NOTICE

CERTAIN DATA CONTAINED IN THIS DOCUMENT MAY BE DIFFICULT TO READ IN MICROFICHE PRODUCTS.

PNL-7954
AD-940

101-SY Hydrogen Safety Project Chemical Analysis Support

Window "C" Total Organic Carbon Analysis

B. M. Gillespie
R. W. Stromatt
D. L. Baldwin
F. V. Hoopes

January 1992

Prepared for the U.S. Department of Energy
under Contract DE-AC06-76RLO 1830

Pacific Northwest Laboratory
Operated for the U.S. Department of Energy
by Battelle Memorial Institute

Battelle

PNL-7954

DISCLAIMER

PACIFIC NORTHWEST LABORATORY
operated by
BATTELLE MEMORIAL INSTITUTE
for the
UNITED STATES DEPARTMENT OF ENERGY
under Contract DE-AC06-76RLO 1830

Printed in the United States of America

Available to DOE and DOE contractors from the Office of Scientific and Technical Information, P.O. Box 62, Oak Ridge, TN 37831; prices available from (615) 576-8401. FTS 626-8401.

Available to the public from the National Technical Information Service, U.S. Department of Commerce, 5285 Port Royal Rd., Springfield, VA 22161.

PNL--7954

DE92 007049

101-SY HYDROGEN SAFETY PROJECT CHEMICAL ANALYSIS SUPPORT

WINDOW "C" TOTAL ORGANIC CARBON ANALYSIS

B. M. Gillespie
R. W. Stromatt
D. L. Baldwin
F. V. Hoopes

January 1992

Prepared for
the U.S. Department of Energy
under Contract DE-AC06-76RLO 1830

Pacific Northwest Laboratory
Richland, Washington 99352

SUMMARY

Core samples taken from Hanford double-shell waste tank 101-SY during Window "C" (after the May 1991 gas release event) were analyzed for total organic carbon by the staff of the Analytical Chemistry Laboratory at Pacific Northwest Laboratory. Westinghouse Hanford Company submitted these samples as Sample Delivery Groups 0, 2, 5, 6, 8, 9, 11, 12, and 13.

The procedures used and the chain of custody were carefully documented. Results of the analyses will be used by the 101-SY Hydrogen Safety Project.

CONTRIBUTORS LIST

PROJECT MANAGEMENT OFFICE

RW Stromatt, Co-Project Manager
BM Gillespie, Co-Project Manager
BO Barnes, Quality Engineer
DR Sauer

HOT CELL OPERATIONS

RT Steele, Sub-Task Leader
JK Rau
FV Hoopes
SA Homi

ORGANIC CHEMISTRY ANALYSIS

RW Stromatt, Sub-Task Leader
EW Hoppe
GA Ross
DL Bellofatto
MJ Steele
WT Cobb
DL Baldwin

CERTIFICATION STATEMENT

I certify that this data package is in compliance with the terms and conditions of the TPP 17667 and QA Plan MCS-027 for completeness. Release of the data contained in this hard copy data package has been authorized by the Analytical Chemistry Laboratory Project Manager or the Project Manager's designee, as verified by the following signature.

B. M. Gillespie
101-SY ACL Project Manager

12-19-91
Date

CONTENTS

TABLES

1.0 INTRODUCTION

This data package contains the results obtained by Pacific Northwest Laboratory (PNL) staff in the characterization of samples for the 101-SY Hydrogen Safety Project. The samples were submitted for analysis by Westinghouse Hanford Company (WHC) under the Technical Project Plan (TPP) 17667 and the Quality Assurance Plan MCS-027. They were from a core sample taken during Window "C" after the May 1991 gas release event. The analytical procedures required for analysis were defined in the Test Instructions (TI) prepared by the PNL 101-SY Analytical Chemistry Laboratory (ACL) Project Management Office in accordance with the TPP and the QA Plan.

The samples (Table 1) were submitted with the appropriate WHC Chain of Custody (COC) and Sample Analysis Request Forms. The samples were delivered to the "B" hot cells in the 325 Building in the 300 Area.

The requested analysis for these samples was for Total Organic Carbon. The quality control (QC) requirements for each sample are defined in the test instructions for each sample. The QC requirements outlined in the procedures and requested in the WHC SOW were followed.

Three appendices are provided: one for Test Instructions; one for Chain of Custody, Sample Analysis Request, and Sample Receipt Forms; and one that contains the primary organic analytical data.

TABLE 1.1. 101-SY Sample Numbers

WHC Sample Number	PNL ALO Sample Number
Sample Delivery Group #0	
#101SY-W	91-2925
#101SY-D	91-2926
#SW LOOSE	91-2927
Sample Delivery Group #2	
#451	91-6424
Sample Delivery Group #5	
#443	91-7320
Sample Delivery Group #6	
#538	91-7485
#634	91-7486
Sample Delivery Group #8	
#631	91-7770
#650	91-7771
#712	91-7772
#667	91-7773
Sample Delivery Group #9	
#641	91-7812
#601	91-7813
Sample Delivery Group #11	
#672	91-7810
#661	91-7811
#776	91-8237
#789	91-8238
#788	91-8239
#766	91-8240
#754	91-8241
#619	91-8242

TABLE 1.1. (contd)

WHC Sample Number	PNL ALO Sample Number
Sample Delivery Group #12	
#821	91-9279
#475	91-9280
#777	91-9281
#859	91-9282
#670	91-9283
#888	91-9284
#849	91-9285
Sample Delivery Group #13	
#1062	91-10516
#1065	91-10517
#1068	91-10518
#1071	91-10519

2.0 TOTAL ORGANIC CARBON ANALYSIS RESULTS

The samples were prepared by procedure PNL-7-40.47, rev. 0, "Determination of TC, TOC, and TIC in Radioactive Liquids, Soils, and Sludges by Hot Persulfate Method." This procedure uses the oxidation/extraction method of hot acid persulfate oxidation. Evolved CO_2 is measured by a UIC Coulometric Carbon Analyzer coulometry detector. Samples are acidified with heated sulfuric acid to drive off all inorganic carbonate carbon as CO_2. Excess potassium persulfate oxidant, along with a silver catalyst, is then added to the heated sulfuric acid solution. All organic carbon is oxidized to CO_2, swept away by the carrier gas to the Coulometrics Analyzer, and the results calculated and displayed directly as μg carbon titrated.

Daily blank values were determined until consecutive blank runs differed by no more than ~10 μg C. Samples were run in duplicate. An α-D-glucose spike was added to one sample daily in addition to the glucose standards analyzed daily in duplicate or triplicate. Reported values (summarized in Table 2) are corrected for percent recovery of standards.

Sample 91-6424/#451 was re-analyzed in duplicate due to instrument problems evident by low standard recoveries and erratic results during the first analysis. The correct results are shown in this report. Furthermore, small sample sizes were used because of titration cell solution discoloring and display run-on past the elapsed analysis time. These considerations should not affect the reported results. Low spike recoveries (<0%-69.3%) for 101-SY blind simulated samples 91-10516/#1068, 91-10517/#1065, 91-10518/#1068, and 91-10519/#1071 are, as of yet, unexplained. Previous spike recoveries for 101-SY samples have consistently been between 85% and 105%. These recoveries have an unknown effect on the reported blind sample results.

TABLE 2.1. Total Organic Carbon Analysis Results

ALO ID	Cust ID	Size (g)	µg C Sample	µg/Kg Results	RPD Dups	Date Analyzed
91-2925	W-1	0.1718	2489	1.54×10^7	2	08/02/91
	-2	0.0787	1167	1.58×10^7		
	Spike (added to sample)			105% Recovery		
91-2926	D-1	0.0622	1142	1.96×10^7	11	08/02/91
	-2	0.0607	1001	1.75×10^7		
	Standard			93.9% Recovery		
	Blank		131			
91-2927	SW Loose-1	0.0839	1420	1.77×10^7	17	08/06/91
	-2	0.0563	1129	2.10×10^7		
	Spike (added to sample)			96.3% Recovery		
	Standard			95.5% Recovery		
	Blank		138			
91-6424	#451-1	0.1275	1920	1.61×10^7	4	08/12/91
	-2	0.1438	2076	1.54×10^7		
91-7320	#443-1	0.1770	2250	1.36×10^7	11	08/12/91
	-2	0.1348	1921	1.52×10^7		
	Spike (added to sample)			85.1% Recovery		
	Standard			93.7% Recovery		
	Blank		100			
91-7485	#538-1	0.1210	1031	0.91×10^7	9	08/13/91
	-2	0.1309	1228	1.00×10^7		
91-7486	#634-1	0.0723	1074	1.58×10^7	7.9	08/13/91
	-2	0.1292	1770	1.46×10^7		
91-7770	#631-1	0.1011	874	0.92×10^7	8	08/13/91
	-2	0.1634	1539	1.00×10^7		
	Spike (added to sample)			97.7% Recovery		
	Standard			93.9% Recovery		
	Blank		96			
91-7771	#650-1	0.1578	1914	1.24×10^7	2	08/14/91
	-2	0.1508	1861	1.26×10^7		

TABLE 2.1. (contd)

ALO ID	Cust ID	Size (g)	µg C Sample	µg/Kg Results	RPD Dups	Date Analyzed
91-7772	#712-1	0.1206	1775	1.51×10^7	6	08/14/91
	-2	0.1147	1793	1.60×10^7		
91-7773	#667-1	0.1291	1812	1.44×10^7	6	08/14/91
	-2	0.1419	2121	1.53×10^7		
	Spike (added to sample)			100.9% Recovery		
91-7812	#641-1	0.1206	1496	1.27×10^7	0	08/14/91
	-2	0.1394	1732	1.27×10^7		
91-7813	#601-1	0.1329	1584	1.22×10^7	2	08/14/91
	-2	0.1367	1671	1.25×10^7		
	Standard			97.2% Recovery		
	Blank		74			
91-7810	#672-1	0.0620	963	1.60×10^7	2	08/20/91
	-2	0.0453	686	1.56×10^7		
91-8237	#776-1	0.0281	420	1.54×10^7	6	08/20/91
	-2	0.0444	626	1.45×10^7		
	Spike (added to sample)			100.1% Recovery		
	Standard			97.0% Recovery		
	Blank		62			
91-7811	#661-1	0.0403	596	1.54×10^7	9.9	08/21/91
	-2	0.0632	1032	1.70×10^7		
91-8238	#789-1	0.0318	469	1.54×10^7	2	08/21/91
	-2	0.0224	323	1.51×10^7		
	Spike (added to sample)			97.0% Recovery		
	Standard			95.8% Recovery		
	Blank		72			
91-8239	#788-1	0.0701	931	1.38×10^7	9.1	08/22/91
	-2	0.0602	726	1.26×10^7		

TABLE 2.1. (contd)

ALO ID	Cust ID	Size (g)	µg C Sample	µg/Kg Results	RPD Dups	Date Analyzed
91-8240	#766-1	0.0747	1010	1.41×10^7	6	08/22/91
	-2	0.0666	959	1.50×10^7		
	Spike (added to sample)			94.5% Recovery		
	Standard			96.0% Recovery		
	Blank		79			
91-8241	#754-1	0.0805	1204	1.51×10^7	3	08/23/91
	-2	0.0504	733	1.47×10^7		
91-8242	#619-1	0.1474	1744	1.19×10^7	3	08/23/91
	-2	0.0649	739	1.15×10^7		
	Spike (added to sample)			91.0% Recovery		
	Standard			99.2% Recovery		
	Blank		82			
91-9279	#821-1	0.0403	523	1.32×10^7	6	09/04/91
	-2	0.0634	869	1.40×10^7		
	Spike (added to sample)			98.7% Recovery		
91-9280	#475-1	0.0645	905	1.43×10^7	4	09/04/91
	-2	0.0596	869	1.49×10^7		
	Standard			98.1% Recovery		
	Blank		93			
91-9281	#777-1	0.0797	1271	1.65×10^7	4	09/06/91
	-2	0.0525	872	1.72×10^7		
	Spike (added to sample)			96.1% Recovery		
91-9282	#859-1	0.0353	564	1.66×10^7	6	09/06/91
	-2	0.0549	829	1.57×10^7		
	Standard			96.4% Recovery		
	Blank		85			
91-9283	#670-1	0.0771	1167	1.61×10^7	5	09/10/91
	-2	0.0724	1146	1.69×10^7		
91-9284	#888-1	0.0317	440	1.48×10^7	4	09/10/91
	-2	0.0491	712	1.54×10^7		
	Spike (added to sample)			95.6% Recovery		

TABLE 2.1. (contd)

ALO ID	Cust ID	Size (g)	µg C Sample	µg/Kg Results	RPD Dups	Date Analyzed
91-9285	#849-1	0.0568	757	1.42×10^7	4	09/10/91
	-2	0.0584	813	1.48×10^7		
	Standard			93.9% Recovery		
	Blank		85			
91-10516	#1062-1	0.1346	2708	2.10×10^7	4.6	09/16/91
	-2	0.1199	2530	2.20×10^7		
91-10517	#1065-1	0.0980	3030	3.22×10^7	2	09/16/91
	-2	0.0677	2045	3.15×10^7		
	Spike (added to sample)			36.4% Recovery		
	Standard			95.6% Recovery		
	Blank		90			
91-10518	#1068-1	0.0878	359	4.25×10^6	0.5	10/02/91
	-2	0.1330	546	4.27×10^6		
91-10519	#1071-1	0.1177	1422	1.26×10^7	9.1	10/02/91
	-2	0.0795	1054	1.38×10^7		
	Spike-1			<0% Recovery		
	-2			69.3% Recovery		
	Standard			96.2% Recovery		
	Blank		76			

Total Organic Carbon by PNL procedure 7-40.47, on instrument WC01713, 325 Bldg., room 201.

3.0 COMPARISON OF BLIND SIMULATED SAMPLE RESULTS OBTAINED WITH THE PNL COMBUSTION AND THE HOT PERSULFATE METHODS

Because of the poor spike recoveries for the blind simulated samples using the Hot Persulfate method (procedure PNL-7-40.47), samples 91-10517/#1065 and 91-10518/#1068 were also analyzed by the PNL combustion method (procedure PNL-7-40.37). With this method the sample is heated at 500-750°C, oxidizing all organic carbon present to CO_2. The CO_2 is measured also by a UIC Coulometric Carbon Analyzer. Results are corrected for α-D-glucose standard recovery and blank values.

Increased run times and small sample sizes were necessary to minimize TOC display run-on. No satisfactory end point was determined for these analyses, however. Carbon dioxide evolution above background levels continued well past the 20-30 minute run times. It is impossible to determine when organic carbon evolution stops, and when inorganic carbonate carbon evolution begins. Longer run times only increase the chance of carbonate carbon evolution being recorded. Higher furnace temperatures modestly increased CO_2 evolution, but did not noticeably decrease run times.

Results for sample 91-10517/#1065 were 11 to 28% lower than those reported using the Hot Persulfate method and were much less consistent. The result for sample 91-10518/#1068, on the other hand, was 22% higher than Hot Persulfate method results. No useful TOC data was generated using the combustion method because of the inability to determine an analysis end point and the variability in the generated values. Analysis was run on instrument WA92040, 325 Building, room 701.

APPENDIX A

TEST INSTRUCTIONS

CONTROLLED DOCUMENT
COPY NO. 01

101-SY SAMPLE TEST INSTRUCTION WINDOW C FOR TOTAL ORGANIC CARBON ANALYSIS

DATE PREPARED: July 31, 1991 PREPARED BY: B. M. Gillespie

SAMPLE NUMBERS: 91-2925 (101-SY-W), 91-2926 (101-SY-D) and 91-2927 (SW Loose)

APPROVED BY: B. M. Gillespie DATE: 7-31-91
Project Manager

CONTROLLING DOCUMENTS:

Project TPP: 101-SY Chemical Analysis Support Task TPP 17667

Project QAPP: Hydrogen Safety Project QA Plan MCS-027

Administrative Control Procedure: PNL-ALO-010

INTRODUCTION

This Test Instruction (TI) defines the scope of work to be completed on 101-SY tank samples that may be crust, slurry/sludge, saltcake and/or liquid samples and their accompanying blind and blank samples requiring Organic analysis.

This TI is based on the TPP 17667. Any deviations from the instructions contained in this TI will require prior approval from the Project Manager.

Upon sample receipt, samples and their extractants will be stored at $4 \pm 2^{o}C$, radioactive levels permitting.

All analyses are to be completed following the identified procedure and reported in the units of ug/L or ug/Kg. If deviations from the procedure must be made, the Project Manager must first be notified. Then the change is documented and this documentation must accompany the analytical data. All analytical data are returned to the ALO Project Support Office. Use of screen is optional for blanks.

REQUESTED ANALYSES

Requested Analysis	Procedure #	Task Leader
Total Organic Carbon	PNL-MA-597, Vol. 7 Method 40.47	Stromatt (Baldwin)

101-SY SAMPLE TEST INSTRUCTION
WINDOW C
FOR TOTAL ORGANIC CARBON ANALYSIS

SAMPLE PREPARATION INSTRUCTIONS

If samples aliquots must be transferred to other groups or out of the building, they must be transfered in accordance with PNL-ALO-010 (i.e. COC).

Respective representative sample aliquots, as spelled out in the procedures below, will be used for sample preparation as follows:

B-HOT CELL PREPARATION INSTRUCTIONS

The preparation and analysis of the samples is performed in a "hot" cell due to high radiation dose rates.

Task	Preparation Procedure	Task Leader
Total Organic Carbon	7-40.47	Stromatt (Baldwin)

QUALITY CONTROL

Each sample shall be analyzed in duplicate with an analytical spike analyzed at the rate of one per day and a blank analyzed at the rate of one per day as per the TPP 17667.

CONTROLLED DOCUMENT
COPY NO. 01

101-SY SAMPLE TEST INSTRUCTION
WINDOW C
FOR ORGANIC ANALYSIS

DATE PREPARED: July 11, 1991 PREPARED BY: R. W. Stromatt

SAMPLE NUMBERS: 91-6424 (#451), 91-6425 (#578), 91-6426 (#579) 91-6427 (#580) and 91-6428 (#581)

APPROVED BY: R. W. Stromatt DATE: 7-11-91
Project Manager

CONTROLLING DOCUMENTS:

Project TPP: 101-SY Chemical Analysis Support Task TPP 17667

Project QAPP: Hydrogen Safety Project QA Plan MCS-027

Administrative Control Procedure: PNL-ALO-010

INTRODUCTION

This Test Instruction (TI) defines the scope of work to be completed on 101-SY tank samples that may be crust, slurry/sludge, saltcake and/or liquid samples and their accompanying blind and blank samples requiring Organic analysis.

This TI is based on the TPP 17667. Any deviations from the instructions contained in this TI will require prior approval from the Project Manager.

Upon sample receipt, samples and their extractants will be stored at 4 $\pm$ 2°C, radioactive levels permitting.

All analyses are to be completed following the identified procedure and reported in the units of ug/L or ug/Kg. If deviations from the procedure must be made, the Project Manager must first be notified. Then the change is documented and this documentation must accompany the analytical data. All analytical data are returned to the ALO Project Support Office. Use of screen is optional for blanks.

REQUESTED ANALYSES

Requested Analysis	Procedure #	Task Leader
Volatile Organics	PNL-ALO-335	Stromatt
Total Organic Carbon	PNL-MA-597 Vol.7, Method 40.47	

Screening Procedures	Procedure #	Task Leader
Volatiles	PNL-ALO-332	Stromatt

101-SY SAMPLE TEST INSTRUCTION
WINDOW C
FOR ORGANIC ANALYSIS

SAMPLE PREPARATION INSTRUCTIONS

If samples aliquots must be transferred to other groups or out of the building, they must be transfered in accordance with PNL-ALO-010 (i.e. COC).

Respective representative sample aliquots, as spelled out in the procedures below, will be used for sample preparation as follows:

Task	Preparation Procedure	Task Leader
Volatiles	PNL-ALO-330	Stromatt

QUALITY CONTROL

The quality control requirements that require the CERCLA QC protocol outlined in the above procedures will be followed except no duplicate analyses or spike analyses are required by the WHC SOW or the TPP 17667.

Volatile sample analyses will be identified by the sample number only.

Data Reporting

Task	Procedure	Task Leader
Volatiles	PNL-ALO-350	Stromatt

CONTROLLED DOCUMENT
COPY NO. 01

101-SY SAMPLE TEST INSTRUCTION
WINDOW C
FOR ORGANIC ANALYSIS

DATE PREPARED: July 25, 1991 PREPARED BY: B. M. Gillespie

SAMPLE NUMBERS: 91-7320 (#443)

APPROVED BY: B.M Gillespie DATE: 7-25-91
Project Manager

CONTROLLING DOCUMENTS:

Project TPP: 101-SY Chemical Analysis Support Task TPP 17667

Project QAPP: Hydrogen Safety Project QA Plan MCS-027

Administrative Control Procedure: PNL-ALO-010

INTRODUCTION

This Test Instruction (TI) defines the scope of work to be completed on 101-SY tank samples that may be crust, slurry/sludge, saltcake and/or liquid samples and their accompanying blind and blank samples requiring Organic analysis.

This TI is based on the TPP 17667. Any deviations from the instructions contained in this TI will require prior approval from the Project Manager.

Upon sample receipt, samples and their extractants will be stored at 4 ± 2°C, radioactive levels permitting.

All analyses are to be completed following the identified procedure and reported in the units of ug/L or ug/Kg. If deviations from the procedure must be made, the Project Manager must first be notified. Then the change is documented and this documentation must accompany the analytical data. All analytical data are returned to the ALO Project Support Office. Use of screen is optional for blanks.

REQUESTED ANALYSES

Requested Analysis	Procedure #	Task Leader
Total Organic Carbon	PNL-MA-597, Vol. 7 Method 40.47	Stromatt

101-SY SAMPLE TEST INSTRUCTION
WINDOW C
FOR ORGANIC ANALYSIS

SAMPLE PREPARATION INSTRUCTIONS

If samples aliquots must be transferred to other groups or out of the building, they must be transfered in accordance with PNL-ALO-010 (i.e. COC).

Respective representative sample aliquots, as spelled out in the procedures below, will be used for sample preparation as follows:

Task	Preparation Procedure	Task Leader
Total Organic Carbon	7-40.47	Stromatt

QUALITY CONTROL

The quality control requirements that require the CERCLA QC protocol outlined in the above procedures will be followed except no duplicate analyses or spike analyses are required by the WHC SOW or the TPP 17667.

Each sample shall be analyzed in duplicate with an analytical spike analyzed at the rate of one per day and a blank analyzed at the rate of one per day.

CONTROLLED DOCUMENT
COPY NO. 01

101-SY SAMPLE TEST INSTRUCTION
WINDOW C
FOR TOTAL ORGANIC CARBON ANALYSIS

DATE PREPARED: July 30, 1991 PREPARED BY: B. M. Gillespie

SAMPLE NUMBERS: 91-7485 (#538) and 91-7486 (#634)

APPROVED BY: B. M. Gillespie DATE: 7-30-91
Project Manager

CONTROLLING DOCUMENTS:

Project TPP: 101-SY Chemical Analysis Support Task TPP 17667

Project QAPP: Hydrogen Safety Project QA Plan MCS-027

Administrative Control Procedure: PNL-ALO-010

INTRODUCTION

This Test Instruction (TI) defines the scope of work to be completed on 101-SY tank samples that may be crust, slurry/sludge, saltcake and/or liquid samples and their accompanying blind and blank samples requiring Organic analysis.

This TI is based on the TPP 17667. Any deviations from the instructions contained in this TI will require prior approval from the Project Manager.

Upon sample receipt, samples and their extractants will be stored at $4 \pm 2^{o}C$, radioactive levels permitting.

All analyses are to be completed following the identified procedure and reported in the units of ug/L or ug/Kg. If deviations from the procedure must be made, the Project Manager must first be notified. Then the change is documented and this documentation must accompany the analytical data. All analytical data are returned to the ALO Project Support Office. Use of screen is optional for blanks.

REQUESTED ANALYSES

Requested Analysis	Procedure #	Task Leader
Total Organic Carbon	PNL-MA-597, Vol. 7 Method 40.47	Stromatt (Baldwin)

101-SY SAMPLE TEST INSTRUCTION
WINDOW C
FOR TOTAL ORGANIC CARBON ANALYSIS

SAMPLE PREPARATION INSTRUCTIONS

If samples aliquots must be transferred to other groups or out of the building, they must be transfered in accordance with PNL-ALO-010 (i.e. COC).

Respective representative sample aliquots, as spelled out in the procedures below, will be used for sample preparation as follows:

B-HOT CELL PREPARATION INSTRUCTIONS

The preparation and analysis of the samples is performed in a "hot" cell due to high radiation dose rates.

Task	Preparation Procedure	Task Leader
Total Organic Carbon	7-40.47	Stromatt (Baldwin)

QUALITY CONTROL

Each sample shall be analyzed in duplicate with an analytical spike analyzed at the rate of one per day and a blank analyzed at the rate of one per day as per the TPP 17667.

101-SY SAMPLE TEST INSTRUCTION
WINDOW C
FOR TOTAL ORGANIC CARBON ANALYSIS

DATE PREPARED: August 6, 1991 PREPARED BY: B. M. Gillespie

SAMPLE NUMBERS: 91-7770 (#631), 91-7771 (#650), 91-7772 (#712) and 91-7773 (#667)

APPROVED BY: B M Gillespie DATE: 8-6-91
Project Manager

CONTROLLING DOCUMENTS:

Project TPP: 101-SY Chemical Analysis Support Task TPP 17667

Project QAPP: Hydrogen Safety Project QA Plan MCS-027

Administrative Control Procedure: PNL-ALO-010

INTRODUCTION

This Test Instruction (TI) defines the scope of work to be completed on 101-SY tank samples that may be crust, slurry/sludge, saltcake and/or liquid samples and their accompanying blind and blank samples requiring Organic analysis.

This TI is based on the TPP 17667. Any deviations from the instructions contained in this TI will require prior approval from the Project Manager.

Upon sample receipt, samples and their extractants will be stored at 4 $\pm$ 2^{o}C, radioactive levels permitting.

All analyses are to be completed following the identified procedure and reported in the units of ug/L or ug/Kg. If deviations from the procedure must be made, the Project Manager must first be notified. Then the change is documented and this documentation must accompany the analytical data. All analytical data are returned to the ALO Project Support Office. Use of screen is optional for blanks.

REQUESTED ANALYSES

Requested Analysis	Procedure #	Task Leader
Total Organic Carbon	PNL-MA-597, Vol. 7 Method 40.47	Stromatt (Baldwin)

101-SY SAMPLE TEST INSTRUCTION
WINDOW C
FOR TOTAL ORGANIC CARBON ANALYSIS

SAMPLE PREPARATION INSTRUCTIONS

If samples aliquots must be transferred to other groups or out of the building, they must be transfered in accordance with PNL-ALO-010 (i.e. COC).

Respective representative sample aliquots, as spelled out in the procedures below, will be used for sample preparation as follows:

B-HOT CELL PREPARATION INSTRUCTIONS

The preparation and analysis of the samples is performed in a "hot" cell due to high radiation dose rates.

Task	Preparation Procedure	Task Leader
Total Organic Carbon	7-40.47	Stromatt (Baldwin)

QUALITY CONTROL

Each sample shall be analyzed in duplicate with an analytical spike analyzed at the rate of one per day and a blank analyzed at the rate of one per day as per the TPP 17667.

CONTROLLED DOCUMENT
COPY NO. 01

101-SY SAMPLE TEST INSTRUCTION
WINDOW C
FOR TOTAL ORGANIC CARBON ANALYSIS

DATE PREPARED: August 8, 1991 PREPARED BY: B. M. Gillespie

SAMPLE NUMBERS: 91-7810 (#672), 91-7811 (#661), 91-7812 (#641) and 91-7813 (#601)

APPROVED BY: B M Gillespie DATE: 8-8-91
Project Manager

CONTROLLING DOCUMENTS:

Project TPP: 101-SY Chemical Analysis Support Task TPP 17667

Project QAPP: Hydrogen Safety Project QA Plan MCS-027

Administrative Control Procedure: PNL-ALO-010

INTRODUCTION

This Test Instruction (TI) defines the scope of work to be completed on 101-SY tank samples that may be crust, slurry/sludge, saltcake and/or liquid samples and their accompanying blind and blank samples requiring Organic analysis.

This TI is based on the TPP 17667. Any deviations from the instructions contained in this TI will require prior approval from the Project Manager.

Upon sample receipt, samples and their extractants will be stored at 4 $\pm$ 2^{o}C, radioactive levels permitting.

All analyses are to be completed following the identified procedure and reported in the units of ug/L or ug/Kg. If deviations from the procedure must be made, the Project Manager must first be notified. Then the change is documented and this documentation must accompany the analytical data. All analytical data are returned to the ALO Project Support Office. Use of screen is optional for blanks.

REQUESTED ANALYSES

Requested Analysis	Procedure #	Task Leader
Total Organic Carbon	PNL-MA-597, Vol. 7 Method 40.47	Stromatt (Baldwin)

101-SY SAMPLE TEST INSTRUCTION
WINDOW C
FOR TOTAL ORGANIC CARBON ANALYSIS

SAMPLE PREPARATION INSTRUCTIONS

If samples aliquots must be transferred to other groups or out of the building, they must be transfered in accordance with PNL-ALO-010 (i.e. COC).

Respective representative sample aliquots, as spelled out in the procedures below, will be used for sample preparation as follows:

B-HOT CELL PREPARATION INSTRUCTIONS

The preparation and analysis of the samples is performed in a "hot" cell due to high radiation dose rates.

Task	Preparation Procedure	Task Leader
Total Organic Carbon	7-40.47	Stromatt (Baldwin)

QUALITY CONTROL

Each sample shall be analyzed in duplicate with an analytical spike analyzed at the rate of one per day and a blank analyzed at the rate of one per day as per the TPP 17667.

CONTROLLED DOCUMENT
COPY NO. 01

101-SY SAMPLE TEST INSTRUCTION WINDOW C FOR TOTAL ORGANIC CARBON ANALYSIS

DATE PREPARED: August 15, 1991 PREPARED BY: B. M. Gillespie

SAMPLE NUMBERS: 91-8237 (#776), 91-8238 (#789), 91-8239 (#788), 91-8240 (#766), 91-8241 (#754) and 91-8242 (#619)

APPROVED BY: B. M. Gillespie DATE: 8-15-91
Project Manager

CONTROLLING DOCUMENTS:

Project TPP: 101-SY Chemical Analysis Support Task TPP 17667

Project QAPP: Hydrogen Safety Project QA Plan MCS-027

Administrative Control Procedure: PNL-ALO-010

INTRODUCTION

This Test Instruction (TI) defines the scope of work to be completed on 101-SY tank samples that may be crust, slurry/sludge, saltcake and/or liquid samples and their accompanying blind and blank samples requiring Organic analysis.

This TI is based on the TPP 17667. Any deviations from the instructions contained in this TI will require prior approval from the Project Manager.

Upon sample receipt, samples and their extractants will be stored at $4 \pm 2^{o}C$, radioactive levels permitting.

All analyses are to be completed within the 14 day hold time following the identified procedure and reported in the units of ug/L or ug/Kg. If deviations from the procedure must be made, the Project Manager must first be notified. Then the change is documented and this documentation must accompany the analytical data. All analytical data are returned to the ALO Project Support Office. Use of screen is optional for blanks.

REQUESTED ANALYSES

Requested Analysis	Procedure #	Task Leader
Total Organic Carbon	PNL-MA-597, Vol. 7 Method 40.47	Stromatt (Baldwin)

101-SY SAMPLE TEST INSTRUCTION
WINDOW C
FOR TOTAL ORGANIC CARBON ANALYSIS

SAMPLE PREPARATION INSTRUCTIONS

If samples aliquots must be transferred to other groups or out of the building, they must be transfered in accordance with PNL-ALO-010 (i.e. COC).

Respective representative sample aliquots, as spelled out in the procedures below, will be used for sample preparation as follows:

B-HOT CELL PREPARATION INSTRUCTIONS

The preparation and analysis of the samples is performed in a "hot" cell due to high radiation dose rates.

Task	Preparation Procedure	Task Leader
Total Organic Carbon	7-40.47	Stromatt (Baldwin)

QUALITY CONTROL

Each sample shall be analyzed in duplicate with an analytical spike analyzed at the rate of one per day and a blank analyzed at the rate of one per day as per the TPP 17667.

CONTROLLED DOCUMENT
COPY NO. 01

101-SY SAMPLE TEST INSTRUCTION
WINDOW C
FOR TOTAL ORGANIC CARBON ANALYSIS

DATE PREPARED: September 3, 1991 PREPARED BY: B. M. Gillespie

SAMPLE NUMBERS: 91-9279 (#821), 91-8280 (#475), 91-9281 (#777), 91-9282 (#839), 91-9283 (#670), 91-9284 (#888) and 91-9285 (#849)

APPROVED BY: B.M. Gillespie DATE: 9-3-91
Project Manager

CONTROLLING DOCUMENTS:

Project TPP: 101-SY Chemical Analysis Support Task TPP 17667

Project QAPP: Hydrogen Safety Project QA Plan MCS-027

Administrative Control Procedure: PNL-ALO-010

INTRODUCTION

This Test Instruction (TI) defines the scope of work to be completed on 101-SY tank samples that may be crust, slurry/sludge, saltcake and/or liquid samples and their accompanying blind and blank samples requiring Organic analysis.

This TI is based on the TPP 17667. Any deviations from the instructions contained in this TI will require prior approval from the Project Manager.

Upon sample receipt, samples and their extractants will be stored at 4 ± 2°C, radioactive levels permitting.

All analyses are to be completed within the 14 day hold time following the identified procedure and reported in the units of ug/L or ug/Kg. If deviations from the procedure must be made, the Project Manager must first be notified. Then the change is documented and this documentation must accompany the analytical data. All analytical data are returned to the ALO Project Support Office. Use of screen is optional for blanks.

REQUESTED ANALYSES

Requested Analysis	Procedure #	Task Leader
Total Organic Carbon	PNL-MA-597, Vol. 7 Method 40.47	Stromatt (Baldwin)

101-SY SAMPLE TEST INSTRUCTION
WINDOW C
FOR TOTAL ORGANIC CARBON ANALYSIS

SAMPLE PREPARATION INSTRUCTIONS

If samples aliquots must be transferred to other groups or out of the building, they must be transfered in accordance with PNL-ALO-010 (i.e. COC).

Respective representative sample aliquots, as spelled out in the procedures below, will be used for sample preparation as follows:

B-HOT CELL PREPARATION INSTRUCTIONS

The preparation and analysis of the samples is performed in a "hot" cell due to high radiation dose rates.

Task	Preparation Procedure	Task Leader
Total Organic Carbon	7-40.47	Stromatt (Baldwin)

QUALITY CONTROL

Each sample shall be analyzed in duplicate with an analytical spike analyzed at the rate of one per day and a blank analyzed at the rate of one per day as per the TPP 17667.

CONTROLLED DOCUMENT
COPY NO. 00001

101-SY SAMPLE TEST INSTRUCTION
WINDOW C
FOR TOTAL ORGANIC CARBON ANALYSIS

DATE PREPARED: September 30, 1991 PREPARED BY: B. M. Gillespie

SAMPLE NUMBERS: 91-10516 (#1062), 91-10517 (#1065), 91-10518 (#1068), and 91-10519 (#1071)

APPROVED BY: _____ DATE: 9-30-91
Project Manager

CONTROLLING DOCUMENTS:

Project TPP: 101-SY Chemical Analysis Support Task TPP 17667

Project QAPP: Hydrogen Safety Project QA Plan MCS-027

Administrative Control Procedure: PNL-ALO-010

INTRODUCTION

This Test Instruction (TI) defines the scope of work to be completed on 101-SY tank samples that may be crust, slurry/sludge, saltcake and/or liquid samples and their accompanying blind and blank samples requiring Organic analysis.

This TI is based on the TPP 17667. Any deviations from the instructions contained in this TI will require prior approval from the Project Manager.

Upon sample receipt, samples and their extractants will be stored at 4 $\pm$ 2^{o}C, radioactive levels permitting.

All analyses are to be completed within the 14 day hold time following the identified procedure and reported in the units of ug/L or ug/Kg. If deviations from the procedure must be made, the Project Manager must first be notified. Then the change is documented and this documentation must accompany the analytical data. All analytical data are returned to the ALO Project Support Office. Use of screen is optional for blanks.

REQUESTED ANALYSES

Requested Analysis	Procedure #	Task Leader
Total Organic Carbon	PNL-MA-597, Vol. 7 Method 40.47	Stromatt (Baldwin)

101-SY SAMPLE TEST INSTRUCTION
WINDOW C
FOR TOTAL ORGANIC CARBON ANALYSIS

SAMPLE PREPARATION INSTRUCTIONS

If samples aliquots must be transferred to other groups or out of the building, they must be transfered in accordance with PNL-ALO-010 (i.e. COC).

Respective representative sample aliquots, as spelled out in the procedures below, will be used for sample preparation as follows:

B-HOT CELL PREPARATION INSTRUCTIONS

The preparation and analysis of the samples is performed in a "hot" cell due to high radiation dose rates.

Task	Preparation Procedure	Task Leader
Total Organic Carbon	7-40.47	Stromatt (Baldwin)

QUALITY CONTROL

Each sample shall be analyzed in duplicate with an analytical spike analyzed at the rate of one per day and a blank analyzed at the rate of one per day as per the TPP 17667.

APPENDIX B

CHAIN OF CUSTODY

APPENDIX B

CHAIN OF CUSTODY

B.1 WESTINGHOUSE CHAIN OF CUSTODY AND SAMPLE ANALYSIS REQUEST FORMS AND PNL SAMPLE RECEIPT FORMS

The following samples were received without sample analysis request form present:

WHC Number	PNL/ALO Number
Sample Delivery Group #0	
#101SY-W	91-2925
#101SY-D	91-2926
#SW LOOSE	91-2927

R 8422

Westinghouse Hanford Company	CHAIN OF CUSTODY 101-SY 4-8-91

Company Contact Dan Herling Telephone 3-2532

Sample Collected by _____ Date _____ Time _____

Sample Locations _____

Ice Chest No. _____ Field Logbook and Page No. _____

Remarks Has Tamper Seal
For Total organic carbon Analysis

Bill of Lading No. _____ Offsite Property No. _____

Method of Shipment _____

Shipped to 325 Building Attn: John Rau - PNL

Possible Sample Hazards See RSR & Regulatory Guide 63

Sample Identification

3 Samples of R8422
SW/Dry
SW/Wet
SW/Loose

Aliquots of the original samples.

Actual sample IDs received were:
101-SY-W (91-2925)
101-SY-D (91-2926)
SW Loose (91-2927)
RTS
4-8-91

Chain of Possession

Relinquished by:	Received by:	Date/Time:
Kenneth J. Patterson	E. F. Rau	4-8-91
Relinquished by: Rick L. Steele	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Westinghouse Hanford Company	CHAIN OF CUSTODY

ompany Contact Bev Crawford Telephone 3-1972

ample Collected by Wayne Edmonson / KJ Patterson Date 7/10/91 Time

ample Locations 101-SY Corel and auger samples

e Chest No.. Field Logbook and Page No.

emarks Samples submitted for VOA and TOC analysis

ill of Lading No. Offsite Property No.

ethod of Shipment ~~32~~ Doorstop carrier / overpack

hipped to 325 Building Attn: Rick Steele - PNL

ossible Sample Hazards see RSR # 12103

Sample Identification

451 - R9217 Auger sample from Riser 13A for TOC
F578 - Hot Cell blank #1 for VOA
F579 - Hot Cell blank #2 for VOA
F580 - Hot Cell blank #3 for VOA
F581 - Hot Cell blank #4 for VOA

Chain of Possession

Relinquished by:	Received by:	Date/Time:
B.A. Crawford	T.J. Bonny	7/10/91 6:56pm
Relinquished by: T.J. Bonny	Received by:	Date/Time:
Rick J. Steele	Rick J. Steele	7/10/91 2050 hrs
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

REQUEST FOR SPECIAL ANALYSIS (RSA) to PNL

ample Point	(2) Date/Time Issued	(3) Date/Time Required	(4) Charge Code
101-SY B.A. Crawford / D. L. Herting	7/10/91 3:30pm	—	(5) Work Package W7A11
(6) Number of Samples: 5 — Dose Rate mRad/Hr (10) Release: — RPT	(7) Customer I.D. #451, #578 #579, #580 #581	(8) Laboratory I.D.	(9) Requester Name/Phone B.A. Crawford 3-1972 (11) Volume of Sample all in 20mL containers. (see below)

(12) Determination	(13) ~~Expected Range~~	(14) ~~Minimum Detection Level~~ OTR values	(15) wt. of sample ~~Method~~ submitted
#451 (R9217 Auger sample) for TOC		200mR/hr	2.31 g
#578 - Hot Cell blank #1 for VOA		<5mR/hr	9.1 g
#579 - Hot Cell blank #2 for VOA		<5mR/hr	11.7 g
#580 - Hot Cell blank #3 for VOA		<5mR/hr	11.7 g
#581 - Hot Cell blank #4 for VOA		<5mR/hr	11.9 g

(16) Matrix (Other Metals or Anions Present)

(17) Radioactivity Level (Actual ☐ Estimated ☐)

Total Alpha _____ µ Ci/L

Total Beta _____ µ Ci/L

Total Gamma _____ µ Ci/L

(18) Additional Information (Measurement Uncertainty or Other Pertinent Information)

(20) Samples Received

(19) ~~Estimated Cost~~	By	From	Date	Time

~~Laboratory Manager~~

(21) Distribution of Final Results/Sample Disposal Instructions

As per SOW

SAMPLE RECEIPT FORM

Delivered by: WHC B-PLANT OVERPACK Date/Time: 2050 hrs 7/10/91

Received by: JK AAN RT STEELE

Customer Sample Number(s): #451 #578 #579 #580 #581

ALO Sample Number(s): 91-6424 91-6425 91-6426 91-6427 91-6428

1. Customer Chain-of-Custody Form: Present X Absent _____

2. Additional Shipping Forms (list):
   OFFSITE RSR
   RSA

3. Custody Seals on Shipping and/or Sample Containers and their Conditions.

   Present X Absent _____

   If Present, Condition: GOOD

4. Sample Tag(s) ID Numbers if not Recorded on the Chain-of-Custody Record or on Sample Vial.

   Notes: N/A

5. Condition of Shipping Container (i,e., broken container, dented, breached plastic bag, temperature of sample container as defined in Section 3.0 in PNL-ALO-051, etc.)
   OK ~25°C (AMBIENT)

6. Condition of Sample Vials.
   GOOD except LIDS have NO SEPTA

7. Verification of Agreement or Nonagreement of Information on Receiving Documents.
   Agreement

8. Resolution of Problems or Discrepancies.
   NA

RETURN COMPLETED FORM TO PROJECT MANAGER

Westinghouse Hanford Company	CHAIN OF CUSTODY

Company Contact: Ben Crawford Telephone: 3-1972

Sample Collected by: Wayne Edmonson Date: _____ Time: _____

Sample Locations: 101-SY

Ice Chest No.: _____ Field Logbook and Page No.: BAC 7/24

Remarks: Samples submitted for TOC and ~~chelator~~ VOA analyses.

Bill of Lading No.: — Offsite Property No.: —

Method of Shipment: B-plant pig in N-55 Overpacks

Shipped to: 325 Bldg Attn: Rick Steele

Possible Sample Hazards: Sat RSR ~~#~~ # 12221

BAC 7/24

Sample Identification

#533 - Sxg 24-101-SY (for VOA analysis) Core 1

#443 - R-9201 Auger sample

Chain of Possession

Relinquished by:	Received by:	Date/Time:
Bruce Hess	Mike Stanley	7-25-91 6:23
Relinquished by: Mike Stanley	Received by: Rick J. Steele	Date/Time: 7-25-91 2115
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

A-6000-107 (04/91)

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector D.W. Edmonson Date Sampled ____ Time ____ hours

Company Contact B.A. Crawford Telephone ( ) 3-1972

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
533	1 20mL I-Chem vial	13.22g sludge	VOA
443	1 20mL I-Chem vial	16.91 crust	TOC & chelators

Field Information** _____

Special Handling and/or Storage VOAs bottled in 20 mL I-Chem jars as collected prior to packaging discussions.

Possible Sample Hazards radioactive material, caustic matrix

PART II: LABORATORY SECTION

Received by _____ Title _____ Date _____

Analysis Required _____

**Use back of page for additional information relative to sample location.

SAMPLE RECEIPT FORM

Delivered by: B-Plant Overpack Truck Date/Time: 7-25-91 2150

Received by: J. K. Rau

Customer Sample Number(s): 533, 443

ALO Sample Number(s): 91-7319 & 91-7320

1. Customer Chain-of-Custody Form: Present X Absent _____

2. Additional Shipping Forms (list): ORSR
SAR

3. Custody Seals on Shipping and/or Sample Containers and their Conditions.

   Present ✓ Absent _____

   If Present, Condition: GOOD

4. Sample Tag(s) ID Numbers if not Recorded on the Chain-of-Custody Record or on Sample Vial.

   Notes: N/A

5. Condition of Shipping Container (i,e., broken container, dented, breached plastic bag, temperature of sample container as defined in Section 3.0 in PNL-ALO-051, etc.) GOOD (28°C)

6. Condition of Sample Vials. OK

7. Verification of Agreement or Nonagreement of Information on Receiving Documents. AGREEMENT

8. Resolution of Problems or Discrepancies.

   N/A

RETURN COMPLETED FORM TO PROJECT MANAGER

Westinghouse Hanford Company	CHAIN OF CUSTODY

Company Contact: Bruce Hey (WHC) / Bev Crawford Telephone: 3-2529 / 3-1972

Sample Collected by: D.W. Edmenson Date: — Time: —

Sample Locations: 101-SY

Ice Chest No.: _____ Field Logbook and Page No.: _____

Remarks: _____

Bill of Lading No.: _____ Offsite Property No.: _____

Method of Shipment: B-plant pig in N-55 overpacks.

Shipped to: 325 Bldg. attn: John Rau

Possible Sample Hazards: Radioactive material (mixed waste)

Sample Identification

#538 2.23g solids 1.3 Rad	1.6×10^{3} µCi crust "Auger" R-9257 A 1.3×10^{-5} g ^{235}U
#634 1.08g slurry	7.9×10^{2} µCi B 1.4×10^{-5} g ^{235}U
	Segment 7 Core 22 sample

Chain of Possession

Relinquished by:	Received by:	Date/Time:
Beverly A. Crawford	Dawn J. Ebberson	7/30/91 6:15pm
Relinquished by: Dawn J. Ebberson	Received by: John K. Rau	Date/Time: 7-30-91
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

A-6000-407 (04/91)

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector D.W. Edmonson Date Sampled — Time — hours

Company Contact B.A. Crawford Telephone ( ) 3-1972

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
#538	1 20 mL vial	solids	TOC & chelators
#134	1 20 mL vial	slurry	TOC

Field Information** _____

Special Handling and/or Storage _____

Possible Sample Hazards radioactive material in caustic matrix

PART II: LABORATORY SECTION

Received by _____ Title _____ Date _____

Analysis Required _____

*Indicate whether sample is soil, sludge, etc.

101-SY
(17667)

SAMPLE RECEIPT FORM

Delivered by: WHC B-PLANT OVERPACK Date/Time: ~~7-3-9~~ 7-30-91 7-30-91 JTR

Received by: JK RAY / HEMI

Customer Sample Number(s): #538 & #634

ALO Sample Number(s): 91-7485 & 91-7486

1. Customer Chain-of-Custody Form: Present X Absent ____

2. Additional Shipping Forms (list): OFFSITE RSE

3. Custody Seals on Shipping and/or Sample Containers and their Conditions.

   Present X Absent ____

   If Present, Condition: GOOD

4. Sample Tag(s) ID Numbers if not Recorded on the Chain-of-Custody Record or on Sample Vial.

   Notes: N/A

5. Condition of Shipping Container (i,e., broken container, dented, breached plastic bag, temperature of sample container as defined in Section 3.0 in PNL-ALO-051, etc.) OK — 24°C (AMBIENT)

6. Condition of Sample Vials.
   OK

7. Verification of Agreement or Nonagreement of Information on Receiving Documents. AGREEMENT.

8. Resolution of Problems or Discrepancies.
   N/A

RETURN COMPLETED FORM TO PROJECT MANAGER

Westinghouse Hanford Company	CHAIN OF CUSTODY

Company Contact: Bev. Crawford Telephone: 3-1972

Sample Collected by: K.J. Patterson/DW Edmonson Date: — Time: —

Sample Locations: 101-SY Core 22

Ice Chest No.: — Field Logbook and Page No.: —

Remarks: —

Bill of Lading No.: Offsite Property No.:

Method of Shipment: B-plant pigs in N-55 overpacks.

Shipped to: 325 Bldg. attn: Rick Steele or John Rau

Possible Sample Hazards: Radioactive waste see PSR #

Sample Identification

#1631 2.42g seg 8 core 22 #1650 9.43g seg 17 core 22	packed in one pig
#712 5.79g R-9221 Auger sample #1667 1.20g seg 16 core 22	packed in one pig

Chain of Possession

Relinquished by:	Received by:	Date/Time:
Dawn K. Crawford	S F Wallace	8-7-91, 1840
Relinquished by: S F Wallace	Received by: John K. Rau	Date/Time: 8-7-91, 2120
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector D W. Edmonson Date Sampled — Time — hours

Company Contact Bill Crawford Telephone ( ) 3-1972

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
631	1ea. 20mL vial	solids	TOC & chelators
650	1ea. 20mL vial	solids	TOC
712	1ea. 20mL vial	solids	TOC & chelators
667	1ea. 20mL vial	solids	TOC

Field Information** _____

Special Handling and/or Storage radioactive material in caustic matrix

Possible Sample Hazards _____

PART II: LABORATORY SECTION

Received by _____ Title _____ Date _____

Analysis Required _____

6 mo 5-6-91 ~~1,6-2~~

101-SY 17667

PNL-ALO-051, Rev. 0
Exhibit 1
Page 1 of 1

SAMPLE RECEIPT FORM

Delivered by: B-PLANT OVERPAK Trn Date/Time: 8-7-91 2120

Received by: [signature] Thom's

Customer Sample Number(s): # 631, # 650, # 712, # 667

ALO Sample Number(s): 91-7770, 91-7771, 91-7772, 91-7773

1. Customer Chain-of-Custody Form: Present ✓ Absent _____

2. Additional Shipping Forms (list): DRSR
SAR

3. Custody Seals on Shipping and/or Sample Containers and their Conditions.

   Present _____ Absent _____

   If Present, Condition: GOOD

4. Sample Tag(s) ID Numbers if not Recorded on the Chain-of-Custody Record or on Sample Vial.

   Notes: 631, 650, 712, 667 (on VIALS & COC)

5. Condition of Shipping Container (i,e., broken container, dented, breached plastic bag, temperature of sample container as defined in Section 3.0 in PNL-ALO-051, etc.)

   GOOD 30°C (AMBIENT TEMP)

6. Condition of Sample Vials.

   GOOD

7. Verification of Agreement or Nonagreement of Information on Receiving Documents. JKR 7-7-91 ~~N/A~~ AGREEMENT

8. Resolution of Problems or Discrepancies.

   N/A

RETURN COMPLETED FORM TO PROJECT MANAGER

Westinghouse Hanford Company	CHAIN OF CUSTODY

Company Contact: Bruce Hey — Telephone: 3-2529

Sample Collected by: D.W. Edmonson — Date: — — Time: —

Sample Locations: 101-SY tank

Ice Chest No.: — — Field Logbook and Page No.: —

Remarks: —

Bill of Lading No. — Offsite Property No. —

Method of Shipment: B-plant pigs in N-55 overpacks

Shipped to: 325 Bldg attn: Rick Steele

Possible Sample Hazards: Radioactive material in caustic matrix

See attached RSR#13647

Sample Identification

BH 3/4 ~~# 1677 4.63 g seg 5 sludge~~ } ~~packed in one pig .780mRad/hr~~

BH 3/4 ~~# total 4.101 g seg 5&R sludge~~ } ~~1000mRad/hr~~

641 1.65 g seg 5 solids } packed in one pig: 1250mRad/hr

6081 3.71 g seg FB solids } 500mRad/hr

Chain of Possession

Relinquished by:	Received by:	Date/Time:
Bruce Hey	K. Lampman	9-8-91
Relinquished by: K. Lampman	Received by: John K. Ron	Date/Time: 9-9-91 2100
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

	SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector D.W. Edmonson Date Sampled — Time — hours

Company Contact Bruce Hey Telephone ( ) 3-2529

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
~~672~~	~~1 ea 20 mL vial~~	~~solids~~	~~Chelators, TOC~~ BH 8/6
~~6801~~	~~1 ea 20 mL vial~~	~~solids~~	~~TOC~~ BH 8/6
672, 6811	1 ea 20 mL vial	solids	TOC
6801	1 ea 20 mL vial	solids	TOC

Field Information** _____

Special Handling and/or Storage radioactive material in caustic matrix.

Possible Sample Hazards _____

PART II: LABORATORY SECTION

eceived by _____ Title _____ Date _____

Analysis Required _____

101-SY

#17667

SAMPLE RECEIPT FORM

Delivered by: B-Plant Overpack Truck Date/Time: 8-8-91

Received by: John K. Rau 8-8-91 JKR

Customer Sample Number(s): ~~#672, #661~~, #641, #601

ALO Sample Number(s): ~~91-7810, 91-7811~~, 91-7812, 91-7813
8-8-91 JKR

1. Customer Chain-of-Custody Form: Present X Absent _____

2. Additional Shipping Forms (list): ORSR
SAR

3. Custody Seals on Shipping and/or Sample Containers and their Conditions.

   Present X Absent _____

   If Present, Condition: GOOD

4. Sample Tag(s) ID Numbers if not Recorded on the Chain-of-Custody Record or on Sample Vial.

   Notes: 601 & 641 WERE ONLY SAMPLES SHIPPED, AS CONTAINER FOR OTHERS WAS NOT AVAILABLE

5. Condition of Shipping Container (i,e., broken container, dented, breached plastic bag, temperature of sample container as defined in Section 3.0 in PNL-ALO-051, etc.) GOOD

6. Condition of Sample Vials.
   GOOD

7. Verification of Agreement or Nonagreement of Information on Receiving Documents.
   AGREE

8. Resolution of Problems or Discrepancies.
   N/A

RETURN COMPLETED FORM TO PROJECT MANAGER

Westinghouse Hanford Company	CHAIN OF CUSTODY

Company Contact: Bruce Hey Telephone: 3-2529

Sample Collected by: Patterson / Edmonson Date: — Time: —

Sample Location: 101-SY see notebook: WHC-N-313-7 page 43

Ice Chest No.: — Field Logbook and Page No.: —

Remarks: —

Bill of Lading No.: Offsite Property No.:

Method of Shipment:

Shipped to:

Possible Sample Hazards: Radioactive material in caustic solution. See RSR#13638

Sample Identification

#672	4.63g	Segment 15	750 mRad/hr.	Riser 22A, Core 22
#661	4.64g	Segment 16r	1000 mRad/hr	
#776	4.58g	Segment 18	1125 mRad/hr	
#789	4.56g	Segment 19	1000 mRad/hr	
#788	5.92g	Segment 20	1050 mRad/hr	
#766	7.07g	Segment 21	1600 mRad/hr	
#754	6.18g	Segment 22	1000 mRad/hr	
#619	3.06g	Segment 4	500 mRad/hr	

Chain of Possession

Relinquished by:	Received by:	Date/Time:
Bruce Hey	John J. Moore	8-15-91 1815
John J. Moore	Jack K. Bro	8-15-91 2105
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

A-6000-407 (04/91)

	SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector Edmonson / Patterson — Date Sampled — — Time — hours

Company Contact Bruce Hey — Telephone ( ) 3-2529

Sample Number	Number and Type of Sample Containers	~~Type of Sample*~~	Analysis Requested
672	4.63g Seg. 15, Core 22, Riser 22A		750 m Rad/hr TOC
661	4.64g Seg. 16r, "	"	1000 m Rad/hr TOC
776	4.58g Seg. 18, "	"	1125 m Rad/hr TOC
789	4.56g Seg. 19, "	"	1000 m Rad/hr TOC
788	5.92g Seg. 20, "	"	1050 m Rad/hr TOC
766	7.07g Seg. 21, "	"	1600 m Rad/hr TOC
754	6.18g Seg. 22, "	"	1000 m Rad/hr TOC
619	3.06g Seg. 4, "	"	500 m Rad/hr TOC

Field Information** _____

Special Handling and/or Storage See laboratory notebook: WHC-N-313-7 page 43 for specific information on sample preparation

Possible Sample Hazards Radioactive material in caustic solution. See RSE # 13638

PART II: LABORATORY SECTION

Received by _____ Title _____ Date _____

Analysis Required _____

101-54
#17667

PNL-ALO-051, Rev. 0
Exhibit 1
Page 1 of 1

SAMPLE RECEIPT FORM

Delivered by: B Plant Overpak Truck Date/Time: 8-15-91 2105

Received by: John C. Boss

Customer Sample Number(s): #672, #661, #776, #789, #788, #766, #754, #619

ALO Sample Number(s): 91-7810, 91-7811, 91-8237 thru ~~91-8247~~ AND 8245-91 91-8242

1. Customer Chain-of-Custody Form: Present X Absent _____

2. Additional Shipping Forms (list): ORSR

3. Custody Seals on Shipping and/or Sample Containers and their Conditions.

   Present X Absent _____

   If Present, Condition: GOOD

4. Sample Tag(s) ID Numbers if not Recorded on the Chain-of-Custody Record or on Sample Vial.

   Notes: N/A

5. Condition of Shipping Container (i,e., broken container, dented, breached plastic bag, temperature of sample container as defined in Section 3.0 in PNL-ALO-051, etc.)

   GOOD AMBIENT TEMP 29°C

6. Condition of Sample Vials.

   GOOD *

7. Verification of Agreement or Nonagreement of Information on Receiving Documents.

   AGREE

8. Resolution of Problems or Discrepancies.

   N/A

   RECD SIR 8-15-91

* Samples 661, #672 ~~RECD~~ & Numbers verified. All others still in cans &

RETURN COMPLETED FORM TO PROJECT MANAGER

WILL BE OPENED IN MORNING.

Westinghouse Hanford Company	CHAIN OF CUSTODY

Company Contact: BW Crawford Telephone: 3-1972

Sample Collected by: Wayne Edmonson / K.J. Patterson Date: 9/3/91 Time: —

Sample Locations:

Ice Chest No.: Field Logbook and Page No.:

Remarks: Samples submitted for TOC and Rheology / Physical tests

Bill of Lading No.: Offsite Property No.:

Method of Shipment: Doorstop carriers and B-plant pig in overpacks

Shipped to: 325 Building Attn: John Rau - PNL

Possible Sample Hazards: See RSR # 13674

Sample Identification

#821 Segment 14 Core 22 for TOC
#475 Segment 14 Core 22 for TOC
#777 Segment 23 Core 22 for TOC
#859 Segment 24 Core 22 for TOC
#670 Segment 25 Core 22 for TOC
#888 Segment 10 Core 22 for TOC
#849 Segment 11 Core 22 for TOC
#817 Aliquot R-9221 Composite for Rheology / Physical tests

Chain of Possession

Relinquished by:	Received by:	Date/Time:
Beverly A. Crawford	Charlene De Baise	9/3/91 1831
Relinquished by:	Received by:	Date/Time:
Charlene De Baise	John K. Rau	9-3-91 2100
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

A-6000-407 (04/91)

SAMPLE ANALYSIS REQUEST PNL

PART I: FIELD SECTION

Collector D.W. Edmonson / K.J. Patterson Date Sampled — Time — hours

Company Contact B.A. Crawford Telephone ( ) 3-1972

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
821	1ea. 20mL vial	3.64g. sludge	TOC
475	" " "	3.17g solids	TOC
777	" " "	4.14g sludge	TOC
859	" " "	4.08g sludge	TOC
670	" " "	6.59g sludge	TOC
888	" " "	4.31g solids	TOC
849	" " "	2.49g. solids	TOC
817	1ea. 125mL jar	111.4g. 101-SY crust	Rheology & physical tests

Field Information** _____

Special Handling and/or Storage radioactive material in caustic matrix.

Possible Sample Hazards _____

PART II: LABORATORY SECTION

Received by _____ Title _____ Date _____

Analysis Required _____

**Use back of page for additional information relative to sample location.

A-6000-406 (03/90)

101-SY
17667

PNL-ALO-051, Rev. 0
Exhibit 1
Page 1 of 1

SAMPLE RECEIPT FORM

Delivered by: B-PLANT OVERPAK TRUCK Date/Time: 9-3-91 2140

Received by: John K. Rom

Customer Sample Number(s): #821, #475, #777, #859, #670, #888, #849

ALO Sample Number(s): 91-9279, 91-9280, 91-9281, 91-9282, 91-9283, 91-9284, 91-9285

1. Customer Chain-of-Custody Form: Present X Absent _____

2. Additional Shipping Forms (list):
   ORSR

3. Custody Seals on Shipping and/or Sample Containers and their Conditions.
   Present X Absent _____
   If Present, Condition: GOOD

4. Sample Tag(s) ID Numbers if not Recorded on the Chain-of-Custody Record or on Sample Vial.
   Notes: ON COC

5. Condition of Shipping Container (i,e., broken container, dented, breached plastic bag, temperature of sample container as defined in Section 3.0 in PNL-ALO-051, etc.) GOOD 25°C AMBIENT

6. Condition of Sample Vials. UNKNOWN UNTIL PUT INTO CELL. (9-4-91 0841 SAMPLES IN CELL & VIALS OK) SAMPLE 817 SENT TO A HOTCELL?)

7. Verification of Agreement or Nonagreement of Information on Receiving Documents.
   AGREE

8. Resolution of Problems or Discrepancies.
   N/A

RETURN COMPLETED FORM TO PROJECT MANAGER

Westinghouse Hanford Company	CHAIN OF CUSTODY

Company Contact B.A. Crawford Telephone 3-1972

Sample Collected by B.A. Crawford Date 9/13/91 Time

Sample Locations Laboratory 222-SA; Blind Standard material WHC-N-313-7 p. 76ff

Ice Chest No. — Field Logbook and Page No. WHC-N-313-7 p. 76-80

Remarks TOC blind standards made in mock 101-SY matrix.

Bill of Lading No. Offsite Property No.

Method of Shipment B-plant sample truck

Shipped to Rick Steele 325 Bldg Hot Cells.

Possible Sample Hazards Caustic

Sample Identification

#1062 WHC-N-313-7 p. 85
#1065 WHC-N-313-7 p. 86
#1068 WHC-N-313-7 p. 86
#1071 WHC-N-313-7 p. 87

Chain of Possession

Relinquished by:	Received by:	Date/Time:
Burleigh A. Crawford	Joseph G Franck	9/24/91 12:10 PM.
Relinquished by:	Received by:	Date/Time:
Joseph G Franck	J R Hem	9/30/91 9:45 AM
Relinquished by:	Received by:	Date/Time:
J R Hem	Rick L Steele	9/30/91 10:50 AM
Relinquished by:	Received by:	Date/Time:

A-6000-407 (04/91)

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector B A Crawford Date Sampled 9/13/91 Time ____ hours

Company Contact B A Crawford Telephone (509) 373-1972

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
1062	1 ea 22 mL	Mock 101-SY	TOC
1065	1 ea 22 mL	" Solids "	TOC
1068	1 ea 22 mL	" "	TOC
1071	1 ea 22 mL	" "	TOC

Field Information** Caustic matrix

Special Handling and/or Storage

Possible Sample Hazards

PART II: LABORATORY SECTION

Received by ____ Title ____ Date ____

Analysis Required

101-SY

PNL-ALO-051, Rev. 0
Exhibit 1
Page 1 of 1

SAMPLE RECEIPT FORM

Delivered by: G.R. HERNANDEZ Date/Time: 9-30-91 1050

Received by: R.T. STEELE

Customer Sample Number(s): 1062, 1065, 1068, 1071

ALO Sample Number(s): 91-10516, ~~91~~ 91-10517, 91-10518, 91-10519 SINCE 9-24-91

1. Customer Chain-of-Custody Form: Present X Absent _____

2. Additional Shipping Forms (list):
   HAZARDOUS MATERIAL SHIPMENT RECORD (HMSR)
   SAMPLE ANALYSIS REQUEST

3. Custody Seals on Shipping and/or Sample Containers and their Conditions.

   Present _____ Absent X

   If Present, Condition: _____

4. Sample Tag(s) ID Numbers if not Recorded on the Chain-of-Custody Record or on Sample Vial.

   Notes: N/A

5. Condition of Shipping Container (i,e., broken container, dented, breached plastic bag, temperature of sample container as defined in Section 3.0 in PNL-ALO-051, etc.)
   GOOD

6. Condition of Sample Vials.
   GOOD

7. Verification of Agreement or Nonagreement of Information on Receiving Documents.
   AGREE

8. Resolution of Problems or Discrepancies.
   N/A

RETURN COMPLETED FORM TO PROJECT MANAGER

B.2 PNL CHAIN OF CUSTODY FORMS

Page 1 of 1

Chain of Custody Number 101-SY-5

ALO CHAIN OF CUSTODY

91-10516	TOC	101-SY #1062
ALO SAMPLE NUMBER	ANALYSIS REQUESTED	SAMPLE DESCRIPTION

SENDER _____ _____ DATE

RECEIVER _____ _____ DATE

91-10517	TOC	101-SY #1065
ALO SAMPLE NUMBER	ANALYSIS REQUESTED	SAMPLE DESCRIPTION

SENDER _____ _____ DATE

RECEIVER _____ _____ DATE

91-10518	TOC	101-SY #1068
ALO SAMPLE NUMBER	ANALYSIS REQUESTED	SAMPLE DESCRIPTION

SENDER _____ _____ DATE

RECEIVER _____ _____ DATE

91-10519	TOC	101-SY #1071
ALO SAMPLE NUMBER	ANALYSIS REQUESTED	SAMPLE DESCRIPTION

SENDER _____ _____ DATE

RECEIVER _____ _____ DATE

Original - Project Management Office
Copy - Sender
Copy - Receiver

Applicable Test Instruction

TI-101-SY-16

SEE ATTACHED FOR SIGNATURES

Chain of Custody Number 101-SY-

10/7/91
DST CHAIN OF CUSTODY

SAMPLE NUMBER	ANALYSIS REQUESTED	SAMPLE DESCRIPTION
91-10516	TOC	10154 #1062

SENDER [signature] 10/2/91 DATE

RECEIVER Bill Cobb 10/3/91 DATE

SAMPLE NUMBER	ANALYSIS REQUESTED	SAMPLE DESCRIPTION
91-10517	TOC	10154 #1065

SENDER [signature] 10/2/91 DATE

RECEIVER Bill Cobb 10/5/91 DATE

SAMPLE NUMBER	ANALYSIS REQUESTED	SAMPLE DESCRIPTION
91-10518	TOC	10154 #1068

SENDER [signature] 10/2/91 DATE

RECEIVER Bill Cobb 10/3/91 DATE

SAMPLE NUMBER	ANALYSIS REQUESTED	SAMPLE DESCRIPTION
91-10519	TOC	10154 #1071

SENDER [signature] 10/2/91 DATE

RECEIVER Bill Cobb 10/3/91 DATE

Original - Project Management Office
Copy - Sender
Copy - Receiver

Applicable Test Instruction TI-101-SY-16

APPENDIX C

TOTAL ORGANIC CARBON RAW DATA

APPENDIX C

TOTAL ORGANIC CARBON RAW DATA

This section of the Primary Data Package contains the raw data forms as required by the Technical Project Plan 17667. The laboratory analyst signature list is provided below:

ORGANIC LABORATORY ANALYST SIGNATURE LIST

Analyst Name	Initials	Written Name	Initials
Robert W. Stromatt	RWS		
Eric W. Hoppe	EWH		
Gerald A. Ross	GAR		
Diana L. Bellofatto	DLB		
Marilyn J. Steele	MJS		
William T. Cobb	WTC		
David L. Baldwin	DLB		
F. Vaughn Hoopes	FVH		

108 7-30-91 DST TOC RESULTS (OLD WORK)

(batch run on 1-29-91 p 98)

WO1743

STD 1	$\frac{(2702-22)\times 100}{22700 \times .1149}$	= 98.5 %	$\frac{(2430-128)\times 100}{6000 \times .1400}$	= 95.9 %
STD 2	$\frac{(1978-22)\times 100}{18000 \times .1199}$	= 90.6 %	$\frac{(2645-128)\times 100}{6800 \times .1400}$	= 92.5 %
STD 3	$\frac{(2372-28)\times 100}{20100 \times .1199}$	= 97.3 %	$\frac{(2092-142)\times 100}{5200 \times .1400}$	= 93.7 %
	avg	= 95.4 %	avg	= 94.0 %
90-7815 #1 10Z AN-SOL	$\frac{(3954-22)\times 100}{.1958g \times .954 \times 10^6}$	= 2.11 %	$\frac{(5120-128)\times 100}{.1958g \times .940 \times 10^6}$ TC = 4.82 %	= 2.71 %
#2	$\frac{(4013-22)\times 100}{.2087g \times .954 \times 10^6}$	= 2.00 %	$\frac{(5342-128)\times 100}{.2087g \times .940 \times 10^6}$ TC = 4.66 %	= 2.66 %
90-7703 #1 10SAW-C-S	$\frac{(315-28)\times 100}{.1666g \times .954 \times 10^6}$	= 0.18 %	$\frac{(595-142)\times 100}{.1666g \times .940 \times 10^6}$ TC = 0.47 %	= 0.29 %
#2	$\frac{(440-28)\times 100}{.2209g \times .954 \times 10^6}$	= 0.20 %	$\frac{(728-142)\times 100}{.2209g \times .940 \times 10^6}$ TC = 0.48 %	= 0.28 %

8/1/91 BNW #53

Began running blanks & standards preparatory to running 101 Sy TOC samples. The cell current seemed very low and ~~digital~~ digital display was slow. Also organic blanks were abnormally high.

The cell frit was found to be quite brown in color so cleaned it thoroughly with 8 M HNO_3 and drew it through the frit with a vacuum line. Rinsed well and resumed work.

8-2-91 J. Cowen — Reviewed pages 27 thru 108 for completeness and legibility, checked ~ 10% of the calculations. No deficiencies found.

(*) Low stds. & erratic results. due evidently to various leaks in connections & insufficient $AgNO_3$ delivery because of bad pipettes. Replaced connections and got new pipets for $AgNO_3$

Changed H_2SO_4 Trap Made up new $AgNO_3$ & 2 M H_2SO_4 For Digestion. Replaced septum w/ stopper.

Project No. _____ Date of Work _____

Entered By D L Baldwin Date 8-21-91

Disclosed To and Understood By

Signed 1. _____ Date _____

2. _____ Date _____

BNW

8/2/91 — 10154 Samples for TOC

@ Balance

		Spl. Size	TIC	TOC	
BIK 1)		—	21	128	131
2)		—	17	134	
Glucose #81A	STd 1)	5.4 mg		2112 - 131 / 2160 = 92%	
	2)	4.9 mg.		2008 / 1960 = 95%	
(91-2925) W-1)		.1718 g.	1280	2620 = 15,500 ppm	
2)		.0787 g.	601	1298	14,800
Spl. + Spike 3)		.1574 g. + 3.8 mg.	1210	4034	
(91-2926) D-1		.0622 g.	47	1273	18,400
D-2		.0607 g.	39	1132	16,500
STd. 3)		5.7 mg.		2265 - 131 / 2280 = 94%	

Results p. 113

8/6/91

		Spl. Size	TIC	TOC	
BIK 1)		—	22	152	143
2)		—	28	138	
Std. 1)		5.1 mg.		2069 - 143 / 2040 = 94% Rec.	
2)		4.2 mg.		1756 / 1680 = 96%	
(91-2927) SW-Loose 1)		.0839 g.	1970	1558	16,800 ppm
2)		.0563 g.	1273	1067	16,400
Spiked Spl. 3)		.0559 g + 5.4 mg.	1190	3255	

(*) 8/7 thru 10/91 System Down) ex p. 108

8/12/91

		Spl. Id	Spl. Size	TIC	TOC	
	BIK 1)		—	16	110	105
	2)		—	20	100	
	STd 1)		4.3 mg.		1695 - 105 ÷ 1720 = 92%	
	2)		2.8 mg.		1168 ÷ 1120 = 95%	
91-6424 #45-1	1)		.1225 g.	1165	2020 = 15,000 ppm	
	2)		.1438 g.	1338	2176	14,400
91-8320 #443	1)		.1770 g.	1690	2350 = 12,700	
	2)		.1348 g.	1360	2021	14,200
Sp + Spl. 3)			.1674 g. + (4.4 mg.)	1525	3856	
STd. 3)			4.2 mg.		1663 - 105 ÷ 1680 = 93%	

Results p. 114

ANW #53268

Project No. _____ Date of Work _____

Entered By D K Baldwin Date 8-26-91

Disclosed To and Understood By

Signed 1. _____ Date _____

2. _____ Date _____

110 8/13/91 ~~Jtb~~ ②

	Spl. Id	Spl. Size	TIC	TOC	
	BLK 1)	—	15⁻	106	100
	2)	—	19	96	
	Std. 1)	2.2 mg.		915 - 100 ÷ 880 =	93% R
	2)	2.8 mg.		1155⁻ - ÷ 1120 =	94%
	91-7485, #538 1)	.1210 g.	1621	1127	8,500 PPM TIC
	2)	.1309 g.	1754	1324	9,300
Results p. 115	91-7486 #634 1)	.0723 g.	825⁻	1170	14,800 PPM
	2)	.1292 g.	1167	1866	13,200
	91-7770 #631 1)	.1011 g.	702	970	8,600 PPM.
	2)	.1634 g.	1089	1635⁻	9,400
	+Spike. 3)	.0924 g. + 2.9mg.	818	2062	
	Std. 3)	3.2 mg.		1302 - 100 ÷ 1280 =	94% R

Had to change cathode solution twice during the day because of off-color, & run-away titrating after elapsed time.

8/14/91 ~~Jtb~~ ②

	BLK 1)	—	16	85⁻	= 80
	2)	—	12	74	
	Std. 1)	3.5 mg.		1458 - 80 ÷ 1400 =	98%
	2)	3.1 mg.		1265⁻ ÷ 1240 =	96%
	91-7771 #650-1)	.1578 g.	1060	1988 =	12,000 PPM
	2)	.1508 g.	1007	1935⁻	12,300
	91-7772 #712 1)	.1206 g.	1226	1849 =	14,700 PPM
Results p. 115-116	2)	.1147 g.	1258	1867	15,600
	91-7773 #667 1)	.1291 g.	1117	1886 =	14,000 PPM
	2)	.1419 g.	1519	2195⁻	14,900
	+Spike 3)	.0835 g. + 2.8mg.	820	2420	
				(Changed Cath. + Anode Here)	
	91-7812 #641 1)	.1206 g.	1191	1570 =	12,400 PPM.
	2)	.1394 g.	1213	1806	12,400
	91-7813 #601 1)	.1329 g.	1318	1658 =	11,900 PPM
	2)	.1367 g.	1385⁻	1745	12,200

BNW #53268

Project No. _____ Date of Work _____

Entered By STD 3) 4.0 mg. 1621 - 80 Date ÷ 1600 = 96% R.

Disclosed To and Understood By

Signed 1. Dr Baldwin Date 8-26-91

2. _____ Date _____

10154 TOC Cont'd

bal. ⑥ Will use smaller sample size to hopefully prevent overloading scrubbers + turning the cathode solution odd colors.

8/20/91 GRB

	Spl. Id	Spl. size	TIC	TOC
	BIK 1)	—		68
	2)	—		62
	STd 1)	4.2 mg.		1688
	(Glucose BIK) 2)	2.9 mg.		1188
RESULTS p. 117	91-7810, #672 1)	.0620 g.	503	1025
	2)	.0453 g.	430	748
	91-8237, #776 1)	.0281 g.	268	482
	2)	.0444 g.	320	688
	+spike. 3)	.0210 g. + 2.0 mg.	240	1168

8/21/91 GRB ⑥

			TOC
BIK 1)	—	—	80
2)	—	—	72
STd 1)	3.7 mg.		1517
Glucose #BIK 2)	5.4 mg.		2098
RESULTS p. 117 91-7811 #661 1)	.0403 g.	219	668
2)	.0632 g.	370	1104
91-8238 #789 1)	.0318 g.	410	541
2)	.0224	300	395
+spike. 3)	.0399 g. + 3.8 mg.	433	2128
STd 3)	2.5 mg.	-	1032

RAW #55266

GRB 8/23/91

Project No. _____ Date of Work _____

Entered By [signature] Date 8/23/91

Disclosed To and Understood By

Signed 1. _____ Date _____

2. _____ Date _____

8/22/91 ⑥

Spl. Id	Spl. Size	TIC	TOC	
BIK 1)	—		85⁻	
2)	—		79	
Glucose # BIF 1)	1.8 mg.		765⁻	
2)	2.8 mg.		1170	
Results p. 118 91-8239, #788 1)	.0333 g.	395⁻	614	(Appears too high)
2)	.0701 g.	759	1010	
3)	.0602 g.	615⁻	805	
91-8240, #766 1)	.0747 g.	670	1089	
2)	.0666 g.	641	1038	
+ Spike. 3)	.0530 + 3.2 mg.	528	2032	
Std. 3)	4.3 mg.		1714-79/1720	

8/23/91 ⑥

Spl. Id.	Spl. Size	TIC	TOC
BIK 1)	—		88
2)	—		82
Glucose # BIF 1)	2.2 mg.		968
2)	2.8 mg.		1176
Results p. 118 91-8241 # 754.1)	.0805⁻ g.	735⁻	1286
2)	.0504 g.	610	815
91-8242 # 619 1)	.1474 g.	1190	1826
2)	.0649 g.	580	821
+ Spike. 3)	.1230 g. + 3.2 mg.	855⁻	2675⁻

BNW #53268

Project No. _____ Date of Work _____

Entered By [signature] Date 8/23/91

Disclosed To and Understood By

Signed 1. _____ Date _____

2. _____ Date _____

101 SY TOC CALCULATIONS / RESULTS 8-20-91 DABaldwin 113

NOTE: As per the SAMPLE TEST INSTRUCTIONS, a spike will now be analyzed in addition to the system standards. The STI calls for a minimum of one spike and one blank per day as well as the samples in duplicate. Our procedure will currently stay the same: 2 blanks, 2 standards, 1 spike, samples in duplicate, ending day with 1 standard + 1 blank. Results are to be reported in ug/L or ug/kg.

The spike can be used in either of two ways, as follows:
A.) To determine spike recovery (using std recoveries and sample values as given)
B.) To determine sample recovery (using std recovery only as measured)
Both ways can be measured, but is time-consuming.
BEST → Simply measured A.) Spike Recovery (using sample value)

8-26-91
3-27-91

General Formula: % Recovery of Spike Added to Sample

$$= \frac{ug\ C_{FOUND(SPK+SPL)} - ug\ C_{FOUND(SPL)}}{ug\ C_{ADDED(SPK)}} \times 100$$

BATCH RUN ON 8/2/91 (INFORMALLY REPORTED ON 8-9-91)

STD 1 $\frac{(2112\ ug - 131) \times 100}{5400 mg \times 0.400}$ = 91.7 % (TOC ONLY)

STD 2 $\frac{(2000 - 131) \times 100}{4900 \times .400}$ = 95.3 %

STD 3 $\frac{(2265 - 131) \times 100}{5700 \times .400}$ = 94.6 %

avg = 93.9 %

91-2925 W-1 $\frac{(2620 - 131) \times 100}{.1718 g \times .939 \times 10^6}$ = 1.54 % TOC

$\bar{x}$ = 1.56 % TOC

W-2 $\frac{(1298 - 131) \times 100}{.0787 g \times .939 \times 10^6}$ = 1.58 % TOC

1.54×10^7 ug/kg 1.58×10^7 ug/kg

SPIKE:
ug $C_{FOUND(SPK+SPL)}$ = 4034 − 131 = 3903 ug C
ug $C_{FOUND(SPL)}$ = .0156 × .1574 × 10^6 × .939 = 2306 ug C
ug $C_{ADDED(SPK)}$ = 3800 × 0.400 = 1520 ug C
% Recovery = $\frac{(3903 - 2306)}{1520} \times 100$ = 105 % Recov

91-2926 D-1 $\frac{(1273 - 131) \times 100}{.0622 \times .939 \times 10^6}$ = 1.96 % TOC = 1.96×10^7 ug/kg

$\bar{x}$ =

D-2 $\frac{(1132 - 131) \times 100}{.0607 \times .939 \times 10^6}$ = 1.76 % TOC = 1.76×10^7 ug/kg

Project No. _____ Date of Work _____

Entered By DA Baldwin Date 8-26-91

Disclosed To and Understood By

Signed 1. _____ Date _____

2. _____ Date _____

Purity #53268

8-26-91
11-1

BATCH RUN ON 8/6/91 (INFORMALLY REPORTED)

STD 1 $\frac{(2069 - 138) \times 100}{5100 \times .400} = 94.7\ \%$ $\bar{x} = 95.5\ \%$

STD 2 $\frac{(1756 - 138) \times 100}{4200 \times .400} = 96.3\ \%$

91-2927 SW LOOSE -1 $\frac{(1558 - 138) \times 100}{.10839\text{g} \times .955 \times 10^6} =$ 1.77 % = 1.77×10^7 ug/kg, $\bar{x} = 1.94\ \%$

-2 $\frac{(1267 - 138) \times 100}{.0563\text{g} \times .955 \times 10^6} =$ 2.10 % = 2.10×10^7 ug/kg

SPIKE:
- ug C FOUND (SPK + SPL) = 3255 - 138 = 3117 ug C
- ug C FOUND (SPL) = .0194 x .0559 x 10^6 x .955 = 1036 ug C
- ug C ADDED (SPK) = 5400 x .400 = 2160 ug C
- % RECOVERY = $\frac{3117 - 1036}{2160} \times 100 =$ 96.3 %

—— System down 8/7 thru 8/10 explan. p 108

BATCH RUN ON 8/12/91 TOC ONLY

STD 1 $\frac{(1695 - 100) \times 100}{4300 \times .400} = 92.7\ \%$

STD 2 $\frac{(1168 - 100) \times 100}{2820 \times .400} = 95.4\ \%$ $\bar{x} = 93.7\ \%$

STD 3 $\frac{(1663 - 100) \times 100}{4200 \times .400} = 93.0\ \%$

91-6424 #457 -1 $\frac{(2020 - 100) \times 100}{.1275\text{g} \times .937 \times 10^6} =$ 1.61 % = 1.61×10^7 ug/kg

-2 $\frac{(2176 - 100) \times 100}{.1438\text{g} \times .937 \times 10^6} =$ 1.54 % = 1.54×10^7 ug/kg

91-7320 #443 -1 $\frac{(2350 - 100) \times 100}{.1770\text{g} \times .937 \times 10^6} =$ 1.36 % = 1.36×10^7 ug/kg, $\bar{x} = 1.44$

-2 $\frac{(2021 - 100) \times 100}{.1348\text{g} \times .937 \times 10^6} =$ 1.52 % = 1.52×10^7 ug/kg

SPIKE:
- ug C FOUND (SPK + SPL) = 3856 - 100 = 3756 mg C
- ug C FOUND (SPL) = .0144 x .1674g x 10^6 x .937 = ~~2273~~ 2258 ug C (MP 8-16-91)
- mg C ADDED (SPK) = 4400 x .400 = 1760 mg C
- % RECOVERY = ~~$\frac{3756 - 2273}{1760} \times 100 =$ 67.2 %~~ (PLB 9-16-91)

$= \frac{3756 - 2258}{1760} \times 100 =$ 85.1 %

Project No. _____ Date of Work _____

Entered By D. L. Baldwin Date 8-26-91

Disclosed To and Understood By

Signed 1. _____ Date _____

2. _____ Date _____

BNW #53268

BATCH RUN ON 8/13/91 TOC ONLY 101-SY 8-26-91

115

STD 1 $\frac{(915-96) \times 100}{2200 \times .400}$ = 93.1 %

STD 2 $\frac{(1155-96) \times 100}{2800 \times .400}$ = 94.6 % $\bar{x}$ = 93.9 %

STD 3 $\frac{(1302-96) \times 100}{3200 \times .400}$ = 94.2 %

91-7485 #538-1 $\frac{(1127-96) \times 100}{.1210 \times .939 \times 10^{6}}$ = 0.91 % = 9.1×10^{6} ug/kg

-2 $\frac{(1324-96) \times 100}{.1309 \times .939 \times 10^{6}}$ = 1.00 % = 1.00×10^{7} ug/kg

91-7486 #634-1 $\frac{(1170-96) \times 100}{.0723 g \times .939 \times 10^{6}}$ = 1.58 % = 1.58×10^{7} ug/kg

-2 $\frac{(1866-96) \times 100}{.1292 g \times .939 \times 10^{6}}$ = 1.46 % = 1.46×10^{7} ug/kg

91-7770 #631-1 $\frac{(970-96) \times 100}{.1011 g \times .939 \times 10^{6}}$ = 0.92 % = 9.2×10^{6} ug/kg

$\bar{x}$ = 0.96

-2 $\frac{(1635-96) \times 100}{.1634 g \times .939 \times 10^{6}}$ = 1.00 = 1.00×10^{7} ug/kg

SPIKE:

ug C FOUND (SPK+SPL) = 2062 - 96 = 1966 ug C

ug C FOUND (SPL) = .0096 x .0924g x 10^{6} x .939 = 833 ug C

ug C ADDED (SPK) = 2900 x .400 = 1160 ug C

% Recovery = $\frac{1966 - 833}{1160} \times 100$ = 97.7 %

BATCH RUN ON 8/14/91 TOC ONLY 101 SY 8-26-91

STD 1 $\frac{(1458-74) \times 100}{3500 \times .400}$ = 98.9 %

STD 2 $\frac{(1265-74) \times 100}{3100 \times .400}$ = 96.1 % $\bar{x}$ = 97.2 %

STD 3 $\frac{(1621-74) \times 100}{4000 \times .400}$ = 96.7 %

91-7771 #650-1 $\frac{(1988-74) \times 100}{.1578 \times .977 \times 10^{6}}$ = 1.24 % = 1.24×10^{7} ug/kg

-2 $\frac{(1935-74) \times 100}{.1508 g \times .977 \times 10^{6}}$ = 1.26 % = 1.26×10^{7} ug/kg

— CONT NEXT PAGE —

PANW #53268

Project No. _____ Date of Work _____

Entered By D R Baldwin Date 8-26-91

Disclosed To and Understood By

Signed 1. _____ Date _____

116

— CON'T F. PREVIOUS PAGE —

91-7772 #712-1 $\frac{(1849-74)\times 100}{.1206\,g \times .977\times10^{6}}$ = 1.51 % = 1.51×10^{7} ug/kg

-2 $\frac{(1867-74)\times 100}{.1147\,g \times .977\times10^{6}}$ = 1.60 % = 1.60×10^{7} ug/kg

91-7773 #667-1 $\frac{(1886-74)\times 100}{.1291\,g \times .977\times10^{6}}$ = 1.44 % = 1.44×10^{7} ug/kg

$\bar{x}$ = 1.49 %

-2 $\frac{(2195-74)\times 100}{.1419\,g \times .977\times10^{6}}$ = 1.53 % = 1.53×10^{7} ug/kg

SPIKE

ug $C_{FOUND\ (SPK+SPL)}$ = 2420 - 74 = 2346 uC

ug $C_{FOUND\ (SPL)}$ = .0149 x .0835 g x $.977\times10^{6}$ = 1215 ug C

ug $C_{ADDED\ (SPK)}$ = 2800 x .400 = 1120 ug C

% RECOVERY = $\frac{2346-1215}{1120}\times100$ = 100.9 %

91-7812 #641-1 $\frac{(1570-74)\times 100}{.1206\,g \times .977\times10^{6}}$ = 1.27 % = 1.27×10^{7} ug/kg

-2 $\frac{(1806-74)\times 100}{.1394\,g \times .977\times10^{6}}$ = 1.27 % = 1.27×10^{7} ug/kg

91-7813 #601-1 $\frac{(1658-74)\times 100}{.1329\,g \times .977\times10^{6}}$ = 1.22 % = 1.22×10^{7} ug/kg

-2 $\frac{(1745-74)\times 100}{.1367\,g \times .977\times10^{6}}$ = 1.25 % = 1.25×10^{7} ug/kg

DA Baldwin 8-26-91

BNW #53268

Reviewed pages 113-116 Checked about 30% of calculations. All were correct. Work is neat and readable

[signature] 8-29-91

Project No. _____ Date of Work _____

Entered By DA Baldwin Date 9-16-91

Disclosed To and Understood By

Signed 1. _____ Date _____

2. _____ Date _____

101 SY TOC CALCULATIONS / RESULTS

9-5-91
117

BATCH RUN ON 8/20/91

STD 1 $\frac{(1688-62)\ \mu g \times 100}{4200\ mg \times 1.400}$ = 96.8 % Recov

STD 2 $\frac{(1188-62)\ \mu g \times 100}{2900\ mg \times 1.400}$ = 97.1 % Recov

$\bar{r}$ = 97.0 % Recov

91-7810 #672 1) $\frac{(1025-62)\ \mu g \times 100}{.10620\ g \times .970 \times 10^{6}}$ = 1.60 % = 1.60×10^{7} µg/kg

2) $\frac{(748-62)\ \mu g \times 100}{.10453\ g \times .970 \times 10^{6}}$ = 1.56 % = 1.56×10^{7} µg/kg

91-8237 #776 1) $\frac{(482-62)\ \mu g \times 100}{.0281\ g \times .97 \times 10^{6}}$ = 1.54 % = 1.54×10^{7} µg/kg

$\bar{r}$ = 1.50

2) $\frac{(688-62)\ \mu g \times 100}{.10444\ g \times .97 \times 10^{6}}$ = 1.45 % = 1.45×10^{7} µg/kg

~~BATCH RUN ON 8/21/91~~ DB 9-5-91

SPIKE:

µg $C_{FOUND\ (SPK+SPL)}$ = 1168 − 62 = 1106 mg

µg $C_{FOUND\ (SPL)}$ = .0210 g × .0150 × $.970 \times 10^{6}$ = 305.5 µg

µg $C_{Added\ (SPK)}$ = 2000 µg × 1.400 = 800 µg

% Recovery = $\frac{1106 - 305.5}{800} \times 100$ = 100.1 %

BATCH RUN ON 8/21/91

STD 1 $\frac{(1517-72)\ \mu g \times 100}{3700\ mg \times 1.400}$ = 97.6 %

STD 2 $\frac{(2098-72)\ \mu g \times 100}{5400\ mg \times 1.400}$ = 93.8 % $\bar{r}$ = 95.8 %

STD 3 $\frac{(1032-72)\ \mu g \times 100}{2500\ mg \times 1.400}$ = 96.0 %

91-7811 #661 #1) $\frac{(668-72)\ \mu g \times 100}{.10403\ g \times .1958 \times 10^{6}}$ = 1.54 % = 1.54×10^{7} µg/kg

2) $\frac{(1104-72)\ \mu g \times 100}{.10632\ g \times .1958 \times 10^{6}}$ = 1.70 % = 1.70×10^{7} µg/kg

91-8258 #789 1) (541 − 72) µg × 100 / .0318 g × $.1958 \times 10^{6}$ = 1.54 % = 1.54×10^{7} µg/kg

2) (395 − 72) µg × 100 / .0224 g × $.1958 \times 10^{6}$ = 1.51 % = 1.51×10^{7} µg/kg

SPIKE:

µg $C_{FOUND\ (SPK+SPL)}$ = 2128 − 72 = 2056 µg

µg $C_{Added\ (SPK)}$ = 3800 µg × 1.400 = 1520 µg

µg $C_{FOUND\ (SPL)}$ = .0152 × .0399 g × $.1958 \times 10^{6}$ = 581

% Recovery = $\frac{2056 - 581}{1520} \times 100$ = 97.0 %

Project No. _____ Date of Work _____

Entered By D L Baldwin Date 9-5-91

Disclosed To and Understood By

Signed 1. _____ Date _____

RMW #53268

118 9-5-91

BATCH RUN ON 8/22/91

STD 1 $\frac{(765-79)\,ug \times 100}{1500\,ug \times 1,400}$ = 95.3 %

$\bar{x}$ = 96.0 %

STD 2 $\frac{(1170-79)\,ug \times 100}{2500\,ug \times 1,400}$ = 97.4 %

STD 3 $\frac{(1720-79)\,ug \times 100}{4300\,ug \times 1,400}$ = 95.4 %

91-8239 #788 1) $\frac{(614-79)\,ug \times 100}{10333g \times 1,960 \times 10^6}$ = 1.67 % ← see page 112 Problem with Analysis Do Not Report

2) $\frac{(1010-79)\,ug \times 100}{10701g \times 1,960 \times 10^6}$ = 1.38 % = 1.38×10^7 ug/kg

3) $\frac{(805-79)\,ug \times 100}{10602g \times 1,960 \times 10^6}$ = 1.26 % = 1.26×10^7 ug/kg

91-8240 #766 1) $\frac{(1089-79)\,ug \times 100}{10747g \times 1,960 \times 10^6}$ = 1.41 % = 1.41×10^7 ug/kg

2) $\frac{(1038-79)\,ug \times 100}{10666g \times 1,960 \times 10^6}$ = 1.50 % = 1.50×10^7 ug/kg

Spike:

ug C FOUND (SPK+SPL) = 2032 - 79 = 1953 ug

ug C FOUND (SPL) = .0530g x .0146 % x .960 x 10^6 = 743 ug

ug C Added (SPK) = 3200 x 1,400 = 1280 ug

% Recovery = (1953 - 743)/1280 x 100 = 94.5 %

BATCH RUN ON 8/23/91

STD 1 $\frac{(968-82)\,ug \times 100}{2200\,ug \times 1,400}$ = 100.7 %

$\bar{x}$ = 99.2 %.

STD 2 $\frac{(1176-82)\,ug \times 100}{2800\,ug \times 1,400}$ = 97.7 %

91-8241 #754 1) $\frac{(1286-82) \times 100}{10865g \times .992 \times 10^6}$ = 1.51 % = 1.51×10^7 ug/kg

2) $\frac{(815-82) \times 100}{10564g \times .992 \times 10^6}$ = 1.47 % = 1.47×10^7 ug/kg

91-8242 #619 1) $\frac{(1826-82) \times 100}{14744g \times .992 \times 10^6}$ = 1.19 % = 1.19×10^7 ug/kg

2) $\frac{(821-82) \times 100}{10649g \times .992 \times 10^6}$ = 1.15 % = 1.15×10^7 ug/kg

Spike:

ug C FOUND (SPK+SPL) = 2675 - 82 = 2593 ug

ug C FOUND (SPL) = .1230g x .0117 x .992 x 10^6 = 1428 ug

ug C Added (SPK) = 3200 ug x 1.400 = 1280 ug

% Recovery (2593 - 1428)/1280 = 91.0 %

Project No. _____ Date of Work _____

Entered By D. Baldwin Date 9-5-91

Disclosed To and Understood By

Signed 1. _____ Date _____

2. _____ Date _____

BNW #53238

Reviewed pages 117 and 118, checked about 30% of the calculations. All were correct. Format is legible and easily followed. [illegible] 9-5-91

		Spl. Id.	Spl. Size	IC	TOC
9/4/91		BLK 1)	—	—	102
		2)	—	—	93
		Std 1)	3.0 mg.		1266
		*BLK 2)	6.9 mg.		2814
	91-9277	#831 1)	.0403 g.	333	616
		2)	.0634 g.	471	962
		+Spike. 3)	.0406 g. + 3.4 mg.	320	1228
	91-9280	#473 1)	.0645 g.	570	998
		2)	.0576 g.	553	962
9/6/91		BLK 1)	—		92
		2)	—		85
		Std 1)	3.2 mg.		1360
		2)	2.8 mg.		1127
	91-9281	#777 1)	.0777 g.	635	1356
		2)	.0525 g.	401	957
		3)	.0876 g + 4.9 mg. sl		3387
	91-9282	#854 1)	.0553 g.	325	649
		2)	.0547 g.	460	914
9/10/91		BLK 1)	—		92
		2)	—		85
		Std. 1)	3.2 mg.	—	1367
		2)	3.4 mg.	—	1385

Project No. _____ Date of Work _____

Entered By D. Baldwin Date 9-16-91

Disclosed To and Understood By

Signed 1. _____ Date _____

2. _____ Date _____

120 9/10/91 (Cont'd)

	Smp Id.	Spl. Size	IC	TOC
91-	9283 #670 1)	.0771 g	610	1252
	2)	.0724 g	600	1331
91-	9284 #888 1)	.0317	260	820
	2)	.0491	510	777
	* spike 3)	.0219 + 3.5 mg	595	2442
91-	9285 #849 1)	.0365	460	842
	2)	.0584	501	~~848~~ 848

9-6-91

CALCULATIONS 10154 TOC

BATCH Run ON 9/4/91 p 119

STD 1 $\frac{(1266 \text{ mg} - 93 \text{ mg}) \times 100}{3600 \text{ mg} \times 1.400} = 97.7\ \%$

$\bar{x} = 99.1\ \%$

STD 2 $\frac{(2814 \text{ mg} - 93 \text{ mg}) \times 100}{6400 \text{ mg} \times 1.400} = 98.6\ \%$

91-9279 #821 #1) $\frac{(616 \text{ mg} - 93 \text{ mg}) \times 100}{.1003 \text{ g} \times .981 \times 10^6} = 1.32\ \% = 1.32 \times 10^7 \text{ mg/kg}$

$\bar{x} = 1.36$

2) $\frac{(962 \text{ mg} - 93) \times 100}{.0634 \text{ g} \times .981 \times 10^6} = 1.40\ \% = 1.40 \times 10^7 \text{ mg/kg}$

SPIKE

mg $C_{FOUND\ (SPL+SPK)}$ = 1978 − 93 = 1885

mg $C_{AMBD\ (SPL)}$ = .0406 g × .0136 (for Fraction) × .981 × 10^6 = 542

mg $C_{Added\ (SPK)}$ = 3400 × 1.400 = 1360

% Recovery = (1885 − 542) / 1360 × 100 = 98.7 %

BATCH Run (con't)

91-9280 #475 1) $\frac{(998 \text{ mg} - 93 \text{ mg}) \times 100}{.0645 \text{ g} \times .981 \times 10^6} = 1.43\ \% = 1.43 \times 10^7 \text{ mg/kg}$

2) $\frac{(962 \text{ mg} - 93) \times 100}{.0596 \text{ g} \times .981 \times 10^6} = 1.49\ \% = 1.49 \times 10^7 \text{ mg/kg}$

BNW #53268

Project No. _____ Date of Work _____

Entered By D. C. Baldwin Date 9-16-91

Disclosed To and Understood By

Signed 1. _____ Date _____

2. _____ Date _____

BATCH RUN ON 9-6-91 p119 — 9-16-91 — 121

STD 1 $\frac{(1360\ ug - 85) \times 100}{3200\ ug \times 1.400}$ = 99.6 %

$\bar{x}$ = 96.4 %

STD 2 $\frac{(1129\ ug - 85) \times 100}{2300\ ug \times 1.400}$ = 93.2 %

91-928 #779 1) $\frac{(1356\ ug - 85) \times 100}{.0797\ g \times .964 \times 10^6}$ = 1.65 % = 1.65×10^7 mg/kg

$\bar{x}$ = 1.68

2) $\frac{(957\ ug - 85) \times 100}{.0525\ g \times .964 \times 10^6}$ = 1.72 % ~ 1.72×10^7 ug/kg

SPIKE

ug C FND (SPL+SPK) = 3387 ug - 85 = 3302

ug C FND (SPL) = .0876 g x .0168 from ... x .964 x 10^6 = 1419

ug C Added (SPK) = 4900 x 1.400 = 1960

% Recovery = (3302 - 1419)/1960 = 96.1 %

91-9282 #859 1) $\frac{(644\ ug - 85) \times 100}{.0353\ g \times .964 \times 10^6}$ = 1.66 % = 1.66×10^7 ug/kg

2) $\frac{(914\ ug - 85) \times 100}{.0549\ g \times .964 \times 10^6}$ = 1.57 % = 1.57×10^7 ug/kg

BATCH RUN ON 9-10-91 p119-120

STD 1 $\frac{(1267\ ug - 85) \times 100}{3200\ ug \times 1.400}$ = 92.3 %

$\bar{x}$ = 93.9 %

STD 2 $\frac{(1385\ ug - 85) \times 100}{3400\ ug \times 1.400}$ = 95.6 %

91-9283 #670 1) $\frac{(1252\ ug - 85) \times 100}{.0771\ g \times .939 \times 10^6}$ = 1.61 % = 1.61×10^7 ug/kg

2) $\frac{(1231\ ug - 85) \times 100}{.0724\ g \times .939 \times 10^6}$ = 1.69 % = 1.69×10^7 ug/kg

91-9284 #888 1) $\frac{(525\ ug - 85) \times 100}{.0317\ g \times .939 \times 10^6}$ = 1.48 % = 1.48×10^7 mg/kg (per 9-16-91)

$\bar{x}$ = 1.51

2) $\frac{(797\ ug - 85) \times 100}{.0491\ g \times .939 \times 10^6}$ = 1.54 % = 1.54×10^7 ug/kg

SPIKE

ug C FND (SPL+SPK) = 2442 ug - 85 = 2357

ug C Added (SPK) = 3500 x 1.400 = 1400

ug C FOUND (SPL) = (per 9-16-91) .0719 x .0151 x .939 x 10^6 = 1019

% Recovery = (2357 - 1019)/1400 = 95.6 %

91-9285 #849 1) $\frac{(842\ ug - 85) \times 100}{.0568\ g \times .939 \times 10^6}$ = 1.42 % = 1.42×10^7 ug/kg

2) $\frac{(898\ ug - 85) \times 100}{.0584\ g \times .939 \times 10^6}$ = 1.48 % = 1.48×10^7 ug/kg

Project No. _____ Date of Work _____

Entered By D. Baldwin Date 9-16-91

Disclosed To and Understood By

Signed 1. _____ Date _____

2. _____ Date _____

RMW #53268

9/16/91 Review of pages 119 - 121 Technical & Surveillance
All entries are neat & Ledgible
All calculations were checked for accuracy and found To be Correct

10/1/91

TOC Blind samples *

	Sample Id		Spl. Size	IC	OC	
(2)	BLK	1)	—		102	
		2)	—		90	
Glucose Lot # BIF	STD.	1)	6.2 mg.		2439	* samples did not dissolve even after the persulfate addition the H_2SO_4 trap appeared darker color after samples were run
		2)	5.7 mg.		2302	
91-10516	#1062	1)	.1346 g.	1451	2798	
		2)	.1199 g.	1398	2620	
91-10517	#1065	1)	.0980 g.	1042	3120	
		2)	.0677 g.	753	2135	
Glucose BIF	+ Spike.	3)	.037? g. + 4.8 mg.	417	1945	
10/2/91	BLK	1)			84	
		2)			76	
Glucose # BIF	STD	1)	3.6		1468	
		2)	5.3		2105	
91-10518	#1068.	1)	.0878	968	435	
		2)	.1330	1675	622	
91-10519	#1071	1)	.1177	1762	1498	
		2)	.0795	797	1130	
	+ Spike	3)	.0995 + 3.0 mg.	1014	82	
Glucose BIF	+ Spike.	4)	.0529 + 8.2 mg.	572	3026	

BNW #53268

Project No. M63056 Date of Work 10/1/91 - 10/2/91
Entered By [signature] Date 10/2/91
Disclosed To and Understood By
Signed 1. _____ Date _____
2. _____ Date _____

CALCULATIONS — TOC BLIND SAMPLES

BATCH # 122 (9-16-91)

STD 1 (Glucose) $\frac{(2439 - 90) \times 100}{6200\ \mu g \times .400}$ = 94.72 %

STD 2 $\frac{(2302 - 90) \times 100}{5700\ \mu g \times .400}$ = 97.02 %

$\bar{x}$ = 95.87 %

91-10516 #1062 1) $\frac{(2793 - 90) \times 100}{.1346\ g \times .959 \times 10^{6}}$ = 2.10 % = 2.10×10^{7} µg/kg

2) $\frac{(2620\ \mu g - 90\ \mu g) \times 100}{.1149\ g \times .959 \times 10^{6}}$ = 2.20 % = 2.20×10^{7} µg/kg

91-10517 #1065 1) $\frac{(3170 - 90) \times 100}{.0980\ g \times .959 \times 10^{6}}$ = 3.22 % = 3.22×10^{7} µg/kg

$\bar{x}$ = 3.18 %

2) $\frac{(2135 - 90) \times 100}{.0677\ g \times .959 \times 10^{6}}$ = 3.15 % = 3.15×10^{7} µg/kg

SPIKE (Glucose) 3) µg C FOUND (SPL+SPK) = 1945 µg − 90 = 1855 µg

µg C FOUND (SPL) = .0379 g × .0318 $\frac{\text{mg C}}{\text{mg COM}}$ × .959 × 10^{6} = 1156

µg C ADDED (SPK) = 4800 µg × .400 = 1920 µg

% Spike Recovery = $\frac{(1855\ \mu g - 1156) \times 100}{1120}$ = 36.4 %

BATCH RUN 10-2-91

STD 1 (glucose) $\frac{(1463\ \mu g - 76\ \mu g) \times 100}{3600\ \mu g \times .400}$ = 96.7 %

~~M~~ DP 11/5/91

STD 2 (") $\frac{(2105 - 76) \times 100}{5340\ \mu g \times .400}$ = 95.7 %

$\bar{x}$ = 96.2 %

BNW 53269

91-10518 #1068 1) $\frac{(435 - 76) \times 100}{.0878\ g \times .962 \times 10^{6}}$ = 0.43 %

2) $\frac{(622 - 76) \times 100}{.1330\ g \times .962 \times 10^{6}}$ = 0.43 %

Project No. _____ Date of Work _____

Entered By D.A. Baldwin Date 10-5-91

Disclosed To and Understood By

Signed 1. _____ Date _____

2. _____ Date

12.1

(cont previous page)

911-10519 #1071

1) $\frac{(1498\ \mu g - 76\ \mu g) \times 100}{.1177\ g \times .962 \times 10^6} = 1.26\ \%$

$\bar{x} = 1.32$

2) $\frac{(1130 - 76) \times 100}{.0795\ g \times .962 \times 10^6} = 1.38\ \%$

Spike (glucose)

$\mu g\ C$ Found (spk mix) = $825\ \mu g - 76 = 749\ \mu g$

$\mu g\ C$ Found (spk) = $.0495 \times .038 \times .926 \times 10^6 = 1271\ \mu g$

μg Carbon (spk) = $3000\ \mu g \times .400 = 1200\ \mu g$

% Spk Recovery = $\frac{(749 - 1271)}{1200} \times 100$ (No Good)

Spike (glucose)

$\mu g\ C$ Found (spl + spk) = $3026 - 76 = 2950\ \mu g$

$\mu g\ C$ Found (spl) = $.0529\ g \times .0138 \times .926 \times 10^6 = 676\ \mu g$

μg Carbon (spk) = $8200\ g \times 0.400 = 3280\ \mu g$

% Spike Recovery = $\frac{(2950 - 676)}{3280} \times 100 = 69.3\ \%$

D L Baldwin 11/5/91

BNW 53268

Project No. _____ Date of Work _____

Entered By D L Baldwin Date 11/5/91

Disclosed To and Understood By

Signed 1. _____ Date _____

2. _____ Date _____

BNW — #52996

13

10/3/91

BEGIN TOC FOR 101 ST SIMULATED WASTE.:

SAMPLE #'s 91-10516 (#1062), 91-10517 (#1065), 91-10518 (#1068), 91-10519 (#1071)

PROCEDURE 7-40.37. RUN TIME = 10 MINS

BALANCE: 360-06-01-023 2.00037g OR

* CHANGED OUT FURNACE TUBE & CONDITIONED 10/3/91

BLANK (µg C) (USING Pt BOAT)

1) 6.81
2) 6.97 } AVG = 6.89 µg C

STANDARD (GLUCOSE; LOT # 0680LPX)

	g SAM	µg C (EXP)	µg C (DISPLAY) − BLK	% REC
1)	0.00466g	2,660	2709.25 − 6.89	102
2)	0.00294g	1,180	1237.54 − 6.89	104%
3)	0.00365g	1,460	1550.00 − 6.89	106%
4)	0.00314	1,260	1300.00 − 6.89	103
5)	0.00477	1,910	1947.95 − 6.89	102

BLANK
3) 14.80 µg C

Bill Cobb END 10/3/91

10/4/91

101 ST SIMULATED SAMPLES (CONT'D)

PROCEDURE 7-40.37 RUN TIME = 10 MINS BALANCE: 360-06-01-023

FURNACE T = 607°C 2.00015g OR

BLANK: (µg C) (Pt BOAT)

1) 11.42

Project No. M46655 Date of Work 10/3/91, 10/4/91

Entered By Bill Cobb Date 10/3/91, 10/4/91

Disclosed To and Understood By 003-019

Signed 1. _____ Date _____

2. _____ Date _____

10/4/91 TOC (CONT'D)

BLANK (µg C)

WRC 10/4/91 ~~1) 9.08~~ 2) 9.08 3) 8.82 } AVG. = 8.95 µg C BLANK

STANDARD (GLUCOSE; LOT # 068021PX)

	g SAM	µg C (EXP)	µg C (DOC) - BLK	% REC
1)	0.00750	1,800	1812.29	100.%
2)	0.00823	3,290	~~3160.28~~ 3151.33	95.8 % } 96.0%
3)	0.00709	1,670	1572.91	96.2 % }

SAMPLE

91-10518 (#1068)

	EMPTY BOAT (g)	BOAT + SAM (g)	SAMPLE (g)	µg C - BLK	C µg/Kg WRC 10/7/91
1)	3.78784	3.87859	0.09375	306.28	~~3.27~~ 5.07 x 10⁶ µg/Kg. WR
2)	3.83909	3.87719	0.03810	193.55	~~3.27~~ x 10⁶ WR

#52996

RUNS ARE NOT LONG ENOUGH FOR THIS SIZE SAMPLE TO RECORD ALL OF THE CARBON COMING OFF THE SAMPLE. ALSO, MUCH CARBON RESIDUE IS LEFT OVER IN THE SAMPLE BOAT AFTER 40 MINS RUN TIME.

Bill Cobb END 10/4/91

10/8/91 101 SR SIM SAM (CONT'D) PROCEDURE 7-70.37 BALANCE 360-06-01-023

FURNACE T = 607 °C 2.00006g WR

RUN TIME DETERMINATION:

SPL #1068 :	EMPTY BOAT (g)	BT + SPL (g)	SPL (g)	RUN TIME	µg C
1)	3.81639	5.83699	0.02060	25 MINS	179.

C03-0.00

Project No. M96655 Date of Work 10/7/91, 10/9/91

Entered By WT COBB Date 10/7/91, 10/9/91

Disclosed To and Understood By

Signed 1. _____ Date _____

2. _____ Date _____

136 10/8/91 TOC (CONT'D)

WTC 10/9/91

~~RUN TIME 25 MIN. BLK: (µg C)(~~ ~~BL)~~

RUN TIME DETERMINATION: FOREIGN BC

WTC 10/9/91	~~MINS~~ g SAM	MINS	Rd OUT (µg C)	µg C/Kg
	0.01343	10	77.85	5.797×10^6
		20	128.00	9.531×10^6
(NO BLANK VALUES		25	150.00	1.117×10^7
SUBTRACTED FROM		30	168.00	1.251×10^7
µg C RESULTS)		35	185.00	1.378×10^7
		40	200.00	1.489×10^7
		45	214.00	1.593×10^7
		50	227.00	1.690×10^7
		55	242.00	1.802×10^7

10/9/91 CHANGED OUT NO_x SCRUBBER TO SEE IF BLANK VALUES WOULD DECREASE & BECOME ~~LESS~~ MORE CONSISTENT.

RAN FURNACE W/ BOAT & LABLE INSERTED UP TO 1000°C FOR FOR 1+ HRS TO PURGE SYSTEM. BROUGHT SYSTEM BACK DOWN TO 600°C; BLANK VALUES APPEAR MUCH LOWER & MUCH MORE STABLE AFTER PURGE & NO_x SCRUBBER REPLACEMENT.

Bill Cobb 10/9/91

BNW #52996

TOC-101 SY SIMULATED - CONT'D

PROCEDURE 7-40.37 RUN TIME = BALANCE: 360-06-01-023

FURNACE T = 607°C 2.00023 g GK

(10 min) BLK: (µg C)(Peak Bl) -1) 5.50 µg C

2) 4.26 } 4.33 = AVG

3) 4.40 }

GLUCOSE STD:	EMPTY BOAT (g)	BL + SPL (g)	SPL (g)	µg C EXP	DISPLAY (µg C)	% REC.
Lot # 6902PX 1)	0.57029	0.57609	0.00580	2,320	2482	107

DISREGARD

Project No. M46655 Date of Work 10/8/91

Entered By WT COBB Date 10/9/91

Disclosed To and Understood By C03-021

Signed 1. Date

2. Date

TOC (CONT'D)

		Empty BC(g)	SPL+BC(g)	SPL (g)	µg C ELP	(µg C) Disp-Blk	% Rec
STD:	2)	0.56937	0.57773	0.00836	3.347	3160	97.5
	3)	0.56944	0.57271	0.00327	1.308	1175	89.8
	4)	4.20826	4.21167	0.00341	1.364	1330	97.5
	5)	4.20815	4.20932	0.00117	468	422	90.2 } 91.6 %
	6)	4.20771	4.21197	0.00426	1.704	1585	93.0 } RECOV.

SPL: 1068

		Emp BC (g)	SPL+BC(g)	SPL (g)	µg C - BLK	µg C / Kg SPL
10 MIN	1)	4.20757	4.21686	0.00932	77.45	7.99 X10⁶

	MINS	µg C
BLK:	5	4.75
	10	4.50
	15	13.75
	20	16.78

					µg C RDOUT	
	2)	4.21113	4.21703	0.00590	(10 min) 46.50	7.88 X10⁶
					(15 min) 59.09	1.00 X10⁷
					(20 min) 68.67	1.16 X10⁷
					(25 min) 77.51	1.31 X10⁷
					(30 min) 92.00	1.56 X10⁷
700 °C	3)	4.21323	4.21789	0.00466	(10 min) 480	1.03 X10⁷
					(15 min) 58.45	1.25 X10⁷
					(20 min) 66.31	1.42 X10⁷

SPL: # 1065

600°C	1)	4.21422	4.22130	0.00708	(10 min) 108.20	1.53 X10⁷
					(15 min) 125.36	1.77 X10⁷
					(20 min) 135.71	1.92 X10⁷
					(25 min) 144.00	2.03 X10⁷

END 10/9/91

10/10/91 TOC (CONT'D) FURN T = 608 °C HET PROCEDURE = 7-40.37

BALANCE 360-06-01-023 2.00032 OK

BLK: ~~CE TOC BC~~; 1) 6.95 µg C 4) 4.20
(NO BC ON LADLE) 2) 5.41 5) 3.95
(10 MINS) 3) 4.61 6) 3.95

Project No. M46655 Date of Work 10/9/91, 10/10/91

Entered By [signature] Date 10/9/91, 10/10/91

Disclosed To and Understood By C03-020 Date

Signed 1. Date

2.

BNW #52996

1/0 REC 107 ILD

TOC (CONTID)

BLK : (10 MIN R.T.; POREC BT & LADLE)

10 MIN 1) 4.96 µg C
15 MIN 6.70 µg C
20 MIN 8.38 µg C
25 MIN 9.94 µg C
30 MIN 11.75

SPL: #1065 - SUCROSE

#	EMP BT (g)	BT + SPL(S)	SPL (g)	(t)	µg C - BLK	µg C/Kg SPL
1)	4.21291	4.21560	0.00269	10m	41.31-4.96	1.35×10^7
				15m	52.0-6.70	1.68×10^7
			DB 11-5-91	20m	67.10-8.38	1.84×10^7
				25m	61.54-9.94	1.91×10^7
				30m	65.08-11.75	1.98×10^7
				35m	68.25	$\sim 1.95 \times 10^7$

BLK : (POREC SPL BT + LDL)

10 MIN 2) 9.77
15 MIN 10.86
20 MIN 12.50
25 MIN 13.95
30 MIN 15.35

SPL : #1065

2)	4.21290	4.21624	0.00334	10m	50.09-4.96	1.35×10^7
				15m	59.57-6.70	1.58×10^7
			DB 11-5-91	20m	65.93-8.38	1.72×10^7
				25m	71.16-9.94	1.93×10^7
				30m	75.67-11.75	1.91×10^7
				35m	79.79	$\sim 1.94 \times 10^7$

SPIKE : #1065

SPL	1a) 4.21368	4.21570	0.00202	30m 273.35-11.75 = 261.60 µg C
WT MINUS SPL + GLU	1b) 4.21570	4.21608	0.00038	

Project No. 10157 - SIMULATE SPL IM46655 Date of Work 10/10/91
Entered By WT COBB Date 10/10/91
Disclosed To and Understood By C03-026
Signed 1. Date
2. Date

BNW #52996

BNW

EXPECTED GLUCOSE RECOVERY: 0.40 x 0.000375 GLUCOSE
= 0.000150 = 150 µg C.

EXPECTED SPL #1065 C RECOVERY: (ASSUMES 2.0 x10⁷ µg C/Kg SPL)

0.00202 g SPL = 2.02 x10⁻⁶ Kg

2.02 x10⁻⁶ Kg SPL x 2.0 x10⁷ µg C/Kg SPL

= 40 µg C

150 µg C + 40 µg C = 190 µg C EXPECTED RECOVERY

261 µg C (DISPLAY - BLK) / 190 µg C (EXPECTED) = 137 % REC.

SUSPECT THERE WAS DEFINITE WEIGHING ERROR. BC WT WAS MUCH HIGHER 'EMPTY' THAN IN RUNS BEFORE. COULD ALSO SUGGEST MUCH BETTER SUCROSE RECOVERY WAS OBSERVED - AS CALCULATED BELOW:

261 µg C TOTAL - 150 µg C (GLUCOSE) = 111 µg C FROM 2.0 x10⁻⁶ Kg SPL.

111 µgC ÷ 2.02 x10⁻⁶ Kg SPL

= 5.5 x10⁷ µg C/Kg SPL

SPIKE: #1065 (30 MINS)

SPL	2a)	4.27104 g	4.21299 g	0.00195 g	5565 µg C - 11.75 = 533.70
GLU	2b)	4.21299 g	4.21217 g	0.00118 g	

GLU (0.000475 g CLC EXP) = 470 µg C

SPL 1.95 x10⁻⁶ Kg x 2.00x10⁷ µg C/Kg = 39 µg C.

509 µg C EXP.

533.70 - 5 / 509 x100 = 105 % REC.

Project No. M96655 Date of Work 10/10/91

Entered By Bill Cobb Date 10/10/91

Disclosed To and Understood By

Signed 1: Date

C03-0024

BNW #52996

1.10 10/10/91 TOC (CONT'D)

BLK: 30 MIN RUN TIME, PORCEL BT.

1) 13.52 µg C

END 10/10/91

10/11/91 TOC (CONT'D) 10151 SIMULATED SPL'S.

RUN TIME = 30 MINS BT = PORCEL. FURNACE T = 603 °C BALANCE: 360-0.0 -0.0 2.000169 GR.

BLK: ~~30~~ 10 MINS

10 MIN 1) 14.30 µgC
2) 9.15 } 7.90 µg C
3) 7.65

30 MIN 4a) 6.85
30 MIN 4b) 18.29

STD: GLUCOSE LOT # 6802 PX

#	EMPTY BT (g)	BT + SPL (g)	SPL (g)	µg C exp	µg C Rpout - BLK	% REC
1)	4.20965	4.21550	0.00585	2,340	2309.93 - 7.90	98.7
2)	4.20841	4.21253	0.00412	1648	1629.77 - 7.90	98.7

SPL: #1065, 30 MINS RUN TIME

						µgC/kg SOIL
1)	4.20925	4.21094	0.00169	—	65.05 - 19.29	2.77×10^7
2)	4.20940	4.21176	0.00236	—	71.34 - 19.29	2.25×10^7
3)	4.20967	4.21283	0.00316	—	80.21 - 19.29	1.96×10^7
4)	4.20968	4.21290	0.00322	—	98.15 - 19.29	2.98×10^7

SPLIT:

GLUCOSE 1)	4.20969	4.21044	0.00075	300	3/4	359.72 - 19.29
SPL 4a)	4.21044	4.21237	0.00193	48		= 321.43 - 48 µg C SOIL

(USING 2.5×10^7 µgC/kg SOIL) = 273.43 ÷ 300 x 100 = 91 % REC

Project No. M46655 Date of Work 10/10/91

Entered By [illegible] Date 10/10/91

Disclosed To and Understood By

Signed 1. _____ Date _____

2. _____ Date _____

C03-025

BNW #52996

10/11/91 RANGE OF RECOVERY BASED ON SPL VALUES:

μg C EXPECTED FROM SPL:

μg C/kg SPL = $1.96 \times 10^7 - 2.77 \times 10^7$

μg C EXPECTED ON READOUT: 37.8 – 53.4

% REC RANGE: 321.73 – 37.8 ÷ 500 x 100 =
321.73 – 53.4 ÷ 500 x 100 =

94.5% – 89.3%

BLK: 30 MIN
1) 14.34 μg C.

END 10/11/91 WTC

10/14/91 CHANGE NO$_x$ SCRUBBER FILLINGS.

10/14/91 TOC – BEGIN FOR 200-BP-1 SPL's 92-00306 & 92-00355

PROCEDURE 7-40.37 T = 610 °C BALANCE: 360-06-01-023
5.00005 g OK.

BLK: RUN TIME = 10 MINS BC = PORCELAIN
WTC 10/14/91 ~~92-0306 & 92-0355~~ 92-0306-T-4 & 92-0355-T-4

NEW BT CHOLE 1) 4.00 μg C
2) 2.55
3) 2.25 } AVG. = 2.40 μg C

STD: α-D-GLUCOSE LOT # 6802PX

#	EMP BT (g)	BT + SPL (g)	SPL (g)	μg C EXP	μg C – BLK	% REC
1)	4.12939	4.13546	0.00607	2430	2397.00 – 2.40	98.5 } AVG. =
2)	4.12916	4.13300	0.00384	1,540	1536.36 – 2.40	99.6 } 99.0 %

BNW #5396

Project No. _____ Date of Work 10/11/91 / 10/14/91

Entered By Bert Cole Date 10/11/91 10/14/91

Disclosed To and Understood By

Signed 1. _____ Date _____

_____ Date _____

101 SY TOC CALCULATIONS/RESULTS — WT COBB 10/25/91 — 149

NOTE: THESE SAMPLES WERE RUN BY THE PNL COMBUSTION METHOD (PROCEDURE 7-10.37) FOR COMPARISON WITH HOT CELL HOT PERSULFATE METHOD RESULTS (PROCEDURE 7-10.47). LONGER RUN TIMES (20 & 30 MINS) & SMALL SAMPLE SIZES WERE NECESSARY TO MINIMIZE ORGANIC CARBON OUTPUT RUN-ON. HIGHER FURNACE TEMPERATURES (700°C) WERE EXAMINED TO SEE IF THEY COUNTERACTED THE CARBON RUN-ON PROBLEM BUT WERE NOT PERSUED AFTER INITIAL TESTS SHOWED LITTLE PROMISE.

BATCH RUN ON 10/9/91

STD (10 MIN RUN)

1) $\frac{(3167 - 7.88) \times 100}{9360\,\mu g \times 0.700} = 94.5\ \%$

2) $\frac{(1179 - 7.33) \times 100}{3270\,\mu g\ C \times 0.700} = 89.8\ \%$

3) $\frac{(1334 - 7.33) \times 100}{3410\,\mu g \times 0.700} = 92.5\ \%$

4) $\frac{(726 - 7.33) \times 100}{1170\,\mu g \times 0.700} = 90.2\ \%$

5) $\frac{(1589 - 7.33) \times 100}{4260\,\mu g \times 0.700} = 93.0\ \%$

AVG. = 93.0 %

91-10518 #1068 (20 MIN RUN)

1) $\frac{(69.64 - 16.78)\,\mu g\ C}{5.70 \times 10^{-6}\,kg \times 0.93\ REC.} =$ **$9.45 \times 10^6\ \mu g\ C/kg\ SPL.$**

BATCH RUN ON 10/10/91

STD (10 MIN RUN)

1) $\frac{(2310 - 6.85) \times 100}{5850\,\mu g \times 0.700} = 98.4\ \%$

2) $\frac{1630 - 6.85 \times 100}{4160\,\mu g \times 0.700} = 98.5\ \%$

AVG. = 98.4 %

91-10517 #1065 (30 MIN RUN)

1) $\frac{(65.05 - 18.29)\,\mu g\ C}{1.698 \times 10^{-6}\,kg \times 0.984} = 2.81 \times 10^7\ \mu g\ C/kg\ SPL$

2) $\frac{(71.37 - 18.29)\,\mu g\ C}{2.36 \times 10^{-6}\,kg \times 0.984} = 2.28 \times 10^7\ \mu g\ C/kg$

3) $\frac{(90.21 - 18.29)\,\mu g\ C}{3.6 \times 10^{-6}\,kg \times 0.984} = 1.99 \times 10^7\ \mu g\ C/kg$

Project No. _____ Date of Work _____

Entered By WT COBB Date 10/25/91

Disclosed To and Understood By

Signed 1. _____ Date _____

2. _____ Date _____

BRW #52996

C02-0027

150

BATCH RUN 10/4/91 (CONT'D)

4) $\frac{(98.15 - 19.24)\ \mu g\ C}{3.122 \times 10^{-5}\ kg \times 0.989} = 2.52 \times 10^{7}\ \mu g\ C/kg$

END 10154 SIMULATED SAMPLE CALCULATIONS WT COBB

D. K. Baldwin 11-5-91

BNW #52996

Project No. _____ Date of Work _____

Entered By: WT COBB Date 10/24/91

Disclosed To and Understood By

Signed 1. _____ Date _____

2. _____ Date _____

C03-028

DISTRIBUTION

No. of
Copies

OFFSITE

2 DOE/Office of Scientific and
Technical Information

ONSITE

4 Westinghouse Hanford Company

J. R. Jewett, T6-50 (4)

14 Pacific Northwest Laboratory

D. L. Baldwin, P7-22
B. M. Gillespie, P7-27 (5)
J. V. Hoopes, P7-22
R. W. Stromatt, P7-22
Publishing Coordination
Technical Report Files (5)

END

DATE
FILMED
3/13/92