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45 DAY SAFETY SCREENING RESULTS & FINAL REPORT FOR
TANK 241-BX-110 AUGER SAMPLES 95-AUG-045 &
95-AUG-046

Pages: 91

NOV 17 1995

ENGINEERING DATA TRANSMITTAL

Page 1 of 1

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2	1	Cog. Eng. R.D. Schreiber	<i>R.D. Schreiber</i>	11/17/95							
2	1	Cog. Mgr. J.G. Kristofzski	<i>J.G. Kristofzski</i>	11/17/95							
2	1	QA Tzu L. Tung	<i>Tzu L. Tung</i>	11/17/95							
		Safety									
		Env.									
2	1	Program Support A.D. Rice	<i>A.D. Rice</i>	11-17-95							

18. A.E. Young <i>A.E. Young</i> Signature of EDT Originator 11-15-95 Date	19. N/A Authorized Representative Date for Receiving Organization	20. J.G. Kristofzski <i>J.G. Kristofzski</i> Cognizant Manager 11/17/95 Date	21. DOE APPROVAL (if required) Ctrl. No. ☐ Approved ☐ Approved w/comments ☐ Disapproved w/comments
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Kara Broz

11/17/95

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ANALYTICAL SERVICES

45-DAY SAFETY SCREENING RESULTS AND FINAL REPORT FOR
TANK 241-BX-110, AUGER SAMPLES
95-AUG-045 AND 95-AUG-046

DATE PRINTED:

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NARRATIVE

**45-DAY SAFETY SCREENING RESULTS AND FINAL REPORT FOR TANK 241-BX-110,
AUGER SAMPLES 95-AUG-045 AND 95-AUG-046****Summary**

This is the 45-day and final report for auger samples taken from risers 3 and 6 of tank 241-BX-110 (BX-110) on October 12, 1995. The samples were received at the 222-S Laboratories on October 13, 1995 and underwent safety screening analyses (differential scanning calorimetry [DSC], thermogravimetric analysis [TGA], total alpha analysis, and bulk density analysis) per the safety screening data quality objective (DQO) (Reference 1). In addition to the safety screening analyses, the tank BX-110 samples were analyzed for total organic carbon (TOC) as part of the organic safety program's DQO (Reference 2). Tank BX-110 is not on the Organic Watch List; however, it is included in Appendix B of the Operating Specification Document (OSD) as a possible Organic Watch List tank. None of the notification limits specified in the tank BX-110 Sampling and Analysis Plan (SAP) (Reference 3) were exceeded for these auger samples; therefore, this tank's classification as an Appendix B tank, based solely on these auger samples, is not warranted. It must be noted, though, that this sampling event obtained only the top 12 inches of waste in a tank which has an estimated waste depth of 71 inches. To fully justify removal of tank BX-110 from Appendix B of the OSD, core sampling must be performed.

The data summary tables included in this report summarize the analytical results associated with these auger samples. In addition, the results of the statistical analyses (calculation of the 95% confidence limits) are given in Tables 2, 3, 4, and 5 on a sample by sample basis. The 95% confidence interval limits have also been calculated assuming that these random samples represent the entire population of the 12 inches sampled (similar to a calculation on an entire tank basis). Alpha total analysis was not included in this calculation because only one auger yielded results above the detection limit. The results for the TGA, DSC, and TOC analyses are summarized in Table 1, and corroborate the conclusion that the top 12 inches of waste in this tank may be classified as "safe".

Table 1: 95% Confidence Interval Limits for
the 12 Inches of Waste Sampled from Tank BX-110

Analysis	Lower or Upper Limit
TGA	0 wt% water (Lower)
DSC	30.87 J/g dry (Upper)
TOC	5376 $\mu\text{g C/g}$ (Upper)

As the final report for this analysis project, this report also contains the following information: chains of custody forms, photographs of the extruded samples, sample preparation data, and the raw data for all analyses. Although not included in this report, the hot cell logbook notes may be found in Reference 4.

Sample Receipt and Extrusion

Auger Sample 95-AUG-045 (Riser 6)

Auger sample 95-AUG-045 was collected from riser 6 of tank BX-110 on October 12, 1995, and was received at the 222-S Laboratories on October 13, 1995. Extrusion took place on October 18, 1995. Solid material totalling 125.7 grams was recovered from the top half of the auger (flutes 1 through 8) and was subsampled into one jar. The solid material was greyish/blue in color and appeared crystalline, similar to crushed ice. All analyses and archiving requirements were performed for the solid subsample in accordance with Reference 3. In addition to the solids, some greyish/blue, opaque drainable liquid was obtained; however, this liquid volume was insufficient for subsampling and was not retained.

Auger Sample 95-AUG-046 (Riser 3)

Auger sample 95-AUG-046 was collected from riser 3 of tank BX-110 on October 12, 1995, and was received at the 222-S Laboratories on October 13, 1995. Extrusion took place on October 19, 1995. Solid material totalling 185.2 grams was found on the bottom half of the auger, on flutes 9 through 20. The solids were a mixture of greyish/blue granular material (predominately flutes 9 through 13) and brown sludge (flutes 14 through 20), and was subsampled into one jar. All analyses and archiving requirements were performed for the solid subsample in accordance with Reference 3. Cloudy, brown liquid was also obtained with the solids, but this liquid volume was insufficient for subsampling. In addition to the solid and liquid sample material, a small piece of cloth covered with brown sludge material was obtained from the tip of the auger. This rag was archived per direction from the Safety Program.

Analytical Results

THERMOGRAVIMETRIC ANALYSIS (Percent Moisture)

Analyses for percent water by TGA were performed on sample numbers S95T002903 and S95T002945 (auger samples 95-AUG-045 and 95-AUG-046, respectively) using procedure LA-560-112, Rev. B-0. All samples were run under a nitrogen atmosphere. Primary and duplicate results varied widely between the two auger samples, with average results of 44.45 percent and 9.04 percent water for samples S95T002903 and S95T002945, respectively. This variability in the data may be a result of heterogeneity observed in the samples due to their crystalline nature (see Sample Receipt and Extrusion section above).

The maximum acceptable analytical precision per the SAP (Reference 3) is a relative percent difference (RPD) of 10% between the primary and duplicate sample results. Although the TGA precision for sample S95T002903 was within this criterion, the precision on sample S95T002945 exceeded the acceptance criterion, with an RPD value of 38.9%. A triplicate analysis was performed on sample S95T002945 due to the high RPD value, yielding a value of 9.66 percent water. This triplicate analysis is listed in the summary tables as an individual sample result and is identified by the number "1" in the Replicate or "R" column. The Laboratory Measurement Control System (LMCS) control standards exhibited recoveries of 101.1 and 101.3 percent, which were within the program's specified accuracy control limits of 90 to 110 percent.

Statistical analyses were performed on the TGA data per the requirements of Reference 2. The 95% confidence interval lower limits for each sample submitted for TGA analysis are presented in Table 2. The 95% confidence interval lower limit (LL) for sample S95T002903 is above the minimum criterion of 17% water stated in Reference 2, but the results for sample S95T002945 are below the limit. Since the DSC results for these samples are much less than the energetics safety limit of 480 J/g (dry weight basis), the low moisture content of sample S95T002945 does not constitute unsafe conditions. Further, a small amount of drainable liquid was obtained in both auger samples (see extrusion photographs), which should be factored in when determining the safety of this sample material from tank BX-110.

Table 2. 95% Confidence Interval Lower Limits for Percent Water (Units are in %).

Sample Number and Description	Avg	$\hat{\sigma}_{\bar{\mu}}^2$	LL
S95T002903 95-AUG-045	44.45	1.20	39.55
S95T002945 95-AUG-046	9.04	3.16	6.04

AUG = auger

$\hat{\sigma}_{\bar{\mu}}^2$ = variance of the mean

DIFFERENTIAL SCANNING CALORIMETRY

Differential thermal analyses were performed using procedure LA-514-113, Rev. C-0, under a nitrogen purge. All results were well below the safety screen notification limit of 480 joules/g (dry weight basis); therefore, no notifications were necessary.

The primary and duplicate sample results for samples S95T002903 and S95T002945 exceeded the precision criterion (RPD of less than 10%), with RPD values of 200% for both samples. Due to these high RPD values, triplicate analyses were performed for both samples, which yielded results of 10.99 J/g and 27.26 J/g (dry weight basis), respectively. These triplicate analyses are listed in the summary tables as additional sample results and are identified by the number "1" in the Replicate or "R" column (the value in the duplicate column is the original duplicate result; no second duplicate was performed). The Laboratory Measurement Control System (LMCS) control standards exhibited recoveries of 97.72 and 106.2 percent, which were within the program's specified accuracy control limits of 90 to 110 percent.

Statistical analyses were performed on the DSC data per the requirements of Reference 1. This document requires comparison of the 95% confidence interval upper limit of the data to the applicable limit (e.g. less than 480 J/g on a dry weight basis). The results for each sample submitted for DSC are presented in Table 3. The upper limit of the 95% confidence interval of the mean for all samples was below the safety screening criterion (Reference 3).

Table 3. 95% Confidence Interval Upper Limits
for DSC (Units are in joules/gram).

Sample Number and Description	Avg	$\hat{\sigma}^2_{\bar{\mu}}$	UL
S95T002903 95-AUG-045	8.23	52.58	20.45
S95T002945 95-AUG-046	15.02	191.60	38.36

AUG = auger

 $\hat{\sigma}^2_{\bar{\mu}}$ = variance of the meanALPHA TOTAL

The alpha total analyses were performed on samples S95T002906 and S95T002946 using procedure LA-508-101, Rev. D-2. Fusion digestions were prepared using procedure LA-549-141, Rev. D-0 and are identified as "F" in the aliquot or "A" column of the summary tables. In order to determine the notification limit for this analysis, the limit of 1 g/L as specified in References 1 and 3 was converted to units of microcuries per gram using the density of each sample (1.57 g/mL and 1.7 g/mL, respectively). For sample S95T002906, the notification limit was calculated to be 39.2 $\mu\text{Ci/g}$, and sample S95T002946 has a notification limit of 36.2 $\mu\text{Ci/g}$.

Both samples were analyzed for total alpha twice due to original spike recoveries which were well below the acceptable criterion. This low spike recovery is most likely due to the fact that a large sample size was used for the analysis, resulting in a high amount of solids on the sample mount. Although the results of this initial run are not shown on the summary tables, the raw data has been included in this report.

Both alpha total results for the second run were well below their respective notification limits and either below or near the instrument detection limit. The spike results for both of the samples were acceptable with values of 85.04% and 82.14%, respectively. However, since the results of sample S95T002906 were below the detection limit of $3.88\text{E-}03 \mu\text{Ci/g}$, and results for sample S95T002946 averaged 0.0109 $\mu\text{Ci/g}$ (about 3300 times below the sample's notification limit of 36.2 $\mu\text{Ci/g}$), the samples were not rerun. The Laboratory Measurement Control System (LMCS) control standard exhibited recovery of 89.84 percent, which was just outside of the program's specified accuracy control limits of 90 to 110 percent.

The statistical analysis (presented in Table 4) indicates that none of the alpha total results exceeded their safety screening notification criterion at an upper confidence level of 95%. Therefore, no additional analyses were necessary.

Table 4. 95% Confidence Interval Upper Limits for Total Alpha (Units are in $\mu\text{Ci/g}$).

Sample Number and Description	Avg	$\hat{\sigma}^2_{\bar{\mu}}$	UL
S95T002906 95-AUG-045	< DL	--	--
S95T002946 95-AUG-046	0.0109	1.45E-06	0.0163

AUG = auger

DL = detection limit

 $\hat{\sigma}^2_{\bar{\mu}}$ = variance of the meanTOTAL ORGANIC CARBON

As part of the organic safety program's DQO requirements, total organic carbon (TOC) analysis was performed on the two auger samples from tank BX-110 (sample numbers S95T002903 and S95T002945). Procedure LA-342-100, Rev. A-0 (direct persulfate method) was used for the analyses. Sample and duplicate values ranged from 0.347 wt% to 0.410 wt% carbon for the two samples, which are nearly a factor of ten below the notification limit of 3 wt% carbon as specified in the SAP. Both samples met the SAP-specified precision requirement of 10% RPD, with values of 0.29 and 5.26%, respectively. Laboratory Measurement Control System (LMCS) control standard exhibited a recovery of 96.33 percent, which was within the program's specified accuracy control limits of 90 to 110 percent. The statistical analysis (presented in Table 5) indicates that, using an upper 95% confidence interval limit, none of the TOC results exceeded the safety screening criterion of 3 wt%.

Table 5. 95% Confidence Interval Upper Limits for TOC (Units are in $\mu\text{g C/g}$).

Sample Number and Description	Avg	$\hat{\sigma}^2_{\bar{\mu}}$	UL
S95T002903 95-AUG-045	3480	50	3506
S95T002945 95-AUG-046	4000	22050	4658

AUG = auger

 $\hat{\sigma}^2_{\bar{\mu}}$ = variance of the mean

Project Coordinator: Ruth Schreiber

References:

- (1) Dukelow, G. T., J. W. Hunt, H. Babad, J. E. Meacham, "Tank Safety Screening Data Quality Objective," WHC-SD-WM-SP-004, Rev. 2, dated August 31, 1995, Westinghouse Hanford Company, Richland, Washington.
- (2) Turner, D. A., "Data Quality Objectives to Support Resolution of the Organic Complexant Safety Issue", WHC-SD-WM-DQO-006, Rev. 2, dated September 8, 1995, Westinghouse Hanford Company, Richland, Washington.
- (3) Schreiber, R. D., "Tank 241-BX-110 Auger Sampling and Analysis Plan," WHC-SD-WM-TSAP-038, Rev. 0, dated October 9, 1995, Westinghouse Hanford Company, Richland, Washington.
- (4) Fuller, R. K., Tank 241-BX-110, WHC-N-1276, Westinghouse Hanford Company, Richland, Washington.

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SAMPLE DATA SUMMARY

45-DAY AND FINAL REPORT FOR TANK
BX-110

CORE NUMBER: n/a
SEGMENT #: 95-AUG-045

SEGMENT PORTION: W Whole Segment

Sample#	R A#	Analyte	Unit	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S95T002903		% Water by TGA using Mettler	%	101.1	n/a	45.22	43.67	44.45	3.49	n/a	n/a	n/a
S95T002903	1	DSC Exotherm Dry Calculated	Joules/g Dry	n/a	n/a	10.99	0.00e+00	5.495	200	n/a	n/a	n/a
S95T002903		DSC Exotherm Dry	Joules/g Dry	n/a	n/a	13.69	0.00e+00	6.845	200	n/a	n/a	n/a
S95T002903	1	DSC Exotherm using Mettler	Joules/g	106.2	n/a	6.100	n/a	n/a	n/a	n/a	n/a	n/a
S95T002903		DSC Exotherm using Mettler	Joules/g	97.72	n/a	7.600	0.00e+00	3.800	200	n/a	n/a	n/a
S95T002903		TIC by Persulfate/Coulometry	ug/g	96.33	5.100	3.48e+03	3.47e+03	3.48e+03	0.29	92.50	80.00	n/a
S95T002903		TIC by Acid/Coulometry	ug/g	99.50	2.00e-01	681.0	687.0	684.0	0.88	102.3	5.000	n/a
S95T002905		Bulk Density of Sample	g/mL	n/a	n/a	1.570	n/a	n/a	n/a	n/a	5.00e-01	n/a
S95T002906	F	Alpha of Digested Solid	uci/g	89.84	<4.68e-03	<2.61E-03	<1.65E-3	n/a	n/a	85.04	3.88e-03	3.77E+02

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45-DAY AND FINAL REPORT FOR TANK
BX-110

CORE NUMBER: n/a
SEGMENT #: 95-AUG-046

SEGMENT PORTION: W Whole Segment

Sample#	R/A#	Analyte	Unit	Standard %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Count Err%
S95T002945	1	% Water by TGA using Mettler	%	101.3	n/a	9.660	n/a	n/a	n/a	n/a	n/a	n/a
S95T002945		% Water by TGA using Mettler	%	101.1	n/a	7.030	10.42	8.725	38.9	n/a	n/a	n/a
S95T002945	1	DSC Exotherm Dry Calculated	Joules/g Dry	n/a	n/a	27.26	17.81	22.54	200	n/a	n/a	n/a
S95T002945		DSC Exotherm Dry Calculated	Joules/g Dry	n/a	n/a	0.00e+00	17.81	8.905	200	n/a	n/a	n/a
S95T002945	1	DSC Exotherm using Mettler	Joules/g	106.2	n/a	24.80	n/a	n/a	n/a	n/a	n/a	n/a
S95T002945		DSC Exotherm using Mettler	Joules/g	97.72	n/a	0.00e+00	16.20	8.100	200	n/a	n/a	n/a
S95T002945		TOC by Persulfate/Coulometry	ug/g	96.35	5.100	4.10e+03	3.89e+03	4.00e+03	5.26	n/a	80.00	n/a
S95T002945		TIC by Acid/Coulometry	ug/g	99.50	2.00e-01	946.0	931.0	938.5	1.60	n/a	5.000	n/a
S95T002946	F	Alpha of Digested Solid	uCi/g	89.84	<4.68e-03	1.01e-02	1.18e-02	1.09e-02	15.5	82.14	4.08e-03	3.90E+01
S95T002948		Bulk Density of Sample	g/mL	n/a	n/a	1.700	n/a	n/a	n/a	n/a	5.00e-01	n/a

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WHC-SD-WM-DP-155, REV. 0

CHAIN OF CUSTODY FORMS

CHAIN-OF-CUSTODY RECORD FOR AUGER SAMPLING

James Sickels

(3) Supervisor

95-Aug-045

(2) Sample Number

2000-08-11

(1) Shipment Number

(4) Tank BX110

(5) Riser 6

(6) Cask Seal Number

Q-1024

Radiation Survey Data:		(7) FIELD		(31) LABORATORY		(18) Shipment Description	
Over Top Dose Rate	5 mR/hr	1.5 mR/hr	1.5 mR/hr	1.5 mR/hr	1.5 mR/hr	A. Work Package Number	ES-95-0352
Side Dose Rate	1 mR/hr	1.5 mR/hr	1.5 mR/hr	1.5 mR/hr	1.5 mR/hr	B. Cask Seal Number	2516
Bottom Dose Rate	1 mR/hr	1.5 mR/hr	1.5 mR/hr	1.5 mR/hr	1.5 mR/hr	C. Date and Time Sample	10/12/95
Removable Contamination	220 DPM	220 DPM	220 DPM	220 DPM	220 DPM	D. Expected Liquid Content	30
	1000 DPM	1000 DPM	1000 DPM	1000 DPM	1000 DPM	E. Expected Solid Content	70
						F. Dose Rate Through Drill String	45 mR/hr
						G. Expected Sample Length	12"
Signature	Signature	Signature	Signature	Signature	Signature		
RCR	RCR	RCR	RCR	RCR	RCR		

(9) INFORMATION (Include statement of laboratory tests to be performed.)

11

(10) Field Comments		(32) Laboratory Comments	

(11) Point of Origin		(12) Destination		(13) Sender Name (Sign and PRINT)		(14) Date/Time		(15) Sender Comments	
241-BX		2225		James Sickels James Sickels		10/13/95			
(17) Requisitioned By (Sign and PRINT)		(18) Received By (Sign and PRINT)		(19) Date/Time		(20) Receiver Comments			
James Sickels James Sickels		James Sickels James Sickels		10/13/95					
(21) Requisitioned By (Sign and PRINT)		(22) Received By (Sign and PRINT)		(23) Date/Time		(24) Receiver Comments			
David James Keane		David James Keane		10/13/95					
(25) Requisitioned By (Sign and PRINT)		(26) Received By (Sign and PRINT)		(27) Date/Time		(28) Receiver Comments			
David James Keane		David James Keane		10/13/95					
(29) Seal Intact Upon Receipt?		(30) Seal Data Consistent with the Record?		Cask Seal No.		Sample No.			
☒ Yes ☐ No		☒ Yes ☐ No		☒ Yes ☐ No		☒ Yes ☐ No			

CHAIN-OF-CUSTODY RECORD FOR AUGER SAMPLING

(1) Shipment Number 200W-08-TF (2) Sample Number 95-Aug-046 (3) Supervisor JAMES SICKELS
 (4) Tank BX-110 (5) Riser 3 (6) Cask Serial Number SN 59

Radiation Survey Data:		(7) FIELD	(31) LABORATORY	(8) Shipment Description	
Over Top Dose Rate	<u>2.5 mR/hr</u>		<u>2.5</u>	A. Work Package Number	<u>ES-95-00352</u>
Side Dose Rate	<u>1.5 mR/hr</u>		<u>3.0</u>	B. Cask Seal Number	<u>2518</u>
Bottom Dose Rate	<u>1 mR/hr</u>		<u>1.5</u>	C. Date and Time Sample	<u>10/12/95 1926</u>
Smearable Contamination	<u>420 DPM</u>		<u>420</u>	Removed from Tank	
	(Alpha)		(Alpha)	D. Expected Liquid Content	<u>30 %</u>
	<u>4100 DPM</u>		<u>4100</u>	E. Expected Solid Content	<u>70 %</u>
	(Beta-Gamma)		(Beta-Gamma)	F. Dose Rate Through Drill String	<u>140 mR/hr</u>
RCT*	<u>[Signature]</u>	RCT*	<u>[Signature]</u>	G. Expected Sample Length	<u>12"</u>
	(Signature)		(Signature)		

(9) INFORMATION (Include statement of laboratory tests to be performed.)

12

(10) Field Comments	(32) Laboratory Comments
---------------------	--------------------------

(11) Point of Origin <u>241-BX</u>	(12) Destination <u>2225</u>	(13) Sender Name (Sign and PRINT) <u>JAMES SICKELS</u>	(14) Date/Time <u>10/13/95 0915</u>	(15) Sender Comments
(17) Relinquished By (Sign and PRINT) <u>JAMES SICKELS</u>	(18) Received By (Sign and PRINT) <u>DAVID KEANE</u>	(19) Date/Time <u>10/19/95 0915</u>	(20) Receiver Comments	
(21) Relinquished By (Sign and PRINT) <u>DAVID KEANE</u>	(22) Received By (Sign and PRINT) <u>EDWINES</u>	(23) Date/Time <u>10-13-95 1025</u>	(24) Receiver Comments	
(25) Relinquished By (Sign and PRINT)	(26) Received By (Sign and PRINT)	(27) Date/Time	(28) Receiver Comments	
(29) Seal Intact Upon Release? ☒ Yes ☐ No	(29) Seal Intact Upon Receipt? ☐ Yes ☐ No	(30) Seal Data Consistent with this Record? ☒ Yes ☐ No		
Shipment No. ☒ Yes ☐ No		Cask Seal No. ☒ Yes ☐ No		Sample No. ☒ Yes ☐ No

WHC-SD-WM-DP-155, REV. 0

PHOTOGRAPHS

BX-110 95-AUG-04S

10-18-95

BX-110 95-AUG-046

WHC-SD-WM-DP-155, REV. 0

SAMPLE HANDLING

LABCORE Data Entry Template for Worklist#

2924

Analyst: EC Instrument: BA000 Book # NA

Method: LO-160-103 Rev/Mod A7

Worklist Comment: BX-110 95-AUG-045 RISER 6 EXTRUSION

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1	INSTCHK01				EXTRUD01	SOLID	<u>20</u>	<u>19.98</u>	<u>N/A</u>	
		2	INSTCHK02				EXTRUD01	SOLID	<u>500</u>	<u>499.75</u>	<u>N/A</u>	
95000160	BX-110	3	SAMPLE	S95T002866	0		DLIQVOL1	SOLID	<u>N/A</u>	<u>0</u>		ml
95000160	BX-110	4	SAMPLE	S95T002866	0		DLIQWT01	SOLID	<u>N/A</u>	<u>0</u>		g
95000160	BX-110	5	SAMPLE	S95T002866	0		EST.G/ML	SOLID	<u>N/A</u>	<u>0</u>		g/ml
95000160	BX-110	6	SAMPLE	S95T002866	0		EXTRUD01	SOLID	<u>N/A</u>	<u>complete</u>		
95000160	BX-110	7	SAMPLE	S95T002866	0		LLIQWT01	SOLID	<u>N/A</u>	<u>0</u>		g
95000160	BX-110	8	SAMPLE	S95T002866	0		NOTEBOOK	SOLID	<u>N/A</u>	<u>N-1276</u> <u>N-1024</u> <u>Box</u> <u>11/15/95</u>		
95000160	BX-110	9	SAMPLE	S95T002866	0		SLDVOL01	SOLID	<u>N/A</u>	<u>NA</u>		ml
95000160	BX-110	10	SAMPLE	S95T002866	0		SLDWT-01	SOLID	<u>N/A</u>	<u>125.7</u>		g
95000160	BX-110	11	SAMPLE	S95T002866	0		APPEAR01	SOLID	<u>N/A</u>	<u>complete</u>		
95000160	BX-110	12	SAMPLE	S95T002866	0		ORGVOL01	SOLID	<u>N/A</u>	<u>0</u>		ml

Final page for worklist #

2924

EC 10-19-95
Analyst Signature Date

EC 10-19-95
Analyst Signature Date

Reviewed by RK Fuller 10/20/95

Data Entry Comments:

LABCORE Data Entry Template for Worklist#

2928

Analyst: EC Instrument: BA000 Book # 4A

Method: LO-160-103 Rev/Mod A-7

Worklist Comment: BX-110 95-AUG-046 RISER 3 EXTRUSION

GROUP	PROJECT	S TYPE	SAMPLE#	R A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 INSTCHK01			EXTRUD01	SOLID	<u>20</u>	<u>19.99</u>	<u>N/A</u>	
		2 INSTCHK02			EXTRUD01	SOLID	<u>500</u>	<u>499.75</u>	<u>N/A</u>	
95000160	BX-110	3 SAMPLE	S95T002867	0	DLIQVOL1	SOLID	<u>N/A</u>	<u>0</u>		mL
95000160	BX-110	4 SAMPLE	S95T002867	0	DLIQWT01	SOLID	<u>N/A</u>	<u>0</u>		g
95000160	BX-110	5 SAMPLE	S95T002867	0	EST.G/ML	SOLID	<u>N/A</u>	<u>0</u>		g/mL
95000160	BX-110	6 SAMPLE	S95T002867	0	EXTRUD01	SOLID	<u>N/A</u>	<u>complete</u>		
95000160	BX-110	7 SAMPLE	S95T002867	0	LLIQWT01	SOLID	<u>N/A</u>	<u>0</u>		g
95000160	BX-110	8 SAMPLE	S95T002867	0	NOTEBOOK	SOLID	<u>N/A</u>	<u>N-1276</u>		
95000160	BX-110	9 SAMPLE	S95T002867	0	SLDVOL01	SOLID	<u>N/A</u>	<u>NA</u>		mL
95000160	BX-110	10 SAMPLE	S95T002867	0	SLDWT-01	SOLID	<u>N/A</u>	<u>185.2</u>		g
95000160	BX-110	11 SAMPLE	S95T002867	0	APPEAR01	SOLID	<u>N/A</u>	<u>complete</u>		
95000160	BX-110	12 SAMPLE	S95T002867	0	ORGVOL01	SOLID	<u>N/A</u>	<u>0</u>		mL

Final page for worklist #

2928

EC 10-25-95
Analyst Signature Date

EC 10-25-95
Analyst Signature Date

Reviewed by Attila B. Bandy 10-25-95

Data Entry Comments:

Bulk Density Worksheet

Requestor: R. Schaefer

Date: 10-23-95

Tank: BX110
Core: -
Seg: -
Auger: -

Start Time: _____
End Time: _____

Homogenization Time (Min.): 2902 ABC
5957002902 10/23/95

Jar#: 8171
Jar/Vial Size: 250 mL
Initial Weight: 15 g
Final Weight: 22.3 g
Net Weight: 7.3 g

Cone#: 8171
Final Vol: 10 mL
Initial Weight: 7.6 g
Final Weight: 22.3 g
Net Weight: 15.7 g

Appearance/Narrative: ABC 11/16/95
15.7 / 10 = 1.57 g/mL

WHC-SD-WM-DP-155, REV. 0

Tank: _____
Core: _____
Seg: _____
Auger: _____

Start Time: _____
End Time: _____

Homogenization Time (Min.): _____

Jar#: 1023
Jar/Vial Size: 42 mL
Initial Weight: _____ g
Final Weight: _____ g
Net Weight: _____ g

Cone#: _____
Final Vol: _____ mL
Initial Weight: _____ g
Final Weight: _____ g
Net Weight: _____ g

Appearance/Narrative: _____

Bulk Density Worksheet

WHC-SD-WM-DP-155, REV. 0

Date: 10/23/95

Requestor: R Schreiber

Tank: BX/10

Core: _____

Seg: _____

Auger: 95 Aug 0016

Start Time: _____
End Time: _____

Homogenization Time (Min.): 5.5

Jar#: 8236

Jar/Vial Size: 250 mL

Initial Weight: 351.5 g

Final Weight: _____ g

Net Weight: _____ g

Cone#: 8236

Final Vol: _____ mL

Initial Weight: 7.6 g

Final Weight: 29.5 g

Net Weight: 21.9 g

Appearance/Narrative:

21.9 / 21.5 = 1.72

Tank: _____

Core: _____

Seg: _____

Auger: _____

Start Time: _____
End Time: _____

Homogenization Time (Min.): _____

Jar#: _____

Jar/Vial Size: _____ mL

Initial Weight: _____ g

Final Weight: _____ g

Net Weight: _____ g

Cone#: _____

Final Vol: _____ mL

Initial Weight: _____ g

Final Weight: _____ g

Net Weight: _____ g

Appearance/Narrative:

WHC-SD-WM-DP-155, REV. 0

SAMPLE PREPARATIONS

LABCORE Data Entry Template for Worklist#

3159

Analyst:

QAM

Instrument:

FUS01 ALV066

Book #

N/A

Method: LA-549-141 Rev/Mod

D-0

Worklist Comment: BX-110 FUSION - 2903->2906, 2945->2946

GROUP	PROJECT	S TYPE	SAMPLE#	R A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 BLNK-PREP			FUSION01	SOLID	<u>-2501</u>	<u>-2501</u>	<u>N/A</u>	<u>g/L</u>
95000160	BX-110	2 SAMPLE	S95T002906	0 F	FUSION01	SOLID	<u>N/A</u>	<u>2.7572</u>		<u>g/L</u>
		<u>.6893g -> .2501</u>								
95000160	BX-110	3 SAMPLE	S95T002906	0 F	DOSE-02	SOLID	<u>N/A</u>	<u>5</u>		<u>mrad/hour</u>
95000160	BX-110	4 DUP	S95T002906	0 F	FUSION01	SOLID	<u>2.7572</u>	<u>2.6588</u>	<u>N/A</u>	<u>g/L</u>
		<u>.6697g -> .2501</u>								
95000160	BX-110	5 DUP	S95T002906	0 F	DOSE-02	SOLID		<u>5</u>	<u>N/A</u>	<u>mrad/hour</u>
95000160	BX-110	6 SAMPLE	S95T002946	0 F	FUSION01	SOLID	<u>N/A</u>	<u>2.6220</u>		<u>g/L</u>
		<u>.6555g -> .2501</u>								
95000160	BX-110	7 SAMPLE	S95T002946	0 F	DOSE-02	SOLID	<u>N/A</u>	<u>7.5</u>		<u>mrad/hour</u>
95000160	BX-110	8 DUP	S95T002946	0 F	FUSION01	SOLID	<u>2.6220</u>	<u>2.6880</u>	<u>N/A</u>	<u>g/L</u>
		<u>.6720g -> .2501</u>								
95000160	BX-110	9 DUP	S95T002946	0 F	DOSE-02	SOLID		<u>7.5</u>	<u>N/A</u>	<u>mrad/hour</u>

Final page for worklist #

3159

QAM
Analyst Signature

11-1-95
Date

R. Jones
Analyst Signature

11-2-95
Date

Data Entry Comments:

Blank 20-ml HCl, 30ml HNO₃, <1% solids. All samples &
dup - 20ml HCl, 30ml HNO₃, <1% solids.
HPT was Bob Clements

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.

Bernard Griffin II 22

11-7-95

WHC-SD-WM-DP-155, REV. 0

INORGANIC ANALYSES

LABCORE Data Entry Template for Worklist#

3314

Analyst: ADP Instrument: DSC0 1 Book # 12N14-A

Method: LA-514-113 Rev/Mod CO

Worklist Comment: Please run BX-110 DSCs under N2. bdv

GROUP	PROJECT	S TYPE	SAMPLE#	R A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 STD			DSC-01	SOLID	<u>28.45</u>	<u>27.8</u>	<u>N/A</u>	Joules/g
95000160	BX-110	2 SAMPLE	S95T002903	0	DSC-01	SOLID	<u>N/A</u>	<u>7.6</u>		Joules/g
95000160	BX-110	3 DUP	S95T002903	0	DSC-01	SOLID	<u>7.6</u>	<u>Ø</u>	<u>N/A</u>	Joules/g
95000160	BX-110	4 SAMPLE	S95T002945	0	DSC-01	SOLID	<u>N/A</u>	<u>Ø</u>		Joules/g
95000160	BX-110	5 DUP	S95T002945	0	DSC-01	SOLID	<u>Ø</u>	<u>16.2</u>	<u>N/A</u>	Joules/g

Final page for worklist #

3314

Anthony Perento 11-9-95
Analyst Signature Date

BD. Valenzuela for Steve Peterson
Analyst Signature Date 11/14/95

Verified by Blandina Valenzuela
11/14/95

S95T002903 produced two endotherms at 119.3°C with a delta H of 773.4 J/g and another at 234.9°C with a delta H of 41.2 J/g.

Data Entry Comments:

S95T002945 produced two endotherms at 119.3°C with a delta H of 808.5 J/g and second at 230.9°C with a delta H of 74.2 J/g.

SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 25 TO 28.

DSC STD 12N14A N2

8.020 mg

Rate: 10.0 °C/min

File: 00015.001

Ident: 0.0

DSC METTLER

09-Nov-95

222-S Laboratory

exo >

10. mW

Integration
Delta H 223 mJ
27.8 J/g
Peak 158.0 °C
-16.0 mW

Ruth D. Schell for BDV
11/17/95

120.

140.

160.

180. °C

WHC-SD-WM-DP-155, REV.0

S95T002903 SAM N2

35.557 mg

Rate: 10.0 °C/min

File: 00017.001

DSC METTLER

09-Nov-95

Ident: 0.0

222-S Laboratory

exo>

50. mW

Integration
Delta H 27498 mJ
773.4 J/g
Peak 119.3°C
-86.6 mW

Integration
Delta H 1465 mJ
41.2 J/g
Peak 234.9°C
-7.0 mW

Integration
Delta H 270 mJ
7.6 J/g
Peak 457.7°C
1.7 mW

100.

200.

300.

400.

°C

WHC-SD-WM-DP-155, REV. 0

S95T002903 DUP N2
 17.344 mg
 File: 00019.001 DSC METTLER 09-Nov-95
 Rate: 10.0 °C/min Ident: 0.0 222-S Laboratory

LABCORE Data Entry Template for Worklist#

3503

Analyst: J&S Instrument: DSC0 1 Book # 12N14A

Method: LA-514-113 Rev/Mod C-0

Worklist Comment: Please run BX-110 DSCs under N2. bdv

GROUP	PROJECT	S TYPE	SAMPLE#	R A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 STD			DSC-01	SOLID	<u>28.45</u>	<u>30.2</u>	<u>N/A</u>	Joules/g
95000160	BX-110	2 SAMPLE	S95T002903	1	DSC-01	SOLID	<u>N/A</u>	<u>6.1</u>		Joules/g
95000160	BX-110	3 SAMPLE	S95T002945	1	DSC-01	SOLID	<u>N/A</u>	<u>24.8</u>		Joules/g

Final page for worklist # **3503**

J&S 11/14/95
Analyst Signature Date

Blandina Valenzuela
Analyst Signature Date

Data Entry Comments: S95T002945 produced two endotherms, one at 134.9°C with a delta H of 986.5 J/g and another at 287.3°C with a delta H of 76.5 J/g
S95T002903 produced two endotherms one at 119.3°C with a delta H of 779.2 J/g and 308.5°C with a delta H of 79.3 J/g
Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 30 TO 32.

S95T002945 N2
 14.060 mg
 Rate: 10.0 °C/min
 File: 00078.001 DSC METTLER 14-Nov-95
 Ident: 0.0 222-S Laboratory

S95T002903 N2

31.227 mg

Rate: 10.0 °C/min

File: 00080.001

Ident: 0.0

DSC METTLER

14-Nov-95

222-S Laboratory

exo>

32

50. mW

Integration
Delta H 2475 mJ
79.3 J/g
Peak 308.5°C
-12.3 mW

Integration
Delta H 24333 mJ
779.2 J/g
Peak 119.3°C
-87.2 mW

Integration
Delta H 773 mJ
24.8 J/g
Peak 431.8°C
4.5 mW

100.

200.

300.

400.

°C

WHC-SD-WM-DP-155, REV. 0

LABCORE Data Entry Template for Worklist#

3509

Analyst: BDV Instrument: DSC01 Book #

Method: LA-514-113 Rev/Mod

Worklist Comment: Dry DSC for BX-110. bdv

GROUP	PROJECT	S TYPE	SAMPLE#	R A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
95000160	BX-110	1 SAMPLE	S95T002903	0	DSC-02	SOLID	N/A	13.69		Joules/g Dry
95000160	BX-110	2 DUP	S95T002903	0	DSC-02	SOLID	13.69	Ø	N/A	Joules/g Dry
95000160	BX-110	3 SAMPLE	S95T002903	1	DSC-02	SOLID	N/A	10.99		Joules/g Dry
95000160	BX-110	4 SAMPLE	S95T002945	0	DSC-02	SOLID	N/A	Ø		Joules/g Dry
95000160	BX-110	5 DUP	S95T002945	0	DSC-02	SOLID	Ø	17.81	N/A	Joules/g Dry
95000160	BX-110	6 SAMPLE	S95T002945	1	DSC-02	SOLID	N/A	27.26		Joules/g Dry

Data entered & verified by **Final page for worklist # 3509**

Blandina Valenzuela
Analyst Signature Date

Analyst Signature Date

Data Entry Comments:

LABCORE Data Entry Template for Worklist#

3124

Analyst: ADP Instrument: TGA0 1 Book # 65N8A

Method: LA-560-112 Rev/Mod 30

Worklist Comment: Please run BX-110 TGAs under N2. bdv

GROUP	PROJECT	S TYPE	SAMPLE#	R A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 STD			TGA-01	SOLID	<u>59.74</u>	<u>60.41</u>	<u>N/A</u>	%
95000160	BX-110	2 SAMPLE	S95T002903	0	TGA-01	SOLID	<u>N/A</u>	<u>45.22</u>		%
95000160	BX-110	3 DUP	S95T002903	0	TGA-01	SOLID	<u>45.22</u>	<u>43.67</u>	<u>N/A</u>	%
95000160	BX-110	4 SAMPLE	S95T002945	0	TGA-01	SOLID	<u>N/A</u>	<u>7.03</u>		%
95000160	BX-110	5 DUP	S95T002945	0	TGA-01	SOLID	<u>7.03</u>	<u>10.42</u>	<u>N/A</u>	%

Final page for worklist #

3124

Anthony Puentes 11-9-95
Analyst Signature Date

Shelley 11/13/95
Analyst Signature Date

Verified by Blandina Valenzuela
11/14/95

Data Entry Comments: S95T002945 produced a second weight loss step of
24.86%

SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 35 TO 39.

S95T002903 SAM N2
36.790 mg

File: 00018.001 TG METTLER 09-Nov-95
Ident: 0.0 222-S Laboratory

Rate: 10.0 °C/min

Step Analysis
Height-16.64 mg
-45.22 %
Resid. 20.15 mg
54.78 %
Dpeak 143.0 °C

S95T002945 SAM N2
41.757 mg

Rate: 10.0 °C/min

File: 00022.001 TG METTLER 09-Nov-95
Ident: 0.0 222-S Laboratory

Step Analysis

Height 10.93 mg

Ratio 27.03 %

Height 25.82 mg

Ratio 61.97 %

Dpeak 11.2 °C

6 mg

Step Analysis

Height 10.99 mg

Ratio 24.86 %

Height 28.44 mg

Ratio 69.14 %

Dpeak 137.0 °C

100. 200. 300. 400. °C

S95T002945 DUP N2

35.467 mg

Rate: 10.0 °C/min

File: 00024.001 TG METTLER 09-Nov-95

Ident: 0.0 222-S Laboratory

Step Analysis

Height 38.70 mg

-10.42 %

Resid. 31.77 mg

91.89 %

Step Analysis

Height 37.27 mg

-20.51 %

Resid. 24.50 mg

69.07 %

Break 147.0 °C

LABCORE Data Entry Template for Worklist#

3504

Analyst: Jds Instrument: TGA0 1 Book # 6518AMethod: LA-560-112 Rev/Mod B-1

Worklist Comment: Please run BX-110 TGAs under N2. bdv

GROUP	PROJECT	S TYPE	SAMPLE#	R A	-----TEST-----	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 STD			TGA-01	SOLID	<u>59.74</u>	<u>60.50</u>	<u>N/A</u>	%
95000160	BX-110	2 SAMPLE	S95T002945	1	TGA-01	SOLID	<u>N/A</u>	<u>9.66</u>		%

Final page for worklist # 3504

Jak Spk 11-14-95
Analyst Signature DateBlandina Valenzuela 11/15/95
Entered & verified by
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.

SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 41 TO 42.

WHC-SD-WM-DP-155, REV. 0
LABCORE Data Entry Template for Worklist#

3410

Analyst: KRM Instrument: CARB2 Book # 17N12A
16N12B

Method: LA-342-100 Rev/Mod C-0

Worklist Comment: BX-110 TICTOC1 KRM

GROUP	PROJECT	S TYPE	SAMPLE#	R A	TEST-----	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 BLNK			@TICTOC1 TIC-02	SOLID	1	5.4	0.2	ug/g
		1 BLNK			@TICTOC1 TOC-02	SOLID	1	5.1	0.2	ug/g
		2 STD			@TICTOC1 TIC-02	SOLID	6.00E ²	5.97E ²	N/A	ug/g
		2 STD			@TICTOC1 TOC-02	SOLID	3.00E ³	2.89E ³	N/A	ug/g
95000160	BX-110	3 SAMPLE	S95T002903	0	@TICTOC1 TIC-02	SOLID	N/A	6.8E ²	5	ug/g
95000160	BX-110	3 SAMPLE	S95T002903	0	@TICTOC1 TOC-02	SOLID	N/A	3.48E ³	40	ug/g
95000160	BX-110	4 DUP	S95T002903	0	@TICTOC1 TIC-02	SOLID	6.8E ²	6.87E ²	N/A	ug/g
95000160	BX-110	4 DUP	S95T002903	0	@TICTOC1 TOC-02	SOLID	3.48E ³	3.47E ³	N/A	ug/g
95000160	BX-110	5 SPK	S95T002903	0	@TICTOC1 TIC-02	SOLID	100	102.3	N/A	ug/g
95000160	BX-110	5 SPK	S95T002903	0	@TICTOC1 TOC-02	SOLID	100	92.5	N/A	ug/g
95000160	BX-110	6 SAMPLE	S95T002945	0	@TICTOC1 TIC-02	SOLID	N/A	9.46E ²	5	ug/g
95000160	BX-110	6 SAMPLE	S95T002945	0	@TICTOC1 TOC-02	SOLID	N/A	4.10E ³	40	ug/g
95000160	BX-110	7 DUP	S95T002945	0	@TICTOC1 TIC-02	SOLID	9.46E ²	9.31E ²	N/A	ug/g
95000160	BX-110	7 DUP	S95T002945	0	@TICTOC1 TOC-02	SOLID	4.10E ³	3.89E ³	N/A	ug/g

Final page for worklist #

3410

Analyst Signature

Date

Analyst Signature

Date

Data Entry Comments:

Reviewed by H. Anastos 11-13-95

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

Sample: BLK

Date: 11/10/95

Time: 08:50:59

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

Analyst : KR MONTEITH
Min Readings = 22
Max Readings = 22
% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.20	0.00
2	1.01	0.40	50.00
3	1.51	0.80	50.00
4	2.00	1.20	33.33
5	2.50	1.50	20.00
6	3.00	1.80	16.67
7	3.50	2.00	10.00
8	4.00	2.30	13.04
9	4.50	2.60	11.54
10	5.00	2.80	7.14
11	5.50	3.00	6.67
12	6.00	3.20	6.25
13	6.50	3.50	8.57
14	7.00	3.70	5.41
15	7.50	3.90	5.13
16	8.00	4.10	4.88
17	8.50	4.30	4.65
18	9.00	4.50	4.44
19	9.50	4.80	6.25
20	10.00	5.00	4.00
21	10.50	5.20	3.85
22	11.00	5.40	3.70

SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 44 TO 59.

BLANK VALUE = 5.4 micrograms carbon

BLANK FACTOR = 5.4 / 10.99969 = +4.9E-01 ug/min Carbon

Sample Run By

KR MONTEITH

11-10-95

00000

WHC-SD-WM-DP-155, REV. 0

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

Sample: BLK

Date: 11/10/95

Time: 09:04:50

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

Analyst : KR MONTEITH
Min Readings = 22
Max Readings = 22
% Difference = 10

== Reading ==	== Analysis Time ==	== Coulometer ==	== % Difference ==
1	0.51	0.10	0.00
2	1.01	1.20	91.67
3	1.50	4.20	71.43
4	2.00	7.40	43.24
5	2.50	9.30	20.43
6	3.01	10.40	10.58
7	3.50	11.10	6.31
8	4.00	11.60	4.31
9	4.50	12.10	4.13
10	5.00	12.60	3.97
11	5.50	13.20	4.55
12	6.00	13.70	3.65
13	6.50	14.10	2.84
14	7.00	14.40	2.08
15	7.50	14.90	3.36
16	8.00	15.20	1.97
17	8.50	15.60	2.56
18	9.00	15.80	1.27
19	9.50	16.00	1.25
20	10.00	16.50	3.03
21	10.50	16.70	1.20
22	11.00	17.00	1.76

BLANK VALUE = 17 micrograms carbon

BLANK FACTOR = 17 / 10.99982 = +1.55E+00 ug/min Carbon

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

Sample Run By:

KR MONTEITH

00000

WHC-SD-WM-DP-155, REV. 0

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: STD

Date: 11/10/95

Time: 09:18:00

Sample Size = 1000 uL

Dil Factor = 1

Blank ID # =

Blank Value = .49 ug/minute C

Analyst : KR MONTEITH

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading ==	== Analysis Time ==	== Coulometer ==	== % Difference ==
1	0.51	0.10	0.00
2	1.01	42.30	99.76
3	1.51	211.90	80.04
4	2.00	378.80	44.06
5	2.50	491.20	22.88
6	3.00	548.90	10.51
7	3.50	575.10	4.56
8	4.00	586.10	1.88
9	4.50	591.10	0.85
10	5.00	593.70	0.44
11	5.50	595.30	0.27
12	6.00	596.50	0.20
13	6.50	597.50	0.17
14	7.00	598.30	0.13
15	7.50	599.00	0.12
16	8.00	599.70	0.12
17	8.50	600.30	0.10
18	9.00	600.80	0.08
19	9.50	601.30	0.08
20	10.00	601.60	0.05
21	10.50	602.10	0.08
22	11.00	602.50	0.07

USER INPUT BLANK VALUE

BLANK VALUE = 5.38991 micrograms carbon

BLANK FACTOR = 5.38991 / 10.99982 = +4.9E-01 ug/min Carbon

SAMPLE RESULTS:

(602.5 - 5.390359) (1) / (1000) = +5.971E-01 g/L Carbon
 (602.5 - 5.390359) (1) / (1000) (12) = +4.976E-02 Molar Carbon

Sample Run By:

KR MONTEITH

00000

WHC-SD-WM-DP-155, REV. 0

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: STD

Date: 11/10/95

Time: 09:30:04

Sample Size = 200 uL

Dil Factor = 1

Blank ID # =

Blank Value = 1.55 ug/minute C

Analyst : KR MONTEITH

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading ==	Analysis Time ==	Coulometer ==	% Difference ==
1	0.51	0.40	0.00
2	1.01	10.90	96.33
3	1.50	103.20	89.44
4	2.00	291.30	64.57
5	2.50	455.50	36.05
6	3.00	534.60	14.80
7	3.50	565.50	5.46
8	4.00	576.90	1.98
9	4.50	581.40	0.77
10	5.00	584.10	0.46
11	5.50	585.80	0.29
12	6.00	587.10	0.22
13	6.50	588.30	0.20
14	7.00	589.10	0.14
15	7.50	590.10	0.17
16	8.00	590.70	0.10
17	8.50	591.60	0.15
18	9.00	592.00	0.07
19	9.50	592.60	0.10
20	10.00	593.10	0.08
21	10.50	593.60	0.08
22	11.00	594.00	0.07

USER INPUT BLANK VALUE

BLANK VALUE = 17.04972 micrograms carbon

BLANK FACTOR = 17.04972 / 10.99982 = +1.5E+00 ug/min Carbon

SAMPLE RESULTS:

(594 - 17.05104) (1) / (200) = +2.885E+00 g/L Carbon
 (594 - 17.05104) (1) / (200) (12) = +2.404E-01 Molar Carbon
 <<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!>>>>

Sample Run By:

KR MONTEITH

00000

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: R BLK

Date: 11/10/95

Time: 11:28:36

Sample Size = 1 uL

Dil Factor = 1

Blank ID # =

Blank Value = .49 ug/minute C

Analyst : KR MONTEITH

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.20	0.00
2	1.01	1.20	83.33
3	1.51	1.80	33.33
4	2.00	2.30	21.74
5	2.50	2.60	11.54
6	3.00	2.80	7.14
7	3.50	3.00	6.67
8	4.00	3.20	6.25
9	4.50	3.30	3.03
10	5.00	3.50	5.71
11	5.50	3.70	5.41
12	6.00	3.80	2.63
13	6.50	3.90	2.56
14	7.00	4.10	4.88
15	7.50	4.20	2.38
16	8.00	4.40	4.55
17	8.50	4.50	2.22
18	9.00	4.60	2.17
19	9.50	4.80	4.17
20	10.00	4.90	2.04
21	10.50	5.00	2.00
22	11.00	5.20	3.85

USER INPUT BLANK VALUE

BLANK VALUE = 5.38991 micrograms carbon

BLANK FACTOR = 5.38991 / 10.99982 = +4.9E-01 ug/min Carbon

SAMPLE RESULTS:

(5.2 - 5.389821) (1) / (1) = < 5.00 E-3 g/L Carbon
(5.2 - 5.389821) (1) / (1) (12) = < 4.17 E-4 Molar Carbon

Sample Run By:

KR MONTEITH

00000

WHC-SD-WM-DP-155, REV. 0

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: R BLK

Date: 11/10/95

Time: 11:41:18

Sample Size = 1 uL

Dil Factor = 1

Blank ID # =

Blank Value = 1.55 ug/minute C

Analyst : KR MONTEITH

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading ==	== Analysis Time ==	== Coulometer ==	== % Difference ==
1	0.51	0.00	0.00
2	1.01	0.80	100.00
3	1.50	3.10	74.19
4	2.00	5.40	42.59
5	2.50	6.90	21.74
6	3.00	7.80	11.54
7	3.50	8.50	8.24
8	4.00	8.90	4.49
9	4.50	9.20	3.26
10	5.00	9.50	3.16
11	5.50	9.80	3.06
12	6.00	10.00	2.00
13	6.50	10.30	2.91
14	7.00	10.50	1.90
15	7.50	10.70	1.87
16	8.00	10.90	1.83
17	8.50	11.10	1.80
18	9.00	11.30	1.77
19	9.50	11.50	1.74
20	10.00	11.60	0.86
21	10.50	11.80	1.69
22	11.00	11.90	0.84

USER INPUT BLANK VALUE

BLANK VALUE = 17.04972 micrograms carbon

BLANK FACTOR = 17.04972 / 10.99982 = +1.5E+00 ug/min Carbon

SAMPLE RESULTS:

(11.9 - 17.04934) (1)/(1) = < 5.00 E-3 g/L Carbon
 (11.9 - 17.04934) (1)/(1) (12) = < 4.17 E-4 Molar Carbon
 <<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!>>>>

Sample Run By:

KR MONTEITH

00000

WHC-SD-WM-DP-155, REV. 0

L 40

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: 2903

Date: 11/10/95

Time: 11:55:03

Sample Size = 1 uL

Dil Factor = 1

Blank ID # =

Blank Value = .49 ug/minute C

Analyst : KR MONTEITH

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading ==	==== Analysis Time ==	==== Coulometer ==	==== % Difference ==
1	0.51	0.20	0.00
2	1.01	4.40	95.45
3	1.50	15.60	71.79
4	2.00	34.90	55.30
5	2.50	51.40	32.10
6	3.00	61.10	15.88
7	3.50	66.10	7.56
8	4.00	68.60	3.64
9	4.50	69.80	1.72
10	5.00	70.60	1.13
11	5.50	71.40	1.12
12	6.00	71.90	0.70
13	6.50	72.20	0.42
14	7.00	72.50	0.41
15	7.50	72.80	0.41
16	8.00	73.10	0.41
17	8.50	73.40	0.41
18	9.00	73.70	0.41
19	9.50	73.90	0.27
20	10.00	74.20	0.40
21	10.50	74.40	0.27
22	11.00	74.80	0.53

USER INPUT BLANK VALUE

BLANK VALUE = 5.38991 micrograms carbon

BLANK FACTOR = 5.38991 / 10.99982 = +4.9E-01 ug/min Carbon

SAMPLE RESULTS:

(74.8 - 5.390299) (1) / (1) = +6.94E+01 g/L Carbon
 (74.8 - 5.390299) (1) / (1) (12) = +5.78E+00 Molar Carbon

Sample Run By:

KR MONTEITH

00000

$\frac{69.4}{.1019} = 6.81 \times 10^2$ WHC-SD-WM-DP-155, REV. 0
50

P

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: 2903

Date: 11/10/95

Time: 12:07:48

Sample Size = 1 uL

Dil Factor = 1

Blank ID # =

Blank Value = 1.55 ug/minute C

Analyst : KR MONTEITH

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading ==	== Analysis Time ==	== Coulometer ==	== % Difference ==
1	0.51	7.20	0.00
2	1.01	173.60	95.85
3	1.51	283.20	38.70
4	2.00	331.20	14.49
5	2.50	351.20	5.69
6	3.00	358.50	2.04
7	3.50	361.60	0.86
8	4.00	363.30	0.47
9	4.50	364.70	0.38
10	5.00	365.70	0.27
11	5.50	366.60	0.25
12	6.00	367.30	0.19
13	6.50	368.00	0.19
14	7.00	368.50	0.14
15	7.50	369.10	0.16
16	8.00	369.70	0.16
17	8.50	370.10	0.11
18	9.00	370.50	0.11
19	9.50	370.90	0.11
20	10.00	371.30	0.11
21	10.50	371.60	0.08
22	11.00	372.00	0.11

USER INPUT BLANK VALUE

BLANK VALUE = 17.04972 micrograms carbon

BLANK FACTOR = 17.04972 / 10.99982 = +1.5E+00 ug/min Carbon

SAMPLE RESULTS:

(372 - 17.04953) (1) / (1) = +3.550E+02 g/L Carbon
 (372 - 17.04953) (1) / (1) (12) = +2.958E+01 Molar Carbon
 <<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!>>>>

Sample Run By:

KR MONTEITH

00000

WHC-SD-WM-DP-155, REV. 0

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: 2903

Date: 11/10/95

Time: 12:24:20

Sample Size = 1 uL

Dil Factor = 1

Blank ID # =

Blank Value = .49 ug/minute C

Analyst : KR MONTEITH

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.10	0.00
2	1.01	5.80	98.28
3	1.51	25.50	77.25
4	2.00	51.00	50.00
5	2.50	72.30	29.46
6	3.00	88.00	17.84
7	3.50	97.50	9.74
8	4.00	102.70	5.06
9	4.50	105.40	2.56
10	5.00	107.20	1.68
11	5.50	108.10	0.83
12	6.00	109.00	0.83
13	6.50	109.60	0.55
14	7.00	110.20	0.54
15	7.50	110.80	0.54
16	8.00	111.40	0.54
17	8.50	111.90	0.45
18	9.00	112.40	0.44
19	9.50	112.90	0.44
20	10.00	113.30	0.35
21	10.50	113.80	0.44
22	11.00	114.10	0.26

USER INPUT BLANK VALUE

BLANK VALUE = 5.38991 micrograms carbon

BLANK FACTOR = 5.38991 / 10.99982 = +4.9E-01 ug/min Carbon

SAMPLE RESULTS:

(114.1 - 5.38991) (1) / (1) = +1.087E+02 g/L Carbon
 (114.1 - 5.38991) (1) / (1) (12) = +9.059E+00 Molar Carbon

Sample Run By:

KR MONTEITH

00000

$$\frac{108.7}{1582} = 6.87 \times 10^{-2}$$

WHC-SD-WM-DP-155, REV. 0

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: 2903

Date: 11/10/95

Time: 12:38:34

Sample Size = 1 uL

Dil Factor = 1

Blank ID # =

Blank Value = 1.55 ug/minute C

Analyst : KR MONTEITH

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading ==	== Analysis Time ==	== Coulometer ==	== % Difference ==
1	0.51	8.00	0.00
2	1.01	245.40	96.74
3	1.50	421.50	41.78
4	2.00	503.30	16.25
5	2.50	537.10	6.29
6	3.00	549.00	2.17
7	3.50	553.70	0.85
8	4.00	556.40	0.49
9	4.50	558.00	0.29
10	5.00	559.30	0.23
11	5.50	560.40	0.20
12	6.00	561.30	0.16
13	6.50	562.20	0.16
14	7.00	562.80	0.11
15	7.50	563.50	0.12
16	8.00	564.10	0.11
17	8.50	564.40	0.05
18	9.00	564.90	0.09
19	9.50	565.30	0.07
20	10.00	565.70	0.07
21	10.50	566.10	0.07
22	11.00	566.50	0.07

USER INPUT BLANK VALUE

BLANK VALUE = 17.04972 micrograms carbon

BLANK FACTOR = 17.04972 / 10.99982 = +1.5E+00 ug/min Carbon

SAMPLE RESULTS:

(566.5 - 17.0482) (1)/(1) = +5.495E+02 g/L Carbon
 (566.5 - 17.0482) (1)/(1) (12) = +4.579E+01 Molar Carbon
 <<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!>>>>

Sample Run By:

KR MONTEITH

00000

$\frac{549.5}{1582} = 3.47 \times 10^{-3}$

WHC-SD-WM-DP-155, REV. 0

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: 2903 + SPK

Date: 11/10/95

Time: 12:50:50

Sample Size = 1 uL

Dil Factor = 1

Blank ID # =

Blank Value = .49 ug/minute C

Analyst : KR MONTEITH

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading ==== Analysis Time ==== Coulometer ==== % Difference ==

1	0.51	0.10	0.00
2	1.01	18.20	99.45
3	1.51	78.60	76.84
4	2.01	140.70	44.14
5	2.51	184.70	23.82
6	3.01	211.60	12.71
7	3.51	226.00	6.37
8	4.01	233.10	3.05
9	4.50	236.40	1.40
10	5.00	238.50	0.88
11	5.50	239.30	0.33
12	6.00	240.20	0.37
13	6.50	240.80	0.25
14	7.00	241.40	0.25
15	7.50	241.80	0.17
16	8.00	242.30	0.21
17	8.50	242.70	0.16
18	9.00	243.10	0.16
19	9.50	243.60	0.21
20	10.00	244.00	0.16
21	10.50	244.30	0.12
22	11.00	244.70	0.16

USER INPUT BLANK VALUE

BLANK VALUE = 5.38991 micrograms carbon

BLANK FACTOR = 5.38991 / 10.99982 = +4.9E-01 ug/min Carbon

SAMPLE RESULTS:

(244.7 - 5.390329) (1) / (1) = +2.393E+02 g/L Carbon
(244.7 - 5.390329) (1) / (1) (12) = +1.994E+01 Molar Carbon

Sample Run By:

KR MONTEITH

00000

$$\left[\left(\frac{244.7}{1019} \right) \cdot 1217 + 150 \right] =$$

WHC-SD-WM-DP-155, REV. 0

102.3 % Rec
54

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: 2903 + SPK

Date: 11/10/95

Time: 13:03:59

Sample Size = 1 uL

Dil Factor = 1

Blank ID # =

Blank Value = 1.55 ug/minute C

Analyst : KR MONTEITH

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading ==	== Analysis Time ==	== Coulometer ==	== % Difference ==
1	0.51	8.60	0.00
2	1.01	223.40	96.15
3	1.50	429.30	47.96
4	2.00	570.30	24.72
5	2.50	636.70	10.43
6	3.00	663.60	4.05
7	3.50	673.10	1.41
8	4.00	677.10	0.59
9	4.50	679.10	0.29
10	5.00	680.80	0.25
11	5.50	681.90	0.16
12	6.00	683.00	0.16
13	6.50	683.80	0.12
14	7.00	684.60	0.12
15	7.50	685.20	0.09
16	8.00	685.80	0.09
17	8.50	686.40	0.09
18	9.00	686.80	0.06
19	9.50	687.20	0.06
20	10.00	687.60	0.06
21	10.50	688.00	0.06
22	11.00	688.40	0.06

USER INPUT BLANK VALUE

BLANK VALUE = 17.04972 micrograms carbon

BLANK FACTOR = 17.04972 / 10.99982 = +1.5E+00 ug/min Carbon

SAMPLE RESULTS:

(688.4 - 17.05104) (1) / (1) = +6.713E+02 g/L Carbon
 (688.4 - 17.05104) (1) / (1) (12) = +5.595E+01 Molar Carbon
 <<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!>>>>

Sample Run By:

KR MONTEITH

00000

$$\frac{688.4}{\left(\frac{372.0}{.1019} \right) - 1217 + 300} = 92.5\% \text{ REC}$$

55

WHC-SD-WM-DP-155, REV. 0

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: 2945

Date: 11/10/95

Time: 13:16:05

Sample Size = 1 uL

Dil Factor = 1

Blank ID # =

Blank Value = .49 ug/minute C

Analyst : KR MONTEITH

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading ==	== Analysis Time ==	== Coulometer ==	== % Difference ==
1	0.51	0.00	0.00
2	1.01	3.80	100.00
3	1.50	17.60	78.41
4	2.00	39.40	55.33
5	2.50	62.00	36.45
6	3.00	78.50	21.02
7	3.50	88.10	10.90
8	4.00	92.90	5.17
9	4.50	95.50	2.72
10	5.00	97.70	2.25
11	5.50	98.90	1.21
12	6.00	100.20	1.30
13	6.50	101.30	1.09
14	7.00	102.40	1.07
15	7.50	103.40	0.97
16	8.00	104.10	0.67
17	8.50	105.00	0.86
18	9.00	106.00	0.94
19	9.50	106.70	0.66
20	10.00	107.60	0.84
21	10.50	108.30	0.65
22	11.00	109.10	0.73

USER INPUT BLANK VALUE

BLANK VALUE = 5.38991 micrograms carbon

BLANK FACTOR = 5.38991 / 10.99982 = +4.9E-01 ug/min Carbon

SAMPLE RESULTS:

(109.1 - 5.389432) (1) / (1) = +1.037E+02 g/L Carbon
 (109.1 - 5.389432) (1) / (1) (12) = +8.643E+00 Molar Carbon

Sample Run By:

KR MONTEITH

00000

WHC-SD-WM-DP-155, REV. 0

56

$\frac{103.7}{1096} = 9.46 \times 10^{-2}$

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: 2945

Date: 11/10/95

Time: 13:28:02

Sample Size = 1 uL

Dil Factor = 1

Blank ID # =

Blank Value = 1.55 ug/minute C

Analyst : KR MONTEITH

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	6.60	0.00
2	1.01	148.20	95.55
3	1.50	276.60	46.42
4	2.00	353.80	21.82
5	2.50	392.90	9.95
6	3.00	412.10	4.66
7	3.50	422.90	2.55
8	4.00	430.10	1.67
9	4.50	435.40	1.22
10	5.00	439.90	1.02
11	5.50	443.80	0.88
12	6.00	447.20	0.76
13	6.50	449.90	0.60
14	7.00	452.90	0.66
15	7.50	455.20	0.51
16	8.00	457.10	0.42
17	8.50	459.00	0.41
18	9.00	460.70	0.37
19	9.50	462.10	0.30
20	10.00	463.40	0.28
21	10.50	464.70	0.28
22	11.00	465.90	0.26

USER INPUT BLANK VALUE

BLANK VALUE = 17.04972 micrograms carbon

BLANK FACTOR = 17.04972 / 10.99982 = +1.5E+00 ug/min Carbon

SAMPLE RESULTS:

(465.9 - 17.04953) (1)/(1) = +4.489E+02 g/L Carbon
 (465.9 - 17.04953) (1)/(1) (12) = +3.740E+01 Molar Carbon
 <<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!>>>>

Sample Run By:

KR MONTEITH

00000

448.9

- 1096

= 4.10 E³

WHC-SD-WM-DP-155, REV. 0

57

~~TIC~~
~~POC~~ TOTAL ORGANIC CARBON ANALYSIS REPORT
 from 11-10-95 TICTOC REV 2.0

Sample: 2945

Date: 11/10/95

Time: 13:40:06

Sample Size = 1 uL

Dil Factor = 1

Blank ID # = ~~11-10-95~~

Blank Value = ~~1.55~~ ug/minute C
 .49

Analyst : KR MONTEITH

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading ==	==== Analysis Time ==	==== Coulometer ==	==== % Difference ==
1	0.51	1.40	0.00
2	1.01	7.90	82.28
3	1.50	32.20	75.47
4	2.00	64.90	50.39
5	2.51	94.40	31.25
6	3.01	113.80	17.05
7	3.51	124.60	8.67
8	4.00	129.30	3.63
9	4.50	132.10	2.12
10	5.00	133.80	1.27
11	5.50	135.10	0.96
12	6.00	136.30	0.88
13	6.50	137.30	0.73
14	7.00	138.50	0.87
15	7.50	139.20	0.50
16	8.00	140.30	0.78
17	8.50	141.10	0.57
18	9.00	142.00	0.63
19	9.50	142.70	0.49
20	10.00	143.60	0.63
21	10.50	144.30	0.49
22	11.00	145.00	0.48

USER INPUT BLANK VALUE

BLANK VALUE = 17.04972 micrograms carbon

BLANK FACTOR = 17.04972 / 10.99982 = +1.5E+00 ug/min Carbon

SAMPLE RESULTS:

(145 - ~~17.05104~~) (1) / (1) = ~~+1.279E+02~~ ^{1.396E2} g/L Carbon
 (145 - ~~17.05104~~) (1) / (1) (12) = ~~+1.066E+01~~ ^{1.396E2} Molar Carbon
 <<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!>>>>

Sample Run By:

KR MONTEITH

00000

WHC-SD-WM-DP-155, REV. 0

$\frac{139.6}{.1500} = 9.31E^2$

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: 2945

Date: 11/10/95

Time: 13:52:55

Sample Size = 1 uL

Dil Factor = 1

Blank ID # =

Blank Value = 1.55 ug/minute C

Analyst : KR MONTEITH

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading ==	==== Analysis Time ==	==== Coulometer ==	==== % Difference ==
1	0.51	2.30	0.00
2	1.01	122.80	98.13
3	1.51	306.70	59.96
4	2.00	425.70	27.95
5	2.50	489.80	13.09
6	3.00	522.30	6.22
7	3.50	538.40	2.99
8	4.00	548.60	1.86
9	4.50	556.50	1.42
10	5.00	562.80	1.12
11	5.50	568.10	0.93
12	6.00	572.80	0.82
13	6.50	577.30	0.78
14	7.00	580.60	0.57
15	7.50	584.10	0.60
16	8.00	587.20	0.53
17	8.50	589.80	0.44
18	9.00	592.40	0.44
19	9.50	594.40	0.34
20	10.00	596.50	0.35
21	10.50	598.40	0.32
22	11.00	600.30	0.32

USER INPUT BLANK VALUE

BLANK VALUE = 17.04972 micrograms carbon

BLANK FACTOR = 17.04972 / 10.99982 = +1.5E+00 ug/min Carbon

SAMPLE RESULTS:

(600.3 - 17.0482) (1)/(1) = +5.833E+02 g/L Carbon
 (600.3 - 17.0482) (1)/(1) (12) = +4.860E+01 Molar Carbon
 <<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!>>>>

Sample Run By:

KR MONTEITH

00000

$\frac{583.3}{1500} = 3.89 \times 10^{-3}$

WHC-SD-WM-DP-155, REV. 0

WHC-SD-WM-DP-155, REV. 0

RADIOCHEMICAL ANALYSES

LABCORE Data Entry Template for Worklist# 3507

Analyst: RKX Instrument: AB00 16 Book# 150BS2

Method: LA-508-101 Rev/Mod D-2

Worklist Comment: .5 ML SAMPLE SIZE (BOILDOWN) / JLS FOR SLF

S Type	Sample#	R A	Test	Matrix	Group#	Project
1 STD			@ALPHA01	SOLID		
2 BLNK-PREP			@ALPHA01	SOLID		
3 BLNK/BKG			@ALPHA01	SOLID		
4 SAMPLE	S95T002906	0 F	@ALPHA01	SOLID	95000160	BX-110
	Analytes Requested: ALPHA01 , ALPHA01E					
5 DUP	S95T002906	0 F	@ALPHA01	SOLID		
6 SPK	S95T002906	0 F	@ALPHA01	SOLID		
7 SAMPLE	S95T002946	0 F	@ALPHA01	SOLID	95000160	BX-110
	Analytes Requested: ALPHA01 , ALPHA01E					
8 DUP	S95T002946	0 F	@ALPHA01	SOLID		
9 SPK	S95T002946	0 F	@ALPHA01	SOLID		

Final page for worklist # 3507

Nob-King 11/14/95
Analyst Signature Date

M. S. R. E. L. M. A. N. 11/15/95
Analyst Signature Date

Data Entry Comments:

initial sample size .5 ml brought up to 10 ml with
.8 m HNO₃

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

LABCORE Completed Worklist Report for Worklist# 3507

Analyst: rwk Instrument: AB16 Book# _____

Method: _____ Rev/Mod _____

Worklist Comment: .5 ML SAMPLE SIZE (BOILDOWN) / JLS FOR SLF

Seq Type	Sample#	R A	Test	Matrix	Actual	Found	DL or Yield	Unit
1 STD		0	QALPHA01 ALPHA01	SOLID	1.28E-05	1.15E-5	89.840 % Recovery	
1 STD		0	QALPHA01 ALPHA01E	SOLID	1.00	4.91E+00	4.910 % Ct. Error	
2 BLNK-PREP		0	QALPHA01 ALPHA01	SOLID	1	<4.68E-3	uCi/g	
2 BLNK-PREP		0	QALPHA01 ALPHA01E	SOLID	1.00	2.02E+02	202.000 % Ct. Error	
3 BLNK/BKG		0	QALPHA01 ALPHA01	SOLID	0.00E+00	2.61E+00	0.000 uCi/g	
4 SAMPLE	S95T002906	0 F	QALPHA01 ALPHA01	SOLID	N/A <	2.61E-03	3.880e-003 uCi/g	
4 SAMPLE	S95T002906	0 F	QALPHA01 ALPHA01E	SOLID	N/A	3.72E+02	0.000 % Ct. Error	
5 DUP	S95T002906	0 F	QALPHA01 ALPHA01	SOLID	<2.61E-3	<1.65E-3	RPD	
5 DUP	S95T002906	0 F	QALPHA01 ALPHA01E	SOLID	1.00	5.00E+02	500.000 % Ct. Error	
6 SPK	S95T002906	0 F	QALPHA01 ALPHA01	SOLID	4.48E-02	3.81E-02	85.040 % Recovery	
7 SAMPLE	S95T002946	0 F	QALPHA01 ALPHA01	SOLID	N/A	1.01E-02	4.080e-003 uCi/g	
7 SAMPLE	S95T002946	0 F	QALPHA01 ALPHA01E	SOLID	N/A	3.90E+01	0.000 % Ct. Error	
8 DUP	S95T002946	0 F	QALPHA01 ALPHA01	SOLID	1.01E-2	1.18E-2	15.530 RPD	
8 DUP	S95T002946	0 F	QALPHA01 ALPHA01E	SOLID	1.00	3.43E+01	34.300 % Ct. Error	
9 SPK	S95T002946	0 F	QALPHA01 ALPHA01	SOLID	4.48E-02	3.68E-02	82.140 % Recovery	

Final page for worklist# 3507

Analyst Signature	Date	Analyst Signature	Date
4/15/95
Reviewer Signature	Date		

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

WHC-SD-WM-DP-155, REV. 0

WORKBOOK PAGE: STD1

AT : LA-508-101 (D-2)

STANDARD

		STANDARD	REPLICATE
Type	DETECTOR NUMBER	16	16
STD	DISH SIZE (1, 2, or 5) (MS)	2	2
Work List	GROSS COUNTS (GC)	1611	1619
3507	COUNT TIME in MINUTES (CT)	30	30
WB7806	BACKGROUND in cpm (BKG)	0.23	0.23
AT	SAMPLE SIZE in mL (SS)	10.000	10.000
Test Code	DILUTION FACTOR (DF)	1	1
@ALPHA01	STANDARD BOOK NUMBER (Std BN)	150B52	150B52
Matrix	EFFICIENCY FACTOR (EFF)	0.2104	0.2104
LIQUID	Lc, Rmax, or Rs.(SAMPLE RATE) as APPROPRIATE	53.470	53.737
Batch Number	Standard Value in $\mu\text{Ci/mL}$	1.28E-05	
95003934	Concentration in $\mu\text{Ci/L}$ =	1.14E-02	
0	Replicate Concentration in $\mu\text{Ci/L}$ =	1.15E-02	
	AVERAGE CONCENTRATION in $\mu\text{Ci/L}$ =	1.1476E-02	
Sample Prep			
N/A			
Sample #	Rs (Sample Count Rate) = (TC / CT) - BKG		
WRKLST#3507	ALPHA TOTAL $\mu\text{Ci/L}$ = Rs * 1000mL/L * DF / (EFF * SS * 2220000dpm/ μCi)		
Instrument Code	ALPHA TOTAL $\mu\text{Ci/mL}$ = ALPHA TOTAL $\mu\text{Ci/L}$ / 1000mL/L		
WB27806	Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100		
Prepared By	Detection Levels and Less Than Values are determined from Procedure LA-508-002.		
MCB			
Chemist			
SLF	ALPHA TOTAL CONCENTRATION in $\mu\text{Ci/mL}$	1.15E-05	
Analyst			
RWK			
Date Complete			
11/15/95	RELATIVE COUNTING ERROR	4.9%	
Analysis Date			
11/14/95			
Analysis Time			
10:30 PM			
Sample Point			
BX-110			

Analyst:	MCB	Date: 15-Nov-95
Signature of Chemist:	SLF	Date: 11/15/95
STANDARD.WB1 Rev. 1.0	508101ML	

AT : LA-508-101 (D-2)

SOLIDS

		BLNK-PREP	REPLICATE
Type	DETECTOR NUMBER	16	16
BLNK-PREP	DISH SIZE (1, 2, or 5) (MS)	2	2
Work List	GROSS COUNTS (GC)	11	26
3507	COUNT TIME in MINUTES (CT)	30	30
or TB	BACKGROUND in cpm (BKG)	0.23	0.23
AT	SAMPLE SIZE in mL (SS)	2.000	2.000
BL COC	DILUTION FACTOR (DF)	20	20
@ALPHA01	DIGEST GRAMS of SOLIDS / L (Dg/L)	2.7572	2.7572
Mark	EFFICIENCY FACTOR (EFF)	0.2104	0.2104
SOLID	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	0.369	0.603
Batch Number			
95003934	Blank Concentration in $\mu\text{Ci/g}$	< 2.87E-03	
Rerun	Replicate Concentration in $\mu\text{Ci/g}$	4.68E-03	
0	Maximum Concentration in $\mu\text{Ci/g}$	< 4.6848E-03	
Sample Prep			
N/A	Rs (Sample Count Rate) = (TC / CT) - BKG		
Sample	ALPHA TOTAL $\mu\text{Ci/g}$ = $Rs * 1000\text{mL/L} * DF / (EFF * SS * Dg/L * 2220000\text{dpm}/\mu\text{Ci})$		
S95T2906			
Instrument Code	Relative Counting Error = $[(The\ Square\ Root\ of\ TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100$		
WB27806	Detection Levels and Less Than Values are determined from Procedure LA-508-002.		
Prepared By			
MCB			
Chemist			
SLF	ALPHA TOTAL in $\mu\text{Ci/g}$	< 4.68E-03	DETECTION LEVEL
Analyst	LESS THAN Value was Determined from Rmax.		
RWK			
Date Complete	RELATIVE COUNTING ERROR	202.3%	3.88E-03 $\mu\text{Ci/g}$
11/15/95			
Analysis Date			
11/14/95			
Analysis Time			
10:30 PM			
Sample Point			
BX-110			

Analyst:	MCB	Date: 15-Nov-95
Signature of Chemist:	SLF	Date: 11/15/95
BLANK.WB1 Rev. 1.0	508101ML	

WORKBOOK PAGE: SAM4

AT : LA-508-101 (D-2) SOLIDS

		SAMPLE	REPLICATE
YPO	DETECTOR NUMBER	18	18
SAMPLE	DISH SIZE (1, 2, or 5) (MS)	2	2
WORK LOG	GROSS COUNTS (GC)	17	9
3507	COUNT TIME In MINUTES (CT)	30	30
ALPHA01	BACKGROUND In cpm (BKG)	0.23	0.23
AT	SAMPLE SIZE In mL (SS)	2.000	2.000
Test Code	DILUTION FACTOR (DF)	20	20
@ALPHA01	DIGEST GRAMS of SOLIDS / L (Dg/L)	2.7572	2.7572
Matrix	EFFICIENCY FACTOR (EFF)	0.2104	0.2104
SOLID	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	0.337	0.289
Batch Number			
95003934	Blank Concentration in $\mu\text{Ci/g}$	2.61E-03	
Rerun	Replicate Concentration in $\mu\text{Ci/g}$	< 2.25E-03	
1	Maximum Concentration in $\mu\text{Ci/g}$	< 2.6142E-03	
Sample Prep			
FUSION01	R_s (Sample Count Rate) = $(TC / CT) - BKG$		
Sample	ALPHA TOTAL $\mu\text{Ci/g}$ = $R_s * 1000\text{mL/L} * DF / (EFF * SS * Dg/L * 2220000\text{dpm}/\mu\text{Ci})$		
S95T002906			
Instrument Code	Relative Counting Error = $[(The\ Square\ Root\ of\ TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100$		
WB27806	Detection Levels and Less Than Values are determined from Procedure LA-508-002.		
Prepared By			
MCB			
Chemist			
SLF			
Analyst			
RWK			
Date Complete			
11/15/95			
Analysis Date			
11/14/95			
Analysis Time			
10:30 PM			
Sample Point			
BX-110			

v RESULTS v

ALPHA TOTAL	in $\mu\text{Ci/g}$	< 2.61E-03	DETECTION LEVEL
LESS THAN Value was Determined from R_s .			
RELATIVE COUNTING ERROR		372.2%	3.88E-03 $\mu\text{Ci/g}$

Analyst:	MCB	Date: 15-Nov-95
Signature of Chemist:	SLF	Date: 11/15/95
SAMPLE.WB1 Rev. 1.0	#08101ML	

AT : LA-508-101 (D-2) SOLIDS

		DUP	REPLICATE
Type	DETECTOR NUMBER	18	18
DUP	DISH SIZE (1, 2, or 5) (MS)	2	2
Work List	GROSS COUNTS (GC)	5	8
3507	COUNT TIME in MINUTES (CT)	30	30
1015	BACKGROUND in cpm (BKG)	0.23	0.23
AT	SAMPLE SIZE in mL (SS)	2.000	2.000
Test Code	DILUTION FACTOR (DF)	20	20
@ALPHA01	DIGEST GRAMS of SOLIDS / L (Dg/L)	2.6588	2.6588
Matrix	EFFICIENCY FACTOR (EFF)	0.2104	0.2104
SOLID	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	0.204	0.204
Batch Number			
95003934	Blank Concentration in $\mu\text{Ci/g}$	< 1.65E-03	
Rerun	Replicate Concentration in $\mu\text{Ci/g}$	< 1.65E-03	
1	Maximum Concentration in $\mu\text{Ci/g}$	< 1.6452E-03	
Sample Prep			
FUSION01	Rs (Sample Count Rate) = (TC / CT) - BKG		
Sample #	ALPHA TOTAL $\mu\text{Ci/g}$ = Rs * 1000mL/L * DF / (EFF * SS * Dg/L * 2220000dpm/ μCi)		
S95T002906			
Instrument Code	Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100		
WB27806	Detection Levels and Less Than Values are determined from Procedure LA-508-002.		
Prepared By			
MCB			
Chemist			
SLF			
Analyst			
RWK			
Date Complete			
11/15/95			
Analysis Date			
11/14/95			
Analysis Time			
10:30 PM			
Sample Point			
BX-110			

v RESULTS v

ALPHA TOTAL	in $\mu\text{Ci/g}$	< 1.65E-03	DETECTION LEVEL
LESS Than Value was Determined from Lc.			
RELATIVE COUNTING ERROR		500.0%	4.02E-03 $\mu\text{Ci/g}$

Analyst:	MCB	Date: 15-Nov-95
Signature of Chemist:	SLF	Date: 11/15/95
SAMPLE.WB1 Rev. 1.0	508101ML	

WORKBOOK PAGE: SPIKE6

AT : LA-508-101 (D-2) SPIKED SAMPLE

		SPIKE	REPLICATE
Type	DETECTOR NUMBER	16	16
SPK	DISH SIZE 1, 2, or 5 (MS)	2	2
Work Log	TOTAL COUNTS (TC)	10632	10716
3507	COUNT TIME in MINUTES (CT)	30	30
AT or TB?	BACKGROUND in cpm (BKG)	0.23	0.23
AT	SAMPLE VOLUME in mL (Spiked Vial) (SS)	2.000	2.000
Test Code	SAMPLE DILUTION FACTOR (Spiked Vial) (DF)	20	20
@ALPHA01	DIGEST GRAMS of SOLIDS / L (Dg/L)	2.7572	2.7572
Matrix	SPIKE VOLUME in mL (SVol)	2.000	2.000
SOLID	SPIKE DILUTION FACTOR (SDF)	100	100
Batch Number	SPIKE BOOK NUMBER (Spk BN)	112B43	112B43
95003934	SPIKE VALUE in $\mu\text{Ci/mL}$ (SVal)	4.4763E-02	4.4763E-02
Rerun	INSTRUMENT EFFICIENCY FACTOR (EFF)	0.2104	0.2104
1	SAMPLE + SPIKE $\mu\text{Ci/g}$ (S+S)	2.75E+00	2.77E+00
Sample Prep	AVERAGE or MAXIMUM $\mu\text{Ci/g}$ in SAMPLE	2.6142E-03	
FUSION01			
Sample #			
S95T002906			
Instrument Code	Rs (Sample Count Rate) = (TC / CT) - BKG		
WB27806	SAMPLE + SPIKE $\mu\text{Ci/g}$ = Rs * 1000mL/L * DF / (EFF * SS * Dg/L * 2220000dpm/ μCi)		
Prepared By	QC ACTUAL = SVal		
MCB	QC FOUND = (((S+S $\mu\text{Ci/g}$ - SAMPLE $\mu\text{Ci/g}$) * ((SDF/(SVol*1000))/(DF/SS/Dg/L))))		
Chemist	PERCENT SPIKE RECOVERY = (QC FOUND / QC ACTUAL) * 100		
SLF			
Analyst			
RWK			
Date Complete	NOTE: Original Sample result was a LESS THAN value. Zero (0) was subtracted from the spiked value for QC found calculation.		
11/15/95			
Analysis Date			
11/14/95	QC ACTUAL =	4.48E-02	
Analysis Time	QC FOUND =	3.81E-02	
10:30 PM	AVG. PERCENT SPIKE RECOVERY =	85.0%	
Sample Point			
BX-110			

Analyst:	MCB	Date: 15-Nov-95
Signature of Chemist:	SLF	Date: 11/15/95
SPIKE.WB1 Rev. 1.0	508101ML	

AT : LA-508-101 (D-2)

SOLIDS

		SAMPLE	REPLICATE
Type	DETECTOR NUMBER	18	18
SAMPLE	DISH SIZE (1, 2, or 5) (MS)	2	2
Work List	GROSS COUNTS (GC)	42	48
3507	COUNT TIME in MINUTES (CT)	30	30
AT or TB	BACKGROUND in cpm (BKG)	0.23	0.23
AT	SAMPLE SIZE in mL (SS)	2.000	2.000
Test Code	DILUTION FACTOR (DF)	20	20
@ALPHA01	DIGEST GRAMS of SOLIDS / L (Dg/L)	2.622	2.622
Matrix	EFFICIENCY FACTOR (EFF)	0.2104	0.2104
SOLID	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	1.170	1.303
Batch Number			
95003934	Blank Concentration in $\mu\text{Ci/g}$	9.55E-03	
Rerun	Replicate Concentration in $\mu\text{Ci/g}$	1.06E-02	
1	Average Concentration in $\mu\text{Ci/g}$	1.0098E-02	
Sample Prep			
FUSION01	R_s (Sample Count Rate) = $(TC / CT) - BKG$		
Sample #	$\text{ALPHA TOTAL } \mu\text{Ci/g} = R_s * 1000\text{mL/L} * DF / (EFF * SS * Dg/L * 2220000\text{dpm}/\mu\text{Ci})$		
S95T002946			
Instrument Code	Relative Counting Error = $[(\text{The Square Root of } TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100$		
WB27806	Detection Levels and Less Than Values are determined from Procedure LA-508-002.		
Prepared By			
MCB			
Chemist			
SLF	α RESULTS α		
Analyst	ALPHA TOTAL in $\mu\text{Ci/g}$	1.01E-02	DETECTION LEVEL
RWK			
Date Complete			4.08E-03 $\mu\text{Ci/g}$
11/15/95	RELATIVE COUNTING ERROR	39.0%	
Analysis Date			
11/14/95			
Analysis Time			
10:30 PM			
Sample Point			
BX-110			

Analyst:	MCB	Date: 15-Nov-95
Signature of Chemist:	SLF	Date: 11/15/95
SAMPLE.WB1 Rev. 1.0	508101ML	

AT : LA-508-101 (D-2)

SOLIDS

		DUP	REPLICATE
Type	DETECTOR NUMBER	18	18
DUP	DISH SIZE (1, 2, or 5) (MS)	2	2
Work List	GROSS COUNTS (GC)	53	50
3507	COUNT TIME In MINUTES (CT)	30	30
AT or TB	BACKGROUND In cpm (BKG)	0.23	0.23
AT	SAMPLE SIZE In mL (SS)	2.000	2.000
Test Code	DILUTION FACTOR (DF)	20	20
@ALPHA01	DIGEST GRAMS of SOLIDS / L (Dg/L)	2.688	2.688
Matrix	EFFICIENCY FACTOR (EFF)	0.2104	0.2104
SOLID	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	1.537	1.437
Batch Number			
95003934	Blank Concentration in $\mu\text{Ci/g}$	1.22E-02	
Rerun	Replicate Concentration in $\mu\text{Ci/g}$	1.14E-02	
1	Average Concentration in $\mu\text{Ci/g}$	1.1841E-02	
Sample Prep			
FUSION01	R_s (Sample Count Rate) = $(TC / CT) - BKG$		
Sample	ALPHA TOTAL $\mu\text{Ci/g}$ = $R_s * 1000\text{mL/L} * DF / (EFF * SS * Dg/L * 2220000\text{dpm}/\mu\text{Ci})$		
S95T002946			
Instrument Code	Relative Counting Error = $[(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100$		
WB27806	Detection Levels and Less Than Values are determined from Procedure LA-508-002.		
Prepared By			
MCB			
Chemist			
SLF			
Analyst			
RWK			
Date Complete			
11/15/95			
Analysis Date			
11/14/95			
Analysis Time			
10:30 PM			
Sample Point			
BX-110			

Analyst:	MCB	Date: 15-Nov-95
Signature of Chemist:	SLF	Date: 11/15/95
SAMPLE.WB1 Rev. 1.0	1508101ML	

WHC-SD-WM-DP-155, REV. 0

WORKBOOK PAGE: SPIKE9

AT : LA-508-101 (D-2) SPIKED SAMPLE

		SPIKE	REPLICATE
Type	DETECTOR NUMBER	16	16
SPK	DISH SIZE 1, 2, or 5 (MS)	2	2
Work List	TOTAL COUNTS (TC)	10265	10454
3507	COUNT TIME in MINUTES (CT)	30	30
AT or TB ?	BACKGROUND in cpm (BKG)	0.23	0.23
AT	SAMPLE VOLUME in mL (Spiked Vial) (SS)	2.000	2.000
Test Code	SAMPLE DILUTION FACTOR (Spiked Vial) (DF)	20	20
@ALPHA01	DIGEST GRAMS of SOLIDS / L (Dg/L)	2.622	2.622
Matrix	SPIKE VOLUME in mL (SVol)	2.000	2.000
SOLID	SPIKE DILUTION FACTOR (SDF)	100	100
Batch Number	SPIKE BOOK NUMBER (Spk BN)	112B43	112B43
95003934	SPIKE VALUE in $\mu\text{Ci/mL}$ (SVal)	4.4763E-02	4.4763E-02
Rerun	INSTRUMENT EFFICIENCY FACTOR (EFF)	0.2104	0.2104
1	SAMPLE + SPIKE $\mu\text{Ci/g}$ (S+S)	2.80E+00	2.84E+00
Sample Prep	AVERAGE or MAXIMUM $\mu\text{Ci/g}$ in SAMPLE	1.0098E-02	
FUSION01			
Sample #			
S95T002946			
Instrument Code			
WB27806			
Prepared By			
MCB			
Chemist			
SLF			
Analyst			
RWK			
Date Complete			
11/15/95			
Analysis Date			
11/14/95	QC ACTUAL	=	4.48E-02
Analysis Time	QC FOUND	=	3.68E-02
10:30 PM	AVG. PERCENT SPIKE RECOVERY	=	82.3%
Sample Point			
BX-110			

$$R_s (\text{Sample Count Rate}) = (TC / CT) - BKG$$

$$\text{SAMPLE} + \text{SPIKE } \mu\text{Ci/g} = R_s * 1000\text{mL/L} * DF / (EFF * SS * Dg/L * 2220000\text{dpm}/\mu\text{Ci})$$

$$QC \text{ ACTUAL} = SVal$$

$$QC \text{ FOUND} = (((S+S \mu\text{Ci/g} - \text{SAMPLE } \mu\text{Ci/g}) * ((SDF/(SVol*1000)))/(DF/SS/Dg/L))))$$

$$\text{PERCENT SPIKE RECOVERY} = (QC \text{ FOUND} / QC \text{ ACTUAL}) * 100$$

Analyst:	MCB	Date: 15-Nov-95
Signature of Chemist:	SLF	Date: 11/15/95
SPIKE.WB1 Rev. 1.0	508101ML	

WHC-SD-WM-DP-155, REV. 0

THE FOLLOWING ANALYSES ARE INCLUDED IN THE DATA PACKAGE BUT THE RESULTS HAVE NOT BEEN REPORTED IN THE FINAL SUMMARY REPORTS.

WHC-SD-WM-DP-155, REV. 0
LABCORE Completed Worklist Report for Worklist# 3471

Analyst: slh Instrument: AB15 Book# 150852

Method: LA-508-101 Rev/Mod D-2

Worklist Comment: Determine sample size using Ludlum. Use .100 mL A-SPK. SLF

Seq Type	Sample#	R A	Test	Matrix	Actual	Found	DL or Yield	Unit
1 STD		0	2ALPHA01 ALPHA01	SOLID	1.28E-05	1.05E-5	82.030 % Recovery	
1 STD		0	2ALPHA01 ALPHA01E	SOLID	1.00	4.86E+00	4.860 % Ct. Error	
2 BLNK-PREP		0	2ALPHA01 ALPHA01	SOLID	1	<4.79E-4	uCi/g	
2 BLNK-PREP		0	2ALPHA01 ALPHA01E	SOLID	1.00	5.00E+02	500.000 % Ct. Error	
3 BLNK/BKG		0	2ALPHA01 ALPHA01	SOLID	0.00E+00	3.73E-01	0.000 uCi/g	
4 SAMPLE	S95T002906	0 F	2ALPHA01 ALPHA01	SOLID	N/A	4.79E-04	1.080e-003 uCi/g	
4 SAMPLE	S95T002906	0 F	2ALPHA01 ALPHA01E	SOLID	N/A	5.00E+02	0.000 % Ct. Error	
5 DUP	S95T002906	0 F	2ALPHA01 ALPHA01	SOLID	<4.79E-4	<4.96E-4	RPD	
5 DUP	S95T002906	0 F	2ALPHA01 ALPHA01E	SOLID	1.00	5.00E+02	500.000 % Ct. Error	
6 SPK	S95T002906	0 F	2ALPHA01 ALPHA01	SOLID	4.48E-02	1.49E-02	33.260 % Recovery	
7 SAMPLE	S95T002946	0 F	2ALPHA01 ALPHA01	SOLID	N/A	1.29E-03	1.140e-003 uCi/g	
7 SAMPLE	S95T002946	0 F	2ALPHA01 ALPHA01E	SOLID	N/A	6.15E+01	0.000 % Ct. Error	
8 DUP	S95T002946	0 F	2ALPHA01 ALPHA01	SOLID	1.29E-3	1.31E-3	1.540 RPD	
8 DUP	S95T002946	0 F	2ALPHA01 ALPHA01E	SOLID	1.00	7.33E+01	73.300 % Ct. Error	
9 SPK	S95T002946	0 F	2ALPHA01 ALPHA01	SOLID	4.48E-02	2.14E-02	47.770 % Recovery	

Final page for worklist# 3471

Analyst Signature _____ Date _____

Analyst Signature _____ Date _____

11/14/95
Reviewer Signature _____ Date _____

Spike recoveries outside of
project limits. Rerun.

**DATA
NOT USED
IN PACKAGE**

LABCORE Data Entry Template for Worklist#

3471

Analyst: SLHB Instrument: AB00 Book # 150B52

Method: LA-508-101 Rev/Mod _____

Worklist Comment: Determine sample size using Ludlum. Use .100 mL A-SPK. SLF

GROUP	PROJECT	S TYPE	SAMPLE#	R A	-----TEST-----	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 STD			0ALPHA01 ALPHA01	SOLID			N/A	uCi/g
		1 STD			0ALPHA01 ALPHA01E	SOLID			N/A	% Ct. Error
		2 BLNK-PREP			0ALPHA01 ALPHA01	SOLID			N/A	uCi/g
		2 BLNK-PREP			0ALPHA01 ALPHA01E	SOLID			N/A	% Ct. Error
		3 BLNK/BKG			0ALPHA01 ALPHA01	SOLID			N/A	uCi/g
95000160	BX-110	4 SAMPLE	S95T002906	0 F	0ALPHA01 ALPHA01	SOLID	N/A			uCi/g
95000160	BX-110	4 SAMPLE	S95T002906	0 F	0ALPHA01 ALPHA01E	SOLID	N/A			% Ct. Error
95000160	BX-110	5 DUP	S95T002906	0 F	0ALPHA01 ALPHA01	SOLID			N/A	uCi/g
95000160	BX-110	5 DUP	S95T002906	0 F	0ALPHA01 ALPHA01E	SOLID			N/A	% Ct. Error
95000160	BX-110	6 SPK	S95T002906	0 F	0ALPHA01 ALPHA01	SOLID			N/A	uCi/g
95000160	BX-110	7 SAMPLE	S95T002946	0 F	0ALPHA01 ALPHA01	SOLID	N/A			uCi/g
95000160	BX-110	7 SAMPLE	S95T002946	0 F	0ALPHA01 ALPHA01E	SOLID	N/A			% Ct. Error
95000160	BX-110	8 DUP	S95T002946	0 F	0ALPHA01 ALPHA01	SOLID			N/A	uCi/g
95000160	BX-110	8 DUP	S95T002946	0 F	0ALPHA01 ALPHA01E	SOLID			N/A	% Ct. Error
95000160	BX-110	9 SPK	S95T002946	0 F	0ALPHA01 ALPHA01	SOLID			N/A	uCi/g

Final page for worklist #

3471

Sandra Hood Boedigert 11-13-95

SE Hogan 11/14/95

Data Entry Comments:

**DATA
NOT USED
IN PACKAGE**

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#

3471

GROUP	PROJECT	S TYPE	SAMPLE#	R A -----TEST-----	MATRIX	ACTUAL	FOUND	DL	UNIT
Analyst Signature		Date			Analyst Signature			Date	

DATA
NOT USED
IN PACKAGE

Data Entry Comments:

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

WHC-SD-WM-DP-155, REV. 0

WORKBOOK PAGE: STD1

AT : LA-508-101 (D-2)

STANDARD

		STANDARD	REPLICATE
	DETECTOR NUMBER	16	16
STD	DISH SIZE (1, 2, or 5) (MS)	2	2
	GROSS COUNTS (GC)	1696	1688
3471	COUNT TIME in MINUTES (CT)	30	30
	BACKGROUND in cpm (BKG)	0.67	0.67
AT	SAMPLE SIZE in mL (SS)	10.000	10.000
	DILUTION FACTOR (DF)	1	1
@ALPHA01	STANDARD BOOK NUMBER (Std BN)	150B52	150B52
	EFFICIENCY FACTOR (EFF)	0.2380	0.2380
LIQUID	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	55.863	55.597
	Standard Value in $\mu\text{Ci/mL}$	1.28E-05	
95003893	Concentration in $\mu\text{Ci/L}$ =	1.06E-02	
	Replicate Concentration in $\mu\text{Ci/L}$ =	1.05E-02	
0	AVERAGE CONCENTRATION in $\mu\text{Ci/L}$ =	1.0548E-02	

N/A

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

ALPHA TOTAL $\mu\text{Ci/L}$ = $Rs * 1000\text{mL/L} * DF / (EFF * SS * 2220000\text{dpm}/\mu\text{Ci})$

ALPHA TOTAL $\mu\text{Ci/mL}$ = ALPHA TOTAL $\mu\text{Ci/L} / 1000\text{mL/L}$

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

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

WB26782			
SEH			
SLF	ALPHA TOTAL CONCENTRATION in $\mu\text{Ci/mL}$	1.05E-05	DETECTION LEVEL
SLH			
11/14/95	RELATIVE COUNTING ERROR =	4.9%	1.49E-07 $\mu\text{Ci/mL}$
11/13/95			
10:30 PM			
BX-110			

Analyst: SEH Date: 14-Nov-95

Signature of Chemist: *[Signature]* SLF Date: 11/14/95

STANDARD.WB1 Rev. 1.0 508101ML

DATA
NOT USED
IN PACKAGE

AT : LA-508-101 (D-2)

SOLIDS

		BLNK-PREP	REPLICATE
	DETECTOR NUMBER	18	15
BLNK-PREP	DISH SIZE (1, 2, or 5) (MS)	2	2
	GROSS COUNTS (GC)	11	4
3471	COUNT TIME in MINUTES (CT)	30	30
	BACKGROUND in cpm (BKG)	0.67	0.67
AT	SAMPLE SIZE in mL (SS)	0.500	0.500
	DILUTION FACTOR (DF)	1	1
@ALPHA01	DIGEST GRAMS of SOLIDS / L (Dg/L)	2.7572	2.7572
	EFFICIENCY FACTOR (EFF)	0.2380	0.2380
SOLID	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	0.349	0.349
95003893	Blank Concentration in $\mu\text{Ci/g}$	< 4.79E-04	
	Replicate Concentration in $\mu\text{Ci/g}$	< 4.79E-04	
0	Maximum Concentration in $\mu\text{Ci/g}$	< 4.7876E-04	
N/A	Rs (Sample Count Rate) = (TC / CT) - BKG		
	ALPHA TOTAL $\mu\text{Ci/g}$ = Rs * 1000mL/L * DF / (EFF * SS * Dg/L * 2220000dpm/ μCi)		
WB26762	Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100		
SEH	Detection Levels and Less Than Values are determined from Procedure LA-508-002.		
SLF	v RESULTS v		
SLH	ALPHA TOTAL in $\mu\text{Ci/g}$ < 4.79E-04		DETECTION LEVEL
11/14/95	LESS Than Value was Determined from L		1.08E-03 $\mu\text{Ci/g}$
11/13/95	RELATIVE COUNTING ERROR 500.0%		
10:30 PM			
BX-110			

Analyst:

SEH

Date: 14-Nov-95

Signature of Chemist:

SLF

Date: 11/14/95

BLANK.WB1 Rev. 1.0

508101ML

DATA
NOT USED
IN PACKAGE

AT : LA-508-101 (D-2)

SOLIDS

		SAMPLE	REPLICATE
DETECTOR NUMBER		15	15
SAMPLE	DISH SIZE (1, 2, or 5) (MS)	2	2
GROSS COUNTS (GC)		9	11
3471	COUNT TIME In MINUTES (CT)	30	30
BACKGROUND In cpm (BKG)		0.67	0.67
AT	SAMPLE SIZE In mL (SS)	0.500	0.500
DILUTION FACTOR (DF)		1	1
@ALPHA01	DIGEST GRAMS of SOLIDS / L (Dg/L)	2.7572	2.7572
EFFICIENCY FACTOR (EFF)		0.2380	0.2380
SOLID	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	0.349	0.349
95003893	Blank Concentration in $\mu\text{Ci/g}$	< 4.79E-04	
0	Replicate Concentration in $\mu\text{Ci/g}$	< 4.79E-04	
	Maximum Concentration in $\mu\text{Ci/g}$	< 4.7875E-04	
FUSION01	Rs (Sample Count Rate) = (TC / CT) - BKG		
S95T002906	ALPHA TOTAL $\mu\text{Ci/g}$ = Rs * 1000mL/L * DF / (EFF * SS * Dg/L * 2220000dpm/ μCi)		
WB26782	Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100		
SEH	Detection Levels and Less Than Values are determined from Procedure LA-508-002.		
SLF	v RESULTS v		
SLH	ALPHA TOTAL in $\mu\text{Ci/g}$ < 4.79E-04		DETECTION LEVEL
	LESS Than Value was Determined from L		
11/14/95	RELATIVE COUNTING ERROR 500.0%		1.08E-03 $\mu\text{Ci/g}$
11/13/95			
10:30 PM			
BX-110			

Analyst:	SEH	Date: 14-Nov-95
Signature of Chemist:	SLF	Date: 11/14/95
SAMPLE.WB1 Rev. 1.0	508101ML	

DATA
NOT USED
IN PACKAGE

WORKBOOK PAGE: DUP5

AT : LA-508-101 (D-2)

SOLIDS

		DUP	REPLICATE
	DETECTOR NUMBER	15	15
DUP	DISH SIZE (1, 2, or 5) (MS)	2	2
	GROSS COUNTS (GC)	8	10
3471	COUNT TIME in MINUTES (CT)	30	30
	BACKGROUND in cpm (BKG)	0.67	0.67
AT	SAMPLE SIZE in mL (SS)	0.500	0.500
	DILUTION FACTOR (DF)	1	1
ALPHA01	DIGEST GRAMS of SOLIDS / L (Dg/L)	2.6588	2.6588
	EFFICIENCY FACTOR (EFF)	0.2380	0.2380
SOLID	Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	0.349	0.349
95003893	Blank Concentration in $\mu\text{Ci/g}$	< 4.96E-04	
	Replicate Concentration in $\mu\text{Ci/g}$	< 4.96E-04	
0	Maximum Concentration in $\mu\text{Ci/g}$	< 4.9647E-04	
FUSION01	Rs (Sample Count Rate) = (TC / CT) - BKG		
S95T002906	ALPHA TOTAL $\mu\text{Ci/g}$ = Rs * 1000mL/L * DF / (EFF * SS * Dg/L * 2220000dpm/ μCi)		
WB26782	Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100		
SEH	Detection Levels and Less Than Values are determined from Procedure LA-508-002.		
SLF	ALPHA TOTAL in $\mu\text{Ci/g}$	< 4.96E-04	DETECTION LEVEL
SLH	LESS Than Value was Determined from L		1.12E-03 $\mu\text{Ci/g}$
11/14/95	RELATIVE COUNTING ERROR	500.0%	
11/13/95			
10:30 PM			
BX-110			

Analyst:	SEH	Date: 14-Nov-95
Signature of Chemist:	SLF	Date: 11/14/95
SAMPLE.WB1 Rev. 1.0	508T01ML	

DATA
NOT USED
IN PACKAGE

AT : LA-508-101 (D-2) SPIKED SAMPLE

		SPIKE	REPLICATE
	DETECTOR NUMBER	15	15
SPK	DISH SIZE 1, 2, or 5 (MS)	2	2
	TOTAL COUNTS (TC)	22307	24876
3471	COUNT TIME in MINUTES (CT)	30	30
	BACKGROUND in cpm (BKG)	0.67	0.67
AT	SAMPLE VOLUME in mL (Spiked Vial) (SS)	0.500	0.500
	SAMPLE DILUTION FACTOR (Spiked Vial) (DF)	1	1
@ALPHA01	DIGEST GRAMS of SOLIDS / L (Dg/L)	2.7572	2.7572
	SPIKE VOLUME in mL (SVol)	0.100	0.100
SOLID	SPIKE DILUTION FACTOR (SDF)	1	1
	SPIKE BOOK NUMBER (Spk BN)	112B43	112B43
95003893	SPIKE VALUE in $\mu\text{Ci/mL}$ (SVal)	4.4763E-02	4.4763E-02
	INSTRUMENT EFFICIENCY FACTOR (EFF)	0.238	0.238
0	SAMPLE + SPIKE $\mu\text{Ci/g}$ (S+S)	1.02E+00	1.14E+00
	AVERAGE or MAXIMUM $\mu\text{Ci/g}$ in SAMPLE	4.7875E-04	
FUSION01			
S95T002906			
Instrument Code			
WB26782			
Prepared By			
SEH			
Chemist			
SLF			
Analyst			
SLH			
Date Complete			
11/14/95			
Analysis Date			
11/13/95			
Analysis Time			
10:30 PM			
Sample Point			
BX-110			

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

SAMPLE + SPIKE $\mu\text{Ci/g}$ = Rs * 1000mL/L * DF / (EFF * SS * Dg/L * 2220000dpm/ μCi)

QC ACTUAL = SVal

QC FOUND = (((S+S $\mu\text{Ci/g}$ - SAMPLE $\mu\text{Ci/g}$) * ((SDF/(SVol*1000)))/(DF/SS/Dg/L))))

PERCENT SPIKE RECOVERY = (QC FOUND / QC ACTUAL) * 100

NOTE: Original Sample result was a LESS THAN value. Zero (0) was subtracted from the spiked value for QC found calculation.

QC ACTUAL	=	4.48E-02
QC FOUND	=	1.49E-02
AVG. PERCENT SPIKE RECOVERY	=	33.2%

Analyst:	SEH	Date: 14-Nov-95
Signature of Chemist:	SLF	Date: 11/14/95
SPIKE.WB1 Rev. 1.0	508101ML	

DATA
NOT USED
IN PACKAGE

AT : LA-508-101 (D-2)

SOLIDS

		SAMPLE	REPLICATE
	DETECTOR NUMBER	15	15
SAMPLE	DISH SIZE (1, 2, or 5) (MS)	2	2
	GROSS COUNTS (GC)	48	48
3471	COUNT TIME In MINUTES (CT)	30	30
	BACKGROUND In cpm (BKG)	0.67	0.67
AT	SAMPLE SIZE In mL (SS)	0.500	0.500
	DILUTION FACTOR (DF)	1	1
@ALPHA01	DIGEST GRAMS of SOLIDS / L (Dg/L)	2.622	2.622
	EFFICIENCY FACTOR (EFF)	0.2380	0.2380
SOLID	Lc, Rmax, or Rs.(SAMPLE RATE) as APPROPRIATE	0.930	0.863
95003893	Blank Concentration In $\mu\text{Ci/g}$	1.34E-03	
0	Replicate Concentration In $\mu\text{Ci/g}$	1.25E-03	
	Average Concentration In $\mu\text{Ci/g}$	1.2945E-03	
FUSION01	Rs (Sample Count Rate) = (TC / CT) - BKG		
S95T002946	ALPHA TOTAL $\mu\text{Ci/g}$ = Rs * 1000mL/L * DF / (EFF * SS * Dg/L * 2220000dpm/ μCi)		
WB26782	Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100		
SEH	Detection Levels and Less Than Values are determined from Procedure LA-508-002.		
SLF	ALPHA TOTAL	1.29E-03	DETECTION LEVEL
SLH	RELATIVE COUNTING ERROR	61.5%	
11/14/95			1.14E-03 $\mu\text{Ci/g}$
11/13/95			
10:30 PM			
BX-110			

Analyst:	SEH	Date: 14-Nov-95
Signature of Chemist:	SLF	Date: 11/14/95
SAMPLE.WB1 Rev. 1.0	508101ML	

DATA
NOT USED
IN PACKAGE

AT : LA-508-101 (D-2)

SOLIDS

	DUP	REPLICATE
DETECTOR NUMBER	15	15
DUP DISH SIZE (1, 2, or 5) (MS)	2	2
GROSS COUNTS (GC)	55	41
3471 COUNT TIME in MINUTES (CT)	30	30
BACKGROUND in cpm (BKG)	0.67	0.67
AT SAMPLE SIZE in mL (SS)	0.500	0.500
DILUTION FACTOR (DF)	1	1
@ALPHA01 DIGEST GRAMS of SOLIDS / L (Dg/L)	2.688	2.688
EFFICIENCY FACTOR (EFF)	0.2380	0.2380
SOLID Lc, Rmax, or Rs, (SAMPLE RATE) as APPROPRIATE	1.163	0.697
Blank Concentration in $\mu\text{Ci/g}$	1.64E-03	
Replicate Concentration in $\mu\text{Ci/g}$	9.81E-04	
Average Concentration in $\mu\text{Ci/g}$	1.3096E-03	
FUSION01 Rs (Sample Count Rate) = (TC / CT) - BKG		
ALPHA TOTAL $\mu\text{Ci/g}$ = Rs * 1000mL/L * DF / (EFF * SS * Dg/L * 2220000dpm/ μCi)		
S95T002946 Relative Counting Error = [(The Square Root of TC + BKG * CT) / (TC - BKG * CT)] * 1.96 * 100		
WB26762 Detection Levels and Less Than Values are determined from Procedure LA-508-002.		
SEH		
Chemist		
SLF		
Analys		
SLH		
Bar Complete		
11/14/95		
Analysis Date		
11/13/95		
Analysis Time		
10:30 PM		
Sample Point		
BX-110		

v RESULTS v

ALPHA TOTAL	in $\mu\text{Ci/g}$	1.31E-03	DETECTION LEVEL
RELATIVE COUNTING ERROR		73.3%	1.11E-03 $\mu\text{Ci/g}$

Analyst:

SEH

Date: 14-Nov-95

Signature of Chemist:

SLF

Date: 11/14/95

SAMPLE.WB1 Rev. 1.0

508101ML

DATA
NOT USED
IN PACKAGE

AT : LA-508-101 (D-2)

SPIKED SAMPLE

		SPIKE	REPLICATE
	DETECTOR NUMBER	15	15
SPK	DISH SIZE 1, 2, or 5 (MS)	2	2
	TOTAL COUNTS (TC)	33568	34221
3471	COUNT TIME in MINUTES (CT)	30	30
	BACKGROUND in cpm (BKG)	0.67	0.67
AT	SAMPLE VOLUME in mL (Spiked Vial) (SS)	0.500	0.500
	SAMPLE DILUTION FACTOR (Spiked Vial) (DF)	1	1
@ALPHA01	DIGEST GRAMS of SOLIDS / L (Dg/L)	2.622	2.622
	SPIKE VOLUME in mL (SVol)	0.100	0.100
SOLID	SPIKE DILUTION FACTOR (SDF)	1	1
	SPIKE BOOK NUMBER (Spk BN)	112B43	112B43
95003893	SPIKE VALUE in $\mu\text{Ci/mL}$ (SVal)	4.4763E-02	4.4763E-02
	INSTRUMENT EFFICIENCY FACTOR (EFF)	0.238	0.238
0	SAMPLE + SPIKE $\mu\text{Ci/g}$ (S+S)	1.61E+00	1.65E+00
	AVERAGE or MAXIMUM $\mu\text{Ci/g}$ in SAMPLE	1.2945E-03	
FUSION01			
SAMPLE			
S95T002946			
Instrument Code			
WB26782			
Prepared By			
SEH			
Chemist			
SLF			
Analyst			
SLH			
Date Complete			
11/14/95			
Analysis Date			
11/13/95			
Analysis Time			
10:30 PM			
Sample Point			
BX-110			

Rs (Sample Count Rate) = (TC / CT) - BKG	
SAMPLE + SPIKE $\mu\text{Ci/g}$ = $Rs \wedge 1000\text{mL/L} \cdot DF / (EFF \wedge SS \cdot Dg/L \cdot 2220000\text{dpm}/\mu\text{Ci})$	
QC ACTUAL = SVal	
QC FOUND = $((S+S \mu\text{Ci/g} - \text{SAMPLE } \mu\text{Ci/g}) \cdot ((SDF/(SVol \cdot 1000)) / (DF/SS/Dg/L)))$	
PERCENT SPIKE RECOVERY = (QC FOUND / QC ACTUAL) * 100	

QC ACTUAL	=	4.48E-02
QC FOUND	=	2.14E-02
AVG. PERCENT SPIKE RECOVERY	=	47.7%

Analyst:

SEH

Date: 14-Nov-95

Signature of Chemist:

SLF

Date: 11/14/95

SPIKE.WB1 Rev. 1.0

508101ML

DATA
NOT USED
IN PACKAGE

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		Date: 11/17/95
Project Title/Work Order WHC-SD-WM-DP-155, Rev. 0, "45-Day Safety Screening Results and Final Report for Tank 241-BX-110, Auger Samples 95-AUG-045 and 95-AUG-046"		EDT NO.: EDT-613469
		ECN NO.: N/A

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Washington State Department of Ecology

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