2. To: (Receiving Organization) Distribution		3. From: (Originating Organization) Production Planning and Control		4. Related EDT No.: N/A	
5. Proj./Prog./Dept./Div.: B-Plant/Waste Management/PPC/AS		6. Design Authority/ Design Agent/Cog. Engr.: Larry L. Fritts		7. Purchase Order No.: N/A	
8. Originator Remarks: This document is being released into the supporting document system for retrievability purposes.				9. Equip./Component No.: N/A	
				10. System/Bldg./Facility: B-Plant	
11. Receiver Remarks: 11A. Design Baseline Document? ☐ Yes ☒ No For release.				12. Major Assm. Dwg. No.: N/A	
				13. Permit/Permit Application No.: N/A	
				14. Required Response Date: 12/06/96	

15. DATA TRANSMITTED					(F)	(G)	(H)	(I)
(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	Approval Design- ator	Reason for Trans- mittal	Orig- inator Dispo- sition	Receiv- er Dispo- sition
1	WHC-SD-WM-DP-213	N/A	0	B Plant, TK-21-1, Analytical Results for the Final Report	Q	2	1	1

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

17. SIGNATURE/DISTRIBUTION (See Approval Designator for required signatures)											
(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN	(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN
		Design Authority									
		Design Agent									
2	1	Cog.Eng. L. L. Fritts	<i>L. L. Fritts</i>	12/6/96							
2	1	Cog. Mgr. A. D. Rice	<i>A. D. Rice</i>	12-6-96							
2	1	QA D. A. Sebelien	<i>D. A. Sebelien</i>	12/6/96							
		Safety									
		Env.									

18. M. T. Ellsworth Signature of EDT Originator		19. N/A Authorized Representative Date for Receiving Organization		20. A. D. Rice Signature of Design Authority/ Cognizant Manager		21. DOE APPROVAL (if required) Ctrl. No. ☐ Approved ☐ Approved w/comments ☐ Disapproved w/comments	
---	--	---	--	---	--	---	--

B Plant, TK-21-1, Analytical Results for the Final Report

Larry L. Fritts

Rust Federal Services of Hanford, Inc., Richland, WA 99352

U.S. Department of Energy Contract DE-AC06-87RL10930

EDT/ECN: EDT-620376

UC: 2070

Org Code: 7576B

Charge Code: MD378

B&R Code: EW 3120074

Total Pages: *122*

Key Words: B Plant, TK-21-1, Analytical Results, Final Report, B.

Abstract: N/A

TRADEMARK DISCLAIMER. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof or its contractors or subcontractors.

Printed in the United States of America. To obtain copies of this document, contact: WHC/BCS Document Control Services, P.O. Box 1970, Mailstop H6-08, Richland WA 99352, Phone (509) 372-2420; Fax (509) 376-4989.

Larry L. Fritts
Release Approval

12/9/96
Date

Approved for Public Release

RUST Rust Federal Services of Hanford Inc.

A WMX Technologies Company
P.O. Box 700
Richland, WA 99352

WHC-SD-WM-DP-213, REV. 0

ANALYTICAL SERVICES

**B PLANT, TK-21-1, ANALYTICAL RESULTS
FOR THE FINAL REPORT**

Project Coordinator: Larry L. Fritts

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

by

222-S Laboratory
Rust Federal Services of Hanford Inc.
P.O. Box 700
Richland, Washington

WHC-SD-WM-DP-213, REV. 0

THIS PAGE WAS INTENTIONALLY LEFT BLANK

TABLE OF CONTENTS

Narrative	1
Sample Data Summary	8
Request for Sample Analysis	14
Breakdown and Sample Preparations	19
Appearance Worklist # 13377 (453)	21
Acid Digestion Worklist # 14962 (534)	22
Inorganic Analysis	23
PH Analysis (PH)	
PH Worklist # 13773 (454)	25
Selenium Analysis (SE)	
SE Worklist # 15000 (534)	26
Ion Chromatographic Analysis (IC)	
IC Worklist # 13776 (454)	39
Inductively Couple Plasma Spectrographic Analysis (ICP)	
ICP Worklist # 13768 (454)	47
Total Inorganic Carbon/Total Organic Carbon (TICTOC)	
TICTOC Worklist # 13774 (454)	65
Total Organic Carbon (TOC)	
TOC Worklist # 15372 (454)	82
Radiochemical Analysis	92
Gamma Energy Analysis (GEA)	
GEA Worklist # 13777 (454)	94
Strontium Analysis (Sr-90)	
Sr-90 Worklist # 13772 (454)	113

This Document consists of pages 1 through 118, Pages ii, 9, 15, 20, 24 and 93 were intentionally left blank.

TRADEMARKS:

Perkin-Elmer is a Registered Trademark of Research and Manufacturing Company, Inc. Mettler is a Registered Trademark of Mettler Electronics.

WHC-SD-WM-DP-213, REV. 0

NARRATIVE

WHC-SD-WM-DP-213, REV. 0

THIS PAGE WAS INTENTIONALLY LEFT BLANK

WHC-SD-WM-DP-213, REV. 0

222-S ANALYTICAL SERVICES

B PLANT, Tk-21-1, ANALYTICAL RESULTS FOR THE FINAL REPORT

This document is the final laboratory report for B Plant Tk-21-1. A Resource Conservation and Recovery Act (RCRA) sample was taken from Tk-21-1 September 26, 1996. This sample was received at 222-S Analytical Laboratory on September 27, 1996. Analyses were performed in accordance with the accompanying Request for Sample Analysis (RSA) and Letter of Instruction *B PLANT RCRA SAMPLES TO 222S LABORATORY, LETTER OF INSTRUCTION (LOI) 2B-96-LOI-012-01* (LOI) (Westra, 1996). LOI was issued subsequent to RSA and replaces Letter of Instruction 2C-96-LOI-004-01 referenced in RSA.

Sample Appearance and Handling

This sample was assigned Laboratory Information Management System (LIMS) identification number S96B000454. The sample was clear and colorless with no apparent solids. No organic layer was noted.

An aliquot of this sample was taken and prepared for Selenium (Se) analysis by performing an acid digest of the liquid. This digest aliquot was assigned LIMS identification number S96B000534.

Analytical Results Summary

The sample data summary section compiles the analytical results that comply with RSA in tabular summary form. The raw data were presented in the sections following the sample data summary section.

Inorganic Analyses

pH

This sample was run in duplicate. No laboratory defined quality control (QC) parameters were exceeded for this analyte (Meznarich, et. al., 1995).

IC - Ion Chromatography

Only required analyte results (F^- , NO_3^{2-} , NO_2^{2-} , SO_4^{2-} , and PO_4^{3-}) as per RSA are considered in this report. Information regarding other IC analytes can be determined from the raw data.

WHC-SD-WM-DP-213, REV. 0

This sample was run in duplicate. No laboratory defined QC parameters were exceeded for these analytes

Laboratory reagent blank shows nitrate at $1.51\text{E-}01 \mu\text{g/mL}$. This concentration has no significant impact on the sample result of $2.84\text{E+}03 \mu\text{g/mL}$.

ICP - Inductively Coupled Plasma Spectroscopy

Only required analyte results (Ba, Cr, Na, and Pb) as per RSA are considered in this report. Information regarding the other ICP analytes can be determined from the raw data.

This sample was run in duplicate with a spike sample and spike duplicate on an aliquot made by adding acid. No laboratory defined quality control (QC) parameters were exceeded for these analytes.

Procedure LA-505-151 was used to perform this analysis. LOI references procedure LA-505-161. These procedures are written for two different brands of ICP instrumentation but are equivalent.

TOC - Total Organic Carbon

This sample was ran in duplicate. A triplicate analysis of this sample was performed on a separate worklist. This analysis was performed by the persulfate method (LA-342-100). LOI references the furnace oxidation method (LA-344-105). Insufficient sample remained for a re-analysis by the furnace oxidation method.

The laboratory reagent blank shows $6.80\text{E-}00 \mu\text{g/mL}$ for the sample and duplicate, and $1.70\text{E-}00 \mu\text{g/mL}$ for the triplicate. These concentrations have no significant impact on the sample results of $9.60\text{E+}01 \mu\text{g/mL}$, $8.30\text{E+}01 \mu\text{g/mL}$, and $4.40\text{E+}01 \mu\text{g/mL}$, respectively. These results are less than five times the detection limit, at this level instrument precision is compromised.

TIC - Total Inorganic Carbon

This result is not required by RSA but is generated with the TOC by persulfate analysis. More information regarding this analyte can be determined from the raw data.

WHC-SD-WM-DP-213, REV. 0

Se - Selenium

This sample was run in duplicate with a spike sample on an acid digested aliquot. The procedure for this analysis does not allow for spike duplicates as required by LOI. With customer concurrence, the sample is being reported without this LOI requirement. No laboratory defined QC parameters were exceeded for these analytes.

Radiochemical Analyses

GEA - Gamma Energy Analysis

Only the required analyte result (^{137}Cs) as per RSA is considered in this report. Information regarding other GEA analytes can be determined from the raw data. No laboratory defined QC parameters were exceeded for this analyte.

^{90}Sr - Strontium-90

This sample was run in duplicate. No laboratory defined QC parameters were exceeded for this analyte.

Laboratory reagent blank shows ^{90}Sr at $7.09\text{E-}04 \mu\text{Ci/mL}$. This concentration has no significant impact on the sample result of $4.88\text{E-}01 \mu\text{Ci/mL}$.

WHC-SD-WM-DP-213, REV. 0

Procedures

Table 1 lists the analytical procedures used for performing the sample analyses. Abbreviations for analyses are defined in the table notes.

Table 1. Analytical Procedures

Analysis	Sample Portion	Preparation Procedure +	Analysis Procedure
pH	Liquid	N/A	LA-212-106 Rev. B-0
IC	Liquid	N/A	LA-533-105 Rev. D-1
ICP	Liquid	N/A	LA-505-151 Rev. D-3
TOC	Liquid	N/A	LA-342-100 Rev. E-0
TIC	Liquid	N/A	LA-342-100 Rev. E-0
Se	Liquid	LA-505-164 Rev. A-0	LA-365-131 Rev. D-0
GEA	Liquid	N/A	LA-548-121 Rev. E-0
⁹⁰ Sr	Liquid	N/A	LA-220-101 Rev. D-1

Abbreviations:

N/A = not applicable (these are direct samples)
pH = pH
IC = ion chromatography
ICP = inductively coupled plasma
TOC = total organic carbon
TIC = total inorganic carbon
Se = selenium
GEA = gamma energy analysis
⁹⁰Sr = strontium-90

WHC-SD-WM-DP-213, REV. 0

References

Meznarich, H. K., et. al., 1995, *Quality Assurance Plan for the 222-S Laboratories*, WHC-SD-CP-QAPP-016, Rev. 0, Westinghouse Hanford Company, Richland, WA 99352.

Westra, A. G., 1996, *B Plant RCRA Samples to 222S laboratory, Letter of Instruction (LOI) 2B-96-LOI-012-01*, 2B-96-LOI-012-01, B&W Hanford Company, Richland, WA 99352.

WHC-SD-WM-DP-213, REV. 0

SAMPLE DATA SUMMARY

WHC-SD-WM-DP-213, REV. 0

THIS PAGE WAS INTENTIONALLY LEFT BLANK

pH Direct

SAMPLE IDENTIFICATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS					
Customer Sample Number	Laboratory Sample Number	Sample Result pH	Duplicate Result pH	Average Result pH	Duplicate Precision RPD %	Standard % Recovery	Blank pH	Spike Recovery %	Spike Duplicate RPD	Detection Limit pH	Counting Error %
Tank 21-1	S96B000454	1.86E+00	1.89E+00	1.88E+00	1.6	100.2	n/a	n/a	n/a	1.00E-02	n/a

TOC by Persulfate/Coulometry

SAMPLE IDENTIFICATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS					
Customer Sample Number	Laboratory Sample Number	Sample Result ug/mL	Duplicate Result ug/mL	Average Result ug/mL	Duplicate Precision RPD %	Standard % Recovery	Blank ug/mL	Spike Recovery %	Spike Duplicate RPD	Detection Limit ug/mL	Counting Error %
Tank 21-1	S96B000454	9.60E+01	8.30E+01	8.95E+01	14.5	90.3	6.80E+00	n/a	n/a	4.00E+01	n/a

TOC by Persulfate/Coulometry(Triplicate Analysis)

SAMPLE IDENTIFICATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS					
Customer Sample Number	Laboratory Sample Number	Sample Result ug/mL	Duplicate Result ug/mL	Average Result ug/mL	Duplicate Precision RPD %	Standard % Recovery	Blank ug/mL	Spike Recovery %	Spike Duplicate RPD	Detection Limit ug/mL	Counting Error %
Tank 21-1	S96B000454	4.40E+01	n/a	n/a	n/a	86.3	1.70E+00	n/a	n/a	4.00E+01	n/a

Strontium-89/90 High Level

SAMPLE IDENTIFICATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS					
Customer Sample Number	Laboratory Sample Number	Sample Result uCi/mL	Duplicate Result uCi/mL	Average Result uCi/mL	Duplicate Precision RPD %	Standard % Recovery	Blank uCi/mL	Spike Recovery %	Spike Duplicate RPD	Detection Limit ug/mL	Counting Error %
Tank 21-1	S96B000454	4.88E-01	5.01E-01	4.94E-01	2.6	105.0	7.09E-04	n/a	n/a	1.00E-03	2.04E+00

**Barium-ICP-Acid Dil.
Acid Digest**

SAMPLE IDENTIFICATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS					
Customer Sample Number	Laboratory Sample Number	Sample Result ug/mL	Duplicate Result ug/mL	Average Result ug/mL	Duplicate Precision RPD %	Standard % Recovery	Blank ug/mL	Spike Recovery %	Spike Duplicate RPD	Detection Limit ug/mL	Counting Error %
Tank 21-1	S96B000454	<1.00E+00	<1.00E+00	n/a	n/a	97.4	<5.00E-02	98.6	1.3	1.00E+00	n/a

**Chromium-ICP-Acid Dil.
Acid Digest**

SAMPLE IDENTIFICATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS					
Customer Sample Number	Laboratory Sample Number	Sample Result ug/mL	Duplicate Result ug/mL	Average Result ug/mL	Duplicate Precision RPD %	Standard % Recovery	Blank ug/mL	Spike Recovery %	Spike Duplicate RPD	Detection Limit ug/mL	Counting Error %
Tank 21-1	S96B000454	7.68E-01	7.49E-01	7.58E-01	2.5	101.2	<1.00E-02	99.1	0.3	2.00E-01	n/a

**Sodium-ICP-Acid Dil.
Acid Digest**

SAMPLE IDENTIFICATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS					
Customer Sample Number	Laboratory Sample Number	Sample Result ug/mL	Duplicate Result ug/mL	Average Result ug/mL	Duplicate Precision RPD %	Standard % Recovery	Blank ug/mL	Spike Recovery %	Spike Duplicate RPD	Detection Limit ug/mL	Counting Error %
Tank 21-1	S96B000454	1.42E+01	1.39E+01	1.41E+01	2.1	95.0	<1.00E-01	95.1	0.2	2.00E+00	n/a

**Lead-ICP-Acid Dil.
Acid Digest**

SAMPLE IDENTIFICATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS					
Customer Sample Number	Laboratory Sample Number	Sample Result ug/mL	Duplicate Result ug/mL	Average Result ug/mL	Duplicate Precision RPD %	Standard % Recovery	Blank ug/mL	Spike Recovery %	Spike Duplicate RPD	Detection Limit ug/mL	Counting Error %
Tank 21-1	S96B000454	<2.00E+00	<2.00E+00	n/a	n/a	100.6	<1.00E-01	100.0	3.1	2.00E+00	n/a

Fluoride-IC-Dionex 4000/4500

SAMPLE IDENTIFICATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS					
Customer Sample Number	Laboratory Sample Number	Sample Result ug/mL	Duplicate Result ug/mL	Average Result ug/mL	Duplicate Precision RPD %	Standard % Recovery	Blank ug/mL	Spike Recovery %	Spike Duplicate RPD	Detection Limit ug/mL	Counting Error %
Tank 21-1	S96B000454	<1.21E+00	<1.21E+00	n/a	n/a	92.7	<1.20E-02	n/a	n/a	1.21E+00	n/a

Nitrite-IC - Dionex 4000/4500

SAMPLE IDENTIFICATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS					
Customer Sample Number	Laboratory Sample Number	Sample Result ug/mL	Duplicate Result ug/mL	Average Result ug/mL	Duplicate Precision RPD %	Standard % Recovery	Blank ug/mL	Spike Recovery %	Spike Duplicate RPD	Detection Limit ug/mL	Counting Error %
Tank 21-1	S96B000454	<1.09E+01	<1.09E+01	n/a	n/a	93.1	<1.08E-01	n/a	n/a	1.09E+01	n/a

Nitrate by IC-Dionex 4000/4500

SAMPLE IDENTIFICATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS					
Customer Sample Number	Laboratory Sample Number	Sample Result ug/mL	Duplicate Result ug/mL	Average Result ug/mL	Duplicate Precision RPD %	Standard % Recovery	Blank ug/mL	Spike Recovery %	Spike Duplicate RPD	Detection Limit ug/mL	Counting Error %
Tank 21-1	S96B000454	2.84E+03	2.88E+03	2.86E+03	1.4	102.7	1.51E-01	n/a	n/a	1.40E+01	n/a

Phosphate-IC-Dionex 4000/4500

SAMPLE IDENTIFICATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS					
Customer Sample Number	Laboratory Sample Number	Sample Result ug/mL	Duplicate Result ug/mL	Average Result ug/mL	Duplicate Precision RPD %	Standard % Recovery	Blank ug/mL	Spike Recovery %	Spike Duplicate RPD	Detection Limit ug/mL	Counting Error %
Tank 21-1	S96B000454	<1.21E+01	<1.21E+01	n/a	n/a	97.8	<1.20E-01	n/a	n/a	1.21E+01	n/a

Sulfate by IC-Dionex 4000/4500

SAMPLE IDENTIFICATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS					
Customer Sample Number	Laboratory Sample Number	Sample Result ug/mL	Duplicate Result ug/mL	Average Result ug/mL	Duplicate Precision RPD %	Standard % Recovery	Blank ug/mL	Spike Recovery %	Spike Duplicate RPD	Detection Limit ug/mL	Counting Error %
Tank 21-1	S96B000454	1.65E+01	1.68E+01	1.67E+01	1.8	103.2	<1.38E-01	n/a	n/a	1.39E+01	n/a

Cesium-137 by GEA

SAMPLE IDENTIFICATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS					
Customer Sample Number	Laboratory Sample Number	Sample Result uCi/mL	Duplicate Result uCi/mL	Average Result uCi/mL	Duplicate Precision RPD %	Standard % Recovery	Blank uCi/mL	Spike Recovery %	Spike Duplicate RPD	Detection Limit uCi/mL	Counting Error %
Tank 21-1	S96B000454	1.90E+01	1.88E+01	1.89E+01	1.1	99.8	<6.18E-02	n/a	n/a	n/a	2.30E-01

Selenium by HYAA

Acid Digest

SAMPLE IDENTIFICATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS					
Customer Sample Number	Laboratory Sample Number	Sample Result ug/mL	Duplicate Result ug/mL	Average Result ug/mL	Duplicate Precision RPD %	Standard % Recovery	Blank ug/mL	Spike Recovery %	Spike Duplicate RPD	Detection Limit ug/mL	Counting Error %
Tank 21-1	S96B000534	<2.50E-01	<2.50E-01	n/a	n/a	113.0	<2.50E-01	104.8	n/a	2.50E-01	n/a

WHC-SD-WM-DP-213, REV. 0

REQUEST FOR SAMPLE ANALYSIS

WHC-SD-WM-DP-213, REV. 0

THIS PAGE WAS INTENTIONALLY LEFT BLANK

96001334

REQUEST FOR SAMPLE ANALYSIS (RSA)

RSA No.

1. Sample Origin
B Plant
Tank 21-12. date Sampled
9/26/964. Requestor's Name
B Plant Shift Manager6. TPCN/Org. Code
KNT6A3. Submitted By
F.M. SIMMONS5. Requestor's Phone/MSIN/FAX
372-0023, FAX 372-0103

7. Customer ID No.	8. Laboratory ID No.	9. Group ID No.	10. Volume of Sample	11. Matrix of Sample	12. Determination(s)	13. Expected Range
N/A	222-8 222-8000-454 1/27/96		35 ml total	LA	Chromium	2.5 mg/L
				LA	Lead	2.5 mg/L
				LA	Barium	<50.0 mg/L
				LA	Selenium	0.5 mg/L
				LA	Nitrate +	2.8E2 µg/ml
				LA	Nitrite +	2,600 µg/ml
				LA	Fluoride +	3.0 µg/ml
				LA	Phosphate +	60.0 µg/ml
				LA	Sulphate +	60.0 µg/ml
				LA	Na +	3.2E3 µg/ml
				LA	Cesium 137	6.0 µCi/ml
				LA	Strontium 90 +	2.0 µCi/ml
				LA	TOC +	
				LA	pH +	N/A
					CV APPEAR +	

14. QC Required

- ☒ Per 222-S Laboratory Quality Assurance Plan (WHC-SD-CP-QAPP-016)
Other (list reference document or attach) Per LOI 2C-96-LOI-004-01 Listed waste requirements only.

15. Chemical Constituents

- ☒ Unknown

16. Special Storage Requirements

- ☒ No
☐ Yes

17. Do samples contain listed waste?

- ☐ No
☒ Yes (See LOI referenced in block 14)

18. Special Instructions (Reporting format, holding times, etc.)

This sample is for the Department of Ecology. pH needs to be done ASAP

19. Requested Turnaround Time

- ☒ 2 Weeks
☐ 4 Weeks
Other

20. Sample Received By:

A. Mally

9/27/96

0015

Date

Time

21. Chain of Custody

- ☐ No
☒ Yes

Number: BP-96-COC-002

Plant Operating Procedure

B Plant

Prepare For and Perform Bulk Sampling of Process Solutions

80-080-020

Rev. B, Mod. 1

Page 27a of 27

ATTACHMENT 2 - B PLANT RCRA SAMPLE IDENTIFICATION INFORMATION

(Page 1 of 1)

Name: <u>Jim Pinkal</u>	Date: <u>9/26/96</u>	Time: <u>9:15 PM</u>
Hanford Environmental Information System sample number: <u>8965 000454</u>		
Sample was collected; Date: <u>9/26/96</u> Time: <u>9:15 PM</u>		
Vessel from which sample was obtained: <u>TK-21-1</u>		
Request for special Analysis form shipped with sample ☒ <u>Attached</u>		
Comments: <u>pH needs to be done ASAP</u>		

WHC-SD-WM-DP-213, REV. 0

BREAKDOWN AND SAMPLE PREPARATIONS

WHC-SD-WM-DP-213, REV. 0

THIS PAGE WAS INTENTIONALLY LEFT BLANK

LABCORE Data Entry Template for Worklist# 13377

Analyst: JHW Instrument: NONE _____ Book # _____

Method: LA-519-151 Rev/Mod _____

Worklist Comment: B PLANT TANK 21-1, 24-1 APPEARANCE tro

GROUP	PROJECT	S TYPE	SAMPLE#	R A	-----TEST-----	MATRIX	ACTUAL	FOUND	DL	UNIT
96001333	TK 24-1	1 SAMPLE	S96B000453	0	APPEAR3 COLOR-01	LIQUID	N/A	See below		
96001333	TK 24-1	1 SAMPLE	S96B000453	0	APPEAR3 DOSERATE	LIQUID	N/A	15,000		mrad/hour
96001333	TK 24-1	1 SAMPLE	S96B000453	0	APPEAR3 ORGVOL02	LIQUID	N/A	500		ml
96001333	TK 24-1	1 SAMPLE	S96B000453	0	APPEAR3 SAMPAMT2	LIQUID	N/A	50		ml
96001333	TK 24-1	1 SAMPLE	S96B000453	0	APPEAR3 VXSLD-02	LIQUID	N/A	1		%
96001334	MISC B-PLANT	2 SAMPLE	S96B000454	0	APPEAR3 COLOR-01	LIQUID	N/A	None		
96001334	MISC B-PLANT	2 SAMPLE	S96B000454	0	APPEAR3 DOSERATE	LIQUID	N/A	250		mrad/hour
96001334	MISC B-PLANT	2 SAMPLE	S96B000454	0	APPEAR3 ORGVOL02	LIQUID	N/A	500		ml
96001334	MISC B-PLANT	2 SAMPLE	S96B000454	0	APPEAR3 SAMPAMT2	LIQUID	N/A	50		ml
96001334	MISC B-PLANT	2 SAMPLE	S96B000454	0	APPEAR3 VXSLD-02	LIQUID	N/A	< 2		%

Final page for worklist # 13377

Analyst Signature

Date

Analyst Signature

Date

S96B000453 Some fine solids on bottom, Clear, color = very light yellow
S96B000454 No Solids, Clear, Colorless

Data Entry Comments:

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

LABCORE Data Entry Template for Worklist# 14962

Analyst: RK7 Instrument: ACD01 Book # 48N11-I
Method: LA-505-164 Rev/Mod A-0 * Used 0.500 ml (500 μ l) of 1.0 ppm As_{13c} to a final volume of 25 ml; For both the Std and SPIKE
Worklist Comment: B PLANT ACID DIGEST TK 24-1, 21-1 lad

GROUP	PROJECT	S TYPE	SAMPLE#	R A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
Final Volume was 25mls for all samples		1	BLNK-PREP		ACIDIG04	LIQUID	<u>1</u>	<u>0.025</u>	N/A	DF
		2	STD-PREP		ACIDIG04	LIQUID	<u>50</u>	<u>50</u>	N/A	DF
96001334	TANK 21-1	3	SAMPLE S96B000534 0 C		ACIDIG04	LIQUID	N/A	<u>100</u>		DF
			0.250mls $\rightarrow$ 25mls							
96001334	TANK 21-1	4	SAMPLE S96B000534 0 C		DOSE-02	LIQUID	N/A	<u>10</u>		mrad/hour
96001334	TANK 21-1	5	DUP S96B000534 0 C		ACIDIG04	LIQUID	<u>100</u>	<u>100</u>	N/A	DF
			0.250mls $\rightarrow$ 25mls							
96001334	TANK 21-1	6	DUP S96B000534 0 C		DOSE-02	LIQUID	<u>10</u>	<u>10</u>	N/A	mrad/hour
96001334	TANK 21-1	7	SPK S96B000534 0 C		ACIDIG04	LIQUID	<u>NA</u>	<u>100</u>	N/A	DF
			0.250ml $\rightarrow$ 25mls							
96001334	TANK 21-1	8	SPK S96B000534 0 C		DOSE-02	LIQUID	<u>NA</u>	<u>10</u>	N/A	mrad/hour
96001333	TANK 24-1	9	SAMPLE S96B000535 0 C		ACIDIG04	LIQUID	N/A	<u>50</u>		DF
			0.500mls $\rightarrow$ 25mls							
96001333	TANK 24-1	10	SAMPLE S96B000535 0 C		DOSE-02	LIQUID	N/A	<u>250</u>		mrad/hour
96001333	TANK 24-1	11	DUP S96B000535 0 C		ACIDIG04	LIQUID	<u>50</u>	<u>50</u>	N/A	DF
			0.500mls $\rightarrow$ 25mls							
96001333	TANK 24-1	12	DUP S96B000535 0 C		DOSE-02	LIQUID	<u>250</u>	<u>250</u>	N/A	mrad/hour
96001333	TANK 24-1	13	SPK S96B000535 0 C		ACIDIG04	LIQUID	<u>NA</u>	<u>50</u>	N/A	DF
			0.500ml $\rightarrow$ 25mls							
96001333	TANK 24-1	14	SPK S96B000535 0 C		DOSE-02	LIQUID	<u>250</u>	<u>250</u>	N/A	mrad/hour

Don Bromley

Final page for worklist # 14962

Keith Fuller 11/15/96
Analyst Signature Date

Keith Fuller 11/16/96
Analyst Signature Date

Data Entry Comments:

Sample 396B000454 had less than 1.5mls. Therefore we used only 0.250mls for sam, dup, and SPIKE on 396B000534. SAMPLE WAS CLEAR AND COLORLESS.

SAMPLE 396B000453 was clear and colorless; some solids present but did not pipette solids into beaker. RK Fuller 11/15/96. HPT was Bill Bishop
Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worksheet Slot Number, R = Replicate Number, A = Aliquot Code.

Validated
11/19/96
RK Fuller

WHC-SD-WM-DP-213, REV. 0

INORGANIC ANALYSIS

WHC-SD-WM-DP-213, REV. 0

THIS PAGE WAS INTENTIONALLY LEFT BLANK

LABCORE Data Entry Template for Worklist# 13773

Analyst: AKB Instrument: PH01 Book # 2212/12-13

Method: LA-212-106 Rev/Mod B-0 AKB 11/25/96

Worklist Comment: TK-24-1 PH. RCJ

GROUP	PROJECT	S TYPE	SAMPLE#	R A	TEST-----	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 STDPH			PH-01	LIQUID	<u>6.00</u>	<u>6.01</u>	<u>N/A</u>	pH
96001333	TK 24-1	2 SAMPLE	S96B000453	0	PH-01	LIQUID	N/A	<u>2.10</u>		pH
96001333	TK 24-1	3 DUP	S96B000453	0	PH-01	LIQUID	<u>2.10</u>	<u>2.05</u>	<u>N/A</u>	pH
96001334	TK 21-1	4 SAMPLE	S96B000454	0	PH-01	LIQUID	<u>N/A</u>	<u>1.86</u>		pH
96001334	TK 21-1	5 DUP	S96B000454	0	PH-01	LIQUID	<u>1.86</u>	<u>1.89</u>	<u>N/A</u>	pH

Final page for worklist # 13773

Analyst Signature AKB Date 10/24/96

Analyst Signature Frank Muck Date 10-25-96

VALIDATED
mick
10/25/96

Data Entry Comments:

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

LABCORE Completed Worklist Report for Worklist# 15000

Analyst: vlm

Instrument: HAA01

Book# 63111C

Method: 1A 368-B Rev/Mod D-0

Worklist Comment: Se Liquid. S96B000534 DF=100 S96B000535 DF=50. nds

Seq Type	Sample# R A	Test	Matrix	Actual	Found	DL or Yield	Unit
1 BLNK-PREP	0	SE-05	LIQUID	1	<0.250		Ratio
2 STD-PREP	0	SE-05	LIQUID	0.1	0.1037	103.700 % Recovery	
3 BLNK	0	SE-05	LIQUID	1	<0.005		Ratio
4 STD	0	SE-05	LIQUID	0.1	0.113	113.000 % Recovery	
5 SAMPLE	S96B000535	0 C	SE-05	LIQUID	N/A	<0.250	0.250 ug/mL
6 DUP	S96B000535	0 C	SE-05	LIQUID	<0.250	<0.250	RFD
7 SPK	S96B000535	0 C	SE-05	LIQUID	100.0	112.5	112.500 % Recovery
8 SAMPLE	S96B000534	0 C	SE-05	LIQUID	N/A	0.250	0.250 ug/mL
9 SPK	S96B000534	0 C	SE-05	LIQUID	100.0	104.8	104.800 % Recovery
10 DUP	S96B000534	0 C	SE-05	LIQUID	<0.250	<0.250	RFD
11 STD	0	SE-05	LIQUID	0.1	0.1058	105.800 % Recovery	

add 11/28/96

Final page for worklist# 15000

Analyst Signature _____ Date _____

Analyst Signature _____ Date _____

Noel Smith 11/22/96
Reviewer Signature _____ Date _____

Validated

LABCORE Data Entry Template for Worklist# 15000

Analyst:

VLM

Instrument: HAA01

✓

Book #

103N11-C

Method: LA-365-131 Rev/Mod

D.O.

Worklist Comment: Se Liquid. S96B000534 DF=100 S96B000535 DF=50. nds

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	-----TEST-----	MATRIX	ACTUAL	FOUND	DL	UNIT
		1	BLNK-PREP				SE-05	LIQUID	<u>1</u>	<u><0.250</u>	<u>N/A</u>	ug/mL
		2	STD-PREP				SE-05	LIQUID	<u>0.1</u>	<u>0.1037</u>	<u>N/A</u>	ug/mL
		3	BLNK				SE-05	LIQUID	<u>1</u>	<u><0.105</u>	<u>N/A</u>	ug/mL
		4	STD				SE-05	LIQUID	<u>0.1</u>	<u>0.113</u>	<u>N/A</u>	ug/mL
96001333	TANK 24-1	5	SAMPLE	S96B000535	0	C	SE-05	LIQUID	<u>N/A</u>	<u><0.250</u>	<u>0.250</u>	ug/mL
96001333	TANK 24-1	6	DUP	S96B000535	0	C	SE-05	LIQUID	<u><0.250</u>	<u><0.250</u>	<u>N/A</u>	ug/mL
96001333	TANK 24-1	7	SPK	S96B000535	0	C	SE-05	LIQUID	<u>100.0</u>	<u>112.5</u>	<u>N/A</u>	ug/mL
96001334	TANK 21-1	8	SAMPLE	S96B000534	0	C	SE-05	LIQUID	<u>N/A</u>	<u><0.250</u>	<u>0.250</u>	ug/mL
96001334	TANK 21-1	9	SPK	S96B000534	0	C	SE-05	LIQUID	<u>100.0</u>	<u>104.8</u>	<u>N/A</u>	ug/mL
96001334	TANK 21-1	10	DUP	S96B000534	0	C	SE-05	LIQUID	<u><0.250</u>	<u><0.250</u>	<u>N/A</u>	ug/mL
		11	STD				SE-05	LIQUID	<u>0.1</u>	<u>0.1058</u>	<u>N/A</u>	ug/mL

Final page for worklist # 15000

Analyst Signature

Date

Analyst Signature

Date

Data Entry Comments:

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

Date: 11-22-96

Property #: WB27979

Start Time: 08:00 End Time: 14:50

Intercept: 0.0308 absorbance units
Slope: 0.0274 abs. units/concentration
Correlation: 0.9991 (unitless)

Sample Name (Std. ID#)	Sample Point	Sam. Size, mL	D or A*	PKHT (Abs.)	ng result	% Rec.	Comments	C C **
Cal. Std. ID	N/A	0.000	D	-.001	0	N/A		
#: 63N11H	"	0.050	D	.146	5	"		
"	"	0.100	D	.305	10	"		
"	"	0.200	D	.629	20	"		
"	"	0.300	D	.866	30	"		
"	"	0.600	D	1.677	60	"		
"	"	0.700	D	1.923	70	"		
ICV	63N11C	0.250	D	.804	28.24	112.95		
ICB	Blank	1.0	A	1.377	49.16	→	very high	
Prep Std	48N11I	2.0	A	1.166	41.46	103.65	Blank suspect	
Prep Blank	Blank	2.0	A	.013	-0.47	1.29	problem with	
Instrument Blank	Blank	1.0	D	-.006	-0.56	1.34	heater block	
596B000524	TK21-1	2.0	A	.013	-0.15		drum defect	
596B000534 Dup	TK21-1 Dup	2.0	A	.012	-0.67		chemist notified	
596B000534upile	TK21-1up	2.0	A	1.178	41.90	104.74	↑	
596B000535	TK21-1	1.0	A	-.006	-1.34			
596B000535 Dup	TK21-1 Dup	1.0	A	-.005	-1.31			
596B000535upile	TK21-1up	1.0	A	.647	22.50	112.52		
CCV	63N11C	.250	D	.755	26.45	105.79		
CCB	Blank	1.0	D	1.399	49.93	→	another of the high blanks explained above.	

* Sample prep. descriptors: D=direct, A=acid digest

**CC = control chart. Check off when control chart entries are made.

16:	Intercept:	0.00308
15:		0.0277
14:	Slope:	0.9999
13:		28.2388
12:		49.164
11:		41.4583
10:		-0.4671
9:		-1.343
8:		-0.649
7:		-0.686
6:		41.896
5:		-1.343
4:		-1.306
3:		22.504
2:		26.448
1:		49.931

CONFIDENTIAL

Call 1-800-333-3333

WHC-SD-WM-DP-213, REV. 0

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

Selenium : LA-365-131 (D-0) Se LIQUID-ACID DIGEST		BLANK	DUPLICATE
Type	Sample Size in mL SS	1.000	
BLANK	Se ng (Nanograms)	-0.47	
Work List	Acid Digest Dilution Factor DF	50.0	
15000	Conc Se µg/mL (or mg/L or PPM)	-0.024	N/A
Test Code	Conc Se µg/L (PPB)	-23.5	N/A
SE-05		N/A	
Matrix		N/A	
LIQUID		N/A	
Sample #	Conc Se µg/mL=(Se ng/SS)*(1µg/1000ng)*DF		
BLNK-PREP	Average Conc.=(Sample + Duplicate)/2		
Calibration Date	Relative % Difference=((ABS(Sam.-Dup.))/Average Conc.)*100		
11/22/96	Detection Limit = (5 ng/SS)*(1µg/1000ng)*DF		
Instrument Code			
HAA01	Detection Limit (µg/mL)	0.250	
Analyst	Detection Limit (µg/L)	250.00	
VALERIE L MASSIE			
Date		BLANK	DUPLICATE
11/22/96	Conc Se (µg/mL)	<0.250	
Time		N/A	
02:50 PM		N/A	

The Result is < Detection Limit

Data Entry by: <i>Valerie L Massie</i>	Date: 11/22/96
Approved by: <i>Valerie L Massie</i>	Date: 11/22/96

Form 365131_3 Rev. 2.2

WHC-SD-WM-DP-213, REV. 0

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

Selenium : LA-365-131 (D-0) Se LIQUID-ACID DIGEST		STANDARD	DUPLICATE
Type	Sample Size in mL SS	2.000	
STANDARD	Se ng (Nanograms)	41.46	
Work List	Acid Digest Dilution Factor DF	50.0	
15000	Conc Se µg/mL (or mg/L or PPM)	1.037	N/A
Test Code	Conc Se µg/L (PPB)	1036.5	N/A
SE-05		N/A	
Matrix		N/A	
LIQUID		N/A	
Sample #	Conc Se µg/mL=(Se ng/SS)*(1µg/1000ng)*DF		
STD-PREP	Average Conc.=(Sample + Duplicate)/2		
Calibration Date	Relative % Difference=((ABS(Sam.-Dup.))/Average Conc.)*100		
11/22/96			
Instrument Code			
HAA01			
Analyst			
VALERIE L MASSIE			
Date		STANDARD	DUPLICATE
11/22/96	Conc Se (µg/mL)	1.04E+00	
Time		N/A	
02:50 PM		N/A	

Data Entry by: <i>Valerie L Massie</i>	Date: 11/22/96
Approved by: <i>Neil Smith</i>	Date: 11/22/96

Form 365131_3 Rev. 2.2

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

Selenium: LA-365-131 (D-0) Se LIQUIDS-DIRECT

		BLANK	DUPLICATE
Type	Sample Size in mL SS	1.000	
BLANK	Se ng (Nanograms)	1.34	
Work List	Conc Se µg/mL (or mg/L or PPM)	0.001	N/A
15000	Conc Se µg/L (PPB)	1.3	N/A
Test Code		N/A	
SE-05		N/A	
Matrix		N/A	

LIQUID	Conc Se µg/mL=(Se ng/SS)*(1µg/1000ng)		
Sample #	Average Conc.=(Sample + Duplicate)/2		
ICB	Relative % Difference=((ABS(Sam.-Dup.))/Average Conc.)*100		
Calibration Date	Detection Limit = (5 ng/SS)*(1µg/1000ng)		
11/22/96	Detection Limit is Corrected for Sample Prep/Dilution		
Instrument Code			
HAA01	Detection Limit (µg/mL) =	0.005	
Analyst	Detection Limit (µg/L) =	5.0	

VALERIE L MASSIE			
Date		BLANK	DUPLICATE
11/22/96	Conc Se µg/mL	<0.005	
Time		N/A	
02:50 PM		N/A	

The Result is < Detection Limit

Data Entry by:	<i>Donnell</i>	Date:	11/22/96
Approved by:	<i>Valerie L Massie</i>	Date:	11/22/96

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

Selenium: LA-365-131 (D-0) Se LIQUIDS-DIRECT		STANDARD	DUPLICATE
Type	Sample Size in mL SS	0.250	
STANDARD	Se ng (Nanograms)	28.24	
Work List	Conc Se µg/mL (or mg/L or PPM)	0.113	N/A
15000	Conc Se µg/L (PPB)	113.0	N/A
Test Code		N/A	
SE-05		N/A	
Matrix		N/A	
LIQUID	Conc Se µg/mL=(Se ng/SS)*(1µg/1000ng)		
Sample #	Average Conc.=(Sample + Duplicate)/2		
ICV	Relative % Difference=((ABS(Sam.-Dup.))/Average Conc.)*100		
Calibration Date			
11/22/96			
Instrument Code			
HAA01			
Analyst			
VALERIE L MASSIE			
Date		STANDARD	DUPLICATE
11/22/96	Conc Se µg/mL	1.13E-01	
Time		N/A	
02:50 PM		N/A	

Data Entry by:	<i>W. Smith</i>	Date:	11/22/96
Approved by:	<i>W. Smith</i>	Date:	11/22/96

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

Selenium : LA-365-131 (D-0) Se LIQUID-ACID DIGEST		SAMPLE	DUPLICATE
Type	Sample Size in mL SS	2.000	
SAMPLE	Se ng (Nanograms)	-0.65	
Work List	Acid Digest Dilution Factor DF	100.0	
15000	Conc Se µg/mL (or mg/L or PPM)	-0.033	N/A
Test Code	Conc Se µg/L (PPB)	-32.5	N/A
SE-05		N/A	
Matrix		N/A	
LIQUID		N/A	
Sample #	Conc Se µg/mL=(Se ng/SS)*(1µg/1000ng)*DF		
S96B000534	Average Conc.=(Sample + Duplicate)/2		
Calibration Date	Relative % Difference=((ABS(Sam.-Dup.))/Average Conc.)*100		
11/22/96	Detection Limit = (5 ng/SS)*(1µg/1000ng)*DF		
Instrument Code			
HAA01	Detection Limit (µg/mL)	0.250	
Analyst	Detection Limit (µg/L)	250.00	
VALERIE L MASSIE			
Date		SAMPLE	DUPLICATE
11/22/96	Conc Se (µg/mL)	<0.250	
Time		N/A	
02:50 PM		N/A	

The Result is < Detection Limit

Data Entry by:	<i>M. Smith</i>	Date:	11/22/96
Approved by:	<i>M. Smith</i>	Date:	11/22/96

Form 365131_3 Rev. 2.2

Page 1 of 1

WHC-SD-WM-DP-213, REV. 0

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

Selenium: LA-365-131 (D-0) Se LIQUIDS-ACID DIGEST

		SAMPLE	SPIKE
Type	Sample (mL)/Vol. Acid Dig. Used SAVOL	2.00	N/A
SPIKE	Spike Std Volume (mL) SSVOL	N/A	0.500
Work List	ng of Spike + Sample ngSSAM	N/A	41.90
15000	ng of Sample ngSAM	-0.65	N/A
Test Code	Final Acid Digest Vol. (mL) ADVOL	N/A	25.00
SE-05		N/A	N/A
Matrix	Spike Std Dilution Factor SPDF	N/A	50.0
LIQUID	Spike Std ID	N/A	48N11-I
Sample #	Spike Std Value (ppm) SS VAL	N/A	1.000
S96B000534	% Recovery	N/A	104.8%
Calibration Date			
11/22/96	Sample result is < 5 ng, 0 ng of sample is used in the calculation for % recovery		
Instrument Code			
HAA01	Spike Std. Dilution Factor = ADVOL/SSVOL		
Analyst			
VALERIE L MASSIE	% Recovery = (((((ngSSAM/SAVOL)*(1/1000))-((0/SAVOL)*(1/1000))))*(SPDF/SS VAL))*100		
Date			
11/22/96			
Time	% Recovery =		104.8%
02:50 PM			

Data Entry by:

Date: 11/22/96

Approved by:

Date: 11/22/96

Form 365131_4 Rev. 1.1

36

Page 1 of 1

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

Selenium : LA-365-131 (D-0) Se LIQUID-ACID DIGEST		SAMPLE	DUPLICATE
Type	Sample Size in mL SS	2.000	2.000
DUPLICATE	Se ng (Nanograms)	-0.65	-0.69
Work List	Acid Digest Dilution Factor DF	100.0	100.0
15000	Conc Se µg/mL (or mg/L or PPM)	-0.033	-0.035
Test Code	Conc Se µg/L (PPB)	-32.5	-34.5
SE-05	Average Conc (µg/mL)	N/A	N/A
Matrix	Average Conc (µg/L)	N/A	N/A
LIQUID	Relative % Difference	N/A	N/A
Sample #	Conc Se µg/mL=(Se ng/SS)*(1µg/1000ng)*DF		
S96B000534	Average Conc.=(Sample + Duplicate)/2		
Calibration Date	Relative % Difference=((ABS(Sam.-Dup.))/Average Conc.)*100		
11/22/96	Detection Limit = (5 ng/SS)*(1µg/1000ng)*DF		
Instrument Code			
HAA01	Detection Limit (µg/mL)	0.250	
Analyst	Detection Limit (µg/L)	250.00	
VALERIE L MASSIE			
Date		SAMPLE	DUPLICATE
11/22/96	Conc Se (µg/mL)	<0.250	<0.250
Time	Average Conc (µg/mL)	N/A	N/A
02:50 PM	Relative % Difference	N/A	N/A

Both Results are < Detection Limit

Data Entry by:	<i>J. Smith</i>	Date:	11/22/96
Approved by:	<i>Val Smith</i>	Date:	11/22/96

Form 365131_3 Rev. 2.2

Page 1 of 1

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

Selenium: LA-365-131 (D-0) Se LIQUIDS-DIRECT

	STANDARD	DUPLICATE
Type	Sample Size in mL SS	0.250
STANDARD	Se ng (Nanograms)	26.45
Work List	Conc Se µg/mL (or mg/L or PPM)	0.106 N/A
15000	Conc Se µg/L (PPB)	105.8 N/A
Test Code		N/A
SE-05		N/A
Matrix		N/A

LIQUID Conc Se µg/mL=(Se ng/SS)*(1µg/1000ng)
 Sample # Average Conc.=(Sample + Duplicate)/2
 CCV Relative % Difference=((ABS(Sam.-Dup.))/Average Conc.)*100

Calibration Date

11/22/96

Instrument Code

HAA01

Analyst

VALERIE L MASSIE

Date

11/22/96

Time

02:50 PM

	STANDARD	DUPLICATE
Conc Se µg/mL	1.06E-01	
	N/A	
	N/A	

Data Entry by:

Date:

11/22/96

Approved by:

Date:

11/22/96

Form 365131_1 Rev. 1.1

Page 1 of 1

LABCORE Completed Worklist Report for Worklist# 13776

Analyst: dpb

Instrument: IC01

Book# 14N20D

Method: 1A-533-705 Rev/Mod D-1

Worklist Comment: TK 24-1 IC. RCJ

Seq Type	Sample#	R A	Test	Matrix	Actual	Found	DL or Yield	Unit
1	CCB	0	⊖IC-QC F	QC	1	<1.20e-2		ug/mL
1	CCB	0	⊖IC-QC CL	QC	1	<1.70e-2		ug/mL
1	CCB	0	⊖IC-QC NO2	QC	1	<1.08e-1		ug/mL
1	CCB	0	⊖IC-QC BR	QC	1	<1.25e-1		ug/mL
1	CCB	0	⊖IC-QC NO3	QC	1	1.51e-01	0.151	ug/mL
1	CCB	0	⊖IC-QC PO4	QC	1	<1.20e-1		ug/mL
1	CCB	0	⊖IC-QC SO4	QC	1	<1.38e-1		ug/mL
1	CCB	0	⊖IC-QC OXALATE2	QC	1	<1.05e-1		ug/mL
2	CCV	0	⊖IC-QC F	QC	5.90e01	5.47e+01	92.712 %	Recovery
2	CCV	0	⊖IC-QC CL	QC	7.90e01	7.42e+01	93.924 %	Recovery
2	CCV	0	⊖IC-QC NO2	QC	5.38e02	5.01e+02	93.123 %	Recovery
2	CCV	0	⊖IC-QC BR	QC	5.89e02	5.74e+02	97.453 %	Recovery
2	CCV	0	⊖IC-QC NO3	QC	5.94e02	6.10e+02	102.694 %	Recovery
2	CCV	0	⊖IC-QC PO4	QC	5.45e02	5.33e+02	97.798 %	Recovery
2	CCV	0	⊖IC-QC SO4	QC	6.31e02	6.51e+02	103.170 %	Recovery
2	CCV	0	⊖IC-QC OXALATE2	QC	5.25e02	5.37e+02	102.286 %	Recovery
3	SAMPLE	S96B000453	⊖IC-01 F-02	LIQUID	N/A	3.256e+00	1.212	ug/mL
3	SAMPLE	S96B000453	⊖IC-01 CL-02	LIQUID	N/A	6.083e+00	1.717	ug/mL
3	SAMPLE	S96B000453	⊖IC-01 NO2-02	LIQUID	N/A	<1.091e+01	10.910	ug/mL
3	SAMPLE	S96B000453	⊖IC-01 BR-02	LIQUID	N/A	<1.262e+01	12.620	ug/mL
3	SAMPLE	S96B000453	⊖IC-01 NO3-02	LIQUID	N/A	3.835e+03	14.040	ug/mL
3	SAMPLE	S96B000453	⊖IC-01 PO4-02	LIQUID	N/A	2.200e+02	12.120	ug/mL
3	SAMPLE	S96B000453	⊖IC-01 SO4-02	LIQUID	N/A	4.344e+01	13.940	ug/mL
3	SAMPLE	S96B000453	⊖IC-01 OXALATE2	LIQUID	N/A	1.891e+01	10.610	ug/mL
4	DUP	S96B000453	⊖IC-01 F-02	LIQUID	3.25e+00	3.35e+00	2.723	RPD
4	DUP	S96B000453	⊖IC-01 CL-02	LIQUID	6.08e+00	6.74e+00	10.296	RPD
4	DUP	S96B000453	⊖IC-01 NO2-02	LIQUID	<1.09e1	<1.09e1		RPD
4	DUP	S96B000453	⊖IC-01 BR-02	LIQUID	<1.26e1	<1.26e1		RPD
4	DUP	S96B000453	⊖IC-01 NO3-02	LIQUID	3.84e+03	3.87e+03	0.778	RPD
4	DUP	S96B000453	⊖IC-01 PO4-02	LIQUID	2.20e+02	2.30e+02	4.444	RPD
4	DUP	S96B000453	⊖IC-01 SO4-02	LIQUID	4.12e+01	4.61e+01	11.226	RPD
4	DUP	S96B000453	⊖IC-01 OXALATE2	LIQUID	1.89e+01	1.47e+01	25.000	RPD
5	SPK	S96B000453	⊖IC-01 F-02	LIQUID	5.90e01	5.62e+01	95.254 %	Recovery
5	SPK	S96B000453	⊖IC-01 CL-02	LIQUID	7.90e01	7.17e+01	90.759 %	Recovery
5	SPK	S96B000453	⊖IC-01 NO2-02	LIQUID	5.38e02	4.96e+02	92.193 %	Recovery
5	SPK	S96B000453	⊖IC-01 BR-02	LIQUID	5.89e02	5.29e+02	89.813 %	Recovery
5	SPK	S96B000453	⊖IC-01 NO3-02	LIQUID	5.94e02	6.01e+02	101.178 %	Recovery
5	SPK	S96B000453	⊖IC-01 PO4-02	LIQUID	5.45e02	5.45e+02	100.000 %	Recovery
5	SPK	S96B000453	⊖IC-01 SO4-02	LIQUID	6.31e02	6.37e+02	100.951 %	Recovery
5	SPK	S96B000453	⊖IC-01 OXALATE2	LIQUID	5.25e02	5.14e+02	97.905 %	Recovery
6	SAMPLE	S96B000454	⊖IC-01 F-02	LIQUID	N/A	<1.212e+00	1.212	ug/mL

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

LABCORE Completed Worklist Report for Worklist# 13776

Seq Type	Sample#	R A	Test	Matrix	Actual	Found	DL or Yield	Unit
6 SAMPLE	S96B000454	0	②IC-01 CL-02	LIQUID	N/A	6.914e+01	1.717	ug/mL
6 SAMPLE	S96B000454	0	②IC-01 NO2-02	LIQUID	N/A	1.091e+01	10.910	ug/mL
6 SAMPLE	S96B000454	0	②IC-01 BR-02	LIQUID	N/A	1.262e+01	12.620	ug/mL
6 SAMPLE	S96B000454	0	②IC-01 NO3-02	LIQUID	N/A	2.841e+03	14.040	ug/mL
6 SAMPLE	S96B000454	0	②IC-01 PO4-02	LIQUID	N/A	1.212e+01	12.120	ug/mL
6 SAMPLE	S96B000454	0	②IC-01 SO4-02	LIQUID	N/A	1.654e+01	13.940	ug/mL
6 SAMPLE	S96B000454	0	②IC-01 OXALATE2	LIQUID	N/A	1.061e+01	10.610	ug/mL
7 DUP	S96B000454	0	②IC-01 F-02	LIQUID	<1.21e0	<1.21e0		RPD
7 DUP	S96B000454	0	②IC-01 CL-02	LIQUID	6.91e+01	6.98e+01	1.008	RPD
7 DUP	S96B000454	0	②IC-01 NO2-02	LIQUID	<1.09e1	<1.09e1		RPD
7 DUP	S96B000454	0	②IC-01 BR-02	LIQUID	<1.26e1	<1.26e1		RPD
7 DUP	S96B000454	0	②IC-01 NO3-02	LIQUID	2.84e+03	2.88e+03	1.399	RPD
7 DUP	S96B000454	0	②IC-01 PO4-02	LIQUID	<1.21e1	<1.21e1		RPD
7 DUP	S96B000454	0	②IC-01 SO4-02	LIQUID	1.65e+01	1.68e+01	1.802	RPD
7 DUP	S96B000454	0	②IC-01 OXALATE2	LIQUID	<1.06e1	<1.06e1		RPD

Final page for worklist# 13776

Analyst Signature _____ Date _____

Analyst Signature _____ Date _____

[Signature]
Reviewer Signature _____ Date 10/30/96

LABCORE Data Entry Template for Worklist# 13776Analyst: DPB Instrument: IC0 _____ Book# 14N20-DMethod: LA-533-105 Rev/Mod D-1

Worklist Comment: TK 24-1 IC. RCJ

S Type	Sample#	R A	Test	Matrix	Group#	Project
1 CCB			@IC-QC	QC		
2 CCV			@IC-QC	QC		
3 SAMPLE	S96B000453 0		@IC-01	LIQUID	96001333	TK 24-1
Analytes Requested: BR-02 , CL-02 , F-02 , NO2-02 , NO3-02 , OXALATE2, PO4-02 , SO4-02						
4 DUP	S96B000453 0		@IC-01	LIQUID		
5 SPK	S96B000453 0		@IC-01	LIQUID		
6 SAMPLE	S96B000454 0		@IC-01	LIQUID	96001334	TK 21-1
Analytes Requested: BR-02 , CL-02 , F-02 , NO2-02 , NO3-02 , OXALATE2, PO4-02 , SO4-02						
7 DUP	S96B000454 0		@IC-01	LIQUID		

Final page for worklist # 13776

Daniel P. Bonaly 10/25/96 0510
 Analyst Signature Date

 Analyst Signature Date

137760C.CSV

Uploaded 10/30/96 JMF
Validated 10/30/96 JMF

Data Entry Comments:

EXPIRED STANDARDS Std did not expire till
10/2/96 12:59 on 10/25 JMF

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

30-Oct-96

Worklist#: 13776					Data File: 13776OC.CSV				
		Seq	Type	Sample #	Seq#		Data File	Sample Name	Dilution
-	=>	1	CCB		-	1	96102321.d03	ELUENT BLANK	1.00
	=>	2	CCV			2	96102321.d05	STD 14N20-D	101.00
	=>	3	SAMPLE	S96B000453		3	96102321.d14	S96B000453 SAM	101.00
	=>	4	DUP	S96B000453		4	96102321.d15	S96B000453 DUP	101.00
	=>	5	SPK	S96B000453		5	96102321.d16	S96B000453 SPK	101.00
	=>	6	SAMPLE	S96B000454		6	96102321.d17	S96B000454 SAM	101.00
	=>	7	DUP	S96B000454		7	96102321.d19	S96B000454 DUP	101.00
+					+				

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

Sample Name: STD 14N20-D Date: 10/24/1996 22:46:45
 Data File : C:\DX\DATA\96102321.D05
 Method : C:\DX\METHOD\KIT.MET
 ACI Address: 1 System: 1 Inject#: 5 Detector: CDM-1
 Analyst : Column: AG4A/AS4A anion column

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area	Reject
External	1	101	3000	5Hz	0.00	10.00		50

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.24		0.000	31	147	1	
2	0.89		0.000	49	201	2	
3	1.05	fluoride	54.696	1904	10771	1	3.27
4	1.61	chloride	74.248	1868	9834	1	-0.41
5	1.92	nitrite	501.423	7478	46234	1	-3.03
6	2.89	bromide	573.559	5172	35207	1	-2.91
7	3.30	nitrate	610.184	5632	46825	1	-3.23
8	4.72	phosphate	532.825	1642	21318	1	-4.26
9	6.19	sulfate	650.506	4672	66540	1	-5.69
10	8.16	oxalate	536.806	2224	42499	1	0.00
Totals			3534.248	30672	279576		

File: 96102321.D05 Sample: STD 14N20-D

SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 43 TO 46.

Donna F. Brumley 10/25/96

```

=====
Sample Name: ELUENT BLANK                      Date: 10/24/1996 22:11:43
Data File  : C:\DX\DATA\96102321.D03
Method     : C:\DX\METHOD\KIT.MET
ACI Address: 1 System: 1 Inject#: 3             Detector: CDM-1
Analyst    :                               Column: AG4A/AS4A anion column
=====
  
```

```

-----
Calibration Volume Dilution Points Rate Start Stop Area Reject
-----
External          1          1 3000 5Hz 0.00 10.00          50
  
```

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	1.41		0.000	26	137	1	
2	1.61	chloride	0.005	22	96	1	0.00
3	3.38	nitrate	0.151	32	221	1	-0.88
4	7.36		0.000	38	456	1	
Totals			0.156	117	911		

File: 96102321.D03 Sample: ELUENT BLANK

```

=====
Sample Name: S96B000454 SAM                      Date: 10/25/1996 02:46:55
Data File  : C:\DX\DATA\96102321.D17
Method     : C:\DX\METHOD\KIT.MET
ACI Address: 1 System: 1 Inject#: 17              Detector: CDM-1
Analyst    :                      Column: AG4A/AS4A anion column
=====

```

Calibration Volume Dilution Points Rate Start Stop Area Reject

External 1 101 3000 5Hz 0.00 10.00 50

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
2	1.42		0.000	56	341	1	
3	1.61	chloride	69.140	1721	9151	1	-0.41
4	3.22	nitrate	2840.512	24932	237230	1	-5.57
5	6.24	sulfate	16.541	72	1211	1	-4.88
Totals			2926.193	26781	247934		

File: 96102321.D17 Sample: S96B000454 SAM

```

=====
Sample Name: S96B000454 DUP                      Date: 10/25/1996 04:30:17
Data File  : C:\DX\DATA\96102321.D19
Method     : C:\DX\METHOD\KIT.MET
ACI Address: 1 System: 1 Inject#: 19              Detector: CDM-1
Analyst    :                      Column: AG4A/AS4A anion column
=====
  
```

```

=====
Calibration Volume Dilution Points Rate Start Stop Area Reject
-----
External          1          101  3000  5Hz   0.00 10.00          50
=====
  
```

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.87		0.000	14	51	1	
2	1.18		0.000	18	150	1	
3	1.41		0.000	107	637	1	
4	1.61	chloride	69.759	1801	9234	1	0.00
5	3.22	nitrate	2881.012	25301	240962	1	-5.57
6	6.24	sulfate	16.766	85	1234	1	-4.88
Totals			2967.536	27326	252268		

File: 96102321.D19 Sample: S96B000454 DUP

10/09/96 06:39
A-0004-1

Page: 1

LABCORE Data Entry Template for Worklist# 13768

Analyst: J. Worrell Instrument: ICP01 Book# 61B 48BMethod: LA-505-151/461 Rev/Mod D-3
10/10/96

Worklist Comment: ICP TK24-1

S Type	Sample#	R A	Test	Matrix	Group#	Project
1	ICV		@ICP-QC	QC		
2	ICB		@ICP-QC	QC		
3	LLS		@ICP-QC	QC		
4	ICSA		@ICP-QC	QC		
5	ICSAB		@ICP-QC	QC		
6	SAMPLE	S96B000453 0 D	@ICP-D01	LIQUID	96001333	TK 24-1
Analytes Requested: AG-D-01 , AL-D-01 , AS-D-01 , B-D-01 , BA-D-01 , BE-D-01 , BI-D-01 , CA-D-01 , CD-D-01 , CE-D-01 , CO-D-01 , CR-D-01 , CU-D-01 , FE-D-01 , K-D-01 , LA-D-01 , LI-D-01 , MG-D-01 , MN-D-01 , MO-D-01 , NA-D-01 , ND-D-01 , NI-D-01 , P-D-01 , PB-D-01 , S-D-01 , SE-D-01 , SI-D-01 , SM-D-01 , SR-D-01 , TI-D-01 , TL-D-01 , U-D-01 , V-D-01 , ZN-D-01 , ZR-D-01						
7	DUP	S96B000453 0 D	@ICP-D01	LIQUID		
8	SPK	S96B000453 0 D	@ICP-D01	LIQUID		
9	SPK-DUP	S96B000453 0 D	@ICP-D01	LIQUID		
10	CCV		@ICP-QC	QC		
11	CCB		@ICP-QC	QC		
12	SAMPLE	S96B000454 0 D	@ICP-D01	LIQUID	96001334	TK 21-1
Analytes Requested: AG-D-01 , AL-D-01 , AS-D-01 , B-D-01 , BA-D-01 , BE-D-01 , BI-D-01 , CA-D-01 , CD-D-01 , CE-D-01 , CO-D-01 , CR-D-01 , CU-D-01 , FE-D-01 , K-D-01 , LA-D-01 , LI-D-01 , MG-D-01 , MN-D-01 , MO-D-01 , NA-D-01 , ND-D-01 , NI-D-01 , P-D-01 , PB-D-01 , S-D-01 , SE-D-01 , SI-D-01 , SM-D-01 , SR-D-01 , TI-D-01 , TL-D-01 , U-D-01 , V-D-01 , ZN-D-01 , ZR-D-01						

Data Entry Comments:

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

10/09/96 06:39
A-0004-1

Page: 2

LABCORE Data Entry Template for Worklist# 13768

S Type	Sample#	R	A	Test	Matrix	Group#	Project
13 DUP	S96B000454	0	D	@ICP-D01	LIQUID		
14 SPK	S96B000454	0	D	@ICP-D01	LIQUID		
15 SPK-DUP	S96B000454	0	D	@ICP-D01	LIQUID		
16 ICSA				@ICP-QC	QC		
17 ICSAB				@ICP-QC	QC		
18 CCV				@ICP-QC	QC		
19 CCB				@ICP-QC	QC		

Final page for worklist # 13768

[Signature]
Analyst Signature 10-9-96
Date

Received by:
[Signature]
Analyst Signature 10/9/96
Date

D/F

S96B000453 SAM 0.5ml-9.5ml 20
DUP 0.5ml-9.5ml 20
P.SPK 0.5ml-1.0-1.0-7.5ml 20
DUP P.SPK 0.5ml-1.0-1.0-7.5ml 20

S96B000454 SAM 0.5ml-9.5ml 20
DUP 0.5ml-9.5ml 20
P.SPK 0.5ml-1.0-1.0-7.5ml 20
DUP P.SPK 0.5ml-1.0-1.0-7.5ml 20

SPIKE₂ In lab. WHC-1 & WHC-2

Data Entry Comments: Spike recovery calculation:

$$S96B000453 \quad Cr = \left(\frac{201.788}{20} \right) - \left(\frac{6.277}{20} \right) \times 100 = 97.8\%$$

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

Spike true value is 10.0 ppb for all elements except for U = 20.0 ppb.

48

<u>Sample #</u>	<u>Element</u>	<u>% Spk</u>	<u>% Spk Dup</u>	<u>% RPD</u>
596B000453	Cu	97.8	98.100.98	3.2
	Pb	96.7	100.3	3.65
	Ba	98.3	98.2	0.10
	Na	97.6	97.2	0.40
596B000454	Cu	99.1	100.4	1.30
	Pb	100.0	103.1	3.1
	Ba	98.6	98.3	0.30
	Na	95.1	94.9	0.21

228
11/25/96

Identity 1: ICV Identity 2: Quality Control 10:32 AM October 9, 1996
 Task name : OPTIMA
 Sample Weight : 1.0000 Solution Volume : 1.00
 On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppm)	Sr (ppm)	Bi (ppm)	Si (ppm)	Al (ppm)	Co (ppm)	Cu (ppm)	Li (ppm)
Mean	4.944	4.825	5.093	4.906	4.890	5.069	4.937	4.806
S.D.	0.006	0.004	0.010	0.011	0.011	0.009	0.004	0.005
% R.S.D.	0.129	0.076	0.201	0.221	0.225	0.170	0.081	0.112
	Zn (ppm)	Ni (ppm)	La (ppm)	Fe (ppm)	Ca (ppm)	Cr (ppm)	Nd (ppm)	U (ppm)
Mean	5.150	4.998	4.991	5.062	4.835	5.063	5.164	9.610
S.D.	0.012	0.006	0.012	0.021	0.005	0.009	0.027	0.036
% R.S.D.	0.224	0.114	0.237	0.412	0.097	0.178	0.514	0.379
	Ce (ppm)	Sm (ppm)	Ba (ppm)	P (ppm)	S (ppm)	Mg (ppm)	As (ppm)	Na (ppm)
Mean	4.915	4.867	4.874	5.014	4.953	5.055	5.121	4.752
S.D.	0.008	0.006	0.004	0.044	0.032	0.007	0.013	0.003
% R.S.D.	0.159	0.132	0.089	0.875	0.656	0.137	0.262	0.056
	Mo (ppm)	Se (ppm)	Ag (ppm)	Pb (ppm)	Ti (ppm)	Cd (ppm)	B (ppm)	K (ppm)
Mean	5.047	5.157	4.997	5.033	4.870	5.054	5.075	4.988
S.D.	0.007	0.045	0.007	0.018	0.003	0.008	0.011	0.017
% R.S.D.	0.141	0.878	0.140	0.363	0.059	0.160	0.212	0.345
	Mn (ppm)	Sb (ppm)	V (ppm)	Be (ppm)	Tl (ppm)			
Mean	5.023	4.719	5.081	5.100	4.980			
S.D.	0.008	0.035	0.011	0.006	0.014			
% R.S.D.	0.166	0.741	0.220	0.113	0.288			

SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
 COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 50 TO 64.

J. L. Howell
 10-9-96

TX241
 596B00453, 454

0.5ml - 7.5ml
 FILE No: 961009B.DAT
 SST-5 = 61848B

SPIKE = Indeo WHC-1 & WHC-2

Identity 1: ICB Identity 2: Quality Control 10:37 AM October 9, 1996
 Task name : OPTIMA
 Sample Weight : 1.0000 Solution Volume : 1.00
 On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppm)	Sr (ppm)	Bi (ppm)	Si (ppm)	Al (ppm)	Co (ppm)	Cu (ppm)	Li (ppm)
Mean	0.001	0.000	0.003	-0.002	-0.005	0.005	-0.000	-0.000
S.D.	0.001	0.000	0.002	0.000	0.001	0.002	0.000	0.000
% R.S.D.	80.720	32.733	64.069	30.943	17.790	34.617	49.254	150.010
	Zn (ppm)	Ni (ppm)	La (ppm)	Fe (ppm)	Ca (ppm)	Cr (ppm)	Nd (ppm)	U (ppm)
Mean	0.001	0.001	0.004	-0.006	0.000	0.001	-0.011	0.036
S.D.	0.000	0.000	0.002	0.002	0.000	0.001	0.002	0.021
% R.S.D.	16.683	11.955	54.275	35.406	100.000	61.406	14.205	57.991
	Ce (ppm)	Sm (ppm)	Ba (ppm)	P (ppm)	S (ppm)	Mg (ppm)	As (ppm)	Na (ppm)
Mean	-0.013	0.010	0.000	0.008	0.002	0.000	0.001	-0.001
S.D.	0.001	0.005	0.000	0.010	0.003	0.000	0.004	0.002
% R.S.D.	10.747	53.303	47.187	123.790	165.167	121717.965	262.802	299.866
	Mo (ppm)	Se (ppm)	Ag (ppm)	Pb (ppm)	Ti (ppm)	Cd (ppm)	B (ppm)	K (ppm)
Mean	0.001	0.001	-0.001	0.004	0.001	-0.002	0.005	0.075
S.D.	0.000	0.010	0.000	0.005	0.000	0.000	0.001	0.010
% R.S.D.	24.115	796.856	38.823	118.836	16.950	7.506	17.808	13.483
	Mn (ppm)	Sb (ppm)	V (ppm)	Be (ppm)	Tl (ppm)			
Mean	-0.001	-0.017	0.001	0.000	-0.027			
S.D.	0.000	0.016	0.001	0.000	0.012			
% R.S.D.	42.828	94.629	64.182	56.475	44.742			

Identity 1: LLS Identity 2: Quality Control 10:40 AM October 9, 1996

Task name : OPTIMA

Sample Weight : 1.0000 Solution Volume : 1.00

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

	Zr (ppm)	Sr (ppm)	Bi (ppm)	Si (ppm)	Al (ppm)	Co (ppm)	Cu (ppm)	Li (ppm)
Mean	0.018	0.020	0.192	0.111	0.100	0.038	0.019	0.019
S.D.	0.000	0.000	0.011	0.001	0.001	0.003	0.000	0.000
% R.S.D.	2.361	0.184	5.625	1.248	1.115	7.515	1.411	0.601

	Zn (ppm)	Ni (ppm)	La (ppm)	Fe (ppm)	Ca (ppm)	Cr (ppm)	Nd (ppm)	U (ppm)
Mean	0.022	0.042	0.105	0.099	0.198	0.020	0.177	0.362
S.D.	0.000	0.002	0.002	0.002	0.000	0.001	0.008	0.028
% R.S.D.	0.023	5.241	1.700	1.867	0.115	6.905	4.677	7.764

	Ce (ppm)	Sm (ppm)	Ba (ppm)	P (ppm)	S (ppm)	Mg (ppm)	As (ppm)	Na (ppm)
Mean	0.167	0.194	0.100	0.388	0.208	0.208	0.194	0.194
S.D.	0.008	0.003	0.000	0.006	0.004	0.000	0.005	0.001
% R.S.D.	4.572	1.474	0.089	1.490	1.899	0.176	2.640	0.693

	Mo (ppm)	Se (ppm)	Ag (ppm)	Pb (ppm)	Ti (ppm)	Cd (ppm)	B (ppm)	K (ppm)
Mean	0.092	0.217	0.017	0.215	0.019	0.009	0.100	0.531
S.D.	0.001	0.011	0.000	0.011	0.000	0.000	0.001	0.005
% R.S.D.	0.701	4.978	2.694	5.136	0.680	0.014	1.217	0.954

	Mn (ppm)	Sb (ppm)	V (ppm)	Be (ppm)	Tl (ppm)
Mean	0.019	0.102	0.098	0.010	0.366
S.D.	0.000	0.013	0.000	0.000	0.020
% R.S.D.	0.872	12.752	0.277	1.275	5.394

Identity 1: ICSA Identity 2: Quality Control 10:43 AM October 9, 1996
 Task name : OPTIMA
 Sample Weight : 1.0000 Solution Volume : 1.00
 On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppm)	Sr (ppm)	Bi (ppm)	Si (ppm)	Al (ppm)	Co (ppm)	Cu (ppm)	Li (ppm)
Mean	-0.003	0.003	-0.039	-0.015	195.549	0.002	0.001	0.001
S.D.	0.001	0.000	0.009	0.002	0.518	0.002	0.000	0.000
% R.S.D.	44.866	5.679	22.221	10.519	0.265	75.854	24.968	28.535
	Zn (ppm)	Ni (ppm)	La (ppm)	Fe (ppm)	Ca (ppm)	Cr (ppm)	Nd (ppm)	U (ppm)
Mean	0.006	0.006	-0.000	93.201	99.319	-0.001	0.022	-0.179
S.D.	0.000	0.001	0.003	0.509	0.321	0.002	0.013	0.075
% R.S.D.	6.103	19.951	1604.148	0.546	0.323	164.531	57.309	42.034
	Ce (ppm)	Sm (ppm)	Ba (ppm)	P (ppm)	S (ppm)	Mg (ppm)	As (ppm)	Na (ppm)
Mean	0.032	0.027	0.003	0.027	-0.056	86.225	0.017	185.236
S.D.	0.012	0.012	0.000	0.009	0.010	0.533	0.004	0.985
% R.S.D.	38.916	45.975	10.430	35.438	17.063	0.618	23.603	0.532
	Mo (ppm)	Se (ppm)	Ag (ppm)	Pb (ppm)	Ti (ppm)	Cd (ppm)	B (ppm)	K (ppm)
Mean	0.001	0.018	0.003	0.035	-0.001	-0.000	0.011	-0.101
S.D.	0.001	0.028	0.001	0.011	0.000	0.001	0.000	0.015
% R.S.D.	102.956	151.392	22.617	30.849	15.311	145.614	1.617	14.432
	Mn (ppm)	Sb (ppm)	V (ppm)	Be (ppm)	Tl (ppm)			
Mean	-0.002	-0.033	0.003	0.002	0.060			
S.D.	0.001	0.021	0.001	0.000	0.039			
% R.S.D.	33.890	63.738	35.650	11.039	65.197			

WHC-SD-WM-DP-213, REV. 0

Identity 1: ICSAB Identity 2: Quality Control 10:47 AM October 9, 1996
 Task name : OPTIMA
 Sample Weight : 1.0000 Solution Volume : 1.00
 On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppm)	Sr (ppm)	Bi (ppm)	Si (ppm)	Al (ppm)	Co (ppm)	Cu (ppm)	Li (ppm)
Mean	-0.003	0.002	-0.026	-0.013	197.391	0.497	0.482	0.907
S.D.	0.001	0.000	0.006	0.003	0.323	0.005	0.001	0.005
% R.S.D.	20.947	1.767	22.577	21.956	0.164	0.961	0.280	0.556

	Zn (ppm)	Ni (ppm)	La (ppm)	Fe (ppm)	Ca (ppm)	Cr (ppm)	Nd (ppm)	U (ppm)
Mean	1.003	0.975	0.001	96.432	101.334	0.494	0.022	-0.075
S.D.	0.001	0.003	0.002	0.130	0.074	0.001	0.008	0.039
% R.S.D.	0.075	0.354	167.308	0.135	0.073	0.218	37.930	52.153

	Ce (ppm)	Sm (ppm)	Ba (ppm)	P (ppm)	S (ppm)	Mg (ppm)	As (ppm)	Na (ppm)
Mean	-0.010	0.053	0.493	0.019	0.001	92.459	0.022	184.641
S.D.	0.007	0.007	0.001	0.006	0.009	0.169	0.009	0.863
% R.S.D.	72.143	13.240	0.230	30.558	930.626	0.183	40.091	0.467

	Mo (ppm)	Se (ppm)	Ag (ppm)	Pb (ppm)	Ti (ppm)	Cd (ppm)	B (ppm)	K (ppm)
Mean	0.000	0.001	1.015	0.983	-0.000	0.987	0.017	0.104
S.D.	0.001	0.037	0.002	0.003	0.000	0.004	0.001	0.025
% R.S.D.	844.722	3900.744	0.164	0.321	94.876	0.371	4.648	23.842

	Mn (ppm)	Sb (ppm)	V (ppm)	Be (ppm)	Tl (ppm)
Mean	0.492	-0.024	0.499	0.493	0.033
S.D.	0.000	0.016	0.001	0.001	0.020
% R.S.D.	0.049	67.445	0.182	0.142	60.358

WHC-SD-WM-DP-213, REV. 0

Identity 1: CCV Identity 2: Quality Control 12:37 PM October 9, 1996
 Task name : OPTIMA
 Sample Weight : 1.0000 Solution Volume : 1.00
 On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppm)	Sr (ppm)	Bi (ppm)	Si (ppm)	Al (ppm)	Co (ppm)	Cu (ppm)	Li (ppm)
Mean	4.928	4.843	5.066	4.831	4.876	4.932	4.947	4.830
S.D.	0.009	0.007	0.026	0.018	0.013	0.022	0.002	0.018
% R.S.D.	0.186	0.139	0.511	0.377	0.275	0.436	0.034	0.371
	Zn (ppm)	Ni (ppm)	La (ppm)	Fe (ppm)	Ce (ppm)	Cr (ppm)	Nd (ppm)	U (ppm)
Mean	5.016	4.903	4.980	5.020	4.816	4.904	5.301	9.689
S.D.	0.025	0.017	0.013	0.017	0.008	0.033	0.015	0.078
% R.S.D.	0.508	0.354	0.264	0.345	0.160	0.677	0.278	0.807
	Ce (ppm)	Sm (ppm)	Ba (ppm)	P (ppm)	S (ppm)	Mg (ppm)	As (ppm)	Na (ppm)
Mean	5.001	4.900	4.893	4.993	4.895	4.936	5.033	4.793
S.D.	0.027	0.010	0.006	0.046	0.043	0.019	0.018	0.011
% R.S.D.	0.543	0.212	0.129	0.921	0.884	0.379	0.350	0.222
	Mo (ppm)	Se (ppm)	Ag (ppm)	Pb (ppm)	Ti (ppm)	Cd (ppm)	B (ppm)	K (ppm)
Mean	4.916	5.155	4.904	4.931	4.774	4.948	5.037	4.932
S.D.	0.016	0.007	0.016	0.015	0.009	0.024	0.009	0.018
% R.S.D.	0.332	0.130	0.330	0.298	0.180	0.489	0.175	0.355
	Mn (ppm)	Sb (ppm)	V (ppm)	Be (ppm)	Tl (ppm)			
Mean	4.908	4.667	5.001	5.067	4.934			
S.D.	0.023	0.024	0.015	0.012	0.055			
% R.S.D.	0.471	0.516	0.292	0.246	1.117			

WHC-SD-WM-DP-213, REV. C

Identity 1: CCB Identity 2: Quality Control 12:40 PM October 9, 1996
 Task name : OPTIMA
 Sample Weight : 1.0000 Solution Volume : 1.00
 On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppm)	Sr (ppm)	Bi (ppm)	Si (ppm)	Al (ppm)	Co (ppm)	Cu (ppm)	Li (ppm)
Mean	0.001	0.001	0.005	-0.003	0.000	0.006	0.001	0.001
S.D.	0.001	0.000	0.007	0.003	0.003	0.004	0.000	0.001
% R.S.D.	101.043	20.904	142.473	91.645	651.577	76.804	43.771	42.500
	Zn (ppm)	Ni (ppm)	La (ppm)	Fe (ppm)	Ca (ppm)	Cr (ppm)	Nd (ppm)	U (ppm)
Mean	0.002	0.003	-0.000	0.001	0.001	0.005	-0.008	-0.078
S.D.	0.000	0.001	0.002	0.002	0.000	0.001	0.006	0.039
% R.S.D.	4.008	47.393	6665.873	132.272	18.875	19.670	77.083	50.397
	Ce (ppm)	Sm (ppm)	Ba (ppm)	P (ppm)	S (ppm)	Mg (ppm)	As (ppm)	Na (ppm)
Mean	0.004	-0.004	0.001	0.004	0.004	0.001	0.000	0.006
S.D.	0.010	0.007	0.000	0.004	0.003	0.000	0.006	0.002
% R.S.D.	243.338	169.086	24.478	105.033	73.927	15.059	3128.271	37.504
	Mo (ppm)	Se (ppm)	Ag (ppm)	Pb (ppm)	Ti (ppm)	Cd (ppm)	B (ppm)	K (ppm)
Mean	0.002	-0.012	0.000	0.012	0.001	-0.001	0.008	0.174
S.D.	0.001	0.011	0.001	0.006	0.001	0.001	0.001	0.004
% R.S.D.	89.252	88.166	603.412	50.974	62.710	97.270	6.815	2.522
	Mn (ppm)	Sb (ppm)	V (ppm)	Be (ppm)	Tl (ppm)			
Mean	0.000	0.031	0.002	0.001	0.015			
S.D.	0.000	0.002	0.001	0.000	0.021			
% R.S.D.	58.012	6.243	52.955	15.381	137.316			

JW 10-9-96

9.5 ml

Identity 1: S968000454 Identity 2: 0.5ml-7.5ml 12:46 PM October 9, 1996

Task name : OPTIMA

Sample Weight : 1.0000 Solution Volume : 20.00

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

	Zr (ppm)	Sr (ppm)	Bi (ppm)	Si (ppm)	Al (ppm)	Co (ppm)	Cu (ppm)	Li (ppm)
Mean	0.046	0.039	-0.082	0.978	2.907	0.054	0.109	0.008
S.D.	0.009	0.001	0.062	0.018	0.086	0.032	0.006	0.000
% R.S.D.	19.162	1.903	75.509	1.837	2.971	59.934	5.590	0.002

	Zn (ppm)	Ni (ppm)	La (ppm)	Fe (ppm)	Ca (ppm)	Cr (ppm)	Nd (ppm)	U (ppm)
Mean	0.610	0.745	0.039	6.789	2.055	0.768	0.061	-0.726
S.D.	0.002	0.043	0.047	0.103	0.002	0.013	0.063	0.403
% R.S.D.	0.358	5.738	118.395	1.514	0.098	1.726	103.492	55.595

	Ce (ppm)	Sm (ppm)	Ba (ppm)	P (ppm)	S (ppm)	Mg (ppm)	As (ppm)	Na (ppm)
Mean	0.092	0.225	0.575	0.089	3.134	0.929	0.013	14.217
S.D.	0.133	0.087	0.001	0.102	0.068	0.002	0.045	0.000
% R.S.D.	144.367	38.791	0.155	114.650	2.166	0.219	348.384	0.000

	Mo (ppm)	Se (ppm)	Ag (ppm)	Pb (ppm)	Ti (ppm)	Cd (ppm)	B (ppm)	K (ppm)
Mean	0.007	0.429	0.215	0.189	0.013	0.003	0.033	1.300
S.D.	0.013	0.106	0.010	0.178	0.010	0.016	0.019	0.101
% R.S.D.	192.393	24.776	4.735	94.629	79.498	497.375	57.456	7.788

	Mn (ppm)	Sb (ppm)	V (ppm)	Be (ppm)	Tl (ppm)
Mean	0.161	-2.876	0.019	-0.009	0.175
S.D.	0.003	0.037	0.004	0.003	0.321
% R.S.D.	2.088	1.288	18.610	27.622	182.952

WHC-SD-WM-DP-213, REV.0

Identity 1: S968000454_D Identity 2: 0.5ml-9.5ml 12:50 PM October 9, 1996

Task name : OPTIMA

Sample Weight : 1.0000 Solution Volume : 20.00

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

	Zr (ppm)	Sr (ppm)	Bi (ppm)	Si (ppm)	Al (ppm)	Co (ppm)	Cu (ppm)	Li (ppm)
Mean	0.012	0.034	-0.344	0.991	2.635	-0.002	0.111	-0.012
S.D.	0.021	0.001	0.138	0.051	0.049	0.033	0.005	0.006
% R.S.D.	168.468	4.330	40.076	5.139	1.859	1358.156	4.099	47.305

	Zn (ppm)	Ni (ppm)	La (ppm)	Fe (ppm)	Ca (ppm)	Cr (ppm)	Nd (ppm)	U (ppm)
Mean	0.782	0.801	0.086	6.865	3.449	0.749	-0.466	-0.317
S.D.	0.008	0.029	0.047	0.049	0.006	0.040	0.203	0.630
% R.S.D.	0.966	3.559	54.364	0.719	0.166	5.318	43.573	198.424

	Ce (ppm)	Sm (ppm)	Ba (ppm)	P (ppm)	S (ppm)	Mg (ppm)	As (ppm)	Na (ppm)
Mean	-0.941	0.110	0.570	0.598	3.435	0.986	0.071	13.922
S.D.	0.098	0.094	0.004	0.147	0.044	0.002	0.115	0.097
% R.S.D.	10.424	85.414	0.616	24.528	1.268	0.206	160.800	0.695

	Mo (ppm)	Se (ppm)	Ag (ppm)	Pb (ppm)	Ti (ppm)	Cd (ppm)	B (ppm)	K (ppm)
Mean	-0.014	0.036	0.081	0.222	0.008	-0.027	0.010	0.810
S.D.	0.016	0.240	0.008	0.210	0.005	0.016	0.015	0.228
% R.S.D.	111.583	661.036	10.410	94.528	59.716	59.987	151.581	28.168

	Mn (ppm)	Sb (ppm)	V (ppm)	Be (ppm)	Tl (ppm)
Mean	0.164	0.602	-0.070	-0.023	-0.773
S.D.	0.003	0.433	0.015	0.003	0.386
% R.S.D.	2.035	72.018	20.749	11.495	49.936

WHC-SD-WM-DP-213, REV. 0

Identity 1: S968000454_A Identity 2: 0.5ml-1ml-1ml-7.5ml

12:54 PM October 9, 1996

Task name : OPTIMA

Sample Weight : 1.0000 Solution Volume : 20.00

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

	Zr (ppm)	Sr (ppm)	Bi (ppm)	Si (ppm)	Al (ppm)	Co (ppm)	Cu (ppm)	Li (ppm)
Mean	200.448	194.005	205.239	203.247	205.991	-0.225	0.122	191.056
S.D.	0.434	0.410	0.765	0.130	0.252	0.099	0.002	1.020
% R.S.D.	0.216	0.211	0.373	0.064	0.123	43.866	1.412	0.534

	Zn (ppm)	Ni (ppm)	La (ppm)	Fe (ppm)	Ca (ppm)	Cr (ppm)	Nd (ppm)	U (ppm)
Mean	1.509	196.977	200.879	207.658	197.552	198.912	212.127	-14.369
S.D.	0.044	0.164	0.489	0.290	0.360	0.309	0.642	0.754
% R.S.D.	2.923	0.083	0.244	0.140	0.182	0.155	0.302	5.247

	Ce (ppm)	Sm (ppm)	Ba (ppm)	P (ppm)	S (ppm)	Mg (ppm)	As (ppm)	Na (ppm)
Mean	199.094	196.594	197.128	203.197	202.608	199.257	203.085	204.347
S.D.	0.529	0.238	0.473	1.580	1.373	0.438	0.761	1.312
% R.S.D.	0.266	0.121	0.240	0.777	0.678	0.220	0.375	0.642

	Mo (ppm)	Se (ppm)	Ag (ppm)	Pb (ppm)	Ti (ppm)	Cd (ppm)	B (ppm)	K (ppm)
Mean	193.272	206.361	200.114	199.971	178.146	199.417	199.694	196.725
S.D.	0.398	1.288	0.311	0.842	0.365	0.587	0.715	2.152
% R.S.D.	0.206	0.624	0.156	0.421	0.205	0.294	0.358	1.094

	Mn (ppm)	Sb (ppm)	V (ppm)	Be (ppm)	Tl (ppm)
Mean	198.010	194.185	1.500	203.059	196.056
S.D.	0.464	0.251	0.004	0.294	0.466
% R.S.D.	0.234	0.129	0.287	0.145	0.238

WHC-SD-WM-DP-213, REV. 0

Identity 1: S968000454_DupA Identity 2: 0.5ml-1ml-1ml-7.5ml 12:57 PM October 9, 1996

Task name : OPTIMA

Sample Weight : 1.0000 Solution Volume : 20.00

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

	Zr (ppm)	Sr (ppm)	Bi (ppm)	Si (ppm)	Al (ppm)	Co (ppm)	Cu (ppm)	Li (ppm)
Mean	200.758	194.312	207.512	205.619	207.023	-0.339	0.153	190.165
S.D.	0.380	0.614	0.865	0.845	0.646	0.001	0.009	0.806
% R.S.D.	0.189	0.316	0.417	0.411	0.312	0.272	5.556	0.424
	Zn (ppm)	Ni (ppm)	La (ppm)	Fe (ppm)	Ca (ppm)	Cr (ppm)	Nd (ppm)	U (ppm)
Mean	1.260	199.233	201.144	209.540	197.210	201.639	209.562	-12.600
S.D.	0.008	0.276	0.326	0.428	0.462	0.436	0.169	0.866
% R.S.D.	0.662	0.138	0.162	0.204	0.234	0.216	0.081	6.872
	Ce (ppm)	Sm (ppm)	Ba (ppm)	P (ppm)	S (ppm)	Mg (ppm)	As (ppm)	Na (ppm)
Mean	201.460	195.640	196.666	206.232	205.409	202.490	205.361	204.083
S.D.	0.891	0.545	0.904	2.651	2.081	0.595	0.242	0.880
% R.S.D.	0.442	0.279	0.460	1.285	1.013	0.294	0.118	0.431
	Mo (ppm)	Se (ppm)	Ag (ppm)	Pb (ppm)	Ti (ppm)	Cd (ppm)	B (ppm)	K (ppm)
Mean	196.038	209.957	202.233	201.633	178.699	201.563	199.798	198.195
S.D.	1.096	1.334	0.238	0.215	0.593	0.620	0.184	0.183
% R.S.D.	0.559	0.635	0.118	0.107	0.332	0.308	0.092	0.092
	Mn (ppm)	Sb (ppm)	V (ppm)	Be (ppm)	Tl (ppm)			
Mean	199.917	194.956	1.549	203.473	197.665			
S.D.	0.245	1.094	0.007	0.359	0.286			
% R.S.D.	0.123	0.561	0.456	0.176	0.145			

WHC-SD-WM-DP-213, REV 0

Identity 1: ICSA Identity 2: Quality Control 1:01 PM October 9, 1996
 Task name : OPTIMA
 Sample Weight : 1.0000 Solution Volume : 1.00
 On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppm)	Sr (ppm)	Bf (ppm)	Si (ppm)	Al (ppm)	Co (ppm)	Cu (ppm)	Li (ppm)
Mean	0.003	0.003	-0.035	-0.007	199.471	0.004	-0.001	0.001
S.D.	0.002	0.000	0.010	0.004	0.791	0.002	0.001	0.001
% R.S.D.	66.360	8.826	28.908	53.564	0.397	36.094	65.079	46.208

	Zn (ppm)	Ni (ppm)	La (ppm)	Fe (ppm)	Ca (ppm)	Cr (ppm)	Nd (ppm)	U (ppm)
Mean	0.005	0.009	0.006	95.008	100.500	-0.001	0.009	-0.022
S.D.	0.000	0.001	0.002	0.212	0.219	0.002	0.007	0.075
% R.S.D.	5.340	15.627	31.110	0.223	0.218	238.286	81.939	348.891

	Ce (ppm)	Sm (ppm)	Ba (ppm)	P (ppm)	S (ppm)	Mg (ppm)	As (ppm)	Na (ppm)
Mean	-0.018	0.079	0.003	0.025	-0.018	89.903	0.002	186.682
S.D.	0.022	0.015	0.000	0.008	0.013	0.215	0.006	0.950
% R.S.D.	121.522	19.123	14.440	31.100	70.742	0.239	333.839	0.509

	Mo (ppm)	Se (ppm)	Ag (ppm)	Pb (ppm)	Ti (ppm)	Cd (ppm)	B (ppm)	K (ppm)
Mean	-0.000	0.036	0.001	0.011	0.001	-0.001	0.021	0.004
S.D.	0.001	0.020	0.001	0.022	0.001	0.001	0.001	0.027
% R.S.D.	725830.108	55.592	120.183	189.979	86.819	121.563	2.433	636.091

	Mn (ppm)	Sb (ppm)	V (ppm)	Be (ppm)	Tl (ppm)
Mean	-0.002	-0.009	-0.000	0.004	-0.016
S.D.	0.001	0.042	0.001	0.000	0.042
% R.S.D.	50.324	480.584	281.751	3.208	258.900

Identity 1: ICSAB Identity 2: Quality Control 1:04 PM October 9, 1996
 Task name : OPTIMA
 Sample Weight : 1.0000 Solution Volume : 1.00
 On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppm)	Sr (ppm)	Bi (ppm)	Si (ppm)	Al (ppm)	Co (ppm)	Cu (ppm)	Li (ppm)
Mean	-0.001	0.002	-0.018	-0.005	195.878	0.476	0.488	0.914
S.D.	0.001	0.000	0.011	0.008	1.247	0.903	0.002	0.009
% R.S.D.	137.618	11.267	59.754	166.475	0.637	0.542	0.501	0.981

	Zn (ppm)	Ni (ppm)	La (ppm)	Fe (ppm)	Ca (ppm)	Cr (ppm)	Nd (ppm)	U (ppm)
Mean	0.964	0.951	0.006	95.280	100.318	0.474	0.031	0.006
S.D.	0.001	0.003	0.003	0.198	0.265	0.002	0.008	0.078
% R.S.D.	0.063	0.308	47.042	0.208	0.264	0.423	27.524	1368.914

	Ce (ppm)	Sm (ppm)	Ba (ppm)	P (ppm)	S (ppm)	Mg (ppm)	As (ppm)	Na (ppm)
Mean	-0.024	0.085	0.499	0.020	-0.020	88.441	0.031	186.019
S.D.	0.026	0.017	0.002	0.007	0.008	0.082	0.009	1.939
% R.S.D.	106.787	20.258	0.433	35.169	40.533	0.092	28.631	1.042

	Mo (ppm)	Se (ppm)	Ag (ppm)	Pb (ppm)	Ti (ppm)	Cd (ppm)	B (ppm)	K (ppm)
Mean	0.003	0.052	0.992	0.959	0.000	0.958	0.016	-0.047
S.D.	0.001	0.027	0.003	0.005	0.001	0.006	0.001	0.029
% R.S.D.	28.784	50.553	0.302	0.522	206.335	0.630	6.698	62.396

	Mn (ppm)	Sb (ppm)	V (ppm)	Be (ppm)	Tl (ppm)
Mean	0.477	0.003	0.487	0.490	0.019
S.D.	0.002	0.025	0.002	0.001	0.045
% R.S.D.	0.378	781.590	0.309	0.206	241.093

WHC-SD-WM-DP-213, REV. 0

Identity 1: CCV Identity 2: Quality Control 1:07 PM October 9, 1996
 Task name : OPTIMA
 Sample Weight : 1.0000 Solution Volume : 1.00
 On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppm)	Sr (ppm)	Bi (ppm)	Si (ppm)	Al (ppm)	Co (ppm)	Cu (ppm)	Li (ppm)
Mean	4.967	4.875	5.076	4.822	4.940	4.923	4.985	4.817
S.D.	0.011	0.009	0.028	0.009	0.043	0.014	0.014	0.018
% R.S.D.	0.218	0.183	0.543	0.178	0.874	0.282	0.277	0.372
	Zn (ppm)	Ni (ppm)	La (ppm)	Fe (ppm)	Ca (ppm)	Cr (ppm)	Nd (ppm)	U (ppm)
Mean	4.994	4.887	5.034	5.092	4.889	4.907	5.410	9.760
S.D.	0.007	0.002	0.011	0.016	0.020	0.003	0.022	0.045
% R.S.D.	0.148	0.041	0.215	0.309	0.400	0.069	0.402	0.460
	Ce (ppm)	Sm (ppm)	Ba (ppm)	P (ppm)	S (ppm)	Mg (ppm)	As (ppm)	Na (ppm)
Mean	4.976	4.953	4.931	4.981	4.845	4.959	5.029	4.846
S.D.	0.012	0.014	0.010	0.005	0.009	0.024	0.017	0.035
% R.S.D.	0.237	0.274	0.204	0.105	0.196	0.479	0.340	0.722
	Mo (ppm)	Se (ppm)	Ag (ppm)	Pb (ppm)	Ti (ppm)	Cd (ppm)	B (ppm)	K (ppm)
Mean	4.882	5.112	4.910	4.923	4.778	4.945	5.060	4.904
S.D.	0.006	0.032	0.012	0.003	0.007	0.011	0.011	0.012
% R.S.D.	0.119	0.619	0.243	0.063	0.157	0.213	0.213	0.237
	Mn (ppm)	Sb (ppm)	V (ppm)	Be (ppm)	Tl (ppm)			
Mean	4.923	4.754	5.024	5.102	4.977			
S.D.	0.003	0.037	0.009	0.011	0.002			
% R.S.D.	0.059	0.778	0.170	0.213	0.041			

WHC-SD-WM-DP-213, REV. 0

Identity 1: CCB Identity 2: Quality Control 1:10 PM October 9, 1996
 Task name : OPTIMA
 Sample Weight : 1.0000 Solution Volume : 1.00
 On-Peak Integrations : 3 Off-Peak Integrations : 1

	Zr (ppm)	Sr (ppm)	Bi (ppm)	Si (ppm)	Al (ppm)	Co (ppm)	Cu (ppm)	Li (ppm)
Mean	0.001	0.002	-0.002	-0.003	0.010	0.011	0.003	0.003
S.D.	0.001	0.000	0.013	0.002	0.005	0.003	0.000	0.001
% R.S.D.	63.568	21.153	741.003	87.777	47.145	28.934	15.032	23.845

	Zn (ppm)	Ni (ppm)	La (ppm)	Fe (ppm)	Ca (ppm)	Cr (ppm)	Nd (ppm)	U (ppm)
Mean	0.002	0.006	0.002	0.009	0.005	0.008	-0.011	-0.039
S.D.	0.000	0.001	0.002	0.002	0.001	0.001	0.005	0.017
% R.S.D.	18.646	10.537	121.504	28.145	20.902	16.229	42.893	43.648

	Ce (ppm)	Sm (ppm)	Ba (ppm)	P (ppm)	S (ppm)	Mg (ppm)	As (ppm)	Na (ppm)
Mean	0.025	-0.000	0.002	0.010	0.003	0.006	0.004	0.016
S.D.	0.006	0.004	0.000	0.005	0.004	0.001	0.003	0.004
% R.S.D.	23.843	2029.007	19.832	50.210	118.103	19.871	78.192	21.823

	Mo (ppm)	Se (ppm)	Ag (ppm)	Pb (ppm)	Ti (ppm)	Cd (ppm)	B (ppm)	K (ppm)
Mean	0.002	-0.013	0.001	0.030	0.002	-0.012	0.009	0.141
S.D.	0.000	0.014	0.001	0.007	0.000	0.001	0.000	0.007
% R.S.D.	8.645	103.735	97.714	22.379	20.619	7.616	4.174	4.754

	Mn (ppm)	Sb (ppm)	V (ppm)	Be (ppm)	Tl (ppm)
Mean	0.001	0.031	0.002	0.002	0.044
S.D.	0.000	0.020	0.000	0.001	0.009
% R.S.D.	50.966	63.858	4.428	34.561	19.846

LABCORE Completed Worklist Report for Worklist# 13774

Analyst: krm

Instrument: CARB2

Book# _____

Method: _____ Rev/Mod _____

Worklist Comment: TK-24-1 TICTOC. RCJ

Seq Type	Sample#	R A	Test	Matrix	Actual	Found	DL or Yield	Unit
1 BLNK	0		@TICTOC1 TIC-02	LIQUID	1	2.10E+0	2.100	ug/mL
1 BLNK	0		@TICTOC1 TOC-02	LIQUID	1	6.80E+0	6.800	ug/mL
2 STD	0		@TICTOC1 TIC-02	LIQUID	6.02E+02	5.97E+2	99.169 % Recovery	
2 STD	0		@TICTOC1 TOC-02	LIQUID	3.00E+03	2.71E+3	90.333 % Recovery	
3 SAMPLE	S96B000453	0	@TICTOC1 TIC-02	LIQUID	N/A	5.00E+00	5.000	ug/mL
3 SAMPLE	S96B000453	0	@TICTOC1 TOC-02	LIQUID	N/A	7.42E+01	40.000	ug/mL
4 DUP	S96B000453	0	@TICTOC1 TIC-02	LIQUID	<5.00E+0	2.10E+1		RPD
4 DUP	S96B000453	0	@TICTOC1 TOC-02	LIQUID	7.42E+1	7.80E+1	4.993	RPD
5 SPK	S96B000453	0	@TICTOC1 TIC-02	LIQUID	1.00E+02	1.01E+02	101.000 % Recovery	
5 SPK	S96B000453	0	@TICTOC1 TOC-02	LIQUID	1.00E+02	9.10E+01	91.000 % Recovery	
6 SAMPLE	S96B000454	0	@TICTOC1 TIC-02	LIQUID	N/A	5.00E+00	5.000	ug/mL
6 SAMPLE	S96B000454	0	@TICTOC1 TOC-02	LIQUID	N/A	9.60E+01	40.000	ug/mL
7 DUP	S96B000454	0	@TICTOC1 TIC-02	LIQUID	<5.00E+0	<5.00E+0		RPD
7 DUP	S96B000454	0	@TICTOC1 TOC-02	LIQUID	9.60E+1	8.30E+1	14.525	RPD

279
11/25/96

Final page for worklist# 13774

Analyst Signature

Date

Analyst Signature

Date

Reviewed RW Schneider 10/29/96
Reviewer Signature Date

Results less than detection limit for TIC'S,
No RPD reported. RW Schneider 10/29/96

10/08/96 09:57
A-0004-1

Page: 1

LABCORE Data Entry Template for Worklist# 13774

Analyst: KRM Instrument: CARB2 Book# 12N12F
24N12AMethod: LA-342-100 Rev/Mod E-0

Worklist Comment: TK-24-1 TICTOC. RCJ

S Type	Sample#	R A	Test	Matrix	Group#	Project
1 BLNK			@TICTOC1	LIQUID		
2 STD			@TICTOC1	LIQUID		
3 SAMPLE	S96B000453 0		@TICTOC1	LIQUID	96001333	TK 24-1
	Analytes Requested: TIC-02 , TOC-02					
4 DUP	S96B000453 0		@TICTOC1	LIQUID		
5 SPK	S96B000453 0		@TICTOC1	LIQUID		
6 SAMPLE	S96B000454 0		@TICTOC1	LIQUID	96001334	TK 21-1
	Analytes Requested: TIC-02 , TOC-02					
7 DUP	S96B000454 0		@TICTOC1	LIQUID		

Final page for worklist # 13774

Analyst Signature

Date

10-24-96

Analyst Signature

Date

10-25-96

Data Entry Comments:

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

TIC/TOC: LA-342-100 (E-0)

WORKLIST

#

ANALYST
INITIALSANALYSIS
DATEANALYSIS
TIMEINSTRUMENT
CODE

13774

KRM

10-24-96

☒ BASELINE
BLANK☐ SAMPLE
DUPLICATE☐ SPIKE
TRIPLICATE

SAMPLE # =

STD # =

SAMPLE WEIGHT (g)

SPIKE/STANDARD VOLUME (mL)

TIC:

TOC:

FINAL COULOMETER READING (u TIC:

TOC:

9.7

26.4

☒ BASELINE
BLANK☐ SAMPLE
DUPLICATE☐ SPIKE
TRIPLICATE

SAMPLE # =

STD # =

SAMPLE WEIGHT (g)

SPIKE/STANDARD VOLUME (mL)

TIC:

TOC:

FINAL COULOMETER READING (u TIC:

TOC:

11.8

33.2

☐ BASELINE
BLANK☒ SAMPLE
DUPLICATE☐ SPIKE
TRIPLICATE

SAMPLE # = 596 B 453

STD # =

SAMPLE WEIGHT (g)

SPIKE/STANDARD VOLUME (mL)

TIC:

TOC:

FINAL COULOMETER READING (u TIC:

TOC:

20.2

65.4

☐ BASELINE
BLANK☒ SAMPLE
DUPLICATE☐ SPIKE
TRIPLICATE

SAMPLE # = 596 B 454

STD # =

SAMPLE WEIGHT (g)

SPIKE/STANDARD VOLUME (mL)

TIC:

TOC:

FINAL COULOMETER READING (u TIC:

TOC:

10.1

36.0

☐ BASELINE
BLANK☒ SAMPLE
DUPLICATE☐ SPIKE
TRIPLICATE

SAMPLE # = 571

STD # =

12N12 F
24N12 D

SAMPLE WEIGHT (g)

SPIKE/STANDARD VOLUME (mL)

TIC:

TOC:

FINAL COULOMETER READING (u TIC:

TOC:

606.8

569.4

☐ BASELINE
BLANK☒ SAMPLE
DUPLICATE☐ SPIKE
TRIPLICATE

SAMPLE # = 596 B 453

STD # =

SAMPLE WEIGHT (g)

SPIKE/STANDARD VOLUME (mL)

TIC:

TOC:

FINAL COULOMETER READING (u TIC:

TOC:

10.9

63.5

☐ BASELINE
BLANK☐ SAMPLE
DUPLICATE☒ SPIKE
TRIPLICATE

SAMPLE # = 596 B 453

STD # =

SAMPLE WEIGHT (g)

SPIKE/STANDARD VOLUME (mL)

TIC:

TOC:

FINAL COULOMETER READING (u TIC:

TOC:

314.1

336.5

☐ BASELINE
BLANK☒ SAMPLE
DUPLICATE☐ SPIKE
TRIPLICATE

SAMPLE # = 596 B 454

STD # =

SAMPLE WEIGHT (g)

SPIKE/STANDARD VOLUME (mL)

TIC:

TOC:

FINAL COULOMETER READING (u TIC:

TOC:

9.6

34.7

WORKBOOK PAGE: BLANK1

TIC/TOC : LA-342-100 (E-0)

LIQUIDS

		TIC	TOC
	Sample Size in mL (SS)	0.5000	0.5000
BLNK	Dilution Factor (DF)	1	1
	µg of Carbon in Sample (C1)	11.8	33.2
13774	µg of Carbon from Baseline (C2)	9.7	26.4

@TICTOC1

LIQUID

96010295

µg of Carbon = |C1-C2|

0

N/A

CARB2

LCM

RWS

KRM

10/25/96

10/24/96

09:21 PM

TK 24-1

Method Detection Limit in µg/mL

TIC

TOC

5

40

µg of Carbon

2.10E+00

6.80E+00

Data Entered By:

Signature of Chemist:

LCM

Date: 10/25/96

Date: 10/29/96

BLANK WB1 REV 1.0

342100ML

WORKBOOK PAGE: STD2

TIC/TOC : LA-342-100 (E-0)

LIQUIDS

		TIC	TOC
STD	Sample Size in mL (SS)	1.0000	0.2000
	Dilution Factor (DF)	1	1
	Final Coulometer Reading in μg (C1)	606.8	569.4
13774	μg of Carbon from Baseline (C2)	9.7	26.4
	Standard Book Number	22N12F	24N12D
@TICTOC1	Standard Value ($\mu\text{g}/\text{mL}$)	602	3000

LIQUID

96010295

0

QC Actual in $\mu\text{g}/\text{mL}$ = Standard Value ($\mu\text{g}/\text{mL}$)

N/A

QC Found in $\mu\text{g}/\text{mL}$ = (C1 - C2) * DF / SS

QC Found in $\mu\text{g}/\text{mL}$ for TIC = 5 if C1 < C2

QC Found in $\mu\text{g}/\text{mL}$ for TOC = 40 if C1 < C2

CARB2

% Recovery = QC Found / QC Actual * 100

LCM

RWS

KRM

10/25/96

10/24/96

		TIC	TOC
	Method Detection Limit in $\mu\text{g}/\text{mL}$	5	40
09:21 PM	QC Actual in $\mu\text{g}/\text{mL}$	6.02E+02	3.00E+03
	QC Found in $\mu\text{g}/\text{mL}$	5.97E+02	2.71E+03
TK 24-1	Percent Standard Recovery	99.2	90.5

Data Entered By:	LCM	Date:	10/25/96
Signature of Chemist:	<i>DW Schreder</i>	Date:	10/29/96
STANDARD WB1 REV 1.0	342100ML		

WORKBOOK PAGE: SAM6

TIC/TOC : LA-342-100 (E-0)

LIQUIDS

		TIC	TOC
SAMPLE	Sample Size in mL (SS)	0.1000	0.1000
	Dilution Factor (DF)	1	1
	µg of Carbon in Sample (C1)	10.1	36
13774	µg of Carbon from Baseline (C2)	9.7	26.4
@TICTOC1			

LIQUID
96010295
0
N/A
S96B000454
CARB2
LCM
RWS
KRM
10/25/96
10/24/96
09:21 PM
TK 24-1

$\mu\text{g of Carbon/mL} = (C1 - C2) * DF / SS$
 $\mu\text{g of Carbon/mL for TIC} = 5 \text{ if } C1 < C2$
 $\mu\text{g of Carbon/mL for TOC} = 40 \text{ if } C1 < C2$

NOTE: FOR TIC: The Reported Result is < 5.

	TIC	TOC
Method Detection Limit in µg/mL	5	40
µg of Carbon/mL Note: <	4.00E+00	9.60E+01

Data Entered By:	LCM	Date: 10/25/96
Signature of Chemist:	<i>Rew Schneider</i>	Date: 10/29/96

SAMPLE WB1 REV 1.0

342100ML

70

WORKBOOK PAGE: DUP7

TIC/TOC : LA-342-100 (E-0)

LIQUIDS

		TIC	TOC
DUP	Sample Size in mL (SS)	0.1000	0.1000
	Dilution Factor (DF)	1	1
13774	µg of Carbon in Sample (C1)	9.6	34.7
	µg of Carbon from Baseline (C2)	9.7	26.4
@TICTOC1	Known µg of C from Original Sample	<4.00E+1	<9.60E+0

LIQUID

96010295

0

N/A

S96B000454

CARB2

LCM

RWS

KRM

10/25/96

10/24/96

09:21 PM

TK-24-1

µg of Carbon/mL = (C1-C2) * DF / SS
 µg of Carbon/mL for TIC = 5 if C1 < C2
 µg of Carbon/mL for TOC = 40 if C1 < C2

NOTE: FOR TIC: The Reported Result is < 5.

Method Detection Limit in µg/mL

	TIC	TOC
Method Detection Limit in µg/mL	5	40
µg of Carbon/mL Note: <	5.00E+00	8.30E+01

Data Entered By:	LCM	Date: 10/25/96
Signature of Chemist:	<i>RW Schmede</i>	Date: 10/29/96

SAMPLE WB1 REV 1.0

342100ML

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

Sample: BASE1

Date: 10/24/96

Time: 21:21:54

Sample Size = 1 uL

Dil Factor = 1

Blank ID # = BASE1

Blank Value = N/A

Analyst : KR MONTEITH

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading ==	==== Analysis Time ==	==== Coulometer ==	==== % Difference ==
1	0.51	1.50	0.00
2	1.01	2.50	40.00
3	1.51	2.90	13.79
4	2.00	3.30	12.12
5	2.50	3.90	15.38
6	3.00	4.30	9.30
7	3.50	4.70	8.51
8	4.00	5.00	6.00
9	4.50	5.40	7.41
10	5.00	5.80	6.90
11	5.50	6.00	3.33
12	6.00	6.50	7.69
13	6.50	6.70	2.99
14	7.00	7.00	4.29
15	7.50	7.40	5.41
16	8.00	7.70	3.90
17	8.50	8.00	3.75
18	9.00	8.20	2.44
19	9.50	8.60	4.65
20	10.00	8.90	3.37
21	10.50	9.30	4.30
22	11.00	9.70	4.12

BLANK VALUE = 9.7 micrograms carbon

BLANK FACTOR = 9.7 / 10.99963 = +8.8E-01 ug/min Carbon

SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
 COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 72 TO 81.

Sample Run By:

KR MONTEITH

00000

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT

TICTOC REV 2.0

<<< BLANK ANALYSIS >>>

Sample: BASE1

Date: 10/24/96

Time: 21:34:35

Sample Size = 1 uL

Analyst : KR MONTEITH

Dil Factor = 1

Min Readings = 22

Blank ID # = BASE1

Max Readings = 22

Blank Value = N/A

% Difference = 10

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

1	0.51	0.40	0.00
2	1.01	1.00	60.00
3	1.50	3.40	70.59
4	2.00	7.60	55.26
5	2.50	12.60	39.68
6	3.00	16.00	21.25
7	3.50	18.10	11.60
8	4.00	19.40	6.70
9	4.50	20.20	3.96
10	5.00	21.10	4.27
11	5.50	21.70	2.76
12	6.00	22.20	2.25
13	6.50	22.70	2.20
14	7.00	23.20	2.16
15	7.50	23.60	1.69
16	8.00	24.10	2.07
17	8.50	24.40	1.23
18	9.00	24.90	2.01
19	9.50	25.20	1.19
20	10.00	25.70	1.95
21	10.50	26.00	1.15
22	11.00	26.40	1.52

BLANK VALUE = 26.4 micrograms carbon

BLANK FACTOR = 26.4 / 11.00061 = +2.40E+00 ug/min Carbon

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

Sample Run By:

KR MONTEITH

00000

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: BLK1

Date: 10/24/96

Time: 22:19:44

Sample Size = 1 uL

Dil Factor = 1

Blank ID # =

Blank Value = .88 ug/minute C

Analyst : KR MONTEITH

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading ==	Analysis Time	Coulometer	% Difference ==
1	0.51	1.00	0.00
2	1.01	2.90	65.52
3	1.51	4.30	32.56
4	2.01	5.40	20.37
5	2.51	5.70	5.26
6	3.01	6.10	6.56
7	3.51	6.50	6.15
8	4.01	6.80	4.41
9	4.50	7.20	5.56
10	5.00	7.40	2.70
11	5.50	7.80	5.13
12	6.00	8.20	4.88
13	6.50	8.60	4.65
14	7.00	9.00	4.44
15	7.50	9.40	4.26
16	8.00	9.80	4.08
17	8.50	10.00	2.00
18	9.00	10.40	3.85
19	9.50	10.90	4.59
20	10.00	11.20	2.68
21	10.50	11.40	1.75
22	11.00	11.80	3.39

USER INPUT BLANK VALUE

BLANK VALUE = 9.680537 micrograms carbon

BLANK FACTOR = 9.680537 / 11.00061 = +8.8E-01 ug/min Carbon

SAMPLE RESULTS:

(11.8 - 9.679033) (1)/(1) = +2.12E+00 g/L Carbon
(11.8 - 9.679033) (1)/(1) (12) = +1.77E-01 Molar Carbon

Sample Run By:

KR MONTEITH

00000

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: BLK1

Date: 10/24/96

Time: 22:45:00

Sample Size = 1 uL

Dil Factor = 1

Blank ID # =

Blank Value = 2.4 ug/minute C

Analyst : KR MONTEITH

Min Readings = 22

Max Readings = 22

% Difference = 10

```

== Reading ==== Analysis Time ==== Coulometer ==== % Difference ==
  1          0.51          0.30          0.00
  2          1.01          2.60         88.46
  3          1.50         10.90        76.15
  4          2.00         17.90        39.11
  5          2.50         21.30        15.96
  6          3.00         23.90       10.88
  7          3.50         25.30         5.53
  8          4.00         26.50         4.53
  9          4.50         27.50         3.64
 10          5.00         28.40         3.17
 11          5.50         29.30         3.07
 12          6.00         29.60         1.01
 13          6.50         30.10         1.66
 14          7.00         30.70         1.95
 15          7.50         31.00         0.97
 16          8.00         31.40         1.27
 17          8.50         31.60         0.63
 18          9.00         32.00         1.25
 19          9.50         32.30         0.93
 20         10.00         32.60         0.92
 21         10.50         33.00         1.21
 22         11.00         33.20         0.60

```

USER INPUT BLANK VALUE

BLANK VALUE = 26.40147 micrograms carbon

BLANK FACTOR = 26.40147 / 11.00061 = +2.4E+00 ug/min Carbon

SAMPLE RESULTS:

```

( 33.2 - 26.39707 ) (1)/(1) = +6.80E+00 g/L Carbon
( 33.2 - 26.39707 ) (1)/(1) (12) = +5.67E-01 Molar Carbon
<<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!>>>>

```

Sample Run By:

KR MONTEITH

00000

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: STD1

Date: 10/24/96

Time: 21:48:42

Sample Size = 1000 uL

Dil Factor = 1

Blank ID # =

Blank Value = .88 ug/minute C

Analyst : KR MONTEITH

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading ==	Analysis Time	Coulometer	% Difference
1	0.51	0.70	0.00
2	1.01	23.80	97.06
3	1.51	163.60	85.45
4	2.01	301.90	45.81
5	2.51	407.00	25.82
6	3.01	479.20	15.07
7	3.51	529.90	9.57
8	4.01	562.70	5.83
9	4.50	582.20	3.35
10	5.00	593.00	1.82
11	5.50	598.50	0.92
12	6.01	601.20	0.45
13	6.51	602.80	0.27
14	7.00	603.60	0.13
15	7.50	604.20	0.10
16	8.00	604.70	0.08
17	8.50	605.00	0.05
18	9.00	605.40	0.07
19	9.50	605.70	0.05
20	10.00	606.10	0.07
21	10.50	606.40	0.05
22	11.00	606.80	0.07

USER INPUT BLANK VALUE

BLANK VALUE = 9.680537 micrograms carbon

BLANK FACTOR = 9.680537 / 11.00061 = +8.8E-01 ug/min Carbon

SAMPLE RESULTS:

(606.8 - 9.682148) (1)/(1000) = +5.971E-01 g/L Carbon
(606.8 - 9.682148) (1)/(1000) (12) = +4.976E-02 Molar Carbon

Sample Run By:

KR MONTEITH

00000

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TIC/TOC REV 2.0

Sample: STD1

Date: 10/24/96

Time: 22:04:52

Sample Size = 200 uL

Dil Factor = 1

Blank ID # =

Blank Value = 2.4 ug/minute C

Analyst : KR MONTEITH

Min Readings = 22

Max Readings = 22

% Difference = 10

Reading	Analysis Time	Coulometer	% Difference
1	0.51	0.30	0.00
2	1.01	1.30	76.92
3	1.50	7.40	82.43
4	2.00	17.30	57.23
5	2.50	28.20	38.65
6	3.00	41.90	32.70
7	3.50	64.90	35.44
8	4.00	167.70	61.30
9	4.50	331.40	49.40
10	5.00	428.80	22.71
11	5.50	484.70	11.53
12	6.00	515.40	5.96
13	6.50	530.70	2.88
14	7.00	538.20	1.39
15	7.50	542.40	0.77
16	8.00	544.80	0.44
17	8.50	546.30	0.27
18	9.00	548.00	0.31
19	9.50	555.30	1.31
20	10.00	560.90	1.00
21	10.50	565.20	0.76
22	11.00	569.40	0.74

USER INPUT BLANK VALUE

BLANK VALUE = 26.40147 micrograms carbon

BLANK FACTOR = 26.40147 / 11.00061 = +2.4E+00 ug/min Carbon

SAMPLE RESULTS:

(569.4 - 26.39707) (1)/(200) = +2.715E+00 g/L Carbon
(569.4 - 26.39707) (1)/(200) (12) = +2.263E-01 Molar Carbon

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

Sample Run By:

KR MONTEITH

00000

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: S96B454-1

Date: 10/24/96

Time: 22:58:54

Sample Size = 1 uL

Dil Factor = 1

Blank ID # =

Blank Value = .88 ug/minute C

Analyst : KR MONTEITH

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading ==	==== Analysis Time ==	==== Coulometer ==	==== % Difference ==
1	0.51	0.40	0.00
2	1.00	1.40	71.43
3	1.50	3.50	60.00
4	2.00	4.80	27.08
5	2.50	5.10	5.88
6	3.00	5.60	8.93
7	3.50	6.00	6.67
8	4.00	6.30	4.76
9	4.50	6.60	4.55
10	5.00	6.90	4.35
11	5.50	7.20	4.17
12	6.00	7.50	4.00
13	6.50	7.60	1.32
14	7.00	7.90	3.80
15	7.50	8.20	3.66
16	8.00	8.50	3.53
17	8.50	8.70	2.30
18	9.00	9.00	3.33
19	9.50	9.20	2.17
20	10.00	9.50	3.16
21	10.50	9.90	4.04
22	11.00	10.10	1.98

USER INPUT BLANK VALUE

BLANK VALUE = 9.680537 micrograms carbon

BLANK FACTOR = 9.680537 / 11.00061 = +8.8E-01 ug/min Carbon

SAMPLE RESULTS:

(10.1 - 9.681289) (1)/(1) = +4.19E-01 g/L Carbon
(10.1 - 9.681289) (1)/(1) (12) = +3.49E-02 Molar Carbon

Sample Run By:

KR MONTEITH

00000

WHC-SD-WM-DP-213, REV. 0

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: S96B454

Date: 10/24/96

Time: 23:21:16

Sample Size = 1 uL

Dil Factor = 1

Blank ID # =

Blank Value = 2.4 ug/minute C

Analyst : KR MONTEITH

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading ==	Analysis Time	Coulometer	% Difference
1	0.51	0.30	0.00
2	1.01	4.40	93.18
3	1.51	15.80	72.15
4	2.01	22.00	28.18
5	2.51	24.90	11.65
6	3.01	27.00	7.78
7	3.50	28.60	5.59
8	4.00	29.50	3.05
9	4.50	30.30	2.64
10	5.00	31.10	2.57
11	5.50	31.80	2.20
12	6.00	32.50	2.15
13	6.50	32.90	1.22
14	7.00	33.40	1.50
15	7.50	33.80	1.18
16	8.00	34.20	1.17
17	8.50	34.60	1.16
18	9.00	34.80	0.57
19	9.50	35.20	1.14
20	10.00	35.40	0.56
21	10.50	35.60	0.56
22	11.00	36.00	1.11

USER INPUT BLANK VALUE

BLANK VALUE = 26.40147 micrograms carbon

BLANK FACTOR = 26.40147 / 11.00061 = +2.4E+00 ug/min Carbon

SAMPLE RESULTS:

(36 - 26.39736) (1)/(1) = +9.60E+00 g/L Carbon
 (36 - 26.39736) (1)/(1)(12) = +8.00E-01 Molar Carbon
 <<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!>>>>

Sample Run By:

KR MONTEITH

00000

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: S96B454DUP-1

Date: 10/24/96

Time: 23:45:25

Sample Size = 1 uL

Dil Factor = 1

Blank ID # =

Blank Value = .88 ug/minute C

Analyst : KR MONTEITH

Min Readings = 22

Max Readings = 22

% Difference = 10

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

1	0.51	0.10	0.00
2	1.01	1.20	91.67
3	1.51	3.40	64.71
4	2.01	4.30	20.93
5	2.50	4.90	12.24
6	3.00	5.20	5.77
7	3.50	5.50	5.45
8	4.00	5.80	5.17
9	4.50	6.10	4.92
10	5.00	6.40	4.69
11	5.50	6.70	4.48
12	6.00	6.90	2.90
13	6.50	7.20	4.17
14	7.00	7.60	5.26
15	7.50	7.90	3.80
16	8.00	8.00	1.25
17	8.50	8.30	3.61
18	9.00	8.50	2.35
19	9.50	8.80	3.41
20	10.00	9.10	3.30
21	10.50	9.40	3.19
22	11.00	9.60	2.08

USER INPUT BLANK VALUE

BLANK VALUE = 9.680537 micrograms carbon

BLANK FACTOR = 9.680537 / 11.00061 = +8.8E-01 ug/min Carbon

SAMPLE RESULTS:

(9.6 - 9.678926) (1)/(1) = < 5.00 E-3 g/L Carbon
 (9.6 - 9.678926) (1)/(1) (12) = < 4.17 E-4 Molar Carbon

Sample Run By:

KR MONTEITH

00000

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: S96B454DUP-1

Date: 10/25/96

Time: 01:06:47

Sample Size = 1 uL

Dil Factor = 1

Blank ID # =

Blank Value = 2.4 ug/minute C

Analyst : KR MONTEITH

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.50	0.00
2	1.01	1.20	58.33
3	1.51	3.40	64.71
4	2.00	8.60	60.47
5	2.50	16.00	46.25
6	3.00	20.70	22.71
7	3.50	23.50	11.91
8	4.00	25.00	6.00
9	4.50	26.10	4.21
10	5.00	27.30	4.40
11	5.50	28.20	3.19
12	6.00	29.00	2.76
13	6.50	29.90	3.01
14	7.00	30.60	2.29
15	7.50	31.20	1.92
16	8.00	31.90	2.19
17	8.50	32.30	1.24
18	9.00	32.70	1.22
19	9.50	33.30	1.80
20	10.00	33.80	1.48
21	%-1429.50	34.40	1.74
22	%-1429.00	34.70	0.86

USER INPUT BLANK VALUE

BLANK VALUE = 0 micrograms carbon

BLANK FACTOR = 0 / 0 =

+2.4E+00 ug/min Carbon

SAMPLE RESULTS:

(34.7 --3429.601) (1) / (1) =

+3.46E+03 g/L Carbon

(34.7 --3429.601) (1) / (1) (12) =

+2.89E+02 Molar Carbon

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

Sample Run By:

KR MONTEITH

00000

LABCORE Data Entry Template for Worklist# 15372Analyst: deg Instrument: TOC01 _____ Book # _____Method: LA-342-100 Rev/Mod E-0

Worklist Comment: 21-1TK TOC. RCJ

GROUP	PROJECT	S TYPE	SAMPLE#	R A	-----TEST-----	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 BLNK			TOC-02	LIQUID	<u>1</u>	<u>1.70</u>	<u>N/A</u>	ug/mL
		2 STD			TOC-02	LIQUID	<u>3.00^{cs}</u>	<u>2.59^{cs}</u>	<u>N/A</u>	ug/mL
96001334	TANK 21-1	3 SAMPLE	S968000454	0	TOC-02	LIQUID	<u>N/A</u>	<u>4.40^{cs}</u>	<u>40</u>	ug/mL

Final page for worklist # 15372

Analyst Signature _____ Date _____

Analyst Signature RLB Date 12-4-96Approved RW Schuch 12/5/96

Data Entry Comments:

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

12/03/96 09:27
A-0004-1

CANC #1

Page: 1

LABCORE Data Entry Template for Worklist# 15372

Analyst: JS Instrument: TOC01 _____ Book# 72C 22N12-F

Method: LA-342-100 Rev/Mod _____

TOC ^{10AS} ~~22C~~ 24N12-F

Worklist Comment: 21-ITK TOC. RCJ

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	BLNK				TOC-02	LIQUID		
2	STD				TOC-02	LIQUID		
3	SAMPLE	S96B000454 0			TOC-02	LIQUID	96001334	TANK 21-1

Analytes Requested: TOC-02

Final page for worklist # 15372

JS Sniffen 12-3-96
 Analyst Signature _____ Date _____

 Analyst Signature _____ Date _____

Very limited sample left (<.25mL). Run with largest sample
 size possible
JS Sniffen 12/3/96

Data Entry Comments:

NO MORE SAMPLE, U.I.P.

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

CARB #1

TIC/TOC: LA-342-100 (E-0)

WORKLIST
#ANALYST
INITIALSANALYSIS
DATEANALYSIS
TIMEINSTRUMENT
CODE

WL 15372

088

12-3-96

2400

☒ BASELINE
BLANK☐ SAMPLE
DUPLICATE☐ SPIKE
TRIPLICATE

SAMPLE # =

STD # =

SAMPLE WEIGHT (g)

SPIKE/STANDARD VOLUME (mL)

TIC:

TOC:

FINAL COULOMETER READING (u TIC: 8.00 TOC: 30.90

☐ BASELINE
BLANK☐ SAMPLE
DUPLICATE☐ SPIKE
TRIPLICATE

SAMPLE # =

STD # =

SAMPLE WEIGHT (g)

SPIKE/STANDARD VOLUME (mL)

TIC:

TOC:

FINAL COULOMETER READING (u TIC: TOC:

☐ BASELINE
BLANK☐ SAMPLE
DUPLICATE☐ SPIKE
TRIPLICATE

SAMPLE # =

STD # =

SAMPLE WEIGHT (g)

SPIKE/STANDARD VOLUME (mL)

TIC:

TOC:

FINAL COULOMETER READING (u TIC: 597.50 TOC: 548.00

☐ BASELINE
BLANK☐ SAMPLE
DUPLICATE☐ SPIKE
TRIPLICATE

SAMPLE # =

STD # =

SAMPLE WEIGHT (g)

SPIKE/STANDARD VOLUME (mL)

TIC:

TOC:

FINAL COULOMETER READING (u TIC: TOC:

☒ BASELINE
BLANK☐ SAMPLE
DUPLICATE☐ SPIKE
TRIPLICATE

SAMPLE # =

STD # =

SAMPLE WEIGHT (g)

SPIKE/STANDARD VOLUME (mL)

TIC:

TOC:

FINAL COULOMETER READING (u TIC: 9.00 TOC: 32.60

☐ BASELINE
BLANK☐ SAMPLE
DUPLICATE☐ SPIKE
TRIPLICATE

SAMPLE # =

STD # =

SAMPLE WEIGHT (g)

SPIKE/STANDARD VOLUME (mL)

TIC:

TOC:

FINAL COULOMETER READING (u TIC: TOC:

☐ BASELINE
BLANK☒ SAMPLE
DUPLICATE☐ SPIKE
TRIPLICATE

SAMPLE # =

STD # =

SAMPLE WEIGHT (g)

SPIKE/STANDARD VOLUME (mL)

TIC:

TOC:

FINAL COULOMETER READING (u TIC: 41.90

☐ BASELINE
BLANK☐ SAMPLE
DUPLICATE☐ SPIKE
TRIPLICATE

SAMPLE # =

STD # =

SAMPLE WEIGHT (g)

SPIKE/STANDARD VOLUME (mL)

TIC:

TOC:

FINAL COULOMETER READING (u TIC: TOC:

#1

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

Sample: BASELINE

Date: 12/03/96

Time: 22:16:23

Sample Size = 1 uL

Dil Factor = 1

Blank ID # = BASELINE

Blank Value = N/A

Analyst : DG GRIFFIN

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading ==	==== Analysis Time ==	==== Coulometer ==	==== % Difference ==
1	0.51	0.30	0.00
2	1.01	2.00	85.00
3	1.50	8.80	77.27
4	2.00	16.20	45.68
5	2.50	20.40	20.59
6	3.00	22.40	8.93
7	3.50	23.60	5.08
8	4.00	24.70	4.45
9	4.50	25.60	3.52
10	5.00	26.30	2.66
11	5.50	26.90	2.23
12	6.00	27.40	1.82
13	6.50	27.80	1.44
14	7.00	28.20	1.42
15	7.50	28.60	1.40
16	8.00	28.90	1.04
17	8.50	29.20	1.03
18	9.00	29.60	1.35
19	9.50	29.90	1.00
20	10.00	30.30	1.32
21	10.50	30.50	0.66
22	11.00	30.90	1.29

BLANK VALUE = 30.9 micrograms carbon

BLANK FACTOR = 30.9 / 11.00061 =

+2.81E+00 ug/min Carbon

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

SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT
 COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 85 TO 88.

Sample Run By:

DG GRIFFIN

00000

#1

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: STD 24N12-E

Date: 12/03/96

Time: 22:47:39

Sample Size = 200 uL

Dil Factor = 1

Blank ID # =

Blank Value = 2.81 ug/minute C

Analyst : DG GRIFFIN

Min Readings = 22

Max Readings = 22

% Difference = 10

== Reading ==	Analysis Time	Coulometer	% Difference
1	0.51	0.40	0.00
2	1.01	1.90	78.95
3	1.50	24.50	92.24
4	2.00	164.20	85.08
5	2.50	392.60	58.18
6	3.00	495.50	20.77
7	3.50	526.30	5.85
8	4.00	536.00	1.81
9	4.50	540.10	0.76
10	5.00	542.00	0.35
11	5.50	543.20	0.22
12	6.00	543.90	0.13
13	6.50	544.40	0.09
14	7.00	545.20	0.15
15	7.50	545.40	0.04
16	8.00	545.90	0.09
17	8.50	546.40	0.09
18	9.00	546.60	0.04
19	9.50	547.00	0.07
20	10.00	547.40	0.07
21	10.50	547.70	0.05
22	11.00	548.00	0.05

USER INPUT BLANK VALUE

BLANK VALUE = 30.91171 micrograms carbon

BLANK FACTOR = 30.91171 / 11.00061 = +2.8E+00 ug/min Carbon

SAMPLE RESULTS:

(548 - 30.90966) (1)/(200) = +2.585E+00 g/L Carbon
 (548 - 30.90966) (1)/(200) (12) = +2.155E-01 Molar Carbon
 <<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!>>>>

Sample Run By:

DG GRIFFIN

00000

#/

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: BLANK

Date: 12/03/96

Time: 23:14:31

Sample Size = 1 uL

Dil Factor = 1

Blank ID # =

Blank Value = 2.81 ug/minute C

Analyst : DG GRIFFIN

Min Readings = 22

Max Readings = 22

% Difference = 10

```

== Reading ==== Analysis Time ==== Coulometer ==== % Difference ==
 1          0.51          0.30          0.00
 2          1.01          1.90          84.21
 3          1.51          9.00          78.89
 4          2.01         18.00         50.00
 5          2.51         23.00         21.74
 6          3.00         25.30          9.09
 7          3.50         26.50          4.53
 8          4.00         27.50          3.64
 9          4.50         28.30          2.83
10          5.00         28.80          1.74
11          5.50         29.30          1.71
12          6.00         29.70          1.35
13          6.50         30.00          1.00
14          7.00         30.40          1.32
15          7.50         30.70          0.98
16          8.00         31.00          0.97
17          8.50         31.20          0.64
18          9.00         31.50          0.95
19          9.50         31.80          0.94
20         10.00         32.00          0.63
21         10.50         32.30          0.93
22         11.00         32.60          0.92
  
```

USER INPUT BLANK VALUE

BLANK VALUE = 30.91171 micrograms carbon

BLANK FACTOR = 30.91171 / 11.00061 = +2.8E+00 ug/min Carbon

SAMPLE RESULTS:

```

( 32.6 - 30.90966 ) (1)/(1) = +1.69E+00 g/L Carbon
( 32.6 - 30.90966 ) (1)/(1) (12) = +1.41E-01 Molar Carbon
<<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!>>>>
  
```

Sample Run By:

DG GRIFFIN

00000

#1

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: S96T000454

Date: 12/03/96

Time: 23:45:49

Sample Size = 1 uL

Dil Factor = 1

Blank ID # =

Blank Value = 2.81 ug/minute C

Analyst : DG GRIFFIN

Min Readings = 22

Max Readings = 22

% Difference = 10

```

== Reading ==== Analysis Time ==== Coulometer ==== % Difference ==
  1          0.51          0.30          0.00
  2          1.01          1.20          75.00
  3          1.50          7.70          84.42
  4          2.00          18.90         59.26
  5          2.50          28.50         33.68
  6          3.00          32.90         13.37
  7          3.50          34.80          5.46
  8          4.00          36.10          3.60
  9          4.50          37.00          2.43
 10          5.00          37.80          2.12
 11          5.50          38.50          1.82
 12          6.00          38.90          1.03
 13          6.50          39.30          1.02
 14          7.00          39.70          1.01
 15          7.50          40.00          0.75
 16          8.00          40.30          0.74
 17          8.50          40.60          0.74
 18          9.00          41.00          0.98
 19          9.50          41.20          0.49
 20         10.00          41.40          0.48
 21         10.50          41.70          0.72
 22         11.00          41.90          0.48

```

USER INPUT BLANK VALUE

BLANK VALUE = 30.91171 micrograms carbon

BLANK FACTOR = 30.91171 / 11.00061 = +2.8E+00 ug/min Carbon

SAMPLE RESULTS:

```

( 41.9 - 30.90931 ) (1)/(1) = +1.10E+01 g/L Carbon
( 41.9 - 30.90931 ) (1)/(1) (12) = +9.16E-01 Molar Carbon
<<<< WARNING - BLANK VALUE EXCEEDS 1.5 ug/min Carbon!!!!>>>>

```

Sample Run By:

DG GRIFFIN

00000

TIC/TOC : LA-342-100 (E-0)

LIQUIDS

		TIC	TOC
	Sample Size in mL (SS)		0.0000
BLANK	Dilution Factor (DF)		1
	µg of Carbon in Sample (C1)		32.6
15372	µg of Carbon from Baseline (C2)		30.9

TOC-02

LIQUID

µg of Carbon = |C1-C2|

BLNK

TOC01

RTS

RWS

DGG

12/04/96

12/03/96

	TIC	TOC
Method Detection Limit in µg/mL	5	40
µg of Carbon		1.70E+00

TANK-21-1

Data Entered By:	RTS	Date:	12/04/96
Signature of Chemist:	<i>RWS</i>	Date:	12/5/96

BLANK.WB1 REV 1.0

342100ML

TIC/TOC : LA-342-100 (E-0)

LIQUIDS

TIC	TOC
	0.2000
	1
	548
	30.9
	24N12E
	3000

LIQUID

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

QC Found in µg/mL = (C1 - C2) * DF / SS

QC Found in µg/mL for TIC = 5 if C1 < C2

QC Found in µg/mL for TOC = 40 if C1 < C2

STD

% Recovery = QC Found / QC Actual * 100

TOC01

RTS

RWS

DGG

12/04/96

NOTE: FOR TIC: The Reported Result is < 5.

12/03/96

TIC	TOC
5	40
	3.00E+03
	2.59E+03
	86.2

Method Detection Limit in µg/mL

QC Actual in µg/mL

QC Found in µg/mL See Note: <

TANK 21-1

Percent Standard Recovery

Data Entered By:

Signature of Chemist:

STANDARD WB1 REV 1.0

342100ML

Date:

12/04/96

Date:

12/5/96

TIC/TOC : LA-342-100 (E-0)

LIQUIDS

		TIC	TOC
SAMPLE	Sample Size in mL (SS)		0.2500
	Dilution Factor (DF)	1	1
	µg of Carbon in Sample (C1)		41.9
15372	µg of Carbon from Baseline (C2)		30.9
TOC-02			

LIQUID
S96B000454
TOC01
RTS
RWS
DGG
12/04/96
12/03/96
Method Detection Limit in µg/mL
µg of Carbon/mL Note: <
TANK 21-1

$\mu\text{g of Carbon/mL} = (C1 - C2) * DF / SS$
 $\mu\text{g of Carbon/mL for TIC} = 5 \text{ if } C1 < C2$
 $\mu\text{g of Carbon/mL for TOC} = 40 \text{ if } C1 < C2$

NOTE: FOR TIC: The Reported Result is < 5.

	TIC	TOC
Method Detection Limit in µg/mL	5	40
µg of Carbon/mL Note: <		4.40E+01

Data Entered By:	RTS	Date: 12/04/96
Signature of Chemist:	<i>RWS</i>	Date: 12/5/96

SAMPLE.WB1 REV 1.0

342100ML

WHC-SD-WM-DP-213, REV. 0

RADIOCHEMICAL ANALYSIS

WHC-SD-WM-DP-213, REV. 0

THIS PAGE WAS INTENTIONALLY LEFT BLANK

LABCORE Completed RadChem Report for Worklist#: 13777

Analyst: krq

Instrument: GEA03

Book#

Method: Rev/Mod

Worklist Comment: Sample size is on traveler.Std:TINKFUS (1.0ml). new

Seq Type	Sample#	R A	Test	Matrix	Actual	Found	DL or Yield	Unit
1 STD	0	0	0GEA-02	CO60-02	LIQUID	7.955e-03	7.82e-03	98.303 % Recovery
1 STD	0	0	0GEA-02	CO60-02E	LIQUID	1	2.26	% Ct Error
1 STD	0	0	0GEA-02	CS13702	LIQUID	7.717e-03	7.70e-03	99.780 % Recovery
1 STD	0	0	0GEA-02	CS13702E	LIQUID	1	2.93	% Ct Error
2 BLNK	0	0	0GEA-02	CO60-02	LIQUID	1	<2.60e-2	uCi/mL
2 BLNK	0	0	0GEA-02	CS13702	LIQUID	1	<6.18e-2	uCi/mL
2 BLNK	0	0	0GEA-02	EU15402	LIQUID	1	<6.67e-2	uCi/mL
2 BLNK	0	0	0GEA-02	EU15502	LIQUID	1	<6.42e-2	uCi/mL
2 BLNK	0	0	0GEA-02	AM24102	LIQUID	1	<1.54e-1	uCi/mL
3 SAMPLE	S96B000453	0	0GEA-02	CO60-02	LIQUID	N/A	2.325e-02	230.0e-004 uCi/mL
3 SAMPLE	S96B000453	0	0GEA-02	CO60-02E	LIQUID	N/A	n/a	0.0e+000 % Ct. Error
3 SAMPLE	S96B000453	0	0GEA-02	CS13702	LIQUID	N/A	4.370e+01	0.0e+000 uCi/mL
3 SAMPLE	S96B000453	0	0GEA-02	CS13702E	LIQUID	N/A	1.04	0.0e+000 % Ct. Error
3 SAMPLE	S96B000453	0	0GEA-02	EU15402	LIQUID	N/A	9.317e-02	930.0e-004 uCi/mL
3 SAMPLE	S96B000453	0	0GEA-02	EU15402E	LIQUID	N/A	n/a	0.0e+000 % Ct. Error
3 SAMPLE	S96B000453	0	0GEA-02	EU15502	LIQUID	N/A	2.503e-01	250.0e-003 uCi/mL
3 SAMPLE	S96B000453	0	0GEA-02	EU15502E	LIQUID	N/A	n/a	0.0e+000 % Ct. Error
3 SAMPLE	S96B000453	0	0GEA-02	AM24102	LIQUID	N/A	6.492e-01	649.0e-003 uCi/mL
3 SAMPLE	S96B000453	0	0GEA-02	AM24102E	LIQUID	N/A	n/a	0.0e+000 % Ct. Error
4 DUF	S96B000453	0	0GEA-02	CO60-02	LIQUID	<2.32e-2	<2.66e-2	RPD
4 DUF	S96B000453	0	0GEA-02	CO60-02E	LIQUID	1	n/a	% Ct Error
4 DUF	S96B000453	0	0GEA-02	CS13702	LIQUID	4.37e+01	4.26e+01	2.549 RPD
4 DUF	S96B000453	0	0GEA-02	CS13702E	LIQUID	1	1.06	1.060 % Ct Error
4 DUF	S96B000453	0	0GEA-02	EU15402	LIQUID	<9.32e-2	<6.67e-2	RPD
4 DUF	S96B000453	0	0GEA-02	EU15402E	LIQUID	1	n/a	% Ct Error
4 DUF	S96B000453	0	0GEA-02	EU15502	LIQUID	<2.50e-1	<2.54e-1	RPD
4 DUF	S96B000453	0	0GEA-02	EU15502E	LIQUID	1	n/a	% Ct Error
4 DUF	S96B000453	0	0GEA-02	AM24102	LIQUID	<6.49e-1	<6.38e-1	RPD
4 DUF	S96B000453	0	0GEA-02	AM24102E	LIQUID	1	n/a	% Ct Error
5 SAMPLE	S96B000454	0	0GEA-02	CO60-02	LIQUID	N/A	6.088e-04	100.0e-005 uCi/mL
5 SAMPLE	S96B000454	0	0GEA-02	CO60-02E	LIQUID	N/A	n/a	0.0e+000 % Ct. Error
5 SAMPLE	S96B000454	0	0GEA-02	CS13702	LIQUID	N/A	1.900e+01	0.0e+000 uCi/mL
5 SAMPLE	S96B000454	0	0GEA-02	CS13702E	LIQUID	N/A	0.230	0.0e+000 % Ct. Error
5 SAMPLE	S96B000454	0	0GEA-02	EU15402	LIQUID	N/A	4.092e-03	400.0e-005 uCi/mL
5 SAMPLE	S96B000454	0	0GEA-02	EU15402E	LIQUID	N/A	n/a	0.0e+000 % Ct. Error
5 SAMPLE	S96B000454	0	0GEA-02	EU15502	LIQUID	N/A	2.108e-02	210.0e-004 uCi/mL
5 SAMPLE	S96B000454	0	0GEA-02	EU15502E	LIQUID	N/A	n/a	0.0e+000 % Ct. Error
5 SAMPLE	S96B000454	0	0GEA-02	AM24102	LIQUID	N/A	5.496e-02	550.0e-004 uCi/mL
5 SAMPLE	S96B000454	0	0GEA-02	AM24102E	LIQUID	N/A	n/a	0.0e+000 % Ct. Error
6 DUF	S96B000454	0	0GEA-02	CO60-02	LIQUID	<6.09e-4	<5.13e-4	RPD
6 DUF	S96B000454	0	0GEA-02	CO60-02E	LIQUID	1	n/a	% Ct Error

11/25/96

LABCORE Completed RadChem Report for Worklist#: 13777

Seq Type	Sample#	R A	Test	Matrix	Actual	Found	DL or Yield	Unit
6 DUP	S96B000454	0	QGEA-02	C813702	LIQUID	1.90e+01	1.88e+01	1.050 RPD
6 DUP	S96B000454	0	QGEA-02	C813702E	LIQUID	1	0.230	0.230 % Ct Error
6 DUP	S96B000454	0	QGEA-02	EUI5402	LIQUID	<4.09e-3	<3.73e-3	RPD
6 DUP	S96B000454	0	QGEA-02	EUI5402E	LIQUID	1	n/a	% Ct Error
6 DUP	S96B000454	0	QGEA-02	EUI5502	LIQUID	<2.11e-2	<2.10e-2	RPD
6 DUP	S96B000454	0	QGEA-02	EUI5502E	LIQUID	1	n/a	% Ct Error
6 DUP	S96B000454	0	QGEA-02	AM24102	LIQUID	<5.50e-2	<5.45e-2	RPD
6 DUP	S96B000454	0	QGEA-02	AM24102E	LIQUID	1	n/a	% Ct Error

Comments Section:

Comments for sample# S96B000453 and test @GEA-02 .
DL=0 => n/a

Final page for worklist# 13777

Analyst Signature

Date

Analyst Signature

Date

Reviewer Signature

Date

Tech Review: Rachel 10/28/96

LABCORE Data Entry Template for Worklist# 13777

Analyst: ABQ Instrument: GEA00 _____ Book# 02B56

Method: LA-548-121 Rev/Mod E-0 223 11/2/96

Worklist Comment: Sample size is on traveler. Std: TINKFUS (1.0ml). new

(G. Miller Samples)

S Type	Sample#	R A	Test	Matrix	Group#	Project
1 STD			@GEA-02	LIQUID		
2 BLNK			@GEA-02	LIQUID		
3 SAMPLE	S96B000453 0		@GEA-02	LIQUID	96001333 TK 24-1	
Analytes Requested: AM24102 , AM24102E, CO60-02 , CO60-02E, CS13702 , CS13702E, EU15402 , EU15402E, EU15502 , EU15502E						
4 DUP	S96B000453 0		@GEA-02	LIQUID		
5 SAMPLE	S96B000454 0		@GEA-02	LIQUID	96001334 TK 21-1	
Analytes Requested: AM24102 , AM24102E, CO60-02 , CO60-02E, CS13702 , CS13702E, EU15402 , EU15402E, EU15502 , EU15502E						
6 DUP	S96B000454 0		@GEA-02	LIQUID		

Final page for worklist # 13777

Analyst Signature

Date

Analyst Signature

Date

Data Entry Comments:

 * 222-S Laboratory Counting Room 25-OCT-1996 03:35:08.01 *

>>>>>>> SAMPLE INFORMATION <<<<<<<<<

Worklist #: 13777
 Sample ID: WL13777-STD
 Sample Size: 1.00000E-03 L
 Dilution Factor: 1.00000E+00

Removed by:

SLH

>>>>>>> COUNT INFORMATION <<<<<<<<<

Detector ID: GEA3
 File Number: dka300:[spec.GEA3]3g3789.cnf
 Geometry: 42
 Count Time: 0 00:50:00.00 sec
 Real Time: 0 00:50:05.96 sec
 Dead Time: 0.2%

Verified by:

SLH 10-2790

>>>>>>> ANALYSIS INFORMATION <<<<<<<<<

Sample Count Time: 25-OCT-1996 02:44:22.84
 Decayed to: 25-OCT-1996 02:44:22.84
 Standard Deviations: 2
 Analysis Library: ENVGEA
 Analyst: SLH2
 Background Subtract: DKA300:[SPEC.GEA3]3GBACK

WHC-SD-WM-DP-213, REV. 0

>>>>>>> CALIBRATION INFORMATION <<<<<<<<<

Date of last energy calibration: 11-MAR-1994 11:47:01.11
 Date of last efficiency calibration: 15-MAR-1994 10:28:40.20

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/L
0	86.37	188	1.77	173.25	169	9	85.2		NP-237	0.696
0	122.88	15903	1.24	246.24	240	11	1.9		EU-152	17.9
									CO-57	5.92
									EU-154	12.5
									EU-154	13.7
0	247.42	2092	1.40	495.22	487	15	9.7			
0	344.15	828	1.63	688.61	684	9	13.5			
0	443.98	162	1.97	888.20	885	8	53.9			
0	582.39*	124	1.68	1164.97	1161	9	61.3			
0	591.80	675	1.61	1183.79	1177	16	19.0			
0	661.57*	6813	1.56	1323.31	1316	16	2.9		CS-137	7.70
0	691.85	147	1.84	1383.86	1378	14	72.1		CO-57	91.1
0	723.20	2179	1.67	1446.57	1440	15	6.5		EU-154	11.3
0	756.73	598	1.79	1513.63	1508	13	17.0			
0	778.94	215	1.82	1558.04	1553	11	38.6		EU-152	1.83
0	873.12	1102	1.61	1746.41	1740	15	11.0		EU-154	11.1
0	963.90	193	1.55	1927.99	1922	12	47.4		EU-152	1.77
0	996.10	885	1.75	1992.39	1986	12	11.7		EU-154	11.7
0	1004.58	1625	1.85	2009.36	2004	12	7.0		EU-154	12.5
0	1085.24	189	2.03	2170.71	2165	11	37.1		EU-152	2.81
0	1112.22	175	2.01	2224.68	2219	13	47.5		EU-152	1.95
0	1173.02	5005	1.87	2346.30	2336	20	3.3		CO-60	7.89
0	1246.01	61	1.43	2492.33	2487	11	59.9			

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/L
0	1274.21	2559	2.09	2548.75	2540	18	4.2		EU-154	12.6
0	1332.23	4426	2.01	2664.84	2655	19	3.1		CO-60	7.75
0	1397.03	52	1.51	2794.49	2785	18	51.2			
0	1407.79	202	2.35	2816.03	2806	18	16.5		EU-152	1.77
0	1493.75	49	0.66	2988.02	2983	12	34.9			
0	1596.22	137	2.24	3193.07	3186	16	19.4			

Total number of lines in spectrum 26
Number of unidentified lines 6
Number of lines tentatively identified by NID 20 76.92%

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/L	Wtd Mean Decay Corr uCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CO-57	271.80D	1.000	9.107E+01	9.107E+01	6.568E+01	72.12	BK6
CO-60	5.27Y	1.000	7.816E+00	7.816E+00	0.177E+00	2.26	
CS-137	30.00Y	1.000	7.700E+00	7.700E+00	0.226E+00	2.93	
EU-152	13.54Y	1.000	1.806E+00	1.806E+00	0.169E+00	9.37	
EU-154	8.59Y	1.000	1.219E+01	1.219E+01	0.034E+01	2.81	
NP-237	2.14E+06Y	1.000	6.958E-01	6.958E-01	5.926E-01	85.17	BK6
Total Activity :			1.213E+02	1.213E+02			<i>10/27/98</i>

Grand Total Activity : 1.213E+02 1.213E+02

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

100

 * 222-S Laboratory Counting Room 25-OCT-1996 05:37:00.64 *

>>>>>>> SAMPLE INFORMATION <<<<<<<<<

Worklist #: 13777
 Sample ID: WL13777-BLK
 Sample Size: 1.00000E-04 L
 Dilution Factor: 1.01000E+02

Removed by:

J. L. Hall

>>>>>>> COUNT INFORMATION <<<<<<<<<

Detector ID: GEA3
 File Number: NI3AC:1.cnf 3790
 Geometry: 42
 Count Time: 0 00:50:00.00 sec
 Real Time: 0 00:50:00.44 sec
 Dead Time: 0.0%

Verified by:

J. L. Hall 10-27-96

>>>>>>> ANALYSIS INFORMATION <<<<<<<<<

Sample Count Time: 25-OCT-1996 03:37:26.48
 Decayed to: 25-OCT-1996 03:37:26.48
 Standard Deviations: 2
 Analysis Library: ENVGEA
 Analyst: SLH2
 Background Subtract: DKA300:[SPEC.GEA3]3GBACK

WHC-SD-WM-DP-213, REV. 0

>>>>>>> CALIBRATION INFORMATION <<<<<<<<<

Date of last energy calibration: 11-MAR-1994 11:47:01.11
 Date of last efficiency calibration: 15-MAR-1994 10:28:40.20

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/L
0	609.06*	21	1.59	1218.31	1211	14112.7				
0	828.04	15	1.41	1656.24	1650	1166.7				
0	910.49*	14	2.18	1821.16	1815	11104.5				
0	1460.37*	24	2.36	2921.23	2911	18105.5			K-40	421.

Total number of lines in spectrum 4
Number of unidentified lines 1
Number of lines tentatively identified by NID 3 75.00%

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/L	Wtd Mean Decay Corr uCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.000	4.213E+02	4.213E+02	4.444E+02	105.50	BKG K-40 10.2746
Total Activity :			4.213E+02	4.213E+02			

Grand Total Activity : 4.213E+02 4.213E+02

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BE-7	36.	477.59	2.0075E+02
NA-22	8.	1274.53	2.2959E+01
NA-24	4.	1368.55	1.7105E+01
CR-51	45.	320.08	1.6753E+02
MN-54	17.	834.83	2.2769E+01
CO-56	12.	846.76	1.9313E+01
CO-57	69.	122.06	1.4521E+01
CO-58	17.	810.78	2.2577E+01
FE-59	10.	1099.25	3.8702E+01
CO-60	10.	1332.50	2.5993E+01
SE-75	57.	264.66	2.8367E+01
SR-85	37.	514.01	2.3024E+01
Y-88	3.	1836.06	1.8354E+01
NB-94	20.	871.09	2.5343E+01
ZRNB-95	21.	724.18	5.1745E+01
RU-103	33.	497.08	2.2573E+01
RURH-106	35.	621.93	5.1507E+02
AG-108m	20.	722.94	2.3768E+01
CD-109	66.	88.03	4.7040E+02
AG-110M	26.	657.76	2.4340E+01
SN-113	42.	391.69	2.9642E+01
TE-123m	91.	159.00	1.7152E+01
SB-124	20.	602.73	1.9104E+01
SB-125	48.	427.89	7.4304E+01
TE-125m	75.	109.27	4.9270E+03
I-131	38.	364.48	2.1286E+01
CS-134	19.	604.70	1.8653E+01
CS-137	136.	661.66	6.1837E+01
BA-140	26.	537.31	7.9641E+01
LA-140	4.	1596.21	1.8818E+01
CEPR-144	87.	133.51	2.4639E+02
EU-152	7.	1408.01	1.0868E+02
EU-154	8.	1274.51	6.6702E+01
EU-155	71.	105.31	6.4209E+01
HG-203	53.	279.20	2.0420E+01
TL-208	57.	277.36	2.7222E+02
BI-212	25.	727.18	3.6787E+02
PB-212	91.	238.63	4.4618E+01
BI-214	53.	609.31	6.8874E+01
PB-214	68.	351.92	1.1093E+02
RA-224	77.	240.99	4.5457E+02
RA-226	91.	186.10	4.5103E+02
AC-228	35.	911.21	1.3158E+02
TH-228	75.	84.37	1.5481E+03
TH-229	66.	88.47	6.8160E+01
PA-233	55.	312.17	4.7584E+01
UTH-233	51.	245.34	1.3841E+04
PA-234M	11.	1001.03	3.6394E+01
TH-234	53.	63.29	8.7605E+02
U-235	91.	185.71	2.7356E+01
NP-237	69.	86.48	1.4419E+02

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
NP-239	78.	106.12	6.3871E+01
PU-239	67.	129.30	1.8821E+05
AM-241	53.	59.54	1.5353E+02
AM-243	73.	74.67	4.2604E+01

Total number of lines in spectrum	2	
Number of unidentified lines	1	
Number of lines tentatively identified by NID	1	50.00%

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/L	Wtd Mean Decay Corr uCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CS-137	30.00Y	1.000	1.901E+04	1.901E+04	0.004E+04	0.23	
Total Activity :			1.901E+04	1.901E+04			

Grand Total Activity :	1.901E+04	1.901E+04
------------------------	-----------	-----------

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BE-7	24305.	477.59	1.0786E+02
NA-22	73.	1274.53	1.4094E+00
NA-24	8.	1368.55	5.0328E-01
K-40	136.	1460.75	2.0033E+01
CR-51	19191.	320.08	7.2124E+01
MN-54	358.	834.83	2.1713E+00
CO-56	361.	846.76	2.2083E+00
CO-57	19655.	122.06	5.0952E+00
CO-58	407.	810.78	2.2707E+00
FE-59	152.	1099.25	3.1726E+00
CO-60	13.	1332.50	6.0879E-01
SE-75	21081.	264.66	1.1325E+01
SR-85	11986.	514.01	8.6598E+00
Y-88	2.	1836.06	3.0982E-01
NB-94	304.	871.09	2.0773E+00
ZRNB-95	625.	724.18	5.8154E+00
RU-103	14845.	497.08	9.8979E+00
RURH-106	4275.	621.93	1.1766E+02
AG-108m	628.	722.94	2.7999E+00
CD-109	16833.	88.03	1.5614E+02
AG-110M	20172.	657.76	1.4050E+01
SN-113	20762.	391.69	1.3757E+01
TE-123m	20349.	159.00	5.3335E+00
SB-124	4571.	602.73	6.0091E+00
SB-125	24778.	427.89	3.5083E+01
TE-125m	18202.	109.27	1.5964E+03
I-131	19792.	364.48	1.0043E+01
CS-134	4577.	604.70	6.0409E+00
BA-140	8813.	537.31	3.0348E+01
LA-140	4.	1596.21	4.1454E-01
CEPR-144	20315.	133.51	7.8347E+01
EU-152	12.	1408.01	2.9068E+00
EU-154	73.	1274.51	4.0924E+00
EU-155	17801.	105.31	2.1084E+01
HG-203	20370.	279.20	8.3013E+00
TL-208	20518.	277.36	1.0703E+02
BI-212	609.	727.18	3.7830E+01
PB-212	23422.	238.63	1.4846E+01
BI-214	4643.	609.31	1.3341E+01
PB-214	19402.	351.92	3.9767E+01
RA-224	23256.	240.99	1.6426E+02
RA-226	27018.	186.10	1.6162E+02
AC-228	290.	911.21	7.9251E+00
TH-228	16947.	84.37	4.8248E+02
TH-229	16967.	88.47	2.2719E+01
PA-233	19006.	312.17	1.8387E+01
UTH-233	22697.	245.34	6.0823E+03
PA-234M	179.	1001.03	3.0424E+00
TH-234	15750.	63.29	3.1329E+02
U-235	26739.	185.71	9.7722E+00
NP-237	16819.	86.48	4.6875E+01

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
NP-239	17824.	106.12	2.0048E+01
PU-239	20017.	129.30	6.7681E+04
AM-241	15563.	59.54	5.4957E+01
AM-243	16339.	74.67	1.3235E+01

 * 222-S Laboratory Counting Room 25-OCT-1996 10:05:26.01 *

>>>>>>> SAMPLE INFORMATION <<<<<<<<<

Worklist #: 13777
 Sample ID: S96B000454-DUP
 Sample Size: 1.00000E-03 L
 Dilution Factor: 2.10000E+01

Removed by:

M. Buela

>>>>>>> COUNT INFORMATION <<<<<<<<<

Detector ID: GEA3
 File Number: dka300:[spec.GEA3]3g3794.cnf
 Geometry: 42
 Count Time: 0 00:50:00.00 sec
 Real Time: 0 00:51:39.21 sec
 Dead Time: 3.2%

Verified by:

H. L. [Signature] 10-27-96

WHC-SD-WM-DP-213, REV. C

>>>>>>> ANALYSIS INFORMATION <<<<<<<<<

Sample Count Time: 25-OCT-1996 09:13:09.15
 Decayed to: 25-OCT-1996 09:13:09.15
 Standard Deviations: 2
 Analysis Library: ENVGEA
 Analyst: AKH
 Background Subtract: DKA300:[SPEC.GEA3]3GBACK

>>>>>>> CALIBRATION INFORMATION <<<<<<<<<

Date of last energy calibration: 11-MAR-1994 11:47:01.11
 Date of last efficiency calibration: 15-MAR-1994 10:28:40.20

Post-NID Peak Search Report

It	Energy	Area	FWHM	Channel	Left	Pw	%Err	Fit	Nuclides	Activity uCi/L
0	661.55*	792944	1.59	1323.27	1315	17	0.2		CS-137	1.882E+04
0	1322.00	145	4.42	2644.37	2638	16	35.3			

Total number of lines in spectrum	2	
Number of unidentified lines	1	
Number of lines tentatively identified by NID	1	50.00%

Nuclide Type :

Nuclide	Hlife	Decay	Wtd Mean Uncorrected uCi/L	Wtd Mean Decay Corr uCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CS-137	30.00Y	1.000	1.882E+04	1.882E+04	0.004E+04	0.23	
Total Activity :			1.882E+04	1.882E+04			

Grand Total Activity :	1.882E+04	1.882E+04
------------------------	-----------	-----------

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
BE-7	23966.	477.59	1.0710E+02
NA-22	60.	1274.53	1.2810E+00
NA-24	6.	1368.55	4.3585E-01
K-40	135.	1460.75	1.9959E+01
CR-51	18691.	320.08	7.1180E+01
MN-54	374.	834.83	2.2212E+00
CO-56	366.	846.76	2.2233E+00
CO-57	19350.	122.06	5.0555E+00
CO-58	389.	810.78	2.2210E+00
FE-59	130.	1099.25	2.9403E+00
CO-60	9.	1332.50	5.1272E-01
SE-75	20892.	264.66	1.1274E+01
SR-85	12268.	514.01	8.7612E+00
Y-88	3.	1836.06	3.8163E-01
NB-94	296.	871.09	2.0507E+00
ZRNB-95	598.	724.18	5.6856E+00
RU-103	14871.	497.08	9.9064E+00
RURH-106	4386.	621.93	1.1917E+02
AG-108m	611.	722.94	2.7620E+00
CD-109	16759.	88.03	1.5579E+02
AG-110M	19110.	657.76	1.3675E+01
SN-113	20696.	391.69	1.3735E+01
TE-123m	20509.	159.00	5.3545E+00
SB-124	4471.	602.73	5.9429E+00
SB-125	24003.	427.89	3.4531E+01
TE-125m	18056.	109.27	1.5900E+03
I-131	19247.	364.48	9.9038E+00
CS-134	4475.	604.70	5.9735E+00
BA-140	8644.	537.31	3.0055E+01
LA-140	5.	1596.21	4.6347E-01
CEPR-144	20125.	133.51	7.7979E+01
EU-152	13.	1408.01	3.0399E+00
EU-154	61.	1274.51	3.7277E+00
EU-155	17642.	105.31	2.0990E+01
HG-203	20221.	279.20	8.2710E+00
TL-208	20102.	277.36	1.0594E+02
BI-212	606.	727.18	3.7741E+01
PB-212	23546.	238.63	1.4885E+01
BI-214	4565.	609.31	1.3229E+01
PB-214	19203.	351.92	3.9555E+01
RA-224	23106.	240.99	1.6373E+02
RA-226	26843.	186.10	1.6110E+02
AC-228	241.	911.21	7.2202E+00
TH-228	16731.	84.37	4.7940E+02
TH-229	16766.	88.47	2.2585E+01
PA-233	18980.	312.17	1.8375E+01
UTH-233	22416.	245.34	6.0446E+03
PA-234M	191.	1001.03	3.1464E+00
TH-234	15665.	63.29	3.1244E+02
U-235	26636.	185.71	9.7532E+00
NP-237	16672.	86.48	4.6669E+01

Nuclide	Bckgnd Sum	Energy (keV)	MDA (uCi/L)
NP-239	17771.	106.12	2.0018E+01
PU-239	19903.	129.30	6.7486E+04
AM-241	15291.	59.54	5.4474E+01
AM-243	16400.	74.67	1.3260E+01

LABCORE Completed RadChem Report for Worklist#: 13772

Analyst: knt

Instrument: AB12

Book# _____

Method: _____ Rev/Mod _____

Worklist Comment: Determine sample size using ludlum.Std:TINKFUS (1.0ml).new

Seq Type	Sample# R A	Test	Matrix	Actual	Found	DL or Yield	Unit
1 STD	0	@SR90-01 SR90-01 LIQUID		1.40E-03	1.47E-3	105.000	% Recovery
1 STD	0	@SR90-01 SR90-01C LIQUID		100	9.34E+01	93.400	% Recovery
1 STD	0	@SR90-01 SR90-01E LIQUID		1.00	1.62E+00	1.620	% Ct. Error
2 BLNK	0	@SR90-01 SR90-01 LIQUID		1	7.09E-4	70.900E-005	uCi/mL
2 BLNK	0	@SR90-01 SR90-01C LIQUID		100	9.26E+01	92.600	% Recovery
2 BLNK	0	@SR90-01 SR90-01E LIQUID		1.00	1.15E+02	115.000	uCi/mL
3 BLNK/BKG	0	@SR90-01 SR90-01 LIQUID		1	1.52E+00	1.520	BLNK/BKG
4 SAMPLE	S96B000453	@SR90-01 SR90-01 LIQUID		N/A	7.68E+01	217.0E-004	uCi/mL
4 SAMPLE	S96B000453	@SR90-01 SR90-01C LIQUID		N/A	8.82E+01	0.0E+000	% Recovery
4 SAMPLE	S96B000453	@SR90-01 SR90-01E LIQUID		N/A	7.24E-01	0.0E+000	% Ct. Error
5 DUP	S96B000453	@SR90-01 SR90-01 LIQUID		7.68E+1	7.33E+1	4.664	RPD
5 DUP	S96B000453	@SR90-01 SR90-01C LIQUID		100	9.24E+01	92.400	% Recovery
5 DUP	S96B000453	@SR90-01 SR90-01E LIQUID		1.00	7.32E-01	0.732	% Ct. Error
6 SAMPLE	S96B000454	@SR90-01 SR90-01 LIQUID		N/A	4.88E-01	109.0E-005	uCi/mL
6 SAMPLE	S96B000454	@SR90-01 SR90-01C LIQUID		N/A	8.83E+01	0.0E+000	% Recovery
6 SAMPLE	S96B000454	@SR90-01 SR90-01E LIQUID		N/A	2.04E+00	0.0E+000	% Ct. Error
7 DUP	S96B000454	@SR90-01 SR90-01 LIQUID		4.88E-1	5.01E-1	2.629	RPD
7 DUP	S96B000454	@SR90-01 SR90-01C LIQUID		100	9.17E+01	91.700	% Recovery
7 DUP	S96B000454	@SR90-01 SR90-01E LIQUID		1.00	1.98E+00	1.980	% Ct. Error

Handwritten: 11/25/96

Final page for worklist# 13772

Analyst Signature _____ Date _____

Handwritten Signature _____ *10-22-96*
Analyst Signature Date

Handwritten Signature _____ OCT 23 1996
Reviewer Signature Date

LABCORE Data Entry Template for Worklist# 13772

Analyst: KNT Instrument: AB00 12 Book# 62B56

Method: LA-220-101 Rev/Mod D-1

Worklist Comment: Determine sample size using ludlum.Std:TINKFUS (1.0ml).new

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				@SR90-01	LIQUID		
2	BLNK				@SR90-01	LIQUID		
3	BLNK/BKG				@SR90-01	LIQUID		
4	SAMPLE	S96B000453 0			@SR90-01	LIQUID	96001333	TK 24-1
					Analytes Requested: SR90-01 , SR90-01C, SR90-01E			
5	DUP	S96B000453 0			@SR90-01	LIQUID		
6	SAMPLE	S96B000454 0			@SR90-01	LIQUID	96001334	TK 21-1
					Analytes Requested: SR90-01 , SR90-01C, SR90-01E			
7	DUP	S96B000454 0			@SR90-01	LIQUID		

Final page for worklist # 13772

Kin Thomas 10-21-96
Analyst Signature Date

Analyst Signature Date

Data Entry Comments:

WORKBOOK PAGE: STD1

Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1) LIQUIDS

				STANDARD
	DETECTOR NUMBER	12	CARRIER ADDED in mL (CVA)	1.000
STD	TOTAL COUNTS (TC)	14764	GROSS WEIGHT (W2)	7.9274
	COUNT TIME in MINUTES (CT)	10	TARE WEIGHT (W1)	7.8340
13772	BACKGROUND in cpm (BKG)	2.7	NET WEIGHT (W3)	0.0934
	SAMPLE VOLUME in mL (SS)	1.000	DELTA TIME (HOURS) (DT)	13.80
@SR90-01	DILUTION FACTOR (DF)	1		
	DIGEST DILUTION FACTOR DDF	1		
LIQUID	SAMPLE COUNT RATE (Rs)	1473.70	Sr-90 EFFICIENCY FACTO (C1)	0.4180
	CRITICAL LEVEL (Lc)	0.99	Y-90 EFFICIENCY FACTOR (C2)	0.4660
96010293	TIME OF SEPARATION (ST)	12:40	Rmax	N/A
	DATE OF SEPARATION (SD)	10/21/96	DETECTION LIMIT (Ld)	2.07
0	TIME OF COUNT (TOC)	02:28	Sr-89/90 CONC. in µCi/L	1.4730E+00
	DATE OF COUNT (DOC)	10/22/96		
N/A	STANDARD BOOK #	62B56		
	STANDARD VALUE in µCi/mL	1.3994E-03		
STANDARD				
AB00	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)			
	Sr-89/90 CONC in µCi/mL REPLACE RS WITH RMAX IF RS<Lc AND RS>=0 OR REPLACE RS WITH Lc IF RS<0			
RCJ	RS*DF*DDF*1000/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)			
	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))			
SLF	Relative Counting Error = The Square Root of ((TC + BKG * CT) / (TC - BKG * CT)*1.96)			
	Percent Carrier Recovery = (Net Weight / Expected weight) * 100			
KNT	NOTE: Expected weight = CVA * 0.1			
	Detection Levels and Less Than Values are determined from Procedure LA-508-002.			
10/22/96	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100			
10/21/96	Sr-89/90 CONCENTRATION	1.47E-03	µCi/mL	DETECTION LEVEL 2.07E-06 µCi/L
12:40 PM	RELATIVE COUNTING ERROR	1.6%		
TK24-1,21-1	PERCENT CARRIER RECOVERY	93.4%		

Analyst:	KNT	Date:	22-Oct-96
Signature of Chemist:	SLF	Date:	OCT 23 1996

STANDARD.WB1 REV 2.0

22010NML

WORKBOOK PAGE: BLANK2

LA-220-101 / D-1 Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

						BLNK
	DETECTOR NUMBER	12	CARRIER ADDED in mL	(CVA)	1.000	
BLNK	TOTAL COUNTS (TC)	41	GROSS WEIGHT	(W2)	7.9139	
	COUNT TIME in MINUTES (CT)	10	TARE WEIGHT	(W1)	7.8213	
13772	BACKGROUND in cpm (BKG)	2.7	NET WEIGHT	(W3)	0.0926	
	SAMPLE VOLUME in mL (SS)	0.200	DELTA TIME (HOURS)	(DT)	14.42	
@SR90-01	DILUTION FACTOR (DF)	101				
	DIGEST DILUTION FACTOR (DDF)	1				
LIQUID	SAMPLE COUNT RATE (Rs)	1.40	Sr-90 EFFICIENCY FACTOR (C1)		0.4180	
	CRITICAL LEVEL (Lc)	0.99	Y-90 EFFICIENCY FACTOR (C2)		0.4660	
96010293	TIME OF SEPARATION (ST)	12:40	Rmax		N/A	
	DATE OF SEPARATION (SD)	10/21/96	DETECTION LIMIT (Ld)		2.07	
0	TIME OF COUNT (TOC)	03:05	Sr-89/90 CONC in µCi/L		7.0886E-01	
	DATE OF COUNT (DOC)	10/22/96				
N/A						
BLANK						
	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)					
AB00	Sr-89/90 CONC in µCi/L Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0					
	RS*DF*DDF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT))))*SS*REC*2220000					
RCJ	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))					
	Relative Counting Error = (The Square Root of (TC + BKG * CT) / (TC - BKG * CT))*1.96					
SLF	Percent Carrier Recovery = (Net Weight / Expected weight) * 100					
	NOTE: Expected weight = CVA * 0.1					
KNT	Detection Levels and Less Than Values are determined from Procedure LA-508-002.					
	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100					
10/22/96						
10/21/96	Sr-89/90 CONCENTRATION	7.09E-04	µCi/mL			DETECTION LEVEL
12:40 PM	RELATIVE COUNTING ERROR	115.4%				1.05E-03
						µCi/mL
TK24-1,21-1	PERCENT CARRIER RECOVERY	92.6%				

Analyst:	KNT	Date:	22-Oct-96
Signature of Chemist:	SLF	Date:	OCT 23 1996

BLANK.WB1 REV 2.0

22010NML

WORKBOOK PAGE: SAM6

Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

				SAMPLE	
	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA) 1.000
SAMPLE	TOTAL COUNTS	(TC) 9282	GROSS WEIGHT	(W2)	7.9415
	COUNT TIME in MINUTES	(CT) 10	TARE WEIGHT	(W1)	7.8532
13772	BACKGROUND in cpm	(BKG) 2.7	NET WEIGHT	(W3)	0.0883
	SAMPLE VOLUME in mL	(SS) 0.200	DELTA TIME (HOURS)	(DT)	15.20
@SR90-01	DILUTION FACTOR	DF 101			
	DIGEST DILUTION FACTOR	(DDF) 1			
LIQUID	SAMPLE COUNT RATE	(Rs) 925.50	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
	CRITICAL LEVEL	(Lc) 0.99	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
96010293	TIME OF SEPARATION	(ST) 12:40	Rmax		N/A
	DATE OF SEPARATION	(SD) 10/21/96	DETECTION LIMIT	(Ld)	2.07
0	TIME OF COUNT	(TOC) 03:52	Sr-89/90 CONC in µCi/L		4.8805E+02
	DATE OF COUNT	(DOC) 10/22/96			
N/A					

S96B000454

	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)				
AB00	Sr-89/90 CONC in µCi/L Replace RS with RMAX if RS<=Lc and RS>=0 or Replace RS with Lc if RS<0				
	RS*DF*DDF/((C1+C2*(1-e to the power of ((-natural log 2)/64.2*DT)))*SS*REC*2220000)				
RCJ	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))				
	Relative Counting Error = (The Square Root of (TC + BKG * CT) / (TC - BKG * CT))*1.96				
SLF	Percent Carrier Recovery = (Net Weight / Expected weight) * 100				
	NOTE: Expected weight = CVA * 0.1				
KNT	Detection Levels and Less Than Values are determined from Procedure LA-508-002.				
	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100				
10/22/96					
10/21/96	Sr-89/90 CONCENTRATION	4.88E-01	µCi/mL	DETECTION LEVEL 1.09E-03 µCi/mL	
12:40 PM	RELATIVE COUNTING ERROR	2.0%			
TK24-1,21-1	PERCENT CARRIER RECOVERY	88.3%			

Analyst:	KNT	Date:	22-Oct-96
Signature of Chemist:	SLF	Date:	OCT 23 1996
SAMPLE.WB1 REV 2.0	22010NML		

WORKBOOK PAGE: DUP7

Sr-89/90 : LA-220-101 (D-1), 102 (E-3), 104 (D-1)

						DUP
DUP	DETECTOR NUMBER		12	CARRIER ADDED in mL	(CVA)	1.000
	TOTAL COUNTS	(TC)	9913	GROSS WEIGHT	(W2)	7.9328
	COUNT TIME in MINUTES	(CT)	10	TARE WEIGHT	(W1)	7.8411
13772	BACKGROUND in cpm	(BKG)	2.7	NET WEIGHT	(W3)	0.0917
	SAMPLE VOLUME in mL	(SS)	0.200	DELTA TIME (HOURS)	(DT)	15.42
@SR90-01	DILUTION FACTOR	DF	101			
	DIGEST DILUTION FACTOR	(DDF)	1			
LIQUID	SAMPLE COUNT RATE	(Rs)	988.60	SR-90 EFFICIENCY FACTOR	(C1)	0.4180
	CRITICAL LEVEL	(Lc)	0.99	Y-90 EFFICIENCY FACTOR	(C2)	0.4660
96010293	TIME OF SEPARATION	(ST)	12:40	Rmax		N/A
	DATE OF SEPARATION	(SD)	10/21/96	DETECTION LIMIT	(Ld)	2.07
0	TIME OF COUNT	(TOC)	04:05	Sr-89/90 CONC in $\mu\text{Ci/L}$		5.0105E+02
	DATE OF COUNT	(DOC)	10/22/96			
N/A						
S96B000454						
AB00	Sample Count Rate (Rs) = (Total Counts (TC) / Count Time (CT)) - Background in cpm (BKG)					
	Sr-89/90 CONC in $\mu\text{Ci/L}$ Replace RS with RMAX if $\text{RS} \leq \text{Lc}$ and $\text{RS} > 0$ or Replace RS with Lc if $\text{RS} < 0$					
RCJ	$\text{RS} * \text{DF} * \text{DDF} / ((\text{C1} + \text{C2} * (1 - e \text{ to the power of } ((-\text{natural log } 2) / 64.2 * \text{DT}))) * \text{SS} * \text{REC} * 22200000)$					
	NOTE: 64.2 = Half Life for Y-90 and Rec. = Fractional Carrier Recovery ((W2-W1) / (CVA * 0.1000))					
SLF	Relative Counting Error = (The Square Root of (TC + BKG * CT) / (TC - BKG * CT)) * 1.96					
	Percent Carrier Recovery = (Net Weight / Expected weight) * 100					
KNT	NOTE: Expected weight = CVA * 0.1					
	Detection Levels and Less Than Values are determined from Procedure LA-508-002.					
10/22/96	Delta Time (hours) = ((DOC - SD) * 24) + (TOC - ST) / 100					
10/21/96	Sr-89/90 CONCENTRATION		5.01E-01	$\mu\text{Ci/mL}$		DETECTION LEVEL 1.05E-03 $\mu\text{Ci/mL}$
12:40 PM	RELATIVE COUNTING ERROR		2.0%			
TK24-1,21-1	PERCENT CARRIER RECOVERY		91.7%			

Analyst:	KNT	Date:	22-Oct-96
Signature of Chemist:	SLF	Date:	OCT 23 '96

SAMPLE.WB1 REV 2.0

22010NML

DISTRIBUTION SHEET

To Distribution	From Production Planning & Control	Page 1 of 1
		Date: 12/06/96
Project Title/Work Order WHC-SD-WM-DP-213, Rev. 0, "B-Plant, TK-21-1, Analytical Results for the Final Report"		EDT NO.: EDT-620376
		ECN NO.: N/A

Name	MSIN	Text With all Attach	EDT/ECN ONLY	
------	------	-------------------------	-----------------	--

B&W Hanford Company

S. E. Killoy	S4-66	X
E. D. Robbins	S6-60	X
F. M. Simmons	S6-60	X
A. G. Westra	S6-60	X

State of Washington, Department of Ecology

J. K. Bartz	B5-18	X
-------------	-------	---

Lockheed Martin Hanford Corp.

A. E. Young	R2-12	X
-------------	-------	---

Lockheed Martin Services, Inc.

Central Files	A3-88	2
---------------	-------	---

Los Alamos Technical Associates

M. T. Ellsworth	T6-06		X*
-----------------	-------	--	----

Rust Federal Services of Hanford, Inc.

L. L. Fritts	T6-06	X	
D. C. Hetzer	H5-27		X
K. L. Powell	T6-04		X
LTIC	T6-03		X

* Needs only releasing paperwork, not a copy of the released document.