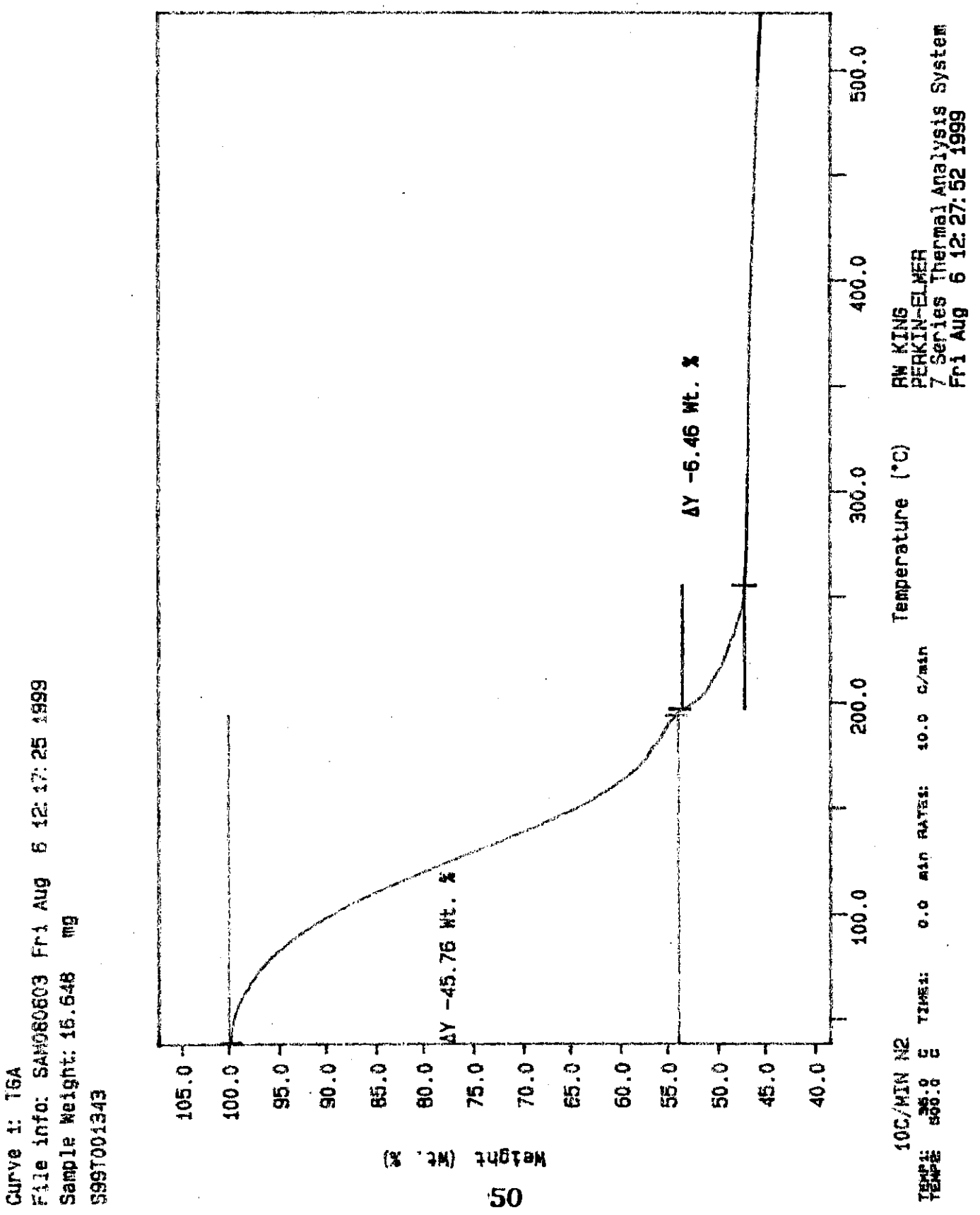
Curve 1: TGA
File info: TER060602 Fri Aug 6 08:39:49 1999
Sample Weight: 15.190 mg
117N8-A

SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 49 TO 55

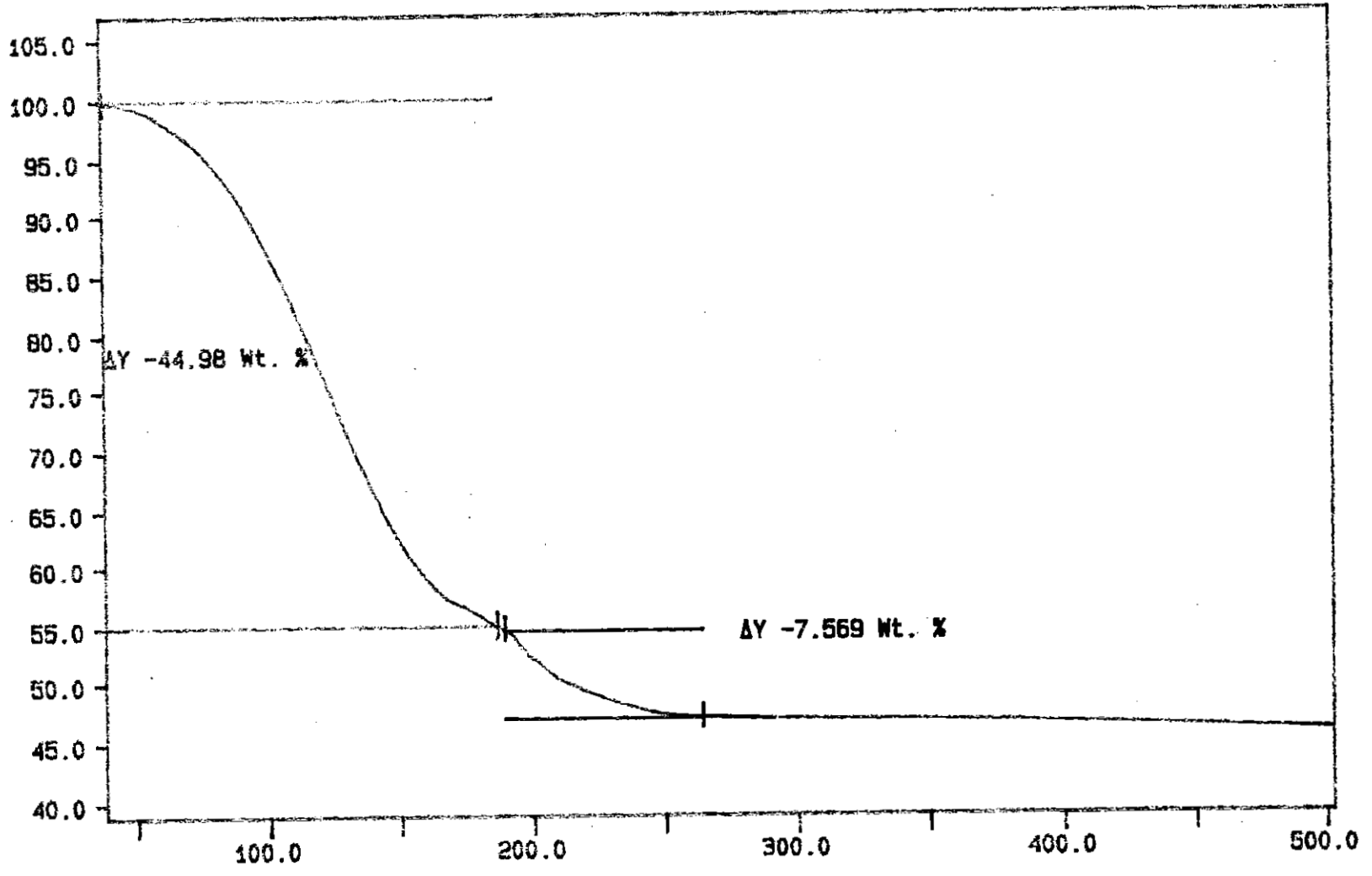


10C/MIN N2
TEMP1: 35.0 C TIME1: 0.0 min RATE1: 10.0 C/min
TEMP2: 300.0 C

RW KING
PERKIN-ELMER
7 Series Thermal Analysis System
Fri Aug 6 08:40:30 1999


Curve 1: TGA
File info: SAM080603 Fri Aug 6 12:17:25 1999
Sample Weight: 16.648 mg
S99T001343
105.0
100.0
95.0
90.0
85.0
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
Weight (Wt. %)
ΔY -45.76 Wt. %
ΔY -6.46 Wt. %
100.0
200.0
300.0
400.0
500.0
Temperature (°C)
10C/MIN N2
TEMP1: 35.0 C TIME1: 0.0 min RATE1: 10.0 C/min
TEMP2: 500.0 C
RW KING
PERKIN-ELMER
7 Series Thermal Analysis System
Fri Aug 6 12:27:52 1999

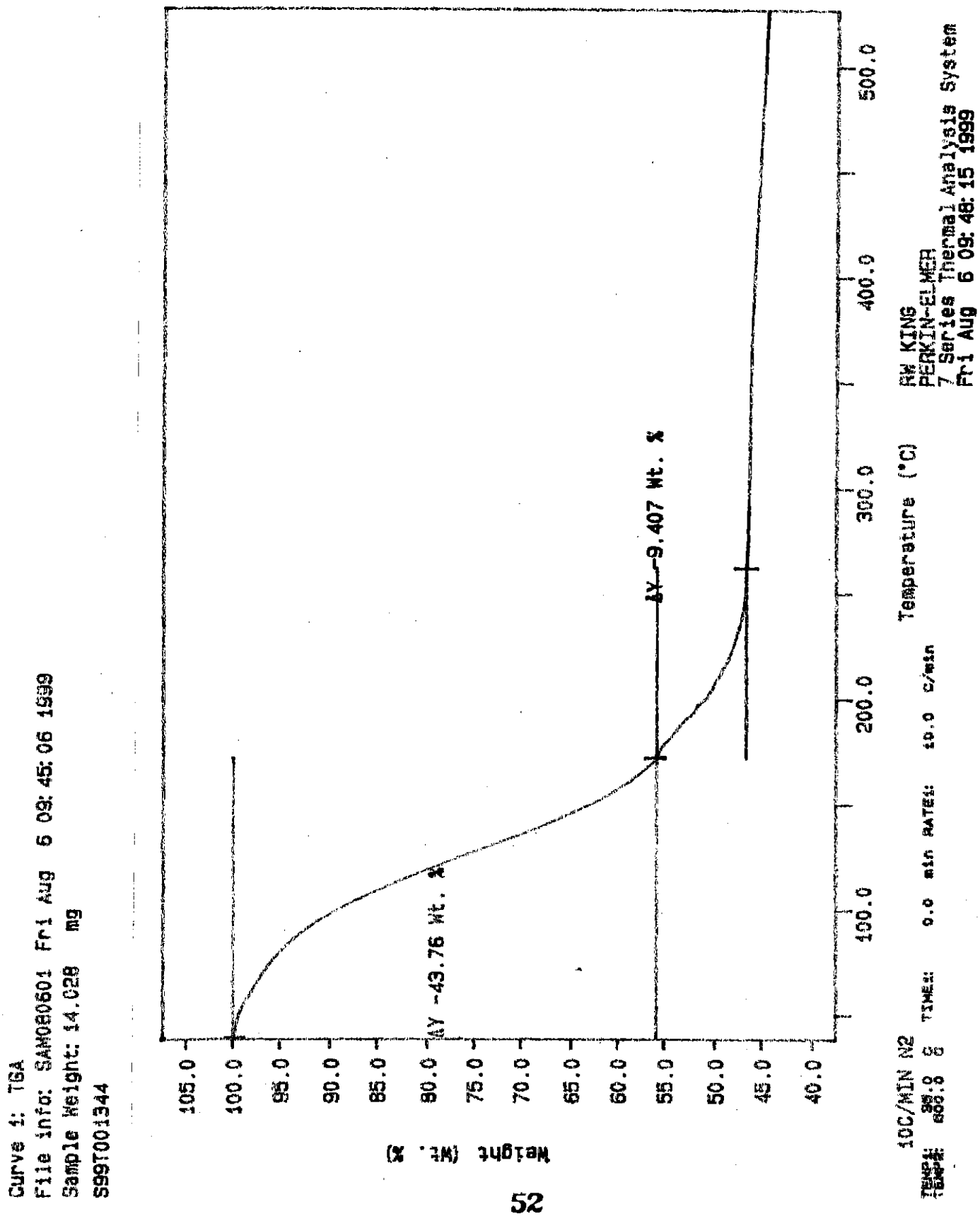
Curve 1: TGA
File info: SAM080604 Fri Aug 6 13:25:02 1999
Sample Weight: 15.128 mg
S99T001343 DUP

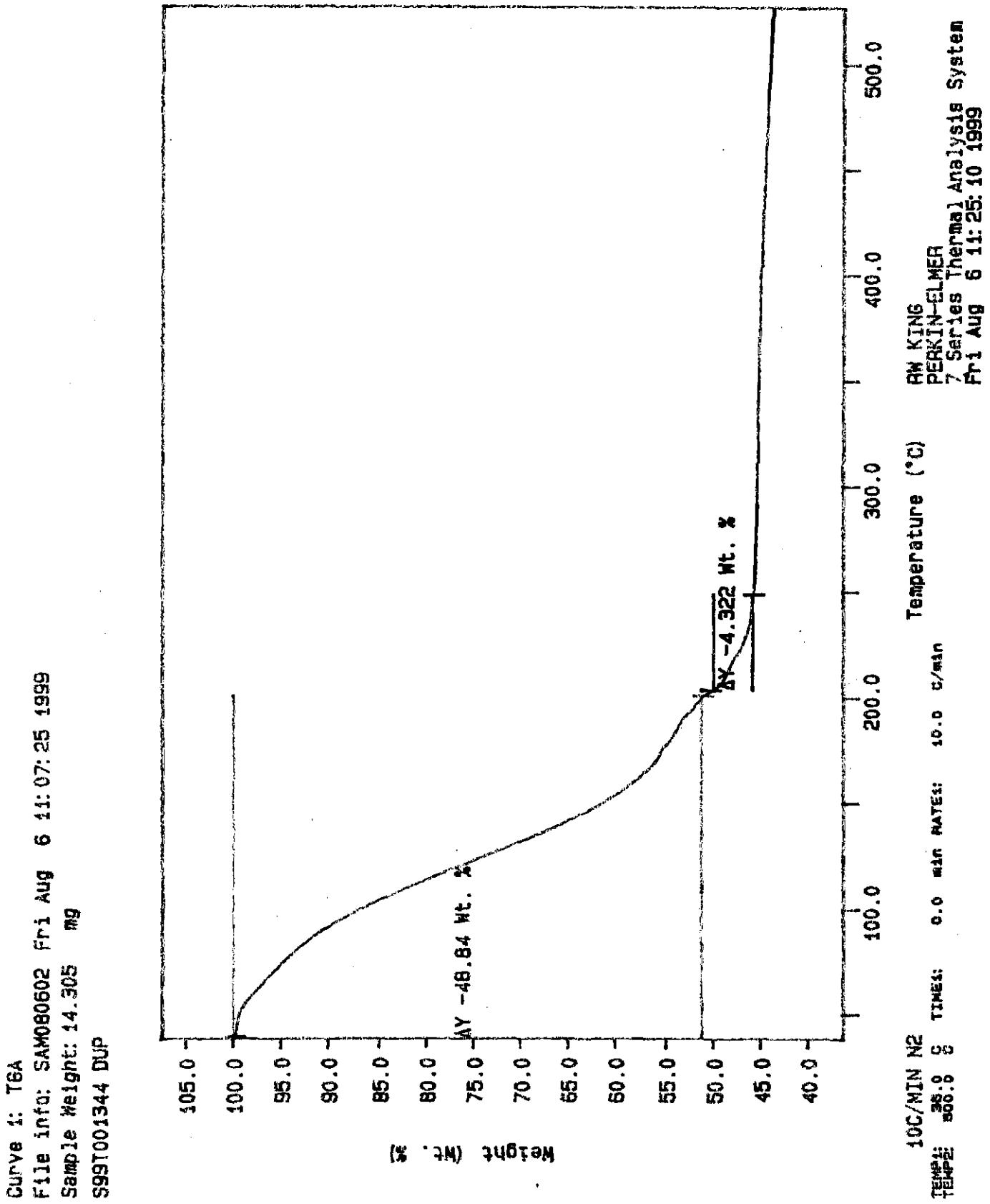


10C/MIN N2
TEMP1: 35.0 C TIME1: 0.0 min RATE1: 10.0 C/min
TEMP2: 500.0 C

RW KING
PERKIN-ELMER
7 Series Thermal Analysis System
Fri Aug 6 13:30:31 1999

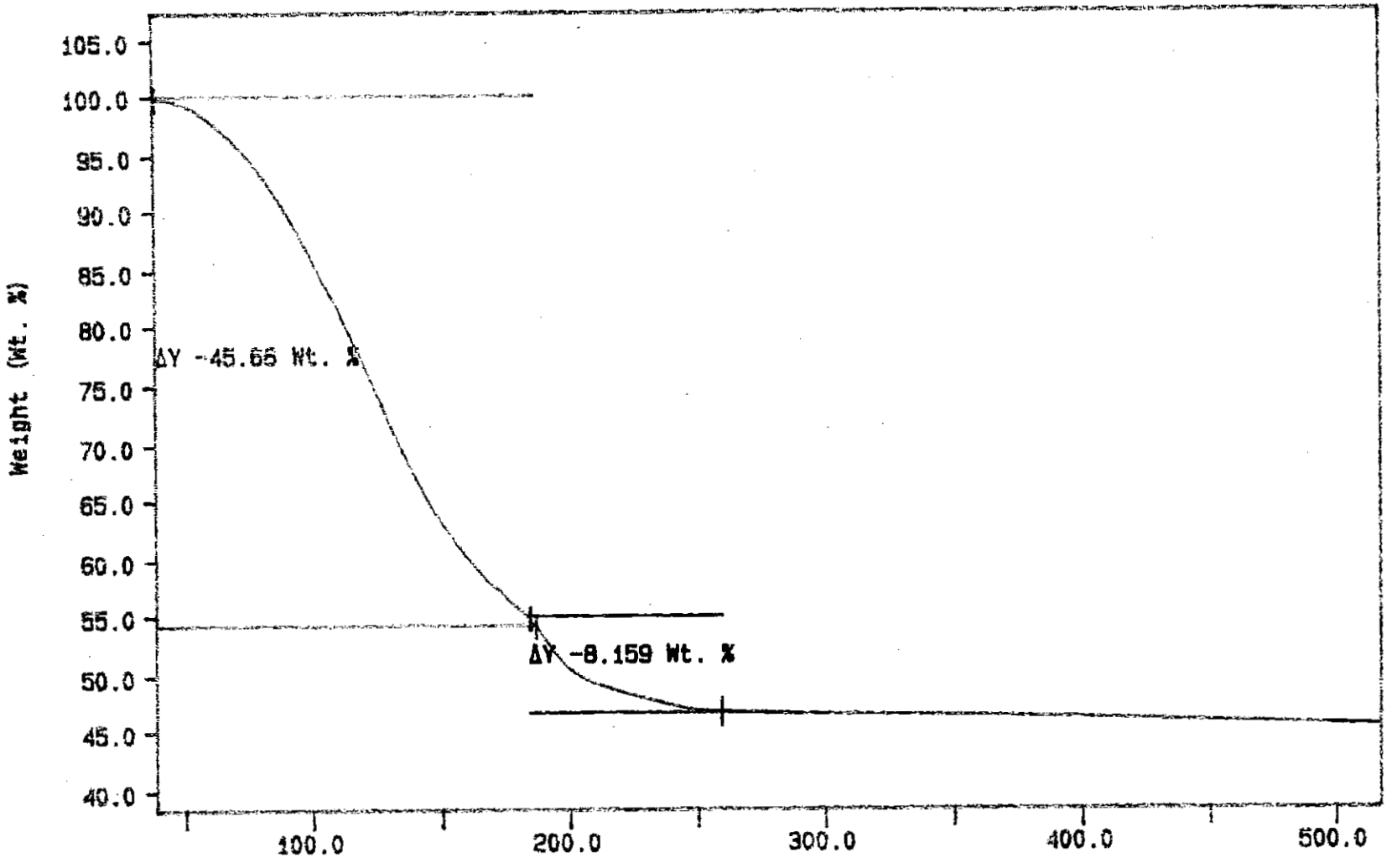
08/06/99 15:46 FAX 004/008


Curve 1: TGA
File info: SAM080601 Fri Aug 6 09:45:06 1999
Sample Weight: 14.028 mg
S99T001344
Weight (Wt. %)
105.0
100.0
95.0
90.0
85.0
80.0
75.0
70.0
65.0
60.0
55.0
50.0
45.0
40.0
ΔY -43.76 Wt. %
ΔY -9.407 Wt. %
100.0
200.0
300.0
400.0
500.0
Temperature (°C)
10C/MIN N2
TEMP: 25.0 C TIME: 0.0 min RATE: 10.0 C/min
TEMP: 600.0 C
RW KING
PERKIN-ELMER
7 Series Thermal Analysis System
Fri Aug 6 09:48:15 1999



800/006
08/06/99 15:46 FAX

Curve 1: TGA
File info: SAM080605 Fri Aug 6 14:29:24 1999
Sample Weight: 14.588 mg
S99T001345

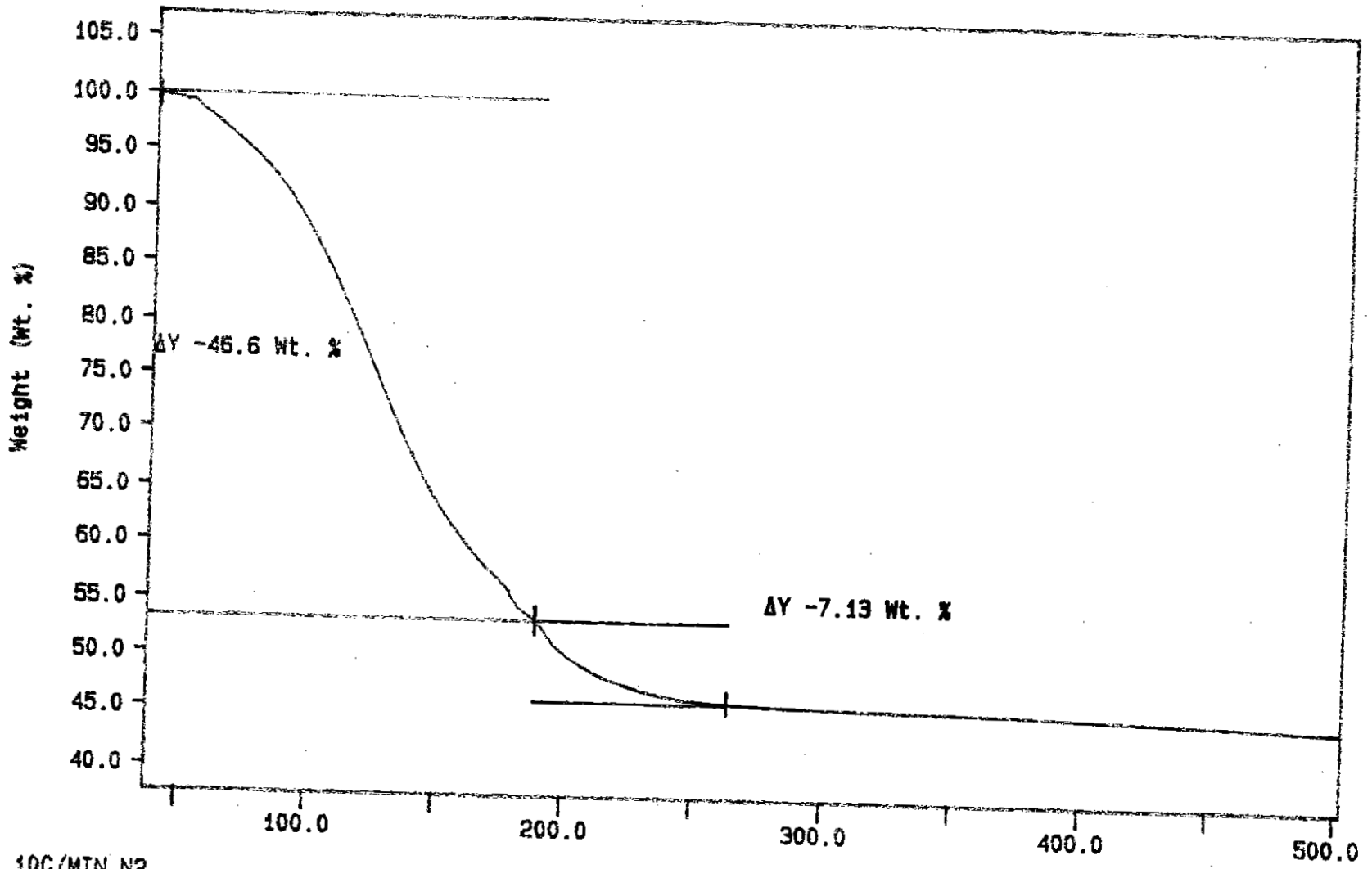


10C/MIN N2
TEMP1: 35.0 C TIME1: 0.0 min RATE1: 10.0 C/min
TEMP2: 500.0 C

RW KING
PERKIN-ELMER
7 Series Thermal Analysis System
Fri Aug 6 14:31:16 1999

08/06/99 15:47 FAX 007/008

Curve 1: TGA
File info: SAM080606 Fri Aug 6 15:39:26 1999
Sample Weight: 15.381 mg
S99T001345 DUP



10C/MIN N2
TEMP1: 35.0 C TIME1: 0.0 min RATE1: 10.0 C/min
TEMP2: 500.0 C

RW KING
PERKIN-ELMER
7 Series Thermal Analysis System
Fri Aug 6 15:39:56 1999

08/06/99 15:47 FAX 008/008

LABCORE Completed Worklist Report for Worklist# 30671

Analyst: rwk **Instrument:** BA001 **Book#:** 134N16C

Method: LA-510-112 Rev/Mod _____

Worklist Comment: S109 FOR SPG-01 RTS

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
1	STD			0	SPG-01	LIQUID	1.3779	1.3700	99.427	% Recovery
2	SAMPLE	S99T001343		0	SPG-01	LIQUID	N/A	1.524	1.00e-003	Sp.G.
3	DUP	S99T001343		0	SPG-01	LIQUID	1.524	1.489	2.323	RPD
4	SAMPLE	S99T001344		0	SPG-01	LIQUID	N/A	1.488	1.00e-003	Sp.G.
5	DUP	S99T001344		0	SPG-01	LIQUID	1.488	1.482	0.404	RPD
6	SAMPLE	S99T001345		0	SPG-01	LIQUID	N/A	1.494	1.00e-003	Sp.G.
7	DUP	S99T001345		0	SPG-01	LIQUID	1.494	1.488	0.402	RPD

Final page for worklist# 30671

Analyst Signature Date

C.J. Jensen 8/9/99
Analyst Signature Date

8/10/99
Reviewer Signature Date

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

HNF-1679 REV. 0

worklistrpt Version 2.1 05/15/95
08/05/99 13:16

LABCORE Data Entry Template for Worklist# 30671

Analyst: NK **Instrument:** BA001 _____ **Book #** 13476-C

Method: LA-510-112 Rev/Mod E-0

Worklist Comment: S109 FOR SPG-01 RTS

GROUP	PROJECT	S TYPE	SAMPLE#	R	A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 STD				SPG-01	LIQUID			N/A	Sp.G.
99000300	S-109 GRAB	2 SAMPLE	S99T001343	0		SPG-01	LIQUID	N/A			Sp.G.
99000300	S-109 GRAB	3 DUP	S99T001343	0		SPG-01	LIQUID			N/A	Sp.G.
99000300	S-109 GRAB	4 SAMPLE	S99T001344	0		SPG-01	LIQUID	N/A			Sp.G.
99000300	S-109 GRAB	5 DUP	S99T001344	0		SPG-01	LIQUID			N/A	Sp.G.
99000300	S-109 GRAB	6 SAMPLE	S99T001345	0		SPG-01	LIQUID	N/A			Sp.G.
99000300	S-109 GRAB	7 DUP	S99T001345	0		SPG-01	LIQUID			N/A	Sp.G.

Final page for worklist # 30671

Mark Wing 8/6/99
Analyst Signature **Date**

C.J. Quinn 8/9/99
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.

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

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

Type
STD
Work List
30671
Test Code
SPG-01
Matrix
LIQUID
Sample #
STD
Instrument Code
BA001
Analyst
RWK
Date
08/06/99
Time
12:00 PM

	STD	REPLICATE
Gross Weight (W2)	1.4531	1.4815
Tare Weight (W1)	1.3170	1.3436
Weight of Solution (W2-W1)	0.1361	0.1379
Volume of Solution µL	100.0000	100.0000
Specific Gravity	1.3610	1.3790
Specific Gravity (Average)	1.3700	

Gross Weight (W2) = Wt. of vial + cap + cotton + solution
Tare Weight (W1) = Wt. of vial + cap + cotton

Specific Gravity = [(W2-W1) * 1000 µL/mL] / [Vol. of Solution µL * 1.000 g/mL]

v RESULT v

Specific Gravity Average =	1.370

Data Entry by:		Date:	08/09/99
Approved by:	NA	Date:	

Form 510112L1 Rev. 1.1

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

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

Type
SAMPLE
Work List
30671
Test Code
SPG-01
Matrix
LIQUID
Sample #
S99T001343
Instrument Code
BA001
Analyst
RWK
Date
08/06/99
Time
12:00 PM

	SAMPLE	REPLICATE
Gross Weight (W2)	1.4936	0.0000
Tare Weight (W1)	1.3412	0.0000
Weight of Solution (W2-W1)	0.1524	0
Volume of Solution µL	100.0000	0.0000
Specific Gravity	1.5240	NA

Gross Weight (W2) = Wt. of vial + cap + cotton + solution
Tare Weight (W1) = Wt. of vial + cap + cotton

Specific Gravity = [(W2-W1) * 1000 µL/mL] / [Vol. of Solution µL • 1.000 g/mL]

v RESULT v

Specific Gravity =	1.524

Data Entry by:		Date:	08/09/99
Approved by:	NA	Date:	

Form 510112L1 Rev. 1.1

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

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

Type		DUP	REPLICATE
DUP	Gross Weight (W2)	1.4655	0.0000
Work List	Tare Weight (W1)	1.3166	0.0000
30671	Weight of Solution (W2-W1)	0.1489	0
Test Code	Volume of Solution µL	100.0000	0.0000
SPG-01	Specific Gravity	1.4890	NA
Matrix			
LIQUID			
Sample #			
S99T001343			
Instrument Code	Gross Weight (W2) = Wt. of vial + cap + cotton + solution		
BA001	Tare Weight (W1) = Wt. of vial + cap + cotton		
Analyst			
RWK	Specific Gravity = [(W2-W1) * 1000 µL/mL] / [Vol. of Solution µL * 1.000 g/mL]		
Date			
08/06/99	v RESULT v		
Time	Specific Gravity =	1.489	
12:00 PM			

Data Entry by:		Date:	08/09/99
Approved by:	NA	Date:	

Form 510112L1 Rev. 1.1

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

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

Type
SAMPLE
Work List
30671
Test Code
SPG-01
Matrix
LIQUID
Sample #
S99T001344
Instrument Code
BA001
Analyst
RWK
Date
08/06/99
Time
12:00 PM

	SAMPLE	REPLICATE
Gross Weight (W2)	1.4629	0.0000
Tare Weight (W1)	1.3141	0.0000
Weight of Solution (W2-W1)	0.1488	0
Volume of Solution µL	100.0000	0.0000
Specific Gravity	1.4880	NA

Gross Weight (W2) = Wt. of vial + cap + cotton + solution

Tare Weight (W1) = Wt. of vial + cap + cotton

Specific Gravity = [(W2-W1) * 1000 µL/mL] / [Vol. of Solution µL * 1.000 g/mL]

v RESULT v

Specific Gravity = 1.488

Data Entry by:		Date:	08/09/99
Approved by:	NA	Date:	

Form 510112L1 Rev. 1.1

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

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

Type		DUP	REPLICATE
DUP	Gross Weight (W2)	1.5054	0.0000
Work List	Tare Weight (W1)	1.3572	0.0000
30671	Weight of Solution (W2-W1)	0.1482	0
Test Code	Volume of Solution µL	100.0000	0.0000
SPG-01	Specific Gravity	1.4820	NA
Matrix			
LIQUID			
Sample #			
S99T001344			
Instrument Code	Gross Weight (W2) = Wt. of vial + cap + cotton + solution		
BA001	Tare Weight (W1) = Wt. of vial + cap + cotton		
Analyst			
RWK	Specific Gravity = [(W2-W1) * 1000 µL/mL] / [Vol. of Solution µL * 1.000 g/mL]		
Date			
08/06/99	v RESULT v		
Time	Specific Gravity =	1.482	
12:00 PM			

Data Entry by:		Date:	08/09/99
Approved by:	NA	Date:	

Form 510112L1 Rev. 1.1

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

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

Type		SAMPLE	REPLICATE
SAMPLE	Gross Weight (W2)	1.4930	0.0000
Work List	Tare Weight (W1)	1.3436	0.0000
30671	Weight of Solution (W2-W1)	0.1494	0
Test Code	Volume of Solution µL	100.0000	0.0000
SPG-01	Specific Gravity	1.4940	NA
Matrix			
LIQUID			
Sample #			
S99T001345			
Instrument Code	Gross Weight (W2) = Wt. of vial + cap + cotton + solution		
BA001	Tare Weight (W1) = Wt. of vial + cap + cotton		
Analyst			
RWK	Specific Gravity = [(W2-W1) * 1000 µL/mL] / [Vol. of Solution µL * 1.000 g/mL]		
Date			
08/06/99	v RESULT v		
Time	Specific Gravity =	1.494	
12:00 PM			

Data Entry by:		Date:	08/09/99
Approved by:	NA	Date:	

Form 510112L1 Rev. 1.1

Page 1 of 1

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

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

Type
DUP
Work List
30671
Test Code
SPG-01
Matrix
LIQUID
Sample #
S99T001345
Instrument Code
BA001
Analyst
RWK
Date
08/06/99
Time
12:00 PM

	DUP	REPLICATE
Gross Weight (W2)	1.5058	0.0000
Tare Weight (W1)	1.3570	0.0000
Weight of Solution (W2-W1)	0.1488	0
Volume of Solution µL	100.0000	0.0000
Specific Gravity	1.4880	NA

Gross Weight (W2) = Wt. of vial + cap + cotton + solution
Tare Weight (W1) = Wt. of vial + cap + cotton

Specific Gravity = [(W2-W1) * 1000 µL/mL] / [Vol. of Solution µL * 1.000 g/mL]

v RESULT v

Specific Gravity =	1.488

Data Entry by:		Date:	08/09/99
Approved by:	NA	Date:	

Form 510112L1 Rev. 1.1

worklistrpt Version 2.1 05/15/95
08/05/99 13:17

LABCORE Data Entry Template for Worklist# 30674

Analyst: JdS **Instrument:** PH01 **Book #** 18N96

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

Worklist Comment: S109 FOR PH-01 RTS

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1	STDPH				PH-01	LIQUID	8.00	8.01	N/A	pH
99000300	S-109 GRAB	2	SAMPLE	S99T001343	0		PH-01	LIQUID	N/A	13.08		pH
99000300	S-109 GRAB	3	DUP	S99T001343	0		PH-01	LIQUID	13.08	13.06	N/A	pH
99000300	S-109 GRAB	4	SAMPLE	S99T001344	0		PH-01	LIQUID	N/A	12.97		pH
99000300	S-109 GRAB	5	DUP	S99T001344	0		PH-01	LIQUID	12.97	12.97	N/A	pH
99000300	S-109 GRAB	6	SAMPLE	S99T001345	0		PH-01	LIQUID	N/A	12.98		pH
99000300	S-109 GRAB	7	DUP	S99T001345	0		PH-01	LIQUID	12.98	12.97	N/A	pH

Final page for worklist # 30674

8/7/99
Analyst Signature **Date**

8/9/99
Analyst Signature **Date**

8/10/99
REVIEWER 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-1679 REV. 0

LABCORE Completed Worklist Report for Worklist# 30673

Analyst: jds **Instrument:** PH01 **Book#:** 33N15A

Method: LA-211-102 Rev/Mod _____

Worklist Comment: S109 FOR OH-01 RTS

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
1	STD			0	OH-01	LIQUID	1.56e4	1.57e+4	100.641	% Recovery
2	SAMPLE	S99T001343		0	OH-01	LIQUID	N/A	8.57e+4	5000.000	ug/mL
3	DUP	S99T001343		0	OH-01	LIQUID	8.57e+4	8.73e+4	1.850	RPD
4	SAMPLE	S99T001344		0	OH-01	LIQUID	N/A	8.96e+4	5000.000	ug/mL
5	DUP	S99T001344		0	OH-01	LIQUID	8.96e+4	8.74e+4	2.486	RPD
6	SAMPLE	S99T001345		0	OH-01	LIQUID	N/A	7.15e+4	5000.000	ug/mL
7	DUP	S99T001345		0	OH-01	LIQUID	7.15e+4	6.98e+4	2.406	RPD

Final page for worklist# 30673

Analyst Signature Date

C.J. Quinn 8/9/99
Analyst Signature Date

8/10/99
Reviewer Signature Date

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

LABCORE Data Entry Template for Worklist# 30673

Analyst: JdS **Instrument:** PH01 _____ **Book#** 33N 15A

Method: LA-211-102 Rev/Mod D-1

Worklist Comment: S109 FOR OH-01 RTS

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				OH-01	LIQUID		
2	SAMPLE	S99T001343	0		OH-01	LIQUID	99000300	S-109 GRAB
		Analytes Requested: OH-01						
3	DUP	S99T001343	0		OH-01	LIQUID		
4	SAMPLE	S99T001344	0		OH-01	LIQUID	99000300	S-109 GRAB
		Analytes Requested: OH-01						
5	DUP	S99T001344	0		OH-01	LIQUID		
6	SAMPLE	S99T001345	0		OH-01	LIQUID	99000300	S-109 GRAB
		Analytes Requested: OH-01						
7	DUP	S99T001345	0		OH-01	LIQUID		

Final page for worklist # 30673

8/8/99
Signature **Date**

C.J. Opinen 8/9/99
Signature **Date**

Data Entry Comments:

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

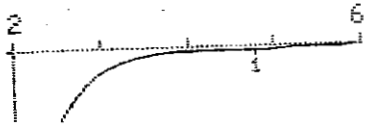
BLK
.025

date 99-08-07 time 19:38
GET pH 12 # 4
Id.#1 893-2
Id.#2 .1981
pH(init) 5.92

	V/ml	pH
EP1	.006	4.79

stop volt.reached
========

date 99-08-07 time 19:38
GET pH 12 # 4
.10ml/div ΔpH=1/div
start V .000 ml



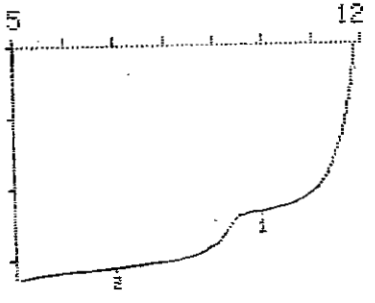
STD
.050

date 99-08-07 time 19:44
GET pH 12 # 5
Id.#1 893-2
Id.#2 .1981
pH(init) 11.85

	V/ml	pH
EP1	.233	9.97
EP2	.310	7.00

stop volt.reached
========

date 99-08-07 time 19:45
GET pH 12 # 5
.10ml/div ΔpH=1/div
start V .000 ml



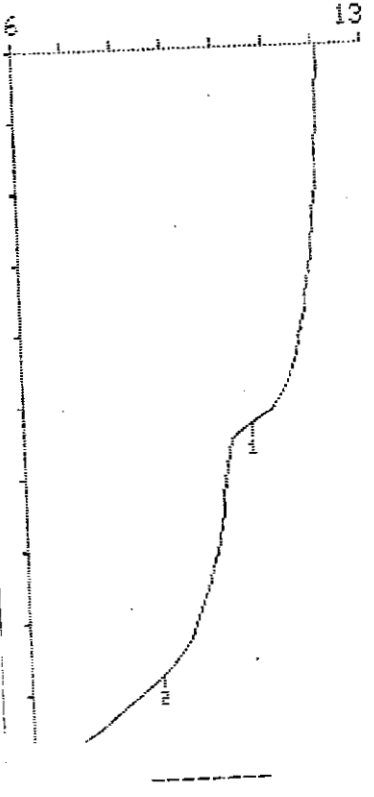
1345

date 99-08-08 time 02:25
GET pH 12 # 11
Id.#1 893-2
Id.#2 .1981
pH(init) 12.07

	V/ml	pH
EP1	.531	10.53
EP2	.876	8.65

stop volt.reached
========

date 99-08-08 time 02:26
GET pH 12 # 11
.10ml/div ΔpH=1/div
start V .000 ml



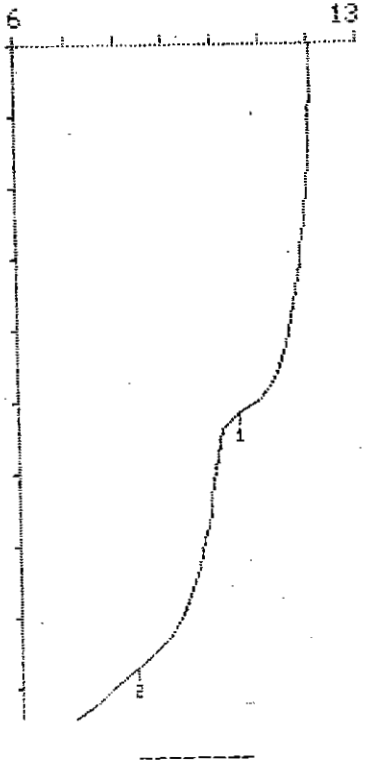
1345 Dup

date 99-08-08 time 02:33
GET pH 12 # 12
Id.#1 893-2
Id.#2 .1981
pH(init) 12.04

	V/ml	pH
EP1	.518	10.51
EP2	.870	8.37

stop volt.reached
========

date 99-08-08 time 02:33
GET pH 12 # 12
.10ml/div ΔpH=1/div
start V .000 ml



.025

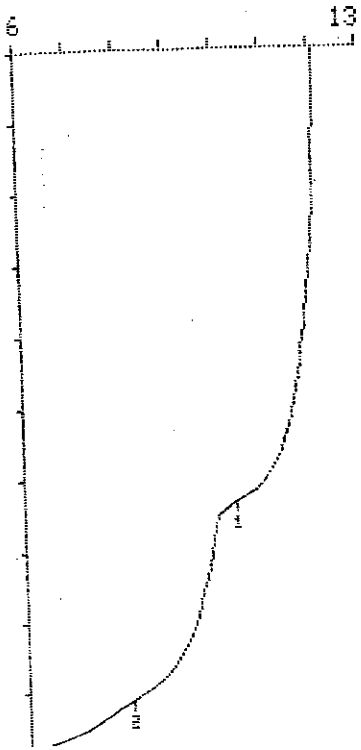
1343

date 99-08-07 time 20:45
GET pH 12 # 7
Id.#1 893-2
Id.#2 .1981
pH(init) 12.07

	V/ml	pH
EP1	.636	10.38
EP2	.914	8.21

manual stop
========

date 99-08-07 time 20:45
GET pH 12 # 7
.10ml/div ΔpH=1/div
start V .000 ml



.025

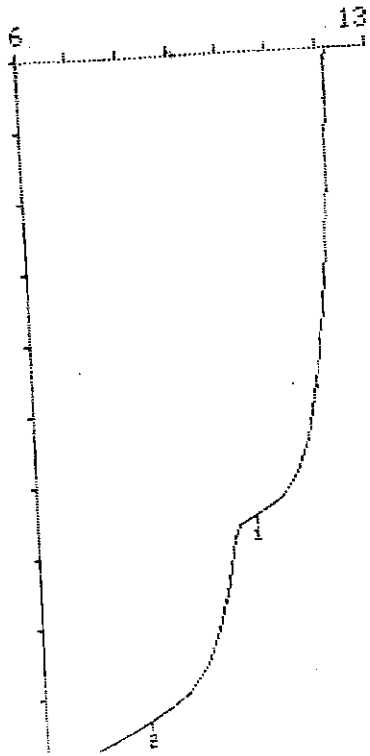
1343 Dup

date 99-08-07 time 20:54
GET pH 12 # 8
Id.#1 893-2
Id.#2 .1981
pH(init) 12.17

	V/ml	pH
EP1	.648	10.40
EP2	.938	8.10

stop volt.reached
========

date 99-08-07 time 20:58
GET pH 12 # 8
.10ml/div ΔpH=1/div
start V .000 ml



.025

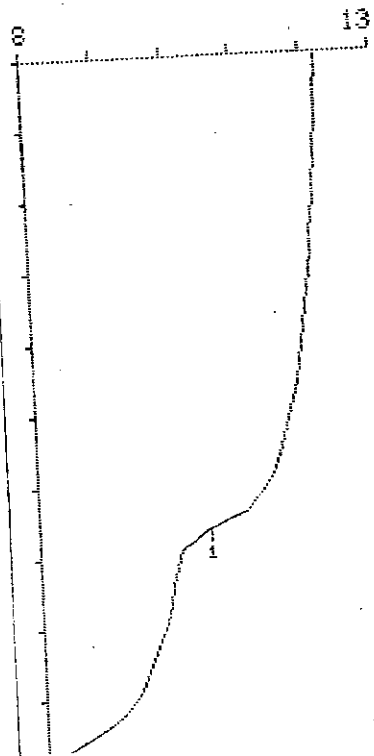
1344

date 99-08-08 time 02:06
GET pH 12 # 9
Id.#1 893-2
Id.#2 .1981
pH(init) 12.19

	V/ml	pH
EP1	.665	10.45

manual stop
========

date 99-08-08 time 02:08
GET pH 12 # 9
.10ml/div ΔpH=1/div
start V .000 ml



.025

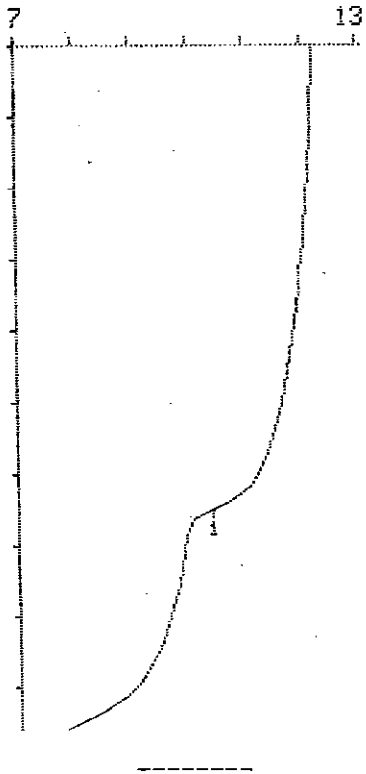
1344 Dup

date 99-08-08 time 02:15
GET pH 12 # 10
Id.#1 893-2
Id.#2 .1981
pH(init) 12.22

	V/ml	pH
EP1	.649	10.44

manual stop
========

date 99-08-08 time 02:15
GET pH 12 # 10
.10ml/div ΔpH=1/div
start V .000 ml



OH (AUTO) : LA-211-102 (D-1)

		STANDARD
Type	Sample Size (mL) SS	0.050
STANDARD	Concentration of Titrant (Molarity)	0.1981
Work List	Titrant volume at end-point in mL	0.233
30673	*** Enter Dilution Factor (DF) or 1 ***	1
Test Code		
OH-01	Concentration of Sample (MOLARITY)	9.23E-01
Matrix	Concentration of Sample in PPM	1.57E+04
LIQUID		
Sample #		
STD	Detection Limit =(125µg/SS)*DF	
Instrument Code		
PH01		2.50E+03
Analyst		
JDS	OH Molarity =((mL HNO3)*(M HNO3))/Sample Size in mL)*Dilution Factor	
Date		
08/08/99	OH in µg/mL = (OH MOLARITY)*(17.0g/mole)*(1000000µg/g)/(1000mL/L)	
Time		
02:20 AM		STANDARD
	Concentration of Sample (MOLARITY)	9.23E-01
	Concentration of Sample in PPM	1.57E+04

OH (AUTO) : LA-211-102 (D-1)

		BLANK
Type	Sample Size (mL) SS	0.025
BLANK	Concentration of Titrant (Molarity)	0.1981
Work List	Titrant volume at end-point in mL	0.006
30673	*** Enter Dilution Factor (DF) or 1 ***	1
Test Code		
OH-01	Concentration of Sample (MOLARITY)	4.75E-02
Matrix	Concentration of Sample in PPM	8.08E+02
LIQUID		
Sample #		
BLANK	Detection Limit =(125µg/SS)*DF	
Instrument Code		
PH01	Detection Limit (PPM)	5.00E+03
Analyst		
JDS	OH Molarity =((mL HNO3)*(M HNO3))/Sample Size in mL)*Dilution Factor	
Date		
08/08/99	OH in µg/mL = (OH MOLARITY)*(17.0g/mole)*(1000000µg/g)/(1000mL/L)	
Time		
02:20 AM		BLANK
	Concentration of Sample (MOLARITY)	4.75E-02
	Concentration of Sample in PPM	<5000

The Result is < Detection Limit

OH (AUTO) : LA-211-102 (D-1)

		SAMPLE
Type	Sample Size (mL) SS	0.025
SAMPLE	Concentration of Titrant (Molarity)	0.1981
Work List	Titrant volume at end-point in mL	0.636
30673	*** Enter Dilution Factor (DF) or 1 ***	1
Test Code		
OH-01	Concentration of Sample (MOLARITY)	5.04E+00
Matrix	Concentration of Sample in PPM	8.57E+04
LIQUID		
Sample #		
S99T001343	Detection Limit =(125µg/SS)*DF	
Instrument Code		
PH01	Detection Limit (PPM)	5.00E+03
Analyst		
JDS	OH Molarity =((mL HNO3)*(M HNO3))/Sample Size in mL)*Dilution Factor	
Date		
08/08/99	OH in µg/mL = (OH MOLARITY)*(17.0g/mole)*(1000000µg/g)/(1000mL/L)	
Time		
02:20 AM		SAMPLE
	Concentration of Sample (MOLARITY)	5.04E+00
	Concentration of Sample in PPM	8.57E+04

OH (AUTO) : LA-211-102 (D-1)

		DUP
Type	Sample Size (mL) SS	0.025
DUP	Concentration of Titrant (Molarity)	0.1981
Work List	Titrant volume at end-point in mL	0.648
30673	*** Enter Dilution Factor (DF) or 1 ***	1
Test Code		
OH-01	Concentration of Sample (MOLARITY)	5.13E+00
Matrix	Concentration of Sample in PPM	8.73E+04
LIQUID		
Sample #		
S99T001343	Detection Limit =(125µg/SS)*DF	
Instrument Code		
PH01	Detection Limit (PPM)	5.00E+03
Analyst		
JDS	OH Molarity =((mL HNO3)*(M HNO3))/Sample Size in mL)*Dilution Factor	
Date		
08/08/99	OH in µg/mL = (OH MOLARITY)*(17.0g/mole)*(1000000µg/g)/(1000mL/L)	
Time		
02:20 AM		DUP
	Concentration of Sample (MOLARITY)	5.13E+00
	Concentration of Sample in PPM	8.73E+04

OH (AUTO) : LA-211-102 (D-1)

		SAMPLE
Type	Sample Size (mL) SS	0.025
SAMPLE	Concentration of Titrant (Molarity)	0.1981
Work List	Titrant volume at end-point in mL	0.665
30673	*** Enter Dilution Factor (DF) or 1 ***	1
Test Code		
OH-01	Concentration of Sample (MOLARITY)	5.27E+00
Matrix	Concentration of Sample in PPM	8.96E+04
LIQUID		
Sample #		
S99T001344	Detection Limit =(125µg/SS)*DF	
Instrument Code		
PH01	Detection Limit (PPM)	5.00E+03
Analyst		
JDS	OH Molarity =((mL HNO3)*(M HNO3))/Sample Size in mL)*Dilution Factor	
Date		
08/08/99	OH in µg/mL = (OH MOLARITY)*(17.0g/mole)*(1000000µg/g)/(1000mL/L)	
Time		
02:20 AM		SAMPLE
	Concentration of Sample (MOLARITY)	5.27E+00
	Concentration of Sample in PPM	8.96E+04

OH (AUTO) : LA-211-102 (D-1)

		DUP
Type	Sample Size (mL) SS	0.025
DUP	Concentration of Titrant (Molarity)	0.1981
Work List	Titrant volume at end-point in mL	0.649
30673	*** Enter Dilution Factor (DF) or 1 ***	1
Test Code		
OH-01	Concentration of Sample (MOLARITY)	5.14E+00
Matrix	Concentration of Sample in PPM	8.74E+04
LIQUID		
Sample #		
S99T001344	Detection Limit =(125µg/SS)*DF	
Instrument Code		
PH01	Detection Limit (PPM)	5.00E+03
Analyst		
JDS	OH Molarity =((mL HNO3)*(M HNO3))/Sample Size in mL)*Dilution Factor	
Date		
08/08/99	OH in µg/mL = (OH MOLARITY)*(17.0g/mole)*(1000000µg/g)/(1000mL/L)	
Time		
02:20 AM		DUP
	Concentration of Sample (MOLARITY)	5.14E+00
	Concentration of Sample in PPM	8.74E+04

OH (AUTO) : LA-211-102 (D-1)

		SAMPLE
Type	Sample Size (mL) SS	0.025
SAMPLE	Concentration of Titrant (Molarity)	0.1981
Work List	Titrant volume at end-point in mL	0.531
30673	*** Enter Dilution Factor (DF) or 1 ***	1
Test Code		
OH-01	Concentration of Sample (MOLARITY)	4.21E+00
Matrix	Concentration of Sample in PPM	7.15E+04
LIQUID		
Sample #		
S99T001345	Detection Limit =(125µg/SS)*DF	
Instrument Code		
PH01	Detection Limit (PPM)	5.00E+03
Analyst		
JDS	OH Molarity =((mL HNO3)*(M HNO3))/Sample Size in mL)*Dilution Factor	
Date		
08/08/99	OH in µg/mL = (OH MOLARITY)*(17.0g/mole)*(1000000µg/g)/(1000mL/L)	
Time		
02:20 AM		SAMPLE
	Concentration of Sample (MOLARITY)	4.21E+00
	Concentration of Sample in PPM	7.15E+04

OH (AUTO) : LA-211-102 (D-1)

		DUP
Type	Sample Size (mL) SS	0.025
DUP	Concentration of Titrant (Molarity)	0.1981
Work List	Titrant volume at end-point in mL	0.518
30673	*** Enter Dilution Factor (DF) or 1 ***	1
Test Code		
OH-01	Concentration of Sample (MOLARITY)	4.10E+00
Matrix	Concentration of Sample in PPM	6.98E+04
LIQUID		
Sample #		
S99T001345	Detection Limit =(125µg/SS)*DF	
Instrument Code		
PH01	Detection Limit (PPM)	5.00E+03
Analyst		
JDS	OH Molarity =((mL HNO3)*(M HNO3))/Sample Size in mL)*Dilution Factor	
Date		
08/08/99	OH in µg/mL = (OH MOLARITY)*(17.0g/mole)*(1000000µg/g)/(1000mL/L)	
Time		
02:20 AM		DUP
	Concentration of Sample (MOLARITY)	4.10E+00
	Concentration of Sample in PPM	6.98E+04

LABCORE Completed Worklist Report for Worklist# 30672

Analyst: rwk **Instrument:** NH301 **Book#** _____

Method: _____ Rev/Mod _____

Worklist Comment: S109 FOR NH3-01 RTS

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
1	BLNK			0	NH3-01	LIQUID	1	<5.00E+1		ug/mL
2	STD			0	NH3-01	LIQUID	4.52E+02	4.36E+2	96.460	% Recovery
3	~~SAMPLE~~	~~S99T001346~~		~~0~~	~~NH3-01~~	~~LIQUID~~	~~N/A~~	~~3.17E+02~~	~~50.000~~	~~ug/mL~~
4	~~DUP~~	~~S99T001346~~		~~0~~	~~NH3-01~~	~~LIQUID~~	~~3.17E+2~~	~~2.98E+2~~	~~6.179~~	~~RPD~~
5	SAMPLE	S99T001347		0	NH3-01	LIQUID	N/A	1.62E+02	50.000	ug/mL
6	DUP	S99T001347		0	NH3-01	LIQUID	1.62E+2	1.42E+2	13.158	RPD
7	SAMPLE	S99T001348		0	NH3-01	LIQUID	N/A	3.95E+02	100.000	ug/mL
8	DUP	S99T001348		0	NH3-01	LIQUID	3.95E+2	3.34E+2	16.735	RPD
9	STD			0	NH3-01	LIQUID	4.52E+02	4.31E+2	95.354	% Recovery

11/15/99

Final page for worklist# 30672

Mary Isaac 8/9/99
Signature Date

REVIEWER SIGNATURE 8/10/99
DATE

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

LABCORE Data Entry Template for Worklist# 30672

Analyst: NK **Instrument:** NH301 _____ **Book#** 59119-C

Method: LA-631-001 Rev/Mod D-0

Worklist Comment: S109 FOR NH3-01 RTS

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	BLNK				NH3-01	LIQUID		
2	STD				NH3-01	LIQUID		
~~3~~	~~SAMPLE~~	~~S99T001346~~	~~0~~		~~NH3-01~~	~~LIQUID~~	~~99000300~~	~~S-109 GRAB~~
		Analytes Requested: NH3-01						
~~4~~	~~DUP~~	~~S99T001346~~	~~0~~		~~NH3-01~~	~~LIQUID~~		
5	SAMPLE	S99T001347	0		NH3-01	LIQUID	99000300	S-109 GRAB
		Analytes Requested: NH3-01						
6	DUP	S99T001347	0		NH3-01	LIQUID		
7	SAMPLE	S99T001348	0		NH3-01	LIQUID	99000300	S-109 GRAB
		Analytes Requested: NH3-01						
8	DUP	S99T001348	0		NH3-01	LIQUID		
9	STD				NH3-01	LIQUID		

11/15/99

Final page for worklist # 30672

Signature Date 8/7/99

Signature Date 8/9/99

Data Entry Comments:

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

DOUBLE KNOWN ADDITION SELECTED
AT 07:34, 08-07-99

SAMPLE VOL= 25.000 AT 07:47, 08-07-99
ENTERED

EMF=-60.0 mV AT 07:50, 08-07-99

EMF=-60.4 mV AT 07:50, 08-07-99

EMF=-60.5 mV AT 07:50, 08-07-99
ENTERED

STD CONCN= 997 AT 07:51, 08-07-99
ENTERED

STD VOL= .25000 AT 07:51, 08-07-99
ENTERED

EMF=-79.8 mV AT 07:52, 08-07-99

EMF=-79.9 mV AT 07:52, 08-07-99
ENTERED

STD VOL= 2.5000 AT 07:53, 08-07-99
ENTERED

EMF=-125.1 mV AT 07:54, 08-07-99

EMF=-125.1 mV AT 07:54, 08-07-99
ENTERED

1:NH3 SLOPE=-59.4 mV/DEC
AT 07:54, 08-07-99

1:NH3 CONCN= 8.74

Std
59719-C
.500mL

DOUBLE KNOWN ADDITION SELECTED
AT 06:21, 08-07-99

SAMPLE VOL= 25.000 AT 06:24, 08-07-99
ENTERED

EMF= 82.6 mV AT 07:03, 08-07-99

EMF= 83.6 mV AT 07:04, 08-07-99

EMF= 83.8 mV AT 07:04, 08-07-99
ENTERED

STD CONCN= 997 AT 07:04, 08-07-99
ENTERED

STD VOL= .25000 AT 07:05, 08-07-99
ENTERED

EMF=-73.2 mV AT 07:06, 08-07-99

EMF=-71.7 mV AT 07:07, 08-07-99

EMF=-71.6 mV AT 07:07, 08-07-99
ENTERED

STD VOL= 2.5000 AT 07:07, 08-07-99
ENTERED

EMF=-130.3 mV AT 07:10, 08-07-99

EMF=-130.6 mV AT 07:11, 08-07-99

EMF=-130.6 mV AT 07:11, 08-07-99
ENTERED

BLK

1:NH3 SLOPE=-59.0 mV/DEC
AT 07:11, 08-07-99

1:NH3 CONCN= .0231

DOUBLE KNOWN ADDITION SELECTED
AT 07:11, 08-07-99

DOUBLE KNOWN ADDITION SELECTED
AT 10:19, 08-07-99

SAMPLE VOL= 25.000 AT 10:19, 08-07-99
ENTERED

EMF=-19.4 mV AT 10:22, 08-07-99

EMF=-19.8 mV AT 10:22, 08-07-99

EMF=-19.9 mV AT 10:22, 08-07-99
ENTERED

STD CONCN= 997 AT 10:23, 08-07-99
ENTERED

STD VOL= .25000 AT 10:23, 08-07-99
ENTERED

EMF=-58.0 mV AT 10:23, 08-07-99

EMF=-55.9 mV AT 10:24, 08-07-99

EMF=-55.6 mV AT 10:25, 08-07-99

EMF=-55.6 mV AT 10:25, 08-07-99
ENTERED

STD VOL= 2.5000 AT 10:25, 08-07-99
ENTERED

EMF=-114.2 mV AT 10:26, 08-07-99

EMF=-108.3 mV AT 10:28, 08-07-99

EMF=-108.3 mV AT 10:28, 08-07-99
ENTERED

1:NH3 SLOPE=-59.2 mV/DEC
AT 10:28, 08-07-99

1:NH3 CONCN= 3.27

1347 SAM,

DOUBLE KNOWN ADDITION SELECTED
AT 11:43, 08-07-99

SAMPLE VOL= 25.000 AT 11:57, 08-07-99
ENTERED

EMF=-7.7 mV AT 11:59, 08-07-99

EMF=-10.0 mV AT 12:00, 08-07-99

EMF=-10.1 mV AT 12:00, 08-07-99
ENTERED

STD CONCN= 997 AT 12:01, 08-07-99
ENTERED

STD VOL= .25000 AT 12:01, 08-07-99
ENTERED

EMF=-53.0 mV AT 12:02, 08-07-99

EMF=-48.9 mV AT 12:03, 08-07-99

EMF=-48.8 mV AT 12:03, 08-07-99
ENTERED

STD VOL= 2.5000 AT 12:04, 08-07-99
ENTERED

1347
DMP

EMF=-107.4 mV AT 12:05, 08-07-99

EMF=-102.8 mV AT 12:07, 08-07-99

EMF=-102.8 mV AT 12:07, 08-07-99
ENTERED

1:NH3 SLOPE=-59.9 mV/DEC
AT 12:07, 08-07-99

1:NH3 CONCN= 2.87

DOUBLE KNOWN ADDITION SELECTED
AT 13:01, 08-07-99

SAMPLE VOL= 25.000 AT 13:11, 08-07-99
ENTERED

EMF=-21.2 mV AT 13:14, 08-07-99

EMF=-21.4 mV AT 13:14, 08-07-99
ENTERED

STD CONCN= 997 AT 13:14, 08-07-99
ENTERED

STD VOL= .25000 AT 13:14, 08-07-99
ENTERED

EMF=-52.4 mV AT 13:15, 08-07-99

EMF=-52.3 mV AT 13:16, 08-07-99
ENTERED

STD VOL= 2.5000 AT 13:16, 08-07-99
ENTERED

EMF=-101.6 mV AT 13:18, 08-07-99

EMF=-101.9 mV AT 13:18, 08-07-99

EMF=-102.0 mV AT 13:18, 08-07-99 S99T1348
ENTERED

1:NH3 SLOPE=-57.1 mV/DEC
AT 13:19, 08-07-99

1:NH3 CONCN= 3.97

DOUBLE KNOWN ADDITION SELECTED
AT 13:19, 08-07-99

SAMPLE VOL= 25.000 AT 14:00, 08-07-99
ENTERED

EMF=-7.6 mV AT 14:04, 08-07-99

EMF=-7.9 mV AT 14:04, 08-07-99
ENTERED

STD CONCN= 997 AT 14:05, 08-07-99
ENTERED

STD VOL= .25000 AT 14:05, 08-07-99
ENTERED

EMF=-42.8 mV AT 14:07, 08-07-99

EMF=-42.6 mV AT 14:08, 08-07-99

EMF=-42.5 mV AT 14:08, 08-07-99
ENTERED

STD VOL= 2.5000 AT 14:08, 08-07-99 1348 DYP
ENTERED

EMF=-95.7 mV AT 14:09, 08-07-99

EMF=-94.4 mV AT 14:10, 08-07-99

EMF=-94.2 mV AT 14:11, 08-07-99

EMF=-94.2 mV AT 14:11, 08-07-99
ENTERED

1:NH3 SLOPE=-58.3 mV/DEC
AT 14:11, 08-07-99

1:NH3 CONCN= 3.36

DOUBLE KNOWN ADDITION SELECTED
AT 14:44, 08-07-99

SAMPLE VOL= 25.000 AT 14:49, 08-07-99
ENTERED

EMF=-40.7 mV AT 14:52, 08-07-99

EMF=-41.2 mV AT 14:52, 08-07-99

EMF=-41.4 mV AT 14:53, 08-07-99

EMF=-41.6 mV AT 14:53, 08-07-99

EMF=-41.7 mV AT 14:53, 08-07-99
ENTERED

STD CONCN= 997 AT 14:53, 08-07-99
ENTERED

STD VOL= .25000 AT 14:53, 08-07-99
ENTERED

EMF=-62.3 mV AT 14:54, 08-07-99

EMF=-60.9 mV AT 14:56, 08-07-99

EMF=-60.8 mV AT 14:56, 08-07-99
ENTERED

STD VOL= 2.5000 AT 14:56, 08-07-99
ENTERED

EMF=-106.4 mV AT 14:57, 08-07-99

EMF=-105.1 mV AT 14:59, 08-07-99

EMF=-105.1 mV AT 14:59, 08-07-99
ENTERED

1:NH3 SLOPE=-58.1 mV/DEC
AT 14:59, 08-07-99

Ending Std

1:NH3 CONCN= 8.65

WORKBOOK PAGE: BLANK1

AMMONIA (NH3) : LA-631-001 (~~C~~-0) D LMD 9/24/99 LIQUIDS/SOLIDS

			BLNK
Type	Instrument Data (µg/mL)	ID	0.000
BLNK	Blank Result from the Instrument (µg/mL)	BR	0.023
Work List	Vol of Sample for Dilution (mL) or Vol of Sample Direct (mL)	VSAM	0.500
30672	Final Vol of Dilution (mL) or Vol of Sample Direct (mL)	FVOL	25.0
Test Code			
NH3-01			
Matrix			
LIQUID	Dilution Factor	DF	1.000
Batch Number			
99003048			
Rerun			
0			
Sample Prep			
N/A	NH3 Concentration (µg/mL)	NH3 CONC	< 5.00E+01
Sample #			
BLNK	**Detection Limit (µg/mL)**	**5.00E+01**	
Instrument Code			
NH301	**Detection Limit = 1.000µg * (FVOL/VSAM)**		
Prepared By			
MF	**NH3 Concentration (µg/mL) = (BR) * (FVOL / VSAM) * DDF**		
Chemist			
MJL			
Analyst			
RWK			
Date Complete			
08/09/99			
Analysis Date			
08/07/99			
Analysis Time			
02:59 PM			
Sample Point	**NH3 Concentration (µg/mL)**		**< 5.00E+01**
S109			

Analyst:		RWK	Date: 08/09/99
Signature of Chemist:	NA	MJL	Date:

SAMPLE.WB1 REV 1.0 631001ML

WORKBOOK PAGE: STD2

AMMONIA (NH3) : LA-631-001 (C-0) LIQUIDS/SOLIDS

			STD
Type	Instrument Data (µg/mL)	ID	8.740
STD	Blank Result from the Instrument (µg/mL)	BR	0.023
Work List	Vol of Sample for Dilution (mL) or Vol of Sample Direct (mL)	VSAM	0.500
30672	Final Vol of Dilution (mL) or Vol of Sample Direct (mL)	FVOL	25.0
Test Code	LCS Standard Book Number	LCS	59N19C
NH3-01	LCS Standard Concentration (µg/mL)	STD VAL	4.52E+02
Matrix			
LIQUID			
Batch Number			
99003048			
Rerun			
0			
Sample Prep			
N/A	NH3 Concentration (µg/mL)	NH3 CONC	4.36E+02
Sample #			
STD	Detection Limit (µg/mL)	5.00E+01	
Instrument Code			
NH301	Detection Limit = 1.000µg * (FVOL/VSAM)		
Prepared By			
MF	NH3 Concentration (µg/mL) = (ID-BR)*(FVOL /VSAM)		
Chemist			
MJL	QC ACTUAL = STD VAL		
Analyst	QC FOUND = (ID-BR) * (FVOL/VSAM)		
RWK			
Date Complete			
08/09/99			
Analysis Date	QC ACTUAL (µg)		4.52E+02
08/07/99	QC FOUND (µg)		4.36E+02
Analysis Time			
02:59 PM			
Sample Point			
S109			

Analyst:	RWK	Date:	08/09/99
Signature of Chemist: NA	MJL	Date:	

SAMPLE.WB1 REV 1.0 631001ML

WORKBOOK PAGE: SAM3

AMMONIA (NH3) : LA-631-001 (C-0) LIQUIDS/SOLIDS

			SAMPLE
Type	Instrument Data (µg/mL)	ID	6.360
SAMPLE	Blank Result from the Instrument (µg/mL)	BR	0.023
Work List	Vol of Sample for Dilution (mL) or Vol of Sample Direct (mL)	VSAM	0.500
30672	Final Vol of Dilution (mL) or Vol of Sample Direct (mL)	FVOL	25.0
Test Code			
NH3-01			
Matrix			
LIQUID	Dilution Factor	DF	1.000
Batch Number			
99003048			
Rerun			
0			
Sample Prep			
N/A	NH3 Concentration (µg/mL)	NH3 CONC	3.17E+02
Sample #			
S99T001346	**Detection Limit (µg/mL)**	**5.00E+01**	
Instrument Code			
NH301	**Detection Limit = 1.000µg • (FVOL/VSAM) • DF**		
Prepared By			
MF	**NH3 Concentration (µg/mL) = (ID-BR) * (FVOL / VSAM)*DF**		
Chemist			
MJL			
Analyst			
RWK			
Date Complete			
08/09/99			
Analysis Date			
08/07/99			
Analysis Time			
02:59 PM			
Sample Point	**NH3 Concentration (µg/mL)**		**3.17E+02**
S109			

Analyst:	RWK	Date:	08/09/99
Signature of Chemist:	MJL	Date:	

SAMPLE.WB1 REV 1.0 631001ML

WORKBOOK PAGE: DUP4

AMMONIA (NH3) : LA-631-001 (C-0) LIQUIDS/SOLIDS

			DUP
Type	Instrument Data (µg/mL)	ID	5.980
DUP	Blank Result from the Instrument (µg/mL)	BR	0.023
Work List	Vol of Sample for Dilution (mL) or Vol of Sample Direct (mL)	VSAM	0.500
30672	Final Vol of Dilution (mL) or Vol of Sample Direct (mL)	FVOL	25.0
Test Code			
NH3-01			
Matrix			
LIQUID	Dilution Factor	DF	1.000
Batch Number			
99003048			
Rerun			
0			
Sample Prep			
N/A	NH3 Concentration (µg/mL)	NH3 CONC	2.98E+02
Sample #			
S99T001346	**Detection Limit (µg/mL)**	**5.00E+01**	
Instrument Code			
NH301	**Detection Limit = 1.000µg * (FVOL/VSAM) * DF**		
Prepared By			
MF	**NH3 Concentration (µg/mL) = (ID-BR) * (FVOL / VSAM)*DF**		
Chemist			
MJL			
Analyst			
RWK			
Date Complete			
08/09/99			
Analysis Date			
08/07/99			
Analysis Time			
02:59 PM			
Sample Point	**NH3 Concentration (µg/mL)**		**2.98E+02**
S109			

Analyst:	RWK	Date:	08/09/99
Signature of Chemist: N/A	MJL	Date:	

SAMPLE.WB1 REV 1.0 631001ML

WORKBOOK PAGE: SAM5

AMMONIA (NH3) : LA-631-001 (C-0) LIQUIDS/SOLIDS

			SAMPLE
Type	Instrument Data (µg/mL)	ID	3.270
SAMPLE	Blank Result from the Instrument (µg/mL)	BR	0.023
Work List	Vol of Sample for Dilution (mL) or Vol of Sample Direct (mL)	VSAM	0.500
30672	Final Vol of Dilution (mL) or Vol of Sample Direct (mL)	FVOL	25.0
Test Code			
NH3-01			
Matrix			
LIQUID	Dilution Factor	DF	1.000
Batch Number			
99003048			
Rerun			
0			
Sample Prep			
N/A	NH3 Concentration (µg/mL)	NH3 CONC	1.62E+02
Sample #			
S99T001347	**Detection Limit (µg/mL)**	**5.00E+01**	
Instrument Code			
NH301	**Detection Limit = 1.000µg * (FVOL/VSAM) * DF**		
Prepared By			
MF	**NH3 Concentration (µg/mL) = (ID-BR) * (FVOL / VSAM)*DF**		
Chemist			
MJL			
Analyst			
RWK			
Date Complete			
08/09/99			
Analysis Date			
08/07/99			
Analysis Time			
02:59 PM			
Sample Point	**NH3 Concentration (µg/mL)**		1.62E+02
S109			

Analyst:		RWK	Date: 08/09/99
Signature of Chemist:	NA	MJL	Date:

SAMPLE.WB1 REV 1.0 631001ML

WORKBOOK PAGE: DUP6

AMMONIA (NH3) : LA-631-001 (~~C~~D-0) 9/24/99 LIQUIDS/SOLIDS

			DUP
Type	Instrument Data (µg/mL)	ID	2.870
DUP	Blank Result from the Instrument (µg/mL)	BR	0.023
Work List	Vol of Sample for Dilution (mL) or Vol of Sample Direct (mL)	VSAM	0.500
30672	Final Vol of Dilution (mL) or Vol of Sample Direct (mL)	FVOL	25.0
Test Code			
NH3-01			
Matrix			
LIQUID	Dilution Factor	DF	1.000
Batch Number			
99003048			
Rerun			
0			
Sample Prep			
N/A	NH3 Concentration (µg/mL)	NH3 CONC	1.42E+02
Sample #			
S99T001347	**Detection Limit (µg/mL)**	**5.00E+01**	
Instrument Code			
NH301	**Detection Limit = 1.000µg * (FVOL/VSAM) * DF**		
Prepared By			
MF	**NH3 Concentration (µg/mL) = (ID-BR) * (FVOL / VSAM)*DF**		
Chemist			
MJL			
Analyst			
RWK			
Date Complete			
08/09/99			
Analysis Date			
08/07/99			
Analysis Time			
02:59 PM			
Sample Point	**NH3 Concentration (µg/mL)**		**1.42E+02**
S109			

Analyst:		RWK	Date: 08/09/99
Signature of Chemist:	NA	MJL	Date:

SAMPLE.WB1 REV 1.0 631001ML

WORKBOOK PAGE: SAM7

AMMONIA (NH3) : LA-631-001 (D-0) LIQUIDS/SOLIDS

			SAMPLE
Type	Instrument Data (µg/mL)	ID	3.970
SAMPLE	Blank Result from the Instrument (µg/mL)	BR	0.023
Work List	Vol of Sample for Dilution (mL) or Vol of Sample Direct (mL)	VSAM	0.250
30672	Final Vol of Dilution (mL) or Vol of Sample Direct (mL)	FVOL	25.0
Test Code			
NH3-01			
Matrix			
LIQUID	Dilution Factor	DF	1.000
Batch Number			
99003048			
Rerun			
0			
Sample Prep			
N/A	NH3 Concentration (µg/mL)	NH3 CONC	3.95E+02
Sample #			
S99T001348	**Detection Limit (µg/mL)**	**1.00E+02**	
Instrument Code			
NH301	**Detection Limit = 1.000µg * (FVOL/VSAM) * DF**		
Prepared By			
MF	**NH3 Concentration (µg/mL) = (ID-BR) * (FVOL / VSAM)*DF**		
Chemist			
MJL			
Analyst			
RWK			
Date Complete			
08/09/99			
Analysis Date			
08/07/99			
Analysis Time			
02:59 PM			
Sample Point	**NH3 Concentration (µg/mL)**		3.95E+02
S109			

Analyst:		RWK	Date: 08/09/99
Signature of Chemist:	NA	MJL	Date:

SAMPLE.WB1 REV 1.0 631001ML

WORKBOOK PAGE: DUP8

AMMONIA (NH3) : LA-631-001 (C-0) LIQUIDS/SOLIDS

			DUP
Type	Instrument Data (µg/mL)	ID	3.360
DUP	Blank Result from the Instrument (µg/mL)	BR	0.023
Work List	Vol of Sample for Dilution (mL) or Vol of Sample Direct (mL)	VSAM	0.250
30672	Final Vol of Dilution (mL) or Vol of Sample Direct (mL)	FVOL	25.0
Test Code			
NH3-01			
Matrix			
LIQUID	Dilution Factor	DF	1.000
Batch Number			
99003048			
Rerun			
0			
Sample Prep			
N/A	NH3 Concentration (µg/mL)	NH3 CONC	3.34E+02
Sample #			
S99T001348	**Detection Limit (µg/mL)**	**1.00E+02**	
Instrument Code			
NH301	**Detection Limit = 1.000µg * (FVOL/VSAM) * DF**		
Prepared By			
MF	**NH3 Concentration (µg/mL) = (ID-BR) * (FVOL / VSAM)*DF**		
Chemist			
MJL			
Analyst			
RWK			
Date Complete			
08/09/99			
Analysis Date			
08/07/99			
Analysis Time			
02:59 PM			
Sample Point	**NH3 Concentration (µg/mL)**		3.34E+02
S109			

Analyst:	RWK	Date:	08/09/99
Signature of Chemist: NA	MJL	Date:	

SAMPLE.WB1 REV 1.0 631001ML

WORKBOOK PAGE: ST_END9

AMMONIA (NH3) : LA-631-001 (~~C~~-0) LIQUIDS/SOLIDS

			STD
Type	Instrument Data (µg/mL)	ID	8.650
STD	Blank Result from the Instrument (µg/mL)	BR	0.023
Work List	Vol of Sample for Dilution (mL) or Vol of Sample Direct (mL)	VSAM	0.500
30672	Final Vol of Dilution (mL) or Vol of Sample Direct (mL)	FVOL	25.0
Test Code	LCS Standard Book Number	LCS	59N19C
NH3-01	LCS Standard Concentration (µg/mL)	STD VAL	4.52E+02
Matrix			
LIQUID			
Batch Number			
99003048			
Rerun			
0			
Sample Prep			
N/A	NH3 Concentration (µg/mL)	NH3 CONC	4.31E+02
Sample #			
	Detection Limit (µg/mL)	5.00E+01	
Instrument Code			
NH301	Detection Limit = 1.000µg * (FVOL/VSAM)		
Prepared By			
MF	NH3 Concentration (µg/mL) = (ID-BR)*(FVOL /VSAM)		
Chemist			
MJL	QC ACTUAL = STD VAL		
Analyst	QC FOUND = (ID-BR) * (FVOL/VSAM)		
RWK			
Date Complete			
08/09/99			
Analysis Date	QC ACTUAL (µg)		4.52E+02
08/07/99	QC FOUND (µg)		4.31E+02
Analysis Time			
02:59 PM			
Sample Point			
S109			

Analyst:	RWK	Date:	08/09/99
Signature of Chemist: NA	MJL	Date:	

SAMPLE.WB1 REV 1.0 631001ML

LABCORE Completed Worklist Report for Worklist# 31578

Analyst: slh **Instrument:** NH301 **Book#:** 59N19F

Method: LA-631-001 Rev/Mod _____

Worklist Comment: S-109 FOR NH3-01, RLC

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
1	BLNK			0	NH3-01	LIQUID	1	<5.00E+2		ug/mL
2	STD			0	NH3-01	LIQUID	4.45E+02	3.54E+2	79.551	% Recovery
3	SAMPLE	S99T001343		0	NH3-01	LIQUID	N/A	1.52E+03	500.000	ug/mL
4	DUP	S99T001343		0	NH3-01	LIQUID	1.52E+3	1.55E+3	1.954	RPD
5	SPK	S99T001343		0	NH3-01	LIQUID	1.11E+02	8.78E+01	79.099	% Recovery
6	STD			0	NH3-01	LIQUID	4.45E+02	4.71E+2	105.843	% Recovery

Final page for worklist# 31578

Analyst Signature Date

Mary Fram 11/2/99
Analyst Signature Date

James M. Fuge 11/5/99
Reviewer Signature Date

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

LABCORE Data Entry Template for Worklist# 31578

Analyst: SLH **Instrument:** NH301 _____ **Book#** 59N19-F

Method: LA-631-001 Rev/Mod D-0

Worklist Comment: S-109 FOR NH3-01, RLC

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	BLNK				NH3-01	LIQUID		
2	STD				NH3-01	LIQUID		
3	SAMPLE	S99T001343	0		NH3-01	LIQUID	99000300	S-109 GRAB
		Analytes Requested:			NH3-01			
4	DUP	S99T001343	0		NH3-01	LIQUID		
5	SPK	S99T001343	0		NH3-01	LIQUID		
6	STD				NH3-01	LIQUID		

Final page for worklist # 31578

Sandra L Hood Boatright
Signature Date 10-29-99

Signature Date 11/2/99

Data Entry Comments:

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

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DOUBLE KNOWN ADDITION SELECTED
AT 01:16, 10-29-99

SAMPLE VOL= 25.000 AT 01:17, 10-29-99
ENTERED

EMF=-1.4 mV AT 01:18, 10-29-99

EMF=-1.5 mV AT 01:18, 10-29-99

EMF=-1.9 mV AT 01:19, 10-29-99
ENTERED

STD CONCN= 998 AT 01:19, 10-29-99
ENTERED

STD VOL= .25000 AT 01:24, 10-29-99
ENTERED

EMF=-36.8 mV AT 01:24, 10-29-99

EMF=-36.9 mV AT 01:25, 10-29-99

EMF=-37.0 mV AT 01:25, 10-29-99

EMF=-37.0 mV AT 01:26, 10-29-99
ENTERED

STD VOL= 2.5000 AT 01:32, 10-29-99
ENTERED

EMF=-89.5 mV AT 01:32, 10-29-99

EMF=-89.6 mV AT 01:32, 10-29-99

EMF=-89.8 mV AT 01:33, 10-29-99

EMF=-89.8 mV AT 01:33, 10-29-99

EMF=-90.1 mV AT 01:34, 10-29-99
ENTERED

1:NH3 SLOPE=-60.0 mV/DEC
AT 01:34, 10-29-99

1:NH3 CONCN= 3.46

.050ml
SS=

S99T001343

Sam

DOUBLE KNOWN ADDITION SELECTED
AT 03:35, 10-29-99

SAMPLE VOL= 25.000 AT 03:35, 10-29-99
ENTERED

EMF= 10.5 mV AT 03:35, 10-29-99

EMF= 10.8 mV AT 03:36, 10-29-99

EMF= 11.2 mV AT 03:36, 10-29-99

EMF= 11.5 mV AT 03:37, 10-29-99

EMF= 11.8 mV AT 03:37, 10-29-99

EMF= 12.1 mV AT 03:38, 10-29-99

EMF= 12.4 mV AT 03:38, 10-29-99

EMF= 12.9 mV AT 03:39, 10-29-99

EMF= 13.2 mV AT 03:39, 10-29-99

EMF= 13.7 mV AT 03:40, 10-29-99

EMF= 13.9 mV AT 03:41, 10-29-99
ENTERED

STD CONCN= 998 AT 03:41, 10-29-99
ENTERED

STD VOL= .25000 AT 03:43, 10-29-99
ENTERED

EMF=-21.1 mV AT 03:44, 10-29-99

EMF=-21.4 mV AT 03:45, 10-29-99

EMF=-21.6 mV AT 03:45, 10-29-99

EMF=-21.7 mV AT 03:45, 10-29-99
ENTERED

STD VOL= 2.5000 AT 03:48, 10-29-99
ENTERED

EMF=-75.4 mV AT 03:49, 10-29-99

EMF=-75.7 mV AT 03:49, 10-29-99

EMF=-75.9 mV AT 03:49, 10-29-99

EMF=-76.0 mV AT 03:49, 10-29-99
ENTERED

1:NH3 SLOPE=-61.5 mV/DEC
AT 03:50, 10-29-99

1:NH3 CONCN= 3.53

SS= .050 ml

S99T00 1343 dup

10/29/99 05:19 FAX 3721143 HALL 900

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DOUBLE KNOWN ADDITION SELECTED
AT 04:24, 10-29-99

SAMPLE VOL= 25.000 AT 04:25, 10-29-99
ENTERED

EMF=-18.4 mV AT 04:25, 10-29-99

EMF=-18.5 mV AT 04:25, 10-29-99

EMF=-18.6 mV AT 04:26, 10-29-99

EMF=-18.5 mV AT 04:26, 10-29-99
ENTERED

STD CONCN= 998 AT 04:26, 10-29-99
ENTERED

STD VOL= .25000 AT 04:32, 10-29-99
ENTERED

EMF=-36.6 mV AT 04:33, 10-29-99

EMF=-36.9 mV AT 04:33, 10-29-99

EMF=-37.0 mV AT 04:33, 10-29-99

EMF=-37.1 mV AT 04:34, 10-29-99

EMF=-37.5 mV AT 04:35, 10-29-99

EMF=-37.5 mV AT 04:35, 10-29-99
ENTERED

STD VOL= 2.5000 AT 04:43, 10-29-99
ENTERED

EMF=-83.6 mV AT 04:44, 10-29-99

EMF=-83.9 mV AT 04:44, 10-29-99

EMF=-84.2 mV AT 04:45, 10-29-99

EMF=-84.4 mV AT 04:46, 10-29-99

EMF=-84.4 mV AT 04:46, 10-29-99
ENTERED

1:NH3 SLOPE=-63.4 mV/DEC
AT 04:46, 10-29-99

1:NH3 CONCN= 9.85

.500ml 59N19-F

End STD

10/29/99 05:19 FAX 3721143 2B HALL 008

WORKBOOK PAGE: BLANK1

AMMONIA (NH3) : LA-631-001 (D-0) LIQUIDS/SOLIDS

				BLNK
Type	Instrument Data (µg/mL)	ID		0.000
BLNK	Blank Result from the Instrument (µg/mL)	BR		0.427
Work List	Vol of Sample for Dilution (mL) or Vol of Sample Direct (mL)	VSAM		0.050
31578	Final Vol of Dilution (mL) or Vol of Sample Direct (mL)	FVOL		25.0
Test Code				
NH3-01				
Matrix				
LIQUID	Dilution Factor	DF		1.000
Batch Number				
99004027				
Rerun				
0				
Sample Prep				
N/A	NH3 Concentration (µg/mL)	NH3 CONC	<	5.00E+02
Sample #				
BLNK	**Detection Limit (µg/mL)**	**5.00E+02**		
Instrument Code				
NH301	**Detection Limit = 1.000µg * (FVOL/VSAM)**			
Prepared By				
MF	**NH3 Concentration (µg/mL) = (BR) * (FVOL / VSAM) * DDF**			
Chemist				
JFG				
Analyst				
SLH				
Date Complete				
11/02/99				
Analysis Date				
10/29/99				
Analysis Time				
05:30 AM				
Sample Point	**NH3 Concentration (µg/mL)**		**< 5.00E+02**	
S-109				

Analyst:		SLH	Date: 11/02/99
Signature of Chemist:	N/A	JFG	Date:

SAMPLE.WB1 REV 1.0 631001ML

WORKBOOK PAGE: STD2

AMMONIA (NH3) : LA-631-001 (D-0) LIQUIDS/SOLIDS

			STD
Type	Instrument Data (µg/mL)	ID	7.500
STD	Blank Result from the Instrument (µg/mL)	BR	0.427
Work List	Vol of Sample for Dilution (mL) or Vol of Sample Direct (mL)	VSAM	0.500
31578	Final Vol of Dilution (mL) or Vol of Sample Direct (mL)	FVOL	25.0
Test Code	LCS Standard Book Number	LCS	59N19F
NH3-01	LCS Standard Concentration (µg/mL)	STD VAL	4.45E+02
Matrix			
Batch Number			
99004027			
Rerun			
0			
Sample Prep			
N/A	NH3 Concentration (µg/mL)	NH3 CONC	3.54E+02
Sample #			
STD	**Detection Limit (µg/mL)**	**5.00E+01**	
Instrument Code			
NH301	**Detection Limit = 1.000µg * (FVOL/VSAM)**		
Prepared By			
MF	**NH3 Concentration (µg/mL) = (ID-BR)*(FVOL /VSAM)**		
Chemist			
JFG	**QC ACTUAL = STD VAL**		
Analyst	**QC FOUND = (ID-BR) * (FVOL/VSAM)**		
SLH			
Date Complete			
11/02/99			
Analysis Date	**QC ACTUAL (µg)**		4.45E+02
10/29/99	**QC FOUND (µg)**		3.54E+02
Analysis Time			
05:30 AM			
Sample Point			
S-109			

Analyst:		SLH	Date: 11/02/99
Signature of Chemist:	N/A	JFG	Date:

SAMPLE.WB1 REV 1.0 631001ML

WORKBOOK PAGE: SAM3

AMMONIA (NH3) : LA-631-001 (D-0) LIQUIDS/SOLIDS

			SAMPLE
Type	Instrument Data (µg/mL)	ID	3.460
SAMPLE	Blank Result from the Instrument (µg/mL)	BR	0.427
Work List	Vol of Sample for Dilution (mL) or Vol of Sample Direct (mL)	VSAM	0.050
31578	Final Vol of Dilution (mL) or Vol of Sample Direct (mL)	FVOL	25.0
Test Code			
NH3-01			
Matrix			
LIQUID	Dilution Factor	DF	1.000
Batch Number			
99004027			
Rerun			
0			
Sample Prep			
N/A	NH3 Concentration (µg/mL)	NH3 CONC	1.52E+03
Sample #			
S99T001343	**Detection Limit (µg/mL)**	**5.00E+02**	
Instrument Code			
NH301	**Detection Limit = 1.000µg * (FVOL/VSAM) * DF**		
Prepared By			
MF	**NH3 Concentration (µg/mL) = (ID-BR) * (FVOL / VSAM)*DF**		
Chemist			
JFG			
Analyst			
SLH			
Date Complete			
11/02/99			
Analysis Date			
10/29/99			
Analysis Time			
05:30 AM			
Sample Point	**NH3 Concentration (µg/mL)**		**1.52E+03**
S-109			

Analyst:		SLH	Date: 11/02/99
Signature of Chemist:		JFG	Date:

SAMPLE.WB1 REV 1.0 631001ML

WORKBOOK PAGE: DUP4

AMMONIA (NH3) : LA-631-001 (D-0) LIQUIDS/SOLIDS

			DUP
Type	Instrument Data (µg/mL)	ID	3.530
DUP	Blank Result from the Instrument (µg/mL)	BR	0.427
Work List	Vol of Sample for Dilution (mL) or Vol of Sample Direct (mL)	VSAM	0.050
31578	Final Vol of Dilution (mL) or Vol of Sample Direct (mL)	FVOL	25.0
Test Code			
NH3-01			
Matrix			
LIQUID	Dilution Factor	DF	1.000
Batch Number			
99004027			
Rerun			
0			
Sample Prep			
N/A	NH3 Concentration (µg/mL)	NH3 CONC	1.55E+03
Sample #			
S99T001343	**Detection Limit (µg/mL)**	**5.00E+02**	
Instrument Code			
NH301	**Detection Limit = 1.000µg * (FVOL/VSAM) * DF**		
Prepared By			
MF	**NH3 Concentration (µg/mL) = (ID-BR) * (FVOL / VSAM)*DF**		
Chemist			
JFG			
Analyst			
SLH			
Date Complete			
11/02/99			
Analysis Date			
10/29/99			
Analysis Time			
05:30 AM			
Sample Point	**NH3 Concentration (µg/mL)**		1.55E+03
S-109			

Analyst:		SLH	Date: 11/02/99
Signature of Chemist:	NA	JFG	Date:

SAMPLE.WB1 REV 1.0 631001ML

WORKBOOK PAGE: SPIKE5

AMMONIA (NH3) : LA-631-001 (D-0) LIQUIDS/SOLIDS

			SPK
Type	Instrument Data (µg/mL)	ID	6.970
SPK	Blank Result from the Instrument (µg/mL)	BR	0.427
Work List	Vol of Sample for Dilution (mL) or Vol of Sample Direct (mL)	VSAM	0.050
31578	Final Vol of Dilution (mL) or Vol of Sample Direct (mL)	FVOL	25.0
Test Code	Spike Book Number	SPK	59N19F
NH3-01	Spike Value (µg/mL)	SPK VAL	4.45E+02
Matrix	Vol of Spike Standard Used (mL)	VOL SPK	0.250
LIQUID			
Batch Number			
99004027			
Rerun	Sample Instrument Data (µg/mL)	SAM ID	3.46
0	Sample Volume of Sample (mL)	SAM VSAM	0.050
Sample Prep	Sample Final Volume (mL)	SAM FVOL	25.0
N/A			
Sample #			
S99T001343			
Instrument Code			
NH301			
Prepared By			
MF			
Chemist			
JFG	QC ACTUAL = SPK VAL * VOL SPK		
Analyst	QC FOUND = (((ID-BR) * FVOL) - (SAM ID - BR) * SAM FVOL * (VSAM / SAM VSAM))		
SLH			
Date Complete			
11/02/99			
Analysis Date	QC ACTUAL (µg)		1.11E+02
10/29/99	QC FOUND (µg)		8.78E+01
Analysis Time			
05:30 AM			
Sample Point			
S-109			

Analyst:	SLH	Date:	11/02/99
Signature of Chemist: NA	JFG	Date:	

SAMPLE.WB1 REV 1.0 631001ML

WORKBOOK PAGE: ST_END6

AMMONIA (NH3) : LA-631-001 (D-0) LIQUIDS/SOLIDS

			STD
Type	Instrument Data (µg/mL)	ID	9.850
STD	Blank Result from the Instrument (µg/mL)	BR	0.427
Work List	Vol of Sample for Dilution (mL) or Vol of Sample Direct (mL)	VSAM	0.500
31578	Final Vol of Dilution (mL) or Vol of Sample Direct (mL)	FVOL	25.0
Test Code	LCS Standard Book Number	LCS	59N19F
NH3-01	LCS Standard Concentration (µg/mL)	STD VAL	4.45E+02
Matrix			
Batch Number			
99004027			
Rerun			
0			
Sample Prep			
N/A	NH3 Concentration (µg/mL)	NH3 CONC	4.71E+02
Sample #			
STD	**Detection Limit (µg/mL)**	**5.00E+01**	
Instrument Code			
NH301	**Detection Limit = 1.000µg * (FVOL/VSAM)**		
Prepared By			
MF	**NH3 Concentration (µg/mL) = (ID-BR)*(FVOL /VSAM)**		
Chemist			
JFG	**QC ACTUAL = STD VAL**		
Analyst	**QC FOUND = (ID-BR) * (FVOL/VSAM)**		
SLH			
Date Complete			
11/02/99			
Analysis Date	**QC ACTUAL (µg)**		4.45E+02
10/29/99	**QC FOUND (µg)**		4.71E+02
Analysis Time			
05:30 AM			
Sample Point			
S-109			

Analyst:		SLH	Date: 11/02/99
Signature of Chemist:	NA	JFG	Date:

SAMPLE.WB1 REV 1.0 631001ML

LABCORE Completed Worklist Report for Worklist# 30670

Analyst: rdm **Instrument:** IC40S1 **Book#:** 82N21E

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

Worklist Comment: S109 FOR @IC-01 RTS

Seq	Type	Sample#	R	A	Test	Matrix	Actual		Found	DL or Yield	Unit
1	CCB		0	@IC-QC	F	QC	1		<1.20e-2		ug/mL
1	CCB		0	@IC-QC	CL	QC	1		<1.70e-2		ug/mL
1	CCB		0	@IC-QC	NO2	QC	1		<1.08e-1		ug/mL
1	CCB		0	@IC-QC	BR	QC	1		<1.25e-1		ug/mL
1	CCB		0	@IC-QC	NO3	QC	1		<1.39e-1		ug/mL
1	CCB		0	@IC-QC	PO4	QC	1		<1.20e-1		ug/mL
1	CCB		0	@IC-QC	SO4	QC	1		<1.38e-1		ug/mL
1	CCB		0	@IC-QC	OXALATE2	QC	1		<1.05e-1		ug/mL
2	LCS-INST		0	@IC-QC	F	QC	5.84e1		6.25e+01	107.021	% Recovery
2	LCS-INST		0	@IC-QC	CL	QC	8.06e1		7.85e+01	97.395	% Recovery
2	LCS-INST		0	@IC-QC	NO2	QC	5.48e2		5.20e+02	94.891	% Recovery
2	LCS-INST		0	@IC-QC	BR	QC	5.76e2		5.68e+02	98.611	% Recovery
2	LCS-INST		0	@IC-QC	NO3	QC	5.84e2		5.35e+02	91.610	% Recovery
2	LCS-INST		0	@IC-QC	PO4	QC	5.44e2		5.48e+02	100.735	% Recovery
2	LCS-INST		0	@IC-QC	SO4	QC	6.42e2		6.42e+02	100.000	% Recovery
2	LCS-INST		0	@IC-QC	OXALATE2	QC	5.17e2		5.28e+02	102.128	% Recovery
3	CCV		0	@IC-QC	F	QC	6.40e1		6.99e+01	109.219	% Recovery
3	CCV		0	@IC-QC	CL	QC	8.95e1		8.74e+01	97.654	% Recovery
3	CCV		0	@IC-QC	NO2	QC	5.25e2		4.95e+02	94.286	% Recovery
3	CCV		0	@IC-QC	BR	QC	6.30e2		6.08e+02	96.508	% Recovery
3	CCV		0	@IC-QC	NO3	QC	7.00e2		6.89e+02	98.429	% Recovery
3	CCV		0	@IC-QC	PO4	QC	6.35e2		6.34e+02	99.843	% Recovery
3	CCV		0	@IC-QC	SO4	QC	7.00e2		6.88e+02	98.286	% Recovery
3	CCV		0	@IC-QC	OXALATE2	QC	5.30e2		5.31e+02	100.189	% Recovery
4	SAMPLE	S99T001343	0	@IC-01	F-02	LIQUID	N/A	<	4.969e+01	49.690	ug/mL
4	SAMPLE	S99T001343	0	@IC-01	CL-02	LIQUID	N/A		9.734e+03	70.400	ug/mL
4	SAMPLE	S99T001343	0	@IC-01	NO2-02	LIQUID	N/A		8.369e+04	447.200	ug/mL
4	SAMPLE	S99T001343	0	@IC-01	BR-02	LIQUID	N/A	<	5.176e+02	517.600	ug/mL
4	SAMPLE	S99T001343	0	@IC-01	NO3-02	LIQUID	N/A		1.281e+05	575.600	ug/mL
4	SAMPLE	S99T001343	0	@IC-01	OXALATE2	LIQUID	N/A	<	4.348e+02	434.800	ug/mL
5	DUP	S99T001343	0	@IC-01	F-02	LIQUID	<4.97e1		<4.97e1		RPD
5	DUP	S99T001343	0	@IC-01	CL-02	LIQUID	9.73e+03		9.97e+03	2.437	RPD
5	DUP	S99T001343	0	@IC-01	NO2-02	LIQUID	8.37e+04		8.51e+04	1.659	RPD
5	DUP	S99T001343	0	@IC-01	BR-02	LIQUID	<5.18e2		<5.18e2		RPD
5	DUP	S99T001343	0	@IC-01	NO3-02	LIQUID	1.28e+05		1.28e+05	0.000	RPD
5	DUP	S99T001343	0	@IC-01	PO4-02	LIQUID	1.37e+03		1.83e+03	28.750	RPD
5	DUP	S99T001343	0	@IC-01	SO4-02	LIQUID	1.39e+03		9.37e+03	148.327	RPD
5	DUP	S99T001343	0	@IC-01	OXALATE2	LIQUID	<4.35e2		<4.35e2		RPD
6	SAMPLE	S99T001344	0	@IC-01	F-02	LIQUID	N/A	<	4.969e+01	49.690	ug/mL
6	SAMPLE	S99T001344	0	@IC-01	CL-02	LIQUID	N/A		1.016e+04	70.400	ug/mL
6	SAMPLE	S99T001344	0	@IC-01	NO2-02	LIQUID	N/A		8.870e+04	447.200	ug/mL

11/15/99

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

LABCORE Completed Worklist Report for Worklist# 30670

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
6	SAMPLE	S99T001344	0	@IC-01	BR-02	LIQUID	N/A <	5.176e+02	517.600	ug/mL
6	SAMPLE	S99T001344	0	@IC-01	NO3-02	LIQUID	N/A	1.390e+05	575.600	ug/mL
6	SAMPLE	S99T001344	0	@IC-01	PO4-02	LIQUID	N/A	1.350e+03	496.900	ug/mL
6	SAMPLE	S99T001344	0	@IC-01	OXALATE2	LIQUID	N/A <	4.348e+02	434.800	ug/mL
7	DUP	S99T001344	0	@IC-01	F-02	LIQUID	<4.97e1	<4.97e1		RPD
7	DUP	S99T001344	0	@IC-01	CL-02	LIQUID	1.02e+04	1.03e+04	0.976	RPD
7	DUP	S99T001344	0	@IC-01	NO2-02	LIQUID	8.87e+04	8.88e+04	0.113	RPD
7	DUP	S99T001344	0	@IC-01	BR-02	LIQUID	<5.18e2	<5.18e2		RPD
7	DUP	S99T001344	0	@IC-01	NO3-02	LIQUID	1.39e+05	1.32e+05	5.166	RPD
7	DUP	S99T001344	0	@IC-01	PO4-02	LIQUID	1.35e+03	1.56e+03	14.433	RPD
7	DUP	S99T001344	0	@IC-01	SO4-02	LIQUID	2.12e+03	3.92e+03	59.603	RPD
7	DUP	S99T001344	0	@IC-01	OXALATE2	LIQUID	<4.35e2	<4.35e2		RPD
8	SAMPLE	S99T001345	0	@IC-01	F-02	LIQUID	N/A <	4.969e+01	49.690	ug/mL
8	SAMPLE	S99T001345	0	@IC-01	CL-02	LIQUID	N/A	8.896e+03	70.400	ug/mL
8	SAMPLE	S99T001345	0	@IC-01	NO2-02	LIQUID	N/A	8.137e+04	447.200	ug/mL
8	SAMPLE	S99T001345	0	@IC-01	BR-02	LIQUID	N/A <	5.176e+02	517.600	ug/mL
8	SAMPLE	S99T001345	0	@IC-01	NO3-02	LIQUID	N/A	1.245e+05	575.600	ug/mL
8	SAMPLE	S99T001345	0	@IC-01	OXALATE2	LIQUID	N/A <	4.348e+02	434.800	ug/mL
9	DUP	S99T001345	0	@IC-01	F-02	LIQUID	<4.97e1	<4.97e1		RPD
9	DUP	S99T001345	0	@IC-01	CL-02	LIQUID	8.90e+03	9.00e+03	1.117	RPD
9	DUP	S99T001345	0	@IC-01	NO2-02	LIQUID	8.14e+04	8.37e+04	2.786	RPD
9	DUP	S99T001345	0	@IC-01	BR-02	LIQUID	<5.18e2	<5.18e2		RPD
9	DUP	S99T001345	0	@IC-01	NO3-02	LIQUID	1.25e+05	1.24e+05	0.803	RPD
9	DUP	S99T001345	0	@IC-01	PO4-02	LIQUID	1.71e+03	6.79e+02	86.312	RPD
9	DUP	S99T001345	0	@IC-01	SO4-02	LIQUID	9.67e+03	1.95e+03	132.874	RPD
9	DUP	S99T001345	0	@IC-01	OXALATE2	LIQUID	<4.35e2	<4.35e2		RPD

Final page for worklist# 30670

Analyst Signature Date

Analyst Signature Date

Reviewer Signature Date 8/11/99

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

LABCORE Data Entry Template for Worklist# 30670

Analyst: RJM **Instrument:** IC 4051 **Book#** LCS 83N21-E
CCV 82N21-E

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

Worklist Comment: S109 FOR @IC-01 RTS

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~~	~~S99T001343~~	~~0~~		~~@IC-01~~	~~LIQUID~~	~~99000300~~	~~S-109~~ GRAB
		Analytes Requested: BR-02, CL-02, F-02, NO2-02, NO3-02, OXALATE2, PO4-02, SO4-02						
~~5~~	~~DUP~~	~~S99T001343~~	~~0~~		~~@IC-01~~	~~LIQUID~~		
6	SAMPLE	S99T001344	0		@IC-01	LIQUID	99000300	S-109 GRAB
		Analytes Requested: BR-02, CL-02, F-02, NO2-02, NO3-02, OXALATE2, PO4-02, SO4-02						
7	DUP	S99T001344	0		@IC-01	LIQUID		
8	SAMPLE	S99T001345	0		@IC-01	LIQUID	99000300	S-109 GRAB
		Analytes Requested: BR-02, CL-02, F-02, NO2-02, NO3-02, OXALATE2, PO4-02, SO4-02						
9	DUP	S99T001345	0		@IC-01	LIQUID		

11/15/99

Final page for worklist # 30670

RJMcCann 8/8/99
Signature **Date**

Signature **Date**

Data Entry Comments:
uploaded 8-9-99
JA Wenell
30670AUG.CSV

Rejected SO_4 & PO_4 on 1343 and SO_4 on 1344 & 1345 rest validated 8/11/99 JM Fuge

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

```
==================================================================================
| Sample Name: CCB                                  Date: 08/08/1999 07:11:37      |
| Data File  : C:\DX\DATA\99080801.D01                                             |
| Method     : C:\DX\METHOD\KIT.MET                                                |
| ACI Address: 1  System: 1  Inject#: 1                          Detector:CDM-1   |
| Analyst    :                  Column: AG4A/AS4A anion column                    |
==================================================================================
```

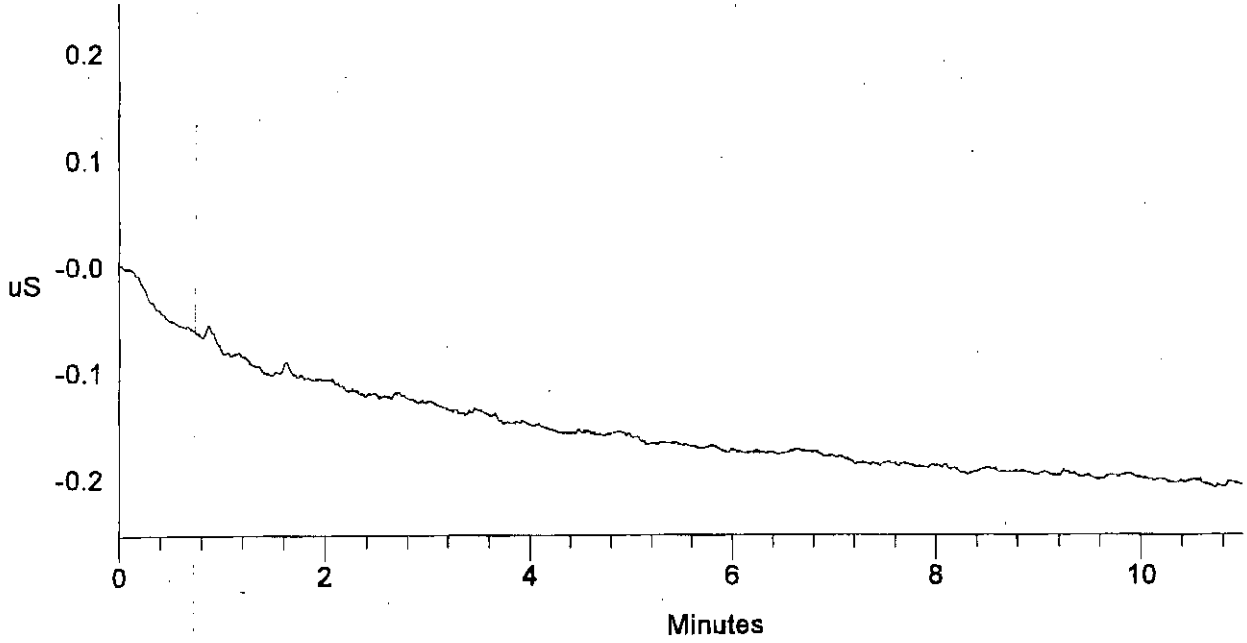
Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area	Reject
External	1	1	3300	5Hz	0.00	11.00		30

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

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

RJ McCown 8/8/99

File: 99080801.D01 Sample: CCB



SIGNATURE ABOVE REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 113 TO 119.

08/08/99 10:54 FAX 3721143 2B HALL 002

Sample Name: LCS-INST Date: 08/08/1999 07:27:27
Data File : C:\DX\DATA\99080801.D02
Method : C:\DX\METHOD\KIT.MET
ACI Address: 1 System: 1 Inject#: 2 Detector:CDM-1
Analyst : Column: AG4A/AS4A anion column

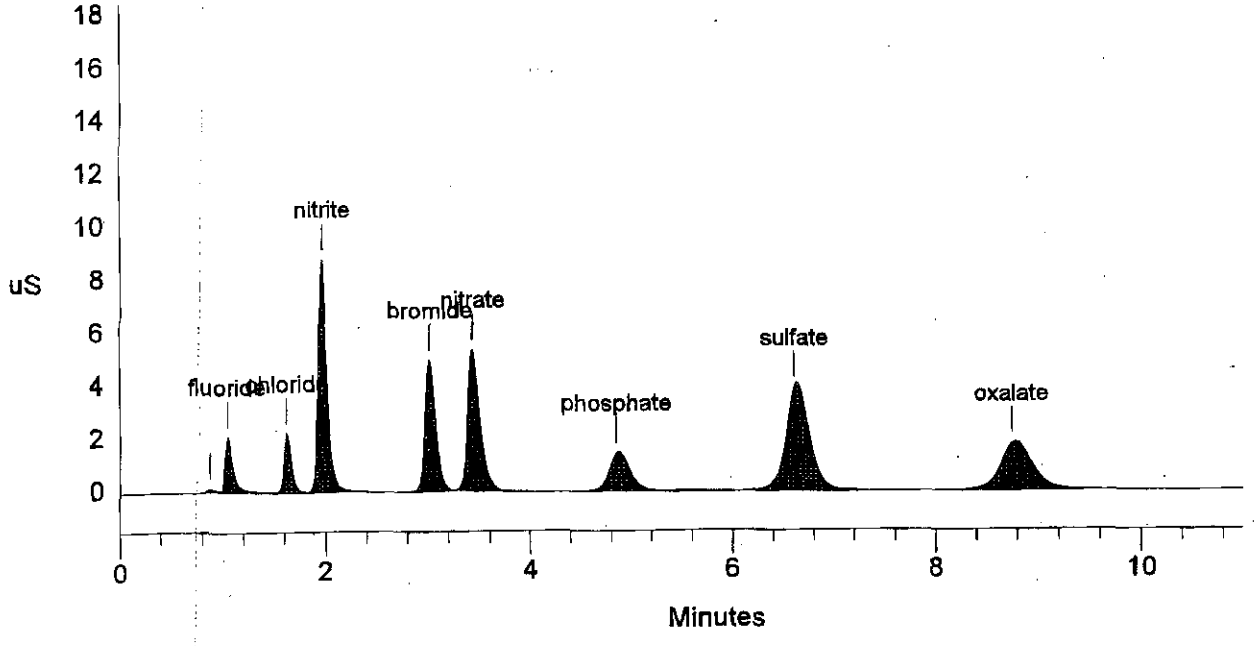
Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area Reject
External	1	101	3300	5Hz	0.00	11.00	30

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.88		0.000	116	569	2	
2	1.05	fluoride	62.481	2070	11098	2	0.64
3	1.62	chloride	78.510	2209	10888	1	0.83
4	1.97	nitrite	519.845	8784	49325	1	1.03
5	3.01	bromide	568.080	4954	35463	1	2.15
6	3.43	nitrate	534.665	5345	44862	1	1.88
7	4.85	phosphate	547.945	1458	21633	1	4.00
8	6.61	sulfate	641.541	3932	66098	1	6.90
9	8.75	oxalate	528.065	1820	41764	1	7.89
		Totals	3481.132	30688	281700		

•100mL – 10mL RJ McCown 8/8/99

File: 99080801.D02 Sample: LCS-INST



08/08/99 10:55 FAX 3721143 2B HALL 003

```
==================================================================================
| Sample Name: CCV                                  Date: 08/08/1999 07:44:57      |
| Data File  : C:\DX\DATA\99080801.D03                                             |
| Method     : C:\DX\METHOD\KIT.MET                                                |
| ACI Address: 1  System: 1  Inject#: 3                          Detector:CDM-1    |
| Analyst    :                     Column: AG4A/AS4A anion column                  |
==================================================================================
```

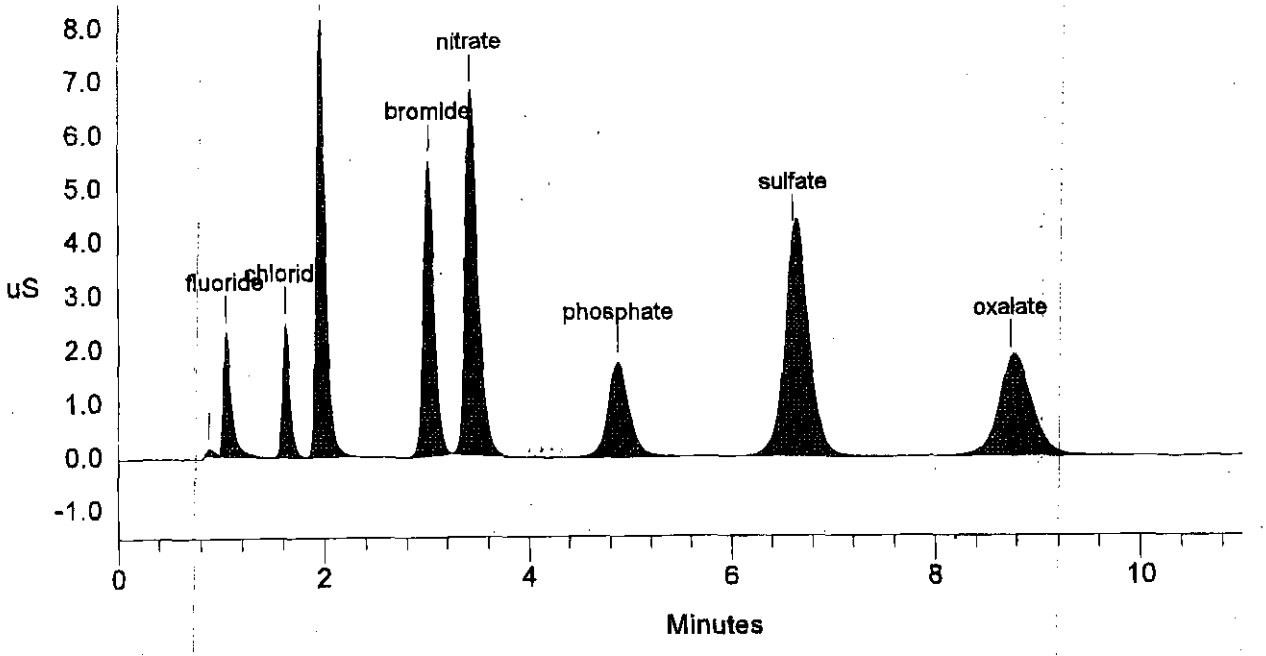
Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area Reject
External	1	101	3300	5Hz	0.00	11.00	30

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.89		0.000	125	603	2	
2	1.05	fluoride	69.867	2297	12437	2	0.64
3	1.63	chloride	87.358	2490	12129	1	1.24
4	1.97	nitrite	495.142	8179	46962	1	1.03
5	3.01	bromide	608.205	5494	38021	1	2.15
6	3.42	nitrate	689.241	6799	58064	1	1.48
7	4.88	phosphate	634.155	1775	25104	1	4.57
8	6.61	sulfate	687.714	4200	70946	1	6.90
9	8.75	oxalate	530.553	1847	41962	1	7.89
		Totals	3802.236	33208	306229		

.100mL - 10mL DJMcCown 8/8/99

File: 99080801.D03 Sample: CCV



08/08/99 10:55 FAX 3721143 2B HALL 004

```
==================================================================================
| Sample Name: S99T001344 SAMPLE                Date: 08/08/1999 10:20:06        |
| Data File  : C:\DX\DATA\99080801.D07                                           |
| Method     : C:\DX\METHOD\KIT.MET                                              |
| ACI Address: 1  System: 1  Inject#: 7                      Detector:CDM-1      |
| Analyst    :                  Column: AG4A/AS4A anion column                  |
==================================================================================
```

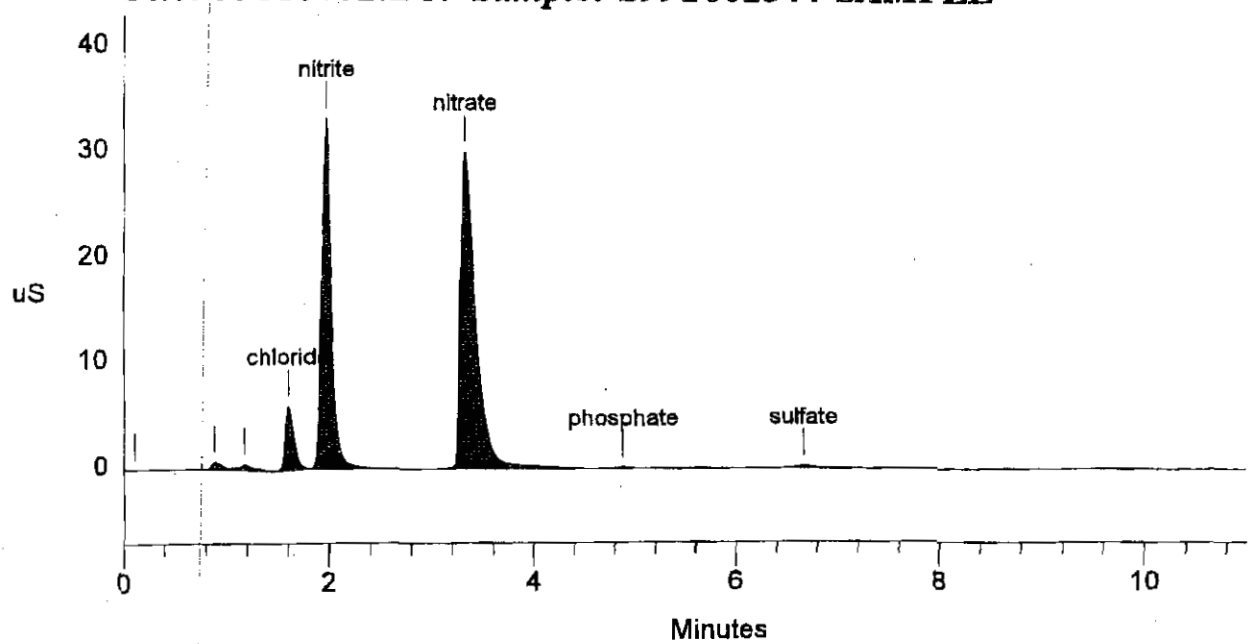
Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area	Reject
External	1	4141	3300	5Hz	0.00	11.00		30

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.11		0.000	41	119	1	
2	0.89		0.000	699	4659	2	
3	1.17		0.000	569	5957	2	
4	1.60	chloride	10157.540	6068	35127	1	-0.41
5	1.97	nitrite	88696.968	33149	210982	1	1.03
6	3.32	nitrate	138994.840	30004	309242	1	-1.48
7	4.88	phosphate	1350.438	113	1280	1	4.57
8	6.67	sulfate	2123.567	269	5252	1	7.76
		Totals	241323.354	70911	572619		

·100mL - 10mL - ·250mL - 10mL

File: 99080801.D07 Sample: S99T001344 SAMPLE



```
==================================================================================
| Sample Name: S99T001344 DUPLICATE          Date: 08/08/1999 10:34:05            |
| Data File  : C:\DX\DATA\99080801.D08                                            |
| Method     : C:\DX\METHOD\KIT.MET                                               |
| ACI Address: 1  System: 1  Inject#: 8                    Detector:CDM-1         |
| Analyst    :                  Column: AG4A/AS4A anion column                   |
==================================================================================
```

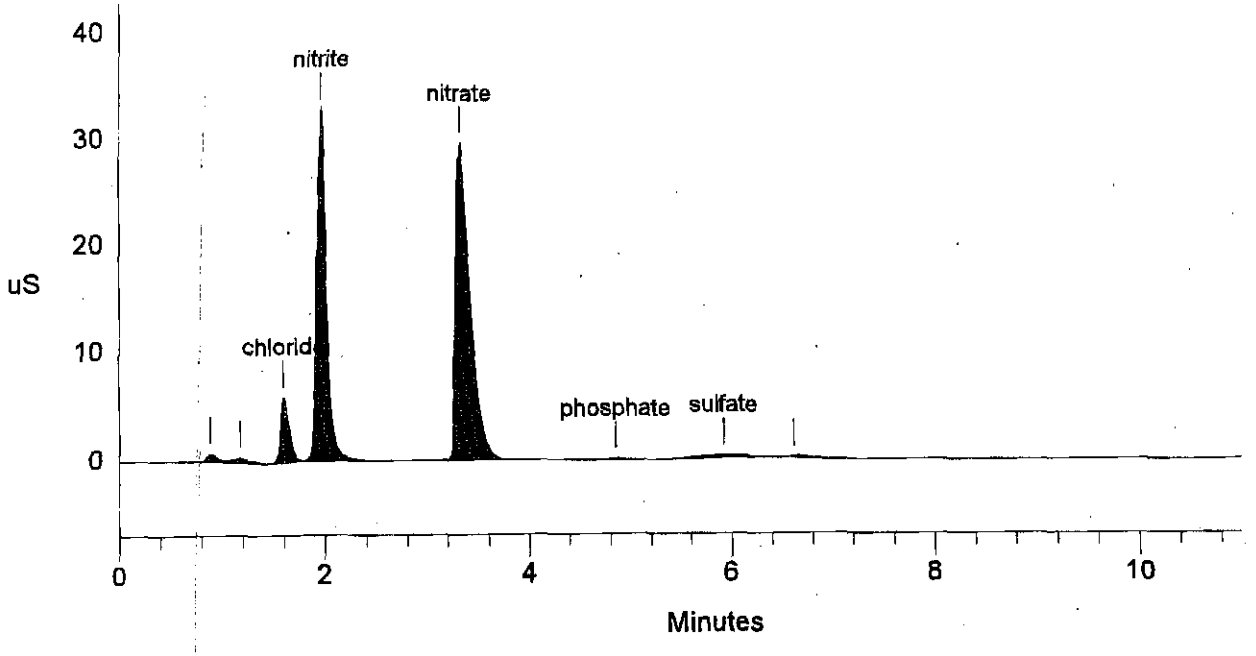
Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area	Reject
External	1	4141	3300	5Hz	0.00	11.00		30

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.89		0.000	700	4497	2	
2	1.17		0.000	439	5211	2	
3	1.60	chloride	10330.567	6038	35746	1	-0.41
4	1.97	nitrite	88760.773	32985	211139	1	1.03
5	3.31	nitrate	131882.415	29750	291734	1	-1.68
6	4.85	phosphate	1557.712	112	1477	1	4.00
7	5.92	sulfate	3924.730	286	9719	1	-4.31
8	6.61		0.000	162	958	1	
		Totals	236456.197	70471	560481		

.100 mL - 10 mL - .250 mL - 10 mL

File: 99080801.D08 Sample: S99T001344 DUPLICATE



```
==================================================================================
| Sample Name: S99T001345 SAMPLE                Date: 08/08/1999 10:47:23        |
| Data File  : C:\DX\DATA\99080801.D09                                           |
| Method     : C:\DX\METHOD\KIT.MET                                              |
| ACI Address: 1  System: 1  Inject#: 9                      Detector:CDM-1      |
| Analyst    :                  Column: AG4A/AS4A anion column                  |
==================================================================================
```

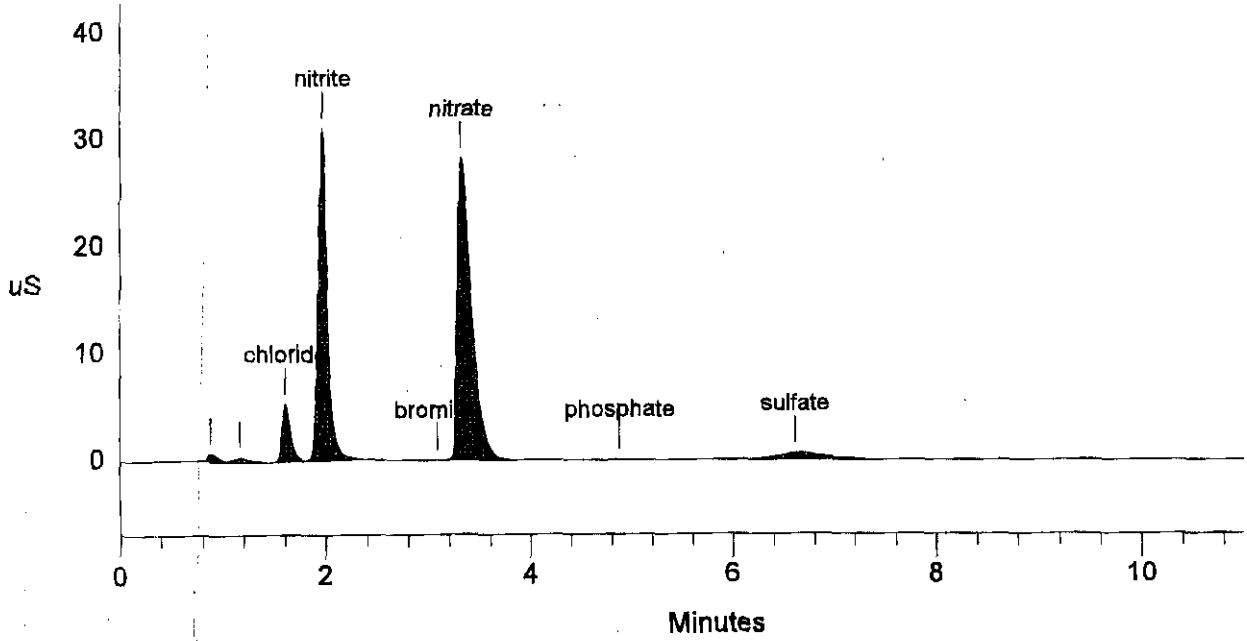
Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area	Reject
External	1	4141	3300	5Hz	0.00	11.00		30

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.89		0.000	692	4676	2	
2	1.17		0.000	443	5020	2	
3	1.61	chloride	8895.769	5383	30637	1	0.00
4	1.97	nitrite	81370.046	31073	192954	1	1.03
5	3.09	bromide	32.061	21	48	1	4.63
6	3.32	nitrate	124458.985	28283	273695	1	-1.48
7	4.88	phosphate	1708.781	112	1620	1	4.57
8	6.61	sulfate	9674.149	661	24045	1	6.90
		Totals	226139.790	66668	532694		

.100mL - 10mL - .250mL - 10mL Rxn

File: 99080801.D09 Sample: S99T001345 SAMPLE



```
==================================================================================
| Sample Name: S99T001345 DUPLICATE          Date: 08/08/1999 11:03:14            |
| Data File  : C:\DX\DATA\99080801.D10                                            |
| Method     : C:\DX\METHOD\KIT.MET                                               |
| ACI Address: 1  System: 1  Inject#: 10                   Detector:CDM-1         |
| Analyst    :                 Column: AG4A/AS4A anion column                     |
==================================================================================
```

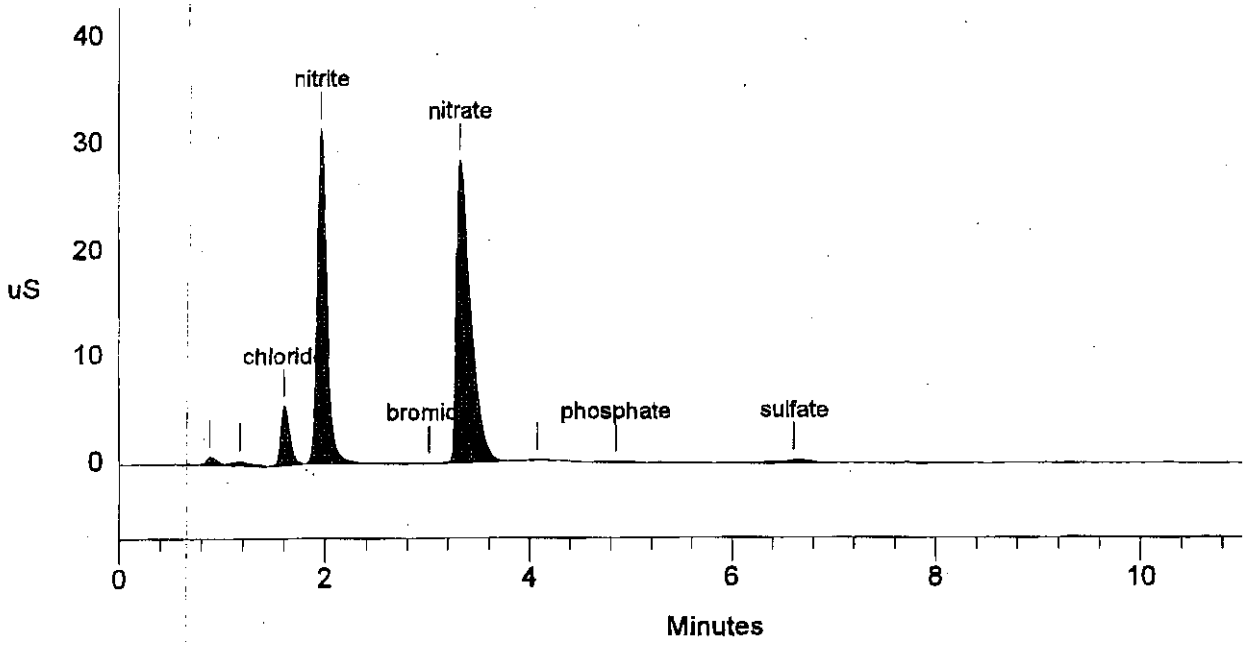
Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area	Reject
External	1	4141	3300	5Hz	0.00	11.00		30

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.89		0.000	689	4572	2	
2	1.17		0.000	441	5005	2	
3	1.61	chloride	9004.707	5451	31023	1	0.00
4	1.97	nitrite	83655.884	31393	198566	1	1.03
5	3.01	bromide	26.439	14	39	1	2.15
6	3.32	nitrate	123695.135	28358	271852	1	-1.48
7	4.07		0.000	28	334	1	
8	4.85	phosphate	678.556	69	643	1	4.00
9	6.61	sulfate	1948.520	272	4819	1	6.90
		Totals	219009.241	66713	516854		

.100mL - 10mL - .250mL - 10mL PSC

File: 99080801.D10 Sample: S99T001345 DUPLICATE



08/08/99 10:56 FAX 3721143 2B HALL 010

LABCORE Completed Worklist Report for Worklist# 30715

Analyst: jds **Instrument:** IC40S1 **Book#:** 82N21E

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

Worklist Comment: S-109 RERUN (POOR RPD) DF=4141 OR 2121 JHW

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
1	CCB		0	@IC-QC	F	QC	1	<1.20e-2		ug/mL
1	CCB		0	@IC-QC	CL	QC	1	<1.70e-2		ug/mL
1	CCB		0	@IC-QC	NO2	QC	1	<1.08e-1		ug/mL
1	CCB		0	@IC-QC	BR	QC	1	<1.25e-1		ug/mL
1	CCB		0	@IC-QC	NO3	QC	1	<1.39e-1		ug/mL
1	CCB		0	@IC-QC	PO4	QC	1	<1.20e-1		ug/mL
1	CCB		0	@IC-QC	SO4	QC	1	<1.38e-1		ug/mL
1	CCB		0	@IC-QC	OXALATE2	QC	1	<1.05e-1		ug/mL
2	LCS-INST		0	@IC-QC	F	QC	5.84e1	5.85e+01	100.171	% Recovery
2	LCS-INST		0	@IC-QC	CL	QC	8.06e1	7.94e+01	98.511	% Recovery
2	LCS-INST		0	@IC-QC	NO2	QC	5.48e2	5.17e+02	94.343	% Recovery
2	LCS-INST		0	@IC-QC	BR	QC	5.76e2	5.63e+02	97.743	% Recovery
2	LCS-INST		0	@IC-QC	NO3	QC	5.84e2	5.48e+02	93.836	% Recovery
2	LCS-INST		0	@IC-QC	PO4	QC	5.44e2	5.37e+02	98.713	% Recovery
2	LCS-INST		0	@IC-QC	SO4	QC	6.42e2	6.47e+02	100.779	% Recovery
2	LCS-INST		0	@IC-QC	OXALATE2	QC	5.17e2	5.39e+02	104.255	% Recovery
3	CCV		0	@IC-QC	F	QC	6.40e1	6.76e+01	105.625	% Recovery
3	CCV		0	@IC-QC	CL	QC	8.95e1	9.17e+01	102.458	% Recovery
3	CCV		0	@IC-QC	NO2	QC	5.25e2	4.85e+02	92.381	% Recovery
3	CCV		0	@IC-QC	BR	QC	6.30e2	6.17e+02	97.937	% Recovery
3	CCV		0	@IC-QC	NO3	QC	7.00e2	7.14e+02	102.000	% Recovery
3	CCV		0	@IC-QC	PO4	QC	6.35e2	6.23e+02	98.110	% Recovery
3	CCV		0	@IC-QC	SO4	QC	7.00e2	7.11e+02	101.571	% Recovery
3	CCV		0	@IC-QC	OXALATE2	QC	5.30e2	5.28e+02	99.623	% Recovery
4	SAMPLE	S99T001343	0	@IC-01	PO4-02	LIQUID	N/A	1.517e+03	254.500	ug/mL
4	SAMPLE	S99T001343	0	@IC-01	SO4-02	LIQUID	N/A	1.516e+03	292.700	ug/mL
5	DUP	S99T001343	0	@IC-01	F-02	LIQUID	?	<2.55e1		RPD
5	DUP	S99T001343	0	@IC-01	CL-02	LIQUID	?	8.96e+03		RPD
5	DUP	S99T001343	0	@IC-01	NO2-02	LIQUID	?	8.12e+04		RPD
5	DUP	S99T001343	0	@IC-01	BR-02	LIQUID	?	1.32e+05		RPD
5	DUP	S99T001343	0	@IC-01	NO3-02	LIQUID	?	<2.95e2		RPD
5	DUP	S99T001343	0	@IC-01	PO4-02	LIQUID	1.52e+03	1.63e+03	6.984	RPD
5	DUP	S99T001343	0	@IC-01	SO4-02	LIQUID	1.52e+03	1.58e+03	3.871	RPD
5	DUP	S99T001343	0	@IC-01	OXALATE2	LIQUID	?	<2.23e2		RPD
6	SAMPLE	S99T001344	0	@IC-01	SO4-02	LIQUID	N/A	1.590e+03	292.700	ug/mL
7	DUP	S99T001344	0	@IC-01	F-02	LIQUID	?	<2.55e1		RPD
7	DUP	S99T001344	0	@IC-01	CL-02	LIQUID	?	9.48e+03		RPD
7	DUP	S99T001344	0	@IC-01	NO2-02	LIQUID	?	7.81e+04		RPD
7	DUP	S99T001344	0	@IC-01	BR-02	LIQUID	?	1.34e+05		RPD
7	DUP	S99T001344	0	@IC-01	NO3-02	LIQUID	?	<2.95e2		RPD
7	DUP	S99T001344	0	@IC-01	PO4-02	LIQUID	?	1.82e+04		RPD

11/15/99

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

LABCORE Completed Worklist Report for Worklist# 30715

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
7	DUP	S99T001344	0	@IC-01	SO4-02	LIQUID	1.59e+03	1.61e+03	1.250	RPD
7	DUP	S99T001344	0	@IC-01	OXALATE2	LIQUID	?	<2.23e2		RPD
8	SAMPLE	S99T001345	0	@IC-01	PO4-02	LIQUID	N/A	1.709e+03	254.500	ug/mL
8	SAMPLE	S99T001345	0	@IC-01	SO4-02	LIQUID	N/A	2.081e+03	292.700	ug/mL
9	DUP	S99T001345	0	@IC-01	F-02	LIQUID	?	<2.55e1		RPD
9	DUP	S99T001345	0	@IC-01	CL-02	LIQUID	?	9.75e+03		RPD
9	DUP	S99T001345	0	@IC-01	NO2-02	LIQUID	?	8.51e+04		RPD
9	DUP	S99T001345	0	@IC-01	BR-02	LIQUID	?	1.44e+05		RPD
9	DUP	S99T001345	0	@IC-01	NO3-02	LIQUID	?	<2.95e2		RPD
9	DUP	S99T001345	0	@IC-01	PO4-02	LIQUID	1.71e+03	1.86e+03	8.403	RPD
9	DUP	S99T001345	0	@IC-01	SO4-02	LIQUID	2.08e+03	2.08e+03	0.000	RPD
9	DUP	S99T001345	0	@IC-01	OXALATE2	LIQUID	?	<2.23e2		RPD

Final page for worklist# 30715

Analyst Signature Date

Analyst Signature Date

Reviewer Signature Date

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

LABCORE Data Entry Template for Worklist# 30715

Analyst: JDS **Instrument:** IC 4051 **Book#** 83N21E ~~82N21E~~

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

Worklist Comment: S-109 RERUN (POOR RPD) DF=4141 OR 2121 JHW

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~~	~~S99T001343~~	~~0~~		~~@IC-01~~	~~LIQUID~~	~~99000300~~	~~S-109 GRAB~~
	Analytes Requested:				PO4-02	, SO4-02		
~~5~~	~~DUP~~	~~S99T001343~~	~~0~~		~~@IC-01~~	~~LIQUID~~		
6	SAMPLE	S99T001344	0		@IC-01	LIQUID	99000300	S-109 GRAB
	Analytes Requested:				SO4-02			
7	DUP	S99T001344	0		@IC-01	LIQUID		
8	SAMPLE	S99T001345	0		@IC-01	LIQUID	99000300	S-109 GRAB
	Analytes Requested:				PO4-02	, SO4-02		
9	DUP	S99T001345	0		@IC-01	LIQUID		

~~[illegible] 8/15/99~~

Final page for worklist # 30715

[illegible] 8/15/99

Signature **Date** **Signature** **Date**

Data Entry Comments:
uploaded 8-16-99 validated 8/16/99 [illegible]
[illegible]
30715AUG.CSV

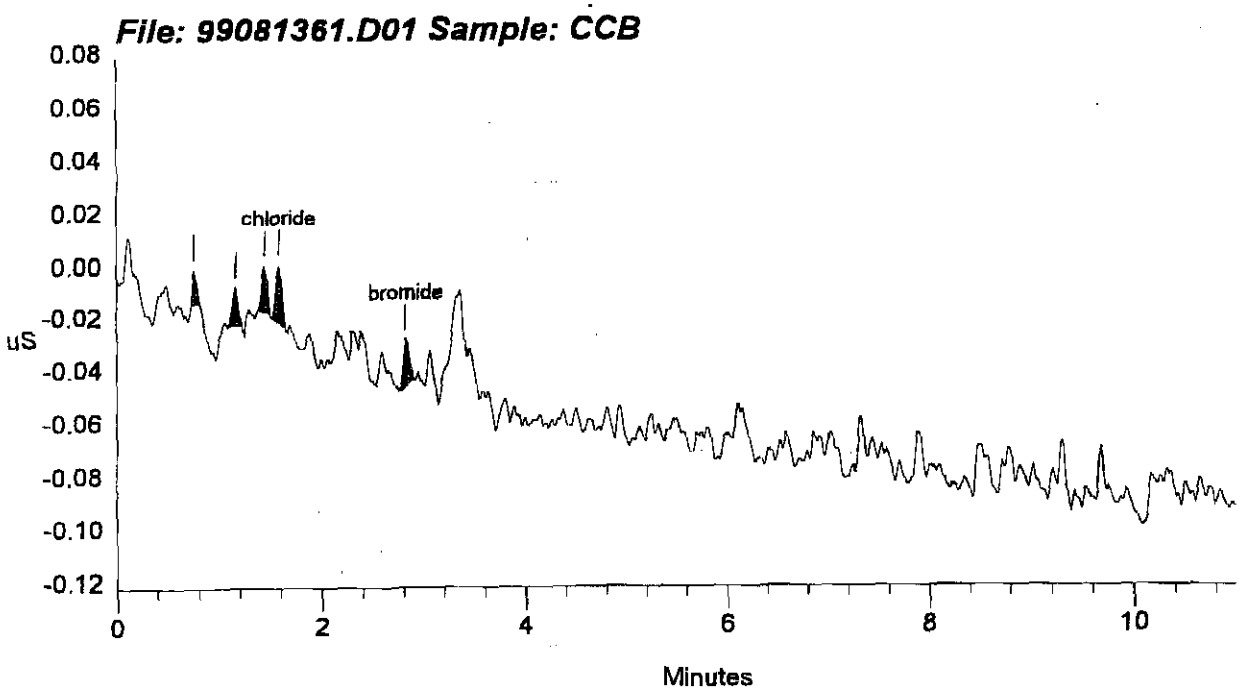
S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

Sample Name: CCB	Date: 08/15/1999 09:14:34
Data File : C:\DX\DATA\99081361.D01	
Method : C:\DX\METHOD\KIT.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	30

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.76		0.000	13	37	1	
2	1.17		0.000	14	56	1	
3	1.45		0.000	17	65	1	
4	1.59	chloride	0.006	21	90	1	-1.24
5	2.83	bromide	0.011	17	71	1	-4.18
		Totals	0.018	81	318		



8/15/99

SIGNATURE ABOVE REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 123 TO 129.

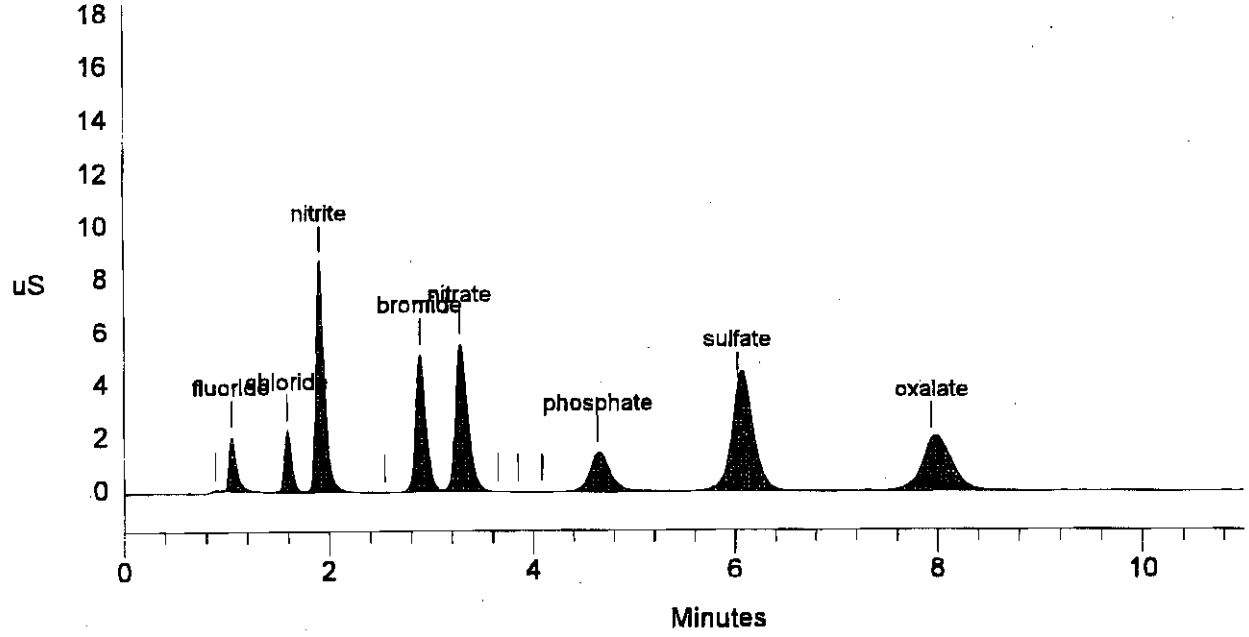
Sample Name: LCS 83N21E	Date: 08/15/1999 09:32:12
Data File : C:\DX\DATA\99081361.D02	
Method : C:\DX\METHOD\KIT.MET	
ACI Address: 1 System: 1 Inject#: 2	Detector:CDM-1
Analyst : Column: AG4A/AS4A anion column	

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area	Reject
External	1	101	3300	5Hz	0.00	11.00		30

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.89		0.000	47	144	1	
2	1.05	fluoride	58.457	2012	10371	1	0.64
3	1.59	chloride	79.393	2282	11012	1	-1.24
4	1.91	nitrite	516.968	8681	49050	1	-2.05
5	2.54		0.000	18	53	1	
6	2.89	bromide	562.788	5162	35127	1	-2.15
7	3.28	nitrate	547.531	5550	45957	1	-2.67
8	3.65		0.000	26	69	1	
9	3.85		0.000	26	94	1	
10	4.09		0.000	34	186	1	
11	4.64	phosphate	537.452	1452	21211	1	-0.57
12	6.03	sulfate	647.154	3895	66687	1	-2.59
13	7.95	oxalate	539.379	1943	42665	1	-1.97
		Totals	3489.121	31127	282624		

File: 99081361.D02 Sample: LCS 83N21E



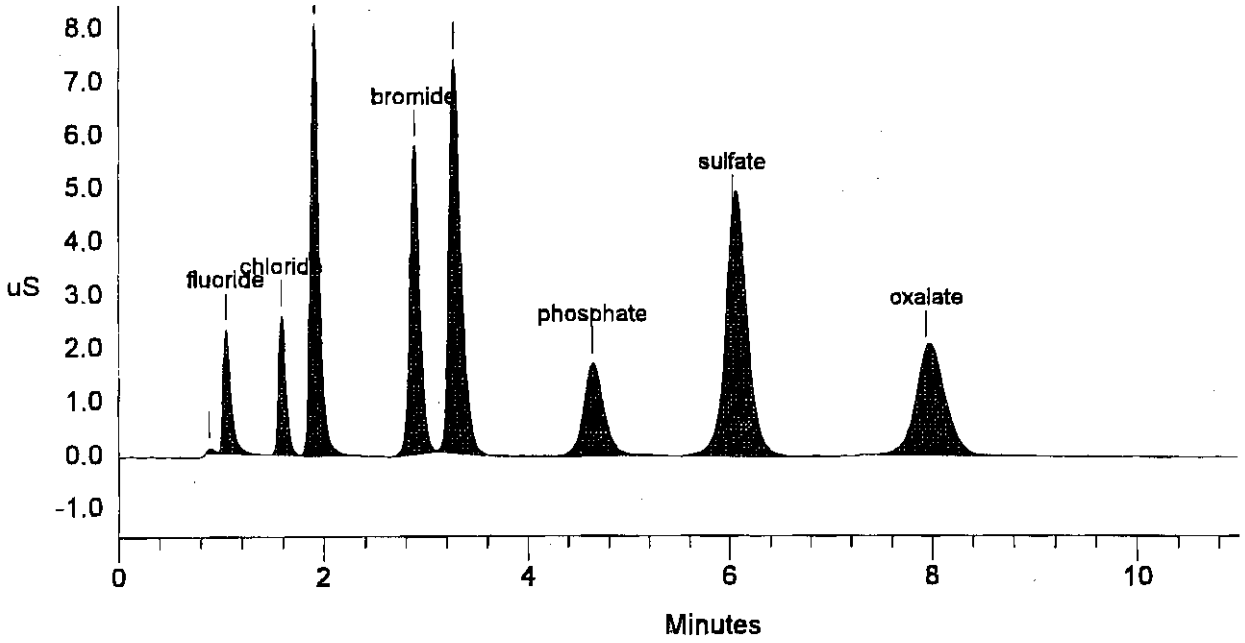
Sample Name: CCV 82N21E Date: 08/15/1999 09:59:33
Data File : C:\DX\DATA\99081361.D03
Method : C:\DX\METHOD\KIT.MET
ACI Address: 1 System: 1 Inject#: 3 Detector:CDM-1
Analyst : Column: AG4A/AS4A anion column

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area Reject
External	1	101	3300	5Hz	0.00	11.00	30

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.89		0.000	89	386	2	
2	1.05	fluoride	67.625	2321	12030	2	0.64
3	1.59	chloride	91.715	2599	12741	1	-1.24
4	1.91	nitrite	484.771	8086	45971	1	-2.05
5	2.88	bromide	617.167	5772	38593	1	-2.37
6	3.27	nitrate	714.370	7388	60221	1	-3.07
7	4.64	phosphate	623.078	1749	24657	1	-0.57
8	6.03	sulfate	710.820	4594	73377	1	-2.59
9	7.95	oxalate	528.051	2045	41763	1	-1.97
		Totals	3837.597	34642	309738		

File: 99081361.D03 Sample: CCV 82N21E



HNF-1679 REV. 0

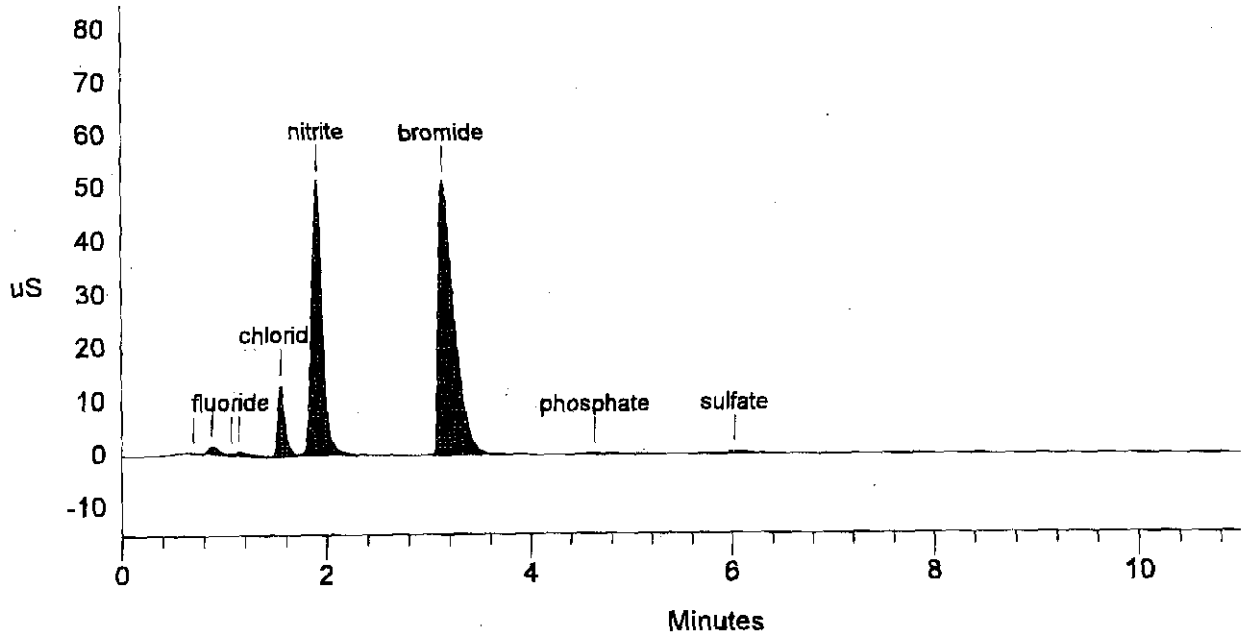
Sample Name: S99T001344 Date: 08/15/1999 13:39:37
Data File : C:\DX\DATA\99081361.D07
Method : C:\DX\METHOD\KIT.MET
ACI Address: 1 System: 1 Inject#: 7 Detector:CDM-1
Analyst : Column: AG4A/AS4A anion column

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area	Reject
External	1	2121	3300	5Hz	0.00	11.00		30

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.70		0.000	138	1560	2	
2	0.89		0.000	1629	10731	2	
3	1.07	fluoride	227.915	489	1899	2	3.21
4	1.15		0.000	783	7721	2	
5	1.55	chloride	9299.651	13318	64543	1	-3.32
6	1.91	nitrite	78128.480	51370	373271	1	-2.05
7	3.13	bromide	132967.870	51189	545841	1	6.21
8	4.64	phosphate	1557.555	200	2886	1	-0.57
9	6.03	sulfate	1589.891	438	7682	1	-2.59
		Totals	223771.362	119554	1016135		

File: 99081361.D07 Sample: S99T001344



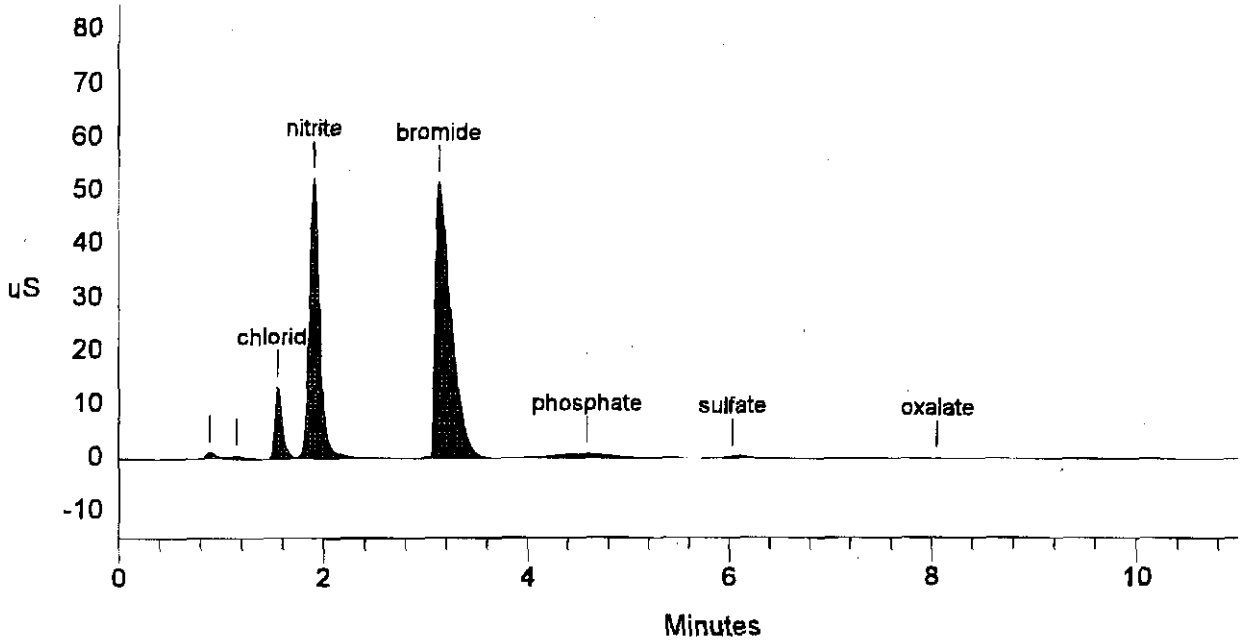
Sample Name: S99T001344DUP Date: 08/15/1999 13:52:59
Data File : C:\DX\DATA\99081361.D08
Method : C:\DX\METHOD\KIT.MET
ACI Address: 1 System: 1 Inject#: 8 Detector:CDM-1
Analyst : Column: AG4A/AS4A anion column

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area Reject
External	1	2121	3300	5Hz	0.00	11.00	30

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.89		0.000	1123	6907	2	
2	1.15		0.000	715	8011	2	
3	1.55	chloride	9475.073	13339	65842	1	-3.32
4	1.91	nitrite	78094.957	52370	373099	1	-2.05
5	3.13	bromide	133651.070	51629	550602	1	5.99
6	4.59	phosphate	18162.211	852	34489	1	-1.71
7	6.03	sulfate	1612.548	451	7792	1	-2.59
8	8.05	oxalate	145.557	22	545	1	-0.66
		Totals	241141.417	120501	1047287		

File: 99081361.D08 Sample: S99T001344DUP



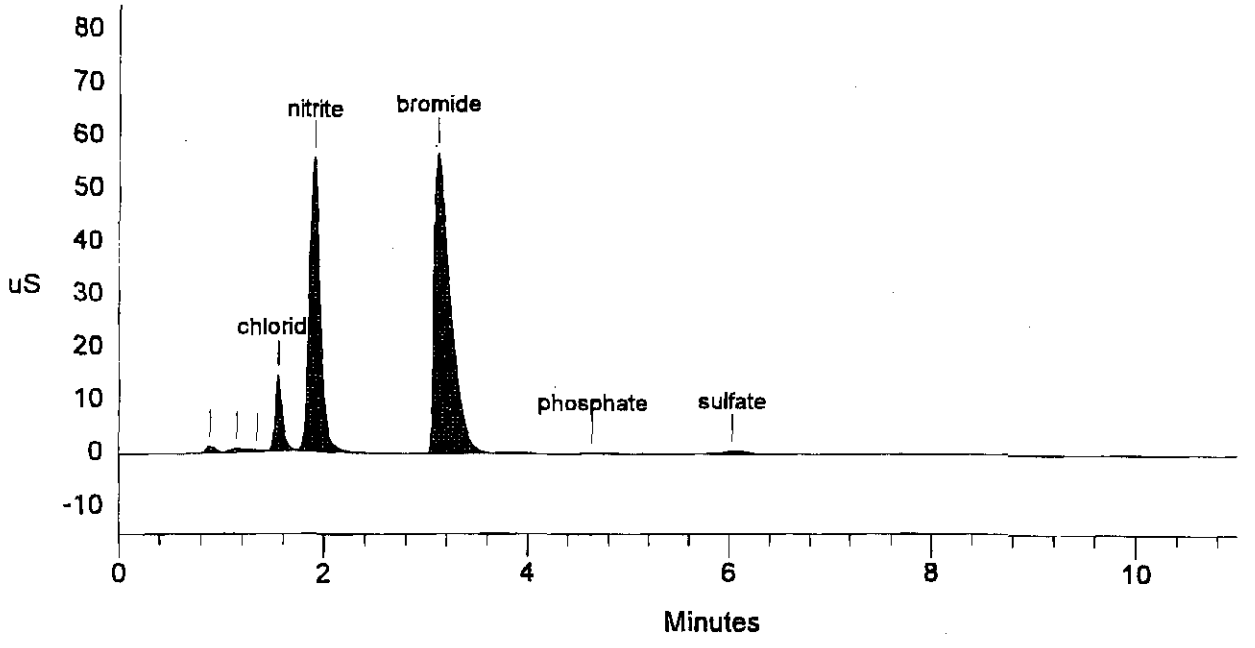
Sample Name: S99T001345~~DUP~~ SAM Date: 08/15/1999 14:22:12
Data File : C:\DX\DATA\99081361.D10
Method : C:\DX\METHOD\KIT.MET
ACI Address: 1 System: 1 Inject#: 10 Detector:CDM-1
Analyst : Column: AG4A/AS4A anion column

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area	Reject
External	1	2121	3300	5Hz	0.00	11.00		30

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.89		0.000	1196	6799	1	
2	1.15		0.000	740	5946	2	
3	1.35		0.000	244	1677	2	
4	1.55	chloride	9638.099	14143	67052	1	-3.32
5	1.91	nitrite	84054.805	55442	403767	1	-2.05
6	3.11	bromide	143217.447	56845	624665	1	5.54
7	4.64	phosphate	1708.782	220	3167	1	-0.57
8	6.03	sulfate	2080.908	598	10061	1	-2.59
		Totals	240700.040	129430	1123133		

File: 99081361.D10 Sample: S99T001345DUP



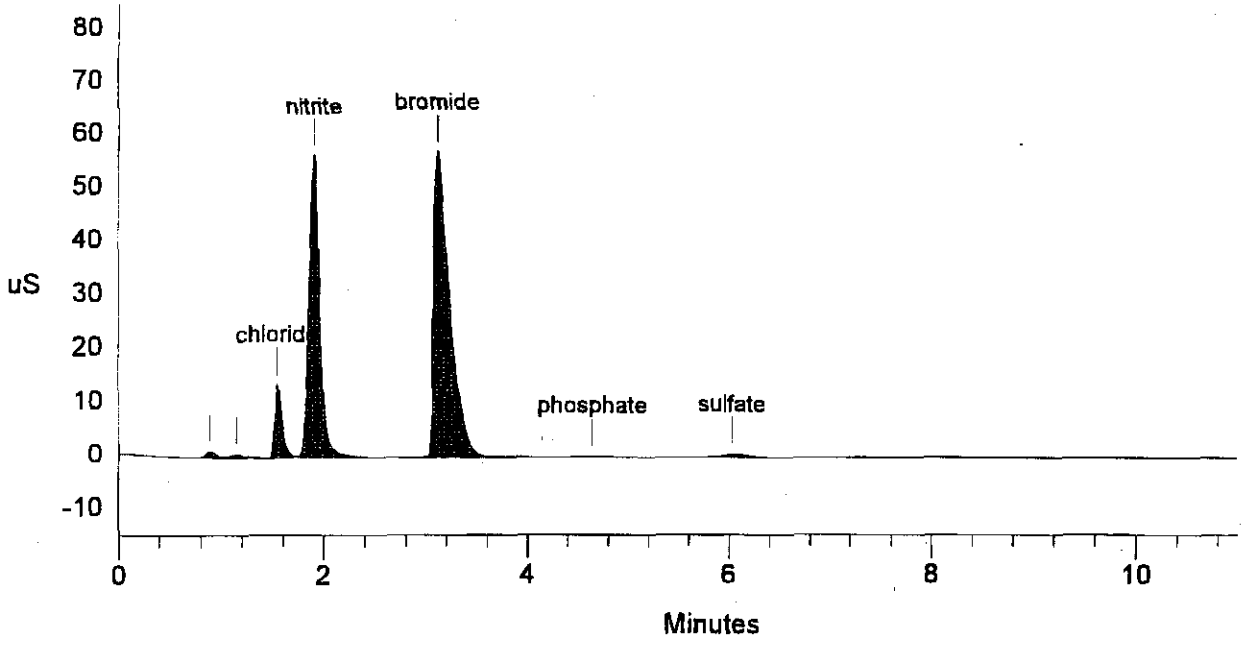
Sample Name: S99T001345DUP Date: 08/15/1999 14:40:05
Data File : C:\DX\DATA\99081361.D11
Method : C:\DX\METHOD\KIT.MET
ACI Address: 1 System: 1 Inject#: 11 Detector:CDM-1
Analyst : Column: AG4A/AS4A anion column

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area Reject
External	1	2121	3300	5Hz	0.00	11.00	30

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.89		0.000	1321	8126	2	
2	1.15		0.000	848	9120	2	
3	1.55	chloride	9747.263	13717	67864	1	-3.73
4	1.91	nitrite	85074.561	56333	409050	1	-2.05
5	3.11	bromide	143600.013	57171	627989	1	5.54
6	4.64	phosphate	1858.437	227	3445	1	-0.57
7	6.03	sulfate	2077.359	587	10044	1	-2.59
		Totals	242357.634	130204	1135638		

File: 99081361.D11 Sample: S99T001345DUP



LABCORE Completed Worklist Report for Worklist# 31576

Analyst: adp **Instrument:** IC40S1 **Book#:** 95N21D

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

Worklist Comment: S-109 FOR @IC-01, RLC

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
1	CCB		0	@IC-QC	F	QC	1	<1.20e-2		ug/mL
1	CCB		0	@IC-QC	CL	QC	1	<1.70e-2		ug/mL
1	CCB		0	@IC-QC	NO2	QC	1	<1.08e-1		ug/mL
1	CCB		0	@IC-QC	BR	QC	1	<1.25e-1		ug/mL
1	CCB		0	@IC-QC	NO3	QC	1	<1.39e-1		ug/mL
1	CCB		0	@IC-QC	PO4	QC	1	<1.20e-1		ug/mL
1	CCB		0	@IC-QC	SO4	QC	1	<1.38e-1		ug/mL
1	CCB		0	@IC-QC	OXALATE2	QC	1	<1.05e-1		ug/mL
2	LCS-INST		0	@IC-QC	F	QC	6.40e1	6.16e+01	96.250	% Recovery
2	LCS-INST		0	@IC-QC	CL	QC	9.00e1	9.15e+01	101.667	% Recovery
2	LCS-INST		0	@IC-QC	NO2	QC	5.29e2	4.85e+02	91.682	% Recovery
2	LCS-INST		0	@IC-QC	BR	QC	6.25e2	5.96e+02	95.360	% Recovery
2	LCS-INST		0	@IC-QC	NO3	QC	6.90e2	7.24e+02	104.928	% Recovery
2	LCS-INST		0	@IC-QC	PO4	QC	6.35e2	6.24e+02	98.268	% Recovery
2	LCS-INST		0	@IC-QC	SO4	QC	6.90e2	6.69e+02	96.957	% Recovery
2	LCS-INST		0	@IC-QC	OXALATE2	QC	5.33e2	5.86e+02	109.944	% Recovery
3	CCV		0	@IC-QC	F	QC	6.35e1	6.03e+01	94.961	% Recovery
3	CCV		0	@IC-QC	CL	QC	8.75e1	8.76e+01	100.114	% Recovery
3	CCV		0	@IC-QC	NO2	QC	5.46e2	5.38e+02	98.535	% Recovery
3	CCV		0	@IC-QC	BR	QC	6.30e2	6.01e+02	95.397	% Recovery
3	CCV		0	@IC-QC	NO3	QC	7.00e2	6.81e+02	97.286	% Recovery
3	CCV		0	@IC-QC	PO4	QC	6.35e2	6.06e+02	95.433	% Recovery
3	CCV		0	@IC-QC	SO4	QC	6.90e2	6.86e+02	99.420	% Recovery
3	CCV		0	@IC-QC	OXALATE2	QC	5.16e2	5.40e+02	104.651	% Recovery
4	SAMPLE	S99T001346	0	@IC-01	F-02	LIQUID	N/A <	1.224e+02	122.400	ug/mL
4	SAMPLE	S99T001346	0	@IC-01	CL-02	LIQUID	N/A	9.201e+03	173.400	ug/mL
4	SAMPLE	S99T001346	0	@IC-01	NO2-02	LIQUID	N/A	8.340e+04	1102.000	ug/mL
4	SAMPLE	S99T001346	0	@IC-01	BR-02	LIQUID	N/A <	1.275e+03	1275.000	ug/mL
4	SAMPLE	S99T001346	0	@IC-01	NO3-02	LIQUID	N/A	1.313e+05	1418.000	ug/mL
4	SAMPLE	S99T001346	0	@IC-01	PO4-02	LIQUID	N/A	1.237e+03	1224.000	ug/mL
4	SAMPLE	S99T001346	0	@IC-01	SO4-02	LIQUID	N/A	1.641e+03	1408.000	ug/mL
4	SAMPLE	S99T001346	0	@IC-01	OXALATE2	LIQUID	N/A <	1.071e+03	1071.000	ug/mL
5	DUP	S99T001346	0	@IC-01	F-02	LIQUID	<1.22e2	<1.22e2		RPD
5	DUP	S99T001346	0	@IC-01	CL-02	LIQUID	9.20e+03	9.22e+03	0.217	RPD
5	DUP	S99T001346	0	@IC-01	NO2-02	LIQUID	8.34e+04	8.32e+04	0.240	RPD
5	DUP	S99T001346	0	@IC-01	BR-02	LIQUID	<1.28e3	<1.28e3		RPD
5	DUP	S99T001346	0	@IC-01	NO3-02	LIQUID	1.31e+05	1.39e+05	5.926	RPD
5	DUP	S99T001346	0	@IC-01	PO4-02	LIQUID	1.24e+03	<1.22e3		RPD
5	DUP	S99T001346	0	@IC-01	SO4-02	LIQUID	1.64e+03	1.49e+03	9.585	RPD
5	DUP	S99T001346	0	@IC-01	OXALATE2	LIQUID	<1.07e3	<1.07e3		RPD
6	SPK	S99T001346	0	@IC-01	F-02	LIQUID	6.40e1	6.81e+01	106.406	% Recovery

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

LABCORE Completed Worklist Report for Worklist# 31576

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
6	SPK	S99T001346	0	@IC-01	CL-02	LIQUID	9.00e1	9.63e+01	107.000 %	Recovery
6	SPK	S99T001346	0	@IC-01	NO2-02	LIQUID	5.29e2	5.56e+02	105.104 %	Recovery
6	SPK	S99T001346	0	@IC-01	BR-02	LIQUID	6.25e2	5.92e+02	94.720 %	Recovery
6	SPK	S99T001346	0	@IC-01	NO3-02	LIQUID	6.90e2	7.91e+02	114.638 %	Recovery
6	SPK	S99T001346	0	@IC-01	PO4-02	LIQUID	6.35e2	6.18e+02	97.323 %	Recovery
6	SPK	S99T001346	0	@IC-01	SO4-02	LIQUID	6.90e2	6.70e+02	97.101 %	Recovery
6	SPK	S99T001346	0	@IC-01	OXALATE2	LIQUID	5.33e2	5.72e+02	107.317 %	Recovery

Final page for worklist# 31576

Analyst Signature **Date**

Analyst Signature **Date**

Jane M. Luge 11/2/99

Reviewer Signature **Date**

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

LABCORE Data Entry Template for Worklist# 31576

Analyst: ADP **Instrument:** IC 4051 **Book#** 95N21-D LCS
94N21-D CCV

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

Worklist Comment: S-109 FOR @IC-01, RLC

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	S99T001346	0		@IC-01	LIQUID	99000300	S-109 GRAB
	Analytes Requested:				BR-02, CL-02, F-02, NO2-02, NO3-02, OXALATE2, PO4-02, SO4-02			
5	DUP	S99T001346	0		@IC-01	LIQUID		
6	SPK	S99T001346	0		@IC-01	LIQUID		

Final page for worklist # 31576

Anthony Pennuto 10-29-99
Signature Date

Signature Date

Data Entry Comments:
uploaded 11-1-99 Validated 11/2/99 JM Fuge
John Worrell
31576OCT.CSV

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

HNF-1679 REV. 0

Data Reprocessed On 10/29/1999 03:32:49

Sample Name: 95N21-D LCS Date: 10/29/1999 03:09:41
Data File : C:\DX\DATA\99102941.D02
Method : C:\DX\METHOD\AUTOMEL.met
ACI Address: 1 System: 1 Inject#: 2 Detector:CDM-1
Analyst : Column: AG4A/AS4A anion column

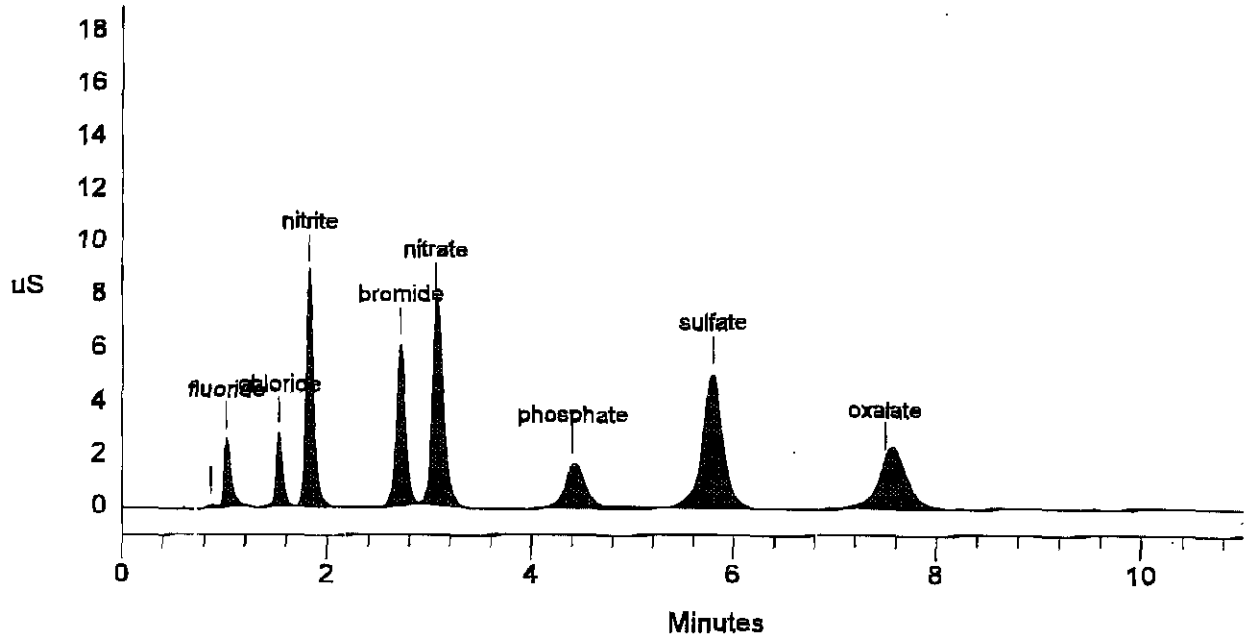
10-29-99

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area	Reject
External	1	101	3300	5Hz	0.00	11.00		30

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.87		0.000	112	467	2	
2	1.02	fluoride	61.626	2580	12139	2	-0.97
3	1.53	chloride	91.529	2792	12370	1	-2.55
4	1.82	nitrite	485.490	8908	46861	1	-3.53
5	2.71	bromide	595.501	6092	37451	1	-5.13
6	3.06	nitrate	723.912	7745	57817	1	0.00
7	4.41	phosphate	623.814	1686	24240	1	-4.62
8	5.79	sulfate	669.410	5118	71597	1	-3.61
9	7.50	oxalate	586.385	1899	46416	1	-5.42
		Totals	3837.667	36934	309357		

File: 99102941.D02 Sample: 95N21-D LCS



SIGNATURE ABOVE REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 133 TO 138.

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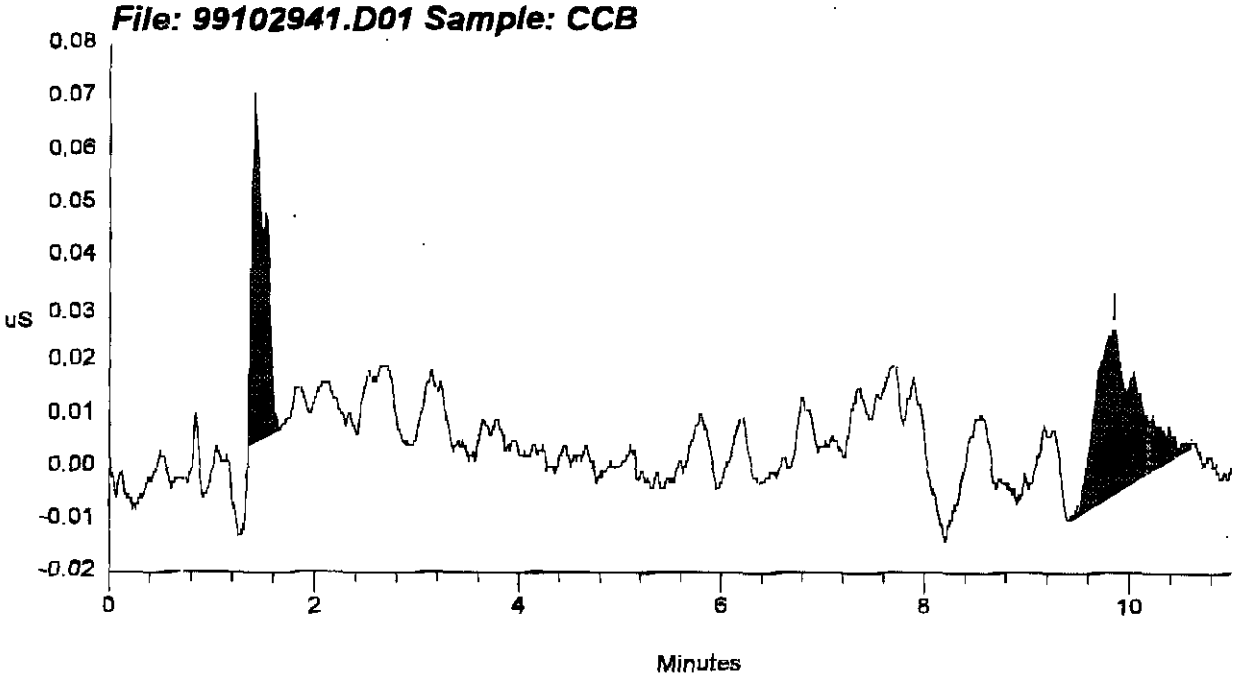
==================================================================================
| Sample Name: CCB                                  Date: 10/29/1999 02:56:01      |
| Data File  : C:\DX\DATA\99102941.D01                                             |
| Method     : C:\DX\METHOD\AUTOMEL.met                                            |
| 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	30

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	1.41		0.000	59	568	1	
2	9.85		0.000	31	883	1	
		Totals	0.000	90	1451		



HNE-1679 REV. 0

Data Reprocessed On 10/29/1999 03:33:57

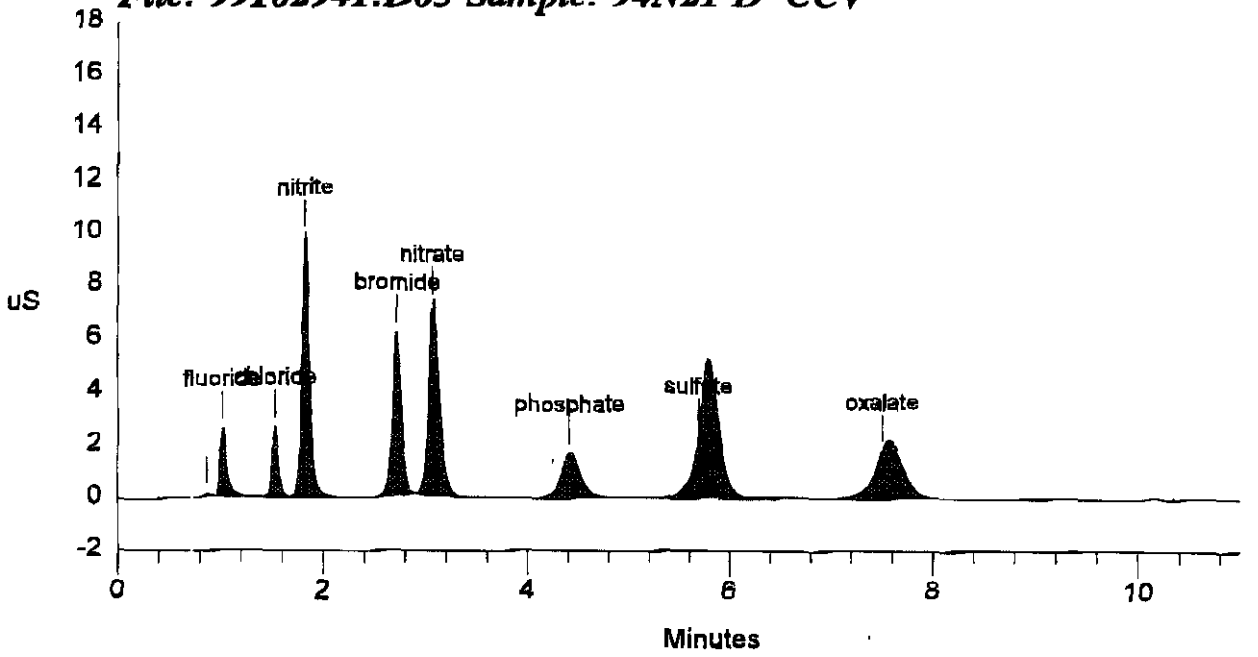
Sample Name: 94N21-D CCV Date: 10/29/1999 03:23:21
Data File : C:\DX\DATA\99102941.D03
Method : C:\DX\METHOD\AUTOMEL.met
ACI Address: 1 System: 1 Inject#: 3 Detector:CDM-1
Analyst : Column: AG4A/AS4A anion column

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area Reject
External	1	101	3300	5Hz	0.00	11.00	30

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.87		0.000	104	411	2	
2	1.02	fluoride	60.251	2550	11864	2	-0.97
3	1.53	chloride	87.586	2663	11828	1	-2.55
4	1.82	nitrite	538.132	9826	51982	1	-3.53
5	2.71	bromide	600.870	6151	37796	1	-5.13
6	3.06	nitrate	681.472	7185	54356	1	0.00
7	4.41	phosphate	605.777	1678	23526	1	-4.62
8	5.69	sulfate	685.898	2373	73396	1	-5.38
9	7.50	oxalate	540.015	1786	42722	1	-5.42
		Totals	3800.000	34316	307882		

File: 99102941.D03 Sample: 94N21-D CCV

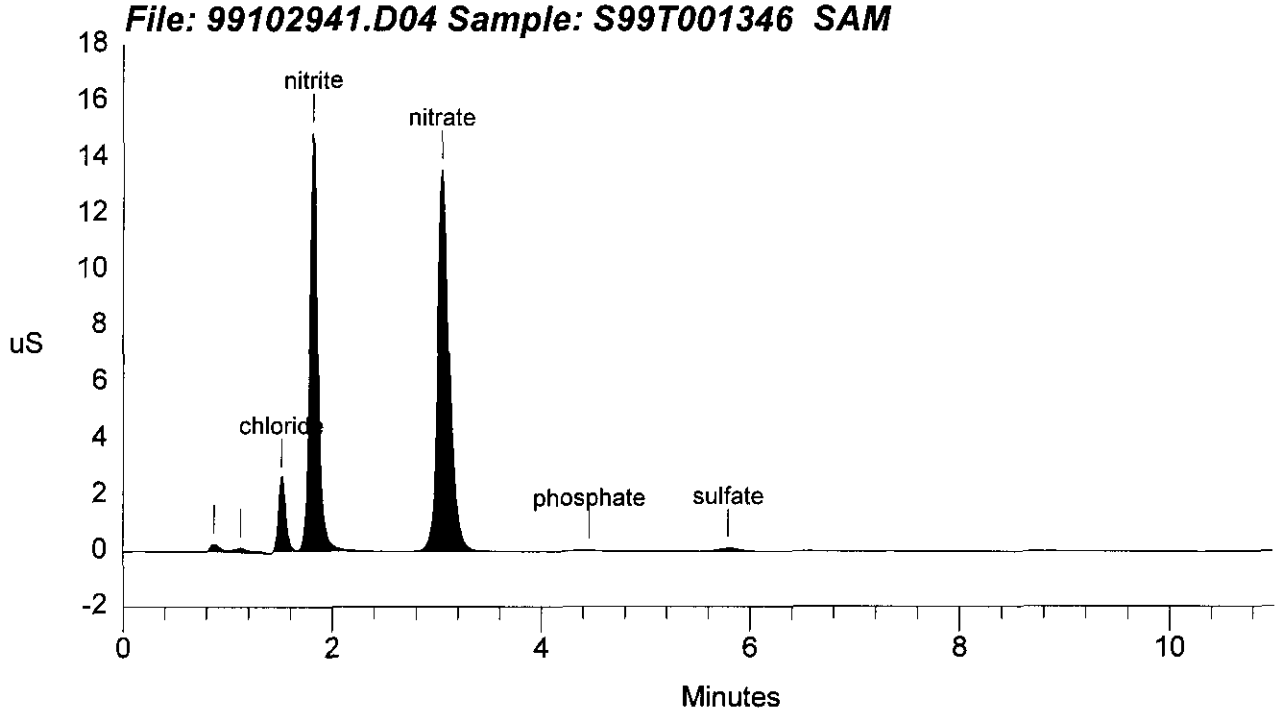


```
==========================================================================
| Sample Name: S99T001346  SAM                Date: 10/29/1999 03:37:00   |
| Data File  : F:\DATA\99102941.D04                                       |
| Method     : C:\DX\METHOD\AUTOMEL.met                                   |
| 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	10201	3300	5Hz	0.00	11.00		30

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.87		0.000	264	1533	2	
2	1.13		0.000	160	1843	2	
3	1.51	chloride	9201.013	2594	12310	1	-3.40
4	1.82	nitrite	83395.790	14860	80101	1	-3.53
5	3.05	nitrate	131342.485	13565	105795	1	12.84
6	4.46	phosphate	1236.520	36	467	1	-3.46
7	5.79	sulfate	1641.273	113	1705	1	-3.61
		Totals	226817.080	31593	203754		



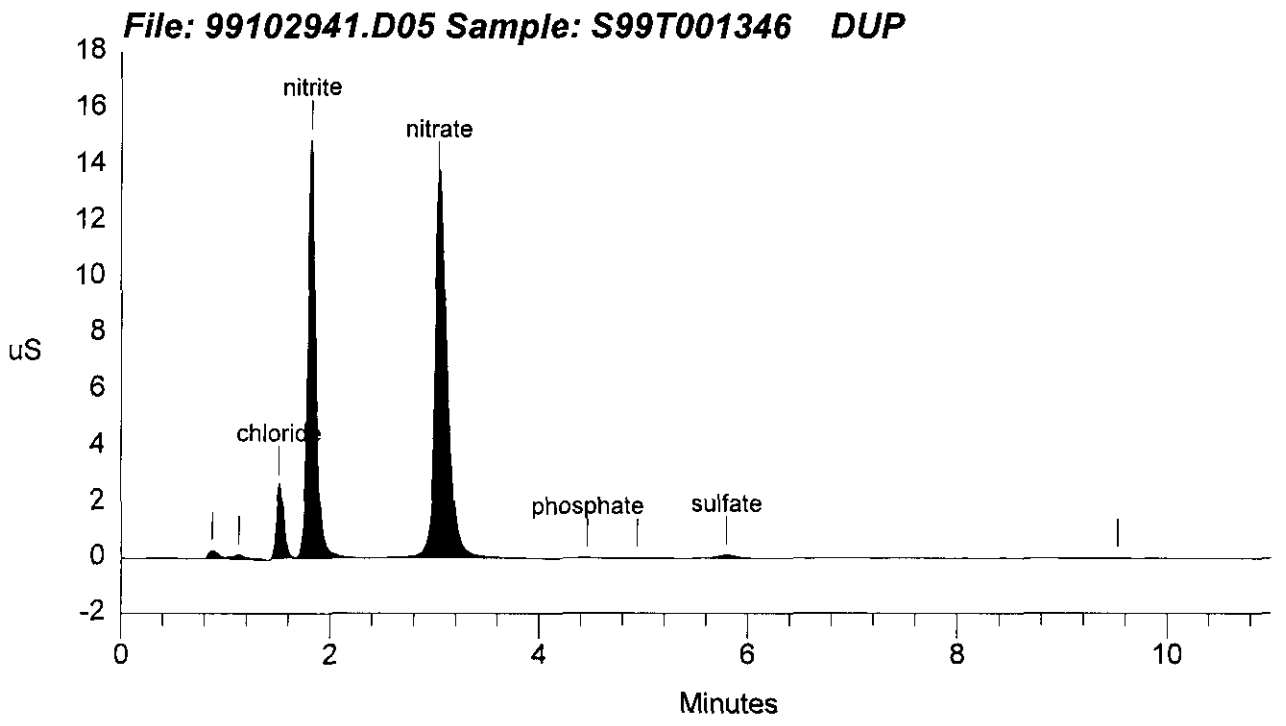
Data Reprocessed On 11/01/1999 11:24:03 **HNF-1679 REV. 0**

Sample Name: S99T001346 DUP	Date: 10/29/1999 03:50:38
Data File : F:\DATA\99102941.D05	
Method : C:\DX\METHOD\AUTOMEL.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	10201	3300	5Hz	0.00	11.00	30

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.87		0.000	259	1511	2	
2	1.13		0.000	160	1810	2	
3	1.51	chloride	9216.891	2603	12332	1	-3.40
4	1.82	nitrite	83172.193	14874	79884	1	-3.53
5	3.03	nitrate	138813.659	13406	112087	1	12.35
6	4.46	phosphate	934.626	31	353	1	-3.46
7	4.94		0.000	20	594	1	
8	5.79	sulfate	1485.892	115	1544	1	-3.61
9	9.53		0.000	19	631	1	
		Totals	233623.261	31488	210745		



Data Reprocessed On 11/01/1999 11:26:31

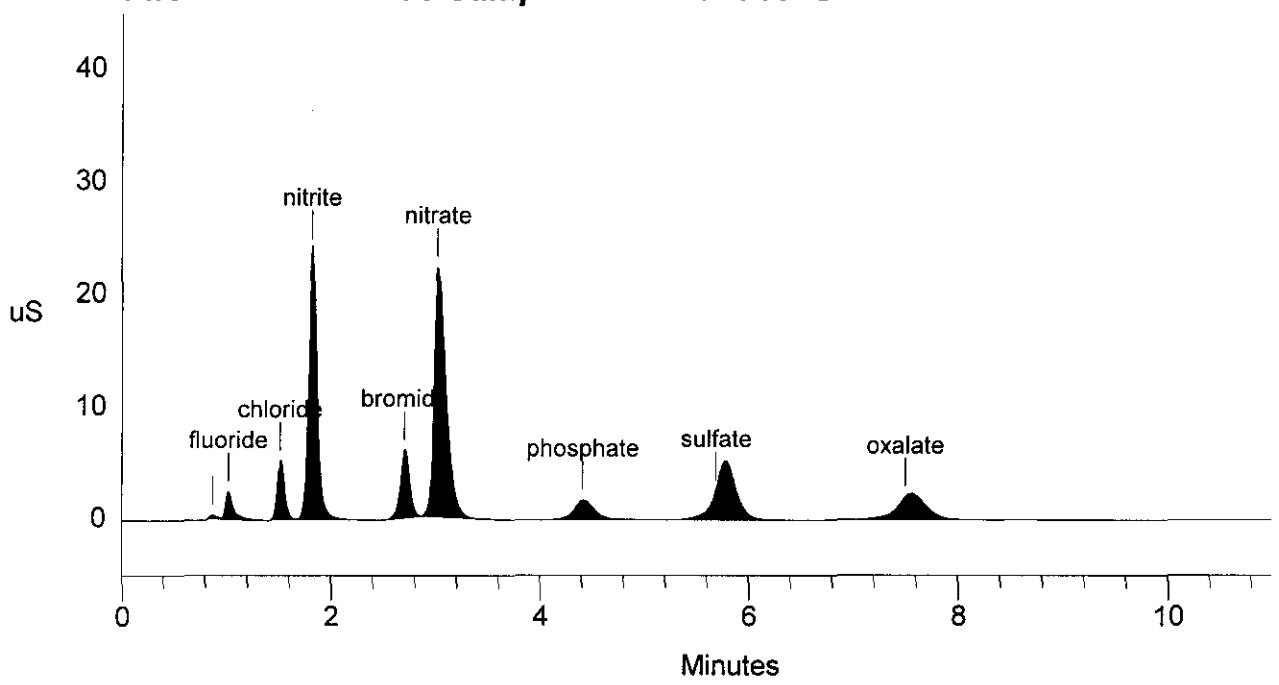
Sample Name: S99T001346 SPK	Date: 10/29/1999 04:04:16
Data File : F:\DATA\99102941.D06	
Method : C:\DX\METHOD\AUTOMEL.met	
ACI Address: 1 System: 1 Inject#: 6	Detector:CDM-1
Analyst :	Column: AG4A/AS4A anion column

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area Reject
External	1	10201	3300	5Hz	0.00	11.00	30

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.87		0.000	317	1536	2	
2	1.02	fluoride	6883.220	2462	13442	2	-0.97
3	1.51	chloride	18924.789	5178	25785	1	-3.40
4	1.82	nitrite	139577.594	23975	135194	1	-3.53
5	2.70	bromide	59762.650	5999	37208	1	-5.59
6	3.02	nitrate	211233.993	22166	174828	1	0.00
7	4.41	phosphate	63645.248	1737	24491	1	-4.62
8	5.69	sulfate	69319.026	2583	73443	1	-5.38
9	7.50	oxalate	57789.579	2011	45283	1	-5.42
		Totals	627136.100	66429	531210		

File: 99102941.D06 Sample: S99T001346 SPK



File #: 99226

09/20/99 12:01
ws2

HNF-1679 REV. 0

LABCORE Data Entry Template for Worklist# 31156

Analyst: JKSch **Instrument:** ICP01 9-22-99 **Book#** 80B48

Method: LA-505-~~151~~/161 Rev/Mod C-4 9-22-99

Worklist Comment: ICP S109 (DIRECT)

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

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	SERDIL	S99T001343	0	D	@ICP-D01	LIQUID		
7	SAMPLE	S99T001343	0	D	@ICP-D01	LIQUID	99000300	S-109 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			
8	DUP	S99T001343	0	D	@ICP-D01	LIQUID		
9	SPK-POST (1ppm) Spike K	S99T001343	0	D	@ICP-D01	LIQUID		
10	CCV Spike Cr (10 ppm) 9-22-99				@ICP-QC	QC		
11	CCB				@ICP-QC	QC		
12	SAMPLE	S99T001344	0	D	@ICP-D01	LIQUID	99000300	S-109 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			

Data Entry Comments:
uploaded 9-22-99
John Worrell

Validated by:
Scott M. Pang
09/22/99

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

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

LABCORE Data Entry Template for Worklist# 31156

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
13	DUP	S99T001344	0	D	@ICP-D01	LIQUID		
14	SAMPLE	S99T001345	0	D	@ICP-D01	LIQUID	99000300	S-109 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

15	DUP	S99T001345	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 # 31156

DX 09-22-99

Signature	Date		
S99T001343_L	.025-15-2-8	DF	3605
S99T001343	.025-15		601
S99T001343_D	.025-15		601
S99T001343_Q	.025-15		601
S99T001343_X	.025-15-1-9		6010
S99T001343_QX	.025-15-1-9		6010
S99T001344	.025-15	DF	601
S99T001344_D	.025-15		601
S99T001345	.025-15	DF	601
S99T001345_D	.025-15		601

Signature	Date

Data Entry Comments:

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

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#	Sample Name	Ag	Al	As	B	Ba	Be
1	ICV	4.7864	4.8626	4.9954	5.0618	4.8487	4.8409
2	ICB	.00276	.01486	-.00460	.00266	.00015	-.00001
3	LLS	.02159	.11551	.18896	.10306	.09631	.00978
4	ICSA	.00024	246.24	-.01338	.00799	.00060	.00017
5	ICSAB	.94705	247.81	-.03259	.00953	.45894	.46046
~~6~~	~~S99T001343_L~~	~~22.109~~	~~41538.~~	~~34.491~~	~~73.414~~	~~.05928~~	~~.21342~~
~~7~~	~~S99T001343~~	~~16.861~~	~~40388.~~	~~36.883~~	~~71.971~~	~~.13971~~	~~.15826~~
~~8~~	~~S99T001343_D~~	~~14.485~~	~~31126.~~	~~31.337~~	~~53.939~~	~~.25276~~	~~.08312~~
9	S99T001343_L	22.129	41175.	-20.120	74.999	.33964	.21372
10	S99T001343	16.112	40475.	-36.086	70.056	.07889	.19049
11	S99T001343_D	18.192	42730.	-44.549	75.959	.20091	.17897
12	S99T001343_A	545.73	39409.	567.26	662.79	556.95	573.98
13	S99T001343_X	21.722	41433.	-64.966	67.045	-.16990	.32075
14	S99T001343_AX	57283.	100360.	59556.	60146.	59622.	59479.
15	CCV	4.8220	4.9099	5.0193	5.1136	4.9303	4.8920
16	CCB	.00294	.01779	.00108	.00372	.00013	.00008
17	S99T001344	17.284	42528.	-42.340	71.011	.08951	.08407
18	S99T001344_D	16.463	39165.	-35.479	67.820	.19749	.14804
19	S99T001345	17.251	57767.	-35.059	74.842	.12331	.16948
20	S99T001345_D	16.957	51322.	-30.665	68.141	.20415	.17938
21	ICSA	-.00092	245.57	-.01511	.00292	.00048	.00035
22	ICSAB	.93983	245.21	-.02856	.00134	.45282	.45875
23	CCV	4.8398	4.9131	5.0473	5.1208	4.9357	4.9150
24	CCB	.00366	.01738	.00086	.00505	.00023	.00005

#	Sample Name	Bi	Ca	Cd	Ce	Co	Cr
1	ICV	5.0030	5.1678	5.0366	4.9641	5.0089	4.9985
2	ICB	-.00886	-.02315	.00037	.01395	-.00217	-.00103
3	LLS	.19654	.24355	.01040	.20958	.03843	.01999
4	ICSA	.01621	261.38	-.00722	.02574	-.00199	-.00220
5	ICSAB	.00051	264.49	.94678	.03013	.46669	.47576
~~6~~	~~S99T001343_L~~	~~48.472~~	~~100.60~~	~~.31712~~	~~17.435~~	~~8.8237~~	~~9954.2~~
~~7~~	~~S99T001343~~	~~6.4887~~	~~.73028~~	~~.40855~~	~~7.9385~~	~~1.4244~~	~~9675.7~~
~~8~~	~~S99T001343_D~~	~~15.104~~	~~13.476~~	~~1.0774~~	~~17.106~~	~~1.3955~~	~~7480.4~~
9	S99T001343_L	-37.696	-88.191	2.1979	44.658	-7.7228	9960.7
10	S99T001343	-22.464	.44030	.06904	1.7746	1.0872	9805.6
11	S99T001343_D	1.5257	-7.6830	.53339	10.052	1.1273	10274.
12	S99T001343_A	598.12	617.50	600.24	580.50	595.39	9838.8
13	S99T001343_X	-118.16	-235.21	-.73902	40.403	-21.013	9907.8
14	S99T001343_AX	60736.	59859.	59942.	59287.	59814.	69433.
15	CCV	5.0750	5.1736	5.0445	5.0239	5.0188	5.0143
16	CCB	-.00881	-.02379	.00066	.00978	-.00198	.00003
17	S99T001344	-6.5004	-11.747	-.20526	3.7257	1.3823	9728.1
18	S99T001344_D	.52002	-10.806	.72184	9.7286	1.1216	8981.4
19	S99T001345	-15.718	-13.865	.57067	6.8032	1.0147	7796.2
20	S99T001345_D	-8.7063	-9.6475	.92780	13.129	1.6564	6978.6
21	ICSA	-.00015	262.01	-.00799	.01455	-.00485	-.00419
22	ICSAB	-.02297	261.77	.93425	.03341	.46502	.47035
23	CCV	5.1261	5.1927	5.0541	5.0516	5.0341	5.0274
24	CCB	.00908	-.02134	.00112	.02284	-.00279	.00010

JK 09-22-99

SIGNATURE ABOVE REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 141 TO 144.

Analysis Report Averages 09/22/99 10:43:21 AM page 3

#	Sample Name	Cu	Eu	Fe	K	La	Li
1	ICV	4.9108	.03359	5.0746	5.1922	5.0102	4.8206
2	ICB	-.00157	.00042	.00218	.25107	.00205	.00064
3	LLS	.01855	.00095	.10013	0.67606	.10101	.02063
4	ICSA	-.00302	.29541	98.328	-.02164	-.00472	.00285
5	ICSAB	.48012	.29724	99.182	.00513	-.00454	.96813
~~6~~	~~S99T001343_L~~	~~-20.856~~	~~.15206~~	~~5.7199~~	~~1973.6~~	~~3.1367~~	~~-.27523~~
~~7~~	~~S99T001343~~	~~-17.215~~	~~.92928~~	~~4.3985~~	~~2202.0~~	~~1.8885~~	~~.66421~~
~~8~~	~~S99T001343_D~~	~~-13.434~~	~~1.1215~~	~~3.4764~~	~~1862.1~~	~~2.7989~~	~~.49690~~
9	S99T001343_L	-18.736	-4.1709	6.6500	2556.1	5.4985	-1.1034
10	S99T001343	-17.646	.28268	3.6444	2159.3	1.0459	.33182
11	S99T001343_D	-18.196	.57715	3.6065	2331.5	2.2329	.44188
12	S99T001343_A	561.55	4.2482	604.86	2582.4	595.78	557.23
13	S99T001343_X	-24.531	-4.8598	2.7809	2117.5	4.8711	-.54998
14	S99T001343_AX	59283.	391.89	59617.	63117.	59345.	58613.
15	CCV	4.9873	.03257	5.0945	5.1337	5.0899	4.9090
16	CCB	-.00128	.00032	.00171	.01822	.00175	.00000
17	S99T001344	-16.585	-.08641	1.6934	2071.3	1.7065	.22120
18	S99T001344_D	-15.771	-.13774	2.1705	2050.1	2.3071	.33205
19	S99T001345	-12.779	.29602	2.3244	2144.3	1.7708	.16490
20	S99T001345_D	-11.077	.93302	2.5620	2135.5	3.0880	.77391
21	ICSA	-.00447	.29746	98.245	.12442	-.00712	.00276
22	ICSAB	.47578	.30462	97.831	.25984	-.00408	.94867
23	CCV	5.0035	.03342	5.0839	5.2111	5.1050	4.8937
24	CCB	-.00113	.00051	.00262	.27201	.00308	.00027

#	Sample Name	Mg	Mn	Mo	Na	Nd	Ni
1	ICV	4.9912	4.7041	4.9599	5.0055	4.9563	4.9963
2	ICB	.01096	.00004	-.00090	.03075	-.00378	.00068
3	LLS	.20185	.01888	.09966	.23551	.20134	.04685
4	ICSA	254.89	-.00941	-.00950	190.84	.01154	-.00203
5	ICSAB	256.19	.42723	-.01080	190.74	.00940	.94681
~~6~~	~~S99T001343_L~~	~~-14.267~~	~~.12809~~	~~80.613~~	~~232040.~~	~~-10.800~~	~~2.1104~~
~~7~~	~~S99T001343~~	~~-4.3775~~	~~.09360~~	~~82.280~~	~~218990.~~	~~-.50948~~	~~2.1982~~
~~8~~	~~S99T001343_D~~	~~5.3248~~	~~.20639~~	~~64.343~~	~~168870.~~	~~.70374~~	~~2.5059~~
9	S99T001343_L	11.528	-.59165	81.948	232400.	-5.1689	-9.1074
10	S99T001343	-11.415	.15704	83.494	222030.	-1.2776	.10000
11	S99T001343_D	-1.0747	.18486	88.083	231720.	-.35514	1.0540
12	S99T001343_A	567.88	538.77	675.13	210850.	587.32	594.10
13	S99T001343_X	-13.007	-.69226	74.534	229870.	-20.887	19.285
14	S99T001343_AX	59487.	59387.	60044.	289450.	59345.	59659.
15	CCV	4.9947	4.7089	4.9907	5.0819	5.0249	4.9887
16	CCB	.00731	.00011	.00009	.00806	-.00066	.00005
17	S99T001344	-7.2528	-.03390	83.158	222120.	-.39409	2.1347
18	S99T001344_D	-.12400	-.03620	76.645	205170.	-1.1564	2.1240
19	S99T001345	-1.6265	-.06008	87.309	228360.	-.37191	-.28477
20	S99T001345_D	4.2151	.04227	76.876	202330.	2.3863	1.7471
21	ICSA	254.42	-.00935	-.01078	186.69	.00379	-.00914
22	ICSAB	253.71	.42213	-.01256	185.47	.00845	.91379
23	CCV	4.9923	4.7118	4.9939	5.0261	5.0112	4.9990
24	CCB	.01386	.00004	-.00109	.01843	.00024	.00304

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#	Sample Name	P	Pb	S	Sb	Se	Si
1	ICV	5.0577	4.9478	4.8447	4.9466	4.8905	5.0569
2	ICB	-.00570	-.01493	.00522	-.01408	.00380	-.00826
3	LLS	.40200	.19005	.20456	.09311	.19740	.15716
4	ICSA	-.01842	.06409	-.02729	.00326	-.06333	-.03526
5	ICSAB	-.01959	1.0284	-.03188	.00019	-.05963	-.02904
~~6~~	~~S99T001343_L~~	~~487.12~~	~~19.866~~	~~497.49~~	~~38.184~~	~~52.740~~	~~85.514~~
~~7~~	~~S99T001343~~	~~477.34~~	~~13.944~~	~~533.66~~	~~52.520~~	~~32.113~~	~~131.09~~
~~8~~	~~S99T001343_D~~	~~408.51~~	~~14.512~~	~~412.82~~	~~43.191~~	~~24.737~~	~~101.80~~
9	S99T001343_L	478.35	4.1548	494.34	48.032	20.176	58.165
10	S99T001343	472.59	13.934	489.92	56.314	29.122	127.29
11	S99T001343_D	507.38	20.808	544.77	56.971	32.151	152.58
12	S99T001343_A	1062.4	607.30	1093.5	652.28	619.28	752.07
13	S99T001343_X	463.82	-77.279	509.27	14.670	28.764	3.0267
14	S99T001343_AX	60194.	60030.	60322.	60246.	60004.	59772.
15	CCV	5.0651	4.9232	4.8563	4.9985	4.9356	5.0741
16	CCB	.00114	-.00188	-.00005	-.00668	.01333	-.01281
17	S99T001344	503.34	15.320	572.66	52.184	25.952	143.70
18	S99T001344_D	523.54	17.418	524.88	51.595	36.429	131.30
19	S99T001345	597.96	24.788	691.18	44.845	45.645	135.20
20	S99T001345_D	530.64	47.855	609.93	39.476	44.447	127.02
21	ICSA	-.01231	.03627	-.03609	-.01547	-.04644	-.03755
22	ICSAB	-.01625	1.0126	-.04753	-.00806	-.04912	-.03736
23	CCV	5.1001	4.9340	4.8825	5.0351	4.9143	5.0878
24	CCB	.01026	-.00801	.00518	.00410	.01267	-.01264

9-22-99

#	Sample Name	Sm	Sr	Th	Ti	Tl	U
1	ICV	4.9673	4.8146	.39591	5.0196	4.9036	9.7563
2	ICB	.00162	-.00012	.01240	-.00037	.00610	.00367
3	LLS	.19619	.01977	.02090	.01994	.41299	.49008
4	ICSA	-.01626	.00116	.13721	.00239	-.06625	.11839
5	ICSAB	-.01257	.00121	.14055	.00171	-.09736	.11768
~~6~~	~~S99T001343_L~~	~~-11.052~~	~~-.54571~~	~~-30.697~~	~~1.1443~~	~~-46.820~~	~~-35.899~~
~~7~~	~~S99T001343~~	~~2.4907~~	~~.01679~~	~~-50.765~~	~~2.4866~~	~~2.3308~~	~~18.683~~
~~8~~	~~S99T001343_D~~	~~7.3981~~	~~.05243~~	~~-29.059~~	~~2.1471~~	~~.47490~~	~~37.282~~
9	S99T001343_L	-25.952	-.72485	2.0214	2.5368	-9.9060	-97.529
10	S99T001343	2.2469	-.00129	-56.676	2.4659	-3.7755	14.512
11	S99T001343_D	2.9894	.01608	-52.393	2.7273	6.8761	29.562
12	S99T001343_A	592.48	568.88	-14.229	600.18	580.10	1161.4
13	S99T001343_X	-12.719	-1.2736	.80843	-.81324	66.548	-80.966
14	S99T001343_AX	59332.	59429.	4704.2	59573.	59465.	118530.
15	CCV	5.0480	4.8871	.38956	5.0901	4.9140	9.8875
16	CCB	.00307	-.00015	.01275	-.00023	.00468	.01013
17	S99T001344	-.80430	-.05569	-54.366	2.4726	-2.4275	9.8999
18	S99T001344_D	.66857	-.03735	-39.743	2.4461	13.190	10.249
19	S99T001345	1.6173	-.02021	-39.370	1.9375	.52272	25.938
20	S99T001345_D	5.1905	.03361	-29.069	2.1422	-.24877	40.299
21	ICSA	-.01392	.00117	.12844	.00069	-.04074	.09736
22	ICSAB	-.01511	.00118	.14235	.00117	-.06526	.08333
23	CCV	5.0787	4.9034	.41284	5.1191	4.9470	9.9345
24	CCB	.00493	-.00009	.02086	-.00020	-.01197	.02030

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Analysis Report Averages 09/22/99 10:43:21 AM page 5

#	Sample Name	V	Y	Zn	Zr
1	ICV	4.9788	.01361	4.9695	4.9826
2	ICB	-.00023	.00023	-.00228	-.00092
3	LLS	.09936	.00042	.02168	.01786
4	ICSA	-.00760	.01048	-.00932	-.00679
5	ICSAB	.46911	.01071	1.0028	-.00676
~~6~~	~~S99T001343_L~~	~~1.8186~~	~~.45710~~	~~4.5985~~	~~.44385~~
~~7~~	~~S99T001343~~	~~3.7295~~	~~.27551~~	~~1.9778~~	~~4.3028~~
~~8~~	~~S99T001343_D~~	~~3.6662~~	~~.50381~~	~~1.0655~~	~~2.9252~~
9	S99T001343_L	-1.1331	-1.6120	-5.2895	-3.7475
10	S99T001343	3.5723	.13555	1.5760	4.7483
11	S99T001343_D	4.1228	.31813	2.1285	4.5332
12	S99T001343_A	594.86	1.7740	599.81	603.18
13	S99T001343_X	.64306	-.91047	-16.140	-2.4337
14	S99T001343_AX	59694.	159.38	59793.	59257.
15	CCV	5.0147	.01277	4.9745	5.0311
16	CCB	-.00005	.00000	-.00184	-.00075
17	S99T001344	2.8611	-.09869	1.1653	3.9731
18	S99T001344_D	2.8324	.04288	1.4651	2.8909
19	S99T001345	2.8496	.17794	.36527	3.0850
20	S99T001345_D	3.3467	.45529	.63400	2.7945
21	ICSA	-.00622	.01041	-.00973	-.00673
22	ICSAB	.46648	.01034	.98891	-.00810
23	CCV	5.0347	.01299	4.9838	5.0500
24	CCB	.00090	.00038	-.00180	-.00137

DK 9-22-99

DK
09-22-99

LABCORE Completed Worklist Report for Worklist# 30603

Analyst: bjg **Instrument:** ICPMS1 **Book#:** 42 B55

Method: LA-506-101 Rev/Mod A-1

Worklist Comment: ICP/MS S-109 (DIRECT)

Seq	Type	Sample#	R	A		Test	Matrix	Actual		Found	DL or Yield	Unit
1	ICV		0		@MSU-QC	U235	QC	0.000170		1.72e-04	101.176	% Recovery
1	ICV		0		@MSU-QC	U238	QC	0.023900		2.39e-02	100.000	% Recovery
2	ICB		0		@MSU-QC	U233	QC	1		<1.20e-5		ug/mL
2	ICB		0		@MSU-QC	U234	QC	1		<1.20e-5		ug/mL
2	ICB		0		@MSU-QC	U235	QC	1		<1.20e-5		ug/mL
2	ICB		0		@MSU-QC	U236	QC	1		<1.60e-5		ug/mL
2	ICB		0		@MSU-QC	U238	QC	1		<1.20e-5		ug/mL
3	SAMPLE	S99T001346	0	D	@MSU-D1	U233-D1	LIQUID	N/A	<	4.860e-01	0.486	ug/mL
3	SAMPLE	S99T001346	0	D	@MSU-D1	U234-D1	LIQUID	N/A	<	4.860e-01	0.486	ug/mL
3	SAMPLE	S99T001346	0	D	@MSU-D1	U235-D1	LIQUID	N/A	<	4.860e-01	0.486	ug/mL
3	SAMPLE	S99T001346	0	D	@MSU-D1	U236-D1	LIQUID	N/A	<	6.480e-01	0.648	ug/mL
3	SAMPLE	S99T001346	0	D	@MSU-D1	U238-D1	LIQUID	N/A		1.401e+00	0.486	ug/mL
4	DUP	S99T001346	0	D	@MSU-D1	U233-D1	LIQUID	<4.86e-1		<4.86e-1		RPD
4	DUP	S99T001346	0	D	@MSU-D1	U234-D1	LIQUID	<4.86e-1		<4.86e-1		RPD
4	DUP	S99T001346	0	D	@MSU-D1	U235-D1	LIQUID	<4.86e-1		<4.86e-1		RPD
4	DUP	S99T001346	0	D	@MSU-D1	U236-D1	LIQUID	<6.48e-1		<6.48e-1		RPD
4	DUP	S99T001346	0	D	@MSU-D1	U238-D1	LIQUID	1.40e+00		1.32e+00	5.882	RPD
5	SPK-~~POST~~	S99T001346	0	D	@MSU-D1	U235-D1	LIQUID	0.000142		1.37e-04	96.479	% Recovery
5	SPK-~~POST~~	S99T001346	0	D	@MSU-D1	U238-D1	LIQUID	0.020		1.91e-02	95.500	% Recovery
6	SAMPLE	S99T001347	0	D	@MSU-D1	U233-D1	LIQUID	N/A	<	4.860e-01	0.486	ug/mL
6	SAMPLE	S99T001347	0	D	@MSU-D1	U234-D1	LIQUID	N/A	<	4.860e-01	0.486	ug/mL
6	SAMPLE	S99T001347	0	D	@MSU-D1	U235-D1	LIQUID	N/A	<	4.860e-01	0.486	ug/mL
6	SAMPLE	S99T001347	0	D	@MSU-D1	U236-D1	LIQUID	N/A	<	6.480e-01	0.648	ug/mL
6	SAMPLE	S99T001347	0	D	@MSU-D1	U238-D1	LIQUID	N/A		1.264e+00	0.486	ug/mL
7	DUP	S99T001347	0	D	@MSU-D1	U233-D1	LIQUID	<4.86e-1		<4.86e-1		RPD
7	DUP	S99T001347	0	D	@MSU-D1	U234-D1	LIQUID	<4.86e-1		<4.86e-1		RPD
7	DUP	S99T001347	0	D	@MSU-D1	U235-D1	LIQUID	<4.86e-1		<4.86e-1		RPD
7	DUP	S99T001347	0	D	@MSU-D1	U236-D1	LIQUID	<6.48e-1		<6.48e-1		RPD
7	DUP	S99T001347	0	D	@MSU-D1	U238-D1	LIQUID	1.26e+00		1.31e+00	3.891	RPD
8	SAMPLE	S99T001348	0	D	@MSU-D1	U233-D1	LIQUID	N/A	<	4.860e-01	0.486	ug/mL
8	SAMPLE	S99T001348	0	D	@MSU-D1	U234-D1	LIQUID	N/A	<	4.860e-01	0.486	ug/mL
8	SAMPLE	S99T001348	0	D	@MSU-D1	U235-D1	LIQUID	N/A	<	4.860e-01	0.486	ug/mL
8	SAMPLE	S99T001348	0	D	@MSU-D1	U236-D1	LIQUID	N/A	<	6.480e-01	0.648	ug/mL
8	SAMPLE	S99T001348	0	D	@MSU-D1	U238-D1	LIQUID	N/A		2.110e+00	0.486	ug/mL
9	DUP	S99T001348	0	D	@MSU-D1	U233-D1	LIQUID	<4.86e-1		<4.86e-1		RPD
9	DUP	S99T001348	0	D	@MSU-D1	U234-D1	LIQUID	<4.86e-1		<4.86e-1		RPD
9	DUP	S99T001348	0	D	@MSU-D1	U235-D1	LIQUID	<4.86e-1		<4.86e-1		RPD
9	DUP	S99T001348	0	D	@MSU-D1	U236-D1	LIQUID	<6.48e-1		<6.48e-1		RPD
9	DUP	S99T001348	0	D	@MSU-D1	U238-D1	LIQUID	2.11e+00		1.98e+00	6.357	RPD
10	CCV		0		@MSU-QC	U235	QC	0.000170		1.60e-04	94.118	% Recovery
10	CCV		0		@MSU-QC	U238	QC	0.023900		2.27e-02	94.979	% Recovery

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

LABCORE Completed Worklist Report for Worklist# 30603

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

Final page for worklist# 30603

Analyst Signature **Date**

Analyst Signature **Date**

Sal M. Pang 08/09/99

Reviewer Signature **Date**

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

FILE # U0809A.TXT

08/03/99 09:02
ws2

LABCORE Data Entry Template for Worklist# 30603

Analyst: [illegible] **Instrument:** ICPMS1 **Book#** 42B55

Method: LA-506-101 **Rev/Mod** A-1

Worklist Comment: ICP/MS S-109 (DIRECT)

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	ICV				@MSU-QC	QC		
2	ICB				@MSU-QC	QC		
3	SAMPLE	S99T001346	0	D	@MSU-D1	LIQUID	99000300	S-109 GRAB
	Analytes Requested: U233-D1 , U234-D1 , U235-D1 , U236-D1 , U238-D1							
4	DUP	S99T001346	0	D	@MSU-D1	LIQUID		
5	SPK-~~POST~~	S99T001346	0	D	@MSU-D1	LIQUID		
6	SAMPLE	S99T001347	0	D	@MSU-D1	LIQUID	99000300	S-109 GRAB
	Analytes Requested: U233-D1 , U234-D1 , U235-D1 , U236-D1 , U238-D1							
7	DUP	S99T001347	0	D	@MSU-D1	LIQUID		
8	SAMPLE	S99T001348	0	D	@MSU-D1	LIQUID	99000300	S-109 GRAB
	Analytes Requested: U233-D1 , U234-D1 , U235-D1 , U236-D1 , U238-D1							
9	DUP	S99T001348	0	D	@MSU-D1	LIQUID		
10	CCV				@MSU-QC	QC		
11	CCB				@MSU-QC	QC		

11/22/99

Final page for worklist # 30603

[illegible] 8-9-99

Signature **Date** **Signature** **Date**

D.F.

S99T001346 .1-10-1 -.025-10-1 40,501
1346-D
1346-A
1347
1347-D
1348
1348-D

Data Entry Comments:

SCANS = 1346, 1347, 1348

POST spk - = .02 -1 of 10 ppm U STD. (20 ppb)

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

Analysis Report **HNF-1679 REV. 0** 08/09/99 13:22:02 page 1

Method: MS_TUNE Sample Name: ms-tune Operator: bjg
Comment:
Run Time: 08/09/99 13:21 Type: Unk Mode: INT Corr.Fact: 1.000000

Elem	In[115]
Line	115/pulse
Units	Cts/S
Avg	180800.
Stddev	1391.
%RSD	.7695
#1	182000.
#2	177700.
#3	180000.
#4	181700.
#5	181100.
#6	182700.
#7	180100.
#8	180800.
#9	181600.
#10	180500.

S-109
599T001346-48
File # U0809A.TXT
W.L. 30603

Uploaded + Validated by:
Saul M. Pang
08/09/99

SIGNATURE ABOVE REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 148 TO 164

Analysis Report **HNF-1679 REV. 0** 08/09/99 13:23:56 page 1

Method: ISOU Sample Name: BLANK Operator:
Comment:
Run Time: 08/09/99 13:22 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	8.168	7.557	7.034	8.268	8.849
Stddev	1.457	1.031	.652	.458	.354
%RSD	17.84	13.65	9.266	5.535	4.002
#1	8.496	7.718	7.576	8.426	8.921
#2	7.750	6.214	7.262	8.937	8.798
#3	6.999	8.038	6.098	7.761	9.216
#4	10.54	8.895	6.637	8.279	9.031
#5	7.057	6.921	7.600	7.939	8.278

Int. Std.	Ir[193]
Line	193/pulse
Units	Cts/S
Avg	7.2229
Stddev	.1207
%RSD	1.6709
#1	7.0618
#2	7.1627
#3	7.2154
#4	7.3575
#5	7.3085

Method : ISOU Standardzn Report 08/09/99 13:24:05 page 1

U_[233]	681.6558	8.1679	1.0000000	08/09/99 13:23:56
U_[234]	682.5147	7.5572	1.0000000	08/09/99 13:23:56
U_[235]	683.2500	7.0344	1.0000000	08/09/99 13:23:56
U_[236]	681.5144	8.2684	1.0000000	08/09/99 13:23:56
U_[238]	637.9233	8.8490	1.0000000	08/09/99 13:23:56

Analysis Report 08/09/99 13:26:13 page 1

HNF-1679 REV. 0

Method: ISOU Sample Name: 100ppb U Operator:
Comment:
Run Time: 08/09/99 13:25 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	461.2	461.2	461.2	461.2	60210.
Stddev	8.0	8.0	8.0	8.0	649.
%RSD	1.744	1.744	1.744	1.744	1.078
#1	451.6	451.6	451.6	451.6	60120.
#2	472.5	472.5	472.5	472.5	60580.
#3	463.1	463.1	463.1	463.1	61080.
#4	462.9	462.9	462.9	462.9	59390.
#5	455.6	455.6	455.6	455.6	59870.

Int. Std.	Ir[193]
Line	193/pulse
Units	Cts/S
Avg	7.1465
Stddev	.1157
%RSD	1.6187
#1	7.2288
#2	8.9612
#3	7.1366
#4	7.2299
#5	7.1860

Method : ISOU Standardzn Report 08/09/99 13:26:20 page 1

U_[233]	637.1121	8.1679	1.0000000	08/09/99 13:26:13
U_[234]	637.9709	7.5572	1.0000000	08/09/99 13:26:13
U_[235]	638.7062	7.0344	1.0000000	08/09/99 13:26:13
U_[236]	636.9706	8.2684	1.0000000	08/09/99 13:26:13
U_[238]	606.2278	8.8490	1.0000000	08/09/99 13:26:13

Method: ISOU Sample Name: blank Operator: bjg
Comment: background
Run Time: 08/09/99 13:29 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	-.0002	-.0002	-.0016	-.0002
Stddev	.0008	.0005	.0008	.0018	.0016
%RSD	33.98	286.9	354.2	111.6	744.2
#1	-.0018	.0001	.0003	.0012	.0023
#2	-.0038	-.0009	-.0007	-.0031	-.0007
#3	-.0020	-.0001	-.0003	-.0032	-.0021
#4	-.0022	.0002	-.0012	-.0012	.0002
#5	-.0021	-.0002	.0008	-.0016	-.0008

Int. Std.	Ir[193]
Line	193/pulse
Units	Cts/S
Avg	7.4434
Stddev	.1291
%RSD	1.7341
#1	7.2313
#2	7.4568
#3	7.6594
#4	7.3981
#5	7.3714

Analysis Report **HNF-1679 REV. 0** 08/09/99 13:32:42 page 1

Method: ISOU Sample Name: icv Operator: bjg
Comment: iso-u lcs
Run Time: 08/09/99 13:31 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	-.0010	.0013	.1717	.0018	23.86
Stddev	.0011	.0011	.0049	.0018	.48
%RSD	109.3	89.97	2.864	101.1	2.029
#1	.0008	.0016	.1691	-.0005	23.35
#2	-.0019	.0018	.1744	.0036	23.49
#3	-.0007	-.0008	.1654	.0003	23.76
#4	-.0018	.0017	.1783	.0024	24.19
#5	-.0015	.0021	.1711	.0033	24.51

Int. Std.	Ir[193]
Line	193/pulse
Units	Cts/S
Avg	7.4319
Stddev	.0579
%RSD	.77914
#1	7.5135
#2	7.3729
#3	7.4193
#4	7.4657
#5	7.3879

Analysis Report

HNF-1679 REV. 0

08/09/99 13:36:56 page 1

Method: ISOU Sample Name: icb Operator: bjg
Comment: 2% hno3
Run Time: 08/09/99 13:35 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	.0005	.0010	-.0014	.0002
Stddev	.0008	.0010	.0014	.0007	.0014
%RSD	63.83	204.0	139.0	49.98	550.6
#1	-.0021	-.0001	.0018	-.0013	.0016
#2	-.0019	-.0003	-.0011	-.0008	.0016
#3	-.0006	-.0002	.0023	-.0025	-.0008
#4	-.0012	.0021	.0019	-.0009	-.0014
#5	-.0003	.0010	.0002	-.0013	.0002

Int. Std.	Ir[193]
Line	193/pulse
Units	Cts/S
Avg	7.7000
Stddev	.0975
%RSD	1.2659
#1	7.8124
#2	7.7115
#3	7.5779
#4	7.7727
#5	7.7646

Analysis Report **HNF-1679 REV. 0** 08/09/99 13:39:04 page 1

Method: ISOU Sample Name: s99t001346 Operator: bjg
Comment: 40501 df
Run Time: 08/09/99 13:37 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	-.0017	.0002	-.0022	.0346
Stddev	.0020	.0003	.0010	.0013	.0025
%RSD	119.3	16.50	512.9	60.57	7.287
#1	-.0021	-.0020	.0015	-.0024	.0349
#2	-.0006	-.0017	-.0006	-.0012	.0356
#3	.0008	-.0019	.0009	-.0039	.0381
#4	-.0020	-.0013	-.0011	-.0030	.0314
#5	-.0046	-.0014	.0003	-.0006	.0332

Int. Std.	Ir[193]
Line	193/pulse
Units	Cts/S
Avg	7.3354
Stddev	.1492
%RSD	2.0336
#1	7.4678
#2	7.1356
#3	7.4634
#4	7.3883
#5	7.2241

Analysis Report **HNF-1679 REV. 0** 08/09/99 13:41:57 page 1

Method: ISOU Sample Name: s99t001346_d Operator: bjg
Comment: 40501 df
Run Time: 08/09/99 13:40 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	-.0018	.0003	-.0015	.0325
Stddev	.0012	.0011	.0012	.0012	.0030
%RSD	64.00	64.26	366.8	83.32	9.107
#1	-.0009	-.0017	.0004	.0004	.0369
#2	-.0018	-.0010	.0008	-.0009	.0325
#3	-.0006	-.0012	.0019	-.0024	.0335
#4	-.0034	-.0011	-.0002	-.0025	.0292
#5	-.0030	-.0037	-.0013	-.0021	.0305

Int. Std.	Ir[193]
Line	193/pulse
Units	Cts/S
Avg	7.1990
Stddev	.0494
%RSD	.68662
#1	7.2610
#2	7.1473
#3	7.1664
#4	7.1791
#5	7.2413

Analysis Report **HNF-1679 REV. 0** 08/09/99 13:44:04 page 1

Method: ISOU Sample Name: s99t001346_a Operator: bjg
Comment: 40501 df
Run Time: 08/09/99 13:42 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	-.0025	.0010	.1373	.0012	19.09
Stddev	.0008	.0013	.0029	.0019	.49
%RSD	32.00	135.5	2.116	156.3	2.551
#1	-.0024	-.0003	.1416	-.0003	19.62
#2	-.0022	.0023	.1344	.0002	19.50
#3	-.0019	.0024	.1351	.0025	19.00
#4	-.0023	-.0002	.1384	-.0003	18.90
#5	-.0039	.0005	.1369	.0038	18.41

Int. Std.	Ir[193]
Line	193/pulse
Units	Cts/S
Avg	7.1590
Stddev	.1492
%RSD	2.0846
#1	7.0459
#2	7.0696
#3	7.0261
#4	7.5086
#5	7.3346

Analysis Report HNF-1679 REV. 0 08/09/99 13:49:37 page 1

Method: ISOU Sample Name: s99t001347 Operator: bjg
Comment: 40501 df
Run Time: 08/09/99 13:48 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	-.0016	-.0011	.0003	-.0020	.0312
Stddev	.0014	.0010	.0013	.0014	.0010
%RSD	88.05	98.13	394.1	71.28	3.310
#1	-.0025	-.0017	-.0015	.0000	.0311
#2	.0006	.0003	-.0003	-.0018	.0298
#3	-.0016	-.0003	.0019	-.0018	.0326
#4	-.0032	-.0021	.0005	-.0026	.0316
#5	-.0014	-.0015	.0012	-.0040	.0307

Int. Std.	Ir[193]
Line	193/pulse
Units	Cts/S
Avg	7.3566
Stddev	.1124
%RSD	1.5286
#1	7.1948
#2	7.4806
#3	7.4414
#4	7.3534
#5	7.3138

Analysis Report HNF-1679 REV. 0 08/09/99 13:52:17 page 1

Method: ISOU Sample Name: s99t001347_d Operator: bjg
Comment: 40501 df
Run Time: 08/09/99 13:51 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	-.0016	-.0006	-.0021	.0324
Stddev	.0011	.0013	.0011	.0005	.0024
%RSD	43.48	78.91	178.7	24.98	7.325
#1	-.0025	-.0003	-.0020	-.0017	.0311
#2	-.0038	-.0022	-.0015	-.0017	.0361
#3	-.0035	-.0026	.0004	-.0026	.0325
#4	-.0015	-.0002	.0004	-.0027	.0328
#5	-.0014	-.0029	-.0004	-.0018	.0298

Int. Std.	Ir[193]
Line	193/pulse
Units	Cts/S
Avg	7.4856
Stddev	.2614
%RSD	3.4913
#1	7.3321
#2	7.2069
#3	7.3617
#4	7.7382
#5	7.7903

Analysis Report **HNF-1679 REV. 0** 08/09/99 13:55:25 page 1

Method: ISOU Sample Name: s99t001348 Operator: bjg
Comment: 40501 df
Run Time: 08/09/99 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	-.0022	-.0014	.0001	-.0024	.0521
Stddev	.0017	.0010	.0015	.0009	.0021
%RSD	77.24	70.47	1257.	38.66	4.052
#1	-.0017	-.0005	.0002	-.0018	.0503
#2	-.0029	-.0009	.0004	-.0022	.0516
#3	-.0046	-.0029	-.0018	-.0015	.0506
#4	-.0019	-.0019	-.0006	-.0025	.0525
#5	.0000	-.0008	.0024	-.0038	.0556

Int. Std.	Ir[193]
Line	193/pulse
Units	Cts/S
Avg	7.5438
Stddev	.1274
%RSD	1.6885
#1	7.4691
#2	[illegible]
#3	[illegible]
#4	[illegible]
#5	7.3928

Analysis Report **HNF-1679 REV. 0** 08/09/99 13:59:07 page 1

Method: ISOU Sample Name: s99t001348_d Operator: bjg
Comment: 40501 df
Run Time: 08/09/99 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	-.0030	-.0007	-.0007	-.0022	.0489
Stddev	.0006	.0016	.0014	.0017	.0018
%RSD	20.11	242.2	205.3	77.92	3.653
#1	-.0034	-.0035	-.0006	-.0021	.0476
#2	-.0030	.0002	-.0005	-.0018	.0477
#3	-.0027	.0000	-.0029	.0002	.0492
#4	-.0023	.0005	.0002	-.0027	.0519
#5	-.0039	-.0005	.0005	-.0045	.0483

Int. Std.	Ir[193]
Line	193/pulse
Units	Cts/S
Avg	7.6285
Stddev	.1968
%RSD	2.5796
#1	7.5783
#2	7.5713
#3	7.5668
#4	7.4616
#5	7.9705

Analysis Report **HNF-1679 REV. 0** 08/09/99 14:01:42 page 1

Method: ISOU Sample Name: ccv Operator: bjg
Comment: iso-u lcs
Run Time: 08/09/99 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	-.0026	-.0001	.1602	-.0005	22.68
Stddev	.0005	.0007	.0070	.0021	.14
%RSD	20.40	1096.	4.342	426.8	.6152
#1	-.0027	.0002	.1717	-.0035	22.52
#2	-.0026	.0011	.1544	-.0001	22.55
#3	-.0018	-.0005	.1568	.0006	22.71
#4	-.0028	-.0005	.1564	.0019	22.81
#5	-.0033	-.0006	.1615	-.0014	22.82

Int. Std.	Ir[193]
Line	193/pulse
Units	Cts/S
Avg	7.9010
Stddev	.1424
%RSD	1.8024
#1	7.6783
#2	8.0755
#3	7.9161
#4	7.9051
#5	7.9301

Analysis Report **HNF-1679 REV. 0** 08/09/99 14:05:12 page 1

Method: ISOU Sample Name: ccb Operator: bjg
Comment: 2% hno2
Run Time: 08/09/99 14:03 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	-.0027	-.0015	-.0007	-.0024	.0005
Stddev	.0009	.0015	.0021	.0010	.0010
%RSD	32.64	98.69	296.7	41.93	197.9
#1	-.0015	-.0013	-.0012	-.0007	.0011
#2	-.0036	-.0027	.0024	-.0033	.0005
#3	-.0035	-.0002	.0001	-.0025	.0008
#4	-.0023	.0000	-.0016	-.0029	-.0012
#5	-.0027	-.0032	-.0033	-.0026	.0014

Int. Std.	Ir[193]
Line	193/pulse
Units	Cts/S
Avg	8.1357
Stddev	.1103
%RSD	1.3559
#1	8.0866
#2	8.0802
#3	8.2636
#4	8.2466
#5	8.0823

8-9-99

worklistdata2 Version 3.0 01/04/99
08/10/99 09:11

LABCORE Completed Worklist Report for Worklist# 30667

Analyst: jds **Instrument:** CARB2 **Book#:** _____

Method: LA-342-100 Rev/Mod F-3

Worklist Comment: S109 FOR @TICTOC1 RTS

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
1	BLNK			0	@TICTOC1 TIC-02	LIQUID	1	1.10E+0 mjc 8/11/99	1.100	ug/mL
1	BLNK			0	@TICTOC1 TOC-02	LIQUID	1	~~1.84E+1~~ 1.87E+1	18.400	ug/mL
2	STD			0	@TICTOC1 TIC-02	LIQUID	6.02E+02	5.79E+2	96.179	% Recovery
2	STD			0	@TICTOC1 TOC-02	LIQUID	3.00E+03	2.92E+3	97.333	% Recovery
3	SAMPLE	S99T001343		0	@TICTOC1 TIC-02	LIQUID	N/A	1.60E+03	5.000	ug/mL
3	SAMPLE	S99T001343		0	@TICTOC1 TOC-02	LIQUID	N/A	1.00E+03	40.000	ug/mL
4	DUP	S99T001343		0	@TICTOC1 TIC-02	LIQUID	1.60E+3	1.14E+3	33.577	RPD
4	DUP	S99T001343		0	@TICTOC1 TOC-02	LIQUID	1.00E+3	7.22E+2	32.288	RPD
5	TRIPL	S99T001343		0	@TICTOC1 TIC-02	LIQUID	1.60E+3	1.73E+3	7.808	RPD
5	TRIPL	S99T001343		0	@TICTOC1 TOC-02	LIQUID	1.00E+3	1.07E+3	6.763	RPD
6	SAMPLE	S99T001344		0	@TICTOC1 TIC-02	LIQUID	N/A	1.96E+03	5.000	ug/mL
6	SAMPLE	S99T001344		0	@TICTOC1 TOC-02	LIQUID	N/A	1.14E+03	40.000	ug/mL
7	DUP	S99T001344		0	@TICTOC1 TIC-02	LIQUID	1.96E+3	1.24E+3	45.000	RPD
7	DUP	S99T001344		0	@TICTOC1 TOC-02	LIQUID	1.14E+3	7.86E+2	36.760	RPD
8	TRIPL	S99T001344		0	@TICTOC1 TIC-02	LIQUID	1.96E+3	1.75E+3	11.321	RPD
8	TRIPL	S99T001344		0	@TICTOC1 TOC-02	LIQUID	1.14E+3	1.06E+3	7.273	RPD

11/15/99

Final page for worklist# 30667

8/10/99
Analyst Signature **Date**

Mary Francis 8/10/99
Analyst Signature **Date**

8/11/99
Reviewer Signature **Date**

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

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0
<<< BLANK ANALYSIS >>>

Sample: BASE Date: 07/16/99 Time: 13:22:34

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

Analyst : JD SPELLMAN
Min Readings = 22
Max Readings = 22
% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.10	0.00
2	1.01	0.30	66.67
3	1.50	0.50	40.00
4	2.00	0.80	37.50
5	2.50	1.00	20.00
6	3.00	1.20	16.67
7	3.50	1.40	14.29
8	4.00	1.50	6.67
9	4.50	1.80	16.67
10	5.00	1.90	5.26
11	5.50	2.10	9.52
12	6.00	2.20	4.55
13	6.50	2.40	8.33
14	7.00	2.50	4.00
15	7.50	2.70	7.41
16	8.00	2.90	6.90
17	8.50	3.10	6.45
18	9.00	3.30	6.06
19	9.50	3.40	2.94
20	10.00	3.70	8.11
21	10.50	3.80	2.63
22	11.00	4.00	5.00

BLANK VALUE = 4 micrograms carbon
BLANK FACTOR = 4 / 10.99884 = +3.6E-01 ug/min Carbon

SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 166 TO 182.

Sample Run By: JD SPELLMAN 8/10/99 11111

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0
<<< BLANK ANALYSIS >>>

Sample: BASE Date: 07/16/99 Time: 13:58:56

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

Analyst : JD SPELLMAN
Min Readings = 22
Max Readings = 22
% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.10	0.00
2	1.01	0.40	75.00
3	1.51	1.20	66.67
4	2.00	2.00	40.00
5	2.50	3.80	47.37
6	3.00	6.20	38.71
7	3.50	9.50	34.74
8	4.00	11.50	17.39
9	4.50	13.00	11.54
10	5.00	13.90	6.47
11	5.50	14.80	6.08
12	6.00	15.90	6.92
13	6.50	16.60	4.22
14	7.00	17.20	3.49
15	7.50	17.90	3.91
16	8.00	18.80	4.79
17	8.50	20.00	6.00
18	9.00	20.60	2.91
19	9.50	21.40	3.74
20	10.00	21.90	2.28
21	10.50	22.30	1.79
22	11.00	22.70	1.76

BLANK VALUE = 22.7 micrograms carbon
BLANK FACTOR = 22.7 / 10.99805 = +2.06E+00 ug/min Carbon

<<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!!>>>>

Sample Run By: _____
JD SPELLMAN 11111

HNF-1679 REV. 0

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: STD Date: 07/16/99 Time: 14:15:18

Sample Size = 1 uL
Dil Factor = 1
Blank ID # =
Blank Value = .36 ug/minute C

Analyst : JD SPELLMAN
Min Readings = 22
Max Readings = 22
% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.50	0.00
2	1.01	39.50	98.73
3	1.51	170.50	76.83
4	2.00	312.90	45.51
5	2.50	422.60	25.96
6	3.00	492.70	14.23
7	3.50	535.40	7.98
8	4.00	558.10	4.07
9	4.50	570.00	2.09
10	5.00	575.50	0.96
11	5.50	577.60	0.36
12	6.00	578.90	0.22
13	6.50	579.70	0.14
14	7.00	580.30	0.10
15	7.50	580.80	0.09
16	8.00	581.10	0.05
17	8.50	581.50	0.07
18	9.00	581.90	0.07
19	9.50	582.20	0.05
20	10.00	582.50	0.05
21	10.50	582.70	0.03
22	11.00	583.10	0.07

USER INPUT BLANK VALUE
BLANK VALUE = 3.959297 micrograms carbon
BLANK FACTOR = 3.959297 / 10.99805 = +3.6E-01 ug/min Carbon

SAMPLE RESULTS:
(583.1 - 3.959209)(1)/(1) = +5.791E+02 g/L Carbon
(583.1 - 3.959209)(1)/(1)(12) = +4.826E+01 Molar Carbon

Sample Run By: JD SPELLMAN 11111

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: STD Date: 07/16/99 Time: 14:28:30

Sample Size = 1 uL
Dil Factor = 1
Blank ID # =
Blank Value = 2.06 ug/minute C

Analyst : JD SPELLMAN
Min Readings = 22
Max Readings = 22
% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.00	0.00
2	1.01	1.20	100.00
3	1.50	13.20	90.91
4	2.00	122.00	89.18
5	2.50	418.10	70.82
6	3.00	530.30	21.16
7	3.50	565.40	6.21
8	4.00	577.50	2.10
9	4.50	582.80	0.91
10	5.00	586.70	0.66
11	5.50	589.30	0.44
12	6.00	591.50	0.37
13	6.50	594.50	0.50
14	7.00	598.20	0.62
15	7.50	601.20	0.50
16	8.00	603.40	0.36
17	8.50	604.30	0.15
18	9.00	605.20	0.15
19	9.50	605.90	0.12
20	10.00	606.20	0.05
21	10.50	606.60	0.07
22	11.00	607.10	0.08

USER INPUT BLANK VALUE
BLANK VALUE = 22.65598 micrograms carbon
BLANK FACTOR = 22.65598 / 10.99805 = +2.1E+00 ug/min Carbon

SAMPLE RESULTS:
(607.1 - 22.65384)(1)/(1) = +5.844E+02 g/L Carbon
(607.1 - 22.65384)(1)/(1)(12) = +4.870E+01 Molar Carbon
<<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!!>>>>

Sample Run By: _____
JD SPELLMAN 11111

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: BLK Date: 07/16/99 Time: 14:43:55

Sample Size = 1 uL
Dil Factor = 1
Blank ID # =
Blank Value = .36 ug/minute C

Analyst : JD SPELLMAN
Min Readings = 22
Max Readings = 22
% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.20	0.00
2	1.01	0.60	66.67
3	1.51	0.70	14.29
4	2.00	1.00	30.00
5	2.50	1.20	16.67
6	3.00	1.70	29.41
7	3.50	1.70	0.00
8	4.00	1.90	10.53
9	4.50	2.20	13.64
10	5.04	2.40	8.33
11	5.54	2.60	7.69
12	6.04	3.00	13.33
13	6.54	3.10	3.23
14	7.03	3.30	6.06
15	7.53	3.50	5.71
16	8.03	3.80	7.89
17	8.53	4.00	5.00
18	9.03	4.20	4.76
19	9.53	4.40	4.55
20	10.03	4.70	6.38
21	10.53	4.90	4.08
22	11.03	5.10	3.92

USER INPUT BLANK VALUE
BLANK VALUE = 3.959297 micrograms carbon
BLANK FACTOR = 3.959297 / 10.99805 = +3.6E-01 ug/min Carbon

SAMPLE RESULTS:
(5.1 - 3.97147)(1)/(1) = +1.1E+00 g/L Carbon
(5.1 - 3.97147)(1)/(1)(12) = +9.4E-02 Molar Carbon

Sample Run By: _____
JD SPELLMAN 11111

HNF-1679 REV. 0

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: BLK Date: 07/16/99 Time: 19:01:19

Sample Size = 1 uL
Dil Factor = 1
Blank ID # =
Blank Value = 2.06 ug/minute C

Analyst : JD SPELLMAN
Min Readings = 22
Max Readings = 22
% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.40	0.00
2	1.01	2.10	80.95
3	1.50	4.40	52.27
4	2.00	6.60	33.33
5	2.50	8.00	17.50
6	3.00	9.40	14.89
7	3.50	10.70	12.15
8	4.00	11.40	6.14
9	4.50	12.10	5.79
10	5.00	13.40	9.70
11	5.50	15.40	12.99
12	6.00	19.70	21.83
13	6.50	25.80	23.64
14	7.00	30.30	14.85
15	7.50	33.60	9.82
16	8.00	35.30	4.82
17	8.50	36.50	3.29
18	9.00	38.00	3.95
19	9.50	39.00	2.56
20	10.00	40.00	2.50
21	10.50	41.00	2.44
22	11.00	41.40	0.97

USER INPUT BLANK VALUE
BLANK VALUE = 22.65598 micrograms carbon
BLANK FACTOR = 22.65598 / 10.99805 = +2.1E+00 ug/min Carbon

SAMPLE RESULTS:
(41.4 - 22.65585)(1)/(1) = +1.87E+01 g/L Carbon
(41.4 - 22.65585)(1)/(1)(12) = +1.56E+00 Molar Carbon
<<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!!>>>>

Sample Run By: _____
JD SPELLMAN 11111

HNF-1679 REV. 0

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: S99T001343 Date: 07/16/99 Time: 19:18:02

Sample Size = 1 uL
Dil Factor = 1
Blank ID # =
Blank Value = .36 ug/minute C

Analyst : JD SPELLMAN
Min Readings = 22
Max Readings = 22
% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.00	0.00
2	1.01	1.60	100.00
3	1.50	21.90	92.69
4	2.00	102.70	78.68
5	2.50	201.40	49.01
6	3.00	260.90	22.81
7	3.50	288.60	9.60
8	4.00	300.50	3.96
9	4.50	305.30	1.57
10	5.00	308.60	1.07
11	5.50	310.90	0.74
12	6.00	312.60	0.54
13	6.50	314.10	0.48
14	7.00	315.70	0.51
15	7.50	316.60	0.28
16	8.00	317.90	0.41
17	8.50	318.80	0.28
18	9.00	319.90	0.34
19	9.50	321.00	0.34
20	10.00	321.80	0.25
21	10.50	322.70	0.28
22	11.00	323.60	0.28

USER INPUT BLANK VALUE
BLANK VALUE = 3.959297 micrograms carbon
BLANK FACTOR = 3.959297 / 10.99805 = +3.6E-01 ug/min Carbon

SAMPLE RESULTS:
(323.6 - 3.959253)(1)/(1) = +3.196E+02 g/L Carbon
(323.6 - 3.959253)(1)/(1)(12) = +2.664E+01 Molar Carbon

Sample Run By: _____
JD SPELLMAN 11111

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: S99T001343 Date: 07/16/99 Time: 19:30:30

Sample Size = 1 uL
Dil Factor = 1
Blank ID # =
Blank Value = 2.06 ug/minute C

Analyst : JD SPELLMAN
Min Readings = 22
Max Readings = 22
% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.80	0.00
2	1.01	20.90	96.17
3	1.50	73.10	71.41
4	2.00	148.80	50.87
5	2.50	182.00	18.24
6	3.00	195.90	7.10
7	3.50	202.40	3.21
8	4.00	206.00	1.75
9	4.50	208.70	1.29
10	5.00	211.00	1.09
11	5.50	213.90	1.36
12	6.00	215.70	0.83
13	6.50	217.10	0.64
14	7.00	218.10	0.46
15	7.50	218.70	0.27
16	8.00	219.50	0.36
17	8.50	220.30	0.36
18	9.00	220.90	0.27
19	9.50	221.40	0.23
20	10.00	222.00	0.27
21	10.50	222.50	0.22
22	11.00	223.10	0.27

USER INPUT BLANK VALUE
BLANK VALUE = 22.65598 micrograms carbon
BLANK FACTOR = 22.65598 / 10.99805 = +2.1E+00 ug/min Carbon

SAMPLE RESULTS:
(223.1 - 22.65572)(1)/(1) = +2.004E+02 g/L Carbon
(223.1 - 22.65572)(1)/(1)(12) = +1.670E+01 Molar Carbon
<<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!!>>>>

Sample Run By: JD SPELLMAN 11111

HNF-1679 REV. 0

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: S99T001343DUP Date: 07/16/99 Time: 19:45:09

Sample Size = 1 uL
Dil Factor = 1
Blank ID # =
Blank Value = .36 ug/minute C

Analyst : JD SPELLMAN
Min Readings = 22
Max Readings = 22
% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.30	0.00
2	1.01	1.00	70.00
3	1.51	5.50	81.82
4	2.00	33.80	83.73
5	2.50	94.30	64.16
6	3.00	153.80	38.69
7	3.50	190.60	19.31
8	4.00	206.80	7.83
9	4.50	214.10	3.41
10	5.00	217.20	1.43
11	5.50	219.70	1.14
12	6.00	221.50	0.81
13	6.50	223.10	0.72
14	7.00	224.20	0.49
15	7.50	225.50	0.58
16	8.00	226.40	0.40
17	8.50	227.50	0.48
18	9.00	228.40	0.39
19	9.50	229.40	0.44
20	10.00	230.30	0.39
21	10.50	231.10	0.35
22	11.00	231.80	0.30

USER INPUT BLANK VALUE
BLANK VALUE = 3.959297 micrograms carbon
BLANK FACTOR = 3.959297 / 10.99805 = +3.6E-01 ug/min Carbon

SAMPLE RESULTS:
(231.8 - 3.959297)(1)/(1) = +2.278E+02 g/L Carbon
(231.8 - 3.959297)(1)/(1)(12) = +1.899E+01 Molar Carbon

Sample Run By: _____
JD SPELLMAN 11111

HNF-1679 REV. 0

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: S99T001343DUP Date: 07/16/99 Time: 19:58:11

Sample Size = 1 uL
Dil Factor = 1
Blank ID # =
Blank Value = 2.06 ug/minute C

Analyst : JD SPELLMAN
Min Readings = 22
Max Readings = 22
% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	1.10	0.00
2	1.01	16.30	93.25
3	1.50	45.80	64.41
4	2.00	100.00	54.20
5	2.50	130.20	23.20
6	3.00	141.30	7.86
7	3.50	147.20	4.01
8	4.00	150.20	2.00
9	4.50	152.50	1.51
10	5.00	154.20	1.10
11	5.50	156.40	1.41
12	6.00	158.80	1.51
13	6.50	160.60	1.12
14	7.00	161.90	0.80
15	7.50	162.90	0.61
16	8.00	163.80	0.55
17	8.50	164.50	0.43
18	9.00	165.10	0.36
19	9.50	165.80	0.42
20	10.00	166.20	0.24
21	10.50	166.70	0.30
22	11.00	167.20	0.30

USER INPUT BLANK VALUE
BLANK VALUE = 22.65598 micrograms carbon
BLANK FACTOR = 22.65598 / 10.99805 = +2.1E+00 ug/min Carbon

SAMPLE RESULTS:
(167.2 - 22.65572)(1)/(1) = +1.445E+02 g/L Carbon
(167.2 - 22.65572)(1)/(1)(12) = +1.205E+01 Molar Carbon
<<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!!>>>>

Sample Run By: _____
JD SPELLMAN 11111

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: S99T001343TRP Date: 07/16/99 Time: 20:10:20

Sample Size = 1 uL
Dil Factor = 1
Blank ID # =
Blank Value = .36 ug/minute C

Analyst : JD SPELLMAN
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	7.30	84.93
4	2.00	55.70	86.89
5	2.50	148.80	62.57
6	3.00	239.70	37.92
7	3.50	292.20	17.97
8	4.00	318.00	8.11
9	4.50	329.00	3.34
10	5.00	333.50	1.35
11	5.50	336.50	0.89
12	6.00	338.20	0.50
13	6.50	339.80	0.47
14	7.00	341.10	0.38
15	7.50	342.60	0.44
16	8.00	343.80	0.35
17	8.50	344.80	0.29
18	9.00	345.70	0.26
19	9.50	346.90	0.35
20	10.00	347.60	0.20
21	10.50	348.50	0.26
22	11.00	349.40	0.26

USER INPUT BLANK VALUE
BLANK VALUE = 3.959297 micrograms carbon
BLANK FACTOR = 3.959297 / 10.99805 = +3.6E-01 ug/min Carbon

SAMPLE RESULTS:
(349.4 - 3.959165)(1)/(1) = +3.454E+02 g/L Carbon
(349.4 - 3.959165)(1)/(1)(12) = +2.879E+01 Molar Carbon

Sample Run By: _____
JD SPELLMAN 11111

HNF-1679 REV. 0

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: S99T001343TRP Date: 07/16/99 Time: 20:23:56

Sample Size = 1 uL
Dil Factor = 1
Blank ID # =
Blank Value = 2.06 ug/minute C

Analyst : JD SPELLMAN
Min Readings = 22
Max Readings = 22
% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	1.10	0.00
2	1.01	18.20	93.96
3	1.50	60.40	69.87
4	2.00	140.20	56.92
5	2.50	188.10	25.47
6	3.00	208.10	9.61
7	3.50	215.90	3.61
8	4.00	219.80	1.77
9	4.50	223.10	1.48
10	5.00	224.90	0.80
11	5.50	226.90	0.88
12	6.00	228.30	0.61
13	6.50	229.90	0.70
14	7.00	230.90	0.43
15	7.50	231.60	0.30
16	8.00	232.40	0.34
17	8.50	233.10	0.30
18	9.00	233.80	0.30
19	9.50	234.70	0.38
20	10.00	235.20	0.21
21	10.50	235.60	0.17
22	11.00	236.10	0.21

USER INPUT BLANK VALUE
BLANK VALUE = 22.65598 micrograms carbon
BLANK FACTOR = 22.65598 / 10.99805 = +2.1E+00 ug/min Carbon

SAMPLE RESULTS:
(236.1 - 22.65396)(1)/(1) = +2.134E+02 g/L Carbon
(236.1 - 22.65396)(1)/(1)(12) = +1.779E+01 Molar Carbon
<<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!!>>>>

Sample Run By: _____
JD SPELLMAN 11111

WORKBOOK PAGE: BLANK1

TIC/TOC : LA-342-100 (F-~~2~~ 3) LAD 9/26/99 LIQUIDS

			TIC	TOC
Type	Sample Size in mL	(SS)	0.0000	0.0000
BLNK	Dilution Factor	(DF)	1	1
Work List	µg of Carbon in Sample	(C1)	5.1	41.4
30667	µg of Carbon from Baseline	(C2)	4	22.7

Test Code	@TICTOC1
Matrix	LIQUID
Batch Number	99003043
Rerun	0
Sample Prep	N/A
Sample #	BLNK
Instrument Code	CARB2
Prepared By	MF
Chemist	MJL
Analyst	JDS
Date Complete	08/10/99
Analysis Date	08/10/99
Analysis Time	08:00 AM
Sample Point	S109

µg of Carbon = |C1-C2|

	TIC	TOC
Method Detection Limit in µg/mL	5	40
µg of Carbon	1.10E+00	1.87E+01

Data Entered By:	MF	Date:	08/10/99
Signature of Chemist:	NA	Date:	

BLANK.WB1 REV 1.0 342100ML

WORKBOOK PAGE: STD2

TIC/TOC : LA-342-100 (F-~~2~~ 3) LAD 9/23/99 LIQUIDS

			TIC	TOC
Type	Sample Size in mL	(SS)	1.0000	0.2000
STD	Dilution Factor	(DF)	1	1
Work List	Final Coulometer Reading in µg	(C1)	583.1	607.1
30667	µg of Carbon from Baseline	(C2)	4	22.7
Test Code	Standard Book Number		25N12E	34N12B
@TICTOC1	Standard Value (µg/ml)		602	3000

Matrix	LIQUID
Batch Number	99003043
Rerun	0
Sample Prep	N/A
Sample #	STD
Instrument Code	CARB2
Prepared By	MF
Chemist	MJL
Analyst	JDS
Date Complete	08/10/99
Analysis Date	08/10/99
Analysis Time	08:00 AM
Sample Point	S109

QC Actual in µg/mL = Standard Value (µg/mL)

QC Found in µg/mL = (C1 - C2) * DF / SS

QC Found in µg/mL for TIC = 5 if C1 < C2

QC Found in µg/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	3.00E+03
QC Found in µg/mL	5.79E+02	2.92E+03
Percent Standard Recovery	96.2	97.4

Data Entered By:	MF	Date:	08/10/99
Signature of Chemist:	NA	Date:	

STANDARD.WB1 REV 1.0 342100ML

WORKBOOK PAGE: SAM3

TIC/TOC : LA-342-100 (F-~~2~~) 3 LAD 9/28/99 LIQUIDS

			TIC	TOC
Type	Sample Size in mL	(SS)	0.2000	0.2000
SAMPLE	Dilution Factor	(DF)	1	1
Work List	µg of Carbon in Sample	(C1)	323.6	223.1
30667	µg of Carbon from Baseline	(C2)	4	22.7
Test Code				
@TICTOC1				

Matrix	LIQUID
Batch Number	99003043
Rerun	0
Sample Prep	N/A
Sample #	S99T001343
Instrument Code	CARB2
Prepared By	MF
Chemist	MJL
Analyst	JDS
Date Complete	08/10/99
Analysis Date	08/10/99
Analysis Time	08:00 AM
Sample Point	S109

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

	TIC	TOC
Method Detection Limit in µg/mL	5	40
µg of Carbon/mL	1.60E+03	1.00E+03

Data Entered By:	MF	Date:	08/10/99
Signature of Chemist:	N/A	Date:	

SAMPLE.WB1 REV 1.0 342100ML

I:\342100\OUT\30667.WB1 08/10/99 08:03:42

WORKBOOK PAGE: DUP4

TIC/TOC : LA-342-100 (F-2) LIQUIDS

			TIC	TOC
Type	Sample Size in mL	(SS)	0.2000	0.2000
DUP	Dilution Factor	(DF)	1	1
Work List	µg of Carbon in Sample	(C1)	231.8	167.2
30667	µg of Carbon from Baseline	(C2)	4	22.7
Test Code	Known µg of C from Original Sample		1.60E+3	1.00E+3
@TICTOC1				

Matrix	LIQUID
Batch Number	99003043
Rerun	0
Sample Prep	N/A
Sample #	S99T001343
Instrument Code	CARB2
Prepared By	MF
Chemist	MJL
Analyst	JDS
Date Complete	08/10/99
Analysis Date	08/10/99
Analysis Time	08:00 AM
Sample Point	S109

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

	TIC	TOC
Method Detection Limit in µg/mL	5	40
µg of Carbon/mL	1.14E+03	7.22E+02

Data Entered By:	MF	Date:	08/10/99
Signature of Chemist:		Date:	

WORKBOOK PAGE: TRIPL5

TIC/TOC : LA-342-100 (F-2) LIQUIDS

			TIC	TOC
Type: TRIPL	Sample Size in mL	(SS)	0.2000	0.2000
	Dilution Factor	(DF)	1	1
Work List: 30667	µg of Carbon in Sample	(C1)	349.4	236.1
	µg of Carbon from Baseline	(C2)	4	22.7
Test Code: @TICTOC1	Known µg of C from Original Sample		1.60E+3	1.00E+3
	Duplicate Result		1.14E+3	7.22E+2

Matrix: LIQUID
Batch Number: 99003043
Rerun: 0
Sample Prep: N/A
Sample #: S99T001343
Instrument Code: CARB2
Prepared By: MF
Chemist: MJL
Analyst: JDS
Date Complete: 08/10/99
Analysis Date: 08/10/99
Analysis Time: 08:00 AM
Sample Point: S109

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

	TIC	TOC
Method Detection Limit in µg/mL	5	40
µg of Carbon/mL	1.73E+03	1.07E+03

Data Entered By:	MF	Date:	08/10/99
Signature of Chemist:		Date:	

SAMPLE.WB1 REV 1.0 342100ML

I:\342100\OUT\30667.WB1 08/10/99 08:04:43

LABCORE Completed Worklist Report for Worklist# 30712

Analyst: jds **Instrument:** CARB2 **Book#:** _____

Method: LA-342-100 Rev/Mod _____

Worklist Comment: S109 FOR @TICTOC1 RTS

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
1	BLNK			0	@TICTOC1 TIC-02	LIQUID	1	2.70E+0	2.700	ug/mL
1	BLNK			0	@TICTOC1 TOC-02	LIQUID	1	1.22E+1	12.200	ug/mL
2	STD			0	@TICTOC1 TIC-02	LIQUID	6.02E+02	6.03E+2	100.166	% Recovery
2	STD			0	@TICTOC1 TOC-02	LIQUID	3.00E+03	2.80E+3	93.333	% Recovery
3	SAMPLE	S99T001345		0	@TICTOC1 TIC-02	LIQUID	N/A	2.41E+03	5.000	ug/mL
3	SAMPLE	S99T001345		0	@TICTOC1 TOC-02	LIQUID	N/A	1.28E+03	40.000	ug/mL
4	DUP	S99T001345		0	@TICTOC1 TIC-02	LIQUID	2.41E+3	2.44E+3	1.237	RPD
4	DUP	S99T001345		0	@TICTOC1 TOC-02	LIQUID	1.28E+3	1.42E+3	10.370	RPD

Final page for worklist# 30712

Analyst Signature Date

Mary Fraus 8/19/99
Analyst Signature Date

8/23/99
Reviewer Signature Date

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

08/10/99 16:32
ws2

LABCORE Data Entry Template for Worklist# 30712

Analyst: JdS **Instrument:** CARB2 _____ **Book#** 25N12E 34N12B

Method: LA-342-100 Rev/Mod F-3

Worklist Comment: S109 FOR @TICTOC1 RTS

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	BLNK				@TICTOC1	LIQUID		
2	STD				@TICTOC1	LIQUID		
3	SAMPLE	S99T001345	0		@TICTOC1	LIQUID	99000300	S-109 GRAB
		Analytes Requested:			TIC-02 , TOC-02			
4	DUP	S99T001345	0		@TICTOC1	LIQUID		

Final page for worklist # 30712

JdS 8/19/99
Signature **Date**

Mary Fraas 8/19/99
Signature **Date**

Data Entry Comments:

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

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0
<<< BLANK ANALYSIS >>>

Sample: BASE Date: 07/16/99 Time: 22:21:40

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

Analyst : JD SPELLMAN
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	1.51	1.50	33.33
4	2.00	2.00	25.00
5	2.50	2.50	20.00
6	3.00	3.10	19.35
7	3.50	3.40	8.82
8	4.00	3.90	12.82
9	4.50	4.50	13.33
10	5.00	4.90	8.16
11	5.50	5.30	7.55
12	6.00	5.80	8.62
13	6.50	6.20	6.45
14	7.00	6.70	7.46
15	7.50	7.00	4.29
16	8.00	7.40	5.41
17	8.50	7.80	5.13
18	9.00	8.20	4.88
19	9.50	8.60	4.65
20	10.00	8.90	3.37
21	10.50	9.40	5.32
22	11.00	9.70	3.09

BLANK VALUE = 9.7 micrograms carbon
BLANK FACTOR = 9.7 / 10.9978 = +8.8E-01 ug/min Carbon

SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 185 TO 200.

Sample Run By: JD SPELLMAN 8/19/99 11111

03/23/15 18:45 FAX 003/011

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0
<<< BLANK ANALYSIS >>>

Sample: BASE Date: 07/16/99 Time: 22:35:40

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

Analyst : JD SPELLMAN
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	1.51	5.10	82.35
4	2.00	10.90	53.21
5	2.50	16.30	33.13
6	3.00	20.30	19.70
7	3.50	23.20	12.50
8	4.00	24.90	6.83
9	4.50	25.90	3.86
10	5.00	27.40	5.47
11	5.50	28.80	4.86
12	6.00	29.50	2.37
13	6.50	30.40	2.96
14	7.00	31.10	2.25
15	7.50	31.80	2.20
16	8.00	32.50	2.15
17	8.50	33.00	1.52
18	9.00	33.50	1.49
19	9.50	34.00	1.47
20	10.00	34.70	2.02
21	10.50	35.10	1.14
22	11.00	35.60	1.40

BLANK VALUE = 35.6 micrograms carbon
BLANK FACTOR = 35.6 / 10.99878 = +3.24E+00 ug/min Carbon

<<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!!>>>>

Sample Run By: _____
JD SPELLMAN 11111

03/23/15 18:45 FAX 004/011

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: STD Date: 07/16/99 Time: 22:52:12

Sample Size = 1 uL
Dil Factor = 1
Blank ID # =
Blank Value = .88 ug/minute C

Analyst : JD SPELLMAN
Min Readings = 22
Max Readings = 22
% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.30	0.00
2	1.01	1.00	70.00
3	1.51	37.80	97.35
4	2.00	181.00	79.12
5	2.50	348.10	48.00
6	3.00	477.50	27.10
7	3.50	547.60	12.80
8	4.00	582.60	6.01
9	4.50	597.50	2.49
10	5.00	603.80	1.04
11	5.50	606.60	0.46
12	6.00	607.90	0.21
13	6.50	608.80	0.15
14	7.00	609.50	0.11
15	7.50	610.20	0.11
16	8.00	610.70	0.08
17	8.50	611.20	0.08
18	9.00	611.50	0.05
19	9.50	612.00	0.08
20	10.00	612.40	0.07
21	10.50	612.80	0.07
22	11.00	613.10	0.05

USER INPUT BLANK VALUE
BLANK VALUE = 9.678926 micrograms carbon
BLANK FACTOR = 9.678926 / 10.99878 = +8.8E-01 ug/min Carbon

SAMPLE RESULTS:
(613.1 - 9.677422)(1)/(1) = +6.034E+02 g/L Carbon
(613.1 - 9.677422)(1)/(1)(12) = +5.029E+01 Molar Carbon

Sample Run By: JD SPELLMAN 11111

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: STD Date: 07/16/99 Time: 23:09:31

Sample Size = 1 uL
Dil Factor = 1
Blank ID # =
Blank Value = 3.24 ug/minute C

Analyst : JD SPELLMAN
Min Readings = 22
Max Readings = 22
% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.30	0.00
2	1.01	9.80	96.94
3	1.50	90.50	89.17
4	2.00	303.90	70.22
5	2.50	484.40	37.26
6	3.00	552.80	12.37
7	3.50	574.00	3.69
8	4.00	581.80	1.34
9	4.50	585.10	0.56
10	5.00	587.10	0.34
11	5.50	588.40	0.22
12	6.00	589.40	0.17
13	6.50	590.30	0.15
14	7.00	591.20	0.15
15	7.50	592.00	0.14
16	8.00	592.80	0.13
17	8.50	593.60	0.13
18	9.00	594.00	0.07
19	9.50	594.50	0.08
20	10.00	595.10	0.10
21	10.50	595.50	0.07
22	11.00	596.00	0.08

USER INPUT BLANK VALUE
BLANK VALUE = 35.63604 micrograms carbon
BLANK FACTOR = 35.63604 / 10.99878 = +3.2E+00 ug/min Carbon

SAMPLE RESULTS:
(596 - 35.63367)(1)/(1) = +5.604E+02 g/L Carbon
(596 - 35.63367)(1)/(1)(12) = +4.670E+01 Molar Carbon
<<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!!>>>>

Sample Run By: JD SPELLMAN 11111

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: BLK Date: 07/16/99 Time: 23:23:23

Sample Size = 1 uL
Dil Factor = 1
Blank ID # =
Blank Value = .88 ug/minute C

Analyst : JD SPELLMAN
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	1.40	21.43
5	2.50	1.80	22.22
6	3.00	2.10	14.29
7	3.50	2.50	16.00
8	4.00	2.80	10.71
9	4.50	3.10	9.68
10	5.00	3.40	8.82
11	5.50	3.70	8.11
12	6.00	4.00	7.50
13	6.50	4.30	6.98
14	7.00	4.60	6.52
15	7.50	4.90	6.12
16	8.00	5.20	5.77
17	8.50	5.50	5.45
18	9.00	5.80	5.17
19	9.50	6.10	4.92
20	10.00	6.40	4.69
21	10.50	6.70	4.48
22	11.00	7.00	4.29

USER INPUT BLANK VALUE
BLANK VALUE = 9.678926 micrograms carbon
BLANK FACTOR = 9.678926 / 10.99878 = +8.8E-01 ug/min Carbon

SAMPLE RESULTS:
(7 - 9.677315)(1)/(1) = < 5.00 E-3 g/L Carbon
(7 - 9.677315)(1)/(1)(12) = < 4.17 E-4 Molar Carbon

Sample Run By: JD SPELLMAN 11111

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: BLK Date: 07/16/99 Time: 23:37:38

Sample Size = 1 uL
Dil Factor = 1
Blank ID # =
Blank Value = 3.24 ug/minute C

Analyst : JD SPELLMAN
Min Readings = 22
Max Readings = 22
% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.20	0.00
2	1.01	1.40	85.71
3	1.50	3.30	57.58
4	2.00	5.50	40.00
5	2.50	9.30	40.86
6	3.00	12.90	27.91
7	3.50	15.10	14.57
8	4.00	16.20	6.79
9	4.50	16.90	4.14
10	5.00	17.50	3.43
11	5.50	18.30	4.37
12	6.00	19.10	4.19
13	6.50	19.70	3.05
14	7.00	20.20	2.48
15	7.50	20.70	2.42
16	8.00	21.20	2.36
17	8.50	21.50	1.40
18	9.00	22.00	2.27
19	9.50	22.30	1.35
20	10.00	22.70	1.76
21	10.50	23.00	1.30
22	11.00	23.40	1.71

USER INPUT BLANK VALUE
BLANK VALUE = 35.63604 micrograms carbon
BLANK FACTOR = 35.63604 / 10.99878 = +3.2E+00 ug/min Carbon

SAMPLE RESULTS:
(23.4 - 35.63051)(1)/(1) = < 5.00 E-3 g/L Carbon
(23.4 - 35.63051)(1)/(1)(12) = < 4.17 E-4 Molar Carbon
<<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!!>>>>

Sample Run By: _____
JD SPELLMAN 11111

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: S99T001345 Date: 07/16/99 Time: 23:49:53

Sample Size = 1 uL
Dil Factor = 1
Blank ID # =
Blank Value = .88 ug/minute C

Analyst : JD SPELLMAN
Min Readings = 22
Max Readings = 22
% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.00	0.00
2	1.00	0.30	100.00
3	1.50	0.70	57.14
4	2.00	3.30	78.79
5	2.50	40.00	91.75
6	3.00	141.30	71.69
7	3.50	246.00	42.56
8	4.00	321.30	23.44
9	4.50	393.60	18.37
10	5.00	439.40	10.42
11	5.50	461.50	4.79
12	6.00	471.20	2.06
13	6.50	476.00	1.01
14	7.00	479.00	0.63
15	7.50	481.00	0.42
16	8.00	482.70	0.35
17	8.50	484.40	0.35
18	9.00	485.70	0.27
19	9.50	487.20	0.31
20	10.00	488.40	0.25
21	10.50	489.70	0.27
22	11.00	491.10	0.29

USER INPUT BLANK VALUE
BLANK VALUE = 9.678926 micrograms carbon
BLANK FACTOR = 9.678926 / 10.99878 = +8.8E-01 ug/min Carbon

SAMPLE RESULTS:
(491.1 - 9.677315)(1)/(1) = +4.814E+02 g/L Carbon
(491.1 - 9.677315)(1)/(1)(12) = +4.012E+01 Molar Carbon

Sample Run By: JD SPELLMAN 11111

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: S99T001345 Date: 07/17/99 Time: 00:07:37

Sample Size = 1 uL
Dil Factor = 1
Blank ID # =
Blank Value = 3.24 ug/minute C

Analyst : JD SPELLMAN
Min Readings = 22
Max Readings = 22
% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.20	0.00
2	1.01	1.10	81.82
3	1.50	1.90	42.11
4	2.00	15.10	87.42
5	2.50	59.40	74.58
6	3.00	168.70	64.79
7	3.50	235.20	28.27
8	4.00	259.50	9.36
9	4.50	269.50	3.71
10	5.00	274.50	1.82
11	5.50	277.80	1.19
12	%-1434.00	280.50	0.96
13	%-1433.50	282.60	0.74
14	%-1433.00	284.10	0.53
15	%-1432.50	285.30	0.42
16	%-1432.00	286.50	0.42
17	%-1431.47	287.50	0.35
18	%-1430.97	288.40	0.31
19	%-1430.47	289.30	0.31
20	%-1429.97	290.20	0.31
21	%-1429.47	290.90	0.24
22	%-1428.97	291.70	0.27

USER INPUT BLANK VALUE
BLANK VALUE = 35.63604 micrograms carbon
BLANK FACTOR = 35.63604 / 10.99878 = +3.2E+00 ug/min Carbon

SAMPLE RESULTS:
(291.7 --4629.86)(1)/(1) = +4.922E+03 g/L Carbon
(291.7 --4629.86)(1)/(1)(12) = +4.101E+02 Molar Carbon
<<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!!>>>>

Sample Run By: _____
JD SPELLMAN 11111

HNF-1679 REV. 0

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

1345 mf 7/19/99

Sample: S99T00~~1245~~DUP Date: 07/17/99 Time: 00:23:51

Sample Size = 1 uL
Dil Factor = 1
Blank ID # =
Blank Value = .88 ug/minute C

Analyst : JD SPELLMAN
Min Readings = 22
Max Readings = 22
% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.50	0.00
2	1.00	1.00	50.00
3	1.50	1.70	41.18
4	2.00	2.60	34.62
5	2.50	6.90	62.32
6	3.00	44.60	84.53
7	3.50	129.10	65.45
8	4.00	210.70	38.73
9	4.50	268.50	21.53
10	5.00	336.00	20.09
11	5.50	412.70	18.58
12	6.00	455.60	9.42
13	6.50	473.10	3.70
14	7.00	480.80	1.60
15	7.50	484.70	0.80
16	8.00	487.30	0.53
17	8.50	489.20	0.39
18	9.00	491.00	0.37
19	9.50	492.70	0.35
20	10.00	494.10	0.28
21	10.50	495.30	0.24
22	11.00	496.70	0.28

USER INPUT BLANK VALUE
BLANK VALUE = 9.678926 micrograms carbon
BLANK FACTOR = 9.678926 / 10.99878 = +8.8E-01 ug/min Carbon

SAMPLE RESULTS:
(496.7 - 9.67736)(1)/(1) = +4.870E+02 g/L Carbon
(496.7 - 9.67736)(1)/(1)(12) = +4.059E+01 Molar Carbon

Sample Run By: _____
JD SPELLMAN 11111

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: S99T001345DUP Date: 07/17/99 Time: 05:38:32

Sample Size = 1 uL
Dil Factor = 1
Blank ID # =
Blank Value = 3.24 ug/minute C

Analyst : JD SPELLMAN
Min Readings = 22
Max Readings = 22
% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.80	0.00
2	1.00	1.70	52.94
3	1.50	2.00	15.00
4	2.00	3.60	44.44
5	2.50	4.50	20.00
6	3.00	15.80	71.52
7	3.50	61.20	74.18
8	4.00	162.20	62.27
9	4.50	237.00	31.56
10	5.00	270.00	12.22
11	5.50	283.80	4.86
12	6.00	290.80	2.41
13	6.50	295.40	1.56
14	7.00	299.00	1.20
15	7.50	301.10	0.70
16	8.00	302.70	0.53
17	8.50	304.20	0.49
18	9.00	305.30	0.36
19	9.50	306.60	0.42
20	10.00	309.30	0.87
21	10.50	314.40	1.62
22	11.00	320.40	1.87

USER INPUT BLANK VALUE
BLANK VALUE = 35.63604 micrograms carbon
BLANK FACTOR = 35.63604 / 10.99878 = +3.2E+00 ug/min Carbon

SAMPLE RESULTS:
(320.4 - 35.63568)(1)/(1) = +2.848E+02 g/L Carbon
(320.4 - 35.63568)(1)/(1)(12) = +2.373E+01 Molar Carbon
<<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!!>>>>

Sample Run By: JD SPELLMAN 11111

WORKBOOK PAGE: BLANK1

TIC/TOC : LA-342-100 (F-~~2~~ 3) LIQUIDS

Type			TIC	TOC
BLNK	Sample Size in mL	(SS)	0.0000	0.0000
	Dilution Factor	(DF)	1	1
Work List: 30712	µg of Carbon in Sample	(C1)	7	23.4
	µg of Carbon from Baseline	(C2)	9.7	35.6

Test Code	@TICTOC1
Matrix	LIQUID
Batch Number	99003082
Rerun	0
Sample Prep	N/A
Sample #	BLNK
Instrument Code	CARB2
Prepared By	MF
Chemist	MJL
Analyst	JDS
Date Complete	08/19/99
Analysis Date	08/14/99
Analysis Time	02:30 AM
Sample Point	S109

µg of Carbon = |C1-C2|

	TIC	TOC
Method Detection Limit in µg/mL	5	40
µg of Carbon	2.70E+00	1.22E+01

Data Entered By:	MF	Date:	08/19/99
Signature of Chemist:	NA	Date:	

BLANK.WB1 REV 1.0 342100ML

WORKBOOK PAGE: STD2

TIC/TOC : LA-342-100 (F-2) 3 MD 9/20/99 LIQUIDS

			TIC	TOC
Type	Sample Size in mL	(SS)	1.0000	0.2000
STD	Dilution Factor	(DF)	1	1
Work List	Final Coulometer Reading in µg	(C1)	613.1	596
30712	µg of Carbon from Baseline	(C2)	9.7	35.6
Test Code	Standard Book Number		25N12E	34N12B
@TICTOC1	Standard Value (µg/ml)		602	3000

Matrix
LIQUID
Batch Number
99003082
Rerun
0
Sample Prep
N/A
Sample #
STD
Instrument Code
CARB2
Prepared By
MF
Chemist
MJL
Analyst
JDS
Date Complete
08/19/99
Analysis Date
08/14/99
Analysis Time
02:30 AM
Sample Point
S109

QC Actual in µg/mL = Standard Value (µg/mL)

QC Found in µg/mL = (C1 - C2) * DF / SS

QC Found in µg/mL for TIC = 5 if C1 < C2

QC Found in µg/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	3.00E+03
QC Found in µg/mL	6.03E+02	2.80E+03
Percent Standard Recovery	100.2	93.4

Data Entered By:	MF	Date:	08/19/99
Signature of Chemist:		Date:	

STANDARD.WB1 REV 1.0 342100ML

WORKBOOK PAGE: SAM3

TIC/TOC : LA-342-100 (F-~~2~~ 3) MD 9/20/99 LIQUIDS

			TIC	TOC
Type	Sample Size in mL	(SS)	0.2000	0.2000
SAMPLE	Dilution Factor	(DF)	1	1
Work List	µg of Carbon in Sample	(C1)	491.1	291.7
30712	µg of Carbon from Baseline	(C2)	9.7	35.6
Test Code				
@TICTOC1				

Matrix	LIQUID
Batch Number	99003082
Rerun	0
Sample Prep	N/A
Sample #	S99T001345
Instrument Code	CARB2
Prepared By	MF
Chemist	MJL
Analyst	JDS
Date Complete	08/19/99
Analysis Date	08/14/99
Analysis Time	02:30 AM
Sample Point	S109

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

	TIC	TOC
Method Detection Limit in µg/mL	5	40
µg of Carbon/mL	2.41E+03	1.28E+03

Data Entered By:	MF	Date:	08/19/99
Signature of Chemist:	N/A	Date:	

SAMPLE.WB1 REV 1.0 342100ML

I:\342100\OUT\30712.WB1 08/19/99 13:12:50

WORKBOOK PAGE: DUP4

TIC/TOC : LA-342-100 (F-2) 3 LAD 9/24/99 LIQUIDS

			TIC	TOC
Type: DUP	Sample Size in mL	(SS)	0.2000	0.2000
	Dilution Factor	(DF)	1	1
Work List: 30712	µg of Carbon in Sample	(C1)	496.7	320.4
	µg of Carbon from Baseline	(C2)	9.7	35.6
Test Code: @TICTOC1	Known µg of C from Original Sample		2.41E+3	1.28E+3
Matrix: LIQUID				
Batch Number: 99003082				
Rerun: 0				
Sample Prep: N/A				
Sample #: S99T001345				
Instrument Code: CARB2				
Prepared By: MF				
Chemist: MJL				
Analyst: JDS				
Date Complete: 08/19/99				
Analysis Date: 08/14/99				
Analysis Time: 02:30 AM				
Sample Point: S109				

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

	TIC	TOC
Method Detection Limit in µg/mL	5	40
µg of Carbon/mL	2.44E+03	1.42E+03

Data Entered By:	MF	Date:	08/19/99
Signature of Chemist: NA		Date:	

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LABCORE Completed Worklist Report for Worklist# 31577

Analyst: slh **Instrument:** CARB2 **Book#:** _____

Method: LA-342-100 Rev/Mod _____

Worklist Comment: S-109 FOR @TICTOC1, RLC

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
1	BLNK		0		@TICTOC1 TIC-02	LIQUID	1	4.00E-1	0.400	ug/mL
1	BLNK		0		@TICTOC1 TOC-02	LIQUID	1	2.00E-1	0.200	ug/mL
2	STD		0		@TICTOC1 TIC-02	LIQUID	6.02E+02	5.94E+2	98.671	% Recovery
2	STD		0		@TICTOC1 TOC-02	LIQUID	3.00E+03	2.85E+3	95.000	% Recovery
3	SAMPLE	S99T001347	0		@TICTOC1 TIC-02	LIQUID	N/A	2.22E+03	5.000	ug/mL
3	SAMPLE	S99T001347	0		@TICTOC1 TOC-02	LIQUID	N/A	1.15E+03	40.000	ug/mL
4	DUP	S99T001347	0		@TICTOC1 TIC-02	LIQUID	2.22E+3	2.18E+3	1.818	RPD
4	DUP	S99T001347	0		@TICTOC1 TOC-02	LIQUID	1.15E+3	1.16E+3	0.866	RPD
5	SPK	S99T001347	0		@TICTOC1 TIC-02	LIQUID	1.00E+02	1.03E+02	103.000	% Recovery
5	SPK	S99T001347	0		@TICTOC1 TOC-02	LIQUID	1.00E+02	9.70E+01	97.000	% Recovery

Final page for worklist# 31577

_____ _____
Analyst Signature **Date**

Mary Franz 11/1/99
Analyst Signature **Date**

James Grolus 11/1/99
Reviewer Signature **Date**

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

LABCORE Data Entry Template for Worklist# 31577

Analyst: SUH **Instrument:** CARB2 _____ **Book#** TIC 25N12-E
TOC 34N12-B

Method: LA-342-100 Rev/Mod F-3

Worklist Comment: S-109 FOR @TICTOC1, RLC

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	BLNK				@TICTOC1	LIQUID		
2	STD				@TICTOC1	LIQUID		
3	SAMPLE	S99T001347	0		@TICTOC1	LIQUID	99000300	S-109 GRAB
		Analytes Requested:			TIC-02 , TOC-02			
4	DUP	S99T001347	0		@TICTOC1	LIQUID		
5	SPK	S99T001347	0		@TICTOC1	LIQUID		

Final page for worklist # 31577

Signature Date 10-29-99

Signature Date 11/1/99

Data Entry Comments:

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

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0
<<< BLANK ANALYSIS >>>

Sample: BASE 2 Date: 10/29/99 Time: 00:19:30

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	1.00	30.00
4	2.00	1.50	33.33
5	2.50	2.40	37.50
6	3.00	3.50	31.43
7	3.50	4.20	16.67
8	4.00	5.00	16.00
9	4.50	5.50	9.09
10	5.00	5.90	6.78
11	5.50	6.20	4.84
12	6.00	6.60	6.06
13	6.50	7.00	5.71
14	7.00	7.30	4.11
15	7.50	7.50	2.67
16	8.00	8.00	6.25
17	8.50	8.10	1.23
18	9.00	8.40	3.57
19	9.50	8.80	4.55
20	10.00	9.00	2.22
21	10.50	9.40	4.26
22	11.00	9.60	2.08

BLANK VALUE = 9.6 micrograms carbon
BLANK FACTOR = 9.6 / 10.99783 = +8.7E-01 ug/min Carbon

SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 203 TO 219.

Sample Run By: SL Hood Boatright
SL HOOD 00002
10-29-99

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0
<<< BLANK ANALYSIS >>>

Sample: BASE 2 Date: 10/29/99 Time: 00:33:26

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	1.00	0.80	62.50
3	1.50	1.00	20.00
4	2.00	2.20	54.55
5	2.50	5.20	57.69
6	3.00	8.90	41.57
7	3.50	12.20	27.05
8	4.00	14.70	17.01
9	4.50	16.60	11.45
10	5.00	17.40	4.60
11	5.50	18.40	5.43
12	6.00	19.20	4.17
13	6.50	19.60	2.04
14	7.00	20.10	2.49
15	7.50	20.50	1.95
16	8.00	21.00	2.38
17	8.50	21.30	1.41
18	9.00	21.80	2.29
19	9.50	22.00	0.91
20	10.00	22.50	2.22
21	10.50	22.80	1.32
22	11.00	23.10	1.30

BLANK VALUE = 23.1 micrograms carbon
BLANK FACTOR = 23.1 / 10.99783 = +2.10E+00 ug/min Carbon

<<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!!>>>>

Sample Run By: SL Hood Bootright SL HOOD 00002
10-29-99

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: STD 2 Date: 10/29/99 Time: 00:50:15

Sample Size = 1000 uL
Dil Factor = 1
Blank ID # =
Blank Value = .87 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	2.70	85.19
3	1.50	21.90	87.67
4	2.00	62.40	64.90
5	2.50	117.90	47.07
6	3.00	197.60	40.33
7	3.50	297.40	33.56
8	4.00	393.70	24.46
9	4.50	470.20	16.27
10	5.00	522.40	9.99
11	5.50	555.60	5.98
12	6.00	575.60	3.47
13	6.50	586.70	1.89
14	7.00	592.20	0.93
15	7.50	596.00	0.64
16	8.00	598.00	0.33
17	8.50	599.60	0.27
18	9.00	600.60	0.17
19	9.50	601.60	0.17
20	10.00	602.30	0.12
21	10.50	602.70	0.07
22	11.00	603.40	0.12

USER INPUT BLANK VALUE
BLANK VALUE = 9.568115 micrograms carbon
BLANK FACTOR = 9.568115 / 10.99783 = +8.7E-01 ug/min Carbon

SAMPLE RESULTS:
(603.4 - 9.567389)(1)/(1000) = +5.938E-01 g/L Carbon
(603.4 - 9.567389)(1)/(1000)(12) = +4.949E-02 Molar Carbon

Sample Run By: SL HOOD 00002

SS = 1ml = 25N12-E

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: STD 2 Date: 10/29/99 Time: 01:06:25

Sample Size = 200 uL
Dil Factor = 1
Blank ID # =
Blank Value = 2.1 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	0.80	50.00
3	1.51	1.30	38.46
4	2.01	9.20	85.87
5	2.51	65.40	85.93
6	3.01	193.10	66.13
7	3.50	337.50	42.79
8	4.00	440.20	23.33
9	4.50	503.60	12.59
10	5.00	540.40	6.81
11	5.50	561.80	3.81
12	6.00	573.70	2.07
13	6.50	579.70	1.04
14	7.00	583.60	0.67
15	7.50	586.00	0.41
16	8.00	587.40	0.24
17	8.50	588.60	0.20
18	9.00	589.60	0.17
19	9.50	590.40	0.14
20	10.00	591.00	0.10
21	10.50	591.70	0.12
22	11.00	592.30	0.10

USER INPUT BLANK VALUE
BLANK VALUE = 23.09545 micrograms carbon
BLANK FACTOR = 23.09545 / 10.99783 = +2.1E+00 ug/min Carbon

SAMPLE RESULTS:
(592.3 - 23.1014)(1)/(200) = +2.846E+00 g/L Carbon
(592.3 - 23.1014)(1)/(200)(12) = +2.372E-01 Molar Carbon
<<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!!>>>>

Sample Run By: _____
SL HOOD 00002

SS= .200ml 34M2-B

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: BLK 2 Date: 10/29/99 Time: 01:19:47

Sample Size = 1 uL
Dil Factor = 1
Blank ID # =
Blank Value = .87 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	0.80	62.50
3	1.50	1.10	27.27
4	2.00	1.50	26.67
5	2.50	2.60	42.31
6	3.00	3.50	25.71
7	3.50	4.40	20.45
8	4.00	4.90	10.20
9	4.50	5.60	12.50
10	5.00	5.90	5.08
11	5.50	6.50	9.23
12	6.00	6.80	4.41
13	6.50	7.10	4.23
14	7.00	7.40	4.05
15	7.50	7.70	3.90
16	8.00	8.10	4.94
17	8.50	8.40	3.57
18	9.00	8.70	3.45
19	9.50	9.00	3.33
20	10.00	9.30	3.23
21	10.50	9.60	3.13
22	11.00	10.00	4.00

USER INPUT BLANK VALUE
BLANK VALUE = 9.568115 micrograms carbon
BLANK FACTOR = 9.568115 / 10.99783 = +8.7E-01 ug/min Carbon

SAMPLE RESULTS:
(10 - 9.567385)(1)/(1) = +4.33E-01 g/L Carbon
(10 - 9.567385)(1)/(1)(12) = +3.61E-02 Molar Carbon

Sample Run By: _____
SL HOOD 00002

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: BLK 2 Date: 10/29/99 Time: 01:33:05

Sample Size = 1 uL
Dil Factor = 1
Blank ID # =
Blank Value = 2.1 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	0.60	33.33
3	1.50	0.90	33.33
4	2.00	1.50	40.00
5	2.50	3.20	53.13
6	3.00	6.70	52.24
7	3.50	10.30	34.95
8	4.00	13.10	21.37
9	4.50	15.20	13.82
10	5.00	16.50	7.88
11	5.50	17.40	5.17
12	6.00	18.20	4.40
13	6.50	18.80	3.19
14	7.00	19.30	2.59
15	7.50	19.80	2.53
16	8.00	20.20	1.98
17	8.50	20.60	1.94
18	9.00	21.10	2.37
19	9.50	21.60	2.31
20	10.00	21.80	0.92
21	10.50	22.10	1.36
22	11.00	22.90	3.49

USER INPUT BLANK VALUE
BLANK VALUE = 23.09545 micrograms carbon
BLANK FACTOR = 23.09545 / 10.99783 = +2.1E+00 ug/min Carbon

SAMPLE RESULTS:
(22.9 - 23.09753)(1)/(1) = < 5.00 E-3 g/L Carbon
(22.9 - 23.09753)(1)/(1)(12) = < 4.17 E-4 Molar Carbon
<<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!!>>>>

Sample Run By: SL HOOD 00002

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: S99T001347 Date: 10/29/99 Time: 01:47:52

Sample Size = 1 uL
Dil Factor = 1
Blank ID # =
Blank Value = .87 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	0.60	33.33
3	1.51	0.90	33.33
4	2.00	1.40	35.71
5	2.50	2.40	41.67
6	3.00	6.10	60.66
7	3.50	14.60	58.22
8	4.00	30.80	52.60
9	4.50	60.60	49.17
10	5.00	105.00	42.29
11	5.50	148.50	29.29
12	6.00	179.70	17.36
13	6.50	200.00	10.15
14	7.00	210.90	5.17
15	7.50	217.60	3.08
16	8.00	221.50	1.76
17	8.50	224.10	1.16
18	9.00	226.10	0.88
19	9.50	227.80	0.75
20	10.00	229.00	0.52
21	10.50	230.10	0.48
22	11.00	231.10	0.43

USER INPUT BLANK VALUE
BLANK VALUE = 9.568115 micrograms carbon
BLANK FACTOR = 9.568115 / 10.99783 = +8.7E-01 ug/min Carbon

SAMPLE RESULTS:
(231.1 - 9.568261)(1)/(1) = +2.215E+02 g/L Carbon
(231.1 - 9.568261)(1)/(1)(12) = +1.846E+01 Molar Carbon

Sample Run By: _____
SL HOOD 00002

SS = .100ml = .1415g

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: S99T001347 Date: 10/29/99 Time: 02:01:23

Sample Size = 1 uL
Dil Factor = 1
Blank ID # =
Blank Value = 2.1 ug/minute C

Analyst : SL HOOD
Min Readings = 22
Max Readings = 22
% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.80	0.00
2	1.01	1.80	55.56
3	1.50	2.50	28.00
4	2.00	4.60	45.65
5	2.50	12.90	64.34
6	3.00	33.80	61.83
7	3.50	62.70	46.09
8	4.00	88.10	28.83
9	4.50	105.30	16.33
10	5.00	116.20	9.38
11	5.50	122.30	4.99
12	6.00	126.40	3.24
13	6.50	128.90	1.94
14	7.00	131.00	1.60
15	7.50	132.30	0.98
16	8.00	133.80	1.12
17	8.50	134.80	0.74
18	9.00	135.60	0.59
19	9.50	136.20	0.44
20	10.00	136.90	0.51
21	10.50	137.60	0.51
22	11.00	138.30	0.51

USER INPUT BLANK VALUE
BLANK VALUE = 23.09545 micrograms carbon
BLANK FACTOR = 23.09545 / 10.99783 = +2.1E+00 ug/min Carbon

SAMPLE RESULTS:
(138.3 - 23.09929)(1)/(1) = +1.152E+02 g/L Carbon
(138.3 - 23.09929)(1)/(1)(12) = +9.600E+00 Molar Carbon
<<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!!>>>>

Sample Run By: _____
SL HOOD 00002

=.100 ml
SG = .1415 g

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: S99T01347 DUP Date: 10/29/99 Time: 02:17:38

Sample Size = 1 uL
Dil Factor = 1
Blank ID # =
Blank Value = .87 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	1.00	1.10	45.45
3	1.50	1.50	26.67
4	2.00	1.90	21.05
5	2.50	3.00	36.67
6	3.00	6.20	51.61
7	3.50	15.90	61.01
8	4.00	36.80	56.79
9	4.50	72.50	49.24
10	5.00	117.40	38.25
11	5.50	156.10	24.79
12	6.00	182.00	14.23
13	6.50	197.70	7.94
14	7.00	206.80	4.40
15	7.50	212.50	2.68
16	8.00	216.80	1.98
17	8.50	219.30	1.14
18	9.00	221.40	0.95
19	9.50	223.40	0.90
20	10.00	224.70	0.58
21	10.50	225.90	0.53
22	11.00	227.20	0.57

USER INPUT BLANK VALUE
BLANK VALUE = 9.568115 micrograms carbon
BLANK FACTOR = 9.568115 / 10.99783 = +8.7E-01 ug/min Carbon

SAMPLE RESULTS:
(227.2 - 9.568122)(1)/(1) = +2.176E+02 g/L Carbon
(227.2 - 9.568122)(1)/(1)(12) = +1.814E+01 Molar Carbon

Sample Run By: _____
SL HOOD 00002

55- .100 ml = .1399g

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: S99T01347 DUP Date: 10/29/99 Time: 02:30:47

Sample Size = 1 uL
Dil Factor = 1
Blank ID # =
Blank Value = 2.1 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	1.00	1.90	47.37
3	1.50	3.20	40.63
4	2.00	4.80	33.33
5	2.50	9.50	49.47
6	3.00	24.80	61.69
7	3.50	52.90	53.12
8	4.00	80.60	34.37
9	4.50	100.70	19.96
10	5.00	113.50	11.28
11	5.50	121.20	6.35
12	6.00	125.90	3.73
13	6.50	129.30	2.63
14	7.00	131.20	1.45
15	7.50	132.90	1.28
16	8.00	133.90	0.75
17	8.50	134.90	0.74
18	9.00	136.10	0.88
19	9.50	137.10	0.73
20	10.00	137.60	0.36
21	10.50	138.40	0.58
22	11.00	139.20	0.57

USER INPUT BLANK VALUE
BLANK VALUE = 23.09545 micrograms carbon
BLANK FACTOR = 23.09545 / 10.99783 = +2.1E+00 ug/min Carbon

SAMPLE RESULTS:
(139.2 - 23.09369)(1)/(1) = +1.161E+02 g/L Carbon
(139.2 - 23.09369)(1)/(1)(12) = +9.676E+00 Molar Carbon
<<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!!>>>>

Sample Run By: _____
SL HOOD 00002

SS = .100 ml = .1399g

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: S99T01347 SPK Date: 10/29/99 Time: 03:23:16

Sample Size = 1 uL
Dil Factor = 1
Blank ID # =
Blank Value = .87 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	0.90	22.22
3	1.50	1.40	35.71
4	2.00	2.70	48.15
5	2.50	24.50	88.98
6	3.00	97.60	74.90
7	3.50	207.40	52.94
8	4.00	319.50	35.09
9	4.50	403.80	20.88
10	5.00	459.80	12.18
11	5.50	492.70	6.68
12	6.00	511.90	3.75
13	6.50	522.20	1.97
14	7.00	527.80	1.06
15	7.50	531.40	0.68
16	8.00	533.80	0.45
17	8.50	535.70	0.35
18	9.00	537.20	0.28
19	9.50	538.50	0.24
20	10.00	539.80	0.24
21	10.50	541.00	0.22
22	11.00	542.20	0.22

USER INPUT BLANK VALUE
BLANK VALUE = 9.568115 micrograms carbon
BLANK FACTOR = 9.568115 / 10.99783 = +8.7E-01 ug/min Carbon

SAMPLE RESULTS:
(542.2 - 9.568115)(1)/(1) = +5.326E+02 g/L Carbon
(542.2 - 9.568115)(1)/(1)(12) = +4.439E+01 Molar Carbon

Sample Run By: SL HOOD 00002

SS = .100 ml = .1451 g + .500 ml spk 25N12-E

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: S99T01347 SPK Date: 10/29/99 Time: 03:43:17

Sample Size = 1 uL
Dil Factor = 1
Blank ID # =
Blank Value = 2.1 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	1.60	56.25
3	1.51	2.40	33.33
4	2.00	4.90	51.02
5	2.50	18.80	73.94
6	3.00	81.80	77.02
7	3.50	191.50	57.28
8	4.00	286.30	33.11
9	4.50	345.20	17.06
10	5.00	380.10	9.18
11	5.50	401.10	5.24
12	6.00	411.40	2.50
13	6.50	417.00	1.34
14	7.00	420.20	0.76
15	7.50	422.60	0.57
16	8.00	424.10	0.35
17	8.50	425.30	0.28
18	9.00	426.30	0.23
19	9.50	427.30	0.23
20	10.00	428.00	0.16
21	10.50	428.80	0.19
22	11.00	429.40	0.14

USER INPUT BLANK VALUE
BLANK VALUE = 23.09545 micrograms carbon
BLANK FACTOR = 23.09545 / 10.99783 = +2.1E+00 ug/min Carbon

SAMPLE RESULTS:
(429.4 - 23.09753)(1)/(1) = +4.063E+02 g/L Carbon
(429.4 - 23.09753)(1)/(1)(12) = +3.386E+01 Molar Carbon
<<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!!>>>>

Sample Run By: _____
SL HOOD 00002

SS= .100ml / .1457g + .100ml spk 34N12-B

WORKBOOK PAGE: BLANK1

TIC/TOC : LA-342-100 (F-3) LIQUIDS

			TIC	TOC
Sample Size in mL	(SS)		0.0000	0.0000
Dilution Factor	(DF)		1	1
µg of Carbon in Sample	(C1)		10	22.9
µg of Carbon from Baseline	(C2)		9.6	23.1

Type	BLNK
Work List	31577
Test Code	@TICTOC1
Matrix	LIQUID
Batch Number	99004026
Rerun	0
Sample Prep	N/A
Sample #	BLNK
Instrument Code	CARB2
Prepared By	MF
Chemist	JFG
Analyst	SLH
Date Complete	11/01/99
Analysis Date	10/29/99
Analysis Time	01:00 AM
Sample Point	S-109

µg of Carbon = |C1-C2|

	TIC	TOC
Method Detection Limit in µg/mL	5	40
µg of Carbon	4.00E-01	2.00E-01

Data Entered By:	MF	Date:	11/01/99
Signature of Chemist:		Date:	

BLANK.WB1 REV 1.0 342100ML

WORKBOOK PAGE: STD2

TIC/TOC : LA-342-100 (F-3) LIQUIDS

			TIC	TOC
Sample Size in mL	(SS)		1.0000	0.2000
Dilution Factor	(DF)		1	1
Final Coulometer Reading in µg	(C1)		603.4	592.3
µg of Carbon from Baseline	(C2)		9.6	23.1
Standard Book Number			25N12E	34N12B
Standard Value (µg/ml)			602	3000

Type	STD
Work List	31577
Test Code	@TICTOC1
Matrix	LIQUID
Batch Number	99004026
Rerun	0
Sample Prep	N/A
Sample #	STD
Instrument Code	CARB2
Prepared By	MF
Chemist	JFG
Analyst	SLH
Date Complete	11/01/99
Analysis Date	10/29/99
Analysis Time	01:00 AM
Sample Point	S-109

QC Actual in µg/mL = Standard Value (µg/mL)

QC Found in µg/mL = (C1 - C2) * DF / SS

QC Found in µg/mL for TIC = 5 if C1 < C2

QC Found in µg/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	3.00E+03
QC Found in µg/mL	5.94E+02	2.85E+03
Percent Standard Recovery	98.6	94.9

Data Entered By:	MF	Date:	11/01/99
Signature of Chemist:	MA	Date:	

STANDARD.WB1 REV 1.0 342100ML

WORKBOOK PAGE: SAM3

TIC/TOC : LA-342-100 (F-3) LIQUIDS

			TIC	TOC
Type	Sample Size in mL	(SS)	0.1000	0.1000
SAMPLE	Dilution Factor	(DF)	1	1
Work List	µg of Carbon in Sample	(C1)	231.1	138.3
31577	µg of Carbon from Baseline	(C2)	9.6	23.1
Test Code				
@TICTOC1				

Matrix	LIQUID
Batch Number	99004026
Rerun	0
Sample Prep	N/A
Sample #	S99T001347
Instrument Code	CARB2
Prepared By	MF
Chemist	JFG
Analyst	SLH
Date Complete	11/01/99
Analysis Date	10/29/99
Analysis Time	01:00 AM
Sample Point	S-109

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

	TIC	TOC
Method Detection Limit in µg/mL	5	40
µg of Carbon/mL	2.22E+03	1.15E+03

Data Entered By:	MF	Date:	11/01/99
Signature of Chemist:	MA	Date:	

SAMPLE.WB1 REV 1.0 342100ML

I:\342100\OUT\31577.WB1 11/01/99 13:36:16

WORKBOOK PAGE: DUP4

TIC/TOC : LA-342-100 (F-3) LIQUIDS

			TIC	TOC
Type	Sample Size in mL	(SS)	0.1000	0.1000
DUP	Dilution Factor	(DF)	1	1
Work List	µg of Carbon in Sample	(C1)	227.2	139.2
31577	µg of Carbon from Baseline	(C2)	9.6	23.1
Test Code	Known µg of C from Original Sample		2.22E+3	1.15E+3
@TICTOC1				

Matrix	LIQUID
Batch Number	99004026
Rerun	0
Sample Prep	N/A
Sample #	S99T001347
Instrument Code	CARB2
Prepared By	MF
Chemist	JFG
Analyst	SLH
Date Complete	11/01/99
Analysis Date	10/29/99
Analysis Time	01:00 AM
Sample Point	S-109

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

	TIC	TOC
Method Detection Limit in µg/mL	5	40
µg of Carbon/mL	2.18E+03	1.16E+03

Data Entered By:	MF	Date:	11/01/99
Signature of Chemist:		Date:	

WORKBOOK PAGE: SPIKE5

TIC/TOC : LA-342-100 (F-3) LIQUIDS

			TIC	TOC
Type	**Sample Vial Data**			
SPK	Sample Volume in mL	(SS)	0.1000	0.1000
Work List	Final Coulometer Reading in µg	(C1)	231.1	138.3
31577	**Spiked Vial Data**			
Test Code	Sample Volume in mL	(SPK SS)	0.1000	0.1000
@TICTOC1	Amount of Spike Std. in mL	(SPK VOL)	0.500	0.100
Matrix	Final Coulometer Reading in µg	(C2)	542.2	429.4
LIQUID	Spike Book Number		25N12E	34N12B
Batch Number	Spike Standard Value in µg/ml	(SPK CONC)	602	3000
99004026	µg C in baseline	(BL)	9.6	23.1

Rerun: 0

Sample Prep: N/A

Sample #: S99T001347

Instrument Code: CARB2

Prepared By: MF

Chemist: JFG

Analyst: SLH

Date Complete: 11/01/99

Analysis Date: 10/29/99

Analysis Time: 01:00 AM

Sample Point: S-109

Percent Spike Recovery = ((C2-BL) - (C1-BL) * (SPK SS) / SS) / ((SPK CONC) • (SPK VOL)) • 100

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	3.00E+03
QC Found in µg/mL	6.22E+02	2.91E+03
Percent Spike Recovery	103.4	97.0

Data Entered By:	MF	Date:	11/01/99
Signature of Chemist:	MA	Date:	

SPIKE.WB1 REV 1.3 342100ML

RADIOCHEMICAL ANALYSIS

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LABCORE Completed Worklist Report for Worklist# 30662

Analyst: scl **Instrument:** AB14 **Book#:** _____

Method: LA-508-101 Rev/Mod _____

Worklist Comment: S109 FOR @ALPHA01 RTS

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
1	STD		0	@ALPHA01	ALPHA01	LIQUID	2.50E-04	2.33E-4	93.200	% Recovery
1	STD		0	@ALPHA01	ALPHA01E	LIQUID	1.00	3.10E+00	3.100	% Ct. Erro
2	BLNK		0	@ALPHA01	ALPHA01	LIQUID	1	<1.30E-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	1.16E+00	1.160	BLNK/BKG
4	SAMPLE	S99T001346	0	@ALPHA01	ALPHA01	LIQUID	N/A <	1.30E-02	1.76e-002	uCi/mL
4	SAMPLE	S99T001346	0	@ALPHA01	ALPHA01E	LIQUID	N/A	5.00E+02		% Ct. Error
5	DUP	S99T001346	0	@ALPHA01	ALPHA01	LIQUID	<1.30E-2	<1.30E-2		RPD
5	DUP	S99T001346	0	@ALPHA01	ALPHA01E	LIQUID	1.00	5.00E+02	500.000	% Ct. Erro
6	SAMPLE	S99T001347	0	@ALPHA01	ALPHA01	LIQUID	N/A <	1.16E-02	1.76e-002	uCi/mL
6	SAMPLE	S99T001347	0	@ALPHA01	ALPHA01E	LIQUID	N/A	5.00E+02		% Ct. Error
7	DUP	S99T001347	0	@ALPHA01	ALPHA01	LIQUID	<1.16E-2	<1.30E-2		RPD
7	DUP	S99T001347	0	@ALPHA01	ALPHA01E	LIQUID	1.00	5.00E+02	500.000	% Ct. Erro
8	SAMPLE	S99T001348	0	@ALPHA01	ALPHA01	LIQUID	N/A <	7.18E-03	1.76e-002	uCi/mL
8	SAMPLE	S99T001348	0	@ALPHA01	ALPHA01E	LIQUID	N/A	5.00E+02		% Ct. Error
9	DUP	S99T001348	0	@ALPHA01	ALPHA01	LIQUID	<7.18E-3	<7.18E-3		RPD
9	DUP	S99T001348	0	@ALPHA01	ALPHA01E	LIQUID	1.00	5.00E+02	500.000	% Ct. Erro

11/15/99

Final page for worklist# 30662

Analyst Signature Date Analyst Signature Date

10 Aug 99

Reviewer Signature Date

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

LABCORE Data Entry Template for Worklist# 30662

Analyst: S.L **Instrument:** AB00 14 **Book#** 50 B57

Method: LA-508-101 Rev/Mod G-0

Worklist Comment: S109 FOR @ALPHA01 RTS

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				@ALPHA01	LIQUID		
2	BLNK				@ALPHA01	LIQUID		
3	BLNK/BKG				@ALPHA01	LIQUID		
4	SAMPLE	S99T001346	0		@ALPHA01	LIQUID	99000300	S-109 GRAB
		Analytes Requested:			ALPHA01 , ALPHA01E			
5	DUP	S99T001346	0		@ALPHA01	LIQUID		
~~6~~	~~SAMPLE~~	~~S99T001347~~	~~0~~		~~@ALPHA01~~	~~LIQUID~~	~~99000300~~	~~S-109 GRAB~~
		Analytes Requested:			ALPHA01 , ALPHA01E			
7	~~DUP~~	~~S99T001347~~	~~0~~		~~@ALPHA01~~	~~LIQUID~~		
8	SAMPLE	S99T001348	0		@ALPHA01	LIQUID	99000300	S-109 GRAB
		Analytes Requested:			ALPHA01 , ALPHA01E			
9	DUP	S99T001348	0		@ALPHA01	LIQUID		

11/15/99

Final page for worklist # 30662

Sue Lai 8-9-99
Signature **Date**

Shan L Hale 8-9-99
Signature **Date**
Gm Bailey 8-10-99

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
Type	DETECTOR NUMBER		14	14
STD	DISH SIZE (1 , 2 , or 5)	(MS)	2	2
Work List	GROSS COUNTS	(GC)	4015	4117
30662	COUNT TIME in MINUTES	(CT)	30	30
AT or TB ?	BACKGROUND in cpm	(BKG)	0.23	0.23
AT	SAMPLE SIZE in mL	(SS)	1.000	1.000
Test Code	DILUTION FACTOR	(DF)	1	1
@ALPHA01	STANDARD BOOK NUMBER	(Std BN)	50B57	50B57
Matrix	EFFICIENCY FACTOR	(EFF)	0.2614	0.2614
LIQUID	Lc, Rmax, or Rs,(SAMPLE RATE) as APPROPRIATE		133.603	137.003
Batch Number	Standard Value in µCi/mL		2.50E-04	
99003038	Concentration in µCi/L	=	2.30E-01	
Rerun	Replicate Concentration in µCi/L	=	2.36E-01	
0	AVERAGE CONCENTRATION in µCi/L	=	2.3316E-01	

Sample Prep	
N/A	Rs (Sample Count Rate) = (TC / CT) - BKG
Sample #	ALPHA TOTAL µCi/L = Rs * 1000mL/L * DF / (EFF * SS * 2220000dpm/µCi)
WL30662-STD	ALPHA TOTAL µCi/mL = ALPHA TOTAL µCi/L / 1000mL/L
Instrument Code	Relative Counting Error = [|(The Square Root of TC + BKG * CT) / (TC - BKG * CT)|] * 1.96 * 100
WB27807	Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Prepared By	
SLH2	
Chemist	
SAC	
Analyst	
SCL	
Date Complete	
08/10/99	
Analysis Date	
08/09/99	
Analysis Time	
01:25 PM	
Sample Point	
S-109 GRAB	

ALPHA TOTAL CONCENTRATION in µCi/mL	=	2.33E-04	DETECTION LEVEL
RELATIVE COUNTING ERROR	=	3.1%	8.60E-07 µCi/mL

Analyst:		SLH2	Date: 10-Aug-99
Signature of Chemist:	S A Cotter	SAC	Date: 10 Aug 99

STANDARD.WB1 Rev. 1.0 508101ML

WORKBOOK PAGE: BLANK2

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

			BLNK	REPLICATE
DETECTOR NUMBER			14	14
DISH SIZE (1 , 2 , or 5)	(MS)		2	2
GROSS COUNTS	(GC)		5	11
COUNT TIME in MINUTES	(CT)		30	30
BACKGROUND in cpm	(BKG)		0.23	0.23
SAMPLE SIZE in mL	(SS)		0.500	0.500
DILUTION FACTOR	(DF)		10201	10201
DIGEST DILUTION FACTOR	(DDF)		1	1
EFFICIENCY FACTOR	(EFF)		0.2614	0.2614
Lc, Rmax, or Rs,(SAMPLE RATE) as APPROPRIATE			0.204	0.369
Blank Concentration in µCi/L		<	7.18E+00	
Replicate Concentration in µCi/L		<	1.30E+01	
Maximum Concentration in µCi/L		<	1.2986E+01	

Type	BLNK
Work List	30662
AT or TB ?	AT
Test Code	@ALPHA01
Matrix	LIQUID
Batch Number	99003038
Rerun	0
Sample Prep	N/A
Sample #	WL30662-BLNK
Instrument Code	WB27807
Prepared By	SLH2
Chemist	SAC
Analyst	SCL
Date Complete	08/10/99
Analysis Date	08/09/99
Analysis Time	01:25 PM
Sample Point	S-109 GRAB

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

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

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

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

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

ALPHA TOTAL in µCi/mL (Maximum)	=	< 1.30E-02	DETECTION LEVEL
LESS Than Value was Determined from Lc.			1.76E-02 µCi/mL
RELATIVE COUNTING ERROR		500.0%	

Analyst:		SCL	Date: 10-Aug-99
Signature of Chemist:	SA Carter	SAC	Date: 10 Aug 99

BLANK.WB1 Rev. 1.0 508101ML

WORKBOOK PAGE: SAM4

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

			SAMPLE	REPLICATE
Type	DETECTOR NUMBER		14	14
SAMPLE	DISH SIZE (1 , 2 , or 5)	(MS)	2	2
Work List	GROSS COUNTS	(GC)	11	5
30662	COUNT TIME in MINUTES	(CT)	30	30
AT or TB ?	BACKGROUND in cpm	(BKG)	0.23	0.23
AT	SAMPLE SIZE in mL	(SS)	0.500	0.500
Test Code	DILUTION FACTOR	(DF)	10201	10201
@ALPHA01	DIGEST DILUTION FACTOR	(DDF)	1	1
Matrix	EFFICIENCY FACTOR	(EFF)	0.2614	0.2614
LIQUID	Lc, Rmax, or Rs,(SAMPLE RATE) as APPROPRIATE		0.369	0.204
Batch Number				
99003038	Blank Concentration in µCi/L	<	1.30E+01	
Rerun	Replicate Concentration in µCi/L	<	7.18E+00	
0	Maximum Concentration in µCi/L	<	1.2986E+01	

Sample Prep: N/A

Sample #: S99T001346

Instrument Code: WB27807

Prepared By: SLH2

Chemist: SAC

Analyst: SCL

Date Complete: 08/10/99

Analysis Date: 08/09/99

Analysis Time: 01:25 PM

Sample Point: S-109 GRAB

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

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

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

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

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

ALPHA TOTAL in µCi/mL (Maximum) =	< 1.30E-02	DETECTION LEVEL
LESS THAN Value was Determined from Rmax.		1.76E-02 µCi/mL
RELATIVE COUNTING ERROR	500.0%	

Analyst:		SCL	Date: 10-Aug-99
Signature of Chemist:	J A Cotton	SAC	Date: 10 Aug 99

SAMPLE.WB1 Rev. 1. 508101ML

WORKBOOK PAGE: DUP5

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

			DUP	REPLICATE
DETECTOR NUMBER			14	14
DISH SIZE (1 , 2 , or 5)	(MS)		2	2
GROSS COUNTS	(GC)		8	11
COUNT TIME in MINUTES	(CT)		30	30
BACKGROUND in cpm	(BKG)		0.23	0.23
SAMPLE SIZE in mL	(SS)		0.500	0.500
DILUTION FACTOR	(DF)		10201	10201
DIGEST DILUTION FACTOR	(DDF)		1	1
EFFICIENCY FACTOR	(EFF)		0.2614	0.2614
Lc, Rmax, or Rs,(SAMPLE RATE) as APPROPRIATE			0.249	0.369
Blank Concentration in µCi/L		<	8.75E+00	
Replicate Concentration in µCi/L		<	1.30E+01	
Maximum Concentration in µCi/L		<	1.2986E+01	

Type	DUP
Work List #	30662
AT or TB ?	AT
Test Code	@ALPHA01
Matrix	LIQUID
Batch Number	99003038
Rerun	0
Sample Prep	N/A
Sample #	S99T001346
Instrument Code	WB27807
Prepared By	SLH2
Chemist	SAC
Analyst	SCL
Date Complete	08/10/99
Analysis Date	08/09/99
Analysis Time	01:25 PM
Sample Point	S-109 GRAB

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

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

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

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

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

ALPHA TOTAL in µCi/mL (Maximum) =	< 1.30E-02	DETECTION LEVEL
LESS THAN Value was Determined from Rmax.		1.76E-02 µCi/mL
RELATIVE COUNTING ERROR	500.0%	

Analyst:		SCL	Date: 10-Aug-99
Signature of Chemist:		SAC	Date: 10 Aug 99

SAMPLE.WB1 Rev. 1. 508101ML

WORKBOOK PAGE: SAM8

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

			SAMPLE	REPLICATE
DETECTOR NUMBER			14	14
DISH SIZE (1 , 2 , or 5)		(MS)	2	2
GROSS COUNTS		(GC)	4	3
COUNT TIME in MINUTES		(CT)	30	30
BACKGROUND in cpm		(BKG)	0.23	0.23
SAMPLE SIZE in mL		(SS)	0.500	0.500
DILUTION FACTOR		(DF)	10201	10201
DIGEST DILUTION FACTOR		(DDF)	1	1
EFFICIENCY FACTOR		(EFF)	0.2614	0.2614
Lc, Rmax, or Rs,(SAMPLE RATE) as APPROPRIATE			0.204	0.204
Blank Concentration in µCi/L	<		7.18E+00	
Replicate Concentration in µCi/L	<		7.18E+00	
Maximum Concentration in µCi/L	<		7.1832E+00	

Type	SAMPLE
Work List	30662
AT or TB ?	AT
Test Code	@ALPHA01
Matrix	LIQUID
Batch Number	99003038
Rerun	0
Sample Prep	N/A
Sample #	S99T001348
Instrument Code	WB27807
Prepared By	SLH2
Chemist	SAC
Analyst	SCL
Date Complete	08/10/99
Analysis Date	08/09/99
Analysis Time	01:25 PM
Sample Point	S-109 GRAB

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

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

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

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

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

ALPHA TOTAL in µCi/mL (Maximum)	=	< 7.18E-03		DETECTION LEVEL
LESS Than Value was Determined from Lc.				1.76E-02 µCi/mL
RELATIVE COUNTING ERROR			500.0%	

Analyst:		SCL	Date: 10-Aug-99
Signature of Chemist:	SCCotton	SAC	Date: 10 Aug 99

SAMPLE.WB1 Rev. 1. 508101ML

WORKBOOK PAGE: DUP9

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

			DUP	REPLICATE
Type	DETECTOR NUMBER		14	14
DUP	DISH SIZE (1 , 2 , or 5)	(MS)	2	2
Work List	GROSS COUNTS	(GC)	5	6
30662	COUNT TIME in MINUTES	(CT)	30	30
AT or TB ?	BACKGROUND in cpm	(BKG)	0.23	0.23
AT	SAMPLE SIZE in mL	(SS)	0.500	0.500
Test Code	DILUTION FACTOR	(DF)	10201	10201
@ALPHA01	DIGEST DILUTION FACTOR	(DDF)	1	1
Matrix	EFFICIENCY FACTOR	(EFF)	0.2614	0.2614
LIQUID	Lc, Rmax, or Rs,(SAMPLE RATE) as APPROPRIATE		0.204	0.204

Blank Concentration in µCi/L	<	7.18E+00
Replicate Concentration in µCi/L	<	7.18E+00
Maximum Concentration in µCi/L	<	7.1832E+00

Batch Number: 99003038
Rerun: 0
Sample Prep: N/A
Sample # : S99T001348
Instrument Code: WB27807
Prepared By: SLH2
Chemist: SAC
Analyst: SCL
Date Complete: 08/10/99
Analysis Date: 08/09/99
Analysis Time: 01:25 PM
Sample Point: S-109 GRAB

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

ALPHA TOTAL in µCi/mL (Maximum)	=	< 7.18E-03	DETECTION LEVEL
LESS Than Value was Determined from Lc.			1.76E-02 µCi/mL
RELATIVE COUNTING ERROR		500.0%	

Analyst:		SCL	Date: 10-Aug-99
Signature of Chemist:	SAC	SAC	Date: 10 Aug 99

SAMPLE.WB1 Rev. 1. 508101ML

LABCORE Completed Worklist Report for Worklist# 31575

Analyst: scl **Instrument:** AB15 **Book#:** _____

Method: LA-508-101 Rev/Mod _____

Worklist Comment: S-109 FOR @ALPHA01, RLC

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
1	BLNK		0	@ALPHA01	ALPHA01	LIQUID	1	<2.02E-2		uCi/mL
1	BLNK		0	@ALPHA01	ALPHA01E	LIQUID	1.00	5.00E+02	500.000	uCi/mL
2	STD		0	@ALPHA01	ALPHA01	LIQUID	2.28E-04	2.44E-4	107.018	% Recovery
2	STD		0	@ALPHA01	ALPHA01E	LIQUID	1.00	3.04E+00	3.040	% Ct. Erro
3	SAMPLE	S99T001344	0	@ALPHA01	ALPHA01	LIQUID	N/A	1.45E-02	3.01e-002	uCi/mL
3	SAMPLE	S99T001344	0	@ALPHA01	ALPHA01E	LIQUID	N/A	1.33E+02		% Ct. Error
4	DUP	S99T001344	0	@ALPHA01	ALPHA01	LIQUID	1.45E-2	<2.30E-2		RPD
4	DUP	S99T001344	0	@ALPHA01	ALPHA01E	LIQUID	1.00	2.45E+02	245.000	% Ct. Erro
5	SPK	S99T001344	0	@ALPHA01	ALPHA01	LIQUID	5.05E-02	4.96E-02	98.218	% Recovery

Final page for worklist# 31575

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

D Cattor 2/1/99

Reviewer Signature **Date**

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

LABCORE Data Entry Template for Worklist# 31575

Analyst: S. L **Instrument:** AB00 15 **Book#** 5-857

Method: LA-508-101 Rev/Mod 6-1

Worklist Comment: S-109 FOR @ALPHA01, RLC

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	BLNK				@ALPHA01	LIQUID		
2	STD				@ALPHA01	LIQUID		
3	SAMPLE	S99T001344	0		@ALPHA01	LIQUID	99000300	S-109 GRAB
		Analytes Requested:			ALPHA01 , ALPHA01E			
4	DUP	S99T001344	0		@ALPHA01	LIQUID		
5	SPK	S99T001344	0		@ALPHA01	LIQUID		

Final page for worklist # 31575

Sue Lai 11-1-99
Signature **Date**

Em Bueler 11-2-99
Signature **Date**

Amy LaPlant 11-2-99

Data Entry Comments:

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

WORKBOOK PAGE: STD2

AT : LA-508-101 (G-0) **LA-508-113 (B-0) STANDARD**

			STANDARD	REPLICATE
Type	DETECTOR NUMBER		15	15
STD	DISH SIZE (1 , 2 , or 5)	(MS)	2	2
Work List	GROSS COUNTS	(GC)	4586	4170
31575	COUNT TIME in MINUTES	(CT)	30	30
AT or TB?	BACKGROUND in cpm	(BKG)	0.17	0.17
AT	SAMPLE SIZE in mL	(SS)	1.000	1.000
Test Code	DILUTION FACTOR	(DF)	1	1
@ALPHA01	STANDARD BOOK NUMBER	(Std BN)	52B57	52B57
Matrix	EFFICIENCY FACTOR	(EFF)	0.2695	0.2695
LIQUID	Lc, Rmax, or Rs,(SAMPLE RATE) as APPROPRIATE		152.697	138.830
Batch Number	Standard Value in µCi/mL		2.28E-04	
99004025	Concentration in µCi/L	=	2.55E-01	
Rerun	Replicate Concentration in µCi/L	=	2.32E-01	
0	AVERAGE CONCENTRATION in µCi/L	=	2.4363E-01	

Sample Prep
N/A

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

Sample #
WL31575-STD

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

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

Instrument Code
WB26872

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.

Prepared By
EMB

Chemist
SAC

ALPHA TOTAL CONCENTRATION in µCi/mL	=	2.44E-04	DETECTION LEVEL
RELATIVE COUNTING ERROR	=	3.0%	7.39E-07 µCi/mL

Analyst
SCL

Date Complete
11/02/99

Analysis Date
11/01/99

Analysis Time
01:30 PM

Sample Point
S-109 GRAB

Analyst:		EMB	Date: 02-Nov-99
Signature of Chemist:		SAC	Date: 2/11/99

STANDARD.WB1 Rev. 1.0 508101ML

WORKBOOK PAGE: BLANK1

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

			BLNK	REPLICATE
Sample Type	DETECTOR NUMBER		15	15
BLNK	DISH SIZE (1 , 2 , or 5)	(MS)	2	2
Work List	GROSS COUNTS	(GC)	7	14
31575	COUNT TIME in MINUTES	(CT)	30	30
AT or TB ?	BACKGROUND in cpm	(BKG)	0.17	0.17
AT	SAMPLE SIZE in mL	(SS)	0.250	0.250
Test Code	DILUTION FACTOR	(DF)	10201	10201
@ALPHA01	DIGEST DILUTION FACTOR	(DDF)	1	1
Matrix	EFFICIENCY FACTOR	(EFF)	0.2695	0.2695
LIQUID	Lc, Rmax, or Rs,(SAMPLE RATE) as APPROPRIATE		0.255	0.297

Batch Number		
99004025	Blank Concentration in µCi/L	< 1.74E+01
Rerun	Replicate Concentration in µCi/L	2.02E+01
0	Maximum Concentration in µCi/L	< 2.0233E+01

Sample Prep: N/A

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

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

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

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

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

Sample #: WL31575 BLNK

Instrument Code: WB26872

Prepared By: EMB

Chemist: SAC

Analyst: SCL

Date Complete: 11/02/99

Analysis Date: 11/01/99

Analysis Time: 01:30 PM

Sample Point: S-109 GRAB

ALPHA TOTAL in µCi/mL (Maximum) =	< 2.02E-02	DETECTION LEVEL
LESS THAN Value was Determined from Rmax.		3.01E-02 µCi/mL
RELATIVE COUNTING ERROR	500.0%	

Analyst:		SCL	Date: 02-Nov-99
Signature of Chemist:		SAC	Date: 2/Nov/99

BLANK.WB1 Rev. 1.0 508101ML

WORKBOOK PAGE: SAM3

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

			SAMPLE	REPLICATE
Type	DETECTOR NUMBER		15	15
SAMPLE	DISH SIZE (1 , 2 , or 5)	(MS)	2	2
Work List	GROSS COUNTS	(GC)	12	11
31575	COUNT TIME in MINUTES	(CT)	30	30
AT or TB ?	BACKGROUND in cpm	(BKG)	0.17	0.17
AT	SAMPLE SIZE in mL	(SS)	0.250	0.250
Test Code	DILUTION FACTOR	(DF)	10201	10201
@ALPHA01	DIGEST DILUTION FACTOR	(DDF)	1	1
Matrix	EFFICIENCY FACTOR	(EFF)	0.2695	0.2695
LIQUID	Lc, Rmax, or Rs,(SAMPLE RATE) as APPROPRIATE		0.230	0.197

Batch Number	
99004025	Blank Concentration in µCi/L 1.57E+01
Rerun	Replicate Concentration in µCi/L 1.34E+01
0	Average Concentration in µCi/L 1.4550E+01

Sample Prep: N/A

Sample # : S99T001344

Instrument Code: WB26872

Prepared By: EMB

Chemist: SAC

Analyst: SCL

Date Complete: 11/02/99

Analysis Date: 11/01/99

Analysis Time: 01:30 PM

Sample Point: S-109 GRAB

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

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

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

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

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

ALPHA TOTAL in µCi/mL (Average)	=	1.45E-02	DETECTION LEVEL
RELATIVE COUNTING ERROR		133.3%	3.01E-02 µCi/mL

Analyst:		SCL	Date: 02-Nov-99
Signature of Chemist:	S A Cathey	SAC	Date: 2/2/99

SAMPLE.WB1 Rev. 1. 508101ML

WORKBOOK PAGE: DUP4

AT : LA-508-101 (G-Ø) LIQUIDS

			DUP	REPLICATE
Type	DETECTOR NUMBER		15	15
DUP	DISH SIZE (1 , 2 , or 5)	(MS)	2	2
Work List	GROSS COUNTS	(GC)	9	8
31575	COUNT TIME in MINUTES	(CT)	30	30
AT or TE ?	BACKGROUND in cpm	(BKG)	0.17	0.17
AT	SAMPLE SIZE in mL	(SS)	0.250	0.250
Test Code	DILUTION FACTOR	(DF)	10201	10201
@ALPHA01	DIGEST DILUTION FACTOR	(DDF)	1	1
Matrix	EFFICIENCY FACTOR	(EFF)	0.2695	0.2695
LIQUID	Lc, Rmax, or Rs,(SAMPLE RATE) as APPROPRIATE		0.337	0.296

Batch Number			
99004025	Blank Concentration in µCi/L	<	2.30E+01
Rerun	Replicate Concentration in µCi/L	<	2.02E+01
0	Maximum Concentration in µCi/L	<	2.2951E+01

Sample Prep: N/A

Sample #: S99T001344

Instrument Code: WB26872

Prepared By: EMB

Chemist: SAC

Analyst: SCL

Date Complete: 11/02/99

Analysis Date: 11/01/99

Analysis Time: 01:30 PM

Sample Point: S-109 GRAB

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

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

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

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

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

ALPHA TOTAL in µCi/mL (Maximum)	=	< 2.30E-02	DETECTION LEVEL
LESS THAN Value was Determined from Rmax.			3.01E-02 µCi/mL
RELATIVE COUNTING ERROR		244.6%	

Analyst:		SCL	Date: 02-Nov-99
Signature of Chemist:	S A Cathey	SAC	Date: 2 Nov 99

SAMPLE.WB1 Rev. 1. 508101ML

WORKBOOK PAGE: SPK5

AT : LA-508-101 (G-0) LA-508-113 (B-0) SPIKED SAMPLE

			SPIKE	REPLICATE
DETECTOR NUMBER			15	15
DISH SIZE 1 , 2 , or 5		(MS)	2	2
TOTAL COUNTS		(TC)	90382	87624
COUNT TIME in MINUTES		(CT)	30	30
BACKGROUND in cpm		(BKG)	0.17	0.17
SAMPLE VOLUME in mL	(Spiked Vial)	(SS)	0.250	0.250
SAMPLE DILUTION FACTOR	(Spiked Vial)	(DF)	10201	10201
DIGEST DILUTION FACTOR		(DDF)	1	1
SPIKE VOLUME in mL		(SVol)	0.100	0.100
SPIKE DILUTION FACTOR		(SDF)	1	1
SPIKE BOOK NUMBER		(Spk BN)	19B59	19B59
SPIKE VALUE in µCi/mL		(SVal)	5.0519E-02	5.0519E-02
INSTRUMENT EFFICIENCY FACTOR		(EFF)	0.2695	0.2695
SAMPLE + SPIKE µCi/mL		(S+S)	2.05E+02	1.99E+02
AVERAGE or MAXIMUM µCi/mL in SAMPLE			1.4550E-02	

Type	SPK
Work List	31575
AT or TB ?	AT
Test Code	@ALPHA01
Matrix	LIQUID
Batch Number	99004025
Rerun	0
Sample Prep	N/A
Sample #	S99T001344
Instrument Code	WB26872
Prepared By	EMB
Chemist	SAC
Analyst	SCL
Date Complete	11/02/99
Analysis Date	11/01/99
Analysis Time	01:30 PM
Sample Point	S-109 GRAB

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

SAMPLE + SPIKE µCi/mL = Rs * DF * DDF / (EFF * SS * 2220000dpm/µCi)

QC ACTUAL = SVal

QC FOUND = (((S+S µCi/mL - SAMPLE µCi/mL) * ((SDF/SVol)/(DF*DDF/SS))))

PERCENT SPIKE RECOVERY = (QC FOUND / QC ACTUAL) *100

QC ACTUAL	=	5.05E-02
QC FOUND	=	4.96E-02
AVG. PERCENT SPIKE RECOVERY	=	98.1%

Analyst:	EMB	Date: 02-Nov-99
Signature of Chemist:	SAC	Date: 2/11/99

SPIKE.WB1 Rev. 1.0 508101ML

HNF-1679 REV. 0

LABCORE Completed Worklist Report for Worklist# 30664

Analyst: scl **Instrument:** GEA03 **Book#:** _____

Method: LA-548-121 Rev/Mod _____

Worklist Comment: S109 FOR @GEA-01 RTS

Seq	Type	Sample#	R	A	Test	Matrix	Actual		Found	DL or Yield	Unit
1	STD		0	@GEA-01	CO60-02	LIQUID	5.113e-03		5.69e-03	111.285	% Recovery
1	STD		0	@GEA-01	CO60-02E	LIQUID	1		2.04	2.040	% Ct Error
1	STD		0	@GEA-01	CS13702	LIQUID	8.045e-03		8.49e-03	105.531	% Recovery
1	STD		0	@GEA-01	CS13702E	LIQUID	1		2.02	2.020	% Ct Error
2	BLNK		0	@GEA-01	CO60-02	LIQUID	1		<1.46e-3		uCi/mL
2	BLNK		0	@GEA-01	CS13702	LIQUID	1		3.55e-03	0.004	uCi/mL
3	SAMPLE	S99T001346	0	@GEA-01	CO60-02	LIQUID	N/A	<	4.162e-03	4.16e-003	uCi/mL
3	SAMPLE	S99T001346	0	@GEA-01	CO60-02E	LIQUID	N/A		n/a		% Ct. Error
3	SAMPLE	S99T001346	0	@GEA-01	CS13702	LIQUID	N/A		3.300e+02		uCi/mL
3	SAMPLE	S99T001346	0	@GEA-01	CS13702E	LIQUID	N/A		0.110		% Ct. Error
4	DUP	S99T001346	0	@GEA-01	CO60-02	LIQUID	<4.16e-3		<4.70e-3		RPD
4	DUP	S99T001346	0	@GEA-01	CO60-02E	LIQUID	1		n/a		% Ct Error
4	DUP	S99T001346	0	@GEA-01	CS13702	LIQUID	3.30e+02		3.28e+02	0.608	RPD
4	DUP	S99T001346	0	@GEA-01	CS13702E	LIQUID	1		0.110	0.110	% Ct Error
5	SAMPLE	S99T001347	0	@GEA-01	CO60-02	LIQUID	N/A	<	4.552e-03	4.55e-003	uCi/mL
5	SAMPLE	S99T001347	0	@GEA-01	CO60-02E	LIQUID	N/A		n/a		% Ct. Error
5	SAMPLE	S99T001347	0	@GEA-01	CS13702	LIQUID	N/A		3.170e+02		uCi/mL
5	SAMPLE	S99T001347	0	@GEA-01	CS13702E	LIQUID	N/A		0.110		% Ct. Error
6	DUP	S99T001347	0	@GEA-01	CO60-02	LIQUID	<4.55e-3		<4.59e-3		RPD
6	DUP	S99T001347	0	@GEA-01	CO60-02E	LIQUID	1		n/a		% Ct Error
6	DUP	S99T001347	0	@GEA-01	CS13702	LIQUID	3.17e+02		3.18e+02	0.315	RPD
6	DUP	S99T001347	0	@GEA-01	CS13702E	LIQUID	1		0.110	0.110	% Ct Error
7	SAMPLE	S99T001348	0	@GEA-01	CO60-02	LIQUID	N/A	<	4.335e-03	4.34e-003	uCi/mL
7	SAMPLE	S99T001348	0	@GEA-01	CO60-02E	LIQUID	N/A		n/a		% Ct. Error
7	SAMPLE	S99T001348	0	@GEA-01	CS13702	LIQUID	N/A		3.000e+02		uCi/mL
7	SAMPLE	S99T001348	0	@GEA-01	CS13702E	LIQUID	N/A		0.110		% Ct. Error
8	DUP	S99T001348	0	@GEA-01	CO60-02	LIQUID	<4.34e-3		<5.00e-3		RPD
8	DUP	S99T001348	0	@GEA-01	CO60-02E	LIQUID	1		n/a		% Ct Error
8	DUP	S99T001348	0	@GEA-01	CS13702	LIQUID	3.00e+02		2.98e+02	0.669	RPD
8	DUP	S99T001348	0	@GEA-01	CS13702E	LIQUID	1		0.110	0.110	% Ct Error

Comments Section:

Comments for sample# S99T001346 **and test** @GEA-01 .
DL=0 => n/a.

Comments for sample# S99T001347 **and test** @GEA-01 .
DL=0 => n/a.

Comments for sample# S99T001348 **and test** @GEA-01 .

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

LABCORE Completed Worklist Report for Worklist# 30664

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

DL=0 => n/a.

Final page for worklist# 30664

Analyst Signature Date

Analyst Signature Date

John Relyea 12 Aug 99

Reviewer Signature Date

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

LABCORE Data Entry Template for Worklist# 30664

Analyst: S.L. **Instrument:** GEA00 #3 **Book#** 46B57

Method: LA-548-121 Rev/Mod F-0

Worklist Comment: S109 FOR @GEA-01 RTS

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				@GEA-01	LIQUID		
2	BLNK				@GEA-01	LIQUID		
3	SAMPLE	S99T001346	0		@GEA-01	LIQUID	99000300	S-109 GRAB
	Analytes Requested: CO60-02 , CO60-02E, CS13702 , CS13702E							
4	DUP	S99T001346	0		@GEA-01	LIQUID		
5	SAMPLE	S99T001347	0		@GEA-01	LIQUID	99000300	S-109 GRAB
	Analytes Requested: CO60-02 , CO60-02E, CS13702 , CS13702E							
6	DUP	S99T001347	0		@GEA-01	LIQUID		
7	SAMPLE	S99T001348	0		@GEA-01	LIQUID	99000300	S-109 GRAB
	Analytes Requested: CO60-02 , CO60-02E, CS13702 , CS13702E							
8	DUP	S99T001348	0		@GEA-01	LIQUID		

Final page for worklist # 30664

Sue Jal 8-9-99
Signature **Date**

RCWright 8/12/99
Signature **Date**

Data Entry Comments:

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

```
*************************************************************************
* 222-S Laboratory Counting Room    9-AUG-1999 13:30:11.64              *
*************************************************************************
      >>>>>>>>>> SAMPLE INFORMATION <<<<<<<<<<
Worklist #:              30664
Sample ID:               WL30664-STD
Sample Size:             1.00000E-03 L
Dilution Factor:         1.00000E+00

      >>>>>>>>>> COUNT INFORMATION <<<<<<<<<<
Detector ID:             GEA3
File Number:             dka300:[spec.GEA3]3g3718.cnf
Geometry:                42
Count Time:              0 00:50:00.00 sec
Real Time:               0 00:50:11.22 sec
Dead Time:               0.4%

      >>>>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<
Sample Count Time:       9-AUG-1999 12:39:24.27
Decayed to:              9-AUG-1999 12:39:24.27
Standard Deviations:     2
Analysis Library:        ENVGEA
Analyst:                 EMB
Background Subtract:     DKA300:[SPEC.GEA3]3GBACK

      >>>>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<
 Date of last energy calibration:       3-MAY-1999 16:16:33.11
 Date of last efficiency calibration:   3-MAY-1999 16:18:22.52
*************************************************************************
```

Removed by: Em Baeb

Verified by: RHJones 8-10-99

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/L
0	661.64*	11007	1.45	1323.40	1318	12	2.0		CS-137	8.49
0	1173.49	5744	1.74	2346.65	2337	19	2.9		CO-60	5.79
0	1332.95	5031	1.82	2665.30	2656	17	2.9		CO-60	5.59

Summary of Nuclide Activity
Sample ID : WL30664-STD

Acquisition date : 9-AUG-1999 12:39:24

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	5.688E+00	5.688E+00	0.116E+00	2.04	
CS-137	30.00Y	1.00	8.487E+00	8.487E+00	0.171E+00	2.02	
			---	---			
Total Activity :			1.418E+01	1.418E+01			
Grand Total Activity :			1.418E+01	1.418E+01			

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

Minimum Detectable Activity Report
Sample ID : WL30664-STD

Acquisition date : 9-AUG-1999 12:39:24

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BE-7	430.	477.59	4.9966E-01
NA-24	29.	1368.55	3.2106E-02
K-40	309.	1460.75	9.4136E-01
AR-41	42.	1293.60	4.1962E-02
SC-46	232.	1120.55	7.1560E-02
CR-51	424.	320.08	3.8402E-01
MN-54	223.	834.83	5.6194E-02
CO-56	192.	846.76	5.2853E-02
CO-58	193.	810.78	5.1487E-02
FE-59	245.	1099.25	1.2810E-01
ZN-65	226.	1115.55	1.3881E-01
SE-75	473.	264.66	6.1012E-02
KR-85	332.	514.00	1.1064E+01
SR-85	331.	514.01	4.9991E-02
Y-88	11.	1836.06	2.5664E-02
Y-91	73.	1204.67	1.4536E+01
NB-94	224.	871.09	5.8156E-02
ZRNB-95	179.	724.20	2.0608E-01
RU-103	339.	497.08	5.2097E-02
RURH-106	224.	621.93	9.1620E-01
AG-108m	182.	722.94	5.0432E-02
CD-109	380.	88.03	1.0028E+00
AG-110M	314.	657.76	5.8842E-02
SN-113	433.	391.69	7.0515E-02
TE-123m	445.	159.00	3.1665E-02
SB-124	223.	602.73	4.5390E-02
SB-125	402.	427.89	1.5752E-01
TE-125m	376.	109.27	9.5073E+00
I-129	316.	39.60	4.4535E+01
I-131	379.	364.48	4.9551E-02
XE-131m	453.	163.93	1.3803E+00
BA-133	439.	356.02	6.8373E-02
CS-134	237.	604.70	4.6913E-02
CS-136	194.	818.51	5.1978E-02
CS-138	21.	1435.86	6.0767E-02
CE-139	447.	165.85	3.3728E-02
BA-140	265.	537.31	1.8239E-01
LA-140	11.	1596.21	2.3873E-02
CE-141	469.	145.44	5.5905E-02
CE-144	429.	133.51	2.3385E-01
CEPR-144	429.	133.51	4.6722E-01
EU-152	427.	121.78	9.3682E-02
EU-154	47.	1274.51	1.0785E-01
EU-155	367.	86.54	1.1238E-01
HF-181	389.	482.18	6.1593E-02
TA-182	324.	67.75	1.7352E-01
HG-203	489.	279.20	4.6206E-02
BI-207	226.	569.70	4.3885E-02
TL-208	451.	277.36	5.7084E-01
PB-210	342.	46.50	1.7684E+01
BI-212	187.	727.18	7.0085E-01

Minimum Detectable Activity Report (continued) Page : 4
Sample ID : WL30664-STD Acquisition date : 9-AUG-1999 12:39:24

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
PB-212	562.	238.63	8.3167E-02
BI-214	269.	609.31	1.0925E-01
PB-214	451.	351.92	2.1254E-01
RA-224	530.	240.99	8.9602E-01
RA-226	543.	186.10	8.8513E-01
AC-228	290.	911.21	2.5558E-01
TH-228	357.	84.37	3.0311E+00
TH-229	363.	88.47	1.4198E-01
U-232	349.	57.78	7.8872E+01
PA-233	443.	312.17	1.0062E-01
UTH-233	523.	245.34	3.2391E+01
PA-234M	246.	1001.03	1.0374E+01
TH-234	351.	63.29	2.6161E+00
U-235	528.	185.71	5.3096E-02
NP-237	367.	86.48	2.9761E-01
U-237	401.	101.07	1.1807E-01
NP-238	217.	984.45	2.2667E-01
NP-239	361.	106.12	1.1846E-01
PU-239	429.	129.30	4.0721E+02
AM-241	338.	59.54	3.6760E-01
AM-243	350.	74.67	8.7748E-02

```
*****************************************************************************
* 222-S Laboratory Counting Room    9-AUG-1999 19:06:43.45                  *
*****************************************************************************
      >>>>>>>>>> SAMPLE INFORMATION <<<<<<<<<<
Worklist #:              30664
Sample ID:               WL30664-BLK
Sample Size:             1.00000E-03 L
Dilution Factor:         1.01000E+02

      >>>>>>>>>> COUNT INFORMATION <<<<<<<<<<
Detector ID:             GEA3
File Number:             dka300:[spec.GEA3]3g3720.cnf
Geometry:                42
Count Time:              0 02:30:00.00 sec
Real Time:               0 02:30:17.22 sec
Dead Time:               0.2%

      >>>>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<
Sample Count Time:       9-AUG-1999 16:35:50.85
Decayed to:              9-AUG-1999 16:35:50.85
Standard Deviations:     2
Analysis Library:        ENVGEA
Analyst:                 EMB
Background Subtract:     DKA300:[SPEC.GEA3]3GBACK

      >>>>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<
 Date of last energy calibration:       3-MAY-1999 16:16:33.11
 Date of last efficiency calibration:   3-MAY-1999 16:18:22.52
*****************************************************************************
```

Removed by:

Verified by: 8-10-99

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/L
0	351.81*	79	1.26	703.70	700	9	88.7			
0	583.29*	61	1.92	1166.70	1160	12	94.7			
0	609.51*	108	1.46	1219.15	1213	14	67.5		BI-214	5.01
0	661.64*	137	1.32	1323.39	1318	12	45.7		CS-137	3.55
0	1120.26*	43	1.20	2240.25	2233	14	106.9		BI-214	9.52
0	1461.43*	48	1.89	2922.02	2913	16	149.5		K-40	17.9
0	1766.10*	24	2.33	3530.61	3523	19	111.2			

Summary of Nuclide Activity
Sample ID : WL30664-BLK

Acquisition date : 9-AUG-1999 16:35:50

Total number of lines in spectrum	7	
Number of unidentified lines	1	
Number of lines tentatively identified by NID	6	85.71%

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/L	Wtd Mean Decay Corr uCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
~~K-40~~	~~1.28E+09Y~~	~~1.00~~	~~1.787E+01~~	~~1.787E+01~~	~~2.670E+01~~	~~149.45~~	~~RAJ~~
CS-137	30.00Y	1.00	3.549E+00	3.549E+00	1.621E+00	45.68	
~~BI-214~~	~~28700.00D~~	~~1.00~~	~~5.458E+00~~	~~5.458E+00~~	~~3.210E+00~~	~~58.80~~	~~RAJ~~
			---	---			
Total Activity :			2.687E+01	2.687E+01			

8-10-99

Grand Total Activity : 2.687E+01 2.687E+01

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

Minimum Detectable Activity Report
Page : 3
Sample ID : WL30664-BLK
Acquisition date : 9-AUG-1999 16:35:50

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BE-7	163.	477.59	1.0548E+01
NA-24	44.	1368.55	1.3584E+00
AR-41	61.	1293.60	2.2329E+00
SC-46	161.	1120.55	2.0195E+00
CR-51	258.	320.08	1.0159E+01
MN-54	81.	834.83	1.1643E+00
CO-56	97.	846.76	1.2830E+00
CO-58	68.	810.78	1.0622E+00
FE-59	61.	1099.25	2.2295E+00
CO-60	61.	1332.50	1.4609E+00
ZN-65	72.	1115.55	2.7215E+00
SE-75	270.	264.66	1.5652E+00
KR-85	242.	514.00	3.1959E+02
SR-85	241.	514.01	1.4429E+00
Y-88	19.	1836.06	1.0855E+00
Y-91	89.	1204.67	5.3738E+02
NB-94	69.	871.09	1.1183E+00
ZRNB-95	116.	724.20	5.6443E+00
RU-103	182.	497.08	1.2992E+00
RURH-106	111.	621.93	2.2023E+01
AG-108m	101.	722.94	1.2855E+00
CD-109	232.	88.03	2.6584E+01
AG-110M	101.	657.76	1.1529E+00
SN-113	213.	391.69	1.6826E+00
TE-123m	306.	159.00	8.8865E-01
SB-124	126.	602.73	1.1616E+00
SB-125	175.	427.89	3.5532E+00
TE-125m	229.	109.27	2.5184E+02
I-129	190.	39.60	1.1738E+03
I-131	189.	364.48	1.1966E+00
XE-131m	291.	163.93	3.7581E+01
BA-133	228.	356.02	1.6755E+00
CS-134	138.	604.70	1.2167E+00
CS-136	78.	818.51	1.1349E+00
CS-138	33.	1435.86	5.1633E+00
CE-139	297.	165.85	9.3256E-01
BA-140	137.	537.31	4.4906E+00
LA-140	21.	1596.21	1.1063E+00
CE-141	268.	145.44	1.4355E+00
CE-144	300.	133.51	6.6202E+00
CEPR-144	300.	133.51	1.3231E+01
EU-152	235.	121.78	2.3621E+00
EU-154	41.	1274.51	3.4259E+00
EU-155	254.	86.54	3.1637E+00
HF-181	152.	482.18	1.3197E+00
TA-182	234.	67.75	4.9866E+00
HG-203	275.	279.20	1.1768E+00
BI-207	149.	569.70	1.2097E+00
TL-208	282.	277.36	1.5313E+01
PB-210	217.	46.50	4.7864E+02
BI-212	138.	727.18	2.0401E+01

Minimum Detectable Activity Report (continued) Page : 4
Sample ID : WL30664-BLK Acquisition date : 9-AUG-1999 16:35:50

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
PB-212	447.	238.63	2.5044E+00
PB-214	435.	351.92	1.5626E+01
RA-224	382.	240.99	2.5889E+01
RA-226	342.	186.10	2.3780E+01
AC-228	180.	911.21	6.8520E+00
TH-228	262.	84.37	8.7821E+01
TH-229	230.	88.47	3.8348E+00
U-232	189.	57.78	1.9745E+03
PA-233	235.	312.17	2.4910E+00
UTH-233	306.	245.34	8.4018E+02
PA-234M	82.	1001.03	2.0761E+02
TH-234	239.	63.29	7.3075E+01
U-235	340.	185.71	1.4424E+00
NP-237	257.	86.48	8.4396E+00
U-237	243.	101.07	3.1298E+00
NP-238	61.	984.45	4.2392E+00
NP-239	265.	106.12	3.4719E+00
PU-239	278.	129.30	1.1111E+04
AM-241	217.	59.54	1.0000E+01
AM-243	301.	74.67	2.7424E+00

```
*****************************************************************************
* 222-S Laboratory Counting Room    9-AUG-1999 21:56:10.09                  *
*****************************************************************************
      >>>>>>>>>> SAMPLE INFORMATION <<<<<<<<<<
Worklist #:              30664
Sample ID:               S99T1346-SAM                    Removed by:
Sample Size:             1.00000E-03 L
Dilution Factor:         1.01000E+02

      >>>>>>>>>> COUNT INFORMATION <<<<<<<<<<
Detector ID:             GEA3                            Verified by:
File Number:             dka300:[spec.GEA3]3g3721.cnf
Geometry:                43                              8-10-99
Count Time:              0 02:30:00.00 sec
Real Time:               0 02:44:02.74 sec
Dead Time:               8.6%

      >>>>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<
Sample Count Time:       9-AUG-1999 19:11:38.48
Decayed to:              9-AUG-1999 19:11:38.48
Standard Deviations:     2
Analysis Library:        ENVGEA
Analyst:                 MB
Background Subtract:     DKA300:[SPEC.GEA3]3GBACK

      >>>>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<
 Date of last energy calibration:       3-MAY-1999 16:16:33.11
 Date of last efficiency calibration:   3-MAY-1999 16:26:42.53
*****************************************************************************
```

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/L
8	12.41	47532	1.53	24.63	20	28	1.8	1.68E+03		
8	14.64	24464	1.18	29.11	20	28	3.2			
8	16.24	25539	1.59	32.31	20	28	3.9			
8	17.79	17093	1.59	35.41	20	28	5.8			
8	19.27	11579	1.61	38.38	20	28	8.5			
8	20.64	7621	1.60	41.12	20	28	12.9			
8	22.11	3779	1.45	44.05	20	28	19.7			
0	661.68*	3561001	1.46	1323.46	1316	15	0.1		CS-137	3.300E+05
0	1323.37	811	2.11	2646.15	2639	17	8.1			

Summary of Nuclide Activity
Sample ID : S99T1346-SAM

Acquisition date : 9-AUG-1999 19:11:38

Total number of lines in spectrum	9	
Number of unidentified lines	8	
Number of lines tentatively identified by NID	1	11.11%

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	3.300E+05	3.300E+05	0.004E+05	0.11	
			---	---			
	Total Activity :		3.300E+05	3.300E+05			
	Grand Total Activity :		3.300E+05	3.300E+05			

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

Minimum Detectable Activity Report
Sample ID : S99T1346-SAM

Acquisition date : 9-AUG-1999 19:11:38

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BE-7	86100.	477.59	8.4268E+02
NA-24	48.	1368.55	4.4820E+00
K-40	934.	1460.75	1.7097E+02
AR-41	61.	1293.60	7.3138E+00
SC-46	201.	1120.55	7.2841E+00
CR-51	71343.	320.08	5.8394E+02
MN-54	177.	834.83	5.8242E+00
CO-56	173.	846.76	5.8172E+00
CO-58	186.	810.78	5.9093E+00
FE-59	125.	1099.25	1.0178E+01
CO-60	49.	1332.50	4.1617E+00
ZN-65	125.	1115.55	1.1407E+01
SE-75	78907.	264.66	9.1924E+01
KR-85	44437.	514.00	1.5199E+04
SR-85	44431.	514.01	6.8750E+01
Y-88	19.	1836.06	3.5685E+00
Y-91	96.	1204.67	1.7813E+03
NB-94	167.	871.09	5.8039E+00
ZRNB-95	301.	724.20	3.1456E+01
RU-103	54637.	497.08	7.8593E+01
RURH-106	16409.	621.93	9.1738E+02
AG-108m	286.	722.94	7.4500E+00
CD-109	52032.	88.03	1.5431E+03
AG-110M	38093.	657.76	7.5734E+01
SN-113	74823.	391.69	1.0974E+02
TE-123m	70919.	159.00	4.8322E+01
SB-124	17812.	602.73	4.7546E+01
SB-125	87519.	427.89	2.7594E+02
TE-125m	58127.	109.27	1.5255E+04
I-129	44061.	39.60	2.5605E+04
I-131	71222.	364.48	8.0259E+01
XE-131m	71551.	163.93	2.0925E+03
BA-133	70784.	356.02	1.0234E+02
CS-134	17335.	604.70	4.7072E+01
CS-136	183.	818.51	5.8866E+00
CS-138	33.	1435.86	1.7409E+01
CE-139	71538.	165.85	5.1264E+01
BA-140	32665.	537.31	2.3983E+02
LA-140	39.	1596.21	4.6140E+00
CE-141	70144.	145.44	8.4064E+01
CE-144	68265.	133.51	3.6765E+02
CEPR-144	68265.	133.51	7.3466E+02
EU-152	65109.	121.78	1.4670E+02
EU-154	73.	1274.51	1.4139E+01
EU-155	51871.	86.54	1.7538E+02
HF-181	70259.	482.18	9.8577E+01
TA-182	46453.	67.75	2.5499E+02
HG-203	75558.	279.20	6.7136E+01
BI-207	20649.	569.70	4.9323E+01
TL-208	76307.	277.36	8.6615E+02
PB-210	43815.	46.50	1.5272E+04

Minimum Detectable Activity Report (continued) Page : 4
Sample ID : S99T1346-SAM Acquisition date : 9-AUG-1999 19:11:38

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BI-212	317.	727.18	1.0739E+02
PB-212	82847.	238.63	1.1793E+02
BI-214	17490.	609.31	1.0350E+02
PB-214	70827.	351.92	7.5705E+02
RA-224	82607.	240.99	1.3155E+03
RA-226	98370.	186.10	1.4118E+03
AC-228	286.	911.21	2.8910E+01
TH-228	51507.	84.37	4.7739E+03
TH-229	52136.	88.47	2.2360E+02
U-232	44162.	57.78	9.5986E+04
PA-233	72374.	312.17	1.5071E+02
UTH-233	81988.	245.34	4.7330E+04
PA-234M	115.	1001.03	8.0399E+02
TH-234	44887.	63.29	3.4793E+03
U-235	96733.	185.71	8.5159E+01
NP-237	51899.	86.48	4.6474E+02
U-237	54961.	101.07	1.8134E+02
NP-238	126.	984.45	1.9862E+01
NP-239	57073.	106.12	1.9526E+02
PU-239	67944.	129.30	6.4278E+05
AM-241	44266.	59.54	4.6920E+02
AM-243	49249.	74.67	1.3323E+02

```
*************************************************************************
* 222-S Laboratory Counting Room   10-AUG-1999 00:49:28.98             *
*************************************************************************
      >>>>>>>>>> SAMPLE INFORMATION <<<<<<<<<<
Worklist #:              30664
Sample ID:               S99T1346-DUP                    Removed by:
Sample Size:             1.00000E-03 L
Dilution Factor:         1.01000E+02                     [illegible]

      >>>>>>>>>> COUNT INFORMATION <<<<<<<<<<
Detector ID:             GEA3                            Verified by:
File Number:             dka300:[spec.GEA3]3g3722.cnf    [illegible] 8-10-99
Geometry:                43
Count Time:              0 02:30:00.00 sec
Real Time:               0 02:43:55.19 sec
Dead Time:               8.5%

      >>>>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<
Sample Count Time:       9-AUG-1999 22:05:03.32
Decayed to:              9-AUG-1999 22:05:03.32
Standard Deviations:     2
Analysis Library:        ENVGEA
Analyst:                 MB
Background Subtract:     DKA300:[SPEC.GEA3]3GBACK

      >>>>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<
 Date of last energy calibration:       3-MAY-1999 16:16:33.11
 Date of last efficiency calibration:   3-MAY-1999 16:26:42.53
*************************************************************************
```

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/L
10	11.86*	32107	1.07	23.54	20	28	1.9	2.79E+02		
10	13.01	32324	1.53	25.85	20	28	2.8			
10	14.41	33474	1.89	28.64	20	28	3.3			
10	16.14	25675	1.90	32.10	20	28	4.2			
10	17.84	19037	1.92	35.50	20	28	6.0			
10	19.59	13374	1.96	39.01	20	28	8.5			
10	21.49	7292	1.97	42.82	20	28	13.3			
0	661.67*	3537890	1.46	1323.45	1315	16	0.1		CS-137	3.279E+05
0	1323.46	762	2.11	2646.34	2637	21	9.3			
0	1765.76*	25	1.76	3529.94	3522	15	96.0		BI-214	24.6

Summary of Nuclide Activity
Sample ID : S99T1346-DUP

Acquisition date : 9-AUG-1999 22:05:03

Total number of lines in spectrum	10	
Number of unidentified lines	8	
Number of lines tentatively identified by NID	2	20.00%

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	3.279E+05	3.279E+05	0.004E+05	0.11	
~~BI-214~~	~~28700.00D~~	~~1.00~~	~~2.461E+01~~	~~2.461E+01~~	~~2.363E+01~~	~~96.01~~	RMJ
			---	---			
Total Activity :			3.279E+05	3.279E+05			
Grand Total Activity :			3.279E+05	3.279E+05			

8-10-99

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

Minimum Detectable Activity Report
Sample ID : S99T1346-DUP

Acquisition date : 9-AUG-1999 22:05:03

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BE-7	85184.	477.59	8.3818E+02
NA-24	33.	1368.55	3.7692E+00
K-40	937.	1460.75	1.7128E+02
AR-41	66.	1293.60	7.5589E+00
SC-46	184.	1120.55	6.9865E+00
CR-51	71578.	320.08	5.8490E+02
MN-54	184.	834.83	5.9407E+00
CO-56	199.	846.76	6.2181E+00
CO-58	173.	810.78	5.7096E+00
FE-59	127.	1099.25	1.0255E+01
CO-60	64.	1332.50	4.7028E+00
ZN-65	119.	1115.55	1.1173E+01
SE-75	78575.	264.66	9.1731E+01
KR-85	44500.	514.00	1.5210E+04
SR-85	44493.	514.01	6.8799E+01
Y-88	16.	1836.06	3.2755E+00
Y-91	89.	1204.67	1.7238E+03
NB-94	193.	871.09	6.2235E+00
ZRNB-95	338.	724.20	3.3274E+01
RU-103	53863.	497.08	7.8035E+01
RURH-106	16445.	621.93	9.1836E+02
AG-108m	331.	722.94	7.9961E+00
CD-109	51283.	88.03	1.5319E+03
AG-110M	38603.	657.76	7.6237E+01
SN-113	73884.	391.69	1.0905E+02
TE-123m	70427.	159.00	4.8154E+01
SB-124	17435.	602.73	4.7043E+01
SB-125	86453.	427.89	2.7426E+02
TE-125m	57804.	109.27	1.5212E+04
I-129	44232.	39.60	2.5655E+04
I-131	71479.	364.48	8.0403E+01
XE-131m	71198.	163.93	2.0874E+03
BA-133	70183.	356.02	1.0190E+02
CS-134	17263.	604.70	4.6975E+01
CS-136	161.	818.51	5.5429E+00
CS-138	34.	1435.86	1.7635E+01
CE-139	71511.	165.85	5.1254E+01
BA-140	32303.	537.31	2.3851E+02
LA-140	24.	1596.21	3.6843E+00
CE-141	69120.	145.44	8.3449E+01
CE-144	67894.	133.51	3.6666E+02
CEPR-144	67895.	133.51	7.3266E+02
EU-152	64975.	121.78	1.4655E+02
EU-154	70.	1274.51	1.3830E+01
EU-155	51348.	86.54	1.7450E+02
HF-181	69276.	482.18	9.7886E+01
TA-182	45616.	67.75	2.5269E+02
HG-203	75618.	279.20	6.7162E+01
BI-207	20398.	569.70	4.9025E+01
TL-208	76135.	277.36	8.6518E+02
PB-210	44052.	46.50	1.5314E+04

Minimum Detectable Activity Report (continued) Page : 4
Sample ID : S99T1346-DUP Acquisition date : 9-AUG-1999 22:05:03

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BI-212	317.	727.18	1.0736E+02
PB-212	82729.	238.63	1.1785E+02
PB-214	71236.	351.92	7.5868E+02
RA-224	81880.	240.99	1.3097E+03
RA-226	97559.	186.10	1.4060E+03
AC-228	291.	911.21	2.9171E+01
TH-228	51204.	84.37	4.7598E+03
TH-229	51198.	88.47	2.2158E+02
U-232	43781.	57.78	9.5572E+04
PA-233	71702.	312.17	1.5001E+02
UTH-233	80849.	245.34	4.7001E+04
PA-234M	107.	1001.03	7.7788E+02
TH-234	44643.	63.29	3.4698E+03
U-235	96024.	185.71	8.4848E+01
NP-237	51385.	86.48	4.6244E+02
U-237	54653.	101.07	1.8083E+02
NP-238	124.	984.45	1.9677E+01
NP-239	56078.	106.12	1.9355E+02
PU-239	67170.	129.30	6.3912E+05
AM-241	44092.	59.54	4.6828E+02
AM-243	48680.	74.67	1.3246E+02

```
*****************************************************************************
* 222-S Laboratory Counting Room   10-AUG-1999 06:52:42.94                  *
*****************************************************************************
      >>>>>>>>>> SAMPLE INFORMATION <<<<<<<<<<
Worklist #:              30664
Sample ID:               S99T1347-SAM                    Removed by:
Sample Size:             1.00000E-03 L
Dilution Factor:         1.01000E+02

      >>>>>>>>>> COUNT INFORMATION <<<<<<<<<<
Detector ID:             GEA3                            Verified by:
File Number:             dka300:[spec.GEA3]3g3725.cnf
Geometry:                43
Count Time:              0 02:30:00.00 sec
Real Time:               0 02:43:27.11 sec
Dead Time:               8.2%

      >>>>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<
Sample Count Time:       10-AUG-1999 04:08:44.91
Decayed to:              10-AUG-1999 04:08:44.91
Standard Deviations:     2
Analysis Library:        ENVGEA
Analyst:                 SLH2
Background Subtract:     DKA300:[SPEC.GEA3]3GBACK

      >>>>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<
 Date of last energy calibration:       3-MAY-1999 16:16:33.11
 Date of last efficiency calibration:   3-MAY-1999 16:26:42.53
*****************************************************************************
```

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/L
0	75.27*	1174	1.14	150.43	149	5	53.1		AM-243	151.
									PB-212	859.
0	661.66*	3420129	1.46	1323.42	1315	16	0.1		CS-137	3.170E+05
0	1323.39	692	1.81	2646.21	2636	20	10.9			
0	1766.02*	23	2.05	3530.45	3522	18	120.0			

Summary of Nuclide Activity
Sample ID : S99T1347-SAM

Acquisition date : 10-AUG-1999 04:08:44

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	3.170E+05	3.170E+05	0.003E+05	0.11	
~~PB-212~~	~~1.91Y~~	~~1.00~~	~~8.590E+02~~	~~8.591E+02~~	~~4.557E+02~~	~~53.05~~	~~AA~~
~~AM-243~~	~~7380.00Y~~	~~********~~	~~1.511E+02~~	~~1.511E+02~~	~~0.802E+02~~	~~53.05~~	~~AA~~
			---	---			
Total Activity :			3.180E+05	3.180E+05			

8-10-99

Grand Total Activity :	3.180E+05	3.180E+05

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

Minimum Detectable Activity Report
Sample ID : S99T1347-SAM Acquisition date : 10-AUG-1999 04:08:44

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BE-7	82450.	477.59	8.2465E+02
NA-24	52.	1368.55	4.6535E+00
K-40	932.	1460.75	1.7083E+02
AR-41	74.	1293.60	7.9861E+00
SC-46	195.	1120.55	7.1778E+00
CR-51	68444.	320.08	5.7198E+02
MN-54	165.	834.83	5.6314E+00
CO-56	173.	846.76	5.8089E+00
CO-58	173.	810.78	5.7004E+00
FE-59	117.	1099.25	9.8510E+00
CO-60	59.	1332.50	4.5524E+00
ZN-65	116.	1115.55	1.1040E+01
SE-75	75796.	264.66	9.0098E+01
KR-85	42756.	514.00	1.4910E+04
SR-85	42749.	514.01	6.7440E+01
Y-88	26.	1836.06	4.0784E+00
Y-91	79.	1204.67	1.6222E+03
NB-94	158.	871.09	5.6502E+00
ZRNB-95	263.	724.20	2.9477E+01
RU-103	51849.	497.08	7.6566E+01
RURH-106	15808.	621.93	9.0049E+02
AG-108m	270.	722.94	7.2496E+00
CD-109	49529.	88.03	1.5056E+03
AG-110M	38025.	657.76	7.5666E+01
SN-113	71841.	391.69	1.0754E+02
TE-123m	68260.	159.00	4.7409E+01
SB-124	17022.	602.73	4.6485E+01
SB-125	84127.	427.89	2.7055E+02
TE-125m	55967.	109.27	1.4969E+04
I-129	42404.	39.60	2.5121E+04
I-131	68382.	364.48	7.8645E+01
XE-131m	68240.	163.93	2.0436E+03
BA-133	67852.	356.02	1.0020E+02
CS-134	17017.	604.70	4.6641E+01
CS-136	157.	818.51	5.4689E+00
CS-138	39.	1435.86	1.8803E+01
CE-139	68550.	165.85	5.0184E+01
BA-140	30713.	537.31	2.3258E+02
LA-140	37.	1596.21	4.4785E+00
CE-141	67362.	145.44	8.2383E+01
CE-144	66269.	133.51	3.6225E+02
CEPR-144	66266.	133.51	7.2384E+02
EU-152	62919.	121.78	1.4422E+02
EU-154	58.	1274.51	1.2662E+01
EU-155	49451.	86.54	1.7125E+02
HF-181	66908.	482.18	9.6202E+01
TA-182	44375.	67.75	2.4924E+02
HG-203	73285.	279.20	6.6120E+01
BI-207	19794.	569.70	4.8296E+01
TL-208	73454.	277.36	8.4985E+02
PB-210	41893.	46.50	1.4934E+04

Minimum Detectable Activity Report (continued) Page : 4
Sample ID : S99T1347-SAM Acquisition date : 10-AUG-1999 04:08:44

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BI-212	320.	727.18	1.0782E+02
BI-214	16833.	609.31	1.0154E+02
PB-214	68319.	351.92	7.4103E+02
RA-224	78732.	240.99	1.2843E+03
RA-226	94492.	186.10	1.3838E+03
AC-228	278.	911.21	2.8553E+01
TH-228	49073.	84.37	4.6600E+03
TH-229	49410.	88.47	2.1769E+02
U-232	42504.	57.78	9.4172E+04
PA-233	69095.	312.17	1.4726E+02
UTH-233	78250.	245.34	4.6241E+04
PA-234M	130.	1001.03	8.5375E+02
TH-234	43236.	63.29	3.4148E+03
U-235	93054.	185.71	8.3528E+01
NP-237	49490.	86.48	4.5385E+02
U-237	52658.	101.07	1.7751E+02
NP-238	121.	984.45	1.9496E+01
NP-239	54581.	106.12	1.9095E+02
PU-239	64736.	129.30	6.2746E+05
AM-241	42429.	59.54	4.5939E+02

```
*************************************************************************
* 222-S Laboratory Counting Room   10-AUG-1999 09:40:39.98             *
*************************************************************************
      >>>>>>>>>> SAMPLE INFORMATION <<<<<<<<<<
Worklist #:              30664
Sample ID:               S99T1347-DUP
Sample Size:             1.00000E-03 L
Dilution Factor:         1.01000E+02

      >>>>>>>>>> COUNT INFORMATION <<<<<<<<<<
Detector ID:             GEA3
File Number:             dka300:[spec.GEA3]3g3726.cnf
Geometry:                43
Count Time:              0 02:30:00.00 sec
Real Time:               0 02:43:30.65 sec
Dead Time:               8.3%

      >>>>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<
Sample Count Time:       10-AUG-1999 06:56:38.67
Decayed to:              10-AUG-1999 06:56:38.67
Standard Deviations:     2
Analysis Library:        ENVGEA
Analyst:                 EMB
Background Subtract:     DKA300:[SPEC.GEA3]3GBACK

      >>>>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<
 Date of last energy calibration:       3-MAY-1999 16:16:33.11
 Date of last efficiency calibration:   3-MAY-1999 16:26:42.53
*************************************************************************
```

Removed by:

Verified by: 8-11-99

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/L
0	661.67*	3432654	1.46	1323.44	1315	16	0.1		CS-137	3.181E+05
0	1323.54	662	1.84	2646.49	2637	19	10.3			
0	1379.68	36	1.38	2758.67	2750	15	91.4			
0	1461.53*	74	1.87	2922.22	2914	18	102.4		K-40	86.8

Summary of Nuclide Activity
Sample ID : S99T1347-DUP

Acquisition date : 10-AUG-1999 06:56:38

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
~~K-40~~	~~1.28E+09Y~~	~~1.00~~	~~8.684E+01~~	~~8.684E+01~~	~~8.894E+01~~	~~102.41~~	~~M~~
CS-137	30.00Y	1.00	3.181E+05	3.181E+05	0.003E+05	0.11	
		Total Activity :	3.182E+05	3.182E+05			
		Grand Total Activity :	3.182E+05	3.182E+05			

8-11-99

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

Minimum Detectable Activity Report
Sample ID : S99T1347-DUP

Acquisition date : 10-AUG-1999 06:56:38

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BE-7	82661.	477.59	8.2570E+02
NA-24	42.	1368.55	4.2170E+00
AR-41	75.	1293.60	8.0495E+00
SC-46	202.	1120.55	7.3091E+00
CR-51	69667.	320.08	5.7705E+02
MN-54	150.	834.83	5.3879E+00
CO-56	163.	846.76	5.6569E+00
CO-58	172.	810.78	5.6931E+00
FE-59	134.	1099.25	1.0503E+01
CO-60	60.	1332.50	4.5895E+00
ZN-65	128.	1115.55	1.1552E+01
SE-75	76217.	264.66	9.0347E+01
KR-85	42657.	514.00	1.4893E+04
SR-85	42650.	514.01	6.7363E+01
Y-88	25.	1836.06	4.0469E+00
Y-91	88.	1204.67	1.7108E+03
NB-94	170.	871.09	5.8536E+00
ZRNB-95	288.	724.20	3.0775E+01
RU-103	52318.	497.08	7.6910E+01
RURH-106	15958.	621.93	9.0474E+02
AG-108m	290.	722.94	7.5018E+00
CD-109	49598.	88.03	1.5066E+03
AG-110M	37544.	657.76	7.5187E+01
SN-113	72147.	391.69	1.0777E+02
TE-123m	68349.	159.00	4.7440E+01
SB-124	17114.	602.73	4.6609E+01
SB-125	83517.	427.89	2.6957E+02
TE-125m	55939.	109.27	1.4966E+04
I-129	42478.	39.60	2.5142E+04
I-131	68411.	364.48	7.8662E+01
XE-131m	68536.	163.93	2.0481E+03
BA-133	68160.	356.02	1.0043E+02
CS-134	16974.	604.70	4.6583E+01
CS-136	164.	818.51	5.5844E+00
CS-138	44.	1435.86	1.9737E+01
CE-139	69059.	165.85	5.0369E+01
BA-140	30767.	537.31	2.3279E+02
LA-140	29.	1596.21	4.0301E+00
CE-141	67165.	145.44	8.2263E+01
CE-144	66533.	133.51	3.6297E+02
CEPR-144	66534.	133.51	7.2530E+02
EU-152	62383.	121.78	1.4360E+02
EU-154	57.	1274.51	1.2565E+01
EU-155	49765.	86.54	1.7179E+02
HF-181	67368.	482.18	9.6532E+01
TA-182	44413.	67.75	2.4934E+02
HG-203	73511.	279.20	6.6222E+01
BI-207	20201.	569.70	4.8788E+01
TL-208	73828.	277.36	8.5200E+02
PB-210	42254.	46.50	1.4999E+04
BI-212	300.	727.18	1.0454E+02

Minimum Detectable Activity Report (continued) Page : 4
Sample ID : S99T1347-DUP Acquisition date : 10-AUG-1999 06:56:38

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
PB-212	80007.	238.63	1.1589E+02
BI-214	17055.	609.31	1.0221E+02
PB-214	68370.	351.92	7.4156E+02
RA-224	79877.	240.99	1.2936E+03
RA-226	94604.	186.10	1.3846E+03
AC-228	243.	911.21	2.6728E+01
TH-228	49431.	84.37	4.6770E+03
TH-229	49397.	88.47	2.1766E+02
U-232	42296.	57.78	9.3942E+04
PA-233	69986.	312.17	1.4820E+02
UTH-233	78574.	245.34	4.6337E+04
PA-234M	140.	1001.03	8.8474E+02
TH-234	43451.	63.29	3.4233E+03
U-235	93165.	185.71	8.3577E+01
NP-237	49786.	86.48	4.5520E+02
U-237	52726.	101.07	1.7762E+02
NP-238	131.	984.45	2.0201E+01
NP-239	54482.	106.12	1.9077E+02
PU-239	65232.	129.30	6.2985E+05
AM-241	42246.	59.54	4.5840E+02
AM-243	46590.	74.67	1.2959E+02

```
*************************************************************************
* 222-S Laboratory Counting Room   10-AUG-1999 12:46:17.92             *
*************************************************************************
      >>>>>>>>>> SAMPLE INFORMATION <<<<<<<<<<
Worklist #:              30664
Sample ID:               S99T1348-SAM
Sample Size:             1.00000E-03 L
Dilution Factor:         1.01000E+02

      >>>>>>>>>> COUNT INFORMATION <<<<<<<<<<
Detector ID:             GEA3
File Number:             dka300:[spec.GEA3]3g3727.cnf
Geometry:                43
Count Time:              0 02:30:00.00 sec
Real Time:               0 02:42:41.97 sec
Dead Time:               7.8%

      >>>>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<
Sample Count Time:       10-AUG-1999 10:03:06.28
Decayed to:              10-AUG-1999 10:03:06.28
Standard Deviations:     2
Analysis Library:        ENVGEA
Analyst:                 MB
Background Subtract:     DKA300:[SPEC.GEA3]3GBACK

      >>>>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<
 Date of last energy calibration:       3-MAY-1999 16:16:33.11
 Date of last efficiency calibration:   3-MAY-1999 16:26:42.53
*************************************************************************
```

Removed by:

Verified by: 8-11-99

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/L
8	11.84*	28401	1.04	23.51	20	29	2.0	2.89E+02		
8	13.05	32343	1.55	25.93	20	29	2.6			
8	14.67	27575	1.56	29.17	20	29	3.2			
8	16.25	20444	1.59	32.33	20	29	4.7			
8	17.73	15702	1.59	35.28	20	29	6.0			
8	19.15	11758	1.60	38.12	20	29	8.0			
8	20.58	8490	1.58	40.99	20	29	11.0			
8	22.23	4980	1.63	44.30	20	29	18.6			
0	25.21	617	0.96	50.26	48	5	104.9			
0	661.64*	3231363	1.46	1323.39	1315	16	0.1		CS-137	2.995E+05
0	1323.27	601	1.79	2645.97	2637	15	9.9			

Summary of Nuclide Activity
Page : 2
Sample ID : S99T1348-SAM
Acquisition date : 10-AUG-1999 10:03:06

Total number of lines in spectrum	11	
Number of unidentified lines	10	
Number of lines tentatively identified by NID	1	9.09%

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	2.995E+05	2.995E+05	0.003E+05	0.11	
			---	---			
	Total Activity :		2.995E+05	2.995E+05			
	Grand Total Activity :		2.995E+05	2.995E+05			

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

Minimum Detectable Activity Report
Sample ID : S99T1348-SAM Acquisition date : 10-AUG-1999 10:03:06

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BE-7	77553.	477.59	7.9984E+02
NA-24	40.	1368.55	4.1066E+00
K-40	957.	1460.75	1.7306E+02
AR-41	71.	1293.60	7.8391E+00
SC-46	187.	1120.55	7.0422E+00
CR-51	64917.	320.08	5.5707E+02
MN-54	152.	834.83	5.4253E+00
CO-56	148.	846.76	5.3890E+00
CO-58	152.	810.78	5.3572E+00
FE-59	128.	1099.25	1.0287E+01
CO-60	54.	1332.50	4.3354E+00
ZN-65	121.	1115.55	1.1261E+01
SE-75	71111.	264.66	8.7274E+01
KR-85	40556.	514.00	1.4522E+04
SR-85	40551.	514.01	6.5689E+01
Y-88	20.	1836.06	3.6195E+00
Y-91	81.	1204.67	1.6450E+03
NB-94	149.	871.09	5.4891E+00
ZRNB-95	280.	724.20	3.0343E+01
RU-103	48765.	497.08	7.4259E+01
RURH-106	15005.	621.93	8.7744E+02
AG-108m	281.	722.94	7.3931E+00
CD-109	47240.	88.03	1.4705E+03
AG-110M	37498.	657.76	7.5141E+01
SN-113	67607.	391.69	1.0433E+02
TE-123m	64512.	159.00	4.6092E+01
SB-124	15961.	602.73	4.5018E+01
SB-125	79479.	427.89	2.6298E+02
TE-125m	52717.	109.27	1.4529E+04
I-129	40290.	39.60	2.4488E+04
I-131	64950.	364.48	7.6649E+01
XE-131m	64536.	163.93	1.9875E+03
BA-133	64897.	356.02	9.8001E+01
CS-134	16047.	604.70	4.5298E+01
CS-136	141.	818.51	5.2065E+00
CS-138	36.	1435.86	1.8091E+01
CE-139	64546.	165.85	4.8699E+01
BA-140	29342.	537.31	2.2734E+02
LA-140	30.	1596.21	4.0842E+00
CE-141	63158.	145.44	7.9776E+01
CE-144	62337.	133.51	3.5136E+02
CEPR-144	62338.	133.51	7.0211E+02
EU-152	59198.	121.78	1.3990E+02
EU-154	63.	1274.51	1.3219E+01
EU-155	46873.	86.54	1.6674E+02
HF-181	63403.	482.18	9.3654E+01
TA-182	41656.	67.75	2.4150E+02
HG-203	68968.	279.20	6.4147E+01
BI-207	18833.	569.70	4.7113E+01
TL-208	69209.	277.36	8.2498E+02
PB-210	39998.	46.50	1.4593E+04

Minimum Detectable Activity Report (continued) Page : 4
Sample ID : S99T1348-SAM Acquisition date : 10-AUG-1999 10:03:06

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BI-212	304.	727.18	1.0521E+02
PB-212	75620.	238.63	1.1268E+02
BI-214	15842.	609.31	9.8520E+01
PB-214	64637.	351.92	7.1772E+02
RA-224	74571.	240.99	1.2499E+03
RA-226	89659.	186.10	1.3480E+03
AC-228	273.	911.21	2.8285E+01
TH-228	46446.	84.37	4.5339E+03
TH-229	47290.	88.47	2.1298E+02
U-232	40314.	57.78	9.1720E+04
PA-233	65782.	312.17	1.4369E+02
UTH-233	74017.	245.34	4.4976E+04
PA-234M	104.	1001.03	7.6862E+02
TH-234	40687.	63.29	3.3129E+03
U-235	88155.	185.71	8.1303E+01
NP-237	46864.	86.48	4.4168E+02
U-237	49656.	101.07	1.7238E+02
NP-238	135.	984.45	2.0528E+01
NP-239	50966.	106.12	1.8452E+02
PU-239	61889.	129.30	6.1354E+05
AM-241	40331.	59.54	4.4792E+02
AM-243	44442.	74.67	1.2657E+02

```
*************************************************************************
* 222-S Laboratory Counting Room   10-AUG-1999 18:32:44.87              *
*************************************************************************
      >>>>>>>>>> SAMPLE INFORMATION <<<<<<<<<<
Worklist #:              30664
Sample ID:               S99T001348-DUP
Sample Size:             1.00000E-03 L
Dilution Factor:         1.01000E+02

      >>>>>>>>>> COUNT INFORMATION <<<<<<<<<<
Detector ID:             GEA3
File Number:             dka300:[spec.GEA3]3g3729.cnf
Geometry:                43
Count Time:              0 02:30:00.00 sec
Real Time:               0 02:42:36.30 sec
Dead Time:               7.8%

      >>>>>>>>>> ANALYSIS INFORMATION <<<<<<<<<<
Sample Count Time:       10-AUG-1999 15:49:36.86
Decayed to:              10-AUG-1999 15:49:36.86
Standard Deviations:     2
Analysis Library:        ENVGEA
Analyst:                 MB
Background Subtract:     DKA300:[SPEC.GEA3]3GBACK

      >>>>>>>>>> CALIBRATION INFORMATION <<<<<<<<<<
 Date of last energy calibration:       3-MAY-1999 16:16:33.11
 Date of last efficiency calibration:   3-MAY-1999 16:26:42.53
*************************************************************************
```

Removed by: URaymond

Verified by: RNJones 8-11-99

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/L
9	11.97	34242	1.16	23.76	20	29	1.9	5.85E+02		
9	13.49	36623	1.71	26.81	20	29	2.6			
9	15.31	27679	1.72	30.45	20	29	3.5			
9	17.08	20410	1.75	33.99	20	29	5.0			
9	18.69	15029	1.76	37.21	20	29	6.7			
9	20.24	9414	1.78	40.30	20	29	10.6			
9	21.58	5862	1.79	43.00	20	29	16.9			
9	22.90	2656	1.80	45.64	20	29	26.4			
0	661.63*	3210655	1.46	1323.37	1315	16	0.1		CS-137	2.976E+05
0	1323.38	576	1.79	2646.18	2639	17	11.1			

Summary of Nuclide Activity
Page : 2
Sample ID : S99T001348-DUP
Acquisition date : 10-AUG-1999 15:49:36

Total number of lines in spectrum 10
Number of unidentified lines 9
Number of lines tentatively identified by NID 1 10.00%

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	2.976E+05	2.976E+05	0.003E+05	0.11	
		Total Activity :	2.976E+05	2.976E+05			
		Grand Total Activity :	2.976E+05	2.976E+05			

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

Minimum Detectable Activity Report
Sample ID : S99T001348-DUP Acquisition date : 10-AUG-1999 15:49:36

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BE-7	76976.	477.59	7.9686E+02
NA-24	38.	1368.55	3.9990E+00
K-40	919.	1460.75	1.6962E+02
AR-41	70.	1293.60	7.7445E+00
SC-46	198.	1120.55	7.2396E+00
CR-51	64783.	320.08	5.5650E+02
MN-54	157.	834.83	5.5017E+00
CO-56	169.	846.76	5.7473E+00
CO-58	145.	810.78	5.2394E+00
FE-59	116.	1099.25	9.8059E+00
CO-60	73.	1332.50	5.0046E+00
ZN-65	138.	1115.55	1.1972E+01
SE-75	70935.	264.66	8.7167E+01
KR-85	40161.	514.00	1.4451E+04
SR-85	40154.	514.01	6.5367E+01
Y-88	23.	1836.06	3.8840E+00
Y-91	82.	1204.67	1.6520E+03
NB-94	152.	871.09	5.5503E+00
ZRNB-95	285.	724.20	3.0628E+01
RU-103	48875.	497.08	7.4343E+01
RURH-106	15004.	621.93	8.7741E+02
AG-108m	282.	722.94	7.4033E+00
CD-109	46072.	88.03	1.4522E+03
AG-110M	37914.	657.76	7.5555E+01
SN-113	67544.	391.69	1.0428E+02
TE-123m	64522.	159.00	4.6096E+01
SB-124	15959.	602.73	4.5015E+01
SB-125	78645.	427.89	2.6160E+02
TE-125m	52576.	109.27	1.4510E+04
I-129	39894.	39.60	2.4368E+04
I-131	64926.	364.48	7.6634E+01
XE-131m	64792.	163.93	1.9914E+03
BA-133	64010.	356.02	9.7330E+01
CS-134	15746.	604.70	4.4873E+01
CS-136	171.	818.51	5.7005E+00
CS-138	37.	1435.86	1.8288E+01
CE-139	64573.	165.85	4.8710E+01
BA-140	29194.	537.31	2.2677E+02
LA-140	25.	1596.21	3.7833E+00
CE-141	63302.	145.44	7.9867E+01
CE-144	61490.	133.51	3.4897E+02
CEPR-144	61489.	133.51	6.9732E+02
EU-152	58759.	121.78	1.3938E+02
EU-154	82.	1274.51	1.4954E+01
EU-155	46103.	86.54	1.6537E+02
HF-181	62680.	482.18	9.3120E+01
TA-182	41170.	67.75	2.4009E+02
HG-203	68813.	279.20	6.4075E+01
BI-207	18752.	569.70	4.7013E+01
TL-208	68995.	277.36	8.2370E+02
PB-210	39327.	46.50	1.4471E+04

Minimum Detectable Activity Report (continued) Page : 4
Sample ID : S99T001348-DUP Acquisition date : 10-AUG-1999 15:49:36

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BI-212	308.	727.18	1.0592E+02
PB-212	74669.	238.63	1.1197E+02
BI-214	15637.	609.31	9.7885E+01
PB-214	63982.	351.92	7.1370E+02
RA-224	74171.	240.99	1.2466E+03
RA-226	88591.	186.10	1.3400E+03
AC-228	244.	911.21	2.6786E+01
TH-228	46476.	84.37	4.5354E+03
TH-229	46133.	88.47	2.1037E+02
U-232	39845.	57.78	9.1187E+04
PA-233	65289.	312.17	1.4315E+02
UTH-233	73715.	245.34	4.4884E+04
PA-234M	125.	1001.03	8.3681E+02
TH-234	40491.	63.29	3.3050E+03
U-235	87320.	185.71	8.0918E+01
NP-237	46176.	86.48	4.3843E+02
U-237	49500.	101.07	1.7211E+02
NP-238	123.	984.45	1.9611E+01
NP-239	51023.	106.12	1.8462E+02
PU-239	61446.	129.30	6.1134E+05
AM-241	40143.	59.54	4.4688E+02
AM-243	44253.	74.67	1.2631E+02

LABCORE Completed Worklist Report for Worklist# 30726

Analyst: crj **Instrument:** AB10 **Book#:** _____

Method: LA-220-101 Rev/Mod _____

Worklist Comment: RERUN OF 30665,S-109 emb

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
1	STD			0	@SR90-01 SR90-01	LIQUID	8.32E-04	8.67E-4	104.207	% Recovery
1	STD			0	@SR90-01 SR90-01C	LIQUID	100	9.21E+01	92.100	% Recovery
1	STD			0	@SR90-01 SR90-01E	LIQUID	1.00	2.18E+00	2.180	% Ct. Erro
2	BLNK			0	@SR90-01 SR90-01	LIQUID	1	1.99E-4	1.990e-004	uCi/mL
2	BLNK			0	@SR90-01 SR90-01C	LIQUID	100	9.31E+01	93.100	% Recovery
2	BLNK			0	@SR90-01 SR90-01E	LIQUID	1.00	1.39E+02	139.000	uCi/mL
3	BLNK/BKG			0	@SR90-01 SR90-01	LIQUID	1	1.23E+00	1.230	BLNK/BKG
4	SAMPLE	S99T001346		0	@SR90-01 SR90-01	LIQUID	N/A	3.12E-01	3.70e-004	uCi/mL
4	SAMPLE	S99T001346		0	@SR90-01 SR90-01C	LIQUID	N/A	9.25E+01		% Recovery
4	SAMPLE	S99T001346		0	@SR90-01 SR90-01E	LIQUID	N/A	1.14E+00		% Ct. Error
5	DUP	S99T001346		0	@SR90-01 SR90-01	LIQUID	3.12E-1	2.99E-1	4.255	RPD
5	DUP	S99T001346		0	@SR90-01 SR90-01C	LIQUID	100	9.33E+01	93.300	% Recovery
5	DUP	S99T001346		0	@SR90-01 SR90-01E	LIQUID	1.00	1.16E+00	1.160	% Cnt Err
6	SAMPLE	S99T001347		0	@SR90-01 SR90-01	LIQUID	N/A	2.50E-01	3.72e-004	uCi/mL
6	SAMPLE	S99T001347		0	@SR90-01 SR90-01C	LIQUID	N/A	9.18E+01		% Recovery
6	SAMPLE	S99T001347		0	@SR90-01 SR90-01E	LIQUID	N/A	1.28E+00		% Ct. Error
7	DUP	S99T001347		0	@SR90-01 SR90-01	LIQUID	2.50E-1	2.45E-1	2.020	RPD
7	DUP	S99T001347		0	@SR90-01 SR90-01C	LIQUID	100	9.24E+01	92.400	% Recovery
7	DUP	S99T001347		0	@SR90-01 SR90-01E	LIQUID	1.00	1.29E+00	1.290	% Cnt Err
8	SAMPLE	S99T001348		0	@SR90-01 SR90-01	LIQUID	N/A	2.73E-01	3.70e-004	uCi/mL
8	SAMPLE	S99T001348		0	@SR90-01 SR90-01C	LIQUID	N/A	9.19E+01		% Recovery
8	SAMPLE	S99T001348		0	@SR90-01 SR90-01E	LIQUID	N/A	1.22E+00		% Ct. Error
9	DUP	S99T001348		0	@SR90-01 SR90-01	LIQUID	2.73E-1	2.40E-1	12.865	RPD
9	DUP	S99T001348		0	@SR90-01 SR90-01C	LIQUID	100	9.25E+01	92.500	% Recovery
9	DUP	S99T001348		0	@SR90-01 SR90-01E	LIQUID	1.00	1.30E+00	1.300	% Cnt Err

Final page for worklist# 30726

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

D D Catt 26 Aug 99
Reviewer Signature **Date**

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

LABCORE Data Entry Template for Worklist# 30726

Analyst: CRJ **Instrument:** AB00 _____ **Book#** 46B57

Method: LA-220-101 Rev/Mod E-4

Worklist Comment: RERUN OF 30665,S-109 emb

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	S99T001346	0		@SR90-01	LIQUID	99000300	S-109 GRAB
		Analytes Requested: SR90-01 , SR90-01C, SR90-01E						
5	DUP	S99T001346	0		@SR90-01	LIQUID		
6	SAMPLE	S99T001347	0		@SR90-01	LIQUID	99000300	S-109 GRAB
		Analytes Requested: SR90-01 , SR90-01C, SR90-01E						
7	DUP	S99T001347	0		@SR90-01	LIQUID		
8	SAMPLE	S99T001348	0		@SR90-01	LIQUID	99000300	S-109 GRAB
		Analytes Requested: SR90-01 , SR90-01C, SR90-01E						
9	DUP	S99T001348	0		@SR90-01	LIQUID		

Final page for worklist # 30726

Signature 8/24/99 Date

Signature 8/25/99 Date

8/25/99

Data Entry Comments: Samples very hard to get representative samples for dup. Kept getting hung up in pipettes. 8/25/99

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

WORKBOOK PAGE: STD1 4 LED 9/22/99

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)	8343	GROSS WEIGHT	(W2)		7.4072
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)		7.3151
30726	BACKGROUND in cpm	(BKG)	8.1	NET WEIGHT	(W3)		0.0921
	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)		13.50
@SR90-01	DILUTION FACTOR	(DF)	1				
	DIGEST DILUTION FACTOR	DDF	1				
LIQUID	SAMPLE COUNT RATE	(Rs)	826.20	SR-90 EFFICIENCY FACTO	(C1)		0.4051
	CRITICAL LEVEL	(Lc)	1.71	Y-90 EFFICIENCY FACTOR	(C2)		0.4503
99003108	TIME OF SEPARATION	(ST)	09:22	Rmax			N/A
	DATE OF SEPARATION	(SD)	08/24/99	DETECTION LIMIT	(Ld)		3.52
0	TIME OF COUNT	(TOC)	22:52	Sr-89/90 CONC. in µCi/L			8.6681E-01
	DATE OF COUNT	(DOC)	08/24/99				
N/A	STANDARD BOOK #		46B57				
	STANDARD VALUE in µCi/mL		8.3152E-04				
WL30726							
WB26870	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)						
	Sr-89/90 CONC in µCi/mL REPLACE RS WITH RMAX IF RS<=LcAND RS>=0 OR REPLACE RS WITH Lc IF RS<0						
SZC	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.						
08/25/99	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100						
							DETECTION LEVEL
08/24/99	Sr-89/90 CONCENTRATION		8.67E-04			µCi/mL	
01:30 PM	RELATIVE COUNTING ERROR		2.2%				3.69E-06 µCi/L
S-109 GRAB	PERCENT CARRIER RECOVERY		92.1%				

Analyst:	CRJ	Date:	25-Aug-99
Signature of Chemist:	SAC	Date:	26 Aug 99

STANDARD.WB1 REV 2.0 22010NML

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)	100	GROSS WEIGHT	(W2)	7.3779
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.2848
30726	BACKGROUND in cpm	(BKG)	8.1	NET WEIGHT	(W3)	0.0931
	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)	13.68
@SR90-01	DILUTION FACTOR	DF	101			
	DIGEST DILUTION FACTOR	(DDF)	1			
LIQUID	SAMPLE COUNT RATE	(Rs)	1.90	SR-90 EFFICIENCY FACTOR	(C1)	0.4051
	CRITICAL LEVEL	(Lc)	1.71	Y-90 EFFICIENCY FACTOR	(C2)	0.4503
99003108	TIME OF SEPARATION	(ST)	09:22	Rmax		N/A
	DATE OF SEPARATION	(SD)	08/24/99	DETECTION LIMIT	(Ld)	3.52
0	TIME OF COUNT	(TOC)	23:03	Sr-89/90 CONC in µCi/L		1.9884E-01
	DATE OF COUNT	(DOC)	08/24/99			
N/A						

WL30726

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)

SZC 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

08/25/99

08/24/99	Sr-89/90 CONCENTRATION	1.99E-04	µCi/mL	DETECTION LEVEL
01:30 PM	RELATIVE COUNTING ERROR	138.8%		3.68E-04 µCi/mL
S-109 GRAB	PERCENT CARRIER RECOVERY	93.1%		

Analyst:	CRJ	Date:	25-Aug-99
Signature of Chemist:	SAC	Date:	26 Aug 99

BLANK.WB1 REV 2.0 22010NML

WORKBOOK PAGE: SAM4 4 KD 9/26/99

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)	29721	GROSS WEIGHT	(W2)	7.4258
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.3333
30726	BACKGROUND in cpm	(BKG)	8.1	NET WEIGHT	(W3)	0.0925
	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)	13.93
@SR90-01	DILUTION FACTOR	DF	101			
	DIGEST DILUTION FACTOR	(DDF)	1			
LIQUID	SAMPLE COUNT RATE	(Rs)	2964.00	SR-90 EFFICIENCY FACTOR	(C1)	0.4051
	CRITICAL LEVEL	(Lc)	1.71	Y-90 EFFICIENCY FACTOR	(C2)	0.4503
99003108	TIME OF SEPARATION	(ST)	09:22	Rmax		N/A
	DATE OF SEPARATION	(SD)	08/24/99	DETECTION LIMIT	(Ld)	3.52
0	TIME OF COUNT	(TOC)	23:18	Sr-89/90 CONC in µCi/L		3.1151E+02
	DATE OF COUNT	(DOC)	08/24/99			
N/A						
S99T001346						

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)

SZC 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

08/25/99

				DETECTION LEVEL
08/24/99	Sr-89/90 CONCENTRATION	3.12E-01	µCi/mL	
01:30 PM	RELATIVE COUNTING ERROR	1.1%		3.70E-04 µCi/mL
S-109 GRAB	PERCENT CARRIER RECOVERY	92.5%		

Analyst:	CRJ	Date:	25-Aug-99
Signature of Chemist:	SAC	Date:	26 Aug 99

SAMPLE.WB1 REV 2.0 22010NML

WORKBOOK PAGE: DUP5

Sr-89/90 : LA-220-101 (E-3), 102 (INACTIVE), 104 (E-5)

							DUP
[redacted]	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA)	1.000
DUP	TOTAL COUNTS	(TC)	28817	GROSS WEIGHT	(W2)	7.4357
[redacted]	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.3424
30726	BACKGROUND in cpm	(BKG)	8.1	NET WEIGHT	(W3)	0.0933
[redacted]	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)	14.13
@SR90-01	DILUTION FACTOR	DF	101			
[redacted]	DIGEST DILUTION FACTOR	(DDF)	1			
LIQUID	SAMPLE COUNT RATE	(Rs)	2873.60	SR-90 EFFICIENCY FACTOR	(C1)	0.4051
[redacted]	CRITICAL LEVEL	(Lc)	1.71	Y-90 EFFICIENCY FACTOR	(C2)	0.4503
99003108	TIME OF SEPARATION	(ST)	09:22	Rmax		N/A
[redacted]	DATE OF SEPARATION	(SD)	08/24/99	DETECTION LIMIT	(Ld)	3.52
0	TIME OF COUNT	(TOC)	23:30	Sr-89/90 CONC in µCi/L		2.9888E+02
[redacted]	DATE OF COUNT	(DOC)	08/24/99			
N/A						
[redacted]						
S99T001346						

[redacted]

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

[redacted] — RS*DF*DDF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)

SZC — NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))

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

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

[redacted] — NOTE: Expected weight = CVA * 0.1

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

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

08/25/99

[redacted]

				DETECTION LEVEL
08/24/99	Sr-89/90 CONCENTRATION	2.99E-01	µCi/mL	
[redacted]				
01:30 PM	RELATIVE COUNTING ERROR	1.2%		3.66E-04 µCi/mL
[redacted]				
S-109 GRAB	PERCENT CARRIER RECOVERY	93.3%		

Analyst:	CRJ	Date:	25-Aug-99
Signature of Chemist:	SAC	Date:	26 Aug 99

SAMPLE.WB1 REV 2.0 22010NML

WORKBOOK PAGE: SAM6 4 wD 9DL/14

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)	23759	GROSS WEIGHT	(W2)	7.4465
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.3547
30726	BACKGROUND in cpm	(BKG)	8.1	NET WEIGHT	(W3)	0.0918
	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)	14.28
@SR90-01	DILUTION FACTOR	DF	101			
	DIGEST DILUTION FACTOR	(DDF)	1			
LIQUID	SAMPLE COUNT RATE	(Rs)	2367.80	SR-90 EFFICIENCY FACTOR	(C1)	0.4051
	CRITICAL LEVEL	(Lc)	1.71	Y-90 EFFICIENCY FACTOR	(C2)	0.4503
99003108	TIME OF SEPARATION	(ST)	09:26	Rmax		N/A
	DATE OF SEPARATION	(SD)	08/24/99	DETECTION LIMIT	(Ld)	3.52
0	TIME OF COUNT	(TOC)	23:43	Sr-89/90 CONC in µCi/L		2.4996E+02
	DATE OF COUNT	(DOC)	08/24/99			
N/A						

S99T001347

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)

SZC 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

08/25/99

				DETECTION LEVEL
08/24/99	Sr-89/90 CONCENTRATION	2.50E-01	µCi/mL	
01:30 PM	RELATIVE COUNTING ERROR	1.3%		3.72E-04 µCi/mL
S-109 GRAB	PERCENT CARRIER RECOVERY	91.8%		

Analyst:	CRJ	Date:	25-Aug-99
Signature of Chemist:	SAC	Date:	26 Aug 99

SAMPLE.WB1 REV 2.0 22010NML

WORKBOOK PAGE: DUP7

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)	23470	GROSS WEIGHT	(W2)	7.4493
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.3569
30726	BACKGROUND in cpm	(BKG)	8.1	NET WEIGHT	(W3)	0.0924
	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)	14.47
@SR90-01	DILUTION FACTOR	DF	101			
	DIGEST DILUTION FACTOR	(DDF)	1			
LIQUID	SAMPLE COUNT RATE	(Rs)	2338.90	SR-90 EFFICIENCY FACTOR	(C1)	0.4051
	CRITICAL LEVEL	(Lc)	1.71	Y-90 EFFICIENCY FACTOR	(C2)	0.4503
99003108	TIME OF SEPARATION	(ST)	09:26	Rmax		N/A
	DATE OF SEPARATION	(SD)	08/24/99	DETECTION LIMIT	(Ld)	3.52
0	TIME OF COUNT	(TOC)	23:54	Sr-89/90 CONC in µCi/L		2.4491E+02
	DATE OF COUNT	(DOC)	08/24/99			
N/A						

S99T001347

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)

SZC 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

08/25/99

				DETECTION LEVEL
08/24/99	Sr-89/90 CONCENTRATION	2.45E-01	µCi/mL	
01:30 PM	RELATIVE COUNTING ERROR	1.3%		3.69E-04 µCi/mL
S-109 GRAB	PERCENT CARRIER RECOVERY	92.4%		

Analyst:	CRJ	Date:	25-Aug-99
Signature of Chemist:	SAC	Date:	26 Aug 99

SAMPLE.WB1 REV 2.0 22010NML

WORKBOOK PAGE: SAM8 4 EAD 8/26/99

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)	26029	GROSS WEIGHT	(W2)	7.3680
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.2761
30726	BACKGROUND in cpm	(BKG)	8.1	NET WEIGHT	(W3)	0.0919
	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)	14.67
@SR90-01	DILUTION FACTOR	DF	101			
	DIGEST DILUTION FACTOR	(DDF)	1			
LIQUID	SAMPLE COUNT RATE	(Rs)	2594.80	SR-90 EFFICIENCY FACTOR	(C1)	0.4051
	CRITICAL LEVEL	(Lc)	1.71	Y-90 EFFICIENCY FACTOR	(C2)	0.4503
99003108	TIME OF SEPARATION	(ST)	09:26	Rmax		N/A
	DATE OF SEPARATION	(SD)	08/24/99	DETECTION LIMIT	(Ld)	3.52
0	TIME OF COUNT	(TOC)	00:06	Sr-89/90 CONC in µCi/L		2.7270E+02
	DATE OF COUNT	(DOC)	08/25/99			
N/A						
S99T001348						

	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)
SZC	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
08/25/99	

				DETECTION LEVEL
08/24/99	Sr-89/90 CONCENTRATION	2.73E-01	µCi/mL	
01:30 PM	RELATIVE COUNTING ERROR	1.2%		3.70E-04 µCi/mL
S-109 GRAB	PERCENT CARRIER RECOVERY	91.9%		

Analyst:	CRJ	Date:	25-Aug-99
Signature of Chemist:	SAC	Date:	26 Aug 99

SAMPLE.WB1 REV 2.0 22010NML

WORKBOOK PAGE: DUP9 4 MD 9/26/99

Sr-89/90 : LA-220-101 (E-β), 102 (INACTIVE), 104 (E-5)

							DUP
	DETECTOR NUMBER		10	CARRIER ADDED in mL	(CVA)	1.000
DUP	TOTAL COUNTS	(TC)	23082	GROSS WEIGHT	(W2)	7.4010
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.3085
30726	BACKGROUND in cpm	(BKG)	8.1	NET WEIGHT	(W3)	0.0925
	SAMPLE VOLUME in mL	(SS)	1.000	DELTA TIME (HOURS)	(DT)	14.88
@SR90-01	DILUTION FACTOR	DF	101			
	DIGEST DILUTION FACTOR	(DDF)	1			
LIQUID	SAMPLE COUNT RATE	(Rs)	2300.10	SR-90 EFFICIENCY FACTOR	(C1)	0.4051
	CRITICAL LEVEL	(Lc)	1.71	Y-90 EFFICIENCY FACTOR	(C2)	0.4503
99003108	TIME OF SEPARATION	(ST)	09:26	Rmax		N/A
	DATE OF SEPARATION	(SD)	08/24/99	DETECTION LIMIT	(Ld)	3.52
0	TIME OF COUNT	(TOC)	00:19	Sr-89/90 CONC in µCi/L		2.3971E+02
	DATE OF COUNT	(DOC)	08/25/99			
N/A						
S99T001348						
	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)					
SZC	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					
08/25/99						
						DETECTION LEVEL
08/24/99	Sr-89/90 CONCENTRATION		2.40E-01		µCi/mL	
01:30 PM	RELATIVE COUNTING ERROR		1.3%			3.67E-04 µCi/mL
S-109 GRAB	PERCENT CARRIER RECOVERY		92.5%			

Analyst:	CRJ	Date:	25-Aug-99
Signature of Chemist:	SAC	Date:	26 Aug 99

SAMPLE.WB1 REV 2.0 22010NML

LABCORE Completed Worklist Report for Worklist# 30663

Analyst: akl **Instrument:** AB19 **Book#:** _____

Method: LA-953-104 Rev/Mod _____

Worklist Comment: S109 FOR @AM24101 RTS

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
1	STD			0	@AM24101 AM24101	LIQUID	1.07E-04	1.09E-4	101.869	% Recovery
1	STD			0	@AM24101 AM24101E	LIQUID	1.0	1.76E+00	1.760	% Ct Error
1	STD			0	@AM24101 AM24101T	LIQUID	100.	9.43E+01	94.300	% Recovery
2	BLNK			0	@AM24101 AM24101	LIQUID	1	<2.53E-5		uCi/mL
2	BLNK			0	@AM24101 AM24101E	LIQUID	1.0	1.00E+02	100.000	% Ct Error
2	BLNK			0	@AM24101 AM24101T	LIQUID	100.0	1.01E+02	101.000	% Recovery
3	SAMPLE	S99T001346		0	@AM24101 AM24101	LIQUID	N/A	2.54E-04	3.93e-005	uCi/mL
3	SAMPLE	S99T001346		0	@AM24101 AM24101E	LIQUID	N/A	3.12E+00		% Ct. Error
3	SAMPLE	S99T001346		0	@AM24101 AM24101T	LIQUID	N/A	1.01E+02		% Recovery
4	DUP	S99T001346		0	@AM24101 AM24101	LIQUID	2.54E-4	2.66E-4	4.615	RPD
4	DUP	S99T001346		0	@AM24101 AM24101E	LIQUID	1.0	3.83E+00	3.830	% Ct Error
4	DUP	S99T001346		0	@AM24101 AM24101T	LIQUID	100.0	9.59E+01	95.900	% Recovery
5	SAMPLE	S99T001347		0	@AM24101 AM24101	LIQUID	N/A	2.40E-04	3.89e-005	uCi/mL
5	SAMPLE	S99T001347		0	@AM24101 AM24101E	LIQUID	N/A	3.23E+00		% Ct. Error
5	SAMPLE	S99T001347		0	@AM24101 AM24101T	LIQUID	N/A	9.53E+01		% Recovery
6	DUP	S99T001347		0	@AM24101 AM24101	LIQUID	2.40E-4	2.11E-4	12.860	RPD
6	DUP	S99T001347		0	@AM24101 AM24101E	LIQUID	1.0	3.28E+00	3.280	% Ct Error
6	DUP	S99T001347		0	@AM24101 AM24101T	LIQUID	100.0	1.03E+02	103.000	% Recovery
7	SAMPLE	S99T001348		0	@AM24101 AM24101	LIQUID	N/A	3.21E-04	4.01e-005	uCi/mL
7	SAMPLE	S99T001348		0	@AM24101 AM24101E	LIQUID	N/A	2.87E+00		% Ct. Error
7	SAMPLE	S99T001348		0	@AM24101 AM24101T	LIQUID	N/A	1.05E+02		% Recovery
8	DUP	S99T001348		0	@AM24101 AM24101	LIQUID	3.21E-4	3.24E-4	0.930	RPD
8	DUP	S99T001348		0	@AM24101 AM24101E	LIQUID	1.0	2.83E+00	2.830	% Ct Error
8	DUP	S99T001348		0	@AM24101 AM24101T	LIQUID	100.0	1.02E+02	102.000	% Recovery

Final page for worklist# 30663

Analyst Signature Date

Analyst Signature Date

John Relyea 12 Aug 99
Reviewer Signature Date

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

LABCORE Data Entry Template for Worklist# 30663

Analyst: AYL **Instrument:** AM01 #19 **Book#** 96B57

Method: LA-953-104 Rev/Mod B 1

Worklist Comment: S109 FOR @AM24101 RTS

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				@AM24101	LIQUID		
2	BLNK				@AM24101	LIQUID		
3	SAMPLE	S99T001346	0		@AM24101	LIQUID	99000300	S-109 GRAB
	Analytes Requested: AM24101 , AM24101E, AM24101T							
4	DUP	S99T001346	0		@AM24101	LIQUID		
5	SAMPLE	S99T001347	0		@AM24101	LIQUID	99000300	S-109 GRAB
	Analytes Requested: AM24101 , AM24101E, AM24101T							
6	DUP	S99T001347	0		@AM24101	LIQUID		
7	SAMPLE	S99T001348	0		@AM24101	LIQUID	99000300	S-109 GRAB
	Analytes Requested: AM24101 , AM24101E, AM24101T							
8	DUP	S99T001348	0		@AM24101	LIQUID		

Final page for worklist # 30663

Alita Hurson 8/10/99
Signature **Date**

Susan Z Chrome 8/10/99
Signature **Date**

RC Wright 8/12/99

Data Entry Comments:

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

222-S Analytical Laboraratory
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
WL30663-STD
File ID: 2a2032.CNF

Counted on: 8/10/99 @16:36
Detector: AEA2
Geometry number: 1
Count time: 28802. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	1184.4	1184.4	298.033	298.033	14.000	7.914	7.000	2.035
2	1101.6	1101.6	252.188	252.080	14.000	6.299	7.000	1.509

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	0.510	5.479	5.467	0.012	0.04	53.80	1.2	245.3	0.111E-03
	~~Pu238~~		5.487	5.467	0.020				320.3	0.144E-03
2	Am243	0.476	5.266	5.256	0.010	0.03	50.17	1.3	217.2	0.979E-04
Totals:		0.985	<--valid peaks only-->				103.97			

KAJ 8-11-99

DETECTOR CALIBRATION
Energy(MEV) = 4.096 + (0.0046)*Channel
Energy range (MeV): 4.096 TO 6.452
Efficiency = 0.2333 CPM/DPM
(Data reduction compression factor: 1.)

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	50645.0	100.000
Smoothed	50645.0	100.000
Composite fit	49909.1	98.547
Residuals	735.9	1.453

Analyzed by: _____
EMB

Spectrum 2a2032.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 8481.7

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2
2
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1.......................2.
1.............................................2.......
..1.............................................................2.....
....1............2......
.........1.
...............  1
...............................1
.............................................................1....
.............................................................. 1
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Raw Data Dump for AEA Spectrum: 2a2032.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	2.	0.	2.	3.
21	2.	2.	1.	5.	1.	0.	2.	1.	3.	2.
31	1.	0.	2.	1.	0.	3.	2.	4.	1.	2.
41	1.	2.	0.	1.	0.	3.	2.	1.	4.	3.
51	1.	1.	2.	1.	1.	1.	2.	4.	1.	1.
61	0.	0.	2.	1.	2.	1.	0.	2.	0.	1.
71	0.	1.	1.	2.	1.	0.	0.	3.	1.	3.
81	2.	5.	0.	1.	3.	6.	2.	3.	3.	4.
91	1.	1.	3.	2.	2.	6.	3.	2.	2.	1.
101	1.	2.	3.	2.	1.	3.	1.	1.	5.	0.
111	3.	4.	1.	2.	3.	6.	4.	3.	3.	1.
121	8.	2.	2.	0.	5.	2.	1.	4.	2.	3.
131	3.	11.	2.	4.	5.	4.	4.	4.	6.	5.
141	3.	5.	10.	3.	7.	6.	5.	4.	2.	5.
151	7.	4.	5.	5.	8.	4.	9.	8.	5.	10.
161	10.	12.	9.	9.	16.	6.	9.	8.	7.	18.
171	6.	15.	16.	10.	7.	17.	13.	23.	16.	11.
181	18.	20.	11.	10.	10.	13.	26.	20.	14.	16.
191	22.	19.	16.	17.	22.	30.	31.	28.	32.	37.
201	39.	41.	38.	40.	40.	45.	40.	54.	63.	55.
211	63.	66.	59.	65.	73.	87.	85.	89.	107.	108.
221	115.	118.	153.	163.	178.	198.	177.	207.	232.	217.
231	283.	305.	319.	334.	396.	399.	469.	520.	609.	581.
241	671.	706.	821.	803.	954.	902.	1040.	1084.	1043.	1137.
251	1150.	1236.	1225.	1130.	1114.	832.	504.	336.	228.	190.
261	161.	174.	151.	173.	168.	165.	183.	154.	154.	174.
271	174.	176.	177.	204.	221.	221.	247.	293.	307.	321.
281	382.	438.	455.	505.	518.	611.	693.	669.	766.	853.
291	936.	1004.	1059.	1064.	1112.	1110.	1265.	1276.	1235.	1211.
301	991.	824.	548.	388.	261.	217.	204.	159.	124.	99.
311	73.	50.	31.	21.	11.	4.	0.	1.	1.	0.
321	0.	0.	1.	0.	1.	0.	0.	0.	1.	1.
331	1.	0.	0.	2.	1.	1.	0.	1.	0.	0.
341	1.	3.	3.	1.	3.	5.	5.	4.	2.	1.
351	0.	2.	1.	0.	1.	0.	0.	0.	0.	2.
361	2.	1.	3.	0.	1.	2.	1.	2.	0.	0.
371	0.	1.	0.	0.	1.	0.	0.	1.	0.	0.
381	0.	0.	0.	0.	0.	3.	0.	0.	0.	1.
391	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
401	1.	0.	0.	0.	0.	1.	1.	0.	0.	0.
411	0.	0.	0.	0.	0.	2.	0.	0.	0.	0.
421	1.	0.	1.	0.	1.	0.	2.	0.	0.	0.
431	1.	1.	1.	0.	0.	1.	3.	0.	0.	1.
441	1.	0.	0.	1.	0.	0.	1.	0.	0.	0.
451	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	3.	1.	0.	1.
471	0.	0.	0.	0.	2.	2.	3.	1.	4.	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 Laboraratory
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
WL30663-BLK
File ID: 3a3571.CNF

Counted on: 8/10/99 @16:36
Detector: AEA3
Geometry number: 1
Count time: 28802. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	516.5	516.5	253.009	253.009	12.000	7.171	6.000	1.559

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	Am243	1.005	5.266	5.257	0.009	0.03	25.64	1.8	113.9	0.513E-04
Totals:		1.005	<--valid peaks only-->				25.64			

8-11-99

DETECTOR CALIBRATION
Energy(MEV) = 4.093 + (0.0046)*Channel
Energy range (MeV): 4.093 TO 6.448
Efficiency = 0.2273 CPM/DPM
(Data reduction compression factor: 1.)

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	12250.0	100.000
Smoothed	12250.0	100.000
Composite fit	12306.7	100.463
Residuals	-56.7	-0.463

Analyzed by: _____
EMB

Spectrum 3a3571.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 3894.5

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1
1
.1
.. 1
.... 1
.......   1
.............    1
........................... 1
...............................................1....
.......................................................................1..
...........................1
1...
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Raw Data Dump for AEA Spectrum: 3a3571.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.	1.	0.	0.	0.	0.	0.	0.	0.	1.
31	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
41	0.	0.	0.	1.	0.	2.	0.	0.	0.	2.
51	1.	1.	0.	0.	0.	1.	0.	0.	1.	0.
61	0.	0.	2.	2.	0.	0.	0.	1.	1.	0.
71	1.	1.	0.	1.	2.	0.	1.	0.	0.	1.
81	1.	1.	1.	1.	3.	0.	0.	2.	1.	1.
91	2.	1.	0.	1.	1.	0.	0.	0.	1.	0.
101	1.	0.	1.	1.	0.	2.	2.	0.	2.	0.
111	0.	1.	1.	0.	3.	1.	0.	0.	2.	1.
121	1.	1.	2.	3.	1.	2.	1.	1.	0.	1.
131	0.	0.	1.	1.	0.	0.	1.	3.	1.	0.
141	2.	0.	3.	0.	1.	2.	2.	1.	3.	1.
151	6.	1.	2.	0.	2.	1.	3.	2.	4.	1.
161	1.	3.	1.	3.	2.	4.	2.	6.	3.	2.
171	4.	2.	2.	1.	5.	4.	3.	3.	9.	8.
181	8.	11.	5.	4.	8.	9.	8.	10.	12.	4.
191	15.	3.	11.	15.	9.	15.	11.	14.	24.	14.
201	21.	14.	12.	16.	17.	25.	22.	31.	29.	27.
211	35.	36.	34.	35.	34.	41.	32.	40.	44.	68.
221	66.	56.	56.	70.	81.	81.	89.	94.	95.	114.
231	124.	132.	146.	145.	168.	207.	211.	228.	274.	265.
241	304.	309.	367.	385.	376.	392.	452.	461.	533.	491.
251	513.	517.	517.	566.	533.	435.	327.	271.	156.	86.
261	80.	41.	41.	34.	27.	37.	29.	26.	16.	19.
271	7.	6.	4.	3.	1.	1.	1.	1.	1.	2.
281	0.	0.	3.	2.	5.	1.	0.	2.	2.	4.
291	5.	3.	6.	9.	6.	6.	3.	7.	4.	8.
301	2.	3.	2.	3.	3.	2.	1.	0.	1.	0.
311	0.	0.	1.	0.	0.	0.	0.	1.	1.	0.
321	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
331	0.	2.	0.	1.	1.	0.	0.	0.	2.	0.
341	1.	0.	0.	4.	3.	3.	2.	2.	5.	2.
351	2.	0.	1.	1.	2.	2.	2.	0.	0.	0.
361	0.	2.	0.	0.	0.	0.	2.	0.	0.	0.
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.	1.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	1.	0.	1.	0.	0.	0.	1.	0.
421	0.	0.	0.	0.	0.	1.	0.	0.	1.	0.
431	0.	0.	0.	0.	0.	1.	1.	1.	0.	1.
441	1.	0.	0.	0.	0.	0.	1.	0.	0.	0.
451	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.
471	1.	0.	1.	0.	1.	0.	3.	3.	2.	1.
481	1.	1.	1.	1.	1.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

222-S Analytical Laboraratory
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
S99T1346-SAM
File ID: 4a4060.CNF

Counted on: 8/10/99 @16:37
Detector: AEA4
Geometry number: 1
Count time: 28804. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	268.7	268.7	296.677	296.677	14.000	8.443	7.000	2.177
2	560.9	560.9	251.069	251.031	14.000	6.038	7.000	1.501

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	0.323	5.479	5.458	0.021	0.04	12.35	2.5	58.0	0.261E-04
	~~Pu238~~		5.487	5.458	0.029				75.8	0.341E-04
2	Am243	0.648	5.266	5.248	0.018	0.03	24.75	1.8	110.4	0.497E-04
Totals:		0.971	<--valid peaks only-->				37.10			

RM
8-11-99

DETECTOR CALIBRATION
Energy(MEV) = 4.093 + (0.0046)*Channel
Energy range (MeV): 4.093 TO 6.448
Efficiency = 0.2264 CPM/DPM
(Data reduction compression factor: 1.)

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	18346.0	100.000
Smoothed	18346.0	100.000
Composite fit	17810.3	97.080
Residuals	535.7	2.920

Analyzed by: _____
EMB

Spectrum 4a4060.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 3939.9

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Raw Data Dump for AEA Spectrum: 4a4060.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
21	1.	0.	1.	0.	0.	1.	0.	1.	0.	1.
31	0.	0.	0.	0.	1.	0.	1.	1.	0.	1.
41	0.	1.	1.	1.	0.	0.	0.	0.	2.	1.
51	0.	2.	0.	1.	1.	2.	1.	2.	0.	0.
61	0.	1.	1.	0.	1.	1.	1.	1.	2.	0.
71	1.	2.	1.	1.	2.	0.	1.	0.	0.	0.
81	0.	1.	0.	1.	0.	0.	1.	1.	1.	1.
91	0.	0.	1.	2.	0.	2.	0.	0.	1.	0.
101	3.	1.	0.	4.	4.	0.	0.	1.	1.	0.
111	0.	1.	3.	2.	1.	0.	2.	0.	1.	0.
121	0.	2.	1.	2.	3.	3.	1.	2.	2.	0.
131	2.	2.	0.	0.	3.	4.	0.	2.	2.	2.
141	6.	6.	4.	2.	5.	6.	2.	1.	2.	2.
151	4.	3.	5.	5.	5.	4.	1.	6.	3.	3.
161	3.	2.	2.	1.	3.	1.	6.	3.	2.	5.
171	9.	12.	4.	4.	6.	11.	5.	7.	3.	13.
181	8.	8.	5.	9.	15.	10.	18.	12.	6.	13.
191	18.	16.	11.	16.	17.	15.	14.	17.	20.	21.
201	30.	24.	17.	23.	16.	24.	29.	37.	27.	32.
211	21.	39.	43.	31.	34.	44.	41.	53.	45.	63.
221	58.	82.	75.	77.	88.	92.	108.	95.	124.	118.
231	152.	141.	189.	201.	176.	256.	237.	261.	281.	338.
241	319.	390.	409.	467.	448.	532.	528.	518.	527.	587.
251	637.	587.	574.	502.	369.	236.	131.	81.	58.	56.
261	65.	74.	54.	63.	58.	49.	57.	44.	45.	42.
271	42.	50.	56.	61.	57.	65.	70.	71.	89.	75.
281	106.	97.	116.	109.	136.	118.	178.	182.	213.	206.
291	218.	226.	257.	264.	280.	288.	280.	276.	274.	231.
301	167.	125.	92.	58.	43.	54.	29.	22.	18.	17.
311	6.	3.	3.	1.	2.	0.	0.	0.	0.	1.
321	0.	1.	1.	0.	0.	2.	0.	1.	1.	0.
331	1.	0.	0.	2.	2.	3.	0.	1.	2.	2.
341	0.	4.	5.	1.	4.	5.	0.	4.	0.	2.
351	1.	2.	1.	3.	4.	2.	2.	2.	0.	2.
361	2.	4.	0.	1.	3.	2.	3.	2.	2.	2.
371	1.	1.	0.	0.	0.	0.	0.	0.	0.	1.
381	1.	0.	0.	0.	1.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	1.	1.	1.	0.	0.	0.	1.	0.	0.	0.
411	0.	1.	1.	0.	0.	0.	2.	0.	0.	0.
421	1.	0.	1.	0.	0.	3.	2.	2.	1.	0.
431	1.	1.	2.	0.	1.	1.	1.	2.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
451	0.	0.	0.	0.	1.	0.	1.	0.	0.	0.
461	0.	0.	0.	0.	0.	0.	1.	0.	1.	0.
471	1.	0.	1.	1.	2.	1.	1.	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 Laboraratory
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
S99T1346-DUP
File ID: 5a5181.CNF

Counted on: 8/10/99 @16:38
Detector: AEA5
Geometry number: 1
Count time: 28803. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	174.4	174.4	300.751	300.751	14.000	7.579	7.000	1.784
2	360.7	360.7	254.897	254.827	14.000	6.273	7.000	1.585

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~~	0.329	5.487	5.474	0.013	0.03	8.30	3.1	48.1	0.217E-04
	~~Am241~~		5.479	5.474	0.005				36.9	0.166E-04
2	Am243	0.629	5.266	5.263	0.003	0.03	15.85	2.3	66.9	0.301E-04
Totals:		0.958	<--valid peaks only-->				24.15			

DETECTOR CALIBRATION
Energy(MEV) = 4.090 + (0.0046)*Channel
Energy range (MeV): 4.090 TO 6.446
Efficiency = 0.2395 CPM/DPM
(Data reduction compression factor: 1.)

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	12096.0	100.000
Smoothed	12096.0	100.000
Composite fit	11593.7	95.848
Residuals	502.3	4.152

Analyzed by: _____
EMB

Spectrum 5a5181.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 2692.1

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Raw Data Dump for AEA Spectrum: 5a5181.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.	0.	1.	1.	0.	0.
31	1.	0.	0.	0.	1.	1.	1.	1.	0.	1.
41	0.	0.	0.	2.	1.	0.	0.	0.	0.	1.
51	1.	0.	0.	1.	1.	0.	0.	0.	0.	0.
61	0.	1.	1.	0.	0.	0.	0.	2.	1.	0.
71	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
81	0.	0.	0.	0.	2.	0.	0.	0.	0.	0.
91	1.	1.	0.	2.	0.	0.	1.	0.	1.	0.
101	0.	0.	0.	0.	0.	0.	2.	3.	0.	0.
111	2.	0.	1.	0.	0.	0.	1.	0.	0.	0.
121	0.	0.	0.	2.	0.	2.	0.	1.	2.	0.
131	1.	5.	1.	0.	2.	1.	0.	3.	0.	1.
141	0.	2.	3.	1.	1.	1.	1.	2.	1.	3.
151	2.	1.	1.	4.	4.	1.	5.	0.	0.	1.
161	2.	0.	3.	4.	2.	5.	3.	1.	1.	4.
171	5.	1.	2.	5.	7.	5.	3.	4.	3.	10.
181	4.	8.	4.	9.	5.	8.	5.	10.	11.	6.
191	6.	8.	9.	7.	11.	9.	13.	11.	19.	16.
201	7.	16.	16.	11.	10.	19.	11.	22.	24.	25.
211	24.	20.	25.	22.	26.	20.	30.	29.	30.	32.
221	35.	42.	36.	39.	48.	49.	54.	48.	71.	69.
231	75.	67.	72.	95.	95.	108.	122.	131.	123.	122.
241	147.	178.	181.	198.	227.	248.	269.	289.	303.	329.
251	323.	347.	397.	366.	389.	404.	363.	322.	251.	137.
261	79.	52.	42.	52.	38.	36.	39.	38.	32.	33.
271	18.	32.	27.	27.	37.	31.	43.	39.	39.	43.
281	40.	49.	55.	52.	60.	73.	76.	88.	102.	100.
291	123.	114.	150.	150.	158.	160.	148.	163.	164.	193.
301	179.	197.	159.	148.	109.	81.	44.	37.	22.	26.
311	18.	8.	9.	7.	6.	9.	3.	0.	2.	0.
321	0.	1.	0.	0.	0.	0.	1.	2.	0.	1.
331	2.	0.	0.	1.	0.	0.	0.	0.	1.	1.
341	1.	0.	2.	2.	2.	1.	2.	0.	2.	0.
351	2.	1.	3.	1.	0.	1.	0.	2.	1.	3.
361	4.	4.	0.	1.	1.	3.	3.	1.	2.	4.
371	3.	1.	1.	0.	2.	0.	2.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
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.	1.	0.	0.	0.	0.	1.	0.
421	1.	0.	1.	0.	0.	1.	1.	0.	1.	2.
431	2.	1.	2.	0.	0.	1.	1.	1.	0.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
451	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
461	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
471	1.	0.	2.	1.	0.	1.	0.	0.	0.	1.
481	4.	1.	1.	1.	1.	2.	1.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

222-S Analytical Laboraratory
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
S99T1347-SAM
File ID: 6a6481.CNF

Counted on: 8/10/99 @16:38
Detector: AEA6
Geometry number: 1
Count time: 28806. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	196.7	196.7	296.564	296.564	20.000	11.669	10.000	2.307
2	460.3	460.3	250.299	250.181	16.000	9.776	8.000	2.150

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	0.324	5.479	5.461	0.018	0.05	11.31	2.7	54.3	0.245E-04
	~~Pu238~~		5.487	5.461	0.026				70.9	0.319E-04
2	Am243	0.687	5.266	5.248	0.018	0.04	23.97	1.9	109.2	0.492E-04
		---					---			
Totals:		1.011	<--valid peaks only-->				35.28			

RKJ
8-11-99

DETECTOR CALIBRATION
Energy(MEV) = 4.097 + (0.0046)*Channel
Energy range (MeV): 4.097 TO 6.452
Efficiency = 0.2217 CPM/DPM
(Data reduction compression factor: 1.)

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	16755.0	100.000
Smoothed	16755.0	100.000
Composite fit	16938.5	101.095
Residuals	-183.5	-1.095

Analyzed by: _____
EMB

Spectrum 6a6481.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 3425.9

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1................................2....
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Raw Data Dump for AEA Spectrum: 6a6481.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	0.	1.	1.
21	1.	1.	2.	1.	1.	0.	0.	0.	1.	1.
31	0.	1.	3.	1.	0.	0.	0.	2.	1.	0.
41	1.	0.	0.	0.	3.	0.	0.	0.	0.	0.
51	1.	2.	2.	0.	1.	1.	2.	0.	1.	0.
61	1.	0.	3.	0.	0.	1.	1.	1.	2.	1.
71	0.	2.	0.	1.	1.	0.	2.	1.	1.	0.
81	2.	0.	1.	0.	0.	0.	1.	1.	1.	1.
91	0.	0.	0.	2.	1.	1.	1.	1.	1.	1.
101	0.	2.	1.	0.	1.	1.	1.	1.	0.	0.
111	2.	1.	1.	1.	2.	0.	1.	1.	2.	1.
121	4.	1.	2.	2.	2.	1.	3.	3.	1.	3.
131	1.	1.	0.	0.	0.	3.	0.	0.	0.	0.
141	1.	1.	0.	2.	0.	2.	1.	1.	1.	0.
151	2.	4.	2.	1.	3.	0.	1.	0.	1.	3.
161	3.	2.	3.	1.	2.	1.	2.	3.	4.	4.
171	4.	2.	2.	4.	6.	5.	3.	6.	5.	2.
181	9.	2.	12.	4.	6.	2.	4.	7.	4.	8.
191	8.	8.	10.	2.	6.	12.	6.	5.	11.	14.
201	7.	12.	11.	13.	14.	14.	15.	14.	20.	22.
211	27.	27.	39.	27.	33.	43.	39.	53.	60.	46.
221	69.	74.	72.	99.	96.	117.	110.	113.	135.	147.
231	192.	176.	172.	191.	239.	266.	271.	294.	307.	312.
241	329.	360.	397.	412.	436.	430.	476.	479.	484.	486.
251	516.	463.	464.	406.	362.	287.	202.	144.	107.	59.
261	62.	47.	47.	57.	47.	47.	63.	49.	37.	51.
271	41.	39.	42.	57.	44.	55.	64.	65.	84.	82.
281	96.	98.	122.	124.	154.	140.	130.	150.	185.	164.
291	179.	171.	198.	185.	196.	211.	200.	209.	189.	166.
301	137.	126.	103.	90.	53.	38.	25.	28.	17.	21.
311	9.	12.	5.	3.	2.	3.	2.	0.	1.	0.
321	0.	0.	0.	0.	0.	1.	0.	2.	0.	0.
331	0.	1.	1.	1.	1.	2.	0.	1.	0.	0.
341	0.	1.	1.	3.	2.	2.	2.	0.	0.	0.
351	2.	2.	1.	0.	0.	4.	3.	3.	9.	2.
361	4.	3.	1.	0.	1.	2.	1.	2.	8.	3.
371	1.	2.	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.	1.	0.
401	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
411	0.	1.	0.	0.	1.	1.	0.	1.	1.	2.
421	1.	0.	2.	1.	0.	0.	0.	0.	0.	2.
431	2.	0.	0.	0.	2.	2.	0.	1.	1.	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.	1.	0.	0.
471	0.	0.	0.	1.	0.	0.	1.	0.	0.	1.
481	0.	1.	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 Laboraratory
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
S99T1347-DUP
File ID: 7a7511.CNF

Counted on: 8/10/99 @16:45
Detector: AEA7
Geometry number: 1
Count time: 28801. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	212.7	212.7	298.725	298.725	14.000	8.697	7.000	1.996
2	537.7	537.7	253.193	253.150	12.000	5.747	6.000	1.273

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	Am241	0.296	5.479	5.471	0.008	0.04	10.55	2.8	46.8	0.211E-04
	~~Pu238~~		5.487	5.471	0.016				61.1	0.275E-04
2	Am243	0.714	5.266	5.261	0.005	0.03	25.43	1.8	107.2	0.483E-04
Totals:		1.010	<--valid peaks only-->				35.98			

RM
8-11-99

DETECTOR CALIBRATION
Energy(MEV) = 4.097 + (0.0046)*Channel
Energy range (MeV): 4.097 TO 6.452
Efficiency = 0.2397 CPM/DPM
(Data reduction compression factor: 1.)

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	17104.0	100.000
Smoothed	17104.0	100.000
Composite fit	17271.6	100.980
Residuals	-167.6	-0.980

Analyzed by: EMB

Spectrum 7a7511.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 4118.3

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1.............................................2.....
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.1.....................2..
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Raw Data Dump for AEA Spectrum: 7a7511.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.	2.	0.	0.	0.	1.	0.	0.
31	0.	1.	0.	1.	0.	0.	1.	0.	0.	1.
41	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
51	0.	0.	1.	0.	1.	0.	0.	0.	1.	0.
61	1.	0.	1.	0.	0.	0.	0.	0.	0.	1.
71	0.	1.	1.	0.	0.	0.	1.	1.	1.	1.
81	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
91	0.	0.	0.	0.	1.	1.	0.	2.	0.	2.
101	0.	1.	0.	0.	0.	1.	0.	0.	1.	3.
111	0.	0.	1.	3.	0.	2.	0.	1.	0.	0.
121	1.	0.	2.	1.	2.	0.	2.	0.	0.	0.
131	0.	1.	2.	0.	2.	1.	3.	1.	2.	1.
141	0.	1.	1.	1.	0.	3.	1.	0.	5.	5.
151	1.	1.	1.	0.	5.	2.	2.	3.	3.	2.
161	3.	5.	3.	1.	6.	3.	1.	6.	3.	5.
171	3.	4.	1.	7.	4.	3.	6.	3.	5.	5.
181	4.	5.	6.	4.	5.	4.	5.	7.	9.	3.
191	14.	8.	9.	6.	6.	14.	9.	13.	15.	6.
201	12.	15.	11.	14.	18.	22.	23.	20.	21.	32.
211	28.	33.	31.	33.	44.	36.	37.	50.	42.	55.
221	64.	66.	60.	76.	74.	88.	78.	97.	101.	93.
231	151.	142.	154.	159.	183.	197.	205.	225.	227.	280.
241	326.	360.	324.	383.	439.	428.	479.	466.	508.	548.
251	544.	524.	563.	608.	565.	492.	370.	197.	119.	80.
261	75.	55.	59.	58.	62.	52.	48.	49.	41.	36.
271	51.	45.	39.	48.	39.	56.	40.	57.	56.	57.
281	71.	88.	96.	89.	102.	116.	114.	117.	139.	142.
291	166.	174.	207.	170.	205.	197.	226.	220.	223.	223.
301	201.	200.	162.	100.	54.	50.	43.	31.	27.	24.
311	16.	16.	9.	9.	4.	2.	1.	0.	0.	0.
321	1.	0.	0.	0.	0.	0.	0.	0.	0.	1.
331	0.	1.	0.	0.	0.	1.	0.	0.	2.	0.
341	1.	0.	1.	1.	0.	0.	1.	4.	0.	1.
351	2.	3.	1.	3.	5.	1.	2.	2.	5.	3.
361	0.	3.	6.	1.	6.	1.	1.	0.	4.	3.
371	2.	1.	0.	0.	0.	0.	0.	0.	1.	0.
381	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
391	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	1.	0.	0.	0.	1.	0.	0.	0.	0.
421	0.	1.	0.	1.	1.	0.	1.	1.	2.	0.
431	1.	0.	0.	1.	0.	3.	0.	0.	0.	1.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	1.	1.	0.	0.	0.	0.	0.	0.
471	0.	2.	0.	0.	2.	0.	1.	0.	0.	0.
481	0.	1.	2.	0.	1.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

222-S Analytical Laboraratory
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
S99T1348-SAM
File ID: 8a8495.CNF

Counted on: 8/10/99 @16:46
Detector: AEA8
Geometry number: 1
Count time: 28801. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	314.6	314.6	298.571	298.571	14.000	8.708	7.000	1.944
2	510.4	510.4	252.927	252.818	12.000	5.980	6.000	1.256

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	0.400	5.479	5.467	0.012	0.04	15.88	2.2	76.7	0.345E-04
	~~Pu238~~		5.487	5.467	0.020				100.1	0.451E-04
2	Am243	0.634	5.266	5.257	0.009	0.03	25.21	1.8	115.6	0.521E-04
Totals:		1.034	<--valid peaks only-->				41.10			

RH 8-11-99

DETECTOR CALIBRATION
Energy(MEV) = 4.094 + (0.0046)*Channel
Energy range (MeV): 4.094 TO 6.449
Efficiency = 0.2204 CPM/DPM
(Data reduction compression factor: 1.)

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	19083.0	100.000
Smoothed	19083.0	100.000
Composite fit	19728.2	103.381
Residuals	-645.2	-3.381

Analyzed by: _____
EMB

Spectrum 8a8495.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 3999.9

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Raw Data Dump for AEA Spectrum: 8a8495.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	1.	0.	1.
21	1.	0.	0.	0.	0.	0.	0.	1.	1.	0.
31	0.	0.	0.	0.	0.	0.	0.	0.	0.	2.
41	1.	0.	0.	0.	0.	0.	0.	1.	0.	0.
51	0.	0.	0.	1.	1.	0.	0.	0.	0.	0.
61	0.	0.	1.	1.	1.	1.	0.	0.	0.	0.
71	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
81	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
91	0.	0.	0.	0.	0.	0.	1.	0.	1.	0.
101	2.	1.	1.	0.	0.	0.	0.	0.	1.	0.
111	0.	0.	0.	0.	0.	0.	0.	2.	0.	0.
121	0.	0.	0.	0.	0.	1.	1.	0.	0.	1.
131	1.	0.	1.	2.	0.	0.	2.	0.	0.	0.
141	0.	1.	0.	0.	0.	0.	0.	0.	0.	1.
151	0.	2.	1.	0.	0.	2.	0.	1.	0.	1.
161	0.	0.	2.	2.	0.	2.	2.	4.	1.	2.
171	2.	1.	4.	4.	0.	0.	3.	2.	2.	4.
181	2.	1.	2.	0.	5.	2.	6.	3.	4.	4.
191	5.	7.	4.	8.	7.	5.	8.	7.	3.	6.
201	13.	10.	12.	20.	11.	10.	16.	9.	23.	17.
211	21.	24.	29.	32.	39.	17.	38.	40.	35.	54.
221	47.	61.	63.	59.	89.	75.	86.	86.	97.	107.
231	123.	145.	154.	191.	202.	210.	220.	251.	261.	302.
241	307.	347.	368.	410.	435.	449.	460.	493.	499.	480.
251	521.	563.	556.	550.	545.	478.	340.	197.	106.	73.
261	76.	58.	70.	53.	61.	61.	46.	50.	56.	56.
271	49.	52.	48.	69.	82.	74.	81.	87.	82.	100.
281	111.	130.	138.	127.	155.	178.	168.	214.	215.	213.
291	247.	302.	265.	323.	303.	296.	320.	302.	349.	302.
301	311.	284.	203.	155.	109.	55.	56.	41.	36.	35.
311	16.	24.	10.	9.	1.	5.	0.	0.	0.	1.
321	0.	0.	0.	1.	0.	0.	0.	1.	0.	0.
331	0.	0.	0.	0.	0.	1.	1.	1.	0.	2.
341	2.	2.	0.	2.	0.	0.	2.	2.	2.	4.
351	0.	1.	5.	2.	4.	2.	3.	2.	3.	4.
361	3.	3.	4.	3.	1.	6.	0.	9.	2.	2.
371	0.	4.	1.	0.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	2.
391	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	1.	0.	0.	0.	1.	1.	0.	1.	0.	0.
421	0.	0.	0.	1.	0.	2.	0.	0.	2.	1.
431	2.	0.	2.	0.	0.	2.	4.	0.	1.	0.
441	0.	0.	0.	0.	0.	0.	1.	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.	1.	1.	1.
481	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
491	2.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

222-S Analytical Laboraratory
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
S99T1348-DUP
File ID: 9a9388.CNF

Counted on: 8/10/99 @16:47
Detector: AEA9
Geometry number: 1
Count time: 28802. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	342.7	342.7	298.924	298.924	14.000	8.515	7.000	2.062
2	557.2	557.2	252.980	252.866	12.000	6.355	6.000	1.497

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	0.393	5.479	5.470	0.009	0.04	16.38	2.2	83.9	0.378E-04
	~~Pu238~~		5.487	5.470	0.017				109.6	0.494E-04
2	Am243	0.617	5.266	5.258	0.008	0.03	25.69	1.8	125.0	0.563E-04
Totals:		1.011	<--valid peaks only-->				42.07			

KM
8-11-99

DETECTOR CALIBRATION
Energy(MEV) = 4.095 + (0.0046)*Channel
Energy range (MeV): 4.095 TO 6.450
Efficiency = 0.2076 CPM/DPM
(Data reduction compression factor: 1.)

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	19984.0	100.000
Smoothed	19984.0	100.000
Composite fit	20196.7	101.064
Residuals	-212.7	-1.065

Analyzed by: _____
EMB

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                    Spectrum 9a9388.CNF
1 Legend:  Raw = ....  Modeled Peaks = 1,2,.., etc     Display Max.:     4357.4

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Raw Data Dump for AEA Spectrum: 9a9388.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.	1.	0.	0.	0.	0.	0.	2.	1.
31	0.	2.	1.	0.	1.	0.	0.	0.	1.	0.
41	0.	0.	0.	0.	0.	0.	0.	0.	2.	0.
51	0.	0.	1.	0.	1.	0.	0.	0.	0.	0.
61	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.
71	0.	0.	0.	1.	0.	0.	1.	0.	0.	0.
81	0.	0.	1.	1.	0.	0.	0.	0.	0.	0.
91	0.	0.	0.	0.	0.	0.	0.	1.	0.	1.
101	1.	0.	0.	0.	0.	0.	0.	0.	1.	0.
111	0.	0.	2.	0.	2.	0.	0.	0.	0.	0.
121	0.	1.	0.	0.	1.	0.	1.	0.	1.	0.
131	0.	0.	0.	0.	0.	0.	0.	1.	1.	2.
141	0.	1.	2.	0.	0.	1.	0.	2.	2.	2.
151	0.	0.	2.	1.	2.	0.	1.	2.	0.	0.
161	1.	0.	1.	0.	2.	3.	0.	3.	1.	6.
171	2.	1.	5.	1.	5.	2.	8.	3.	3.	5.
181	3.	4.	3.	2.	8.	2.	9.	5.	8.	5.
191	6.	3.	10.	7.	6.	5.	14.	7.	9.	12.
201	12.	13.	12.	15.	8.	16.	21.	20.	19.	25.
211	23.	17.	17.	24.	25.	29.	42.	38.	41.	34.
221	42.	71.	49.	53.	78.	84.	78.	104.	100.	132.
231	117.	149.	148.	162.	189.	184.	250.	225.	278.	276.
241	294.	307.	378.	403.	419.	459.	492.	519.	551.	577.
251	561.	621.	570.	613.	596.	516.	377.	232.	139.	77.
261	77.	74.	78.	57.	59.	66.	61.	55.	46.	63.
271	47.	48.	48.	46.	58.	64.	79.	74.	101.	103.
281	112.	118.	120.	144.	167.	189.	163.	195.	219.	217.
291	267.	298.	287.	309.	320.	323.	364.	347.	360.	353.
301	350.	313.	243.	203.	100.	83.	51.	56.	42.	37.
311	23.	28.	19.	10.	6.	4.	0.	0.	0.	0.
321	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
331	0.	0.	0.	1.	0.	0.	0.	1.	1.	0.
341	2.	1.	0.	1.	1.	2.	3.	1.	1.	3.
351	1.	2.	3.	0.	2.	3.	3.	2.	2.	4.
361	1.	6.	1.	0.	6.	1.	3.	3.	4.	2.
371	1.	2.	0.	0.	0.	0.	0.	0.	0.	1.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	1.	0.	1.	1.	0.	0.	0.	0.	1.	1.
431	1.	1.	0.	2.	2.	0.	0.	0.	0.	1.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
461	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
471	0.	1.	0.	0.	0.	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.								

WORKBOOK PAGE: STD1

Am 241 and Cm 243/244: LA-953-103 (VOID) or LA-953-104(B-0)) LAD 9/21/99 LIQUID

						STD
STD	Date Counted		AUG-10-99	Am 241 AEA Frac.	(C241)	0.51
	Sample Volume in mL	(SS)	1.000	Am 243 AEA Frac.	(C243)	0.476
30663	Sample D.F.	(DF)	1	Cm 243/244 AEA Frac.	(Cm)	0
	Tracer Volume in mL	(SPKV)	0.200	Total AT Counts		4545
@AM24101	Digest D.F.	(DDF)	1.000	AT Count Time (min)	(TC)	30
	Tracer Book No.		10B59	Background in cpm	(Bkg)	0.27
LIQUID	Am-243 Tracer Value	(dpm/mL)	1130	Am 241 cpm		53.8
	Detector Number		19	Am 243 cpm		50.17
99003039	Detector Efficiency	(DetEff)	0.3379	Cm 243/244 cpm		0
	Standard Book No		46B57	AEA Count Time	(min)	480
0	Standard Value in µCi/mL		1.070E-04	Am 241 µCi/L =		1.0907E-01
				Cm 243/244 µCi/L =	<	1.1344E-02

N/A

Am-241 µCi/L = (C241 * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))

WL30663

Cm-243/244 µCi/L = (Cm * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))

WC16100

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

SZC

JFR

Am 241 µCi/mL	=	1.09E-04	DETECTION LEVELS in µCi/mL
Relative Counting Error	=	1.8%	
NOTE: Cm-243/244 Result is a LESS THAN Value.			Am 241
Cm 243/244 µCi/mL		< 1.13E-05	1.13E-05
Relative Counting Error	=	100.0%	Cm 243/244
Am 243 Tracer Recovery	=	94.3%	1.13E-05

AKL

08/11/99

08/10/99

09:30 AM

S-109 GRAB

Analyst:		AKL	Date:	08/11/99
Signature of Chemist:	John Rolya	JFR	Date:	12 Aug 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)! LA-Pg 104 LIQUID / SO

	Date Counted		AUG-10-99	Am 241 AEA Frac.	(C241)	BLNK	0
BLNK	Sample Volume in mL	(SS)	0.100	Am 243 AEA Frac.	(C243)		1.005
	Sample D.F.	(DF)	1	Cm 243/244 AEA Frac.	(Cm)		0
30663	Tracer Volume in mL	(SPKV)	0.100	Total AT Counts			1161
	Digest D.F.	(DDF)	1.000	AT Count Time (min)	(TC)		30
@AM24101	Tracer Book No.		10B59	Background in cpm	(Bkg)		0.27
	Am-243 Tracer Value	(dpm/mL)	1130	Am 241 cpm			0
LIQUID	Detector Number		19	Am 243 cpm			25.64
	Detector Efficiency	(DetEff)	0.3379	Cm 243/244 cpm			0
99003039				AEA Count Time	(min)		480
				Am 241 µCi/L =	<		2.5324E-02
0				Cm 243/244 µCi/L =	<		2.5324E-02
N/A							

Am-241 µCi/L = (C241 * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))

WL30663 Cm-243/244 µCi/L = (Cm * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))

WC16100 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

SZC

NOTE: Am-241 Result is a LESS THAN Value.

JFR	Am 241 µCi/mL =	< 2.53E-05	DETECTION LEVELS in µCi/mL
	Relative Counting Error =	100.0%	
AKL			
	NOTE: Cm-243/244 Result is a LESS THAN Value.		Am 241
08/11/99	Cm 243/244 µCi/mL	< 2.53E-05	2.53E-05
	Relative Counting Error =	100.0%	Cm 243/244
08/10/99	Am 243 Tracer Recovery =	101.2%	2.53E-05
09:30 AM			
S-109 GRAB			

Analyst:		AKL	Date:	08/11/99
Signature of Chemist:	John Rolyea	JFR	Date:	12 Aug 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-0)) LIQUID / SO

	Date Counted		AUG-10-99	Am 241 AEA Frac.	(C241)		0.323
SAMPLE	Sample Volume in mL	(SS)	0.100	Am 243 AEA Frac.	(C243)		0.648
	Sample D.F.	(DF)	1	Cm 243/244 AEA Frac.	(Cm)		0
30663	Tracer Volume in mL	(SPKV)	0.100	Total AT Counts			1789
	Digest D.F.	(DDF)	1.000	AT Count Time (min)	(TC)		30
@AM24101	Tracer Book No.		10B59	Background in cpm	(Bkg)		0.27
	Am-243 Tracer Value	(dpm/mL)	1130	Am 241 cpm			12.35
LIQUID	Detector Number		19	Am 243 cpm			24.75
	Detector Efficiency	(DetEff)	0.3379	Cm 243/244 cpm			0
99003039				AEA Count Time	(min)		480
				Am 241 µCi/L =			2.5372E-01
0				Cm 243/244 µCi/L =		<	3.9275E-02

SAMPLE

N/A

Am-241 µCi/L = (C241 * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))

S99T001346

Cm-243/244 µCi/L = (Cm * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))

WC18100

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

SZC

JFR

Am 241 µCi/mL	=	2.54E-04	DETECTION LEVELS in µCi/mL
Relative Counting Error	=	3.1%	
NOTE: Cm-243/244 Result is a LESS THAN Value.			Am 241 3.93E-05
Cm 243/244 µCi/mL		< 3.93E-05	
Relative Counting Error	=	100.0%	Cm 243/244 3.93E-05
Am 243 Tracer Recovery	=	100.7%	

AKL

08/11/99

08/10/99

09:30 AM

S-109 GRAB

Analyst:		AKL	Date:	08/11/99
Signature of Chemist:	John Relyea	JFR	Date:	12 Aug 99

SAMPLE.WB1 REV 1.2 953103ML

30-Dec-1899

Am 241 and Cm 243/244: LA-953-103 (VOID) or LA-953-104(B-0)) LIQUID / SO

	Date Counted		AUG-10-99	Am 241 AEA Frac.	(C241)	0.329
DUP	Sample Volume in mL	(SS)	0.100	Am 243 AEA Frac.	(C243)	0.629
	Sample D.F.	(DF)	1	Cm 243/244 AEA Frac.	(Cm)	0
30663	Tracer Volume in mL	(SPKV)	0.100	Total AT Counts		1754
	Digest D.F.	(DDF)	1.000	AT Count Time (min)	(TC)	30
@AM24101	Tracer Book No.		10B59	Background in cpm	(Bkg)	0.27
	Am-243 Tracer Value	(dpm/mL)	1130	Am 241 cpm		8.3
LIQUID	Detector Number		19	Am 243 cpm		15.85
	Detector Efficiency	(DetEff)	0.3379	Cm 243/244 cpm		0
99003039				AEA Count Time	(min)	480
				Am 241 µCi/L =		2.6624E-01
0				Cm 243/244 µCi/L =	<	4.2205E-02

N/A

Am-241 µCi/L = (C241 * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))

S99T001346

Cm-243/244 µCi/L = (Cm * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))

WC16100

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

SZC

JFR

Am 241 µCi/mL	=	2.66E-04	DETECTION LEVELS in µCi/mL
Relative Counting Error	=	3.8%	
NOTE: Cm-243/244 Result is a LESS THAN Value.			Am 241
Cm 243/244 µCi/mL		< 4.22E-05	4.22E-05
Relative Counting Error	=	100.0%	Cm 243/244
Am 243 Tracer Recovery	=	95.9%	4.22E-05

AKL

08/11/99

08/10/99

09:30 AM

S-102 GRAB

Analyst:		AKL	Date:	08/11/99
Signature of Chemist:	John Relyea	JFR	Date:	12 Aug 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)) LAD 8/24/99 LIQUID / SO

	Date Counted		AUG-10-99	Am 241 AEA Frac.	(C241)	SAMPLE	0.324
SAMPLE	Sample Volume in mL	(SS)	0.100	Am 243 AEA Frac.	(C243)		0.687
	Sample D.F.	(DF)	1	Cm 243/244 AEA Frac.	(Cm)		0
30663	Tracer Volume in mL	(SPKV)	0.100	Total AT Counts			1597
	Digest D.F.	(DDF)	1.000	AT Count Time (min)	(TC)		30
@AM24101	Tracer Book No.		10B59	Background in cpm	(Bkg)		0.27
	Am-243 Tracer Value	(dpm/mL)	1130	Am 241 cpm			11.31
LIQUID	Detector Number		19	Am 243 cpm			23.97
	Detector Efficiency	(DetEff)	0.3379	Cm 243/244 cpm			0
99003039				AEA Count Time	(min)		480
				Am 241 µCi/L =			2.4006E-01
0				Cm 243/244 µCi/L =		<	3.8875E-02
N/A							

Am-241 µCi/L = (C241 * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))

S99T001347

Cm-243/244 µCi/L = (Cm * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))

WC16100

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

SZC

JFR

Am 241 µCi/mL	=	2.40E-04	DETECTION LEVELS in µCi/mL
Relative Counting Error	=	3.2%	
NOTE: Cm-243/244 Result is a LESS THAN Value.			Am 241
Cm 243/244 µCi/mL		< 3.89E-05	3.89E-05
Relative Counting Error	=	100.0%	Cm 243/244
Am 243 Tracer Recovery	=	95.3%	3.89E-05

AKL

08/11/99

08/10/99

09:30 AM

S-109 GRAB

Analyst:		AKL	Date:	08/11/99
Signature of Chemist:	John Relyea	JFR	Date:	12 Aug 99

SAMPLE.WB1 REV 1.2 953103ML

WORKBOOK PAGE: DUP6

Am 241 and Cm 243/244: LA-953-103 (VOID) or LA-953-104(B-0)) LIQUID / SO

							DUP
	Date Counted		AUG-10-99	Am 241 AEA Frac.	(C241)	0.296
DUP	Sample Volume in mL	(SS)	0.100	Am 243 AEA Frac.	(C243)	0.714
	Sample D.F.	(DF)	1	Cm 243/244 AEA Frac.	(Cm)	0
30663	Tracer Volume in mL	(SPKV)	0.100	Total AT Counts		1658
	Digest D.F.	(DDF)	1.000	AT Count Time (min)	(TC)	30
@AM24101	Tracer Book No.		10B59	Background in cpm	(Bkg)	0.27
	Am-243 Tracer Value	(dpm/mL)	1130	Am 241 cpm		10.55
LIQUID	Detector Number		19	Am 243 cpm		25.43
	Detector Efficiency	(DetEff)	0.3379	Cm 243/244 cpm		0
99003039				AEA Count Time	(min)	480
				Am 241 µCi/L =		2.1102E-01
0				Cm 243/244 µCi/L =	<	3.5645E-02
N/A						

Am-241 µCi/L = (C241 * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))

S99T001347

Cm-243/244 µCi/L = (Cm * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))

WC16100

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

SZC

JFR

Am 241 µCi/mL	=	2.11E-04	DETECTION LEVELS in µCi/mL
Relative Counting Error	=	3.3%	
NOTE: Cm-243/244 Result is a LESS THAN Value.			Am 241
Cm 243/244 µCi/mL		< 3.56E-05	3.56E-05
Relative Counting Error	=	100.0%	Cm 243/244
Am 243 Tracer Recovery	=	102.8%	3.56E-05

AKL

08/11/99

08/10/99

09:30 AM

S-109 GRAB

Analyst:		AKL	Date:	08/11/99
Signature of Chemist:	John Relyea	JFR	Date:	12 Aug 99

SAMPLE.WB1 REV 1.2 953103ML

WORKBOOK PAGE: SAM7

Am 241 and Cm 243/244: LA-953-103 (VOID) or LA-953-104(B-0)) LIQUID / SO

	Date Counted		AUG-10-99	Am 241 AEA Frac.	(C241)	SAMPLE	0.4
SAMPLE	Sample Volume in mL	(SS)	0.100	Am 243 AEA Frac.	(C243)		0.634
	Sample D.F.	(DF)	1	Cm 243/244 AEA Frac.	(Cm)		0
30663	Tracer Volume in mL	(SPKV)	0.100	Total AT Counts			1897
	Digest D.F.	(DDF)	1.000	AT Count Time (min)	(TC)		30
@AM24101	Tracer Book No.		10B59	Background in cpm	(Bkg)		0.27
	Am-243 Tracer Value	(dpm/mL)	1130	Am 241 cpm			15.88
LIQUID	Detector Number		19	Am 243 cpm			25.21
	Detector Efficiency	(DetEff)	0.3379	Cm 243/244 cpm			0
99003039				AEA Count Time	(min)		480
				Am 241 µCi/L =			3.2114E-01
0				Cm 243/244 µCi/L =		<	4.0143E-02

N/A

Am-241 µCi/L = (C241 * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))

S99T001348

Cm-243/244 µCi/L = (Cm * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))

WC16100

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

SZC

JFR

Am 241 µCi/mL	=	3.21E-04
Relative Counting Error	=	2.9%

AKL

NOTE: Cm-243/244 Result is a LESS THAN Value.

08/11/99

Cm 243/244 µCi/mL		< 4.01E-05
Relative Counting Error	=	100.0%
Am 243 Tracer Recovery	=	104.5%

08/10/99

09:30 AM

S-109 GRAB

DETECTION LEVELS in µCi/mL	
Am 241	4.01E-05
Cm 243/244	4.01E-05

Analyst:		AKL	Date:	08/11/99
Signature of Chemist:	John Relyea	JFR	Date:	12 Aug 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		AUG-10-99	Am 241 AEA Frac.	(C241)	0.393
DUP	Sample Volume in mL	(SS)	0.100	Am 243 AEA Frac.	(C243)	0.617
	Sample D.F.	(DF)	1	Cm 243/244 AEA Frac.	(Cm)	0
30663	Tracer Volume in mL	(SPKV)	0.100	Total AT Counts		1905
	Digest D.F.	(DDF)	1.000	AT Count Time (min)	(TC)	30
@AM24101	Tracer Book No.		10B59	Background in cpm	(Bkg)	0.27
	Am-243 Tracer Value	(dpm/mL)	1130	Am 241 cpm		16.38
LIQUID	Detector Number		19	Am 243 cpm		25.69
	Detector Efficiency	(DetEff)	0.3379	Cm 243/244 cpm		0
99003039				AEA Count Time	(min)	480
				Am 241 µCi/L =		3.2421E-01
0				Cm 243/244 µCi/L =	<	4.1249E-02
N/A						

Am-241 µCi/L = (C241 * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))

S99T001348 Cm-243/244 µCi/L = (Cm * Am-243 Tracer Value * SPKV * DF * DDF * (1000mL/L)) / (C243 * SS * (2220000dpm/µCi))

WC16100 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

SZC

JFR

Am 241 µCi/mL	=	3.24E-04	DETECTION LEVELS in µCi/mL
Relative Counting Error	=	2.8%	
NOTE: Cm-243/244 Result is a LESS THAN Value.			Am 241
Cm 243/244 µCi/mL		< 4.12E-05	4.12E-05
Relative Counting Error	=	100.0%	Cm 243/244
Am 243 Tracer Recovery	=	102.2%	4.12E-05

AKL

08/11/99

08/10/99

09:30 AM

S-109 GRAB

Analyst:		AKL	Date:	08/11/99
Signature of Chemist:	John Relyea	JFR	Date:	12 Aug 99

SAMPLE.WB1 REV 1.2 953103ML

LABCORE Completed Worklist Report for Worklist# 30666

Analyst: akl **Instrument:** AB20 **Book#:** _____

Method: LA-953-104 Rev/Mod _____

Worklist Comment: S109 FOR @PU23901 RTS

Seq	Type	Sample#	R	A	Test	Matrix	Actual		Found	DL or Yield	Unit
1	STD		0		@PU23901 PU23901	LIQUID	1.26E-04		1.30E-4	103.175	% Recovery
1	STD		0		@PU23901 PU23901T	LIQUID	100		9.04E+01	90.400	% Recovery
1	STD		0		@PU23901 PU23901E	LIQUID	1.00		1.76E+00	1.760	% Ct Error
2	BLNK		0		@PU23901 PU23901	LIQUID	1		<3.71E-5		uCi/mL
2	BLNK		0		@PU23901 PU23901T	LIQUID	100		8.75E+01	87.500	% Recovery
2	BLNK		0		@PU23901 PU23901E	LIQUID	1.00		1.00E+02	100.000	uCi/mL
3	SAMPLE	S99T001346	0		@PU23901 PU23901	LIQUID	N/A	<	3.34E-05	3.34e-005	uCi/mL
3	SAMPLE	S99T001346	0		@PU23901 PU23901T	LIQUID	N/A		9.63E+01		% Recovery
3	SAMPLE	S99T001346	0		@PU23901 PU23901E	LIQUID	N/A		8.05E+00		% Ct. Error
4	DUP	S99T001346	0		@PU23901 PU23901	LIQUID	<3.34E-5		<3.56E-5		RPD
4	DUP	S99T001346	0		@PU23901 PU23901T	LIQUID	100		9.12E+01	91.200	% Recovery
4	DUP	S99T001346	0		@PU23901 PU23901E	LIQUID	1.00		7.73E+00	7.730	% Ct Error
5	SAMPLE	S99T001347	0		@PU23901 PU23901	LIQUID	N/A	<	3.56E-05	3.56e-005	uCi/mL
5	SAMPLE	S99T001347	0		@PU23901 PU23901T	LIQUID	N/A		9.07E+01		% Recovery
5	SAMPLE	S99T001347	0		@PU23901 PU23901E	LIQUID	N/A		7.57E+00		% Ct. Error
6	DUP	S99T001347	0		@PU23901 PU23901	LIQUID	<3.56E-5		<3.68E-5		RPD
6	DUP	S99T001347	0		@PU23901 PU23901T	LIQUID	100		8.76E+01	87.600	% Recovery
6	DUP	S99T001347	0		@PU23901 PU23901E	LIQUID	1.00		8.11E+00	8.110	% Ct Error
7	SAMPLE	S99T001348	0		@PU23901 PU23901	LIQUID	N/A		9.06E-05	3.80e-005	uCi/mL
7	SAMPLE	S99T001348	0		@PU23901 PU23901T	LIQUID	N/A		9.06E+01		% Recovery
7	SAMPLE	S99T001348	0		@PU23901 PU23901E	LIQUID	N/A		4.51E+00		% Ct. Error
8	DUP	S99T001348	0		@PU23901 PU23901	LIQUID	9.06E-5		8.97E-5	0.998	RPD
8	DUP	S99T001348	0		@PU23901 PU23901T	LIQUID	100		9.30E+01	93.000	% Recovery
8	DUP	S99T001348	0		@PU23901 PU23901E	LIQUID	1.00		4.53E+00	4.530	% Ct Error

Final page for worklist# 30666

Analyst Signature Date

Analyst Signature Date

John Relyea 12 Aug 99
Reviewer Signature Date

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

LABCORE Data Entry Template for Worklist# 30666

Analyst: AKL **Instrument:** PU01 20 **Book#** 46B57

Method: LA-953-104 Rev/Mod B-1

Worklist Comment: S109 FOR @PU23901 RTS

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				@PU23901	LIQUID		
2	BLNK				@PU23901	LIQUID		
3	SAMPLE	S99T001346	0		@PU23901	LIQUID	99000300	S-109 GRAB
	Analytes Requested: PU23901 , PU23901E, PU23901T							
4	DUP	S99T001346	0		@PU23901	LIQUID		
5	SAMPLE	S99T001347	0		@PU23901	LIQUID	99000300	S-109 GRAB
	Analytes Requested: PU23901 , PU23901E, PU23901T							
6	DUP	S99T001347	0		@PU23901	LIQUID		
7	SAMPLE	S99T001348	0		@PU23901	LIQUID	99000300	S-109 GRAB
	Analytes Requested: PU23901 , PU23901E, PU23901T							
8	DUP	S99T001348	0		@PU23901	LIQUID		

Final page for worklist # 30666

Signature Date 8/10/99 Signature Date 8/11/99

Data Entry Comments:

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

222-S Analytical Laboraratory
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
WL30666-STD
File ID: 10a1033.CNF

Counted on: 8/10/99 @16:50
Detector: AEA10
Geometry number: 1
Count time: 28804. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1?	10.9	10.9	473.252	473.252	14.000	4.559	7.000	3.255
2	1523.6	1523.6	359.068	359.068	10.000	3.271	5.000	1.288
3?	39.5	39.5	300.837	300.562	30.000	5.446	15.000	14.996
4	119.4	119.4	284.536	284.521	10.000	3.564	5.000	2.166
5?	31.2	31.2	267.618	266.998	12.000	3.248	6.000	1.140
6	2419.2	2419.2	226.027	226.027	10.000	3.348	5.000	1.817

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		????		6.274			0.27	17.4		
2	Pu236	0.394	5.755	5.749	0.006	0.02	44.92	1.3	216.2	0.974E-04
3		????		5.480			0.92	10.7		
4	Th228	0.025	5.400	5.406	-.006	0.02	2.86	5.5	19.0	0.857E-05
5		????		5.325			0.99	11.6		
6	Pu239	0.527	5.147	5.137	0.010	0.02	60.12	1.2	283.6	0.128E-03
	Pu240		5.144	5.137	0.007				283.6	0.128E-03
		---					---			
Totals:		0.946	<--valid peaks only-->				107.91			

MA
8-11-99

DETECTOR CALIBRATION
Energy(MEV) = 4.097 + (0.0046)*Channel
Energy range (MeV): 4.097 TO 6.452
Efficiency = 0.2120 CPM/DPM
(Data reduction compression factor: 1.)

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	54733.0	100.000
Smoothed	54732.9	100.000
Composite fit	52844.0	96.549
Residuals	1889.0	3.451

Spectrum 10a1033.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 13345.5

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Raw Data Dump for AEA Spectrum: 10a1033.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	1.	0.	0.	2.	0.
21	0.	1.	0.	0.	1.	0.	0.	1.	1.	0.
31	0.	2.	0.	0.	0.	2.	1.	1.	0.	1.
41	2.	1.	3.	1.	0.	0.	1.	3.	0.	0.
51	4.	2.	0.	1.	1.	1.	0.	0.	2.	0.
61	0.	0.	1.	0.	0.	1.	2.	2.	0.	2.
71	0.	0.	1.	2.	2.	0.	1.	0.	2.	2.
81	2.	2.	0.	2.	2.	2.	2.	1.	1.	0.
91	0.	1.	2.	3.	1.	3.	2.	3.	1.	1.
101	1.	0.	3.	2.	0.	1.	1.	3.	2.	2.
111	1.	1.	2.	4.	1.	2.	5.	5.	2.	1.
121	1.	2.	4.	5.	2.	2.	2.	2.	5.	2.
131	2.	2.	4.	4.	4.	0.	5.	2.	3.	1.
141	0.	4.	5.	3.	9.	5.	6.	6.	2.	6.
151	3.	6.	2.	1.	8.	4.	6.	10.	6.	7.
161	6.	10.	3.	4.	9.	6.	9.	6.	9.	14.
171	11.	17.	18.	21.	18.	28.	22.	28.	22.	28.
181	31.	28.	44.	34.	40.	35.	43.	50.	53.	53.
191	55.	59.	55.	71.	74.	84.	87.	99.	103.	96.
201	133.	114.	170.	166.	174.	176.	187.	250.	256.	277.
211	368.	410.	479.	586.	641.	700.	822.	838.	953.	1034.
221	1220.	1574.	1886.	2319.	2723.	2916.	2790.	2337.	1485.	777.
231	292.	84.	33.	10.	8.	3.	5.	7.	5.	2.
241	4.	5.	3.	10.	6.	7.	5.	6.	12.	5.
251	13.	12.	11.	7.	13.	10.	8.	10.	18.	16.
261	21.	23.	25.	40.	31.	40.	47.	42.	44.	28.
271	34.	18.	26.	30.	29.	32.	35.	47.	63.	52.
281	78.	99.	139.	141.	151.	116.	107.	62.	28.	15.
291	8.	12.	16.	18.	15.	24.	25.	29.	21.	27.
301	34.	33.	28.	12.	11.	12.	12.	11.	18.	17.
311	20.	18.	17.	17.	19.	14.	20.	27.	32.	30.
321	19.	35.	30.	27.	52.	41.	51.	53.	71.	56.
331	64.	71.	87.	107.	98.	115.	115.	140.	130.	173.
341	204.	238.	241.	308.	376.	452.	552.	636.	807.	794.
351	826.	777.	807.	822.	963.	1100.	1342.	1652.	1880.	1729.
361	1473.	950.	483.	182.	53.	7.	4.	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.	1.	0.	0.	0.	1.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
411	0.	0.	2.	0.	0.	0.	0.	1.	0.	2.
421	0.	1.	0.	1.	0.	0.	4.	2.	0.	0.
431	0.	0.	1.	0.	0.	0.	0.	0.	1.	0.
441	1.	1.	0.	0.	0.	0.	0.	0.	0.	0.
451	4.	0.	0.	0.	1.	2.	1.	0.	0.	0.
461	2.	2.	1.	2.	4.	1.	5.	11.	7.	9.
471	9.	6.	15.	15.	6.	7.	7.	3.	6.	0.
481	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
511	0.	0.								

222-S Analytical Laboraratory
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
WL30666-BLK
File ID: 11a1196.CNF

Counted on: 8/10/99 @16:50
Detector: AEA11
Geometry number: 1
Count time: 28802. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1?	13.7	13.7	474.690	474.690	12.000	3.336	6.000	2.800
2	1569.8	1569.8	361.028	361.028	10.000	2.982	5.000	1.268
3	33.0	33.0	303.210	302.968	12.000	1.059	6.000	0.391
4	122.9	122.9	286.634	286.574	8.000	2.497	4.000	1.583
5	29.8	29.8	269.349	268.502	10.000	4.069	5.000	1.894

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		????		6.275			0.29	16.7		
2	Pu236	0.898	5.755	5.752	0.003	0.01	43.39	1.4	203.2	0.915E-04
3	Pu238	0.018	5.487	5.485	0.002	0.00	0.86	10.1	5.5	0.246E-05
	~~Am241~~		5.479	5.485	-.006				4.2	0.189E-05
4	Th228	0.054	5.400	5.410	-.010	0.01	2.63	5.9	17.0	0.765E-05
5		0.017		5.327		0.02	0.84	13.5	3.8	0.173E-05
Totals:		0.987	<--valid peaks only-->				47.71			

EMB
8-11-98

DETECTOR CALIBRATION
Energy(MEV) = 4.091 + (0.0046)*Channel
Energy range (MeV): 4.091 TO 6.447
Efficiency = 0.2179 CPM/DPM
(Data reduction compression factor: 1.)

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	23200.0	100.000
Smoothed	23200.0	100.000
Composite fit	23039.7	99.309
Residuals	160.3	0.691

Analyzed by: _____
EMB

Spectrum 11a1196.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 7754.0

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Raw Data Dump for AEA Spectrum: 11a1196.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	1.	0.	1.	1.	0.	1.
21	0.	0.	1.	0.	0.	1.	1.	0.	0.	0.
31	1.	0.	0.	0.	0.	0.	0.	0.	0.	1.
41	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
51	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
61	0.	1.	0.	0.	0.	2.	0.	0.	1.	0.
71	0.	0.	0.	2.	0.	0.	0.	0.	0.	0.
81	1.	0.	1.	0.	0.	0.	3.	2.	0.	0.
91	1.	0.	0.	0.	2.	0.	0.	0.	0.	0.
101	0.	0.	0.	0.	0.	0.	1.	1.	1.	0.
111	0.	0.	0.	0.	0.	1.	1.	0.	1.	0.
121	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
131	0.	0.	1.	2.	0.	0.	1.	1.	0.	0.
141	0.	1.	1.	0.	0.	0.	0.	1.	0.	0.
151	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
161	1.	1.	0.	0.	0.	0.	0.	2.	1.	0.
171	0.	1.	0.	0.	0.	0.	0.	0.	2.	2.
181	0.	1.	0.	0.	1.	1.	1.	0.	2.	0.
191	1.	1.	0.	1.	0.	0.	1.	1.	0.	1.
201	1.	1.	1.	1.	1.	1.	0.	0.	0.	0.
211	2.	1.	1.	1.	4.	0.	2.	2.	1.	1.
221	4.	2.	0.	5.	1.	3.	2.	4.	1.	2.
231	4.	2.	2.	0.	3.	1.	5.	1.	6.	1.
241	5.	4.	3.	4.	3.	2.	2.	8.	7.	6.
251	5.	11.	7.	7.	10.	13.	10.	7.	9.	13.
261	11.	15.	10.	24.	31.	32.	37.	39.	49.	32.
271	41.	33.	21.	22.	31.	36.	27.	29.	39.	46.
281	47.	59.	70.	107.	124.	150.	167.	154.	87.	47.
291	19.	15.	17.	18.	14.	11.	14.	10.	17.	17.
301	12.	18.	24.	20.	17.	18.	10.	5.	8.	7.
311	13.	11.	14.	14.	17.	11.	13.	18.	16.	23.
321	21.	20.	26.	27.	30.	37.	32.	33.	40.	41.
331	49.	56.	51.	70.	82.	66.	79.	85.	124.	135.
341	169.	165.	193.	202.	262.	276.	369.	375.	521.	608.
351	784.	806.	805.	780.	701.	763.	933.	1103.	1382.	1708.
361	1917.	1928.	1410.	880.	382.	129.	40.	3.	3.	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.	1.	0.	0.	0.	0.
411	0.	1.	0.	0.	0.	1.	0.	2.	2.	2.
421	1.	2.	2.	1.	0.	1.	2.	1.	1.	1.
431	1.	1.	0.	0.	0.	0.	0.	0.	0.	0.
441	1.	0.	0.	0.	0.	0.	1.	0.	0.	1.
451	0.	1.	0.	0.	0.	0.	1.	4.	1.	1.
461	4.	1.	1.	0.	3.	2.	3.	3.	4.	9.
471	7.	10.	11.	20.	17.	12.	14.	3.	3.	4.
481	2.	1.	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 Laboraratory
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
S99T1346-SAM
File ID: 12a1275.CNF

Counted on: 8/10/99 @16:51
Detector: AEA12
Geometry number: 1
Count time: 28804. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1?	13.9	13.9	474.457	474.457	14.000	4.120	7.000	6.387
2	1691.0	1691.0	360.429	360.429	12.000	3.806	6.000	1.959
3	36.5	36.5	301.171	301.110	10.000	1.747	5.000	0.980
4	97.8	97.8	285.481	285.387	10.000	3.415	5.000	2.785
5?	21.6	21.6	268.624	268.064	8.000	2.686	4.000	1.676
6	54.3	54.3	226.883	226.882	12.000	4.094	6.000	2.988

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		????		6.281			0.28	16.8		
2	Pu236	0.907	5.755	5.757	-.002	0.02	44.57	1.3	230.5	0.104E-03
3	Pu238	0.016	5.487	5.484	0.003	0.01	0.77	10.3	5.4	0.244E-05
	~~Am241~~		5.479	5.484	-.005				4.1	0.187E-05
4	Th228	0.042	5.400	5.412	-.012	0.02	2.07	6.7	14.8	0.666E-05
5		????		5.332			0.47	16.3		
6	Pu239	0.026	5.147	5.143	0.004	0.02	1.27	8.0	6.4	0.289E-05
	Pu240		5.144	5.143	0.001				6.4	0.289E-05
Totals:		0.991	<--valid peaks only-->				48.67			

RAJ
8-11-99

DETECTOR CALIBRATION
Energy(MEV) = 4.099 + (0.0046)*Channel
Energy range (MeV): 4.099 TO 6.454
Efficiency = 0.1973 CPM/DPM
(Data reduction compression factor: 1.)

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	23580.0	100.000
Smoothed	23580.0	100.000
Composite fit	23731.4	100.642
Residuals	-151.4	-0.642

Spectrum 12a1275.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 9008.7

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Raw Data Dump for AEA Spectrum: 12a1275.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.	0.	0.	0.	0.	0.	0.	0.
31	0.	0.	0.	0.	0.	1.	0.	0.	1.	0.
41	0.	2.	1.	0.	0.	0.	0.	0.	1.	0.
51	0.	0.	0.	0.	0.	0.	0.	1.	1.	0.
61	0.	2.	0.	0.	0.	0.	0.	0.	0.	1.
71	0.	0.	0.	0.	0.	0.	0.	0.	1.	1.
81	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
91	1.	0.	0.	0.	0.	1.	0.	0.	0.	0.
101	0.	1.	0.	0.	0.	0.	0.	0.	0.	2.
111	1.	0.	2.	0.	0.	0.	0.	1.	1.	0.
121	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
131	0.	1.	0.	1.	0.	0.	0.	0.	3.	0.
141	0.	2.	0.	1.	1.	0.	0.	1.	3.	0.
151	2.	0.	0.	0.	2.	1.	0.	1.	0.	1.
161	0.	1.	1.	0.	1.	0.	0.	0.	0.	2.
171	0.	1.	2.	0.	1.	0.	1.	0.	0.	0.
181	1.	1.	0.	3.	1.	0.	0.	1.	0.	0.
191	0.	3.	0.	0.	1.	1.	0.	1.	0.	0.
201	1.	0.	1.	1.	3.	0.	2.	0.	1.	2.
211	4.	5.	6.	6.	6.	7.	13.	14.	18.	23.
221	19.	33.	32.	44.	48.	69.	67.	59.	50.	26.
231	30.	12.	5.	2.	0.	4.	1.	2.	1.	2.
241	2.	1.	1.	1.	1.	0.	1.	3.	6.	1.
251	6.	5.	5.	4.	7.	4.	4.	1.	6.	6.
261	3.	11.	10.	15.	20.	23.	29.	23.	35.	21.
271	24.	13.	16.	5.	12.	10.	20.	28.	30.	50.
281	57.	72.	106.	120.	88.	128.	112.	80.	42.	28.
291	21.	12.	10.	9.	10.	11.	14.	12.	18.	28.
301	25.	22.	22.	18.	16.	9.	6.	2.	3.	2.
311	3.	4.	2.	1.	2.	1.	1.	3.	6.	1.
321	2.	5.	7.	5.	9.	3.	10.	11.	11.	11.
331	14.	15.	12.	14.	12.	20.	22.	27.	48.	50.
341	66.	94.	98.	143.	168.	242.	315.	458.	532.	675.
351	742.	793.	757.	717.	845.	973.	1155.	1516.	1821.	2049.
361	2009.	1750.	1367.	834.	436.	173.	69.	22.	10.	7.
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.	1.	0.	0.	0.	1.
421	0.	1.	1.	1.	1.	1.	1.	1.	2.	0.
431	1.	3.	0.	0.	0.	0.	0.	0.	0.	0.
441	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
451	0.	0.	1.	0.	0.	0.	1.	0.	0.	0.
461	1.	0.	0.	0.	2.	3.	1.	2.	2.	6.
471	10.	11.	13.	18.	21.	11.	7.	8.	8.	8.
481	1.	3.	0.	0.	1.	2.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

222-S Analytical Laboraratory
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
S99T1346-DUP
File ID: 13a1358.CNF

Counted on: 8/10/99 @16:52
Detector: AEA13
Geometry number: 1
Count time: 28803. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	1707.5	1707.5	362.023	362.023	10.000	2.624	5.000	1.184
2	22.5	22.5	304.070	303.965	30.000	9.848	15.000	15.316
3	87.6	87.6	287.430	287.393	10.000	3.120	5.000	2.352
4	21.5	21.5	270.877	270.423	12.000	2.979	6.000	1.394
5	56.6	56.6	229.408	229.404	10.000	3.505	5.000	2.028

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	0.899	5.755	5.752	0.003	0.01	44.40	1.3	199.5	0.899E-04
2	~~Am241~~	0.014	5.479	5.485	-.006	0.05	0.70	12.5	3.3	0.148E-05
	Pu238		5.487	5.485	0.002				4.3	0.193E-05
3	Th228	0.037	5.400	5.409	-.009	0.01	1.85	6.8	11.5	0.517E-05
4		0.011		5.331		0.01	0.56	15.0	2.5	0.111E-05
5	Pu239	0.028	5.147	5.142	0.005	0.02	1.38	7.6	6.1	0.274E-05
	Pu240		5.144	5.142	0.002				6.1	0.274E-05
		---					---			
Totals:		0.990	<--valid peaks only-->				48.89			

MJ 8-11-99

DETECTOR CALIBRATION
Energy(MEV) = 4.087 + (0.0046)*Channel
Energy range (MeV): 4.087 TO 6.442
Efficiency = 0.2271 CPM/DPM
(Data reduction compression factor: 1.)

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	23712.0	100.000
Smoothed	23711.9	99.999
Composite fit	23470.4	98.981
Residuals	241.6	1.019

Analyzed by: _____

Spectrum 13a1358.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 8773.0

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Raw Data Dump for AEA Spectrum: 13a1358.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.	0.	1.	0.	0.	0.	0.	0.	0.
31	0.	0.	0.	0.	0.	0.	1.	0.	2.	0.
41	0.	1.	0.	0.	0.	0.	0.	1.	0.	0.
51	0.	0.	0.	1.	1.	0.	0.	0.	0.	0.
61	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
71	0.	1.	0.	2.	0.	0.	0.	0.	0.	0.
81	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
91	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
101	0.	0.	0.	2.	0.	1.	0.	1.	1.	0.
111	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
121	1.	0.	1.	0.	0.	0.	1.	1.	0.	1.
131	0.	0.	0.	2.	0.	1.	0.	1.	0.	0.
141	0.	0.	0.	2.	0.	1.	0.	1.	4.	1.
151	1.	1.	1.	0.	0.	0.	2.	0.	0.	1.
161	1.	0.	0.	1.	0.	0.	0.	1.	0.	1.
171	1.	2.	0.	2.	0.	0.	0.	1.	1.	1.
181	4.	1.	1.	0.	1.	0.	1.	0.	0.	2.
191	0.	1.	0.	1.	0.	0.	3.	4.	2.	6.
201	0.	1.	3.	3.	3.	3.	4.	2.	6.	6.
211	5.	3.	8.	5.	5.	11.	13.	11.	14.	14.
221	18.	28.	20.	25.	37.	35.	60.	59.	65.	63.
231	74.	35.	20.	12.	5.	4.	1.	3.	0.	4.
241	4.	6.	4.	4.	3.	4.	8.	2.	4.	1.
251	4.	2.	4.	5.	5.	8.	9.	6.	5.	6.
261	8.	3.	9.	9.	10.	15.	16.	18.	25.	31.
271	31.	25.	22.	18.	14.	10.	16.	18.	19.	15.
281	28.	40.	44.	61.	81.	96.	93.	116.	95.	57.
291	35.	17.	7.	10.	11.	17.	14.	15.	14.	12.
301	15.	20.	21.	27.	31.	19.	14.	5.	8.	9.
311	5.	7.	11.	8.	9.	13.	11.	5.	15.	9.
321	15.	10.	23.	14.	16.	15.	41.	27.	43.	37.
331	47.	42.	46.	50.	61.	59.	64.	71.	92.	103.
341	118.	138.	129.	180.	212.	222.	286.	319.	401.	572.
351	662.	809.	831.	847.	758.	712.	831.	930.	1226.	1470.
361	1799.	2168.	2030.	1601.	818.	251.	65.	6.	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.	1.	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.	1.	1.	0.	0.	1.	0.
431	0.	1.	0.	1.	0.	1.	0.	0.	0.	0.
441	0.	1.	1.	1.	0.	0.	0.	0.	1.	1.
451	1.	0.	0.	0.	1.	0.	0.	1.	2.	1.
461	2.	1.	1.	0.	2.	1.	4.	2.	4.	4.
471	11.	6.	11.	9.	6.	10.	15.	5.	3.	2.
481	1.	0.	0.	0.	1.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

222-S Analytical Laboraratory
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
S99T1347-SAM
File ID: 14a1448.CNF

Counted on: 8/10/99 @16:53
Detector: AEA14
Geometry number: 1
Count time: 28802. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1?	10.6	10.6	474.021	474.021	10.000	4.367	5.000	2.869
2	1804.8	1804.8	360.360	360.360	10.000	2.725	5.000	1.218
3	24.7	24.7	302.475	302.388	30.000	5.710	15.000	14.996
4	109.4	109.4	285.587	285.582	10.000	2.783	5.000	2.190
5	25.6	25.6	268.349	267.980	10.000	3.204	5.000	1.579
6	59.7	59.7	227.539	227.535	10.000	3.647	5.000	2.209

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		????		6.280			0.26	17.4		
2	Pu236	0.903	5.755	5.757	-.002	0.01	47.53	1.3	216.3	0.974E-04
3	Pu238	0.011	5.487	5.490	-.003	0.03	0.59	13.2	3.6	0.164E-05
	~~Am241~~		5.479	5.490	-.011				2.8	0.125E-05
4	Th228	0.042	5.400	5.413	-.013	0.01	2.20	6.1	13.8	0.622E-05
5		0.013		5.332		0.01	0.66	13.7	2.9	0.133E-05
6	Pu239	0.027	5.147	5.146	0.001	0.02	1.44	7.5	6.4	0.290E-05
	Pu240		5.144	5.146	-.002				6.4	0.290E-05
Totals:		0.995	<--valid peaks only-->				52.42			

RAJ
8-11-99

DETECTOR CALIBRATION
Energy(MEV) = 4.099 + (0.0046)*Channel
Energy range (MeV): 4.099 TO 6.454
Efficiency = 0.2242 CPM/DPM
(Data reduction compression factor: 1.)

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	25277.0	100.000
Smoothed	25276.8	99.999
Composite fit	25288.8	100.047
Residuals	-11.8	-0.047

```
                    Spectrum 14a1448.CNF
1 Legend:  Raw = ....  Modeled Peaks = 1,2,.., etc     Display Max.:    9543.3

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Raw Data Dump for AEA Spectrum: 14a1448.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.	0.	0.	0.	0.	1.	0.	0.
31	0.	0.	0.	1.	2.	0.	0.	2.	2.	0.
41	1.	1.	0.	1.	0.	0.	0.	0.	0.	0.
51	1.	0.	0.	0.	0.	0.	1.	1.	0.	0.
61	1.	0.	0.	1.	1.	0.	1.	1.	1.	1.
71	1.	1.	0.	0.	0.	0.	1.	0.	1.	1.
81	0.	0.	1.	0.	0.	0.	2.	1.	0.	1.
91	0.	1.	0.	0.	3.	0.	0.	0.	0.	0.
101	0.	0.	3.	0.	0.	0.	0.	0.	1.	0.
111	1.	0.	1.	1.	4.	1.	0.	0.	1.	0.
121	0.	0.	1.	0.	0.	1.	1.	0.	0.	0.
131	2.	0.	0.	1.	1.	2.	0.	1.	1.	0.
141	1.	0.	2.	0.	0.	1.	2.	3.	0.	0.
151	2.	5.	1.	0.	1.	2.	1.	2.	2.	2.
161	0.	1.	0.	0.	0.	0.	1.	1.	0.	0.
171	3.	2.	1.	0.	0.	0.	1.	1.	3.	0.
181	0.	1.	0.	2.	1.	0.	0.	3.	0.	0.
191	0.	0.	0.	1.	1.	2.	1.	1.	4.	3.
201	3.	0.	5.	2.	2.	1.	3.	4.	3.	4.
211	3.	4.	6.	11.	13.	13.	10.	11.	15.	23.
221	42.	27.	38.	36.	48.	63.	61.	83.	54.	49.
231	30.	13.	5.	8.	3.	3.	0.	4.	5.	2.
241	2.	1.	3.	1.	2.	4.	1.	4.	7.	4.
251	3.	16.	8.	5.	5.	3.	3.	10.	8.	7.
261	9.	16.	13.	15.	20.	27.	22.	35.	44.	19.
271	18.	15.	18.	16.	17.	21.	21.	30.	30.	42.
281	54.	47.	94.	89.	152.	137.	123.	76.	29.	12.
291	12.	7.	16.	11.	12.	7.	13.	12.	11.	20.
301	21.	26.	35.	27.	13.	7.	4.	3.	6.	3.
311	4.	8.	8.	7.	11.	16.	13.	10.	16.	13.
321	19.	19.	19.	19.	23.	19.	26.	23.	31.	31.
331	38.	47.	52.	56.	62.	58.	66.	75.	84.	106.
341	134.	135.	202.	214.	245.	335.	395.	531.	652.	839.
351	962.	904.	841.	764.	833.	1027.	1280.	1485.	1763.	2210.
361	2239.	2000.	1162.	436.	93.	9.	3.	1.	0.	0.
371	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
381	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	1.	0.	0.	0.	0.	0.
401	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
421	0.	0.	0.	1.	1.	1.	2.	4.	0.	0.
431	0.	0.	0.	0.	1.	1.	0.	1.	0.	0.
441	0.	2.	0.	0.	0.	0.	1.	2.	0.	0.
451	0.	0.	0.	1.	0.	2.	1.	2.	0.	2.
461	0.	4.	3.	0.	5.	4.	4.	3.	7.	4.
471	2.	13.	15.	10.	14.	10.	8.	2.	3.	4.
481	0.	1.	4.	0.	0.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

222-S Analytical Laboraratory
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
S99T1347-DUP
File ID: 15a1519.CNF

Counted on: 8/10/99 @16:54
Detector: AEA15
Geometry number: 1
Count time: 28802. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1?	11.9	11.9	477.567	477.567	12.000	4.278	6.000	3.880
2	1707.1	1707.1	363.692	363.692	10.000	3.072	5.000	1.384
3	26.1	26.1	305.442	305.362	10.000	3.218	5.000	0.649
4	84.2	84.2	288.797	288.702	10.000	2.486	5.000	1.760
5	22.4	22.4	272.112	271.578	12.000	2.426	6.000	1.176
6	50.3	50.3	230.425	230.414	14.000	4.287	7.000	2.744

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		????		6.278			0.27	17.4		
2	Pu236	0.906	5.755	5.754	0.001	0.01	45.88	1.3	206.3	0.929E-04
3	Pu238	0.024	5.487	5.486	0.001	0.01	1.23	8.4	7.5	0.338E-05
	~~Am241~~		5.479	5.486	-.007				5.8	0.259E-05
4	Th228	0.034	5.400	5.409	-.009	0.01	1.71	8.1	10.6	0.477E-05
5		0.011		5.330		0.01	0.55	16.9	2.4	0.109E-05
6	Pu239	0.025	5.147	5.141	0.006	0.02	1.25	8.1	5.5	0.248E-05
	Pu240		5.144	5.141	0.003				5.5	0.248E-05
		---					---			
Totals:		0.999	<--valid peaks only-->				50.62			

KH
8-11-99

DETECTOR CALIBRATION
Energy(MEV) = 4.081 + (0.0046)*Channel
Energy range (MeV): 4.081 TO 6.436
Efficiency = 0.2270 CPM/DPM
(Data reduction compression factor: 1.)

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	24316.0	100.000
Smoothed	24316.0	100.000
Composite fit	24426.6	100.455
Residuals	-110.6	-0.455

```
                    Spectrum 15a1519.CNF
1 Legend:  Raw = ....  Modeled Peaks = 1,2,.., etc     Display Max.:   10680.3

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Raw Data Dump for AEA Spectrum: 15a1519.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	0.	0.	2.
21	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
31	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
41	0.	0.	0.	0.	0.	0.	0.	3.	0.	0.
51	0.	1.	0.	0.	0.	0.	0.	0.	0.	0.
61	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
71	0.	0.	2.	0.	0.	1.	1.	0.	1.	1.
81	0.	0.	1.	0.	0.	0.	1.	1.	0.	0.
91	0.	0.	1.	2.	0.	0.	0.	1.	0.	0.
101	2.	0.	0.	0.	0.	1.	1.	0.	1.	0.
111	0.	0.	0.	0.	0.	0.	1.	0.	1.	1.
121	1.	1.	0.	0.	0.	0.	0.	1.	0.	1.
131	0.	0.	1.	0.	1.	0.	0.	1.	0.	0.
141	1.	1.	1.	1.	1.	1.	0.	2.	1.	0.
151	1.	1.	0.	0.	0.	1.	1.	0.	1.	1.
161	1.	1.	1.	0.	0.	0.	0.	0.	0.	1.
171	0.	1.	1.	0.	1.	0.	1.	0.	0.	0.
181	1.	2.	0.	1.	0.	0.	1.	1.	1.	1.
191	0.	1.	0.	0.	2.	1.	0.	1.	2.	1.
201	1.	0.	1.	3.	0.	0.	2.	1.	3.	2.
211	2.	6.	3.	4.	1.	7.	11.	7.	11.	13.
221	19.	15.	19.	23.	19.	23.	42.	39.	52.	68.
231	58.	48.	39.	25.	20.	15.	7.	3.	4.	1.
241	2.	2.	0.	3.	4.	6.	2.	0.	1.	6.
251	7.	7.	6.	11.	5.	5.	7.	11.	9.	6.
261	6.	13.	6.	9.	10.	18.	14.	19.	22.	34.
271	39.	28.	40.	30.	22.	15.	12.	22.	17.	24.
281	28.	34.	31.	57.	68.	83.	82.	113.	120.	101.
291	86.	46.	25.	8.	11.	9.	9.	19.	18.	16.
301	16.	10.	26.	28.	23.	35.	36.	11.	14.	3.
311	6.	7.	6.	6.	4.	5.	5.	6.	10.	19.
321	16.	7.	12.	12.	10.	11.	6.	22.	19.	22.
331	28.	30.	30.	24.	43.	44.	47.	59.	56.	68.
341	59.	86.	106.	127.	145.	154.	172.	248.	264.	356.
351	437.	595.	718.	820.	852.	856.	838.	810.	925.	1010.
361	1358.	1609.	1972.	2129.	1888.	1432.	779.	317.	90.	20.
371	2.	0.	0.	0.	0.	0.	0.	0.	0.	0.
381	0.	0.	0.	1.	0.	0.	0.	0.	0.	0.
391	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
401	0.	0.	0.	0.	0.	0.	0.	1.	0.	0.
411	0.	1.	0.	0.	0.	0.	0.	2.	0.	0.
421	1.	0.	0.	0.	0.	1.	0.	0.	0.	0.
431	1.	0.	0.	0.	0.	0.	0.	0.	2.	0.
441	1.	0.	0.	0.	0.	0.	0.	1.	0.	1.
451	1.	0.	0.	1.	1.	0.	0.	0.	0.	1.
461	1.	2.	0.	2.	0.	3.	2.	3.	3.	5.
471	2.	1.	2.	3.	15.	11.	15.	16.	13.	5.
481	9.	7.	2.	5.	2.	0.	0.	0.	0.	0.
491	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

222-S Analytical Laboraratory
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
S99T1348-SAM
File ID: 16a1626.CNF

Counted on: 8/10/99 @16:56
Detector: AEA16
Geometry number: 1
Count time: 28803. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1	1781.0	1781.0	362.156	362.156	10.000	2.786	5.000	1.284
2	38.8	38.8	303.904	303.853	10.000	2.935	5.000	0.876
3	77.6	77.6	287.457	287.325	10.000	2.868	5.000	2.022
4?	23.7	23.7	270.278	269.849	10.000	2.076	5.000	1.238
5	172.5	172.5	229.235	229.234	12.000	3.954	6.000	2.337

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	0.848	5.755	5.751	0.004	0.01	46.28	1.3	212.2	0.956E-04
2	Pu238	0.025	5.487	5.482	0.005	0.01	1.35	7.9	8.4	0.378E-05
	~~Am241~~		5.479	5.482	-.003				6.4	0.290E-05
3	Th228	0.030	5.400	5.406	-.006	0.01	1.64	8.3	10.4	0.468E-05
4		????		5.326			0.50	16.6		
5	Pu239	0.079	5.147	5.139	0.008	0.02	4.31	4.3	19.4	0.873E-05
	Pu240		5.144	5.139	0.005				19.4	0.873E-05
Totals:		0.981	<--valid peaks only-->				53.59			

RHJ
8-11-99

DETECTOR CALIBRATION
Energy(MEV) = 4.085 + (0.0046)*Channel
Energy range (MeV): 4.085 TO 6.440
Efficiency = 0.2226 CPM/DPM
(Data reduction compression factor: 1.)

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	26211.0	100.000
Smoothed	26211.3	100.001
Composite fit	25964.4	99.059
Residuals	246.6	0.941

 Analyzed by: _____

Spectrum 16a1626.CNF

1 Legend: Raw = ... Modeled Peaks = 1,2,.., etc Display Max.: 9496.8

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Raw Data Dump for AEA Spectrum: 16a1626.CNF

1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
21	0.	0.	0.	0.	0.	0.	1.	0.	0.	0.
31	0.	0.	0.	0.	0.	0.	0.	1.	1.	1.
41	1.	0.	0.	1.	0.	0.	0.	0.	0.	0.
51	0.	0.	0.	0.	0.	2.	1.	0.	1.	0.
61	0.	0.	0.	1.	0.	0.	0.	2.	0.	0.
71	0.	0.	0.	0.	0.	1.	0.	0.	0.	0.
81	0.	0.	0.	0.	2.	2.	0.	0.	1.	0.
91	2.	0.	1.	0.	0.	1.	0.	0.	0.	0.
101	0.	1.	0.	0.	0.	1.	0.	1.	0.	0.
111	0.	0.	1.	0.	1.	0.	1.	0.	1.	0.
121	0.	0.	0.	1.	0.	1.	1.	3.	0.	1.
131	1.	0.	1.	1.	1.	0.	0.	1.	1.	0.
141	0.	1.	0.	0.	1.	1.	2.	1.	1.	2.
151	4.	0.	2.	1.	1.	2.	1.	2.	0.	1.
161	3.	0.	2.	1.	0.	1.	2.	2.	1.	1.
171	1.	0.	2.	1.	2.	0.	0.	0.	1.	1.
181	1.	1.	2.	0.	0.	3.	1.	2.	3.	3.
191	5.	4.	4.	3.	4.	4.	2.	4.	1.	8.
201	3.	3.	4.	6.	2.	9.	10.	9.	8.	8.
211	11.	18.	21.	13.	16.	32.	41.	39.	53.	42.
221	60.	46.	82.	98.	100.	157.	170.	187.	197.	205.
231	186.	116.	74.	41.	20.	10.	3.	2.	3.	3.
241	2.	2.	2.	4.	1.	2.	2.	3.	6.	7.
251	3.	3.	4.	4.	6.	7.	10.	4.	4.	7.
261	7.	5.	12.	13.	12.	14.	24.	25.	27.	40.
271	35.	25.	18.	15.	17.	10.	15.	17.	24.	20.
281	40.	45.	60.	63.	80.	84.	109.	103.	99.	64.
291	30.	28.	18.	16.	34.	11.	21.	18.	19.	24.
301	30.	29.	46.	50.	48.	31.	23.	8.	4.	3.
311	6.	3.	5.	7.	7.	9.	6.	8.	16.	14.
321	9.	8.	12.	13.	22.	24.	23.	19.	23.	22.
331	41.	25.	45.	47.	47.	45.	56.	62.	74.	79.
341	93.	103.	146.	155.	221.	214.	260.	320.	425.	528.
351	658.	797.	905.	814.	808.	827.	823.	941.	1211.	1548.
361	1876.	2221.	2154.	1759.	1036.	397.	99.	11.	4.	0.
371	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
381	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
391	1.	0.	0.	0.	0.	0.	0.	0.	1.	0.
401	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
411	0.	1.	0.	0.	0.	0.	1.	0.	0.	0.
421	0.	0.	1.	1.	1.	0.	1.	0.	0.	0.
431	1.	0.	1.	0.	0.	0.	0.	0.	0.	0.
441	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
451	1.	1.	1.	0.	0.	0.	0.	0.	1.	0.
461	2.	0.	3.	0.	2.	1.	2.	1.	5.	3.
471	9.	7.	7.	10.	12.	13.	10.	6.	10.	6.
481	3.	4.	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 Laboraratory
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
S99T1348-DUP
File ID: 17a1762.CNF

Counted on: 8/10/99 @16:56
Detector: AEA17
Geometry number: 1
Count time: 28804. Sec

PEAK ANALYSIS

Peak ID	Peak height Initial	Peak height Final	Peak center Initial	Peak center Final	FWHM Initial	FWHM Final	Tau Initial	Tau Final
1?	13.1	13.1	476.827	476.827	14.000	4.278	7.000	4.191
2	1910.4	1910.4	362.592	362.592	10.000	2.961	5.000	1.580
3	36.8	36.8	303.889	303.865	32.000	6.192	16.000	15.958
4	94.7	94.7	288.014	287.999	10.000	3.404	5.000	2.861
5	24.8	24.8	270.061	269.841	10.000	3.108	5.000	2.074
6	187.8	187.8	229.250	229.250	12.000	3.702	6.000	2.679

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		????		6.287			0.29	16.6		
2	Pu236	0.857	5.755	5.762	-.007	0.01	46.44	1.3	193.1	0.870E-04
	~~Cm243~~		5.779	5.762	0.017				259.2	0.117E-03
3	Pu238	0.017	5.487	5.492	-.005	0.03	0.91	9.6	5.1	0.232E-05
	~~Am241~~		5.479	5.492	-.013				3.9	0.178E-05
4	Th228	0.037	5.400	5.419	-.019	0.02	1.99	6.6	11.4	0.514E-05
5		0.010		5.335	0.01		0.55	14.7	2.2	0.101E-05
6	Pu239	0.079	5.147	5.148	-.001	0.02	4.26	4.3	17.3	0.781E-05
	Pu240		5.144	5.148	-.004				17.3	0.781E-05
		---					---			
Totals:		1.000	<--valid peaks only-->				54.14			

RKJ
8-11-99

DETECTOR CALIBRATION
Energy(MEV) = 4.094 + (0.0046)*Channel
Energy range (MeV): 4.094 TO 6.449
Efficiency = 0.2454 CPM/DPM
(Data reduction compression factor: 1.)

TOTAL COUNT DATA:

Item	Total	% Recovery
Raw spectrum	26002.0	100.000
Smoothed	26002.4	100.001
Composite fit	26131.0	100.496
Residuals	-129.0	-0.496

```
                Spectrum 17a1762.CNF
1 Legend:  Raw = ....  Modeled Peaks = 1,2,.., etc     Display Max.:   10868.9

.6
.......6
.6

5
5
5
..4
.4
3
3

2
.. 2
.............2.
.............................................2
.......................................................................2
..2...
```

Raw Data Dump for AEA Spectrum: 17a1762.CNF

1	0.	0.	2.	0.	0.	0.	0.	0.	0.	1.
11	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
21	0.	0.	0.	0.	0.	0.	0.	1.	1.	0.
31	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
41	1.	0.	1.	0.	0.	0.	1.	1.	0.	0.
51	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
61	0.	0.	1.	0.	0.	2.	1.	0.	1.	0.
71	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
81	0.	1.	0.	0.	1.	0.	0.	0.	1.	0.
91	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
101	1.	0.	0.	0.	0.	0.	0.	0.	0.	0.
111	0.	1.	0.	1.	0.	0.	0.	0.	0.	0.
121	1.	0.	1.	0.	1.	0.	0.	0.	1.	0.
131	0.	0.	0.	0.	0.	1.	0.	0.	1.	0.
141	0.	0.	4.	4.	2.	0.	4.	1.	0.	4.
151	1.	0.	1.	0.	0.	1.	2.	1.	1.	1.
161	0.	0.	0.	0.	0.	1.	1.	0.	0.	0.
171	0.	0.	1.	1.	0.	0.	1.	2.	0.	1.
181	0.	0.	0.	0.	0.	1.	0.	0.	1.	0.
191	0.	0.	2.	1.	3.	0.	1.	1.	1.	1.
201	0.	2.	1.	0.	1.	1.	2.	2.	4.	5.
211	7.	7.	7.	15.	20.	21.	30.	38.	43.	39.
221	53.	61.	76.	76.	107.	130.	165.	227.	223.	237.
231	177.	130.	93.	38.	20.	5.	3.	2.	2.	1.
241	2.	0.	1.	2.	2.	1.	0.	5.	2.	3.
251	3.	2.	3.	3.	7.	5.	1.	7.	8.	5.
261	2.	5.	6.	10.	14.	18.	15.	22.	26.	39.
271	29.	23.	10.	12.	14.	21.	11.	11.	14.	17.
281	25.	24.	49.	62.	94.	76.	99.	127.	100.	92.
291	43.	20.	24.	12.	17.	14.	23.	22.	21.	21.
301	23.	33.	36.	46.	40.	29.	24.	13.	3.	0.
311	1.	1.	4.	1.	2.	1.	2.	1.	2.	5.
321	1.	5.	6.	5.	8.	5.	5.	9.	9.	12.
331	11.	11.	11.	14.	19.	19.	20.	19.	25.	31.
341	47.	53.	61.	82.	94.	129.	184.	247.	338.	433.
351	571.	685.	786.	863.	792.	770.	796.	924.	1203.	1492.
361	1870.	2260.	2437.	2088.	1446.	784.	288.	86.	16.	6.
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.	1.	0.	0.
401	0.	0.	1.	0.	0.	2.	0.	1.	1.	0.
411	0.	0.	1.	0.	1.	0.	0.	0.	0.	1.
421	0.	2.	2.	0.	0.	0.	0.	3.	1.	0.
431	0.	0.	0.	1.	1.	1.	0.	0.	2.	0.
441	0.	0.	0.	0.	0.	0.	0.	0.	0.	1.
451	0.	0.	0.	0.	0.	0.	0.	0.	1.	0.
461	0.	1.	0.	0.	4.	2.	1.	2.	4.	3.
471	4.	7.	5.	10.	16.	18.	14.	16.	10.	13.
481	3.	3.	2.	2.	1.	0.	0.	1.	0.	0.
491	0.	0.	1.	0.	0.	0.	0.	0.	0.	0.
511	0.	0.								

WORKBOOK PAGE: STD1

Pu 238 and 239/240 : LA-943-128 (VOID) or LA-953-104(B-0)) LAD 9/24/99 LIQUID

						STD
	DATE COUNTED		AUG-10-99	PU 236 AEA FRAC	(C236)	0.394
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)	0.527
30666	TRACER VOLUME in mL	SPKV	0.100	TOTAL AT COUNTS		4981
	DIGEST DILUTION FACTOR	DDF	1.000	AT COUNT TIME (MIN)		30
@PU23901	TRACER BOOK NO		16B59	BACKGROUND in cpm	(Bkg)	0.130
	DETECTOR NUMBER		20	PU 236 cpm		44.920
LIQUID	EFFICIENCY FACTOR	EFF	0.335	PU 238 cpm		0.000
	TRACER PREPARATION DATE		04/13/99	PU 239 cpm		60.120
99003041	TRACER PREPARATION VALUE (dpm/mL)		2338.000	AEA COUNT TIME		480
	PU-236 DECAY CORR'D VALUE	(dpm/mL)	2159.888	Pu 239/240 µCi/L		1.3013E-01
0	PU-238 TRACER VALUE	(dpm/mL)	0.000			
	STANDARD BOOK NO		46B57			
N/A	STANDARD VALUE in µCi/mL		1.260E-04			
WL30666						

Decay Time = Date Counted - Tracer Preparation Date

WC16101 — Pu-236 Decay Corr'd Value = Pu-236 Preparation Value *[e to the power of {(-ln2 * Decay Time/1040.95)]

Pu 236 Tracer Recovery = (Total AT Counts / TC -Bkg)* 1/EFF *C236*100/Pu-236 Decay Corr'd Value * SPKV

SZC — Pu 239/240 µCi/L = (C239)(Pu 236 Decay Corr'd Value)(SPKV)(1000mL/L)(DF)(DDF) / [(C236)(SS)(2220000 dpm/µCi)]

Pu 238 dpm = [(Total AT Counts / TC) - Bkg * 1/EFF * C238] - (Pu-238 Tracer Value *SPKV *Pu 236 Tracer Recovery / 100)

JFR — Pu 238 µCi/L = [(Pu 238 dpm)(DF)(DDF)(1000mL/L)] / [(Pu-236 Tracer Recovery /100)(2220000 dpm/µCi)(D g/L)(SS)]

Relative Counting Error = Square Root of [(1/(Pu 236 cpm * min)) + (1 / (Pu 238 or 239/240 cpm * min))] * 1.96 * 100

AKL

08/11/99	Pu 239/240 µCi/mL		1.30E-04	DETECTION LEVELS in µCi/mL
	Relative Counting Error	=	1.8%	
08/10/99				Pu 239/240
				8.19E-06
09:30 AM				
S-109 GRAB	Pu 236 Tracer Recovery	=	90.4%	

Analyst:		AKL	Date:	11-Aug-99
Signature of Chemist:	John Relyea	JFR	Date:	12 Aug 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)) LAD 9/24/99 LI

	DATE COUNTED		AUG-10-99	PU 236 AEA FRAC	(C236)	0.898
BLNK	SAMPLE VOLUME in mL	SS	0.100	PU 238 AEA FRAC	(C238)	0.018
	SAMPLE DILUTION FACTOR	DF	1.000	PU 239 AEA FRAC	(C239)	0.000
30666	TRACER VOLUME in mL	SPKV	0.100	TOTAL AT COUNTS		2118
	DIGEST DILUTION FACTOR	DDF	1.0000	AT COUNT TIME (MIN)		30
@PU23901	TRACER BOOK NO		16B59	BACKGROUND in cp	(Bkg)	0.130
	DETECTOR NUMBER		20	PU 236 cpm		43.390
LIQUID	EFFICIENCY FACTOR	EFF	0.3347	PU 238 cpm		0.860
	TRACER PREPARATION DATE		04/13/99	PU 239 cpm		0.000
99003041	TRACER PREPARATION VALUE (dpm/mL)		2338.00	AEA COUNT TIME		480
	PU-236 DECAY CORR'D VALUE	(dpm/mL)	2159.89	Pu 239/240 µCi/L =	<	3.713E-02
0	PU-238 TRACER VALUE	(dpm/m	0.00			

N/A

Decay Time = Date Counted - Tracer Preparation Date

WL30666

Pu-236 Decay Corr'd Value = Pu-236 Preparation Value *[e to the power of {(-ln2 * Decay Time/1040.95)}]

Pu 236 Tracer Recovery = (Total AT Counts / TC -Bkg)*C236*100/(Pu-236 Decay Corr'd Value * SPKV*EFF)

WC16101

Pu 239/240 µCi/L = (C239)(Pu 236 Decay Corr'd Value)(SPKV)(1000mL/L)(DF)(DDF) / [(C236)(SS)(D g/L)(2220000 dpm/µCi)]

Pu 238 dpm = [(Total AT Counts / TC) - Bkg * 1/EFF * C238] - (Pu-238 Tracer Value *SPKV *Pu 236 Tracer Recovery / 100)

SZC

Pu 238 µCi/L = [(Pu 238 dpm)(DF)(DDF)(1000mL/L)] / [(Pu-236 Tracer Recovery /100)(2220000 dpm/µCi)(D g/L)(SS)]

Relative Counting Error = Square Root of [(1/(Pu 236 cpm * min)) + (1 / (Pu 238 or 239/240 cpm * min))] * 1.96 * 100

JFR

AKL

08/11/99

08/10/99

09:30 AM

S-109 GRAB

Pu 239/240 µCi/mL		< 3.71E-05	DETECTION LEVELS in µCi/mL
Relative Counting Error	=	100.0%	
NOTE: Pu 238 Result is a LESS THAN Value.			Pu 239/240 3.71E-05
Pu 238 µCimL		< 3.71E-05	
Relative Counting Error	=	9.7%	Pu 238 3.71E-05
Pu 236 Tracer Recovery	=	87.5%	

Analyst:		AKL	Date:	11-Aug-99
Signature of Chemist:	John Rahyra	JFR	Date:	12 Aug 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		AUG-10-99	PU 236 AEA FRAC		(C236)	0.907
SAMPLE	SAMPLE VOLUME in mL	SS	0.100	PU 238 AEA FRAC		(C238)	0.016
	SAMPLE DILUTION FACTOR	DF	1.000	PU 239 AEA FRAC		(C239)	0.026
30666	TRACER VOLUME in mL	SPKV	0.100	TOTAL AT COUNTS			2307
	DIGEST DILUTION FACTOR	DDF	1.0000	AT COUNT TIME (MIN)			30
@PU23901	TRACER BOOK NO		16B59	BACKGROUND in cpm		(Bkg)	0.130
	DETECTOR NUMBER		20	PU 236 cpm			44.570
LIQUID	EFFICIENCY FACTOR	EFF	0.335	PU 238 cpm			0.770
	TRACER PREPARATION DATE		04/13/99	PU 239 cpm			1.270
99003041	TRACER PREPARATION VALUE (dpm/mL)		2338.000	AEA COUNT TIME			480
	PU-236 DECAY CORR'D VALUE (dpm/mL)		2159.888	Pu 239/240 µCi/L =		<	3.3410E-02
0	PU-238 TRACER VALUE (dpm/mL)		0.000				

N/A

Decay Time = Date Counted - Tracer Preparation Date

S99T001346

Pu-236 Decay Corr'd Value = Pu-236 Preparation Value *[e to the power of {(-ln2 * Decay Time/1040.95)]

Pu 236 Tracer Recovery = (Total AT Counts / TC -Bkg) *C236*100/(Pu-236 Decay Corr'd Value * SPKV * EFF)

WC16101

Pu 239/240 µCi/L = (C239)(Pu 236 Decay Corr'd Value)(SPKV)(1000mL/L)(DF)(DDF) / [(C236)(SS)(D g/L)(2220000 dpm/µCi)]

Pu 238 dpm = [(Total AT Counts / TC) - Bkg * 1/EFF * C238] - (Pu-238 Tracer Value *SPKV *Pu 236 Tracer Recovery / 100)

SZC

Pu 238 µCi/L = [(Pu 238 dpm)(DF)(DDF)(1000mL/L)] / [(Pu-236 Tracer Recovery /100)(2220000 dpm/µCi)(D g/L)(SS)]

Relative Counting Error = Square Root of [(1/(Pu 236 cpm * min)) + (1 / (Pu 238 or 239/240 cpm * min))] * 1.96 * 100

JFR

AKL

08/11/99

08/10/99

09:30 AM

S-109 GRAB

Pu 239/240 µCi/mL		< 3.34E-05	DETECTION LEVELS in µCi/mL
Relative Counting Error	=	8.1%	
NOTE: Pu 238 Result is a LESS THAN Value.			Pu 239/240 3.34E-05
Pu 238 µCimL		< 3.34E-05	
Relative Counting Error	=	10.3%	Pu 238 3.34E-05
Pu 236 Tracer Recovery	=	96.3%	

Analyst:	AKL	Date:	11-Aug-99
Signature of Chemist: John Relyea	JFR	Date:	12 Aug 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		AUG-10-99	PU 236 AEA FRAC	(C236)	0.899
DUP	SAMPLE VOLUME in mL	SS	0.100	PU 238 AEA FRAC	(C238)	0.014
	SAMPLE DILUTION FACTOR	DF	1.000	PU 239 AEA FRAC	(C239)	0.028
30666	TRACER VOLUME in mL	SPKV	0.100	TOTAL AT COUNTS		2205
	DIGEST DILUTION FACTOR	DDF	1.0000	AT COUNT TIME (MIN)		30
@PU23901	TRACER BOOK NO		16B59	BACKGROUND in cpm	(Bkg)	0.130
	DETECTOR NUMBER		20	PU 236 cpm		44.400
LIQUID	EFFICIENCY FACTOR	EFF	0.335	PU 238 cpm		0.700
	TRACER PREPARATION DATE		04/13/99	PU 239 cpm		1.380
99003041	TRACER PREPARATION VALUE (dpm/mL)		2338.000	AEA COUNT TIME		480
	PU-236 DECAY CORR'D VALUE	(dpm/mL)	2159.888	Pu 239/240 µCi/L =	<	3.5583E-02
0	PU-238 TRACER VALUE	(dpm/mL)	0.000			

N/A

Decay Time = Date Counted - Tracer Preparation Date

S99T001346 Pu-236 Decay Corr'd Value = Pu-236 Preparation Value *[e to the power of {(-ln2 * Decay Time/1040.95)]

Pu 236 Tracer Recovery = (Total AT Counts / TC -Bkg) *C236*100/(Pu-236 Decay Corr'd Value * SPKV * EFF)

WC16101 Pu 239/240 µCi/L = (C239)(Pu 236 Decay Corr'd Value)(SPKV)(1000mL/L)(DF)(DDF) / [(C236)(SS)(D g/L)(2220000 dpm/µCi)]

Pu 238 dpm = [(Total AT Counts / TC) - Bkg * 1/EFF * C238] - (Pu-238 Tracer Value *SPKV *Pu 236 Tracer Recovery / 100)

SZC Pu 238 µCi/L = [(Pu 238 dpm)(DF)(DDF)(1000mL/L)] / [(Pu-236 Tracer Recovery /100)(2220000 dpm/µCi)(D g/L)(SS)]

Relative Counting Error = Square Root of [(1/(Pu 236 cpm * min)) + (1 / (Pu 238 or 239/240 cpm * min))] * 1.96 * 100

JFR

AKL

08/11/99	Pu 239/240 µCi/mL		< 3.56E-05	DETECTION LEVELS in µCi/mL
	Relative Counting Error	=	7.7%	
08/10/99				
	NOTE: Pu 238 Result is a LESS THAN Value.			Pu 239/240
09:30 AM	Pu 238 µCimL		< 3.56E-05	3.56E-05
	Relative Counting Error	=	10.8%	Pu 238
S-109 GRAB	Pu 236 Tracer Recovery	=	91.2%	3.56E-05

Analyst:		AKL	Date:	11-Aug-99
Signature of Chemist:	John Relyea	JFR	Date:	12 Aug 99

SAMPLE.WB1 REV 1.0 943128ML

WORKBOOK PAGE: SAM5

Pu 238 and 239/240 : LA-943-128 (VOID) or LA-953-104(B-0) LIQUID / SAMPLE

	DATE COUNTED		AUG-10-99	PU 236 AEA FRAC	(C236)	0.903
SAMPLE	SAMPLE VOLUME in mL	SS	0.100	PU 238 AEA FRAC	(C238)	0.011
	SAMPLE DILUTION FACTOR	DF	1.000	PU 239 AEA FRAC	(C239)	0.027
30666	TRACER VOLUME in mL	SPKV	0.100	TOTAL AT COUNTS		2183
	DIGEST DILUTION FACTOR	DDF	1.0000	AT COUNT TIME (MIN)		30
@PU23901	TRACER BOOK NO		16B59	BACKGROUND in cpm	(Bkg)	0.130
	DETECTOR NUMBER		20	PU 236 cpm		47.530
LIQUID	EFFICIENCY FACTOR	EFF	0.335	PU 238 cpm		0.590
	TRACER PREPARATION DATE		04/13/99	PU 239 cpm		1.440
99003041	TRACER PREPARATION VALUE (dpm/mL)		2338.000	AEA COUNT TIME		480
	PU-236 DECAY CORR'D VALUE	(dpm/mL)	2159.888	Pu 239/240 µCi/L =	<	3.5625E-02
0	PU-238 TRACER VALUE	(dpm/mL)	0.000			

N/A

Decay Time = Date Counted - Tracer Preparation Date

S99T001347

Pu-236 Decay Corr'd Value = Pu-236 Preparation Value *[e to the power of {(-ln2 * Decay Time/1040.95)]

Pu 236 Tracer Recovery = (Total AT Counts / TC -Bkg) *C236*100/(Pu-236 Decay Corr'd Value * SPKV * EFF)

WC16101

Pu 239/240 µCi/L = (C239)(Pu 236 Decay Corr'd Value)(SPKV)(1000mL/L)(DF)(DDF) / [(C236)(SS)(D g/L)(2220000 dpm/µCi)]

Pu 238 dpm = [(Total AT Counts / TC) - Bkg * 1/EFF * C238] - (Pu-238 Tracer Value *SPKV *Pu 236 Tracer Recovery / 100)

SZC

Pu 238 µCi/L = [(Pu 238 dpm)(DF)(DDF)(1000mL/L)] / [(Pu-236 Tracer Recovery /100)(2220000 dpm/µCi)(D g/L)(SS)]

Relative Counting Error = Square Root of [(1/(Pu 236 cpm * min)) + (1 / (Pu 238 or 239/240 cpm * min))] * 1.96 * 100

JFR

AKL

08/11/99

08/10/99

09:30 AM

S-100 GRAB

Pu 239/240 µCi/mL		< 3.56E-05	DETECTION LEVELS in µCi/mL
Relative Counting Error	=	7.6%	
NOTE: Pu 238 Result is a LESS THAN Value.			Pu 239/240 3.56E-05
Pu 238 µCimL		< 3.56E-05	
Relative Counting Error	=	11.7%	Pu 238 3.56E-05
Pu 236 Tracer Recovery	=	90.7%	

Analyst:	AKL	Date:	11-Aug-99
Signature of Chemist: John Relyea	JFR	Date:	12 Aug 99

SAMPLE.WB1 REV 1.0 943128ML

WORKBOOK PAGE: DUP6

Pu 238 and 239/240 : LA-943-128 (VOID) or LA-953-104(B-0) LIQUID /

	DATE COUNTED		AUG-10-99	PU 236 AEA FRAC	(C236)		0.906
DUP	SAMPLE VOLUME in mL	SS	0.100	PU 238 AEA FRAC	(C238)		0.024
	SAMPLE DILUTION FACTOR	DF	1.000	PU 239 AEA FRAC	(C239)		0.025
30666	TRACER VOLUME in mL	SPKV	0.100	TOTAL AT COUNTS			2100
	DIGEST DILUTION FACTOR	DDF	1.0000	AT COUNT TIME (MIN)			30
@PU23901	TRACER BOOK NO		16B59	BACKGROUND in cpm	(Bkg)		0.130
	DETECTOR NUMBER		20	PU 236 cpm			45.880
LIQUID	EFFICIENCY FACTOR	EFF	0.335	PU 238 cpm			1.230
	TRACER PREPARATION DATE		04/13/99	PU 239 cpm			1.250
99003041	TRACER PREPARATION VALUE (dpm/mL)		2338.000	AEA COUNT TIME			480
	PU-236 DECAY CORR'D VALUE	(dpm/mL)	2159.888	Pu 239/240 µCi/L =		<	3.6791E-02
0	PU-238 TRACER VALUE	(dpm/mL)	0.000				

N/A

Decay Time = Date Counted - Tracer Preparation Date

S99T001347

Pu-236 Decay Corr'd Value = Pu-236 Preparation Value *[e to the power of {(-ln2 * Decay Time/1040.95)]

Pu 236 Tracer Recovery = (Total AT Counts / TC -Bkg) *C236*100/(Pu-236 Decay Corr'd Value * SPKV * EFF)

WC16101

Pu 239/240 µCi/L = (C239)(Pu 236 Decay Corr'd Value)(SPKV)(1000mL/L)(DF)(DDF) / [(C236)(SS)(D g/L)(2220000 dpm/µCi)]

Pu 238 dpm = [(Total AT Counts / TC) - Bkg * 1/EFF * C238] - (Pu-238 Tracer Value *SPKV *Pu 236 Tracer Recovery / 100)

SZC

Pu 238 µCi/L = [(Pu 238 dpm)(DF)(DDF)(1000mL/L)] / [(Pu-236 Tracer Recovery /100)(2220000 dpm/µCi)(D g/L)(SS)]

Relative Counting Error = Square Root of [(1/(Pu 236 cpm * min)) + (1 / (Pu 238 or 239/240 cpm * min))] * 1.96 * 100

JFR

AKL

08/11/99

08/10/99

09:30 AM

S-109 GRAB

Pu 239/240 µCi/mL		< 3.68E-05	DETECTION LEVELS in µCi/mL	
Relative Counting Error	=	8.1%		
NOTE: Pu 238 Result is a LESS THAN Value.			Pu 239/240	
Pu 238 µCimL		< 3.68E-05	3.68E-05	
Relative Counting Error	=	8.2%	Pu 238	
Pu 236 Tracer Recovery	=	87.6%	3.68E-05	

Analyst:		AKL	Date:	11-Aug-99
Signature of Chemist:	John Relyea	JFR	Date:	12 Aug 99

SAMPLE.WB1 REV 1.0 943128ML

0.1

Pu 238 and 239/240 : LA-943-128 (VOID) or LA-953-104(B-Ø)) 9/24/99 LIQUID /

							SAMPLE
	DATE COUNTED		AUG-10-99	PU 236 AEA FRAC	(C236)		0.848
SAMPLE	SAMPLE VOLUME in mL	SS	0.100	PU 238 AEA FRAC	(C238)		0.025
	SAMPLE DILUTION FACTOR	DF	1.000	PU 239 AEA FRAC	(C239)		0.079
30666	TRACER VOLUME in mL	SPKV	0.100	TOTAL AT COUNTS			2322
	DIGEST DILUTION FACTOR	DDF	1.0000	AT COUNT TIME (MIN)			30
@PU23901	TRACER BOOK NO		16B59	BACKGROUND in cpm	(Bkg)		0.130
	DETECTOR NUMBER		20	PU 236 cpm			46.280
LIQUID	EFFICIENCY FACTOR	EFF	0.335	PU 238 cpm			1.350
	TRACER PREPARATION DATE		04/13/99	PU 239 cpm			4.310
99003041	TRACER PREPARATION VALUE (dpm/mL)		2338.000	AEA COUNT TIME			480
	PU-236 DECAY CORR'D VALUE	(dpm/mL)	2159.888	Pu 239/240 µCi/L			9.0638E-02
0	PU-238 TRACER VALUE	(dpm/mL)	0.000				

N/A

Decay Time = Date Counted - Tracer Preparation Date

S99T001348

Pu-236 Decay Corr'd Value = Pu-236 Preparation Value *[e to the power of {(-ln2 * Decay Time/1040.95)]

Pu 236 Tracer Recovery = (Total AT Counts / TC -Bkg) *C236*100/(Pu-236 Decay Corr'd Value * SPKV * EFF)

WC16101

Pu 239/240 µCi/L = (C239)(Pu 236 Decay Corr'd Value)(SPKV)(1000mL/L)(DF)(DDF) / [(C236)(SS)(D g/L)(2220000 dpm/µCi)]

Pu 238 dpm = [(Total AT Counts / TC) - Bkg * 1/EFF * C238] - (Pu-238 Tracer Value *SPKV *Pu 236 Tracer Recovery / 100)

SZC

Pu 238 µCi/L = [(Pu 238 dpm)(DF)(DDF)(1000mL/L)] / [(Pu-236 Tracer Recovery /100)(2220000 dpm/µCi)(D g/L)(SS)]

Relative Counting Error = Square Root of [(1/(Pu 236 cpm * min)) + (1 / (Pu 238 or 239/240 cpm * min))] * 1.96 * 100

JFR

AKL

08/11/99

08/10/99

09:30 AM

S-109 GRAB

Pu 239/240 µCi/mL		9.06E-05	DETECTION LEVELS in µCi/mL
Relative Counting Error	=	4.5%	
NOTE: Pu 238 Result is a LESS THAN Value.			Pu 239/240 3.80E-05
Pu 238 µCimL		< 3.80E-05	
Relative Counting Error	=	7.8%	Pu 238 3.80E-05
Pu 236 Tracer Recovery	=	90.6%	

Analyst:		AKL	Date:	11-Aug-99
Signature of Chemist:	John Relyea	JFR	Date:	12 Aug 99

SAMPLE.WB1 REV 1.0 943128ML

WORKBOOK PAGE: DUP8

Pu 238 and 239/240 : LA-943-128 (VOID) or LA-953-104(B-0) LIQUID / DUP

	DATE COUNTED		AUG-10-99	PU 236 AEA FRAC	(C236)	0.857
DUP	SAMPLE VOLUME in mL	SS	0.100	PU 238 AEA FRAC	(C238)	0.017
	SAMPLE DILUTION FACTOR	DF	1.000	PU 239 AEA FRAC	(C239)	0.079
30666	TRACER VOLUME in mL	SPKV	0.100	TOTAL AT COUNTS		2357
	DIGEST DILUTION FACTOR	DDF	1.0000	AT COUNT TIME (MIN)		30
@PU23901	TRACER BOOK NO		16B59	BACKGROUND in cpm	(Bkg)	0.130
	DETECTOR NUMBER		20	PU 236 cpm		46.440
LIQUID	EFFICIENCY FACTOR	EFF	0.335	PU 238 cpm		0.910
	TRACER PREPARATION DATE		04/13/99	PU 239 cpm		4.260
99003041	TRACER PREPARATION VALUE (dpm/mL)		2338.000	AEA COUNT TIME		480
	PU-236 DECAY CORR'D VALUE	(dpm/mL)	2159.888	Pu 239/240 µCi/L		8.9686E-02
0	PU-238 TRACER VALUE	(dpm/mL)	0.000			

N/A

Decay Time = Date Counted - Tracer Preparation Date

S99T001348

Pu-236 Decay Corr'd Value = Pu-236 Preparation Value *[e to the power of {(-ln2 * Decay Time/1040.95)]

Pu 236 Tracer Recovery = (Total AT Counts / TC -Bkg) *C236*100/(Pu-236 Decay Corr'd Value * SPKV * EFF)

WC15101

Pu 239/240 µCi/L = (C239)(Pu 236 Decay Corr'd Value)(SPKV)(1000mL/L)(DF)(DDF) / [(C236)(SS)(D g/L)(2220000 dpm/µCi)]

Pu 238 dpm = [(Total AT Counts / TC) - Bkg * 1/EFF * C238] - (Pu-238 Tracer Value *SPKV *Pu 236 Tracer Recovery / 100)

SZC

Pu 238 µCi/L = [(Pu 238 dpm)(DF)(DDF)(1000mL/L)] / [(Pu-236 Tracer Recovery /100)(2220000 dpm/µCi)(D g/L)(SS)]

Relative Counting Error = Square Root of [(1/(Pu 236 cpm * min)) + (1 / (Pu 238 or 239/240 cpm * min))] * 1.96 * 100

JFR

AKL

08/11/99

08/10/99

08:30 AM

S-109 GRAB

Pu 239/240 µCi/mL		8.97E-05	DETECTION LEVELS in µCi/mL	
Relative Counting Error	=	4.5%		
NOTE: Pu 238 Result is a LESS THAN Value.			Pu 239/240	
Pu 238 µCimL		< 3.66E-05	3.66E-05	
Relative Counting Error	=	9.5%	Pu 238	
Pu 236 Tracer Recovery	=	93.0%	3.66E-05	

Analyst:		AKL	Date:	11-Aug-99
Signature of Chemist:	John Relyea	JFR	Date:	12 Aug 99

SAMPLE.WB1 REV 1.0 943128ML

OPPORTUNISTIC ANALYTES

(APPENDIX A)

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Appendix A. Opportunistic Analyte Results.
S-109 GRAB

RISER: 13
SEGMENT #: 9S-99-1

SEGMENT PORTION: Supernate

Sample#	R	A#	Analyte	Unit	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S99T001340			Volume % Settled Solids	%	n/a	n/a	Trace	n/a	n/a	n/a	n/a	1.00e-01	n/a
S99T001343		D	Silver-ICP-Acid Dil.	ug/mL	95.80	<1.00e-02	16.10	18.20	17.15	12.2	88.10	6.010	n/a
S99T001343		D	Arsenic-ICP-Acid Dil.	ug/mL	100.0	<1.00e-01	< 60.10	<6.01e1	n/a	n/a	94.40	60.10	n/a
S99T001343		D	Boron-ICP-Acid Dil.	ug/mL	101.2	<5.00e-02	70.10	76.00	73.05	8.08	98.60	30.10	n/a
S99T001343		D	Barium-ICP-Acid Dil.	ug/mL	97.00	<5.00e-02	< 30.10	<3.01e1	n/a	n/a	92.70	30.10	n/a
S99T001343		D	Beryllium-ICP-Acid Dil.	ug/mL	96.80	<5.00e-03	< 3.010	<3.01e0	n/a	n/a	95.50	3.010	n/a
S99T001343		D	Bismuth-ICP-Acid Dil.	ug/mL	100.0	<1.00e-01	< 60.10	<6.01e1	n/a	n/a	99.50	60.10	n/a
S99T001343		D	Calcium-ICP-Acid Dil.	ug/mL	103.4	<1.00e-01	< 60.10	<6.01e1	n/a	n/a	103.0	60.10	n/a
S99T001343		D	Cadmium-ICP-Acid Dil.	ug/mL	100.8	<5.00e-03	< 3.010	<3.01e0	n/a	n/a	99.90	3.010	n/a
S99T001343		D	Cerium-ICP-Acid Dil.	ug/mL	99.20	<1.00e-01	< 60.10	<6.01e1	n/a	n/a	96.60	60.10	n/a
S99T001343		D	Cobalt-ICP-Acid Dil.	ug/mL	100.2	<2.00e-02	< 12.00	<1.20e1	n/a	n/a	99.10	12.00	n/a
S99T001343		D	Copper-ICP-Acid Dil.	ug/mL	98.20	<1.00e-02	< 6.010	<6.01e0	n/a	n/a	93.40	6.010	n/a
S99T001343		D	Potassium-ICP-Acid Dil.	ug/mL	103.8	<5.00e-01	<3.01e+03	2.33e+03	n/a	n/a	105.0	3.01e+03	n/a
S99T001343		D	Lanthanum-ICP-Acid Dil.	ug/mL	100.2	<5.00e-02	< 30.10	<3.01e1	n/a	n/a	99.10	30.10	n/a
S99T001343		D	Lithium-ICP-Acid Dil.	ug/mL	96.40	<1.00e-02	< 6.010	<6.01e0	n/a	n/a	92.70	6.010	n/a
S99T001343		D	Magnesium-ICP-Acid Dil.	ug/mL	99.80	<1.00e-01	< 60.10	<6.01e1	n/a	n/a	94.50	60.10	n/a
S99T001343		D	Molybdenum-ICP-Acid Dil.	ug/mL	99.20	<5.00e-02	83.50	88.10	85.80	5.36	98.40	30.10	n/a
S99T001343		D	Neodymium-ICP-Acid Dil.	ug/mL	99.20	<1.00e-01	< 60.10	<6.01e1	n/a	n/a	97.70	60.10	n/a
S99T001343		D	Phosphorus-ICP-Acid Dil.	ug/mL	101.2	<2.00e-01	4.73e+02	507.0	490.0	6.94	98.10	120.0	n/a
S99T001343		D	Lead-ICP-Acid Dil.	ug/mL	99.00	<1.00e-01	< 60.10	<6.01e1	n/a	n/a	101.0	60.10	n/a
S99T001343		D	Sulfur-ICP-Acid Dil.	ug/mL	96.80	<1.00e-01	4.90e+02	545.0	517.5	10.6	100.0	60.10	n/a
S99T001343		D	Antimony-ICP-Acid Dil.	ug/mL	99.00	<6.00e-02	56.30	57.00	56.65	1.24	99.20	36.10	n/a
S99T001343		D	Selenium-ICP-Acid Dil.	ug/mL	97.80	<1.00e-01	< 60.10	<6.01e1	n/a	n/a	103.0	60.10	n/a
S99T001343		D	Silicon-ICP-Acid Dil.	ug/mL	101.2	<5.00e-02	1.27e+02	153.0	140.0	18.6	104.0	30.10	n/a
S99T001343		D	Samarium-ICP-Acid Dil.	ug/mL	99.40	<1.00e-01	< 60.10	<6.01e1	n/a	n/a	98.60	60.10	n/a
S99T001343		D	Strontium-ICP-Acid Dil.	ug/mL	96.20	<1.00e-02	< 6.010	<6.01e0	n/a	n/a	94.70	6.010	n/a
S99T001343		D	Titanium-ICP-Acid Dil.	ug/mL	100.4	<1.00e-02	< 6.010	<6.01e0	n/a	n/a	99.90	6.010	n/a
S99T001343		D	Thallium-ICP-Acid Dil.	ug/mL	98.00	<2.00e-01	<1.20e+02	<1.20e2	n/a	n/a	96.50	120.0	n/a
S99T001343		D	Uranium-ICP-Acid Dil.	ug/mL	97.60	<5.00e-01	<3.01e+02	<3.01e2	n/a	n/a	96.50	301.0	n/a
S99T001343		D	Vanadium-ICP-Acid Dil.	ug/mL	99.60	<5.00e-02	< 30.10	<3.01e1	n/a	n/a	99.00	30.10	n/a
S99T001343		D	Zinc-ICP-Acid Dil.	ug/mL	99.40	<1.00e-02	< 6.010	<6.01e0	n/a	n/a	99.80	6.010	n/a
S99T001346			Bromide by Ion Chromatograph	ug/mL	95.36	<1.25e-01	<1.28e+03	<1.28e3	n/a	n/a	94.72	1.28e+03	n/a
S99T001346			Oxalate-IC-Dionex 4000/450	ug/mL	109.9	<1.05e-01	<1.07e+03	<1.07e3	n/a	n/a	107.3	1.07e+03	n/a
S99T001346			Cobalt-60 by GEA	uCi/mL	111.3	<1.46e-03	<4.16e-03	<4.70e-3	n/a	n/a	n/a	4.00e-03	n/a

Appendix A. Opportunistic Analyte Results.
S-109 GRAB

RISER: 13
SEGMENT #: 9S-99-2

SEGMENT PORTION: Supernate

Sample#	R	A#	Analyte	Unit	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S99T001341			Volume % Settled Solids	%	n/a	n/a	Trace	n/a	n/a	n/a	n/a	1.00e-01	n/a
S99T001344		D	Silver-ICP-Acid Dil.	ug/mL	95.80	<1.00e-02	17.30	16.50	16.90	4.73	n/a	6.010	n/a
S99T001344		D	Arsenic-ICP-Acid Dil.	ug/mL	100.0	<1.00e-01	< 60.10	<6.01e1	n/a	n/a	n/a	60.10	n/a
S99T001344		D	Boron-ICP-Acid Dil.	ug/mL	101.2	<5.00e-02	71.00	67.80	69.40	4.61	n/a	30.10	n/a
S99T001344		D	Barium-ICP-Acid Dil.	ug/mL	97.00	<5.00e-02	< 30.10	<3.01e1	n/a	n/a	n/a	30.10	n/a
S99T001344		D	Beryllium-ICP-Acid Dil.	ug/mL	96.80	<5.00e-03	< 3.010	<3.01e0	n/a	n/a	n/a	3.010	n/a
S99T001344		D	Bismuth-ICP-Acid Dil.	ug/mL	100.0	<1.00e-01	< 60.10	<6.01e1	n/a	n/a	n/a	60.10	n/a
S99T001344		D	Calcium-ICP-Acid Dil.	ug/mL	103.4	<1.00e-01	< 60.10	<6.01e1	n/a	n/a	n/a	60.10	n/a
S99T001344		D	Cadmium-ICP-Acid Dil.	ug/mL	100.8	<5.00e-03	< 3.010	<3.01e0	n/a	n/a	n/a	3.010	n/a
S99T001344		D	Cerium-ICP-Acid Dil.	ug/mL	99.20	<1.00e-01	< 60.10	<6.01e1	n/a	n/a	n/a	60.10	n/a
S99T001344		D	Cobalt-ICP-Acid Dil.	ug/mL	100.2	<2.00e-02	< 12.00	<1.20e1	n/a	n/a	n/a	12.00	n/a
S99T001344		D	Copper-ICP-Acid Dil.	ug/mL	98.20	<1.00e-02	< 6.010	<6.01e0	n/a	n/a	n/a	6.010	n/a
S99T001344		D	Potassium-ICP-Acid Dil.	ug/mL	103.8	<5.00e-01	2.07e+03	2.05e+03	2.06e+03	0.97	n/a	301.0	n/a
S99T001344		D	Lanthanum-ICP-Acid Dil.	ug/mL	100.2	<5.00e-02	< 30.10	<3.01e1	n/a	n/a	n/a	30.10	n/a
S99T001344		D	Lithium-ICP-Acid Dil.	ug/mL	96.40	<1.00e-02	< 6.010	<6.01e0	n/a	n/a	n/a	6.010	n/a
S99T001344		D	Magnesium-ICP-Acid Dil.	ug/mL	99.80	<1.00e-01	< 60.10	<6.01e1	n/a	n/a	n/a	60.10	n/a
S99T001344		D	Molybdenum-ICP-Acid Dil.	ug/mL	99.20	<5.00e-02	83.20	76.60	79.90	8.26	n/a	30.10	n/a
S99T001344		D	Neodymium-ICP-Acid Dil.	ug/mL	99.20	<1.00e-01	< 60.10	<6.01e1	n/a	n/a	n/a	60.10	n/a
S99T001344		D	Phosphorus-ICP-Acid Dil.	ug/mL	101.2	<2.00e-01	5.03e+02	524.0	513.5	4.09	n/a	120.0	n/a
S99T001344		D	Lead-ICP-Acid Dil.	ug/mL	99.00	<1.00e-01	< 60.10	<6.01e1	n/a	n/a	n/a	60.10	n/a
S99T001344		D	Sulfur-ICP-Acid Dil.	ug/mL	96.80	<1.00e-01	5.73e+02	525.0	549.0	8.74	n/a	60.10	n/a
S99T001344		D	Antimony-ICP-Acid Dil.	ug/mL	99.00	<6.00e-02	52.20	51.60	51.90	1.16	n/a	36.10	n/a
S99T001344		D	Selenium-ICP-Acid Dil.	ug/mL	97.80	<1.00e-01	< 60.10	<6.01e1	n/a	n/a	n/a	60.10	n/a
S99T001344		D	Silicon-ICP-Acid Dil.	ug/mL	101.2	<5.00e-02	1.44e+02	131.0	137.5	9.45	n/a	30.10	n/a
S99T001344		D	Samarium-ICP-Acid Dil.	ug/mL	99.40	<1.00e-01	< 60.10	<6.01e1	n/a	n/a	n/a	60.10	n/a
S99T001344		D	Strontium-ICP-Acid Dil.	ug/mL	96.20	<1.00e-02	< 6.010	<6.01e0	n/a	n/a	n/a	6.010	n/a
S99T001344		D	Titanium-ICP-Acid Dil.	ug/mL	100.4	<1.00e-02	< 6.010	<6.01e0	n/a	n/a	n/a	6.010	n/a
S99T001344		D	Thallium-ICP-Acid Dil.	ug/mL	98.00	<2.00e-01	<1.20e+02	<1.20e2	n/a	n/a	n/a	120.0	n/a
S99T001344		D	Uranium-ICP-Acid Dil.	ug/mL	97.60	<5.00e-01	<3.01e+02	<3.01e2	n/a	n/a	n/a	301.0	n/a
S99T001344		D	Vanadium-ICP-Acid Dil.	ug/mL	99.60	<5.00e-02	< 30.10	<3.01e1	n/a	n/a	n/a	30.10	n/a
S99T001344		D	Zinc-ICP-Acid Dil.	ug/mL	99.40	<1.00e-02	< 6.010	<6.01e0	n/a	n/a	n/a	6.010	n/a
S99T001344			Bromide by Ion Chromatograph	ug/mL	98.61	<1.25e-01	<5.18e+02	<5.18e2	n/a	n/a	n/a	517.6	n/a
S99T001344			Oxalate-IC-Dionex 4000/450	ug/mL	102.1	<1.05e-01	<4.35e+02	<4.35e2	n/a	n/a	n/a	434.8	n/a
S99T001347			Cobalt-60 by GEA	uCi/mL	111.3	<1.46e-03	<4.55e-03	<4.59e-3	n/a	n/a	n/a	5.00e-03	n/a

Appendix A. Opportunistic Analyte Results.
S-109 GRAB

RISER: 13
SEGMENT #: 9S-99-3

SEGMENT PORTION: Supernate

Sample#	R	A#	Analyte	Unit	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S99T001342			Volume % Settled Solids	%	n/a	n/a	Trace	n/a	n/a	n/a	n/a	1.00e-01	n/a
S99T001345		D	Silver-ICP-Acid Dil.	ug/mL	95.80	<1.00e-02	17.30	17.00	17.15	1.75	n/a	6.010	n/a
S99T001345		D	Arsenic-ICP-Acid Dil.	ug/mL	100.0	<1.00e-01	< 60.10	<6.01e1	n/a	n/a	n/a	60.10	n/a
S99T001345		D	Boron-ICP-Acid Dil.	ug/mL	101.2	<5.00e-02	74.80	68.10	71.45	9.38	n/a	30.10	n/a
S99T001345		D	Barium-ICP-Acid Dil.	ug/mL	97.00	<5.00e-02	< 30.10	<3.01e1	n/a	n/a	n/a	30.10	n/a
S99T001345		D	Beryllium-ICP-Acid Dil.	ug/mL	96.80	<5.00e-03	< 3.010	<3.01e0	n/a	n/a	n/a	3.010	n/a
S99T001345		D	Bismuth-ICP-Acid Dil.	ug/mL	100.0	<1.00e-01	< 60.10	<6.01e1	n/a	n/a	n/a	60.10	n/a
S99T001345		D	Calcium-ICP-Acid Dil.	ug/mL	103.4	<1.00e-01	< 60.10	<6.01e1	n/a	n/a	n/a	60.10	n/a
S99T001345		D	Cadmium-ICP-Acid Dil.	ug/mL	100.8	<5.00e-03	< 3.010	<3.01e0	n/a	n/a	n/a	3.010	n/a
S99T001345		D	Cerium-ICP-Acid Dil.	ug/mL	99.20	<1.00e-01	< 60.10	<6.01e1	n/a	n/a	n/a	60.10	n/a
S99T001345		D	Cobalt-ICP-Acid Dil.	ug/mL	100.2	<2.00e-02	< 12.00	<1.20e1	n/a	n/a	n/a	12.00	n/a
S99T001345		D	Copper-ICP-Acid Dil.	ug/mL	98.20	<1.00e-02	< 6.010	<6.01e0	n/a	n/a	n/a	6.010	n/a
S99T001345		D	Potassium-ICP-Acid Dil.	ug/mL	103.8	<5.00e-01	2.14e+03	2.14e+03	2.14e+03	0.00	n/a	301.0	n/a
S99T001345		D	Lanthanum-ICP-Acid Dil.	ug/mL	100.2	<5.00e-02	< 30.10	<3.01e1	n/a	n/a	n/a	30.10	n/a
S99T001345		D	Lithium-ICP-Acid Dil.	ug/mL	96.40	<1.00e-02	< 6.010	<6.01e0	n/a	n/a	n/a	6.010	n/a
S99T001345		D	Magnesium-ICP-Acid Dil.	ug/mL	99.80	<1.00e-01	< 60.10	<6.01e1	n/a	n/a	n/a	60.10	n/a
S99T001345		D	Molybdenum-ICP-Acid Dil.	ug/mL	99.20	<5.00e-02	87.30	76.90	82.10	12.7	n/a	30.10	n/a
S99T001345		D	Neodymium-ICP-Acid Dil.	ug/mL	99.20	<1.00e-01	< 60.10	<6.01e1	n/a	n/a	n/a	60.10	n/a
S99T001345		D	Phosphorus-ICP-Acid Dil.	ug/mL	101.2	<2.00e-01	5.98e+02	531.0	564.5	11.9	n/a	120.0	n/a
S99T001345		D	Lead-ICP-Acid Dil.	ug/mL	99.00	<1.00e-01	< 60.10	<6.01e1	n/a	n/a	n/a	60.10	n/a
S99T001345		D	Sulfur-ICP-Acid Dil.	ug/mL	96.80	<1.00e-01	6.91e+02	610.0	650.5	12.5	n/a	60.10	n/a
S99T001345		D	Antimony-ICP-Acid Dil.	ug/mL	99.00	<6.00e-02	44.80	39.50	42.15	12.6	n/a	36.10	n/a
S99T001345		D	Selenium-ICP-Acid Dil.	ug/mL	97.80	<1.00e-01	< 60.10	<6.01e1	n/a	n/a	n/a	60.10	n/a
S99T001345		D	Silicon-ICP-Acid Dil.	ug/mL	101.2	<5.00e-02	1.35e+02	127.0	131.0	6.11	n/a	30.10	n/a
S99T001345		D	Samarium-ICP-Acid Dil.	ug/mL	99.40	<1.00e-01	< 60.10	<6.01e1	n/a	n/a	n/a	60.10	n/a
S99T001345		D	Strontium-ICP-Acid Dil.	ug/mL	96.20	<1.00e-02	< 6.010	<6.01e0	n/a	n/a	n/a	6.010	n/a
S99T001345		D	Titanium-ICP-Acid Dil.	ug/mL	100.4	<1.00e-02	< 6.010	<6.01e0	n/a	n/a	n/a	6.010	n/a
S99T001345		D	Thallium-ICP-Acid Dil.	ug/mL	98.00	<2.00e-01	<1.20e+02	<1.20e2	n/a	n/a	n/a	120.0	n/a
S99T001345		D	Uranium-ICP-Acid Dil.	ug/mL	97.60	<5.00e-01	<3.01e+02	<3.01e2	n/a	n/a	n/a	301.0	n/a
S99T001345		D	Vanadium-ICP-Acid Dil.	ug/mL	99.60	<5.00e-02	< 30.10	<3.01e1	n/a	n/a	n/a	30.10	n/a
S99T001345		D	Zinc-ICP-Acid Dil.	ug/mL	99.40	<1.00e-02	< 6.010	<6.01e0	n/a	n/a	n/a	6.010	n/a
S99T001345			Bromide by Ion Chromatograph	ug/mL	98.61	<1.25e-01	<5.18e+02	<5.18e2	n/a	n/a	n/a	517.6	n/a
S99T001345			Oxalate-IC-Dionex 4000/450	ug/mL	102.1	<1.05e-01	<4.35e+02	<4.35e2	n/a	n/a	n/a	434.8	n/a
S99T001348			Cobalt-60 by GEA	uCi/mL	111.3	<1.46e-03	<4.34e-03	<5.00e-3	n/a	n/a	n/a	4.00e-03	n/a

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