This document was too large to scan as a whole document, therefore it required breaking into smaller sections.

Document number: SD-WM-DP-142

Section 1 **of** 10

Title: Final Characterization and Safety Screen Report of Double Shell Tank 241-AP-104 for 242-A Evaporator, Campaign 96-1

Date: 4/19/96 **Revision:** 1

Originator: Shuey, George S
Co:

Recipient:
Co:

References: ECN-629035

COMPLETE

ENGINEERING CHANGE NOTICE

Page 1 of 2

1. ECN 629035

Proj. ECN

2. ECN Category (mark one)	3. Originator's Name, Organization, MSIN, and Telephone No.	3a. USQ Required?	4. Date
Supplemental [] Direct Revision [X] Change ECN [] Temporary [] Standby [] Supersedure [] Cancel/Void []	George L. Miller, Production Planning & Control/T6-06/373-4739	[] Yes [X] No	04-09-96
	5. Project Title/No./Work Order No.	6. Bldg./Sys./Fac. No.	7. Approval Designator
	Tank 241-AP-104	NA	Q
	8. Document Numbers Changed by this ECN (includes sheet no. and rev.)	9. Related ECN No(s).	10. Related PO No.
	WHC-SD-WM-DP-142, REV. 0	NA	NA

11a. Modification Work	11b. Work Package No.	11c. Modification Work Complete	11d. Restored to Original Condition (Temp. or Standby ECN only)
[] Yes (fill out Blk. 11b) [X] No (NA Blks. 11b, 11c, 11d)	NA	N/A Cog. Engineer Signature & Date	N/A Cog. Engineer Signature & Date

12. Description of Change

This ECN is being generated in order to update/add additional information to the existing document.

13a. Justification (mark one)

Criteria Change	[X]	Design Improvement	[]	Environmental	[]	Facility Deactivation	[]
As-Found	[]	Facilitate Const	[]	Const. Error/Omission	[]	Design Error/Omission	[]

13b. Justification Details

This ECN will assist in the completion of the documentation process for this document.

14. Distribution (include name, MSIN, and no. of copies)

See Attached Distribution Sheet.

RELEASE STAMP

DATE: APR 19 1996

STA: 4

HANFORD RELEASE

A-7900-013-2 (11/94) GEF095

ENGINEERING CHANGE NOTICE

1. ECN (use no. from pg. 1) 629035

15. Design Verification Required	16. Cost Impact				17. Schedule Impact (days)	
	ENGINEERING		CONSTRUCTION			
[] Yes	Additional	[] $	Additional	[] $	Improvement	[]
[X] No	Savings	[] $	Savings	[] $	Delay	[]

18. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 12. Enter the affected document number in Block 19.

SDD/DD	[]	Seismic/Stress Analysis	[]	Tank Calibration Manual	[]
Functional Design Criteria	[]	Stress/Design Report	[]	Health Physics Procedure	[]
Operating Specification	[]	Interface Control Drawing	[]	Spares Multiple Unit Listing	[]
Criticality Specification	[]	Calibration Procedure	[]	Test Procedures/Specification	[]
Conceptual Design Report	[]	Installation Procedure	[]	Component Index	[]
Equipment Spec.	[]	Maintenance Procedure	[]	ASME Coded Item	[]
Const. Spec.	[]	Engineering Procedure	[]	Human Factor Consideration	[]
Procurement Spec.	[]	Operating Instruction	[]	Computer Software	[]
Vendor Information	[]	Operating Procedure	[]	Electric Circuit Schedule	[]
OM Manual	[]	Operational Safety Requirement	[]	ICRS Procedure	[]
FSAR/SAR	[]	IEFD Drawing	[]	Process Control Manual/Plan	[]
Safety Equipment List	[]	Cell Arrangement Drawing	[]	Process Flow Chart	[]
Radiation Work Permit	[]	Essential Material Specification	[]	Purchase Requisition	[]
Environmental Impact Statement	[]	Fac. Proc. Samp. Schedule	[]	Tickler File	[]
Environmental Report	[]	Inspection Plan	[]		[]
Environmental Permit	[]	Inventory Adjustment Request	[]		[]

19. Other Affected Documents: (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.

Document Number/Revision	Document Number/Revision	Document Number Revision
NA		

20. Approvals

Signature	Date	Signature	Date
OPERATIONS AND ENGINEERING		ARCHITECT-ENGINEER	
Cog. Eng. G. L. Miller	4/12/96	PE	
Cog. Mgr. J. G. Kristofzski	4/19/96	QA	
AEQA D. A. Sebelien	4/19/96	Safety	
QA T. L. Tung	4/18/96	Design	
Environ.		Environ.	
Other		Other	
Production Planning & Control A. D. Rice	4-18-96		
		DEPARTMENT OF ENERGY	
		Signature or a Control Number that tracks the Approval Signature	
		ADDITIONAL	

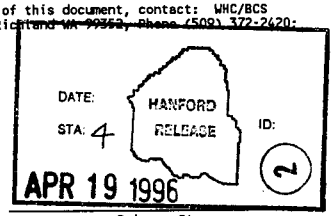
"FINAL CHARACTERIZATION AND SAFETY SCREEN REPORT OF DOUBLE SHELL TANK 241-AP-104 FOR 242-A EVAPORATOR, CAMPAIGN 96-1"

George L. Miller
Westinghouse Hanford Company, Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-87RL10930

EDT/ECN: ECN-629035 UC: 2070
Org Code: 75725 Charge Code: MD378
B&R Code: EW 3120074 Total Pages: 1528

Key Words: Final Report for Tank 241-AP-104, 242-A Evaporator, Campaign 96-1

Abstract: N/A



Release Approval 4/19/96 Date

Release Stamp

Approved for Public Release

RECORD OF REVISION

(1) Document Number: WHC-SD-WM-DP-142

(2) Title

Final Characterization and Safety Screen Report of Double Shell Tank 241-AP-104 for 242-A Evaporator, Campaign 96-1

CHANGE CONTROL RECORD

(3) Revision	(4) Description of Change - Replace, Add, and Delete Pages	Authorized for Release	
		(5) Cog. Engr.	(6) Cog. Mgr. Date
0	(7) Initially released on EDT-614783	G. L. Miller	J. G. Kristofzski
1 RS	Incorporate per ECN 629035	G. L. Miller	J. G. Kristofzski 4/19/96

Westinghouse
Hanford Company

P.O. Box 1970 Richland, WA 99352

WHC-SD-WM-DP-142, REV. 1

ANALYTICAL SERVICES

FINAL CHARACTERIZATION & SAFETY SCREEN REPORT OF DOUBLE SHELL TANK 241-AP-104 FOR 242-A EVAPORATOR, CAMPAIGN 96-1

Project Coordinator: GEORGE L. MILLER

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

by

**Westinghouse Hanford Company
Box 1970
Richland, Washington**

TABLE OF CONTENTS

This document consists of two sections.

Part I consists of pages 1 through 1457, plus pages 84.1, 278.1, 720.1, 866.1, 1181.1 - 1181.2, 1259.1, and 1346.1, and pages 1.1, 55, 79, 90, 97, 103, 137, 343, 469, 827, and 1171 have been intentionally left blank.

Part II consists of pages 2-1 through 2-47, plus pages 2-4, 2-10, 2-17, and 2-43 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

NARRATIVE

THIS PAGE WAS INTENTIONALLY LEFT BLANK

FINAL CHARACTERIZATION AND SAFETY SCREEN REPORT OF DOUBLE SHELL TANK 241-AP-104 FOR 242-A EVAPORATOR CAMPAIGN 96-1

CASE NARRATIVE

INTRODUCTION

SOURCE DOCUMENTATION

Evaporator candidate feed from tank 241-AP-104 (hereafter referred to as AP-104) was characterized for physical, inorganic, organic and radiochemical parameters by the Westinghouse Hanford Company, 222-S Laboratory, and by the Battelle Pacific Northwest National Laboratory (PNNL), Analytical Chemistry Laboratory (ACL) as directed by the Tank Sample and Analysis Plan (TSAP), References 1 through 4.

This data package satisfies the requirement for a format IV, final report as described in Reference 1. This data package is also a follow-up to the 45-Day safety screen report for tank AP-104, Reference 7, which was issued on March 7, 1996, and is attached as Section II. Preliminary data in the form of summary analytical tables were provided to the project in advance of this final report to enable early estimation of evaporator operational parameters, using the Predict modeling program.

Laboratory analyses at ACL Laboratory was performed according to the TSAP. Analyses were performed at the 222-S Laboratory as defined and specified in the TSAP and the Laboratory's Quality Assurance Plan, References 5 and 6. Any deviations from the instructions documented in the TSAP are discussed in this narrative and are supported with additional documentation.

SAMPLING

The TSAP, section 2, provided sampling information for waste samples collected from tank AP-104. The "bottle-on-a-string" method was used to collect liquid grab samples from the tank. Each glass sample bottle was amber, precleaned, and contained approximately 100 milliliters. Each bottle was closed with a teflon seal cap (or teflon septum for volatile organic analysis samples).

Field blank samples were prepared by placing deionized water into sampling bottles, lowering the unclosed bottles into the riser for a period of time, retrieving them from the riser, and then closing the bottles with the same types of caps used for the tank samples.

None of the samples were preserved by acidification. Upon receipt, the sample bottles destined for organic analyses were placed in a refrigerator. No attempt was made during sampling to assure the complete filling of the bottles so as to exclude all headspace. These actions were consistent with safety procedures, which attempt to limit personnel exposure to hazardous ionizing radiation.

Chain-of-Custody forms were generated by the sample collector and delivered to 222-S Laboratory with the samples. Copies of these Chain-of-Custody forms are included in this data package beginning on page 78. Samples were transported to the 222-S laboratory receiving door in shielded pigs.

Samples requiring volatile organic analyses (VOA) were transported in Hedgehog shipping casks, with accompanying Chain-of-Custody sheets, to the Analytical Chemistry Laboratory (PNNL) for analyses.

Sample collection and identification data are summarized in Table 1.

LABORATORY OPERATIONS

SAMPLE TRACKING

RECEIVING PROCEDURES/CHAIN-OF-CUSTODY

Tank AP-104 samples were received into the 222-S Laboratory by the laboratory's sample custodian, who signed the Chain-of-Custody form, becoming the new sample custodian. The Chain-of-Custody form, a legal document, tracks the transfer of samples between individuals or organizations to establish sample ownership. All samples shipped to PNNL for VOA analyses were accompanied by a Chain-of-Custody form.

The pigs containing the samples were transported to a hood where the sample bottles were removed, and visually inspected. A radioactive dose rate at one inch from the side of the samples was measured by a Health Physics Technician. The measured dose rate was multiplied by five as a correction factor to compensate for sample geometry. Samples were placed in shielded containers, relabeled to include the laboratory identification number, and transferred to metal storage cabinets in a secured area. Because the sample dose rate was not sufficiently high, it was determined that processing the samples through the hot cell was not required. Hot cell processing of samples is required when the sample dose rate measured at the laboratory exceeds 7 rem per hour or 25 rad per hour.

SAMPLE LOGGING/DATA HANDLING

At the 222-A Laboratory, a computerized Laboratory Information Management System (LIMS) called LABCORE was used by the project coordinator to log samples directly into a computer, assign analyses to be performed on each sample, and to assign quality control parameters. Chemists generated worklists, assigning samples to batches for analysis. As analytical data were generated, the results were entered to LABCORE either manually or through a direct data upload from the instrumentation. The LIMS was used to periodically track the complete/incomplete status of each sample.

The procedures for boildown and mixing/compatibility will be performed on a composite of samples from AP-104. As instructed in the TSAP, Reference 1, these data are to be reported independently, with data attached to an Internal Memo.

Table 1: Tank AP-104 Grab Sample Information

CUSTOMER SAMPLE NUMBER	DATE SAMPLED	SAMPLE SEAL NUMBER	LABORATORY ID NUMBER	ANALYSES TO BE PERFORMED ON WASTE	WASTE TYPE	SAMPLE LOCATION*	SAMPLE DEPTH** Feet	Date Sample Received
104-AP-1A	1/23/96	4089	PNNL 96-3095	Organic/VOA	Supernate	Riser 1, 30° N	8	1/24/96
104-AP-1B	1/23/96	4092	S96V000017	Organic/sVOA	Supernate	Riser 1, 30° N	8	1/24/96
104-AP-1C	1/23/96	4091	S96V000006, direct S96V000009, acid digestion	Inorg/Rad	Supernate	Riser 1, 30° N	8	1/24/96
104-AP-1D	1/23/96	4090	S96V000021	Mixing/Boildown	Supernate	Riser 1, 30° N	8	1/24/96
104-AP-2A	1/18/96	4082	PNNL 96-3096	Organic/VOA	Supernate	Riser 1, 30° N	25	1/19/96
104-AP-2B	1/18/96	4083	S96V000018	Organic/sVOA	Supernate	Riser 1, 30° N	25	1/19/96
104-AP-2C	1/23/96	4094	S96V000007 (direct) S96V000010 (acid digest)	Inorg/Rad	Supernate	Riser 1, 30° N	25	1/24/96
104-AP-2D	1/18/96	4084	S96V000022	Mixing/Boildown	Supernate	Riser 1, 30° N	25	1/19/96
104-AP-3A	1/23/96	4095	PNNL 96-3097	Organic/VOA	Supernate	Riser 1, 270° N	16	1/24/96
104-AP-3B	1/23/96	4096	S96V000019	Organic/sVOA	Supernate	Riser 1, 270° N	16	1/24/96
104-AP-3C	1/23/96	4097	S96V000008 (direct) S96V000011 (acid digest)	Inorg/Rad	Supernate	Riser 1, 270° N	16	1/24/96
104-AP-3D	1/23/96	4098	S96V000023	Mixing/Boildown	Supernate	Riser 1, 270° N	16	1/24/96
104-AP-4	1/23/96	4062	S96V000012 (direct) S96V000013 (acid digest)	TOC & Safety Screen	Surface	Riser 1, 270° N	approx. 33	1/24/96
104-AP-IB1	1/18/96	4085	S96V000014 (direct) S96V000015 (acid digest)	Inorg/Rad	Field Blank	Riser 1, 30° N	53	1/19/96
104-AP-IB2	1/18/96	4086	S96V000016 (direct)	Inorg/Rad	Field Blank	Riser 1, 30° N	53	1/22/96
104-AP-OB1	1/18/96	4087	PNNL 96-3093	Organic/VOA	Field Blank	Riser 1, 30° N	53	1/22/96
104-AP-OB2	1/18/96	4088	S96V000020	Organic/sVOA	Field Blank	Riser 1, 30° N	53	1/22/96
104-AP-TB1	1/23/96	4099	PNNL 96-3094	Organic/VOA	Trip Blank	Trip Blank	n/a	1/25/96
104-AP-TB2	1/23/96	4100	S96V000025	Organic/sVOA	Trip Blank	Trip Blank	n/a	1/25/96

Sample Elevation is defined as the distance from the tank bottom to the mouth of the sample bottle.

SAMPLE IDENTIFICATION

Customer generated sample identification numbers for each sample were provided in the TSAP, Reference 2. New sample identification numbers were assigned by LABCORE to each sample when logged into the 222-S Laboratory. Table 1 relates the customer identification number and laboratory identification number to each sampling location. As can be seen in Table 1, multiple samples from each location were collected and given unique identification numbers to enable better sample handling and control within the laboratory, particularly with regard to organic analyses. Four bottles were provided from each of three subsurface locations to insure ample sample volume for analyses. An additional sample was collected from the waste surface for total organic carbon and safety screening analyses.

Two trip blanks were collected for organic analyses: one for VOA and one for Semi-VOA. Trip blank analyses were required by the TSAP only when those analytes required in the TSAP were observed in the field blanks.

QUALITY ASSURANCE OF THE ANALYTICAL SYSTEM AND DATA

CONTROLLED PROCEDURES

Each procedure used at 222-S for this project was a controlled procedure. All procedures were evaluated and approved for a maximum period of two years. Procedures may be revised, modified, or deleted as appropriate. Each time a procedure was revised or modified, however, a new revision/modification number was added to the procedure number. Upon review (at the end of the two year period), a procedure approval may be extended for another two year period without a change in the revision/modification number.

STATISTICAL EVALUATION

Performance data have been gathered historically on each analytical procedure for which a laboratory control standard was available. Summary statistics were calculated for the percent recovery from which estimates of the procedure precision and accuracy were obtained. These procedure control limits were/are statistically re-evaluated upon acquiring 100 additional data points, whichever occurs first. If necessary, new acceptance control limits were/are generated.

REVIEW OF DATA

Descriptive information was provided on the Worklist Data Entry sheets when unusual conditions occurred during analysis of a batch. These narrative comments were generally also noted in this case narrative unless the data were rejected and not reported.

Each analytical batch was reviewed for correctness of data at several levels. Chemists reviewed not only analytical calculations, but assured that the analytical system was performing appropriately and that the laboratory technicians were following written procedures. All analysis results, which had been entered into LABCORE, were reviewed by the cognizant chemist, verifying data accuracy and completeness. Once this process was completed,

which was a step termed "validation" by LABCORE, then access to the data was locked to prevent further entries or corrections.

All data were reviewed by the project coordinator to also verify that correct values had been entered to LABCORE from the hand written Worklist Data Entry sheets. Correctness of case narrative text and tables was reviewed by the project coordinator.

A peer review of this case narrative was performed by an independent project coordinator in the Program Support Group. Errors and unclear statements were subsequently corrected in the released data package.

The internal quality assurance group performed a general review of this data package, including a 10% review of the analytical data, where final analytical values were recalculated from the raw data to verify analytical accuracy and completeness. Case narrative text and tables were also examined for accuracy, clarity and completeness.

ANALYTICAL DATA REPORTING

LABCORE REPORTS

LABCORE has the capability of generating final reports from analytical data which were input to the system. Safety Screen (Reference 7) and preliminary reports were prepared using the system's "45-Day Report" format, in which results from all analyses were presented per each individual sample. This format was acceptable for the Safety Screen Report, and the data were accurately presented.

The LABCORE system is new to the 222-S Laboratory. Because of having several Safety Screen Reports generated prior to this evaporator tank project, the system's reporting errors had been detected and corrected for the suite of analytes common to the Safety Screen Project. For the broader suite of analytes required by this project, some analytes were reported incompletely using the 45-Day report format. Consequently, all data were downloaded from LABCORE to spreadsheet format, where missing data could be added.

SAFETY SCREEN AND PRELIMINARY REPORTS

The TSAP, Reference 1, required delivery of a 45-day Safety Screen Report by March 10, 1995. This report (Reference 7) was released as a supporting document on March 7, 1995, which was 3 days ahead of the required delivery date.

A preliminary summary report of all analytical results was delivered by FAX to Treatment Systems Plant Engineering to enable early process control planning. The report format was LABCORE "45-Day Report" for all analyses except for VOA and semi-volatile organic analyses (Semi-VOA). For analytes determined by VOA and Semi-VOA, the report consisted of summary data spreadsheets, where the data were taken from contract laboratory program (CLP) type data packages. It was understood by the program that these data were neither final nor validated.

CASE NARRATIVE

This case narrative was prepared in accordance with TSAP, sections 3 and 6.

The intent of the case narrative within this data package is to:

- Present required analytical data,
- Evaluate the quality of these data,
- Document problems encountered while performing the analytical procedures,
- Characterize the nature of the constituents within tank AP-104, and
- Interpret, whenever possible, the relevance or impact of these findings on the evaporator program.

ANALYTICAL REQUIREMENTS AND PROCEDURES

SAMPLE PRESERVATION

The TSAP was silent regarding sample preservation requirements. No preservation of samples occurred prior to being received in the laboratory. Once the samples were "broken down" at the time of arrival at the 222-S Laboratory, all sample bottles, which were designated for organic analyses, were maintained at 4°C.

SAMPLE HOLDING TIME

The TSAP, section 3.2, states the following:

> "... the laboratory and sampling organization should strive to meet SW-846 (EPA 1986) holding times. However, adherence to SW-846 holding times is not strictly required if documented cases show that additional time was required to ship, process, and analyze the samples ..."

For inorganic and radiochemical analytes, the SW-846 maximum sample holding time limits that were applicable are found in volume IA, Table 2-21 (revision 1, July 1992). SW-846 sample holding times for organic analytes are specified in Volume IB, Chapter 4, Table 4-1. Table 2 presents these sample holding times.

Table 2. Maximum SW-846 Sample Holding Limits

Parameter	Maximum Holding Time	Preservation
Nitrate	48 hours	4°C
Sulfate	28 days	4°C
Aluminum	6 months	HNO_3 to pH <2
Sodium	6 months	HNO_3 to pH <2
pH	Analyze immediately	None
Total Organic Carbon	28 days	4°C
Volatile Organic Analysis	14 days	4°C, 0.008% $Na_2S_2O_3$
Semi-Volatile Organic Analysis	14 days for extraction, 40 days for analysis of extract	4°C, 0.008% $Na_2S_2O_3$
Total Alpha	6 months	HNO_3 to pH<2
Total Beta	6 months	HNO_3 to pH<2
Radium (radiological)	6 months	HNO_3 to pH<2

Agreement within the scientific community is divided with regard to reasonable sample holding times. SW-846 holding times are based on worst-case scenarios and in many cases are excessively short. Note that SW-846 protocol expects that samples are to be preserved at the time of collection for SW-846 holding times to be valid. However, tank AP-104 samples were intentionally not preserved so as to limit the exposure dosage of ionizing radiation to personnel.

Sample degradation can occur due to many factors. One of these factors, biological degradation, is typically controlled by the addition of a strong acid, creating a hostile biological environment due to extreme pH. Relative to biological degradation of tank AP-104 samples, it can be argued that sample preservation with the use of acid was unnecessary because of high level ionizing radiation lethal to micro-organisms, as well a pH in the high extreme (ranging from 12.2 to 12.9).

The actual sample holding time for each sample is discussed relative to each analyte in the Results of Analyses section in this narrative.

ANALYTICAL ALIQUOTS

Because multiple samples were collected from each sample point, the probability was low that the sample would be exhausted before all of the analyses could be analyzed and results accepted. Direction was given by the project coordinator in a pre-job briefing that analytical aliquots were to be optimized to achieve the lowest detection limits whenever the analyte concentration in the sample was expected to approach the detection limit.

PREPARATIVE METHODS

Table 2 of the TSAP specified which preparative method was to be used for each constituent. All sample preparations conformed to the TSAP specifications. Table 3 indicates the preparative procedures stated in the TSAP.

Table 3. TSAP Cited Preparation Procedures

Analytical Procedure	Preparative Procedure
Differential Scanning Calorimetry (DSC)	direct *
Thermal Gravimetric Analysis (TGA)	direct *
pH	direct *
Specific Gravity	direct *
Hydroxide	direct *
Ion Chromatography: F, NO_2, NO_3, SO_4, PO_4	direct *
Inductively Coupled Plasma/Optical Emission Spectrometry: Al, Na	acid digestion
Total Carbon (TC)	direct *
CO_3 (TIC)	direct *
Total Organic Carbon (TOC)	direct *
Ammonia	direct *
Volatile Organic Analysis (VOA): Acetone, 1-Butanol, 2-Butanone, 2-Hexanone, Methyl Isobutyl Ketone (4-Methyl-2-pentanone), 2-Pentanone, Tetrahydrofuran	direct *
Semi-Volatile Organic Analysis (Semi-VOA): 2-Butoxyethanol, n-Tributylphosphate	direct *
Uranium, gross (U-gross)	direct *
Total Alpha (AT)	acid digestion
Total Beta (TB)	acid digestion
^{238}Pu, $^{239/240}Pu$	acid digestion
^{237}Np	acid digestion
^{99}Tc	acid digestion
^{90}Sr	acid digestion
^{14}C	direct *
^{3}H	direct *
^{79}Se	acid digestion
^{129}I	direct *
Gamma Energy Analysis (GEA): ^{60}Co, ^{137}Cs, ^{106}Ru, ^{134}Cs, ^{144}Ce, ^{154}Eu, ^{155}Eu, ^{94}Nb, ^{226}Ra, ^{237}Np	acid digestion
$^{243/244}Cm$ (and ^{241}Am)	acid digestion

* The TSAP, Table 2 states, "Direct liquid samples may be diluted in acid or water to adjust to proper sample size and/or pH".

ANALYTICAL PROCEDURES

Table 4 summarizes the analytical procedures which were used for analyses of AP-104 samples. The procedures used were the same as those cited in TSAP, Table 2, except for plutonium analyses. At the time that the TSAP was being prepared, procedure LA-943-127 was a valid, active procedure, however that procedure was inactivated when it was replaced with procedure LA-943-128 on 11/28/95.

Table 4. AP-104 Procedure Listing

TSAP Cited Procedure		Actual Procedure Used			
Procedure #	Procedure Title	Procedure #	Rev #	Procedure Title	Issue Date
LA-519-151	Visual Check and Over-The-Top Reading	LA-519-151	E-2	Visual Check and Over-The-Top Reading	07-06-94
LA-514-113	Differential Scanning Calorimetry (DSC)	LA-514-113	C-1	Differential Scanning Calorimetry (DSC)	11-15-95
LA-560-112	Determination of Weight Loss as Percent Water by Thermogravimetric Analysis (TGA) - Mettler1 TG 50	LA-560-112	B-1	Determination of Weight Loss as Percent Water by Thermogravimetric Analysis (TGA) - Mettler1 TG 50	11-17-95
LA-212-106	pH Determination of Aqueous Wastes	LA-212-106	A-0	pH Determination of Aqueous Wastes	08-23-95
LA-510-112	Specific Gravity of High Beta Gamma Caustic Samples	LA-510-112	C-3	Specific Gravity of High Beta Gamma Caustic Samples	06-13-94
LA-211-102	Determination of Free OH^-/H^+ Using Metrohm 682 Titroprocessor	LA-211-102	C-0	Determination of Free OH^-/H^+ Using Metrohm 682 Titroprocessor (Hydroxide)	08-24-95
LA-631-001	Determination of Ammonia by Selective Ion Electrode Using a Double Increment Known Additions Method	LA-631-001	B-2	Determination of Ammonia by Selective Ion Electrode Using a Double Increment Known Additions Method	02-08-96
LA-622-102	Determination of Carbonate in Solutions by Coulometry (Total Inorganic Carbon)	LA-622-102	C-0	Determination of Carbonate in Solutions by Coulometry (Total Inorganic Carbon)	08-29-95
LA-344-105	Determination of Carbon in Solutions by Combustion and Coulometry (Total Carbon)	LA-344-105	C-0	Determination of Carbon in Solutions by Combustion and Coulometry (Total Carbon)	08-29-95
LA-344-105	Determination of Carbon in Solutions by Combustion and Coulometry (Total Organic Carbon)	LA-344-105	C-0	Determination of Carbon in Solutions by Combustion and Coulometry (Total Organic Carbon)	08-29-95
LA-533-105	Anion Analysis on Dionex Model 4000i and 4500i	LA-533-105	D-1	Anion Analysis on Dionex Model 4000i and 4500i	09-18-95
LA-505-161	Inductively Coupled Plasma (ICP) Emission Spectrometric Method for the Thermal Jarell Ash (TJA), Type 61E	LA-505-161	B-0	Inductively Coupled Plasma (ICP) Emission Spectrometric Method for the Thermal Jarell Ash (TJA), Type 61E	08-25-95
LA-505-151	Inductively Coupled Plasma (ICP) Emission Spectrometric Method for the Applied Research Laboratories Model 3580	LA-505-151	D-3	Inductively Coupled Plasma (ICP) Emission Spectrometric Method for the Applied Research Laboratories Model 3580	08-23-95
LA-925-009	Determination of Uranium by Kinetic Phosphorescence	LA-925-009	A-1	Determination of Uranium by Kinetic Phosphorescence	06-07-95
LA-548-121	Preparation of Sample Mounts for GE(Li) GEA - Low Level	LA-548-121	D-1	Preparation of Sample Mounts for GE(Li) GEA - Low Level (preparation for LA-508-162)	07-28-94
	Not Cited	LA-508-162	B-0	Gamma Energy Analysis - The Genie System (subsequent to LA-548-121)	09-20-95
LA-508-101	Low Level Alpha and Beta in Water Samples (prep)	LA-508-101	D-2	Low Level Alpha and Beta in Water Samples (preparation for LA-508-114)	08-01-94
	Not Cited	LA-508-114	A-2	Operation of Gamma Products Alpha Beta Counting Systems Using PC Control (Subsequent to LA-508-101)	08-15-94

Table 4. AP-104 Procedure Listing

TSAP Cited Procedure		Actual Procedure Used			
Procedure #	Procedure Title	Procedure #	Rev #	Procedure Title	Issue Date
LA-953-103	Determination of Americium by Extraction with TRU·Spec Resin	LA-953-103	A-4	Determination of Americium by Extraction with TRU·Spec Resin (also Cm-243/244)	09-19-95
LA-943-127	Determination of Pu by Ion Exchange	LA-943-128	A-0	Determination of Plutonium by Extraction with TRU·Spec Resin (Pu-239/240 & Pu-238)	11-20-95
LA-218-114	Tritium by Lachat Micro-Dist. and Liquid Scintillation Counting (LS)	LA-218-114	A-4	Tritium by Lachat Micro-Dist. and Liquid Scintillation Counting (LS)	04-17-95
LA-348-104	C-14 in Small Volume Samples by Persulfate Oxidation and Liquid Scintillation	LA-348-104	B-1	C-14 in Small Volume Samples by Persulfate Oxidation and Liquid Scintillation	05-03-94
	Not Cited	LA-508-121	B-2	Operation of the Beckman Liquid Scintillation Counter (subsequent to LA-218-114 & LA-348-104)	08-09-94
LA-438-101	Determination of Tc-99 by Solvent Extraction and Liquid Scintillation Counting	LA-438-101	D-2	Determination of Tc-99 by Solvent Extraction and Liquid Scintillation Counting	05-27-94
LA-220-101	High Level Strontium-89,90 in Aqueous Samples	LA-220-101	D-1	High Level Strontium-89,90 in Aqueous Samples	07-06-94
LA-365-132	Determination of Se-79	LA-365-132	B-2	Determination of Se-79	06-09-94
LA-933-141	Determination of Np-237 by TiOA/TTA Extraction and Alpha Counting	LA-933-141	H-1	Determination of Np-237 by TiOA/TTA Extraction and Alpha Counting	12-13-94
LA-378-103	Determination of Iodine-129 in Waste Tank Samples	LA-378-103	C-0	Determination of Iodine-129 in Waste Tank Samples	09-27-95
PNL-ALO-335	Volatile Organics by Gas Chromatography/ Mass Spectroscopy (VOA)	PNL-ALO-335		Volatile Organics by Gas Chromatography/ Mass Spectrometry (VOA)	
	Not Cited	LA-523-105	A-0	Continuous Liquid-Liquid Extraction of Semivolatiles based on SW-846 Methods	04-27-94
LA-523-406	Semivolatile Organics by Gas Chromatography/Mass Spectroscopy Based on SW-846, Method 8270A (Semi-VOA)	LA-523-406	A-0	Semivolatile Organics by Gas Chromatography/Mass Spectroscopy Based on SW-846, Method 8270A (Semi-VOA)	07-16-93
	Not Cited	LA-505-158	B-0	Acid Digestion of Aqueous Samples and Extracts for Total Metals for Analysis by FLAA and ICP Spectroscopy	08-30-95

DETECTION LIMITS

Detection limits were defined for each procedure without reference to a uniform laboratory protocol to determine such limits. Some of the procedures used the reagent blank value as the detection limit. Some procedures used the concentration of the lowest standard in the calibration curve as the detection limit, and others used the EPA replicate procedure. Generally, the sample matrix was not considered in generating the detection limit and therefore would be more indicative of an "instrument detection limit", rather than a "method detection limit". Wherever possible, the detection limit was modified by the typical dilution factor of the samples to provide a more representative value relative to the samples. All of the practices described above for estimation of the detection limit are allowed as estimated quantitation limits by SW-846 protocol.

SIGNIFICANT FIGURES

A review was made of each controlled procedure to assure compliance with any stated significant figure requirements. Generally three significant figures were reported because data were formatted into scientific notation. Specific gravity was the only procedure for which significant figures were specified for reporting. For this analysis, the reported value must have three digits to the right of the decimal in standard numerical notation (not scientific notation) format. Specific gravity results were reported with the specified number of significant digits.

CALIBRATION DATA

Raw calibration data can be found on instrumentation printouts, which were incorporated in the raw data portion of this data package for reference.

None of the 222-S analytical procedures that were required for this project specified a required correlation coefficient (r^2).

EVAPORATOR NOTIFICATION LIMITS

To evaluate compliance with operational, safety and environmental requirements, limits were established, whereby if any analytical results exceeded these limits, the safety screen and/or evaporator program(s) was to be immediately notified. The analytical results are summarized in the sample Data Summary Tables section and evaluated in the Results of Analyses section.

During the analysis of AP-104, a notification was made for ^{226}Ra. The calculated results for 104-AP-1C, 104-AP-2C and 104-AP-3C were all less than the detection limits of 0.0638, 0.0489 and 0.0506 μCi/ml, respectively. These detection limits, however, exceeded the ^{226}Ra notification limit of >0.033 μCi/ml. Because of the insignificance of reporting data less than the

detection limit, the value and relevance of this required immediate notification is questionable.

Notification limits, as cited in the TSAP, Table A-2, are shown in Table 5.

QUALITY CONTROL REQUIREMENTS

STANDARDS

Laboratory control standards (LCS) are required to be analyzed with each batch of analyses for SW-846 procedures. 222-S Laboratory analyzes such standards, whenever available, with each analytical batch. These standards were used as an independent confirmation of proper calibration of the analytical system. LCS standards were prepared from materials traceable to National Institute of Standards and Technology (NIST) standards and were not used for instrument calibration. The LCS standards which were analyzed were normally generated in house by a special group within 222-S Laboratory using controlled procedures. Analyte concentrations of these standards were known in advance to the analysts.

LCS control limits were typically defined as the statistical mean plus or minus three standard deviations of the existing values in the data base. For those procedures which didn't have a data base large enough to provide statistically significant data, an administratively set control limit was used.

If a standard failed to meet the control criteria, all data associated with that batch were invalidated. A new batch, including the appropriate standard and quality control analyses, was rerun. The standard associated with the new batch must pass the standard acceptance criteria before data from that batch are able to be reported.

No LCS standard was available for the following analytes: appearance, ^{106}Ru, ^{134}Cs, ^{144}Ce, ^{154}Eu, ^{155}Eu, ^{94}Nb, ^{79}Se, ^{226}Ra, ^{238}Pu and $^{243/244}Cm$.

BLANKS

A reagent blank was analyzed with each batch except for visual appearance, pH, specific gravity, TGA and DSC. A preparation blank was analyzed with each batch of acid digested samples.

Table 2 of the TSAP, required that field blanks be analyzed for all analytes except for DSC, TGA, pH, specific gravity, visual appearance, and total organic carbon (on the surface sample only).

The TSAP further required that the corresponding trip blank would be analyzed if any of the organic analytes, TC or TIC were observed in the field blanks. None of these analytes were detectable in the field blanks, however, PNNL

Table 5. Notification Limits for Tank AP-104

Analytical Parameter	Limit Which if Exceeded Requires Notification
Differential Scanning Calorimetry (DSC)	Exotherms < 335°F, and Σ exotherms ÷ Σ endotherms > 1
Visual Determination of Organic Layer	Presence of Organic Layer
Specific Gravity	> 1.41
Hydroxide	< 170 µg/ml, or > 170,000 µg/ml
Nitrite	< 506 or > 253,000 µg/ml
Nitrate	> 341,000 µg/ml
Phosphate	> 9,450 µg/ml
Sodium	> 184,000 µg/ml
Calculated Total Organic Carbon	Total Carbon - Total Inorganic Carbon > 87 µg/ml
Analytically Derived Total Organic Carbon (surface sample only)	> 2,600 µg/ml
Ammonia (NH_3)	> 5,000 µg NH_3/ml
Acetone	> 87,000 µg/L
1-Butanol	> 226,000 µg/L
2-Butoxyethanol	> 95,200 µg/L
2-Butanone	> 58,000 µg/L
n-Tributylphosphate	> 10,150,000 µg/L
U-gross	$^{239/240}Pu$ + (1.077E-10 x U-gross) > 0.005 g/L
Total Alpha	> (0.10 x Specific Gravity) as µCi/ml; > 41 µCi/ml (safety screen)
$^{239/240}Pu$	$^{239/240}Pu$ + (1.077E-10 x U-gross) > 0.005 g/L
^{14}C	> 0.26 µCi/ml
^{79}Se	> 0.078 µCi/ml
^{90}Sr	> 220 µCi/ml
^{60}Co	> 1.2 µCi/ml
^{137}Cs	> 800 µCi/ml
^{106}Ru	> 53 µCi/ml
^{134}Cs	> 15 µCi/ml
^{94}Nb	> 0.098 µCi/ml
^{154}Eu	> 5.0 µCi/ml
^{155}Eu	> 7.0 µCi/ml
^{226}Ra	> 0.033 µCi/ml
^{99}Tc	> 2 µCi/ml
^{129}I	> 0.0026 µCi/ml
^{238}Pu	> 0.0013 µCi/ml
^{241}Am	> 1 µCi/ml
^{244}Cm	> 0.013 µCi/ml

chose to perform an analysis on the trip blank for VOA analytes because their procedure required such an analysis.

The *242-A Evaporator Quality Assurance Project Plan* (Reference 8), section 2.5, paragraph 13, defined blank contamination as follows.

> "Contamination of blanks is indicated when any analyte exceeds 20% of the lowest sample concentration in that batch. This criterion is not valid when the sample concentration is less than 10 times the detection limit for an analyte."

Because the samples were not processed in a hot cell, a hot cell blank was neither required nor analyzed.

DUPLICATE ANALYSIS

Precision quality control criteria were specified in the TSAP for each analyte. Generally, precision was determined as the relative percent difference (RPD) between the percent recoveries of a spike and its corresponding spike duplicate. However, precision for analytes which were not able to be spiked (e.g. DSC, TGA, pH, Hydroxide, specific gravity, ^{79}Se, ^{60}Co, ^{137}Cs, ^{154}Eu, ^{106}Ru, ^{134}Cs, ^{144}Ce, ^{94}Nb, ^{155}Eu, ^{226}Ra, ^{238}Pu and $^{243/244}Cm$) was based on the RPD between the sample and its corresponding duplicate. Rerun requirements were not specified by the TSAP when its precision criteria were not met. No duplicate analytical data were provided for those analyses which were visually based, such as Appearance.

SPIKE/SPIKE DUPLICATE ANALYSIS

To evaluate accuracy of data, the TSAP, Table 2, specified that samples be spiked for the following analytes: NO_2, NO_3, F, PO_4, SO_4, Al, Na, Total Inorganic Carbon (TIC), Total Organic Carbon (TOC), NH_3, Acetone, 1-Butanol, 2-Butoxyethanol, 2-Butanone, 2-Hexanone, Methyl Isobutyl Ketone, 2-Pentanone, Tetrahydrofuran, Tributylphosphate, U-gross, total alpha, total beta, $^{239/240}Pu$, ^{241}Am, ^{3}H, ^{14}C, ^{99}Tc, ^{90}Sr, ^{129}I, and ^{237}Np.

A minimum of one spike and one spike duplicate was performed for each of the above procedures for the one sampling event. "Sampling event" was defined as all samples collected from one tank.

Accuracy criteria as determined by percent recovery were valid only when the analyte concentration in the spiked sample was increased by at least 25 percent more than the original sample concentration.

When precision criteria were based on the difference between the spike and spike duplicate, they were valid only when the analyte concentrations of the spike and spike duplicate were greater than ten times the detection limit.

This allowed the precision evaluation to be made on analyte concentrations that were within the quantifiable range.

Because spiking standards were not available, neither spikes nor spike duplicates were performed for the following analytes: visual appearance, DSC, TGA, pH, specific gravity, hydroxide, ^{79}Se, ^{60}Co, ^{137}Cs, ^{106}Ru, ^{134}Cs, ^{144}Ce, ^{94}Nb, ^{154}Eu, ^{155}Eu, ^{226}Ra, and $^{243/244}Cm$.

Accuracy control limits were specified in the TSAP for DSC and TGA. Percent recovery of laboratory control standards was used to evaluate accuracy for these analytes.

RESULTS OF ANALYSES (DATA SUMMARY AND EVALUATION)

PHYSICAL ANALYSES

APPEARANCE/HOMOGENEITY

Observations were performed on the direct (unmodified) sample. No instruments were used, consequently there was no instrument calibration. No quality control criteria were specified in the TSAP.

Analyses were performed by procedure number LA-519-151/E-2 at approximately 24°C on 1/25/96. SW-846 does not define a holding time criteria for this parameter.

From the visual appearance, these liquid samples were essentially homogeneous. Except for a small solid "chunk" of material in sample 4AP-96-2C, no solids or turbidity were seen, and no organic phase was observed. Consequently the notification limit of "No Observable Organic Layer" was not exceeded. These samples did not require heating or dilution to maintain solubility. The samples were collected in amber glass bottles, making the observation of color not possible.

The sample dose rates ranged from 90 to 220 mrad/hour and 75 to 175 mR/hour, appearing to be relatively homogeneous.

DIFFERENTIAL SCANNING CALORIMETRY (DSC)

Analyses were performed in duplicate on the direct sample using procedure/revision number LA-514-113/C-1.

No unusual instances or problems occurred during the analyses of DSC. SW-846 protocol do not specify a hold time for DSC. Sample holding times ranged from 11 to 16 days.

The TSAP requires an LCS percent recovery of 80 to 120 percent. DSC analyses of LCS standards yielded recoveries of 97.7 and 109.0 percent, meeting the TSAP accuracy quality control limits.

Endotherms were observed as expected in the standards, as well as in all samples. The sample endotherms were due mainly or wholly to the presence of water. No blank was run for DSC, because it was unnecessary. The DSC instrument is sufficiently stable that any occurrence of baseline aberration is observable on the sample thermogram. No baseline drift was seen.

No exotherms were observed in any of the samples or their duplicates. Sample average endotherms ranged from 1890 to 2100 J/g, and endotherm precision values were 15.0 RPD, 2.7 RPD , 15.1 RPD and 5.5 RPD for samples 1C, 2C 3C and 4, respectively. None of the samples exceeded the TSAP specified precision criterion of ±20 RPD for exotherms (or for endotherms).

Because no standard exists that can be spiked into the samples, the evaluation of spike accuracy was not possible.

No notification limit was exceeded. The TSAP notification limit specified (for evaporator operations) that the absolute value of the ratio of exotherm to endotherm could not exceed 1, nor could any exotherm exist which occurred at a temperature less than 335 °F (safety screen).

THERMOGRAVIMETRIC ANALYSIS (TGA)

All analyses were performed in a nitrogen atmosphere in duplicate on the direct sample, using procedure/revision number LA-560-112/B-1. No unusual instances or problems occurred during the analyses. SW-846 protocol do not specify a hold time for TGA. Sample holding times ranged from 11 to 16 days.

The TSAP requires an LCS percent recovery of 80 to 120 percent. TGA analyses of LCS standards yielded recoveries of 102.3 and 100.9 percent, meeting TSAP accuracy quality control criteria.

Average weight percent of water in the samples ranged from 94.2 to 98.8. The grand mean TGA value of all samples was 96.6 weight percent.

The TSAP specified precision criterion of ±20 RPD was met with precision values ranging from 0.2 to 0.8 RPD. No blank was run for TGA.

Because no standard exists that can be spiked into the samples, the evaluation of spike accuracy was not possible.

SPECIFIC GRAVITY

Analyses were performed on the direct samples using procedure/revision number LA-510-112/C-3. No unusual instances or problems occurred during the analyses. SW-846 protocol does not specify a sample holding time for specific gravity. The sample holding times ranged from 29 to 34 days.

The TSAP did not specify an accuracy limit, however, the LCS standard for specific gravity yielded a reasonable recovery of 100.9 percent.

No blank was run for specific gravity. Precision of the sample duplicates was acceptable with values ranging from 0.6 RPD to 1.5 RPD. The TSAP precision criterion was ±20 RPD.

Because no standard exists that can be spiked into the samples, the evaluation of spike accuracy was not possible.

Average specific gravity of samples 1C, 2C, 3C and 4 was 1.035, 0.998, 1.028 and 1.003, respectively, with a mean of 1.016. The TSAP specified notification limit of >1.41 was not exceeded.

INORGANIC ANALYSES

HYDROGEN ION ACTIVITY, pH (by pH Meter/Electrode)

Analyses were performed on the direct samples using procedure/revision number LA-212-106/A-0. No unusual instances or problems occurred during the analyses. SW-846 protocol specify the hold time for pH as "analyze immediately", which could be met only as a field measurement. Sample holding times ranged from 10 to 15 days.

The TSAP did not specify an accuracy limit, but the LCS standard for pH yielded recoveries of 100.3 and 100.7 percent.

No blank was run for pH. The duplicate analysis on sample 1C resulted in an acceptable precision value of 0.1 RPD. The TSAP precision criterion was ± 0.3 pH units.

Because no standard exists that can be spiked into the samples, the evaluation of spike accuracy was not possible.

The pH of samples 1C, 2C and 3C was 13.95, 12.23 and 12.88, respectively. The TSAP notification limit of <8.0 was not exceeded.

HYDROXIDE (by Titration)

Hydroxide was performed by procedure/revision number LA-211-102/C-0 on direct samples. There did not appear to be any analytical anomalies or difficulties during the analyses of this analyte.

Sample holding times ranged from 20 to 25 days. SW-846 did not specify a sample holding time for hydroxide, consequently sample holding time requirements were met.

The autotitrator pH was calibrated using standards of pH 7.00 and 10.00. During sample analyses, all titration endpoints were within the calibration range of pH 7 to 10 (except for the blanks as expected, where the pH shift was extreme with a minute addition of HNO_3 titrant).

Typical titration curves were seen in the analyses of tank AP-104 samples despite the presence of sample ammonia in samples 2C and 3C. In earlier work (tank AP-101), it was found that a cause of major interference with the analysis of hydroxide was the presence of high ammonia concentration.

No spikes were required by the TSAP, and no spikes were analyzed. The TSAP did not specify accuracy control limits.

Precision between the samples and sample duplicates ranging from 0.0 to 1.9 RPD was acceptable (less than the TSAP specified maximum control limit of ±20 RPD).

Although reagent blanks were analyzed, the procedure uses them to correct sample values, consequently it is not possible to determine an independent analytical value for a reagent blank because it is subtracted from itself to yield a result of zero. The field blank hydroxide concentration was less than the detection limit, and was determined to not be contaminated.

Sample hydroxide concentrations ranged from 462 to 3,680 µg/ml. The mean hydroxide concentration of the three samples was 2,262 µg/ml.

ION CHROMATOGRAPHY

All ion chromatography (IC) analyses were performed on the direct samples, using procedure/revision number LA-533-105/D-1. As was discussed above, tank AP-104 samples were not preserved. Due, however, to the characteristic high pH and radioactivity of the waste, the samples were not likely to be subject to biodegradation, which is generally the greatest source of nitrate deterioration.

The procedure detection limit shown in the summary tables for all of the IC analytes was set at the concentration equivalent to the lowest standard within the calibration curve multiplied by the dilution factor. The *sample* detection limit was generated by multiplying the above detection limit by an additional

factor based on the sample aliquot that was injected into the IC (that is to say, 11 or 101).

FLUORIDE

There did not appear to be any obvious analytical anomalies or difficulties during the analyses of this analyte. Sample holding times ranged from 25 to 30 days. SW-846 does not specify a holding time for fluoride.

LCS recoveries for all Tank AP-104 samples were acceptable with values ranging from 91.9 percent to 97.0 percent.

The accuracy control limits were 75 to 125 percent recovery. Fluoride accuracy was acceptable with a spike recoveries 92.6 and 93.8 percent.

Precision between the spikes and spike duplicates was acceptable with values of 0.1 and 2.3 RPD, meeting the TSAP acceptance limits of ±20%.

The reagent blanks and field blank fluoride concentrations were less than the detection limits of 0.013 μg/ml, indicating the absence of contamination.

Sample fluoride concentrations ranged from 113 to 652 μg/ml with a mean concentration of 442 μg/ml.

NITRATE

There did not appear to be any analytical anomalies or difficulties during the analyses of this analyte. Sample holding times ranged from 25 to 30 days. SW-846 specifies a holding time for nitrate of 48 hours, consequently none of the sample holding times were met. It should be noted that for handling high radiation dosage samples, the required operational procedures make attaining analytical results on protocol analyses within 48 hours quite unlikely.

LCS recoveries were acceptable with values of 95.8 percent and 97.7 percent.

Spike accuracy was acceptable with recoveries of 97.9 and 106.8 percent recovery. The TSAP specified accuracy acceptance limits were 75 to 125 percent recovery.

Precision between the spike and spike duplicate met the program's precision criterion of ±20%, by yielding values of 0.2 and 3.6 relative percent difference.

The reagent blank nitrate concentrations were less than the detection limit of 0.23 μg/ml, and were determined to not be contaminated. The field blank was very slightly greater than the detection limit with an average concentration of 0.0232 μg/ml. It was determined to not be contaminated.

Sample nitrate concentrations ranged from 2,940 to 19,600 µg/ml, with a mean of 13,200 µg/ml.

NITRITE

There did not appear to be any analytical anomalies or difficulties during the analyses of this analyte.

Sample holding times ranged from 25 to 30 days. SW-846 does not specify a sample holding time for nitrite. It is known, nonetheless, that in the environment, nitrite is chemically less stable than nitrate, suggesting that at least for environmental samples, a sample holding time of short duration is reasonable. Tank AP-104 matrix is significantly different from that encountered environmentally, and may, however, have such conditions that nitrite could be chemically stable. Nitrite concentrations are expected to change through oxidation-reduction reactions as a corrosion inhibitor.

LCS recoveries were acceptable ranging from 93.1 to 94.0 percent.

Accuracy, as indicated by recoveries of the spikes, was acceptable with recoveries of 92.6 and 93.8 percent. The accuracy control limits were 75 to 125 percent recovery.

Precision between the spikes and spike duplicates met the acceptance criterion of ±20%, where the values were 0.0 and 1.2 RPD.

The reagent blanks and field blank nitrite concentrations were less than the detection limit of 0.107 µg/ml. These blanks were determined to not be contaminated.

Sample nitrite concentrations ranged from 1,080 to 3,330 µg/ml, with a mean of 1,952 µg/ml.

PHOSPHATE (ORTHO-PHOSPHATE)

There did not appear to be any analytical anomalies or difficulties during the analyses of this analyte.

Sample holding times ranged from 25 to 30 days. SW-846 does not specify a holding time for phosphate.

LCS recoveries were acceptable, ranging from 95.6 to 97.4 percent.

Accuracy was acceptable as indicated by recoveries of the spikes with 94.2 percent and 94.4 percent. The accuracy control limits were 75 to 125 percent recovery.

Precision between the spikes and spike duplicates was acceptable with values of 0.1 and 0.0 RPD. The TSAP specified precision acceptance limits were ±20 RPD.

The reagent blanks and field blank phosphate concentrations were less than the detection limit of 0.12 μg/ml and were determined to not be contaminated.

Sample phosphate concentrations ranged from 372 to 1,600 μg/ml with a mean of 876 μg/ml.

SULFATE

There did not appear to be any analytical anomalies or difficulties during the analyses of this analyte.

The sample holding time for samples 1C, 2C and 3C was 25 days. The SW-846 holding time of 28 days was exceeded for the field blank, which was held 30 days.

LCS recoveries were acceptable ranging from 96.2 to 96.7 percent.

Accuracy was acceptable as indicated by percent recoveries of 95.2 and 93.8 for the spikes. The TSAP accuracy control limits were 75 to 125 percent recovery.

Precision between the spikes and spike duplicates was acceptable with values of 0.2 and 0.2 RPD. The TSAP specified precision acceptance limits were ±20 RPD.

Field blank and reagent blank sulfate concentrations were less than the detection limit of 0.12 μg/ml. All blanks were determined to not be contaminated.

Sample sulfate concentrations ranged from 495 to 1,500 μg/ml with a mean of 876 μg/ml.

TOTAL CARBON, TC (by Combustion and Coulometry)

Total carbon (TC) analyses were performed on direct samples using procedure/revision number LA-344-105/C-0. Total carbon analysis is a subset of the procedure for total organic carbon. A maximum sample holding time for total carbon was not specified in SW-846 protocol, but is set at 28 days for total organic carbon. The actual sample holding times for TC was 35 days for samples 1C, 2C and 3C, and was 74 days for the field blank. The tank samples were rerun once because in the original run, the spike recovery was unacceptable. The field blank was rerun twice because its spike failed to meet recovery criteria on the first rerun.

The LCS recoveries were acceptable with values of 101 and 102.3 percent.

Accuracy for the spikes were acceptable with percent recoveries of 99.4 and 104.9. The TSAP specified range of acceptance was 75 to 125 percent recovery.

Precision between the spike and spike duplicate was acceptable with a value of 4.1 RPD. The TSAP specified range of acceptance was ±20 RPD.

The field blank total carbon concentration was less than the detection limit of 5 μg C/ml. The detection limit shown on the data summary sheet was based on a standard volume of 0.20 milliliters (an optimal value). Generally the least amount of carbon detectable was 1 μg. Thus, one microgram of carbon divided by 0.20 ml equaled 5.00 μg C/ml. A concentration of 1.1 μg C/ml was found in the reagent blanks, but because it was less than 5% of the average sample concentration, they too were determined to not be contaminated.

Total carbon concentrations of the samples ranged from 729 μg C/ml to 1560 μg C/ml. The mean concentration of the three samples was 1020 μg/ml.

TOTAL INORGANIC CARBON, (CARBONATE) (by Coulometry)

Total inorganic carbon (TIC) analyses were performed on direct samples with procedure/revision number LA-622-102/C-0. There did not appear to be any analytical anomalies or difficulties during the analyses of this analyte.

A maximum sample holding time for this analyte was not specified in SW-846 protocol, but the actual holding times ranged from 14 to 19 days.

The LCS recovery was acceptable with a value of 97.3 percent.

Accuracy for the spike was acceptable with a percent recovery of 99.7. The TSAP specified range of acceptance was 75 to 125 percent recovery.

Precision between the spike and spike duplicate was acceptable with an RPD of 0.7. The TSAP specified range of acceptance was ±20 RPD.

The field blank carbon concentration was less than the detection limit of 5 μg C/ml. The reagent blanks had a TIC concentration of 0.70 μg C/ml, which was much less than 5% of the lowest sample concentration. Consequently all blanks were determined to not be contaminated.

In calculating the sample concentrations, an instrument blank value was subtracted from the sample value. Values shown on the data summary sheet for each reagent blank were uncorrected because, if the result blank value was subtracted from itself, it would yield an erroneously corrected blank value of zero.

Carbonate (TIC) concentrations of the samples ranged from 446 μg C/ml to 1480 μg C/ml. The mean concentration of the three samples was 836 μg C/ml.

TOTAL ORGANIC CARBON, TOC (by Combustion and Coulometry)

Total organic carbon (TOC) analyses were performed on direct samples using procedure/revision number LA-344-105/C-0.

A maximum sample holding time of 28 days was specified in SW-846 protocol for total organic carbon. The sample holding time was met for the tank samples with 24 days. For the field blank, however, the holding time was 29 days.

There did not appear to be any analytical anomalies or difficulties during the analyses of this analyte

LCS recovery was acceptable with a value of 101.0 percent.

Accuracy for the spike was acceptable with a percent recovery of 94.7. The TSAP specified range of acceptance was 75 to 125 percent recovery.

Precision between the spike and spike duplicate was acceptable with an RPD of 3.3. The TSAP specified range of acceptance was ±20 RPD.

The field and reagent blank's total organic carbon concentrations were 12 μg C/ml. Using the definition of contamination provided in Reference 8, as discussed in the "*Blanks*" section above, it was determined that the blanks were not contaminated because the TOC concentrations of the blanks were less than 20% of the lowest sample concentration (110 μg C/ml).

TOC concentrations of the samples, including the tank surface sample, ranged from 110 μg C/ml to 221 μg C/ml. The mean concentration of the four samples was 154 μg C/ml.

CALCULATED TOTAL ORGANIC CARBON

The analysis of total organic carbon by combustion is subject to potential underestimation of the total concentration of organic carbon due to losses of purgable (volatile) organics (if present at a significant concentration) during the acidified sparging phase of sample preparation. The total organic carbon concentration of samples can also be obtained as the difference in concentrations between two individual analyses: total carbon and total inorganic carbon (carbonate). This calculation method is useful as a comparative check against TOC by combustion, as shown in Table 6.

Table 6. Comparison of Calculated TOC with Analytically Derived TOC

Sample ID Number	Sample Description	Total Carbon μg C/ml	Total Inorganic Carbon μg C/ml	Calculated TOC (TC-TIC) μg C/ml	TOC by Combustn. μg C/ml
S96V000016	4AP-96-IB2 field blank	<5.0	<5.0	≤5.0	12.0
S96V000006	4AP-96-1C	1560	1480	80	167
S96V000007	4AP-96-2C	759	586	173	118
S96V000008	4AP-96-3C	729	446	283	221

The notification limit for calculated TOC was >87 μg C/ml. The limit was exceeded by samples 2C and 3C. From Table 6, it appears that the differences between calculated TOC and TOC analysis results were small and are within expected experimental error. It was inferred from these data that the amount of purgable (volatile) organic material lost during TOC analyses was relatively small.

AMMONIA (by Ion Selective Electrode)

Ammonia analyses were performed using procedure/revision number LA-631-001/B-2 on direct samples. There did not appear to be any analytical anomalies or difficulties during the analyses.

SW-846 does not specify a sample holding time for ammonia, but should be as short as possible to prevent losses due to a high pH sample matrix. Sample holding times ranged from 22 to 27 days. For ammonia, the accepted method of preservation is to acidify samples at the time of collection to pH <2 with nitric acid. Time was intentionally not spent to preserve these samples, so as to limit the exposure of sample collectors to excessive radiation dosage. Although biodegradation was not expected to be a significant factor for ammonia decomposition in these samples due to levels of radioactivity, which is lethal to microorganisms, it was expected and quite likely that, due to the high pH of these samples, sample degradation could occur due to chemical reactions. At higher pH, ionic ammonia reacts with hydroxide to generate NH_3, which is volatile and is readily dissipated at ambient temperature. The hydroxide concentration of these samples was sufficient to cause such losses. Thus due to sample matrix conditions, it is possible that these ammonia data could be biased low.

LCS recovery was acceptable at 94.9 percent.

Spike accuracy was acceptable with a percent recovery of 101.4, as evaluated against the TSAP specified accuracy criteria of 75 to 125 percent recovery.

Precision was determined to be acceptable with a 1.9 RPD between the spike and its duplicate. The TSAP specified limit for precision was ±20 RPD.

Ammonia concentration was less than the detection limit for the field blank and only slightly greater than the detection limit for the reagent blank, indicating the absence of blank contamination.

Sample concentrations were low, ranging from <5 to 133 μg NH_3/ml, with a mean concentration of 51 μg NH_3/ml.

INDUCTIVELY COUPLED PLASMA/EMISSION SPECTROSCOPY (by ICP)

An acid predigestion was performed on ICP samples prior to analysis. Analyses were performed by procedure/revision numbers LA-505-161/B-0 and LA-505-151/D-3. There did not appear to be any analytical anomalies or difficulties during analysis of these analytes. Sample 3C was analyzed twice because during the initial run, the spike duplicate had been omitted.

Sample holding times for ICP analyses ranged from 44 to 55 days. SW-846 protocol require that the holding time for these metals may not exceed six months. All ICP analyses were completed within the required holding time.

An undigested blank and standard was used to initially calibrate the ICP instrument and to check calibration on a continuing basis. A digested reagent blank included with each batch, however, was used to determine the extent of blank contamination introduced during sample preparation (and by inference, the estimated amount of sample contamination due to digestion).

ICP accuracy evaluation criteria for LCS standards were based on the undigested initial calibration verification (ICV) standards.

Interelement data corrections were automatically performed for spectral interferences from calcium on iron, manganese, and silicon; from chromium on iron, silicon and uranium; from iron on chromium, and manganese; from potassium on silicon; from sodium on silicon and nickel; from antimony on nickel; and from uranium on aluminum, chromium, iron, manganese, nickel, and silicon.

The linear concentration range was determined for ICP analytes. The maximum concentration within the linear range (defined as the highest concentration in which the percent recovery of a standard deviates less than five percent from 100 percent with a 5 second signal integration time) was 1,000 μg/ml for aluminum and 1000 μg/ml for sodium.

Although the elements, chromium, iron, Manganese, nickel, silicon and uranium, were not required to be analyzed (because they were not primary safety

screening analytes), they were analyzed with aluminum and sodium to maximize analytical efficiency in the case that data for the secondary analytes would be required.

ALUMINUM

Percent recoveries of the undigested LCS standards were acceptable with values of 98.6 and 103.8 percent recovery.

Spike accuracy was acceptable with values of 92.7 and 113.7 percent recovery. The TSAP specified acceptance limits were 75 to 125 percent recovery.

Precision between the spike and spike duplicate was acceptable with a 9.8 relative percent difference. The TSAP specified limits for precision were ±20 RPD. Precision between the samples and their corresponding duplicates was good, ranging from 0.2 to 2.4 RPD.

The aluminum concentrations of the field and preparation blanks were less than the detection limit, indicating the absence of contamination.

There was good comparison between the two sets of data for sample 2C, with average sample concentrations of 165 and 170 μg/ml. Average aluminum concentrations of the samples were rather low, ranging from 33.1 to 549 μg/ml, with a mean of 198 μg/ml.

CHROMIUM

Percent recoveries of the undigested LCS standards were acceptable with values of 99.8 and 100.0 percent recovery.

Spike accuracy was acceptable with values of 97.8 and 102.9 percent recovery. The TSAP was not explicit in specifying acceptance limits, however it was assumed that they were consistent with those for aluminum and sodium, which were 75 to 125 percent recovery.

Precision between the spike and spike duplicate was acceptable with a 1.7 relative percent difference. The TSAP was not explicit in specifying acceptance limits for precision, however it was assumed that they were consistent with those for aluminum and sodium, which were ±20 RPD. Precision between the samples and their corresponding duplicates was good, ranging from 0.0 to 2.3 RPD.

The chromium concentrations of the field and preparation blanks were less than the detection limit, indicating the absence of contamination.

There was good comparison between the two sets of data for sample 2C, with average sample concentrations of 19.3 and 19.4 μg/ml. Average chromium

concentrations of the samples were rather low, ranging from 16.2 to 85.3 μg/ml, with a mean of 34.5 μg/ml.

IRON

Percent recoveries of the undigested LCS standards were acceptable with values of 98.6 and 99.0 percent recovery.

Spike accuracy was acceptable with values of 96.8 and 103.0 percent recovery. The TSAP was not explicit in specifying acceptance limits, however it was assumed that they were consistent with those for aluminum and sodium, which were 75 to 125 percent recovery.

Precision between the spike and spike duplicate was acceptable with a 3.2 relative percent difference. The TSAP was not explicit in specifying acceptance limits for precision, however it was assumed that they were consistent with those for aluminum and sodium, which were ±20 RPD. Precision between the samples and their corresponding duplicates was consistent, of which all were less than the detection limit.

The iron concentrations of the field and preparation blanks were also less than the detection limit, indicating the absence of contamination.

Because all sample concentrations were less than the detection limit, the average iron concentrations of the samples were not able to be calculated. All sample iron concentrations were less than 2.5 μg/ml.

MANGANESE

Percent recoveries of the undigested LCS standards were acceptable with values of 97.6 and 99.4 percent recovery.

Spike accuracy was acceptable with values of 95.4 and 102.2 percent recovery. The TSAP was not explicit in specifying acceptance limits, however it was assumed that they were consistent with those for aluminum and sodium, which were 75 to 125 percent recovery.

Precision between the spike and spike duplicate was acceptable with a 1.4 relative percent difference. The TSAP was not explicit in specifying acceptance limits for precision, however it was assumed that they were consistent with those for aluminum and sodium, which were ±20 RPD. Precision between the samples and their corresponding duplicates was consistent, of which all were less than the detection limit.

The manganese concentrations of the field and preparation blanks were also less than the detection limit, indicating the absence of contamination.

Because all sample concentrations were less than the detection limit, the average manganese concentrations of the samples were not able to be calculated. All sample manganese concentrations were less than 0.8 μg/ml.

SODIUM

Recovery of the undigested LCS standards were acceptable for the rerun of sample 3C with 100.2 percent recovery, and marginal for the initial run with a percent recovery of 120.8.

When sample sodium concentrations exceed 1000 μg/ml, the normal control limits for accuracy determination are not applicable. This occurs because the instrument's detector is overwhelmed with the intensity of the signal at extremely high analyte concentrations, causing detector insensitivity to even large concentration differences. The sodium concentration of each sample was determined to exceed 1000 μg/ml, consequently an alternative evaluation of accuracy was applied using serial dilution. Upon serial dilution of reanalyzed sample 3C, a dilution RPD value was determined. The formula for this calculation follows:

$$\textit{Dilution RPD} = \frac{\textit{[initial conc.]-([serial dil'n conc.] x dilution factor)}}{\textit{[initial concentration]}} \textit{ x 100}$$

Using a dilution rather than a spike has advantages and disadvantages as a data quality evaluation tool. Although an evaluation of the deviation between the actually derived concentration and the expected concentration following dilution does not definitively indicate the degree of matrix interference within a sample, it does establish whether or not the analysis was performed within the linear portion of the calibration curve. It should be understood, however, that matrix interference is generally insignificant when the analyte is present in such high concentrations in the sample. Conversely, a spike is not particularly useful when the initial sample concentration is very high. To be distinguishable above the initial sample concentration, spiking must generate a final concentration at least 25 percent greater than the initial concentration, yet this frequently places the analyte concentration within the region of calibration non-linearity. The result is that percent recovery is significantly underestimated. For example, accuracy for sample 3C was not acceptable as indicated by the spike recovery of 1070 percent. As an alternative, the dilution method was applied to sodium (the only ICP analyte in which the sample concentrations exceeded 1000 μg/ml). Dilution RPD values less than five percent indicate that measurements are within the linear portion of the calibration curve. Sample 3C had a dilution RPD value of 3.1 percent which was within the 5% limit.

Precision between the spike and spike duplicate was meaningless and was consequently not determined. The TSAP specified criterion for precision was

±20 RPD. Precision was determined, however, between the tank samples and their duplicates, where RPDs ranged from 0.0 to 2.0. The field blank's precision would ordinarily be unacceptable at 21.5 RPD, however it was measured near the detection limit and was thus considered to be acceptable.

All preparation blank concentrations were four to five orders of magnitude less than the mean of sample values, indicating the absence of contamination. The field blank's sodium concentration was three orders of magnitude less than the lowest mean sample concentration, consequently it too was determined to not be contaminated.

Average sample sodium concentrations ranged from 4,280 to 16,400 μg/ml, with a grand mean of 9,805 μg/ml.

NICKEL

Percent recoveries of the undigested LCS standards were acceptable with values of 100.2 and 100.8 percent recovery.

Spike accuracy was acceptable with values of 100.2 and 104.6 percent recovery. The TSAP was not explicit in specifying acceptance limits, however it was assumed that they were consistent with those for aluminum and sodium, which were 75 to 125 percent recovery.

Precision between the spike and spike duplicate was acceptable with a 1.1 relative percent difference. The TSAP was not explicit in specifying acceptance limits for precision, however it was assumed that they were consistent with those for aluminum and sodium, which were ±20 RPD. Precision between the samples and their corresponding duplicates was consistent, and acceptable. All nickel results for samples 1C and 3C were less than the detection limit. For samples 2C and 4, the precision was acceptable with values of 7.7 and 6.7 RPD, respectively.

The nickel concentrations of the field and preparation blanks were less than the detection limit, indicating the absence of contamination.

Because the concentrations for two of the samples were less than the detection limit, the grand average nickel concentration of all samples was not able to be calculated. For samples 2C and 4, the average nickel concentrations were 0.326 and 0.331 μg/ml, respectively.

SILICON

Percent recovery of the undigested LCS standard was not acceptable for any of the samples (except for the rerun of sample 3C), where the recovery was 280.0 percent recovery. For the rerun of sample 3C, the standard had an acceptable recovery of 98.0 percent. Because the LCS standard was out of control on the

initial run, these data are invalid. Only data from the rerun of sample 3C are valid.

Spike accuracy was acceptable for the rerun of sample 3C, with 98.8 percent recovery. The spike recovery for the original run was not acceptable with a value of 202.5 percent. The TSAP was not explicit in specifying acceptance limits, however it was assumed that they were consistent with those for aluminum and sodium, which were 75 to 125 percent recovery.

Precision between the sample 3C rerun spike and spike duplicate was acceptable with a 6.1 relative percent difference. The TSAP was not explicit in specifying acceptance limits for precision, however it was assumed that they were consistent with those for aluminum and sodium, which were ±20 RPD. Precision between rerun sample 3C and its corresponding duplicate was good, with a 8.5 RPD. For the initial run, the sample/duplicate precision was variable, ranging from an acceptable 3.0 RPD to an unacceptable 77.2 RPD.

The silicon concentrations of the field and preparation blanks were near or less than the detection limit, indicating the absence of contamination.

There appeared to be a significant difference between the initial and rerun sets of data for sample 3C, with average sample concentrations of 86.0 and 30.6 µg/ml, respectively. Average silicon concentrations of the samples were not determined because all except for rerun sample 3C were invalid.

URANIUM

Percent recoveries of the undigested LCS standards were acceptable with values of 93.6 and 96.7 percent recovery.

Spike accuracy was acceptable with values of 102.0 and 115.0 percent recovery. The TSAP was not explicit in specifying acceptance limits, however it was assumed that they were consistent with those for aluminum and sodium, which were 75 to 125 percent recovery.

Precision between the spike and spike duplicate was acceptable with a 3.7 relative percent difference. The TSAP was not explicit in specifying acceptance limits for precision, however it was assumed that they were consistent with those for aluminum and sodium, which were ±20 RPD. Precision between the samples and their corresponding duplicates was consistent, and acceptable. All uranium results for samples 1C and 3C were less than the detection limit. For samples 2C and 4, the precision was acceptable with values of 3.7 and 0.9 RPD, respectively.

The uranium concentrations of the field and preparation blanks were less than the detection limit, indicating the absence of contamination.

Because the concentrations for two of the samples were less than the detection limit, the grand average uranium concentration of all samples was not able to

be calculated. For samples 2C and 4, the average uranium concentrations were 32.2 and 34.5 µg/ml, respectively.

TOTAL URANIUM (by Kinetic Phosphorescence)

These chemical (not radiochemical) analyses for total uranium were performed on direct samples using procedure/revision number LA-925-009/A-1. There did not appear to be any analytical anomalies or difficulties during the analyses of this analyte.

Sample holding times for uranium ranged from 25 to 30 days. A maximum sample holding time was not specified for this analyte in SW-846 protocol.

The LCS standard recovery was acceptable with a value of 99.8 percent.

Spike accuracy was acceptable at 102.6 percent recovery. The TSAP specified requirement for spike accuracy was 70 to 130 percent recovery.

Precision between the spike and spike duplicate was not acceptable with a value of 22.5 relative percent difference, which exceeded the TSAP specified criterion for precision of ±20 RPD. A rerun was not requested or performed.

The preparation blank and field blank uranium concentrations were three orders of magnitude less than the mean of sample concentrations, indicating the absence of contamination.

Sample concentrations for total uranium ranged from 9.41 µg/ml to 34.2 µg/ml, with a mean of 17.8 µg/ml. These data were consistent with the analytical results for uranium by ICP.

RADIOCHEMICAL ANALYSES

In the Raw Analytical Data section, Radiochemical Analyses subsection (ahead of the actual raw analytical data), is the Data Verification and Deliverable (DVD) summary report for radionuclide analyses. This report summarizes the activity results for all requested radionuclides, and provides data qualifiers and total propagated uncertainty (TPU) values for results. The TPU values are based on the uncertainties inherent in each step of the analysis process. They are used to determine "reasonable" RPD values, which may be used to accept valid data that do not meet TSAP acceptance criteria. A report guide is provided immediately following the DVD report to assist in understanding this report.

TOTAL ALPHA (by Proportional Counter)

Total alpha analyses were performed on acid predigested samples (assuring that the analyte was fully dissolved to facilitate analyte detection) using

procedure/revision number LA-508-101/D-2. Sample holding times ranged from 29 to 39 days. The required maximum sample holding time for total alpha activity as specified in SW-846 protocol is six months. Tank AP-104 analyses for total alpha were analyzed within the required holding time. The field blank appeared to have been contaminated with beta activity during the initial run, and because alpha and beta are analyzed together, alpha activity was also rerun. Otherwise, there were no analytical anomalies or difficulties.

LCS standard recoveries were acceptable with 85.5 and 98.0 percent recovery.

The accuracy of the spike was acceptable with a recovery of 95.9 percent. The TSAP specified criterion for spike recovery was 70 to 130 percent.

Precision between the spike and spike duplicate was acceptable with 4.7 RPD. Precision between the tank samples 1C, 2C, 3C and their duplicates was acceptable with RPDs ranging from 3.0 to 6.0. Precision between the tank surface sample, 4, and its duplicate slightly exceeded the QC limit with 25.5 RPD. Because the alpha activity of sample 4 was very near to the detection limit, the QC limit is not applicable, and therefore the results are acceptable. The TSAP specified criteria for precision for both the spike/spike duplicate and the samples/sample duplicates was ±25 RPD.

Alpha activities of the field blank and reagent blanks for the tank samples were less than the detection limit, indicating the absence of contamination for all blanks.

All sample total alpha activities were only slightly greater than their detection limits, ranging from 0.000233 to 0.000458 μCi/ml. The notification limit specified in the TSAP was to be calculated as "> 0.10 x specific gravity". Table 7 compares the calculated notification limit against sample alpha activities. The alpha notification limit was not exceeded for any of the samples.

Table 7. Comparison of Alpha Activities and Action Limits

Sample Number	Average Specific Gravity	Calculated Notification Limit	Average Sample Alpha Activity, μCi/ml
4AP-96-1C	1.035	0.1035	0.000233
4AP-96-2C	0.998	0.0998	0.000458
4AP-96-3C	1.028	0.1028	0.000351
4AP-96-4	1.003	0.1003	0.000271

TOTAL BETA (by Proportional Counter)

Total beta analyses were performed on acid predigested samples (assuring that the analyte was fully dissolved to facilitate analyte detection) using procedure/revision number LA-508-101/D-2. Sample holding times ranged from 29 to 39 days. The required maximum sample holding time for total beta activity as specified in SW-846 protocol is six months. Tank AP-104 analyses for total beta were analyzed within the required holding time. The field blank appeared to have been contaminated during the initial run, so it was rerun. Otherwise, there were no analytical anomalies or difficulties.

LCS standard recoveries were acceptable with 94.5 and 100.9 percent recovery.

Accuracy for the total beta spike was acceptable with 97.6 percent recovery. The TSAP specified limits for accuracy were 70 to 130 percent recovery.

Precision between the spike and spike duplicate was acceptable with 6.8 relative percent difference. The TSAP specified limits for precision between spikes was ±25 RPD. Precision between the samples and their duplicates ranged from 0.3 to 3.1 RPD.

The field blank, which was rerun due to apparent contamination, had an activity that was less than the detection limit. However, the rerun field blank duplicate's activity was 11 times greater than the detection limit, indicating that it was contaminated. Such contamination appeared to be caused during the analysis rather than being inherent to the sample itself, consequently the field blank itself was determined to not be contaminated. Preparation blank beta activities were less than the detection limit, and were not contaminated during analyses. Because the preparation blanks were not contaminated, it is unlikely that the tank samples were contaminated during the analyses.

Average beta activities for the samples ranged from 3.77 to 6.24 μCi/ml, with an average activity of 4.48 μCi/ml.

GAMMA ENERGY ANALYSES (GEA)

Samples were acid predigested and analyzed using procedure/revision number LA-548-121/D-1. Sample holding times ranged from 21 to 26 days. Except for radium-226 with a maximum holding time of six months, there were no specified maximum holding times in SW-846 protocol. All GEA analytes were, therefore, within the required holding time criteria. There did not appear to be any analytical anomalies or difficulties during these analyses.

The GEA procedure does not use an LCS quality control standard for every isotope; the LCS standard contained only ^{60}Co and ^{137}Cs. Quality control parameters for all of the GEA analytes were expressed relative to these two isotopes.

The ^{137}Cs LCS standard recovery was acceptable with 99.3 percent recovery. The ^{60}Co LCS standard recovery was also acceptable with 98.1 percent recovery.

The GEA procedure is sufficiently free of matrix interference with analyte quantitation that the procedure does not require spiking to assess matrix effects. However, another quality control parameter, percent counting error, was of significance. It was determined and reported when the sample analyte activity was above the detection limit.

Precision evaluation was based on the difference between the samples and their corresponding duplicates. The TSAP specified control limit for precision for all GEA analytes was ±20 RPD.

CESIUM-137 (by GEA)

^{137}Cs precision values for sample 1C was acceptable with 0.7 RPD.

The counting error for all samples ranged from 0.3 to 0.4 percent.

^{137}Cs activities in the preparation blank and field blank were less than the detection limit, indicating the absence of contamination.

Sample ^{137}Cs activities ranged from 3.68 to 6.17 $\mu Ci/ml$, with a mean value of 4.57 $\mu Ci/ml$. These activities were significantly less than the notification limit specified in the TSAP.

CESIUM-134 (by GEA)

^{134}Cs precision RPD between sample 1C and its duplicate was not able to be determined because the sample activity values were less than the detection limit.

Sample counting errors ranged from 10.8 to 26.7 percent for those samples having activities greater than the detection limit.

Preparation blank activity was less than the detection limit, indicating the absence of contamination. ^{134}Cs activity in the field blank was also less than the detection limit, indicating the absence of ^{134}Cs contamination.

Sample ^{134}Cs activities ranged from <0.00236 to 0.00658 $\mu Ci/ml$. These activities were significantly less than the notification limit specified in the TSAP.

CERIUM/PRASEODYMIUM-144 (by GEA)

^{144}Ce is counted with ^{144}Pr because the two isotopes are indistinguishable by GEA analysis. ^{144}Pr is the decay daughter product of ^{144}Ce. The combined

activity was determined from the ^{144}Pr gamma energy line when the parent and daughter were at secular equilibrium.

$^{144}Ce/Pr$ precision values between samples and their duplicates were not able to be determined. $^{144}Ce/Pr$ values for each sample and sample duplicate were less than the detection limit.

Sample counting errors were indeterminable because all sample activities were less than the detection limit.

$^{144}Ce/Pr$ activities for the preparation blank and field blank were less than the detection limit, indicating the absence of contamination.

Average sample $^{144}Ce/Pr$ activities were not able to be calculated because all were less than the detection limit. The $^{144}Ce/Pr$ activity for all samples was less than 0.0305 $\mu Ci/ml$.

COBALT-60 (by GEA)

^{60}Co precision values between samples and their duplicates were not able to be determined because activities for each sample and sample duplicate were less than the detection limit.

Sample counting errors were indeterminable because all sample activities were less than the detection limit.

^{60}Co activities for the preparation blank and field blank were less than the detection limit, indicating the absence of contamination.

Average sample activities were not able to be calculated because all were less than the detection limit. The ^{60}Co activity for all samples was less than 0.000499 $\mu Ci/ml$. These activities were significantly less than the notification limit specified in the TSAP.

EUROPIUM-154 (by GEA)

^{154}Eu precision values between samples and their duplicates were not able to be determined because activities for each sample and sample duplicate were less than the detection limit.

Sample counting errors were indeterminable because all sample activities were less than the detection limit.

^{154}Eu activities for the preparation blank and field blank were less than the detection limit, indicating the absence of contamination.

Average sample activities were not able to be calculated because all were less than the detection limit. ^{154}Eu activity for all samples was less than 0.0013 μCi/ml. These activities were significantly less than the notification limit specified in the TSAP.

EUROPIUM-155 (by GEA)

^{155}Eu precision values between samples and their duplicates were not able to be determined because activities for each sample and sample duplicate were less than the detection limit.

Sample counting errors were indeterminable because all sample activities were less than the detection limit.

^{155}Eu activities for the preparation blank and field blank were less than the detection limit, indicating the absence of contamination.

Average sample activities were not able to be calculated because all were less than the detection limit. ^{155}Eu activity for all samples was less than 0.00824 μCi/ml. These activities were significantly less than the notification limit specified in the TSAP.

NIOBIUM-94 (by GEA)

^{94}Nb precision values between samples and their duplicates were not able to be determined because activities for each sample and sample duplicate were less than the detection limit.

Sample counting errors were indeterminable because all sample activities were less than the detection limit.

^{94}Nb activities for the preparation blank and field blank were less than the detection limit, indicating the absence of contamination.

Average sample activities were not able to be calculated because all were less than the detection limit. ^{94}Nb activity for all samples was less than 0.000740 μCi/ml. These activities were significantly less than the notification limit specified in the TSAP.

RUTHENIUM/RHODIUM-106 (by GEA)

^{106}Ru is detected in the presence of its daughter, ^{106}Rh because the two isotopes are indistinguishable by GEA analysis. Radioactivity values were shown in the spread sheet as the sum of Rh^{106} and Ru^{106} activities at secular equilibrium.

$^{106}Ru/Rh$ precision values between samples and their duplicates were not able to be determined because activities for each sample and sample duplicate were less than the detection limit.

Sample counting errors were indeterminable because all sample activities were less than the detection limit.

$^{106}Ru/Rh$ activities for the preparation blank and field blank were less than the detection limit, indicating the absence of contamination.

Average sample activities were not able to be calculated because all were less than the detection limit. $^{106}Ru/Rh$ activity for all samples was less than 0.0464 μCi/ml. These activities were significantly less than the notification limit specified in the TSAP.

RADIUM-226 (by GEA)

^{226}Ra precision values between samples and their duplicates were not able to be determined because activities for each sample and sample duplicate were less than the detection limit. Because the detection limit for ^{226}Ra is characteristically very high by the GEA procedure, it is not the procedure of choice for samples with low activity.

Sample counting errors were indeterminable because all sample activities were less than the detection limit.

^{226}Ra activities for the preparation blank and field blank were less than the detection limit, indicating the absence of contamination.

Average sample activities were not able to be calculated because all were less than the detection limit. ^{226}Ra activity for all samples was less than 0.0638 μCi/ml. Despite being less than the detection limit, all sample results exceeded the notification limit of >0.033 μCi/ml. Failure to provide sample results that were less that the notification limit occurred because of the relatively high ^{137}Cs activity in the samples. To minimize the excessive background, dilutions of the sample were required, causing the detection limits to be increased by the sample dilution factor.

TRITIUM (by Lachat/Liquid Scintillation)

This procedure was performed on the direct sample using procedure/revision number LA-218-114/A-4. Sample holding times ranged from 39 to 54 days. A required sample holding time was not specified in SW-846 protocol for this analyte.

Data from the initial analytical run were rejected because the spike results showed the absence of analyte (0% recovery). An investigation of this run disclosed that the spike was prepared incorrectly. In the first rerun, the

spike duplicate had a recovery that yielded an unacceptable precision RPD, consequently sample 1C was run a third time.

Performance on the LCS standard was acceptable with recoveries of 106.1 and 94.6 percent.

Spike accuracy was acceptable, being within the TSAP specified acceptance criteria of 70 to 130 percent recovery, with a value of 115.5 percent recovery.

Precision, as measured by the relative percent difference between the spike and spike duplicate, was within the TSAP specified acceptance limit of ±25 RPD with a value of 4.3 RPD. Precision between the samples and their duplicates ranged from 2.4 to 6.4 RPD.

The counting error for all samples ranged from 0.8 to 5.7 percent.

The activity of the reagent blank for sample 1C was slightly greater than the detection limit, while the other reagent blank was less than the detection limit, indicating the absence of contamination. The field blank activity was also less than the detection limit, indicating that it was not contaminated.

^{3}H activities for the tank samples ranged from 0.000327 to 0.0125 μCi/ml, with a mean activity of samples of 0.00478 μCi/ml.

CARBON-14 (by Liquid Scintillation)

This procedure was performed on the direct sample using procedure/revision number LA-348-104/B-1. Sample holding times ranged from 59 to 64 days. A required sample holding time was not specified in SW-846 protocol for ^{14}C. Data from the initial analytical run was invalidated because the LCS standard was out of control. All samples were rerun, but for sample 1C the spike recovery was too low, and failed to meet accuracy acceptance criteria. An investigation determined that the low spike recovery was due to adding the spike after the distillation had already started, causing loss of CO_2. Sample 1C was rerun a second time.

The LCS standard recoveries were within acceptance limits with values of 91.7 and 94.6 percent.

Spike accuracy was acceptable, being within the TSAP specified acceptance criteria of 70 to 130 percent recovery with a value of 93.5 percent recovery.

Accuracy performance between the spike and spike duplicate failed to meet the TSAP specified acceptance limit of ±25 RPD, having a value of 27.5 RPD. No additional reruns were requested.

The counting error for tank samples was reasonable for liquid scintillation analyses, ranging from 1.6 to 3.2 percent.

The ^{14}C activity of the reagent blank for samples 2C, 3C and the field blank was only slightly greater than the detection limit. The activity of sample 1C's reagent blank and the field blank were less than the detection limit. Consequently is was determined that all blanks were not contaminated.

Average ^{14}C activities for the tank samples ranged from 0.0000192 to 0.000160 μCi/ml, with a mean activity of samples of 0.0000761 μCi/ml. These activities were significantly less than the notification limit specified in the TSAP.

SELENIUM-79 (by Ion Exchange/Dist/Liquid Scintillation)

^{79}Se analysis was performed on acid digestions of the samples. The digestion generated soluble selenium needed for full recovery of the analyte, and also produced an acid matrix which was required for this procedure.

^{79}Se analyses were performed using procedure/revision number LA-365-132/B-2. Sample holding times ranged from 39 to 44 days. A required maximum sample holding time was not specified in SW-846 protocol for this analyte. There did not appear to be any analytical anomalies or difficulties during the analyses of this analyte.

^{79}Se activity was based upon calibration with a ^{14}C standard, since both nuclides have approximately the same beta energy. This was necessary because no ^{79}Se standard exists.

Isotopic recovery through the preparative procedure was estimated gravimetrically by the use of a carrier for both the sample and the blanks. Carrier recoveries were good for the field blank, samples and duplicate with values ranging from 69.5 to 86.5 percent.

The counting error of ^{79}Se for all samples ranged from 3.75 to 4.41 percent.

The ^{79}Se activities of the field blank and reagent blanks were less than the detection limit, indicating the absence of contamination.

The precision performance did not meet the TSAP specified acceptance criteria of ±25, where the RPD for sample 1C was 30.1. Precision for ^{79}Se is based on the difference between a sample and its duplicate. The cognizant chemist noted, however, that the data were technically acceptable despite the high RPD because the analytical results were very near the detection limit. At this concentration, the data are subject to significantly greater normal variability.

^{79}Se activities for samples 2C and 3C were less than their detection limits which were from <0.000000337 μCi/ml and <0.000000283 μCi/ml. The average ^{79}Se activity for sample 1C was 0.000000498 μCi/ml. These activities were significantly less than the notification limit specified in the TSAP.

STRONTIUM-89/90 (by Separation/Proportional Counting)

This procedure was performed on acid digestions of the samples using procedure/revision number LA-220-101/D-1. Sample holding times ranged from 39 to 44 days. A required sample holding time was not specified in SW-846 protocol for this analyte. There did not appear to be any analytical anomalies or difficulties during the analyses of this analyte.

The $^{89/90}Sr$ LCS standard percent recovery of 101.6 was within acceptance limits.

Spike accuracy was acceptable, being within the TSAP specified acceptance criteria of 75 to 125 percent recovery, with a value of 103.3 percent recovery.

Precision as measured by the relative percent difference between the spike and spike duplicate was within the TSAP specified acceptance limit of ±20 RPD with a value of 14.4 RPD.

The counting error for the tank samples was low, ranging from 2.0 to 3.3 percent. For the field blank, the counting error was high with a value of 177.0 percent, which is expected because of the low number of counts detected for a blank. Sample carrier recoveries were acceptable, ranging from 81.9 to 85.6 percent.

The activity of the field blank was less than the detection limit, and the preparation blank activity was only slightly greater than the detection limit. Consequently, all blanks were determined to not be contaminated.

$^{89/90}Sr$ activities for the samples ranged from 0.0405 to 0.106 μCi/ml. These activities were significantly less than the notification limit specified in the TSAP.

TECHNETIUM-99 (by EXTRACTION/LIQUID SCINTILLATION)

^{99}Tc analyses were prepared by performing an acid predigestion of samples. Digestion was performed to fully dissolved the analyte, facilitating analyte detection. Analyses were performed using procedure/revision number LA-438-101/D-2. Sample holding times ranged from 43 to 48 days. A required maximum sample holding time was not specified in SW-846 protocol for this analyte.

There did not appear to be any analytical anomalies or difficulties during the analyses of this analyte.

^{99}Tc LCS standard recovery was acceptable with 107.1 percent recovery.

Accuracy as evaluated by percent recovery of spike was acceptable, with a value of 110.5 percent. The TSAP specified limits for accuracy were 75 to 125 percent recovery.

Precision performance, as measured by the relative percent difference between the spike and its duplicate, was acceptable at 0.5 RPD. The TSAP specified limit for precision was ±20 RPD.

Sample tracer recoveries ranged from 51.1 to 57.3 percent, which were of marginal quality. The counting error for all samples ranged from 3.7 to 6.8 percent and was also of marginal quality.

The ^{99}Tc activities of the field blank and preparation blank were less than the detection limit and were determined to not be contaminated.

^{99}Tc activities for the tank samples ranged from 0.000724 to 0.00533 $\mu Ci/ml$ (significantly less than the notification limit of >2 $\mu Ci/ml$). The mean activity for all samples was 0.00294 $\mu Ci/ml$.

IODINE-129 (by Distillation/Ion Exchange/GEA)

^{129}I analysis was performed on direct samples using procedure/revision LA-378-103/C-0. Sample holding times ranged from 49 to 54 days. Required maximum sample holding times are not specified in SW-846 protocol for this analyte. Analytical data from the initial analytical run were invalidated because the LCS standard failed to meet internal QC requirements. The quality of the data from the rerun were acceptable.

Accuracy performance, as determined by the recovery of the rerun LCS standard, was acceptable with a value of 91.0 percent recovery.

The accuracy control limits specified in the TSAP were 75 to 125 percent recovery. Accuracy was acceptable for the spike with a percent recovery of 93.3.

The precision control limit specified in the TSAP was ±20 RPD. Precision between the spike and its duplicate was acceptable with 2.0 RPD.

Sample carrier recoveries ranged from 61.0 to 71.1 percent.

Activities of the field blank and reagent blanks were less than the detection limit, indicating the absence of contamination.

^{129}I activity was less than the detection limit for all samples, ranging in values from <0.0000835 to <0.000140 $\mu Ci/ml$, and did not exceed the notification limit of >0.0026 $\mu Ci/ml$.

NEPTUNIUM-237 (by Extraction/Internal Proportional Counter)

^{237}Np analyses were performed on previously acid digested samples, using procedure/revision LA-933-141/H-1. Sample holding times ranged from 23 to 28 days. A required maximum sample holding time was not specified in SW-846

protocol for this analyte. There did not appear to be any analytical anomalies or difficulties during the analyses of this analyte.

Accuracy performance, as measured by percent recovery of the LCS standard, was acceptable with 69.4 percent recovery, despite seeming to be extremely low. Internal control limits for the ^{237}Np LCS standard were 43.78 percent to 114.25 percent. The limits are empirically derived and set at ±3 standard deviations from the mean of the historical data.

Accuracy for the spike was not acceptable with a percent recoveries of 72.5. The TSAP specified range of acceptance was 75 to 125 percent recovery. A rerun was neither requested nor performed.

Precision performance was acceptable between the spike and spike duplicate with a 0.4 relative percent difference. The TSAP specified acceptance limit was ±20 RPD.

The counting errors were high for all samples, ranging from 101.0 to 146.0 percent, because the analytical values were near the detection limit.

Activities of the field blank and preparation blank were less than the detection limit, indicating the absence of contamination.

Estimated ^{237}Np activities for all samples were less than the minimum detectable activity (detection limit), ranging from <0.000305 to 0.000202 μCi/ml. The minimum detectable activity was 0.000339 μCi/ml.

PLUTONIUM-239/240 (by Ion Exchange/Alpha Energy Analysis)

$^{239/240}Pu$ analyses were performed using procedure/revision LA-943-128/A-0 on samples which had been previously digested. There did not appear to be any analytical anomalies or difficulties for these analyses.

The sample holding times ranged from 23 to 28 days. A required maximum sample holding time was not specified in SW-846 protocol for this analyte.

Percent recovery of the LCS standard was acceptable with a result of 97.7.

Accuracy performance was acceptable for the spike with a percent recovery of 95.3 percent. The TSAP specified acceptance limits for $^{239/240}Pu$ accuracy were 70 and 130 percent recovery.

Precision between the spike and its duplicate was acceptable with 10.7 RPD. The TSAP specified acceptance limit for precision was ±25 RPD.

^{236}Pu tracer recoveries were acceptable with values ranging from 80.4 to 103.0 percent. The sample counting error for all samples was 100.0 percent.

The field blank and preparation blank had activities less than the detection limit, indicating the absence of contamination.

The tank sample $^{239/240}Pu$ activities were all less than 0.0000368 μCi/ml, and did not exceed the TSAP specified notification limit.

PLUTONIUM-238 (by Ion Exchange/Alpha Energy Analysis)

^{238}Pu analyses were generated coincidentally with $^{239/240}Pu$ data in the $Pu^{239/240}$ procedure. Acid digested samples were prepared and then analyzed using procedure/revision LA-943-128/A-0. There did not appear to be any analytical anomalies or difficulties with these analyses.

The sample holding times ranged from 23 to 28 days. A required maximum sample holding time was not specified in SW-846 protocol for this analyte.

The assessment of accuracy for this method was based on the recovery of the ^{239}Pu LCS standard because no ^{238}Pu standard was available. Percent recovery of the LCS standard was acceptable with a result of 97.7.

An evaluation of accuracy and precision based on a spike and spike duplicate was not possible because a spiking standard was not available. Sample 2C was analyzed in duplicate to evaluate the precision, but because the duplicate result was less than the detection limit, a RPD could not be calculated.

^{236}Pu tracer recoveries were acceptable with values ranging from 80.4 to 103.0 percent. Counting error for sample 1C was 7.0 percent. The counting error for the other samples was 100.0%.

Field blank and preparation blank activities (based on $Pu^{239/240}$) were less than the detection limit, indicating the absence of contamination.

^{238}Pu activities in the tank samples ranged from less than 0.0000368 μCi/ml for samples 1C and 3C to 0.0000426 μCi/ml for 2C. Reported "less than" values for the ^{238}Pu detection limit were generated using 20 dpm for the sample activity. Sample analytical values did not exceed the notification limit.

AMERICIUM-241 (by Extraction/Alpha Energy Analysis)

^{241}Am analyses were performed on acid digested samples using the newly developed procedure/revision LA-953-103/A-4. There did not appear to be any analytical anomalies or difficulties for these analyses.

The sample holding times ranged from 23 to 28 days. A required maximum sample holding time was not specified in SW-846 protocol for this analyte.

Percent recovery of the LCS standard was acceptable with a value of 89.3.

Accuracy performance was acceptable for the spike with a percent recovery of 97.3 percent. The TSAP specified acceptance limits for ^{241}Am accuracy were 70 and 130 percent recovery.

Precision between the spike and its duplicate was acceptable with 4.6 RPD. The TSAP specified acceptance limit for precision was ±20 RPD.

^{243}Am tracer recoveries were good, ranging from 65.7 to 79.7 percent.

The field blank and preparation blank had activities less than the detection limit, indicating the absence of contamination.

^{241}Am activity was less than the detection limit for all samples, with values ranging from <0.000146 to <0.000150 μCi/ml. These "less than" values were determined using 5 percent of the ^{243}Am tracer peak as the ^{241}Am peak. The notification limit of >1 μCi/ml was not exceeded by any sample.

CURIUM-243/244 (by Extraction/Alpha Energy Analysis)

$^{243/244}Cm$ analytical data were generated as an analytical by-product of ^{241}Am analysis, using the newly developed ^{241}Am procedure/revision LA-953-103/A-4 on acid digested samples. There did not appear to be analytical anomalies or difficulties for $^{243/244}Cm$ analyses.

The sample holding times ranged from 23 to 28 days. A required maximum sample holding time was not specified in SW-846 protocol for this analyte.

$^{243/244}Cm$ and ^{241}Am were analyzed simultaneously using the same procedure, however there was no ^{244}Cm standard or spike available for the evaluation of $^{243/244}Cm$ accuracy. Because of this, ^{241}Am was used as a surrogate LCS standard, and ^{243}Am was used as a tracer to estimate accuracy. ^{241}Am standard recovery was acceptable with a value of 89.3.

To verify that the procedure could appropriately measure ^{244}Cm, the counter was calibrated for efficiency. It was determined that the counting efficiency was uniform across the entire energy counting spectrum.

The $^{243/244}Cm$ counting error for the samples and field blank was 100.0 percent. ^{243}Am tracer recoveries were good, ranging from 65.7 to 79.7 percent.

Evaluations of accuracy and precision based on a spike and spike duplicate were not possible because a spiking standard was not available. Sample 2C was analyzed in duplicate to assess $^{243/244}Cm$ precision. An RPD value could not be calculated for that sample, however, because the activities for the sample and duplicate were less than the detection limit.

The activities of the field and preparation blanks were less than the detection limit, indicating the absence of contamination.

The $^{243/244}Cm$ activity of all samples was less than their detection limits, which ranged from <0.000127 to <0.000150 μCi/ml. These "less than" values were determined using 5 percent of the ^{243}Am tracer peak as the $^{243/244}Cm$ and ^{241}Am peaks. No sample exceeded the notification limit of >0.013 μCi/ml.

ORGANIC ANALYSES

Although Total Organic Carbon is an organic analysis and would generally be discussed in this section, it was placed in the inorganic section. This placement enabled consolidating the discussion of total carbon, total inorganic carbon and total organic carbon and their interrelationships in the characterization of AP-104 waste.

The matrix for tank AP-104 samples as defined by SW-846 was concentrated aqueous waste. Sample holding times for both volatile organic analysis (VOA) and semi-volatile organics (Semi-VOA) were defined in volume 1, section B, chapter 4, table 4-1 of SW-846, as 14 days prior to extraction. For semi-volatiles, extracts must be analyzed within 40 days following extraction.

Analytical accuracy was based on the percent recovery of target compound spikes. Analytical precision was based on the relative percent difference between these spikes and their duplicates. Accuracy and precision acceptance. criteria for each compound were given Table 2 of the TSAP.

To enable interpretation of summary data for VOA and Semi-VOA compounds, Table 8 defines the qualifiers, called Q-flags, shown on Form I in the Organic Raw Analytical Data section and on the Data Summary Tables.

Table 8. Data Qualifier Definitions

Q-FLAG	DEFINITION
U	Indicates the compound was analyzed for but not detected; the U-flagged concentration number is the quantitation limit.
J	Indicates an estimated value for the target or tentatively identified compounds; spectra meet criteria but response is below the quantitation limit for the target compounds.
B	Compound was found in the blank.
D	Analysis was performed on a diluted sample.
E	Indicates that quantitation was above the calibration range.
N	Indicates the presumptive evidence of a compound. This flag is only used for tentatively identified compounds, where the identification is based on a mass spectral library search.
X	Indicates nitration product of the acid surrogate.

Raw data can be found in the Raw Analytical Data section under Organic Analyses.

VOLATILE ORGANIC ANALYSIS, VOA (by GC/MS)

The samples were analyzed by Battelle Pacific Northwest National Laboratory (PNNL), Analytical Chemistry Laboratory, using method PNL-ALO-335, a purge and trap/gas chromatograph-mass spectrometer instrumental method. A narrative by the cognizant chemist at PNNL was provided in the raw data section of the data package which gives additional information.

A 0.1 ml aliquot of the sample was combined with 4.9 ml of lab blank water in the purge vessel. Hanford wastes have historically been difficult to analyze because of the carry-over of foam into the trap from the VOA sparging vessel. As a consequence, the sample aliquot was limited to the largest aliquot (0.1 ml) that was not expected to produce foaming above the vessel during sparging. Sample holding times ranged from 30 to 35 days. The SW-846 holding time for VOA is 14 days. It was not possible to meet the SW-846 holding time for VOAs because the samples required additional shipping (to the 325 Laboratory) and radiological material handling.

The Internal Standard compounds (IS) were bromochloromethane, 1,4-difluorobenzene and chlorobenzene-d5.

None of the target compounds exceeded the maximum percent difference of ±40 percent for continuing calibration.

The System Monitoring Compounds (SMC), also called surrogates, were toluene-d8, bromofluorobenzene, and 1,2-dichloroethane-d4. LCS control limits applied to VOA analyses were those criteria specified in the Contract Laboratory Program (CLP) Statement of Work (SOW), August 1991, for System Monitoring Compounds (SMC). The LCS standard for VOA is defined as the method blank, which contains internal standards and surrogates and is analyzed at the start of each 12 hour analysis window. The acceptance criteria used are located on the Recovery Report page for each sample in the Raw Analytical Data section and in the Data Summary Tables section (shown as surrogates). Recovery of all surrogates was acceptable, meeting the recovery limit criteria.

The Matrix Spike compounds (MS), which were analyzed, were the same as the target analytes which were required by the TSAP in Table 2. The target analytes for which the spike failed to meet TSAP acceptance limits were acetone, and 1-butanol with recoveries of 124 and 140 percent, respectively. Table 9 indicates the control limits specified in the TSAP for the VOA compounds, where the upper control limit for acetone and 1-butanol is 110 percent recovery.

Precision performance was evaluated as the relative percent difference between the matrix spikes and their duplicates. The RPD for all spike duplicates was acceptable with values less than or equal to 25.

Precision estimates were also available between sample 2C and its duplicate. For acetone and 1-butanol, these RPDs were 14.3 and 5.3, respectively. RPD values for the other compounds could not be calculated because the analyte concentrations were less than the quantitation limit.

The concentrations of all target compounds in the field blank, trip blank and reagent blank were less than the quantitation limit and consequently were determined to not be contaminated.

Table 9. TSAP Specified Control limits for VOA Compounds

Target Compound Name	Precision Control Limits	Accuracy Control Limits
Acetone	±25 RPD	40 - 110 % Recovery
1-Butanol	±25 RPD	30 - 110 % Recovery
2-Butanone	±25 RPD	40 - 110 % Recovery
2-Hexanone	±25 RPD	40 - 125 % Recovery
Methyl Isobutyl Ketone	±25 RPD	40 - 110 % Recovery
2-Pentanone	±25 RPD	40 - 125 % Recovery
Tetrahydrofuran	±25 RPD	30 - 110 % Recovery

The compound Methyl Isobutyl Ketone (MIBK) is specified as an analyte in the TSAP. The preferred name for this compound is 4-Methyl-2-pentanone.

All raw data, including calibration information, were furnished as instrument printouts.

No target analytes were observed in any of the samples above the notification limit. 1-Butanol was detected in sample 4AP-96-3A. Acetone was observed in samples 4AP-96-2A and 4AP-96-3A. Information on Tentatively Identified Compounds (TIC) is available in the raw data section.

SEMI-VOLATILE ORGANIC ANALYSIS, Semi-VOA (by GC/MS)

The samples were extracted with a continuous liquid/liquid extractor using procedure LA-523-105/A-0. The sample extracts were analyzed by a gas chromatograph/mass spectrometer instrument using procedure LA-523-406/A-0. A narrative by the cognizant chemist was provided in the raw data section of the data package which gives additional information. That narrative noted that this analysis had difficulties with a five-point calibration, internal standard area count losses in samples, and loss of acid surrogates in the

samples. Several observations of color changes and precipitate formation were also recorded during the extractions.

The SW-846 specified holding time (Table 2) of 14 days for extraction was exceeded for samples 4AP-96-2B, 4AP-96-0B2 and 4AP-96-TB2. The sample holding times for extraction ranged from 14 to 48 days. The SW-846 specified holding time of 40 days for analysis was exceeded for only sample 4AP-96-TB2. The sample holding times for analyses ranged from 30 to 49 days. It was not possible to meet the SW-846 short holding time for extraction of Semi-VOAs because of the extra procedural steps necessary to handle radiological material. The TSAP required that the trip blank be analyzed only after target compounds were detected in the field blank. Because target compounds were detected in the tank samples, however, it was decided to also analyze the trip blank.

LCS control limits for the Semi-VOA compounds were administratively set to the criteria listed in procedure LA-523-406/A-0 for surrogates. The LCS standard for Semi-VOA is defined as the method blank, which contained internal standards and surrogates. The internal standards were 1,4-Dichlorobenzene-d4; Naphthalene-d8, Acenapthene-d10; Phenanthrene-d10 and Chrysene-d12. The surrogates (SMCs) were 2-Fluorophenol; Phenol-d5; 2-Chlorophenol-d4; 1,2-Dichlorobenzene-d4; Nitrobenzene-d5; 2-Fluorobiphenyl; 2,4,6-Tribromophenol and Terphenyl-d14. The acceptance criteria used are located on Form 2C in the Organic Raw Analytical Data section and on the data summary tables.

2-Butoxyethanol and tri-butylphosphate had acceptable percent differences of 13.4 and 4.1, respectively for the continuing calibration check.

All analytes had percent relative standard deviations less than 15% for the 5 point calibration curve except for phenol-d5. See the chemist's narrative for additional information.

The acid surrogate recoveries were affected by the sample matrices. The nitration of phenolic surrogates and other phenolic compounds in Hanford tank waste samples is expected. Such nitration does not occur in the blanks or other non-tank waste matrices. For example, 2-Fluorophenol can be seen to be nitrated to form 2-Fluoro-4-nitrophenol and 2-Fluoro-6-nitrophenol. Surrogate nitration products, flagged on form 1F with an X, were found in all three samples. Acid surrogate recoveries for the trip blank and field blank were acceptable, except for phenol-d5 (with 128% and 136%, respectively), which were above the control limit of 110%.

Acceptable tributylphosphate (TBP) recoveries of 63% and 79% were obtained in the matrix spike (MS) and duplicate (MSD), respectively. The TSAP specified limits for accuracy for TBP were 40 to 125 percent recovery. Precision between the MS and MSD was 22 RPD. 2-Butoxyethanol had acceptable accuracy (with MS and MSD results of 60 and 92 percent recovery). However, the precision between the MS and MSD (with 42 RPD) was not acceptable, exceeding the TSAP control limit of ±25RPD.

All of the samples and blanks met the internal standard criteria, with the following exceptions: Perylene-d12 (the last eluting internal standard) was present below the lower acceptance limit for samples 1B and 2B. The loss of this internal standard had no impact, however, on any of the surrogates or target analytes, because they used other internal standards for quantitation.

Raw data, including calibration information, were furnished in the Raw Data section.

Many Tentatively Identified Compounds (TIC's) were observed in the AP-104 samples. An attempt was made to identify some of the surrogate nitration products and were flagged with an X on the 1F forms. The library was unable to produce even poor quality hits on many peaks. On the others, the library match was considered very tentative, and no attempt was made to verify the TIC with an external standard.

CONCLUSIONS

The major constituents in the samples taken from tank AP-104 were (not surprisingly) aluminum, sodium, hydroxide, nitrate and nitrite. Although the concentrations of total organic carbon and fluoride were not high, they were present at significant concentration relative to other tank waste. ^{137}Cs activity accounted for nearly all of the total beta activity.

Of interest was ^{238}Pu, which was detected above the detection limit in sample 2C. ^{237}Np activity accounted for nearly all of the total alpha activity in sample 1C. Iron was not detected in any of the samples, whereas it is frequently found in tank samples.

From a cursory review of the data, it appeared that the waste material in the tank may be stratified. In order of sample depth from the top to the bottom, sample 4 was collected from the surface, with samples 2, 3 and 1 following in descending order.

The following analytes varied in concentration directly with the depth:
TGA, specific gravity, pH, uranium, tritium and ^{90}Sr.

The following analytes varied inversely in concentration with the depth:
nitrite, aluminum, chromium, sodium, total beta, ^{137}Cs, and ^{99}Tc

Calculations were performed to evaluate the waste composition with respect to the waste compatibility corrosion rules. The data generated in Table 10 indicate that the waste in all three tank samples meets the corrosion specifications.

WASTE COMPATIBILITY CORROSION RULES

Sample ID	Analyte	Result (ug/mL)	Result (M)	Is [NO3]...	Is [OH]...	Is [NO2]...	Is [OH] + [NO2]...
Tank AP-104 4AP-96-1C S96V000006	NO3	1.71E+04	0.276	<= 1.0 M? YES	0.010 M <= [OH] <= 5.0 M? YES	0.011 M <= [NO2] <= 5.5 M YES	
	OH	2.64E+03	0.155				
	NO2	3.33E+03	0.072	1.0 M < [NO3] <= 3.0 M?	0.1 M * [NO3] <= [OH] < 10 M?		>= 0.4 * [NO3]?
				3.0 M < [NO3] <= 5.5 M?	0.3 <= [OH] < 10 M?		>= 1.2 M?

Sample ID	Analyte	Result (ug/mL)	Result (M)	Is [NO3]...	Is [OH]...	Is [NO2]...	Is [OH] + [NO2]...
Tank AP-104 4AP-96-2C S96V000007	NO3	2.94E+03	0.047	<= 1.0 M? YES	0.010 M <= [OH] <= 5.0 M? YES	0.011 M <= [NO2] <= 5.5 M YES	
	OH	4.62E+02	0.027				
	NO2	1.08E+03	0.023	1.0 M < [NO3] <= 3.0 M?	0.1 M * [NO3] <= [OH] < 10 M?		>= 0.4 * [NO3]?
				3.0 M < [NO3] <= 5.5 M?	0.3 <= [OH] < 10 M?		>= 1.2 M?

Sample ID	Analyte	Result (ug/mL)	Result (M)	Is [NO3]...	Is [OH]...	Is [NO2]...	Is [OH] + [NO2]...
Tank AP-104 4AP-96-3C S96V000008	NO3	1.96E+04	0.316	<= 1.0 M? YES	0.010 M <= [OH] <= 5.0 M? YES	0.011 M <= [NO2] <= 5.5 M YES	
	OH	3.68E+03	0.216				
	NO2	1.44E+04	0.313	1.0 M < [NO3] <= 3.0 M?	0.1 M * [NO3] <= [OH] < 10 M?		>= 0.4 * [NO3]?
				3.0 M < [NO3] <= 5.5 M?	0.3 <= [OH] < 10 M?		>= 1.2 M?

References

1. WHC-SD-WM-TSAP-069, REV. 0, "Tank 241-AP-104 Grab Sampling and Analysis Plan", dated January 9, 1996, Westinghouse Hanford Company, Richland, WA 99352.

2. WHC-SD-WM-TSAP-069, REV. 0A, "Tank 241-AP-104 Grab Sampling and Analysis Plan", dated January 10, 1996, Westinghouse Hanford Company, Richland, WA 99352.

3. WHC-SD-WM-TSAP-069, REV. 0B, "Tank 241-AP-104 Grab Sampling and Analysis Plan", dated January 26, 1996, Westinghouse Hanford Company, Richland, WA 99352.

4. WHC-SD-WM-TSAP-069, REV. 0C, "Tank 241-AP-104 Grab Sampling and Analysis Plan", dated February 23, 1996, Westinghouse Hanford Company, Richland, WA 99352.

5. WHC-SD-CP-QAPP-016, Rev. 1, "222-S Laboratory Quality Assurance Plan", dated July 31, 1995, Westinghouse Hanford Company, Richland, WA 99352.

6. WHC-SD-CP-QAPP-016, Rev. 1A, "222-S Laboratory Quality Assurance Plan", dated August 31, 1995, Westinghouse Hanford Company, Richland, WA 99352.

7. WHC-SD-DP-142, Rev. 0, "45-Day Safety Screening Results for Tank 241-AP-104, Grab Samples 4AP-96-1C, 4AP-96-2C, 4AP-96-3C, 4AP-96-4, and 4AP-96-IB1", dated, March 7, 1996, Westinghouse Hanford Company, Richland, WA 99352.

8. WHC-SD-WM-QAPP-009, Rev. 2, "242-A Evaporator Quality Assurance Project Plan", dated May 4, 1995, Westinghouse Hanford Company, Richland, WA 99352.

DATA SUMMARY TABLES

THIS PAGE WAS INTENTIONALLY LEFT BLANK

Differential Scanning Calorimetry - Exotherm using Mettler

Direct Analysis

SAMPLE INFORMATION		EXOTHERM SAMPLE RESULTS				ENDOTHERM SAMPLE RESULTS				QUALITY CONTROL RESULTS		
Custormer Identification	Laboratory Identification	Sample Result Joules/g	Duplicate Result Joules/g	Average Result Joules/g	Sample Precision RPD	Sample Result Joules/g	Duplicate Result Joules/g	Average Result Joules/g	Sample Precision RPD	Detection Limit Joules/g	Standard Recovery %	Reagent Blank Exotherms Joules/g
4AP-96-1C	S96V000006	0.00E+00	0.00E+00	0.00E+00	0.0	1.80E+03	2.09E+03	1.94E+03	15.0	n/a	109.0	n/a
4AP-96-2C	S96V000007	0.00E+00	0.00E+00	0.00E+00	0.0	2.12E+03	2.07E+03	2.10E+03	2.7	n/a	97.7	n/a
4AP-96-3C	S96V000008	0.00E+00	0.00E+00	0.00E+00	0.0	2.05E+03	1.76E+03	1.90E+03	15.1	n/a	97.7	n/a
4AP-96-4	S96V000012	0.00E+00	0.00E+00	0.00E+00	0.0	1.84E+03	1.94E+03	1.89E+03	5.5	n/a	97.7	n/a

% Water by TGA using Mettler

Direct Analysis

SAMPLE INFORMATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS				
Custormer Identification	Laboratory Identification	Sample Result %	Duplicate Result %	Average Result %	Sample Precision RPD	Detection Limit %	Standard % Recovery	Spike Accuracy % Recovery	Spike Dupl. Precision RPD	Reagent Blank %
4AP-96-1C	S96V000006	9.44E+01	9.39E+01	9.42E+01	0.6	n/a	102.3	n/a	n/a	n/a
4AP-96-2C	S96V000007	9.87E+01	9.89E+01	9.88E+01	0.2	n/a	100.9	n/a	n/a	n/a
4AP-96-3C	S96V000008	9.52E+01	9.48E+01	9.50E+01	0.4	n/a	100.9	n/a	n/a	n/a
4AP-96-4	S96V000012	9.88E+01	9.81E+01	9.85E+01	0.8	n/a	100.9	n/a	n/a	n/a

Specific Gravity

Direct Analysis

SAMPLE INFORMATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS				
Custormer Identification	Laboratory Identification	Sample Result Sp. G.	Duplicate Result Sp. G.	Average Result Sp. G.	Sample Precision RPD	Detection Limit Sp. G.	Standard % Recovery	Spike Accuracy % Recovery	Spike Dupl. Precision RPD	Reagent Blank Sp. G.
4AP-96-1C	S96V000006	1.039	1.031	1.035	0.8	0.001	100.9	n/a	n/a	n/a
4AP-96-2C	S96V000007	1.001	0.995	0.998	0.6	0.001	100.9	n/a	n/a	n/a
4AP-96-3C	S96V000008	1.021	1.035	1.028	1.4	0.001	100.9	n/a	n/a	n/a
4AP-96-4	S96V000012	0.996	1.011	1.003	1.5	0.001	100.9	n/a	n/a	n/a

pH
Direct Analysis

SAMPLE INFORMATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS				
Custormer Identification	Laboratory Identification	Sample Result pH Units	Duplicate Result pH Units	Average Result pH Units	Sample Precision RPD	Detection Limit pH Units	Standard within ±0.3 pH units	Spike Accuracy % Recovery	Spike Dupl. Precision RPD	Reagent Blank pH Units
4AP-96-1C	S96V000006	12.94	12.95	12.95	0.1	0.01	Yes	n/a	n/a	n/a
4AP-96-2C	S96V000007	12.23	n/a	n/a	n/a	0.01	Yes	n/a	n/a	n/a
4AP-96-3C	S96V000008	12.88	n/a	n/a	n/a	0.01	Yes	n/a	n/a	n/a

OH^- by Potentiometric Titration
Direct Analysis

SAMPLE INFORMATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS				
Custormer Identification	Laboratory Identification	Sample Result µg/mL	Duplicate Result µg/mL	Average Result µg/mL	Sample Precision RPD	Detection Limit µg/mL	Standard % Recovery	Spike Accuracy % Recovery	Spike Dupl. Precision RPD	Reagent Blank µg/mL
4AP-96-1C	S96V000006	2.64E+03	2.64E+03	2.64E+03	0.0	6.25E+02	95.8	n/a	n/a	<4.20E+01
4AP-96-2C	S96V000007	4.64E+02	4.60E+02	4.62E+02	0.9	1.25E+02	95.8	n/a	n/a	<4.20E+01
4AP-96-3C	S96V000008	3.72E+03	3.65E+03	3.68E+03	1.9	6.25E+02	95.8	n/a	n/a	<4.20E+01
4AP-96-IB1	S96V000014	<4.20E+01	<4.20E+01	n/a	n/a	4.17E+01	95.8	n/a	n/a	<4.20E+01

Ammonia by Ion Selective Electrode -Standard Additions
Direct Analysis

SAMPLE INFORMATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS				
Custormer Identification	Laboratory Identification	Sample Result µg/mL	Duplicate Result µg/mL	Average Result µg/mL	Sample Precision RPD	Detection Limit µg/mL	Standard % Recovery	Spike Accuracy % Recovery	Spike Dupl. Precision RPD	Reagent Blank µg/mL
4AP-96-1C	S96V000006	<5.00E+00	n/a	n/a	n/a	5.00E+00	94.9	n/a	n/a	5.08E+00
4AP-96-2C	S96V000007	1.54E+01	n/a	n/a	n/a	5.00E+00	94.9	101.4	1.9	5.08E+00
4AP-96-3C	S96V000008	1.33E+02	n/a	n/a	n/a	5.00E+00	94.9	n/a	n/a	5.08E+00
4AP-96-IB2	S96V000016	<5.00E+00	n/a	n/a	n/a	5.00E+00	94.9	n/a	n/a	5.08E+00

Uranium by Phosphorescence

Direct Analysis

SAMPLE INFORMATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS					
Custormer Identification	Laboratory Identification	Sample Result µg/mL	Duplicate Result µg/mL	Average Result µg/mL	Sample Precision RPD	Detection Limit µg/mL	Standard % Recovery	Spike Accuracy % Recovery	Spike Dupl. Precision RPD	Reagent Blank µg/mL	Relative Uncertainty %
4AP-96-1C	S96V000006	9.41E+00	n/a	n/a	n/a	4.07E-03	99.8	102.6	22.5	3.02E-03	3.3
4AP-96-2C	S96V000007	3.42E+01	n/a	n/a	n/a	3.70E-04	99.8	n/a	n/a	3.02E-03	3.3
4AP-96-3C	S96V000008	9.76E+00	n/a	n/a	n/a	3.70E-04	99.8	n/a	n/a	3.02E-03	3.8
4AP-96-IB1	S96V000014	3.91E-03	n/a	n/a	n/a	3.70E-04	99.8	n/a	n/a	3.02E-03	2.3

Sulfate by Ion Chromatography - Dionex4000i/4500

Direct Analysis

SAMPLE INFORMATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS				
Custormer Identification	Laboratory Identification	Sample Result µg/mL	Duplicate Result µg/mL	Average Result µg/mL	Sample Precision RPD	Detection Limit µg/mL	Standard % Recovery	Spike Accuracy % Recovery	Spike Dupl. Precision RPD	Reagent Blank µg/mL
4AP-96-1C	S96V000006	1.48E+03	1.51E+03	1.50E+03	2.0	7.01E+02	96.2	95.2	0.2	<1.36E-01
4AP-96-2C	S96V000007	5.57E+02	5.62E+02	5.60E+02	0.9	1.97E+02	96.2	n/a	n/a	<1.36E-01
4AP-96-3C	S96V000008	4.95E+02	4.94E+02	4.95E+02	0.2	1.97E+02	96.7	93.8	0.2	<1.36E-01
4AP-96-IB1	S96V000014	1.96E-01	1.85E-01	1.91E-01	5.8	1.36E-01	96.7	n/a	n/a	<1.36E-01

Phosphate by Ion Chromatography - Dionex 4000i/4500

Direct Analysis

SAMPLE INFORMATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS				
Custormer Identification	Laboratory Identification	Sample Result µg/mL	Duplicate Result µg/mL	Average Result µg/mL	Sample Precision RPD	Detection Limit µg/mL	Standard % Recovery	Spike Accuracy % Recovery	Spike Dupl. Precision RPD	Reagent Blank µg/mL
4AP-96-1C	S96V000006	1.58E+03	1.62E+03	1.60E+03	2.5	6.18E+02	95.6	94.4	0.1	<1.19E-01
4AP-96-2C	S96V000007	6.60E+02	6.55E+02	6.57E+02	0.8	1.74E+02	95.6	n/a	n/a	<1.19E-01
4AP-96-3C	S96V000008	3.67E+02	3.76E+02	3.72E+02	2.4	1.74E+02	97.4	94.2	0.0	<1.19E-01
4AP-96-IB1	S96V000014	<1.20E-01	<1.20E-01	n/a	n/a	1.20E-01	97.4	n/a	n/a	<1.19E-01

Nitrate by Ion Chromatography - Dionex 4000i/4500

Direct Analysis

SAMPLE INFORMATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS				
Custormer Identification	Laboratory Identification	Sample Result µg/mL	Duplicate Result µg/mL	Average Result µg/mL	Sample Precision RPD	Detection Limit µg/mL	Standard % Recovery	Spike Accuracy % Recovery	Spike Dupl. Precision RPD	Reagent Blank µg/mL
4AP-96-1C	S96V000006	1.72E+04	1.71E+04	1.71E+04	0.6	7.21E+02	95.8	97.9	0.2	2.29E-01
4AP-96-2C	S96V000007	2.93E+03	2.96E+03	2.94E+03	1.0	2.03E+02	95.8	n/a	n/a	2.29E-01
4AP-96-3C	S96V000008	1.96E+04	1.96E+04	1.96E+04	0.0	2.03E+02	97.7	106.8	3.6	2.30E-01
4AP-96-IB1	S96V000014	2.30E-01	2.33E-01	2.32E-01	1.3	1.40E-01	97.7	n/a	n/a	2.30E-01

Nitrite by Ion Chromatography - Dionex 4000i/4500

Direct Analysis

SAMPLE INFORMATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS				
Custormer Identification	Laboratory Identification	Sample Result µg/mL	Duplicate Result µg/mL	Average Result µg/mL	Sample Precision RPD	Detection Limit µg/mL	Standard % Recovery	Spike Accuracy % Recovery	Spike Dupl. Precision RPD	Reagent Blank µg/mL
4AP-96-1C	S96V000006	3.34E+03	3.31E+03	3.33E+03	0.9	5.51E+02	93.1	93.8	1.2	<1.07E-01
4AP-96-2C	S96V000007	1.09E+03	1.08E+03	1.08E+03	0.9	1.55E+02	93.1	n/a	n/a	<1.07E-01
4AP-96-3C	S96V000008	1.44E+03	1.45E+03	1.44E+03	0.7	1.55E+02	94.0	92.6	0.0	<1.07E-01
4AP-96-IB1	S96V000014	<1.07E-01	<1.07E-01	n/a	n/a	1.07E-01	94.0	n/a	n/a	<1.07E-01

Fluoride by Ion Chromatography - Dionex 4000i/4500

Direct Analysis

SAMPLE INFORMATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS				
Custormer Identification	Laboratory Identification	Sample Result µg/mL	Duplicate Result µg/mL	Average Result µg/mL	Sample Precision RPD	Detection Limit µg/mL	Standard % Recovery	Spike Accuracy % Recovery	Spike Dupl. Precision RPD	Reagent Blank µg/mL
4AP-96-1C	S96V000006	5.61E+02	5.58E+02	5.60E+02	0.5	6.70E+01	91.9	92.1	0.1	<1.30E-02
4AP-96-2C	S96V000007	1.14E+02	1.12E+02	1.13E+02	1.8	1.88E+01	91.9	n/a	n/a	<1.30E-02
4AP-96-3C	S96V000008	6.56E+02	6.49E+02	6.52E+02	1.1	1.88E+01	97.0	96.1	2.3	<1.30E-02
4AP-96-IB1	S96V000014	<1.30E-02	<1.30E-02	n/a	n/a	1.30E-02	97.0	n/a	n/a	<1.30E-02

Total Carbon by Coulometry
Direct Analysis

SAMPLE INFORMATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS				
Custormer Identification	Laboratory Identification	Sample Result µg/mL	Duplicate Result µg/mL	Average Result µg/mL	Sample Precision RPD	Detection Limit µg/mL	Standard % Recovery	Spike Accuracy % Recovery	Spike Dupl. Precision RPD	Reagent Blank µg/mL
4AP-96-1C	S96V000006	1.55E+03	1.57E+03	1.56E+03	1.3	5.50E+01	101.0	n/a	n/a	1.10E+00
4AP-96-2C	S96V000007	7.41E+02	7.77E+02	7.59E+02	4.7	3.00E+01	101.0	99.4	n/a	1.10E+00
4AP-96-3C	S96V000008	7.11E+02	7.47E+02	7.29E+02	4.9	3.00E+01	101.0	n/a	n/a	1.10E+00
4AP-96-IB2	S96V000016	<5.00E+00	n/a	n/a	n/a	5.00E+00	102.3	104.9	4.1	6.00E-01

Total Organic Carbon by Coulometry
Direct Analysis

SAMPLE INFORMATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS				
Custormer Identification	Laboratory Identification	Sample Result µg/mL	Duplicate Result µg/mL	Average Result µg/mL	Sample Precision RPD	Detection Limit µg/mL	Standard % Recovery	Spike Accuracy % Recovery	Spike Dupl. Precision RPD	Reagent Blank µg/mL
4AP-96-1C	S96V000006	1.67E+02	n/a	n/a	n/a	6.00E+00	101.0	n/a	n/a	1.20E+01
4AP-96-2C	S96V000007	1.18E+02	n/a	n/a	n/a	6.00E+00	101.0	94.7	3.3	1.20E+01
4AP-96-3C	S96V000008	2.21E+02	n/a	n/a	n/a	6.00E+00	101.0	n/a	n/a	1.20E+01
4AP-96-4	S96V000012	1.10E+02	n/a	n/a	n/a	6.00E+00	101.0	n/a	n/a	1.20E+01
4AP-96-IB2	S96V000016	1.20E+01	n/a	n/a	n/a	6.00E+00	101.0	n/a	n/a	1.20E+01

Total Inorganic Carbon by Coulometry
Direct Analysis

SAMPLE INFORMATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS				
Custormer Identification	Laboratory Identification	Sample Result µg/mL	Duplicate Result µg/mL	Average Result µg/mL	Sample Precision RPD	Detection Limit µg/mL	Standard % Recovery	Spike Accuracy % Recovery	Spike Dupl. Precision RPD	Reagent Blank µg/mL
4AP-96-1C	S96V000006	1.48E+03	n/a	n/a	n/a	5.00E+00	97.3	n/a	n/a	7.00E-01
4AP-96-2C	S96V000007	5.86E+02	n/a	n/a	n/a	5.00E+00	97.3	n/a	n/a	7.00E-01
4AP-96-3C	S96V000008	4.46E+02	n/a	n/a	n/a	5.00E+00	97.3	n/a	n/a	7.00E-01
4AP-96-IB2	S96V000016	<5.00E+00	n/a	n/a	n/a	5.00E+00	97.3	99.7	0.7	7.00E-01

Aluminum by Inductively Coupled Plasma/Emission Spectroscopy
Acid Digestion

SAMPLE INFORMATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS				
Custormer Identification	Laboratory Identification	Sample Result µg/mL	Duplicate Result µg/mL	Average Result µg/mL	Sample Precision RPD	Detection Limit µg/mL	Standard % Recovery	Spike Accuracy % Recovery	Spike Dupl. Precision RPD	Preparation Blank µg/mL
4AP-96-1C	S96V000009	5.48E+02	5.49E+02	5.49E+02	0.2	2.50E+00	103.8	92.7	n/a	<5.00E-02
4AP-96-2C	S96V000010	4.11E+01	4.16E+01	4.14E+01	1.2	5.00E-01	103.8	n/a	n/a	<5.00E-02
4AP-96-3C	S96V000011	1.64E+02	1.65E+02	1.65E+02	0.6	1.66E+00	103.8	n/a	n/a	<5.00E-02
4AP-96-3C	S96V000026	1.68E+02	1.72E+02	1.70E+02	2.4	4.00E+00	98.6	113.7	9.8	<5.00E-02
4AP-96-4	S96V000013	3.32E+01	3.29E+01	3.31E+01	0.9	5.00E-01	103.8	n/a	n/a	<5.00E-02
4AP-96-IB1	S96V000015	<5.00E-01	<5.00E-01	n/a	n/a	5.00E-01	103.8	n/a	n/a	<5.00E-02

Chromium by Inductively Coupled Plasma/Emission Spectroscopy
Acid Digestion

SAMPLE INFORMATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS				
Custormer Identification	Laboratory Identification	Sample Result µg/mL	Duplicate Result µg/mL	Average Result µg/mL	Sample Precision RPD	Detection Limit µg/mL	Standard % Recovery	Spike Accuracy % Recovery	Spike Dupl. Precision RPD	Preparation Blank µg/mL
4AP-96-1C	S96V000009	8.51E+01	8.54E+01	8.53E+01	0.4	5.00E-01	100.0	97.8	n/a	<1.00E-02
4AP-96-2C	S96V000010	1.69E+01	1.73E+01	1.71E+01	2.3	1.00E-01	100.0	n/a	n/a	<1.00E-02
4AP-96-3C	S96V000011	1.93E+01	1.93E+01	1.93E+01	0.0	3.33E-01	100.0	n/a	n/a	<1.00E-02
4AP-96-3C	S96V000026	1.94E+01	1.93E+01	1.94E+01	0.5	8.00E-01	99.8	102.9	1.7	<1.00E-02
4AP-96-4	S96V000013	1.61E+01	1.63E+01	1.62E+01	1.2	1.00E-01	100.0	n/a	n/a	<1.00E-02
4AP-96-IB1	S96V000015	<1.00E-01	<1.00E-01	n/a	n/a	1.00E-01	100.0	n/a	n/a	<1.00E-02

Iron by Inductively Coupled Plasma/Emission Spectroscopy
Acid Digestion

SAMPLE INFORMATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS				
Custormer Identification	Laboratory Identification	Sample Result µg/mL	Duplicate Result µg/mL	Average Result µg/mL	Sample Precision RPD	Detection Limit µg/mL	Standard % Recovery	Spike Accuracy % Recovery	Spike Dupl. Precision RPD	Preparation Blank µg/mL
4AP-96-1C	S96V000009	<2.50E+00	<2.50E+00	n/a	n/a	2.50E+00	98.6	96.8	n/a	<5.00E-02
4AP-96-2C	S96V000010	<5.00E-01	<5.00E-01	n/a	n/a	5.00E-01	98.6	n/a	n/a	<5.00E-02
4AP-96-3C	S96V000011	<1.66E+00	<1.66E+00	n/a	n/a	1.66E+00	98.6	n/a	n/a	<5.00E-02
4AP-96-3C	S96V000026	<4.00E+00	<4.00E+00	n/a	n/a	4.00E+00	99.0	103.0	3.2	<5.00E-02
4AP-96-4	S96V000013	<5.00E-01	<5.00E-01	n/a	n/a	5.00E-01	98.6	n/a	n/a	<5.00E-02
4AP-96-IB1	S96V000015	<5.00E-01	<5.00E-01	n/a	n/a	5.00E-01	98.6	n/a	n/a	<5.00E-02

Manganese by Inductively Coupled Plasma/Emission Spectroscopy
Acid Digestion

SAMPLE INFORMATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS				
Custormer Identification	Laboratory Identification	Sample Result µg/mL	Duplicate Result µg/mL	Average Result µg/mL	Sample Precision RPD	Detection Limit µg/mL	Standard % Recovery	Spike Accuracy % Recovery	Spike Dupl. Precision RPD	Preparation Blank µg/mL
4AP-96-1C	S96V000009	<5.00E-01	<5.00E-01	n/a	n/a	5.00E-01	97.6	95.4	n/a	<1.00E-02
4AP-96-2C	S96V000010	<1.00E-01	<1.00E-01	n/a	n/a	1.00E-01	97.6	n/a	n/a	<1.00E-02
4AP-96-3C	S96V000011	<3.33E-01	<3.33E-01	n/a	n/a	3.33E-01	97.6	n/a	n/a	<1.00E-02
4AP-96-3C	S96V000026	<8.00E-01	<8.00E-01	n/a	n/a	8.00E-01	99.4	102.2	1.4	<1.00E-02
4AP-96-4	S96V000013	<1.00E-01	<1.00E-01	n/a	n/a	1.00E-01	97.6	n/a	n/a	<1.00E-02
4AP-96-IB1	S96V000015	<1.00E-01	<1.00E-01	n/a	n/a	1.00E-01	97.6	n/a	n/a	<1.00E-02

Sodium by Inductively Coupled Plasma/Emission Spectroscopy
Acid Digestion

SAMPLE INFORMATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS				
Custormer Identification	Laboratory Identification	Sample Result µg/mL	Duplicate Result µg/mL	Average Result µg/mL	Sample Precision RPD	Detection Limit µg/mL	Standard % Recovery	Spike Accuracy % Recovery	Serial Dilution % Difference	Preparation Blank µg/mL
4AP-96-1C	S96V000009	1.64E+04	1.64E+04	1.64E+04	0.0	5.00E+00	120.8	n/a	n/a	2.93E-01
4AP-96-2C	S96V000010	4.49E+03	4.58E+03	4.54E+03	2.0	1.00E+00	120.8	n/a	n/a	2.93E-01
4AP-96-3C	S96V000011	1.39E+04	1.41E+04	1.40E+04	1.4	3.33E+00	120.8	n/a	n/a	2.93E-01
4AP-96-3C	S96V000026	1.39E+04	1.41E+04	1.40E+04	1.4	8.00E+00	100.2	1070	3.1	1.60E-01
4AP-96-4	S96V000013	4.27E+03	4.30E+03	4.28E+03	0.7	1.00E+00	120.8	n/a	n/a	2.93E-01
4AP-96-IB1	S96V000015	4.01E+00	3.23E+00	3.62E+00	21.5	1.00E+00	120.8	n/a	n/a	2.93E-01

Nickel by Inductively Coupled Plasma/Emission Spectroscopy
Acid Digestion

SAMPLE INFORMATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS				
Custormer Identification	Laboratory Identification	Sample Result µg/mL	Duplicate Result µg/mL	Average Result µg/mL	Sample Precision RPD	Detection Limit µg/mL	Standard % Recovery	Spike Accuracy % Recovery	Spike Dupl. Precision RPD	Preparation Blank µg/mL
4AP-96-1C	S96V000009	<1.00E+00	<1.00E+00	n/a	n/a	1.00E+00	100.2	100.2	n/a	<2.00E-02
4AP-96-2C	S96V000010	3.38E-01	3.13E-01	3.26E-01	7.7	2.00E-01	100.2	n/a	n/a	<2.00E-02
4AP-96-3C	S96V000011	<6.66E-01	<6.66E-01	n/a	n/a	6.66E-01	100.2	n/a	n/a	<2.00E-02
4AP-96-3C	S96V000026	<1.60E+00	<1.60E+00	n/a	n/a	1.60E+00	100.8	104.6	1.1	<2.00E-02
4AP-96-4	S96V000013	3.42E-01	3.20E-01	3.31E-01	6.7	2.00E-01	100.2	n/a	n/a	<2.00E-02
4AP-96-IB1	S96V000015	<2.00E-01	<2.00E-01	n/a	n/a	2.00E-01	100.2	n/a	n/a	<2.00E-02

Silicon by Inductively Coupled Plasma/Emission Spectroscopy

Acid Digestion

SAMPLE INFORMATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS				
Custormer Identification	Laboratory Identification	Sample Result µg/mL	Duplicate Result µg/mL	Average Result µg/mL	Sample Precision RPD	Detection Limit µg/mL	Standard % Recovery	Spike Accuracy % Recovery	Spike Dupl. Precision RPD	Preparation Blank µg/mL
4AP-96-1C	S96V000009	1.18E+01	1.41E+01	1.30E+01	17.8	2.50E+00	280.0	202.5	n/a	<5.00E-02
4AP-96-2C	S96V000010	1.98E+01	2.04E+01	2.01E+01	3.0	5.00E-01	280.0	n/a	n/a	<5.00E-02
4AP-96-3C	S96V000011	9.01E+01	8.18E+01	8.60E+01	9.7	1.66E+00	280.0	n/a	n/a	<5.00E-02
4AP-96-3C	S96V000026	3.19E+01	2.93E+01	3.06E+01	8.5	4.00E+00	98.0	98.6	6.1	<5.00E-02
4AP-96-4	S96V000013	1.82E+01	8.06E+00	1.31E+01	77.2	5.00E-01	280.0	n/a	n/a	<5.00E-02
4AP-96-IB1	S96V000015	9.07E-01	<5.00E-01	n/a	n/a	5.00E-01	280.0	n/a	n/a	<5.00E-02

Uranium by Inductively Coupled Plasma/Emission Spectroscopy

Acid Digestion

SAMPLE INFORMATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS				
Custormer Identification	Laboratory Identification	Sample Result µg/mL	Duplicate Result µg/mL	Average Result µg/mL	Sample Precision RPD	Detection Limit µg/mL	Standard % Recovery	Spike Accuracy % Recovery	Spike Dupl. Precision RPD	Preparation Blank µg/mL
4AP-96-1C	S96V000009	<2.50E+01	<2.50E+01	n/a	n/a	2.50E+01	93.6	102.0	n/a	<5.00E-01
4AP-96-2C	S96V000010	3.16E+01	3.28E+01	3.22E+01	3.7	5.00E+00	93.6	n/a	n/a	<5.00E-01
4AP-96-3C	S96V000011	<1.66E+01	<1.66E+01	n/a	n/a	1.66E+01	93.6	n/a	n/a	<5.00E-01
4AP-96-3C	S96V000026	<4.00E+01	<4.00E+01	n/a	n/a	4.00E+01	96.7	115.0	3.7	<5.00E-01
4AP-96-4	S96V000013	3.43E+01	3.46E+01	3.45E+01	0.9	5.00E+00	93.6	n/a	n/a	<5.00E-01
4AP-96-IB1	S96V000015	<5.00E+00	<5.00E+00	n/a	n/a	5.00E+00	93.6	n/a	n/a	<5.00E-01

Alpha in Liquid Samples
Acid Digestion

SAMPLE INFORMATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS					
Custormer Identification	Laboratory Identification	Sample Result µCi/mL	Duplicate Result µCi/mL	Average Result µCi/mL	Sample Precision RPD	Detection Limit µCi/mL	Standard % Recovery	Spike Accuracy % Recovery	Spike Dupl. Precision RPD	Preparation Blank µCi/mL	Counting Error %
4AP-96-1C	S96V000009	2.36E-04	2.29E-04	2.33E-04	3.0	1.50E-04	85.5	n/a	n/a	<9.72E-05	59.9
4AP-96-2C	S96V000010	4.51E-04	4.65E-04	4.58E-04	3.1	1.50E-04	85.5	95.9	4.70	<9.72E-05	42.6
4AP-96-3C	S96V000011	3.61E-04	3.40E-04	3.51E-04	6.0	1.50E-04	85.5	n/a	n/a	<9.72E-05	43.7
4AP-96-4	S96V000013	3.05E-04	2.36E-04	2.71E-04	25.5	1.50E-04	85.5	n/a	n/a	<9.72E-05	51.6
4AP-96-IB1	S96V000015	<5.78E-06	<2.21E-06	n/a	n/a	5.10E-06	98.0	n/a	n/a	4.35E-06	500

Beta in Liquid Samples
Acid Digestion

SAMPLE INFORMATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS					
Custormer Identification	Laboratory Identification	Sample Result µCi/mL	Duplicate Result µCi/mL	Average Result µCi/mL	Sample Precision RPD	Detection Limit µCi/mL	Standard % Recovery	Spike Accuracy % Recovery	Spike Dupl. Precision RPD	Preparation Blank µCi/mL	Counting Error %
4AP-96-1C	S96V000009	6.25E+00	6.23E+00	6.24E+00	0.3	1.00E-03	94.5	n/a	n/a	<4.77E-04	0.2
4AP-96-2C	S96V000010	3.86E+00	3.98E+00	3.92E+00	3.1	1.00E-03	94.5	97.6	6.8	<4.77E-04	0.3
4AP-96-3C	S96V000011	4.00E+00	3.97E+00	3.99E+00	0.8	1.00E-03	94.5	n/a	n/a	<4.77E-04	0.3
4AP-96-4	S96V000013	3.75E+00	3.79E+00	3.77E+00	1.1	1.00E-03	94.5	n/a	n/a	<4.77E-04	0.3
4AP-96-IB1	S96V000015	<1.92E-05	4.07E-04	n/a	n/a	3.64E-05	100.9	n/a	n/a	<2.04E-05	500

Ce/Pr-144 by GEA
Acid Digestion

SAMPLE INFORMATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS				
Custormer Identification	Laboratory Identification	Sample Result µCi/mL	Duplicate Result µCi/mL	Average Result µCi/mL	Sample Precision RPD	Detection Limit µCi/mL	Standard Co-60 % Recovery	Standard Cs-137 % Recovery	Preparation Blank µCi/mL	Counting Error %
4AP-96-1C	S96V000009	<3.05E-02	<3.07E-02	n/a	n/a	3.00E-02	98.1	99.3	<2.77E-03	n/a
4AP-96-2C	S96V000010	<2.38E-02	n/a	n/a	n/a	2.40E-02	98.1	99.3	<2.77E-03	n/a
4AP-96-3C	S96V000011	<2.45E-02	n/a	n/a	n/a	2.40E-02	98.1	99.3	<2.77E-03	n/a
4AP-96-IB1	S96V000015	<1.96E-03	n/a	n/a	n/a	2.00E-03	98.1	99.3	<2.77E-03	n/a

Cobalt-60 by GEA
Acid Digestion

SAMPLE INFORMATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS				
Custormer Identification	Laboratory Identification	Sample Result µCi/mL	Duplicate Result µCi/mL	Average Result µCi/mL	Sample Precision RPD	Detection Limit µCi/mL	Standard Co-60 % Recovery	Standard Cs-137 % Recovery	Preparation Blank µCi/mL	Counting Error %
4AP-96-1C	S96V000009	<4.88E-04	<4.46E-04	n/a	n/a	4.88E-04	98.1	99.3	<1.98E-04	n/a
4AP-96-2C	S96V000010	<3.15E-04	n/a	n/a	n/a	3.15E-04	98.1	99.3	<1.98E-04	n/a
4AP-96-3C	S96V000011	<4.99E-04	n/a	n/a	n/a	4.99E-04	98.1	99.3	<1.98E-04	n/a
4AP-96-IB1	S96V000015	<1.82E-04	n/a	n/a	n/a	1.82E-04	98.1	99.3	<1.98E-04	n/a

Cesium-134 by GEA
Acid Digestion

SAMPLE INFORMATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS				
Custormer Identification	Laboratory Identification	Sample Result µCi/mL	Duplicate Result µCi/mL	Average Result µCi/mL	Sample Precision RPD	Detection Limit µCi/mL	Standard Co-60 % Recovery	Standard Cs-137 % Recovery	Preparation Blank µCi/mL	Counting Error %
4AP-96-1C	S96V000009	<2.36E-03	<2.37E-03	n/a	n/a	2.00E-03	98.1	99.3	<2.57E-04	n/a
4AP-96-2C	S96V000010	1.83E-03	n/a	n/a	n/a	n/a	98.1	99.3	<2.57E-04	26.7
4AP-96-3C	S96V000011	6.58E-03	n/a	n/a	n/a	n/a	98.1	99.3	<2.57E-04	10.8
4AP-96-IB1	S96V000015	<2.47E-04	n/a	n/a	n/a	2.47E-04	98.1	99.3	<2.57E-04	n/a

Cesium-137 by GEA
Acid Digestion

SAMPLE INFORMATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS				
Custormer Identification	Laboratory Identification	Sample Result µCi/mL	Duplicate Result µCi/mL	Average Result µCi/mL	Sample Precision RPD	Detection Limit µCi/mL	Standard Co-60 % Recovery	Standard Cs-137 % Recovery	Preparation Blank µCi/mL	Counting Error %
4AP-96-1C	S96V000009	6.15E+00	6.19E+00	6.17E+00	0.7	n/a	98.1	99.3	<6.96E-04	0.3
4AP-96-2C	S96V000010	3.67E+00	n/a	n/a	n/a	n/a	98.1	99.3	<6.96E-04	0.4
4AP-96-3C	S96V000011	3.88E+00	n/a	n/a	n/a	n/a	98.1	99.3	<6.96E-04	0.4
4AP-96-IB1	S96V000015	<6.03E-04	n/a	n/a	n/a	1.00E-03	98.1	99.3	<6.96E-04	n/a

Europium-154 by GEA
Acid Digestion

SAMPLE INFORMATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS				
Custormer Identification	Laboratory Identification	Sample Result µCi/mL	Duplicate Result µCi/mL	Average Result µCi/mL	Sample Precision RPD	Detection Limit µCi/mL	Standard Co-60 % Recovery	Standard Cs-137 % Recovery	Preparation Blank µCi/mL	Counting Error %
4AP-96-1C	S96V000009	<1.30E-03	<1.33E-03	n/a	n/a	1.00E-03	98.1	99.3	<5.18E-04	n/a
4AP-96-2C	S96V000010	<9.61E-04	n/a	n/a	n/a	1.00E-03	98.1	99.3	<5.18E-04	n/a
4AP-96-3C	S96V000011	<1.15E-03	n/a	n/a	n/a	1.00E-03	98.1	99.3	<5.18E-04	n/a
4AP-96-IB1	S96V000015	<8.11E-04	n/a	n/a	n/a	1.00E-03	98.1	99.3	<5.18E-04	n/a

Europium-155 by GEA
Acid Digestion

SAMPLE INFORMATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS				
Custormer Identification	Laboratory Identification	Sample Result µCi/mL	Duplicate Result µCi/mL	Average Result µCi/mL	Sample Precision RPD	Detection Limit µCi/mL	Standard Co-60 % Recovery	Standard Cs-137 % Recovery	Preparation Blank µCi/mL	Counting Error %
4AP-96-1C	S96V000009	<8.24E-03	<8.20E-03	n/a	n/a	8.00E-03	98.1	99.3	<8.10E-04	n/a
4AP-96-2C	S96V000010	<6.37E-03	n/a	n/a	n/a	6.00E-03	98.1	99.3	<8.10E-04	n/a
4AP-96-3C	S96V000011	<6.52E-03	n/a	n/a	n/a	7.00E-03	98.1	99.3	<8.10E-04	n/a
4AP-96-IB1	S96V000015	<6.31E-04	n/a	n/a	n/a	1.00E-03	98.1	99.3	<8.10E-04	n/a

Niobium-94 by GEA
Acid Digestion

SAMPLE INFORMATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS				
Custormer Identification	Laboratory Identification	Sample Result µCi/mL	Duplicate Result µCi/mL	Average Result µCi/mL	Sample Precision RPD	Detection Limit µCi/mL	Standard Co-60 % Recovery	Standard Cs-137 % Recovery	Preparation Blank µCi/mL	Counting Error %
4AP-96-1C	S96V000009	<7.40E-04	<7.18E-04	n/a	n/a	1.00E-03	98.1	99.3	<2.69E-04	n/a
4AP-96-2C	S96V000010	<5.06E-04	n/a	n/a	n/a	1.00E-03	98.1	99.3	<2.69E-04	n/a
4AP-96-3C	S96V000011	<5.11E-04	n/a	n/a	n/a	1.00E-03	98.1	99.3	<2.69E-04	n/a
4AP-96-IB1	S96V000015	<2.28E-04	n/a	n/a	n/a	2.28E-04	98.1	99.3	<2.69E-04	n/a

Radium-226 by GEA
Acid Digestion

SAMPLE INFORMATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS				
Custormer Identification	Laboratory Identification	Sample Result µCi/mL	Duplicate Result µCi/mL	Average Result µCi/mL	Sample Precision RPD	Detection Limit µCi/mL	Standard Co-60 % Recovery	Standard Cs-137 % Recovery	Preparation Blank µCi/mL	Counting Error %
4AP-96-1C	S96V000009	<6.38E-02	<6.39E-02	n/a	n/a	6.40E-02	98.1	99.3	<4.18E-03	n/a
4AP-96-2C	S96V000010	<4.89E-02	n/a	n/a	n/a	4.90E-02	98.1	99.3	<4.18E-03	n/a
4AP-96-3C	S96V000011	<5.06E-02	n/a	n/a	n/a	5.10E-02	98.1	99.3	<4.18E-03	n/a
4AP-96-IB1	S96V000015	<4.58E-03	n/a	n/a	n/a	5.00E-03	98.1	99.3	<4.18E-03	n/a

Ru/Rh-106 by GEA
Acid Digestion

SAMPLE INFORMATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS				
Custormer Identification	Laboratory Identification	Sample Result µCi/mL	Duplicate Result µCi/mL	Average Result µCi/mL	Sample Precision RPD	Detection Limit µCi/mL	Standard Co-60 % Recovery	Standard Cs-137 % Recovery	Preparation Blank µCi/mL	Counting Error %
4AP-96-1C	S96V000009	<4.64E-02	<4.64E-02	n/a	n/a	4.60E-02	98.1	99.3	<4.25E-03	n/a
4AP-96-2C	S96V000010	<3.57E-02	n/a	n/a	n/a	3.60E-02	98.1	99.3	<4.25E-03	n/a
4AP-96-3C	S96V000011	<3.68E-02	n/a	n/a	n/a	3.70E-02	98.1	99.3	<4.25E-03	n/a
4AP-96-IB1	S96V000015	<4.31E-03	n/a	n/a	n/a	4.00E-03	98.1	99.3	<4.25E-03	n/a

Pu-238 by Ion Exchange
Acid Digestion

SAMPLE INFORMATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS					
Custormer Identification	Laboratory Identification	Sample Result µCi/mL	Duplicate Result µCi/mL	Average Result µCi/mL	Sample Precision RPD	Detection Limit µCi/mL	Standard Pu-239 % Recovery	Spike Accuracy % Recovery	Spike Dupl. Precision RPD	Preparation Blank µCi/mL	Counting Error %
4AP-96-1C	S96V000009	<3.68E-05	n/a	n/a	n/a	3.68E-05	97.7	n/a	n/a	<4.36E-05	100.0
4AP-96-2C	S96V000010	4.26E-05	<3.56E-05	n/a	n/a	3.60E-05	97.7	n/a	n/a	<4.36E-05	7.0
4AP-96-3C	S96V000011	<3.27E-05	n/a	n/a	n/a	3.27E-05	97.7	n/a	n/a	<4.36E-05	100.0
4AP-96-IB1	S96V000015	<3.74E-05	n/a	n/a	n/a	3.74E-05	97.7	n/a	n/a	<4.36E-05	100.0

Pu-239/240 by TRU-SPEC Resin
Acid Digestion

SAMPLE INFORMATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS					
Custormer Identification	Laboratory Identification	Sample Result µCi/mL	Duplicate Result µCi/mL	Average Result µCi/mL	Sample Precision RPD	Detection Limit µCi/mL	Standard Pu-239 % Recovery	Spike Accuracy % Recovery	Spike Dupl. Precision RPD	Preparation Blank µCi/mL	Counting Error %
4AP-96-1C	S96V000009	<3.68E-05	n/a	n/a	n/a	3.68E-05	97.7	n/a	n/a	<4.36E-05	100.0
4AP-96-2C	S96V000010	<3.60E-05	<3.56E-05	n/a	n/a	3.60E-05	97.7	95.3	10.7	<4.36E-05	100.0
4AP-96-3C	S96V000011	<3.27E-05	n/a	n/a	n/a	3.27E-05	97.7	n/a	n/a	<4.36E-05	100.0
4AP-96-IB1	S96V000015	<3.74E-05	n/a	n/a	n/a	3.74E-05	97.7	n/a	n/a	<4.36E-05	100.0

Am-241 by Extraction
Acid Digestion

SAMPLE INFORMATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS					
Custormer Identification	Laboratory Identification	Sample Result µCi/mL	Duplicate Result µCi/mL	Average Result µCi/mL	Sample Precision RPD	Detection Limit µCi/mL	Standard Am-241 % Recovery	Spike Accuracy % Recovery	Spike Dupl. Precision RPD	Preparation Blank µCi/mL	Counting Error %
4AP-96-1C	S96V000009	<1.50E-04	n/a	n/a	n/a	1.50E-04	89.3	n/a	n/a	<1.30E-04	100.0
4AP-96-2C	S96V000010	<1.47E-04	<1.41E-04	n/a	n/a	1.47E-04	89.3	87.3	4.6	<1.30E-04	100.0
4AP-96-3C	S96V000011	<1.46E-04	n/a	n/a	n/a	1.46E-04	89.3	n/a	n/a	<1.30E-04	100.0
4AP-96-IB1	S96V000015	<1.27E-04	n/a	n/a	n/a	1.27E-04	89.3	n/a	n/a	<1.30E-04	100.0

Cm-243/244 by Extraction
Acid Digestion

SAMPLE INFORMATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS					
Custormer Identification	Laboratory Identification	Sample Result µCi/mL	Duplicate Result µCi/mL	Average Result µCi/mL	Sample Precision RPD	Detection Limit µCi/mL	Standard Am-241 % Recovery	Spike Accuracy % Recovery	Spike Dupl. Precision RPD	Preparation Blank µCi/mL	Counting Error %
4AP-96-1C	S96V000009	<1.50E-04	n/a	n/a	n/a	1.50E-04	89.3	n/a	n/a	<1.30E-04	100.0
4AP-96-2C	S96V000010	<1.47E-04	<1.41E-04	n/a	n/a	1.47E-04	89.3	n/a	n/a	<1.30E-04	100.0
4AP-96-3C	S96V000011	<1.46E-04	n/a	n/a	n/a	1.46E-04	89.3	n/a	n/a	<1.30E-04	100.0
4AP-96-IB1	S96V000015	<1.27E-04	n/a	n/a	n/a	1.27E-04	89.3	n/a	n/a	<1.30E-04	100.0

Np237 by TTA Extraction
Acid Digestion

SAMPLE INFORMATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS					
Custormer Identification	Laboratory Identification	Sample Result µCi/mL	Duplicate Result µCi/mL	Average Result µCi/mL	Sample Precision RPD	Detection Limit µCi/mL	Standard % Recovery	Spike Accuracy % Recovery	Spike Dupl. Precision RPD	Preparation Blank µCi/mL	Counting Error %
4AP-96-1C	S96V000009	2.02E-04	n/a	n/a	n/a	3.39E-04	69.4	n/a	n/a	<2.59E-04	101.0
4AP-96-2C	S96V000010	<3.05E-04	<2.51E-04	n/a	n/a	3.39E-04	69.4	72.5	0.4	<2.59E-04	146.0
4AP-96-3C	S96V000011	1.87E-04	n/a	n/a	n/a	3.39E-04	69.4	n/a	n/a	<2.59E-04	108.0
4AP-96-IB1	S96V000015	1.87E-04	n/a	n/a	n/a	3.39E-04	69.4	n/a	n/a	<2.59E-04	108.0

Selenium-79 by Liquid Scintillation
Acid Digestion

SAMPLE INFORMATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS					
Custormer Identification	Laboratory Identification	Sample Result µCi/mL	Duplicate Result µCi/mL	Average Result µCi/mL	Sample Precision RPD	Detection Limit µCi/mL	Standard % Recovery	Spike Accuracy % Recovery	Spike Dupl. Precision RPD	Preparation Blank µCi/mL	Counting Error %
4AP-96-1C	S96V000009	4.23E-07	5.73E-07	4.98E-07	30.1	2.74E-07	n/a	n/a	n/a	<2.92E-07	3.8
4AP-96-2C	S96V000010	<3.37E-07	n/a	n/a	n/a	3.37E-07	n/a	n/a	n/a	<2.92E-07	4.3
4AP-96-3C	S96V000011	<2.83E-07	n/a	n/a	n/a	2.83E-07	n/a	n/a	n/a	<2.92E-07	4.1
4AP-96-IB1	S96V000015	<3.31E-07	n/a	n/a	n/a	3.31E-07	n/a	n/a	n/a	<2.92E-07	4.4

Tritium By Lachat
Direct Analysis

SAMPLE INFORMATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS					
Custormer Identification	Laboratory Identification	Sample Result µCi/mL	Duplicate Result µCi/mL	Average Result µCi/mL	Sample Precision RPD	Detection Limit µCi/mL	Standard % Recovery	Spike Accuracy % Recovery	Spike Dupl. Precision RPD	Reagent Blank µCi/mL	Counting Error %
4AP-96-1C	S96V000006	3.27E-04	n/a	n/a	n/a	2.17E-05	106.1	115.5	4.3	5.49E-05	3.0
4AP-96-2C	S96V000007	1.25E-02	1.22E-02	1.23E-02	2.4	3.79E-05	94.6	n/a	n/a	<3.800E-05	0.8
4AP-96-3C	S96V000008	1.66E-03	1.77E-03	1.71E-03	6.4	3.77E-05	94.6	n/a	n/a	<3.800E-05	2.1
4AP-96-IB2	S96V000016	<3.83E-05	<3.80E-05	n/a	n/a	3.83E-05	94.6	n/a	n/a	<3.800E-05	5.7

C-14 Small Volume
Direct Analysis

SAMPLE INFORMATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS					
Custormer Identification	Laboratory Identification	Sample Result µCi/mL	Duplicate Result µCi/mL	Average Result µCi/mL	Sample Precision RPD	Detection Limit µCi/mL	Standard % Recovery	Spike Accuracy % Recovery	Spike Dupl. Precision RPD	Reagent Blank µCi/mL	Counting Error %
4AP-96-1C	S96V000006	4.79E-05	5.01E-05	4.90E-05	4.5	2.28E-06	91.7	93.5	27.5	<2.30E-06	2.4
4AP-96-2C	S96V000007	1.45E-04	1.75E-04	1.60E-04	18.8	2.28E-06	94.6	n/a	n/a	3.09E-06	1.6
4AP-96-3C	S96V000008	1.85E-05	1.99E-05	1.92E-05	7.3	2.32E-06	94.6	n/a	n/a	3.09E-06	3.2
4AP-96-IB2	S96V000016	<2.32E-06	<2.33E-06	n/a	n/a	2.32E-06	94.6	n/a	n/a	3.09E-06	4.2

Strontium-89/90 High Level
Acid Digestion

SAMPLE INFORMATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS					
Custormer Identification	Laboratory Identification	Sample Result µCi/mL	Duplicate Result µCi/mL	Average Result µCi/mL	Sample Precision RPD	Detection Limit µCi/mL	Standard % Recovery	Spike Accuracy % Recovery	Spike Dupl. Precision RPD	Preparation Blank µCi/mL	Counting Error %
4AP-96-1C	S96V000009	1.13E-01	9.94E-02	1.06E-01	12.8	2.76E-04	101.6	103.3	14.4	2.08E-04	2.0
4AP-96-2C	S96V000010	7.81E-02	n/a	n/a	n/a	2.62E-04	101.6	n/a	n/a	2.08E-04	2.3
4AP-96-3C	S96V000011	4.05E-02	n/a	n/a	n/a	2.64E-04	101.6	n/a	n/a	2.08E-04	3.3
4AP-96-IB1	S96V000015	<1.01E-04	n/a	n/a	n/a	1.07E-04	101.6	n/a	n/a	2.08E-04	177.0

Technetium-99 Liq. Scint
Acid Digestion

SAMPLE INFORMATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS					
Custormer Identification	Laboratory Identification	Sample Result µCi/mL	Duplicate Result µCi/mL	Average Result µCi/mL	Sample Precision RPD	Detection Limit µCi/mL	Standard % Recovery	Spike Accuracy % Recovery	Spike Dupl. Precision RPD	Preparation Blank µCi/mL	Counting Error %
4AP-96-1C	S96V000009	5.21E-03	5.46E-03	5.33E-03	4.7	3.68E-04	107.1	110.5	0.5	<3.71E-04	3.7
4AP-96-2C	S96V000010	7.24E-04	n/a	n/a	n/a	4.12E-04	107.1	n/a	n/a	<3.71E-04	6.0
4AP-96-3C	S96V000011	2.76E-03	n/a	n/a	n/a	4.13E-04	107.1	n/a	n/a	<3.71E-04	4.7
4AP-96-IB1	S96V000015	<4.08E-04	n/a	n/a	n/a	4.08E-04	107.1	n/a	n/a	<3.71E-04	6.8

Iodine-129 Waste Tank Samples

Direct Analysis

SAMPLE INFORMATION		SAMPLE RESULTS				QUALITY CONTROL RESULTS					
Custormer Identification	Laboratory Identification	Sample Result µCi/mL	Duplicate Result µCi/mL	Average Result µCi/mL	Sample Precision RPD	Detection Limit µCi/mL	Standard % Recovery	Spike Accuracy % Recovery	Spike Dupl. Precision RPD	Preparation Blank µCi/mL	Counting Error %
4AP-96-1C	S96V000006	<1.54E-06	2.93E-06	n/a	n/a	1.54E-06	91.0	93.3	2.0	<6.15E-06	0.0
4AP-96-2C	S96V000007	<6.41E-06	<5.59E-06	n/a	n/a	6.41E-06	91.0	n/a	n/a	<6.15E-06	0.0
4AP-96-3C	S96V000008	<6.33E-06	<6.21E-06	n/a	n/a	6.33E-06	91.0	n/a	n/a	<6.15E-06	0.0
4AP-96-IB2	S96V000016	<5.17E-06	<4.64E-06	n/a	n/a	5.17E-06	91.0	n/a	n/a	<6.15E-06	0.0

ACETONE by Volatile Organic Analysis

Direct Analysis

SAMPLE INFORMATION		SAMPLE RESULTS				Q C RESULTS									
Custormer Identification	Laboratory Identification PNNL/ACL	Sample Result µg/L	Q	Duplicate Result µg/L	Q	Quantitation Limit	Continuing Calibration % Difference	Surrogate Recovery TOL %	BFB %	DCE %	Spike % Recovery	Spike Duplicate % Recovery	Spike RPD %	Reagent Blank µg/L	Q
4AP-96-1A	96-3095	5.00E+02	U	n/a		5.00E+02	12.7	94	97	87	n/a	n/a	n/a	1.00E+01	U
4AP-96-2A	96-3096	1.40E+03		n/a		5.00E+02	12.7	92	95	84	n/a	n/a	n/a	1.00E+01	U
4AP-96-3A	96-3097	1.50E+03		1.30E+03		5.00E+02	12.7	90	94	87	124	96	25	1.00E+01	U
4AP-96-OB1	96-3093	5.00E+02	U	n/a		5.00E+02	12.7	95	95	84	n/a	n/a	n/a	1.00E+01	U
4AP-96-TB1	96-3094	5.00E+02	U	n/a		5.00E+02	12.7	93	94	87	n/a	n/a	n/a	1.00E+01	U

1-BUTANOL by Volatile Organic Analysis

Direct Analysis

SAMPLE INFORMATION		SAMPLE RESULTS				Q C RESULTS									
Custormer Identification	Laboratory Identification PNNL/ACL	Sample Result µg/L	Q	Duplicate Result µg/L	Q	Quantitation Limit	Continuing Calibration % Difference	Surrogate Recovery TOL %	BFB %	DCE %	Spike % Recovery	Spike Duplicate % Recovery	Spike RPD %	Reagent Blank µg/L	Q
4AP-96-1A	96-3095	2.00E+04	U	n/a		2.00E+04	21.8	94	97	87	n/a	n/a	n/a	4.00E+02	U
4AP-96-2A	96-3096	2.00E+04	U	n/a		2.00E+04	21.8	92	95	84	n/a	n/a	n/a	4.00E+02	U
4AP-96-3A	96-3097	3.70E+04		3.90E+04		2.00E+04	21.8	90	94	87	140	120	15	4.00E+02	U
4AP-96-OB1	96-3093	2.00E+04	U	n/a		2.00E+04	21.8	95	95	84	n/a	n/a	n/a	4.00E+02	U
4AP-96-TB1	96-3094	2.00E+04	U	n/a		2.00E+04	21.8	93	94	87	n/a	n/a	n/a	4.00E+02	U

Surrogates:

		QC Limits (CLP)
TOL	Toluene-d8	88-110%
BFB	Bromofluorobenzene	86-115%
DCE	1,2-Dichloroethane-d4	76-114%

Q (Qualifier) Definitions:

U Indicates the compound was analyzed for, but not detected. The U-flagged number is the quantitation limit, including applicable factors related to sample concentrating.

J Indicates the estimated value. Spectra meet criteria, but response is below the quantitation limit for the target compound.

D Indicates that the associated compound was identified in the analysis at a secondary dilution factor.

2-BUTANONE by Volatile Organic Analysis
Direct Analysis

SAMPLE INFORMATION		SAMPLE RESULTS				Q C RESULTS									
Custormer Identification	Laboratory Identification PNNL/ACL	Sample Result µg/L	Q	Duplicate Result µg/L	Q	Quantitation Limit	Continuing Calibration % Difference	Surrogate Recovery TOL %	BFB %	DCE %	Spike % Recovery	Spike Duplicate % Recovery	Spike RPD %	Reagent Blank µg/L	Q
4AP-96-1A	96-3095	5.00E+02	U	n/a		5.00E+02	2.9	94	97	87	n/a	n/a	n/a	1.00E+01	U
4AP-96-2A	96-3096	5.00E+02	U	n/a		5.00E+02	2.9	92	95	84	n/a	n/a	n/a	1.00E+01	U
4AP-96-3A	96-3097	5.00E+02	U	5.00E+02	U	5.00E+02	2.9	90	94	87	92	88	4	1.00E+01	U
4AP-96-OB1	96-3093	5.00E+02	U	n/a		5.00E+02	2.9	95	95	84	n/a	n/a	n/a	1.00E+01	U
4AP-96-TB1	96-3094	5.00E+02	U	n/a		5.00E+02	2.9	93	94	87	n/a	n/a	n/a	1.00E+01	U

2-HEXANONE by Volatile Organic Analysis
Direct Analysis

SAMPLE INFORMATION		SAMPLE RESULTS				Q C RESULTS									
Custormer Identification	Laboratory Identification PNNL/ACL	Sample Result µg/L	Q	Duplicate Result µg/L	Q	Quantitation Limit	Continuing Calibration % Difference	Surrogate Recovery TOL %	BFB %	DCE %	Spike % Recovery	Spike Duplicate % Recovery	Spike RPD %	Reagent Blank µg/L	Q
4AP-96-1A	96-3095	5.00E+02	U	n/a		5.00E+02	13.1	94	97	87	n/a	n/a	n/a	1.00E+01	U
4AP-96-2A	96-3096	5.00E+02	U	n/a		5.00E+02	13.1	92	95	84	n/a	n/a	n/a	1.00E+01	U
4AP-96-3A	96-3097	5.00E+02	U	5.00E+02	U	5.00E+02	13.1	90	94	87	100	92	8	1.00E+01	U
4AP-96-OB1	96-3093	5.00E+02	U	n/a		5.00E+02	13.1	95	95	84	n/a	n/a	n/a	1.00E+01	U
4AP-96-TB1	96-3094	5.00E+02	U	n/a		5.00E+02	13.1	93	94	87	n/a	n/a	n/a	1.00E+01	U

Surrogates:

		QC Limits (CLP)
TOL	Toluene-d8	88-110%
BFB	Bromofluorobenzene	86-115%
DCE	1,2-Dichloroethane-d4	76-114%

Q (Qualifier) Definitions:

U Indicates the compound was analyzed for, but not detected. The U-flagged number is the quantitation limit, including applicable factors related to sample concentrating.

J Indicates the estimated value. Spectra meet criteria, but response is below the quantitation limit for the target compound.

D Indicates that the associated compound was identified in the analysis at a secondary dilution factor.

METHYL ISOBUTYL KETONE by Volatile Organic Analysis
(4-Methyl-2-pentanone)
Direct Analysis

SAMPLE INFORMATION		SAMPLE RESULTS				Q C RESULTS										
Custormer Identification	Laboratory Identification PNNL/ACL	Sample Result µg/L	Q	Duplicate Result µg/L	Q	Quantitation Limit	Continuing Calibration % Difference	Surrogate Recovery TOL %	BFB %	DCE %	Spike % Recovery	Spike Duplicate % Recovery	Spike RPD %	Reagent Blank µg/L	Q
4AP-96-1A	96-3095	5.00E+02	U	n/a		5.00E+02	6.6	94	97	87	n/a	n/a	n/a	1.00E+01	U
4AP-96-2A	96-3096	5.00E+02	U	n/a		5.00E+02	6.6	92	95	84	n/a	n/a	n/a	1.00E+01	U
4AP-96-3A	96-3097	5.00E+02	U	5.00E+02	U	5.00E+02	6.6	90	94	87	100	92	8	1.00E+01	U
4AP-96-OB1	96-3093	5.00E+02	U	n/a		5.00E+02	6.6	95	95	84	n/a	n/a	n/a	1.00E+01	U
4AP-96-TB1	96-3094	5.00E+02	U	n/a		5.00E+02	6.6	93	94	87	n/a	n/a	n/a	1.00E+01	U

2-PENTANONE by Volatile Organic Analysis
Direct Analysis

SAMPLE INFORMATION		SAMPLE RESULTS				Q C RESULTS										
Custormer Identification	Laboratory Identification PNNL/ACL	Sample Result µg/L	Q	Duplicate Result µg/L	Q	Quantitation Limit	Continuing Calibration % Difference	Surrogate Recovery TOL %	BFB %	DCE %	Spike % Recovery	Spike Duplicate % Recovery	Spike RPD %	Reagent Blank µg/L	Q
4AP-96-1A	96-3095	5.00E+02	U	n/a		5.00E+02	0.0	94	97	87	n/a	n/a	n/a	1.00E+01	U
4AP-96-2A	96-3096	5.00E+02	U	n/a		5.00E+02	0.0	92	95	84	n/a	n/a	n/a	1.00E+01	U
4AP-96-3A	96-3097	5.00E+02	U	5.00E+02	U	5.00E+02	0.0	90	94	87	92	80	14	1.00E+01	U
4AP-96-OB1	96-3093	5.00E+02	U	n/a		5.00E+02	0.0	95	95	84	n/a	n/a	n/a	1.00E+01	U
4AP-96-TB1	96-3094	5.00E+02	U	n/a		5.00E+02	0.0	93	94	87	n/a	n/a	n/a	1.00E+01	U

Surrogates:

		QC Limits (CLP)
TOL	Toluene-d8	88-110%
BFB	Bromofluorobenzene	86-115%
DCE	1,2-Dichloroethane-d4	76-114%

Q (Qualifier) Definitions:

U Indicates the compound was analyzed for, but not detected. The U-flagged number is the quantitation limit, including applicable factors related to sample concentrating.

J Indicates the estimated value. Spectra meet criteria, but response is below the quantitation limit for the target compound.

D Indicates that the associated compound was identified in the analysis at a secondary dilution factor.

TETRAHYDROFURAN by Volatile Organic Analysis
Direct Analysis

SAMPLE INFORMATION		SAMPLE RESULTS				QC RESULTS								
Custormer Identification	Laboratory Identification PNNL/ACL	Sample Result µg/L	Q	Duplicate Result µg/L	Q	Quantitation Limit	Continuing Calibration % Difference	Surrogate Recovery TOL %	BFB %	DCE %	Spike % Recovery	Spike Duplicate % Recovery	Spike RPD %	Reagent Blank µg/L	Q
4AP-96-1A	96-3095	5.00E+02	U	n/a		5.00E+02	6.6	94	97	87	n/a	n/a	n/a	1.00E+01	U
4AP-96-2A	96-3096	5.00E+02	U	n/a		5.00E+02	6.6	92	95	84	n/a	n/a	n/a	1.00E+01	U
4AP-96-3A	96-3097	5.00E+02	U	5.00E+02	U	5.00E+02	6.6	90	94	87	108	96	8	1.00E+01	U
4AP-96-OB1	96-3093	5.00E+02	U	n/a		5.00E+02	6.6	95	95	84	n/a	n/a	n/a	1.00E+01	U
4AP-96-TB1	96-3094	5.00E+02	U	n/a		5.00E+02	6.6	93	94	87	n/a	n/a	n/a	1.00E+01	U

Surrogates:

		QC Limits (CLP)
TOL	Toluene-d8	88-110%
BFB	Bromofluorobenzene	86-115%
DCE	1,2-Dichloroethane-d4	76-114%

Q (Qualifier) Definitions:

U Indicates the compound was analyzed for, but not detected. The U-flagged number is the quantitation limit, including applicable factors related to sample concentrating.

J Indicates the estimated value. Spectra meet criteria, but response is below the quantitation limit for the target compound.

D Indicates that the associated compound was identified in the analysis at a secondary dilution factor.

2-BUTOXYETHANOL by Semi-Volatile Organic Analysis

Direct Analysis

SAMPLE INFORMATION		SAMPLE RESULTS		QC RESULTS						
Custormer Identification	Laboratory Identification	Sample Result µg/L	Q	Quantitation Limit	Continuing Calibration % Difference	Spike % Recovery	Spike Duplicate % Recovery	Spike RPD %	Reagent Blank µg/L	Q
4AP-96-1B	S96V000017	5.70E+02		4.00E+02	6.0	n/a	n/a	n/a	5.00E+01	U
4AP-96-2B	S96V000018	4.10E+02		4.00E+02	6.0	60	92	42	5.00E+01	U
4AP-96-3B	S96V000019	1.10E+03		4.00E+02	6.0	n/a	n/a	n/a	5.00E+01	U
4AP-96-OB2	S96V000020	4.00E+02	U	4.00E+02	6.0	n/a	n/a	n/a	5.00E+01	U
4AP-96-TB2	S96V000025	4.00E+02	U	4.00E+02	13.4	n/a	n/a	n/a	5.00E+01	U

SAMPLE INFORMATION		SURROGATE RECOVERY							
Custormer Identification	Laboratory Identification	S1 %	S2 %	S3 %	S4 %	S5 %	S6 %	S7 %	S8 %
4AP-96-1B	S96V000017	97	93	94	0	0	0	0	82
4AP-96-2B	S96V000018	96	101	106	0	0	0	0	85
4AP-96-3B	S96V000019	102	96	36	0	0	0	0	84
4AP-96-OB2	S96V000020	94	88	98	136	94	97	99	83
4AP-96-TB2	S96V000025	82	84	89	128	90	92	90	82

Surrogates:

		QC Limits (CLP)
S1	Nitrobenzene-d5	35-114%
S2	2-Fluorobiphenyl	43-116%
S3	Terphenyl-d14	33-141%
S4	Phenol-d5	10-110%
S5	2-Fluorophenol	21-110%
S6	2,4,6-Tribromophenol	10-123%
S7	2-Chlorophenol-d4	33-110% (advisory)
S8	1,2-Dichlorobenzene-d4	16-110% (advisory)

Q (Qualifier) Definitions:

U Indicates the compound was analyzed for, but not detected. The U-flagged number is the quantitation limit, including applicable factors related to sample concentrating.

J Indicates the estimated value. Spectra meet criteria, but response is below the quantitation limit for the target compound.

D Indicates that the associated compound was identified in the analysis at a secondary dilution factor.

TRI-n-BUTYLPHOSPHATE by Semi-Volatile Organic Analysis

Direct Analysis

SAMPLE INFORMATION		SAMPLE RESULTS		Q C RESULTS						
Custormer Identification	Laboratory Identification	Sample Result µg/L	Q	Quantitation Limit	Continuing Calibration % Difference	Spike % Recovery	Spike Duplicate % Recovery	Spike RPD %	Reagent Blank µg/L	Q
4AP-96-1B	S96V000017	1.90E+02	J	4.00E+02	0.4	n/a	n/a	n/a	5.00E+01	U
4AP-96-2B	S96V000018	9.70E+02		4.00E+02	0.4	63	79	22	5.00E+01	U
4AP-96-3B	S96V000019	8.80E+03	D	4.00E+02	0.4	n/a	n/a	n/a	5.00E+01	U
4AP-96-OB2	S96V000020	4.00E+02	U	4.00E+02	0.4	n/a	n/a	n/a	5.00E+01	U
4AP-96-TB2	S96V000025	4.00E+02	U	4.00E+02	4.1	n/a	n/a	n/a	5.00E+01	U

SAMPLE INFORMATION		SURROGATE RECOVERY							
Custormer Identification	Laboratory Identification	S1 %	S2 %	S3 %	S4 %	S5 %	S6 %	S7 %	S8 %
4AP-96-1B	S96V000017	97	93	94	0	0	0	0	82
4AP-96-2B	S96V000018	96	101	106	0	0	0	0	85
4AP-96-3B	S96V000019	102	96	36	0	0	0	0	84
4AP-96-OB2	S96V000020	94	88	98	136	94	97	99	83
4AP-96-TB2	S96V000025	82	84	89	128	90	92	90	82

Surrogates:

		QC Limits (CLP)
S1	Nitrobenzene-d5	35-114%
S2	2-Fluorobiphenyl	43-116%
S3	Terphenyl-d14	33-141%
S4	Phenol-d5	10-110%
S5	2-Fluorophenol	21-110%
S6	2,4,6-Tribromophenol	10-123%
S7	2-Chlorophenol-d4	33-110% (advisory)
S8	1,2-Dichlorobenzene-d4	16-110% (advisory)

Q (Qualifier) Definitions:

U Indicates the compound was analyzed for, but not detected. The U-flagged number is the quantitation limit, including applicable factors related to sample concentrating.

J Indicates the estimated value. Spectra meet criteria, but response is below the quantitation limit for the target compound.

D Indicates that the associated compound was identified in the analysis at a secondary dilution factor.

CHAIN OF CUSTODY FORMS

THIS PAGE WAS INTENTIONALLY LEFT BLANK

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. No. N/A

Page 1 of 1

Collector: R.J. PRAZNIK	Contact/Requestor: MA	Telephone No.: 373-7151	MSIN: 57-03 FAX: 373-9191
SAF No.: MA	Sample Origin: AD104 riser 1 @ 30°N	Purchase Order/Charge Code: MA	
Project Title: MA	Logbook No.: MA	Ice Chest No.: MA	Temp.
Shipped To (Lab): 222-S	Method of Shipment: TRUCK	Bill of Lading/Air Bill No.: MA	
Protocol: MA	Data Turnaround: MA	Offsite Property No.: MA	

Sample No.	Lab ID	*	Date	Time	No./Type Container	Sample Analysis	Preservative
4AP-96-1A	222-S	L	1-23-96	1349 hr	1/125ml Glass	Dose @ contact 35 mR/hr Seal # 4089	MA
4AP-96-4	222-S	L	1-23-96	1855 hr	1/125ml Glass	Dose @ contact 22 mR/hr Seal # 4062	MA

POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes): RADIOACTIVE

MSDS: ☐ Yes ☒ No

SPECIAL INSTRUCTIONS: WHC-SD-WM-DP-142, REV. 1 Hold Time

Relinquished By (Print / Sign)	Date/Time	Received By (Print / Sign)	Date/Time
JAMES SICKELS	1845 1-24-96		1845 1-24-96
	1-24-96 1930	MICHAEL A. WOODRUFF	1/24/96

Matrix*

S = Soil	DS = Drum Solids		
SE = Sediment	DL = Drum Liquids		
SO = Solid	T = Tissue		
SL = Sludge	WI = Wipe		
W = Water	L = Liquid		
O = Oil	V = Vegetation		
A = Air	X = Other		

FINAL SAMPLE DISPOSITION: Disposal Method (e.g., Return to customer, per lab procedure, used in process) — Disposed By — Date/Time

All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.

DISTRIBUTION: White - Remain with Samples Color - Customer

01/25/96 16:17 222 ANALYTICAL LAB 001

200 E-07-TF

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. No. 1 N/A DCD 7-21-96

Page 1 of 1

Collector: R.J. Praznik	Contact/Requestor: NA	Telephone No. 373-7751 MSIN 57-03 FAX 373-9191
SAF No. NA	Sample Origin: AP104 riser 1 @ 30° N	Purchase Order/Charge Code: NA
Project Title: NA	Logbook No. NA	Ice Chest No. NA Temp.
Shipped To (Lab): 222-S	Method of Shipment: TRUCK	Bill of Lading/Air Bill No. NA
Protocol: NA	Data Turnaround: NA	Offsite Property No. NA

Sample No.	Lab ID	*	Date	Time	No./Type Container	Sample Analysis	Preservative
4AP-96-1C	222-S	L	1-23-96	1330hr	1/125ml Glass	Dose @ contact 50mR/hr Seal #4091 Seal was not intact DCD	NA
4AP-96-1D	222-S	L	1-23-96	1335hr	1/125ml Glass	Dose @ contact 45mR/hr Seal #4090	NA

31

POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes): RADIOACTIVE

MSDS ☐ Yes ☒ No

SPECIAL INSTRUCTIONS: WHC-SD-WM-DP-142, REV. 1

Hold Time

Relinquished By (Print)	Sign	Date/Time	Received By (Print)	Sign	Date/Time
James Sickels	[signature]	1445 1-24-96	David J Keane	[signature]	1455 1-24-96
David J Keane	[signature]	1520 1-24-96		[signature]	1520 1-24-96
[signature]	James Sickels	1645 1-24-96	[signature]	[signature]	1-24-96 16:45
[signature]	[signature]	1-24-96 17:57	David C Dunham	[signature]	17:45 1-24-96

Matrix*

S = Soil; SE = Sediment; SO = Solid; SL = Sludge; W = Water; O = Oil; A = Air; DS = Drum Solids; DL = Drum Liquids; T = Tissue; WI = Wipe; L = Liquid; V = Vegetation; X = Other

FINAL SAMPLE DISPOSITION — Disposal Method (e.g., Return to customer, per lab procedure, used in process) — Disposed By — Date/Time

All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	C.O.C. No. 200E-07-TF Page 1 of 1

Collector: R. J. PRAZNIK	Contact/Requester: NA	Telephone No.: 3-7751	MSIN: S7-03 FAX: 376-9191
SAF No.: NA	Sample Origin: AP104 riser 1 @ 30° N	Purchase Order/Charge Code: NA	
Project Title: NA	Logbook No.: NA	Ice Chest No.: NA	Temp.
Shipped To (Lab): 222-S	Method of Shipment: TRUCK	Bill of Lading/Air Bill No.: NA	
Protocol: NA	Data Turnaround: NA	Offsite Property No.: NA	

Sample No.	Lab ID	*	Date	Time	No./Type Container	Sample Analysis	Preservative
4AP.96-2C	222-S	L	1-23-96	1300hr	1/125ml Glass	Dose @ contact 15 mR/hr Seal # 4094	NA
4AP.96-1B	222-S	L	1-23-96	1320hr 1300hr 1-24-96	1/125ml Glass	Dose @ contact 35 mR/hr Seal # 4092	NA

POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes): RADIOACTIVE

MSDS: ☐ Yes ☒ No

SPECIAL INSTRUCTIONS: WHC-SD-WM-DP-142, REV. 1

Hold Time

Relinquished By (Print / Sign)	Date/Time	Received By (Print / Sign)	Date/Time
JAMES SICKELS	1-24-96 1330	DAVID J KEARNE	1-24-96 1325
DAVID J KEARNE	1-24-96 1400	E E DUBOIS	1-24-96 1400

Matrix*

S = Soil	DS = Drum Solids		
SE = Sediment	DL = Drum Liquids		
SO = Solid	T = Tissue		
SL = Sludge	WI = Wipe		
W = Water	L = Liquid		
O = Oil	V = Vegetation		
A = Air	X = Other		

FINAL SAMPLE DISPOSITION: Disposal Method (e.g., Return to customer, per lab procedure, used in process) — Disposed By — Date/Time

All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.

01/25/96 16:19 222 ANALYTICAL LAB 004

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	C.O.C. No. N/A
		Page 1 of 1

Collector: R.S. PEAZNIK	Contact/Requestor: MA	Telephone No.: 3-7751	MSIN: S7-03 FAX: 376-9191
SAF No.: MA	Sample Origin: AP104 riser 1 @ 30° N	Purchase Order/Charge Code: MA	
Project Title: MA	Logbook No.: MA	Ice Chest No.: MA	Temp.
Shipped To (Lab): 222-S	Method of Shipment: TRUCK	Bill of Lading/Air Bill No.: MA	
Protocol: MA	Data Turnaround: MA	Offsite Property No.: MA	

Sample No.	Lab ID	*	Date	Time	No./Type Container	Sample Analysis	Preserva
AAP96-2A	222-S	L	1-18-96	1125hr	1/glass 125ml	Dose on contact 15mR/hr	MA
AAP-96-2B	222-S	L	1-18-96	1133hr	1/glass 125ml	Dose on contact 15mR/hr	MA
						Seals # 2A "4082"	
						2B "4083"	

POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes): RADIOACTIVE

MSDS ☐ Yes ☒ No

SPECIAL INSTRUCTIONS: Hold Time

WHC-SD-WM-DP-142, REV. 1

Relinquished By (Print / Sign)	Date/Time	Received By (Print / Sign)	Date/Time
JAMES SICKELS James Sickels	1-19-96 1055	Christine S Parker Christine S Parker	1/19/96 10:55
Christine S Parker Christine S. Parker	1-19-96 1215	EE Dorbes EE Dorbes	1-19-96 12:15
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

Matrix*: S = Soil; SE = Sediment; SO = Solid; SL = Sludge; W = Water; O = Oil; A = Air; DS = Drum Solid; DL = Drum Liquid; T = Tissue; WI = Wipe; L = Liquid; V = Vegetation; X = Other

FINAL SAMPLE DISPOSITION: Disposal Method (e.g., Return to customer, per lab procedure, used in process) | Disposed By | Date/Time

All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.

DISTRIBUTION: White - Remain with Samples; Color - Customer

002 509 373 1432 15:21 01/25/96

Vestinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. No.

Page 1 of 1

Sector: R.J. PRAZNIK	Contact/Requestor: MA	Telephone No.: 373-7151	MSIN: 57-03 FAX: 373-9191
F No.: MA	Sample Origin: AP104 risers / @270°N	Purchase Order/Charge Code: MA	
ject Title: MA	Logbook No.: MA	Ice Chest No.: MA	Temp.:
pped To (Lab): 222-S	Method of Shipment: TRUCK	Bill of Lading/Air Bill No.: MA	
tocol: MA	Data Turnaround: MA	Offsite Property No.: MA	

Sample No.	Lab ID	*	Date	Time	No./Type Container	Sample Analysis	Preservative
P-96-3A	222-S	L	1-23-96	1905hrs	1/125ml Glass	Dose @ contact 26 mR/hr, Seal # 4095	MA
P-96-3B	222-S	L	1-23-96	1915hrs	1/125ml Glass	Dose @ contact 22 mR/hr, Seal # 4096	MA

POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes): RADIOACTIVE

MSDS ☐ Yes ☒ No

SPECIAL INSTRUCTIONS: Hold Time

WHC-SD-WM-DP-142, REV. 1

Relinquished By (Print / Sign)	Date/Time	Received By (Print / Sign)	Date/Time
JAMES SICKELS	1-24-96 2015	C.E. Byrd	1-24-96 2015
C.E. Byrd	1-24-96 2100	MICHAEL A. LOCKRIDGE	1/24/96 2100
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

Matrix*: S = Soil; SE = Sediment; SO = Solid; SL = Sludge; W = Water; O = Oil; A = Air; DS = Drum Solids; DL = Drum Liquids; T = Tissue; WI = Wipe; L = Liquid; V = Vegetation; X = Other

FINAL SAMPLE DISPOSITION: Disposal Method (e.g., Return to customer, per lab procedure, used in process) — Disposed By — Date/Time

All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.

DISTRIBUTION: White - Remain with Samples; Color - Customer

BC-0000-828 (09/95)

01/25/96 16:17 222 ANALYTICAL LAB 002

stinghouse Hanford
npany

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. No.

Page 1 of 1

or R.S. PROMNIK	Contact/Requestor MA	Telephone No. 373-7751 MSIN 57-03 FAX 373-5191	
MA	Sample Origin AP104 risers 1 @ 270° N	Purchase Order/Charge Code MA	
Title MA	Logbook No. MA	Ice Chest No. MA Temp.	
d To (Lab) 222-S	Method of Shipment TRUCK	Bill of Lading/Air Bill No. MA	
ol MA	Date Turnaround MA	Offsite Property No. MA	

ple No.	Lab ID	*	Date	Time	No./Type Container	Sample Analysis	Preservative
96-3C	222-S	L	1-23-96	1920hrs	1/125ml Glass	Dose @ contact 26 mR/hr Seal # 4097	MA
96-3D	222-S	L	1-23-96	1920hrs	1/125 ml Glass	Dose @ contact 32 mR/hr Seal # 4098	MA

SIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS ☐ Yes ☒ No

RADIOACTIVE

SPECIAL INSTRUCTIONS Hold Time

WHC-SD-WM-DP-142, REV. 1

nquished By Print / Sign	Date/Time	Received By Print / Sign	Date/Time
James Sickels	2135 1-24-96	C E Boyd	2135 1-24-96
C E Boyd	1-24-96 2222	MICHAEL A. LOOK	1/24/96 2222
nquished By	Date/Time	Received By	Date/Time
nquished By	Date/Time	Received By	Date/Time

Matrix*

S = Soil	DS = Drum Solids		
SE = Sediment	DL = Drum Liquids		
SO = Solid	T = Tissue		
SL = Sludge	WI = Wipe		
W = Water	L = Liquid		
O = Oil	V = Vegetation		
A = Air	X = Other		

AL SAMPLE SPOSITION | Disposal Method (e.g., Return to customer, per lab procedure, used in process) | Disposed By | Date/Time

samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.

STRIBUTION: White - Remain with Samples Color - Customer

8C-6000-020 (09/95)

01/25/96 16:20 222 ANALYTICAL LAB 006

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	C.O.C. No.
		Page 1 of 1

Collector: R.J. PRAZNIK	Contact/Requester: NA	Telephone No.: 3-7751	MSIN: S1-03 FAX: 376-9191
SAF No.: NA	Sample Origin: AP104 riser 1@ 30° N	Purchase Order/Charge Code: NA	
Project Title: NA	Logbook No.: NA	Ice Chest No.: NA	Temp.:
Shipped To (Lab): 222S	Method of Shipment: TRUCK	Bill of Lading/Air Bill No.: NA	
Protocol: NA	Data Turnaround: NA	Offsite Property No.: NA	

Sample No.	Lab ID	*	Date	Time	No./Type Container	Sample Analysis	Preserval
HAP96-2D	222-S	L	1-18-96	1248hrs	1/glass 125ml	Dose @ contact 15 mR/hr	N/A
HAP96-IB1	222S	L	1-18-96	1118hrs	1/GLASS 125ML	DOSE ON CONTACT 20.5mR/hr	N/A
						Seal" 2D "4084"	
						IB1 "4085".	

POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes): RADIO ACTIVE

MSDS ☐ Yes ☒ No

SPECIAL INSTRUCTIONS: Hold Time

WHC-SD-WM-DP-142, REV. 1

Relinquished By (Print / Sign)	Date/Time	Received By (Print / Sign)	Date/Time
JAMES Sickels James Sickels	1-19-96 1315	[illegible] James R Fruhauf	1-19-96 1341
James R Fruhauf James R Fruhauf	1-19-96 1425	EE Dubbs EE Dubbs	1-19-96 1425

Matrix*

S = Soil	DS = Drum So	SE = Sediment	DL = Drum Lic
SO = Solid	T = Tissue	SL = Sludge	WI = Wipe
W = Water	L = Liquid	O = Oil	V = Vegetati
A = Air	X = Other		

FINAL SAMPLE DISPOSITION: Disposal Method (e.g., Return to customer, per lab procedure, used in process) | Disposed By | Date/Time

All samples containing hazardous materials shall be picked up by requester and returned to parent container or site of origin.

DISTRIBUTION: White - Receiving Samples; Pink - Customer

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. No.

Page 1 of 1

Collector: R.J. PRAZNIK	Contact/Requestor: NA	Telephone No. 3-7751	MSIN S7-03 / FAX 376-9191
SAF No.: NA	Sample Origin: AP104 riser 1 @ 30° N	Purchase Order/Charge Code: NA	
Project Title: NA	Logbook No.: NA	Ice Chest No.: NA	Temp.
Shipped To (Lab): 222-S	Method of Shipment: TRUCK	Bill of Lading/Air Bill No.: NA	
Protocol: NA	Data Turnaround: NA	Offsite Property No.: NA	

Sample No.	Lab ID	*	Date	Time	No./Type Container	Sample Analysis	Preservative
P-96-OB1	222-S	L	1-18-96	1110hrs	1 / Glass 125ml	Dose on Contact <0.5 mR/hr	NA
P-96-OB2	222-S	L	1-18-96	1112hrs	1 / Glass 125ml	Dose at Contact <0.5 mR/hr	NA
						Seal # OB1 - 4087	
						OB2 - 4088	

POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes): RADIOACTIVE

MSDS ☐ Yes ☒ No

SPECIAL INSTRUCTIONS

Hold Time

WHC-SD-WM-DP-142, REV. 1

Relinquished By (Print)	Sign	Date/Time	Received By (Print)	Sign	Date/Time
JAMES Sickels	[signature] (Sign for Praznik)	0930 1-22-96	[signature]	Dave Keane	0930 1-22-96
David J Keane	[signature]	10:15 1-22-96	[signature]	E E Dubois	1-22-96 1015

Matrix*

S	= Soil	DS	= Drum Solids
SE	= Sediment	DL	= Drum Liquids
SO	= Solid	T	= Tissue
SL	= Sludge	WI	= Wipe
W	= Water	L	= Liquid
O	= Oil	V	= Vegetation
A	= Air	X	= Other

FINAL SAMPLE DISPOSITION — Disposal Method (e.g., Return to customer, per lab procedure, used in process) | Disposed By | Date/Time

All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.

DISTRIBUTION: White - Remain with Samples Color - Customer

BC-6000-628 (09/95)

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. No. N/A

Page 1 of 1

Collector: R.D. PRAZNIK	Contact/Requestor: NA	Telephone No.: 373-7751	MSIN: S7-03 FAX: 373-9191
AF No.: NA	Sample Origin: AP104 Trip Blanks	Purchase Order/Charge Code: NA	
Project Title: NA	Logbook No.: NA	Ice Chest No.: NA	Temp.
Shipped To (Lab): 222-S	Method of Shipment: TRUCK	Bill of Lading/Air Bill No.: NA	
Protocol: NA	Date Turnaround: NA	Offsite Property No.: NA	

Sample No.	Lab ID	*	Date	Time	No./Type Container	Sample Analysis	Preservative
AP-96-TB1	222-S	L	1-23-96	2230hr	1/125ml Glass	Dose @ contact < 0.5 mR/hr, Seal # 4099	NA
AP96-TB2	222-S	L	1-23-96	2230hr	1/125ml Glass	Dose @ contact < 0.5 mR/hr Seal # 4100	NA

POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes): RADIOACTIVE

MSDS ☐ Yes ☒ No

SPECIAL INSTRUCTIONS: Trip Blanks

Hold Time

WHC-SD-WM-DP-142, REV. 1

Relinquished By (Print / Sign)	Date/Time	Received By (Print / Sign)	Date/Time
JAMES SICKELS	1-25-96		10:45 1-25-96
Relinquished By	1-25-96 11:35	Received By N Lapiers NLAPIERS	1-25-96 1135
Relinquished By		Received By	
Relinquished By		Received By	

Matrix*

S = Soil	DS = Drum Solids		
SE = Sediment	DL = Drum Liquids		
SO = Solid	T = Tissue		
SL = Sludge	WI = Wipe		
W = Water	L = Liquid		
O = Oil	V = Vegetation		
A = Air	X = Other		

FINAL SAMPLE DISPOSITION: Disposal Method (e.g., Return to customer, per lab procedure, used in process) | Disposed By | Date/Time

All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.

DISTRIBUTION: White - Remain with Samples Color - Customer

SC-0000-820 (09/95)

01/25/96 16:18 222 ANALYTICAL LAB 003

01/25/96 15:27 509 373 1432 001

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. No.

Page 1 of 1

Collector: R.J. Praznik	Contact/Requestor: NA	Telephone No.: 3-7151 · MSIN: S7-03 · FAX: 376-9191
SAF No.: NA	Sample Origin: AP104 main 1 @ 30° N	Purchase Order/Charge Code: NA
Project Title: NA	Logbook No.: NA	Ice Chest No.: NA · Temp.:
Shipped To (Lab): 222-S	Method of Shipment: TRUCK	Bill of Lading/Air Bill No.: NA
Protocol: NA	Data Turnaround: NA	Offsite Property No.: NA

Sample No.	Lab ID	*	Date	Time	No./Type Container	Sample Analysis	Preservative
4AP-96-IB2	222-S	L	1-18-96	1115hrs	1/Glass 125ml	Dose @ contact <0.5mR/hr	NA
~~4AB~~ (initialed) 1-18-92						Serl # 4086	~~NA~~ (initialed) 1-18
~~4AP-96-IB1~~	~~222-S~~	~~L~~	~~1-18-96~~	~~1118hrs~~	~~1/Glass 125ml~~	~~Dose @ contact <0.5mR/hr~~ (initialed) 1-19-96	~~NA~~

(The 4AP-96-IB1 row is struck through.)

POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes): RADIOACTIVE

MSDS ☐ Yes ☒ No

SPECIAL INSTRUCTIONS

Hold Time

LW 1/23/96

WHC-SD-WM-DP-~~145~~ 142, REV. 1

Relinquished By (Print)	Sign	Date/Time	Received By (Print)	Sign	Date/Time
JAMES Sickels	[signature]	1405 1-22-96	[signature]	DAVID KEANE	1405 1-22-96
DAVID Keane	[signature]	1445 1-22-96	[signature]	EEDuchos	1-22-96 1445
Relinquished By		Date/Time	Received By		Date/Time
Relinquished By		Date/Time	Received By		Date/Time

Matrix*

S = Soil		DS = Drum Solids	
SE = Sediment		DL = Drum Liquid	
SO = Solid		T = Tissue	
SL = Sludge		WI = Wipe	
W = Water		L = Liquid	
O = Oil		V = Vegetation	
A = Air		X = Other	

FINAL SAMPLE DISPOSITION — Disposal Method (e.g., Return to customer, per lab procedure, used in process) — Disposed By — Date/Time

All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.

DISTRIBUTION: White - Remain with Samples Color - Customer

BC-6000-828 (09/95)

RAW ANALYTICAL DATA

DATA SUMMARY TABLES

THIS PAGE WAS INTENTIONALLY LEFT BLANK

WHC-SD-WM-DP-142, REV. 1

LABCORE Data Entry Template for Worklist# 5170

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

Method: LA-519-151 Rev/Mod E-2

Worklist Comment: EVAP BREAKDOWN. GJH

GROUP	PROJECT	S TYPE	SAMPLE#	R	A	-------TEST------	MATRIX	ACTUAL	FOUND	DL	UNIT
96000036	AP-104	1 SAMPLE	S96V000001	0		DOSERATE	LIQUID	N/A	170		mrad/hour
96000036	AP-104	2 SAMPLE	S96V000002	0		DOSERATE	LIQUID	N/A	140		mrad/hour
96000036	AP-104	3 SAMPLE	S96V000003	0		DOSERATE	LIQUID	N/A	115		mrad/hour
96000036	AP-104	4 SAMPLE	S96V000004	0		DOSERATE	LIQUID	N/A	<0.5		mrad/hour
96000036	AP-104	5 SAMPLE	S96V000006	0		@BRKDWN1 DOSERATE	LIQUID	N/A	220		mrad/hour
96000036	AP-104	5 SAMPLE	S96V000006	0		@BRKDWN1 APPEAR02	LIQUID	N/A	Complete		
96000036	AP-104	6 SAMPLE	S96V000008	0		@BRKDWN1 DOSERATE	LIQUID	N/A	125		mrad/hour
96000036	AP-104	6 SAMPLE	S96V000008	0		@BRKDWN1 APPEAR02	LIQUID	N/A	Complete		
96000036	AP-104	7 SAMPLE	S96V000014	0		DOSERATE	LIQUID	N/A	<0.5		mrad/hour
96000036	AP-104	8 SAMPLE	S96V000016	0		DOSERATE	LIQUID	N/A	<0.5		mrad/hour

Final page for worklist # 5170

Analyst Signature Date 1/25/96

Analyst Signature Date 1/25/96

S96V000008 Appearance: Clear, no solids, one phase, color not observable

S96V000006 Appearance: Clear, no solids, one phase, color not observable

Data Entry Comments: Reviewed & Approved, 2/2/96

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# 5171

Analyst: ________ **Instrument:** NONE ________ **Book #** ________

Method: LA-519-151 Rev/Mod E2

Worklist Comment: EVAP breakdown, gjh

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
96000036	AP-104	1	SAMPLE	S96V000017	0		DOSERATE	LIQ	N/A	165		mrad/hour
96000036	AP-104	2	SAMPLE	S96V000018	0		DOSERATE	LIQ	N/A	125		mrad/hour
96000036	AP-104	3	SAMPLE	S96V000019	0		DOSERATE	LIQ	N/A	125		mrad/hour
96000036	AP-104	4	SAMPLE	S96V000020	0		DOSERATE	LIQ	N/A	<0.5		mrad/hour

Final page for worklist # 5171

Daniel P. Bromley 1/25/96 1530
Analyst Signature **Date**

McWright 1/25/96
Analyst Signature **Date**

Data Entry Comments: Reviewed & Approved, 2/2/96

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

WHC-SD-WM-DP-142, REV. 1

LABCORE Data Entry Template for Worklist# 5172

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

Method: LA-519-151 Rev/Mod E-2

Worklist Comment: EVAP BREAKDOWN, GJH

GROUP	PROJECT	S TYPE	SAMPLE#	R	A	-------TEST------	MATRIX	ACTUAL	FOUND	DL	UNIT
96000036	AP-104	1 SAMPLE	S96V000012	0		@APPEAR2 ORGVOL02	LIQUID	N/A	0		mL
96000036	AP-104	1 SAMPLE	S96V000012	0		@APPEAR2 APPEAR02	LIQUID	N/A	Complete		
96000036	AP-104	1 SAMPLE	S96V000012	0		@APPEAR2 SAMPAMT2	LIQUID	N/A	125		mL
96000036	AP-104	1 SAMPLE	S96V000012	0		@APPEAR2 DOSE-02	LIQUID	N/A	130		mrad/hour
96000036	AP-104	2 SAMPLE	S96V000021	0		@APPEAR2 ORGVOL02	LIQUID	N/A	0		mL
96000036	AP-104	2 SAMPLE	S96V000021	0		@APPEAR2 ORGVOL02	LIQUID	N/A	N/A		mL
96000036	AP-104	2 SAMPLE	S96V000021	0		@APPEAR2 APPEAR02	LIQUID	N/A	Complete		
96000036	AP-104	2 SAMPLE	S96V000021	0		@APPEAR2 APPEAR02	LIQUID	N/A	N/A		
96000036	AP-104	2 SAMPLE	S96V000021	0		@APPEAR2 DOSE-02	LIQUID	N/A	175		mrad/hour
96000036	AP-104	2 SAMPLE	S96V000021	0		@APPEAR2 DOSE-02	LIQUID	N/A	N/A		mrad/hour
96000036	AP-104	3 SAMPLE	S96V000022	0		@APPEAR2 ORGVOL02	LIQUID	N/A	0		mL
96000036	AP-104	3 SAMPLE	S96V000022	0		@APPEAR2 APPEAR02	LIQUID	N/A	Complete		
96000036	AP-104	3 SAMPLE	S96V000022	0		@APPEAR2 DOSE-02	LIQUID	N/A	90		mrad/hour
96000036	AP-104	4 SAMPLE	S96V000023	0		@APPEAR2 ORGVOL02	LIQUID	N/A	0		mL
96000036	AP-104	4 SAMPLE	S96V000023	0		@APPEAR2 APPEAR02	LIQUID	N/A	Complete		
96000036	AP-104	4 SAMPLE	S96V000023	0		@APPEAR2 DOSE-02	LIQUID	N/A	115		mrad/hour

Data Entry Comments: Reviewed & Approved. GJH 2/2/96

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# 5172

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

Final page for worklist # 5172

Analyst Signature Date 1/25/96

Analyst Signature Date 1/25/96

bom 1/24/96

~~S96V000000~~

S96V000012 Appearance: Clear, no solids, one phase, color not observable

S96V000023 Appearance: Clear, no solids, one phase, color not observable

S96V000022 Appearance: Clear, ~~no~~ Some solids, one phase, color, not observable
bom 1/25/96

S96V000021 Appearance: clear, no solids, one phase, color not observable

Data Entry Comments: Reviewed & Approved. bom 2/2/96

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# 5184

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

Method: LA-519-151 Rev/Mod E-2

Worklist Comment: EVAP BREAKDOWN. GJH

GROUP	PROJECT	S TYPE	SAMPLE#	R	A	-------TEST------	MATRIX	ACTUAL	FOUND	DL	UNIT
96000036	AP-104	1 SAMPLE	S96V000005	0		DOSERATE	LIQUID	N/A	<0.5		mrad/hour
96000036	AP-104	2 SAMPLE	S96V000007	0		@BRKDWN1 DOSERATE	LIQUID	N/A	100		mrad/hour
96000036	AP-104	2 SAMPLE	S96V000007	0		@BRKDWN1 APPEAR02	LIQUID	N/A	Complete		

Final page for worklist # 5184

Analyst Signature Date 1/29/96

Analyst Signature Date 1/25/96

S96V000007 Appearance: clear, 1 large solid chunk, one phase, color not observable

Data Entry Comments: Reviewed & Approved, JGH 2/2/96

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.

SAMPLE PREPARATIONS

THIS PAGE WAS INTENTIONALLY LEFT BLANK

LABCORE Data Entry Template for Worklist# 5320

Analyst: lmh **Instrument:** ACD01 **Book #** WHC-2 (WHC IA)

Method: LA-505-158 Rev/Mod B-0

Worklist Comment: AP-104 EVAP FEED TK 1C,2C,3C,4,IB1 ACID DIG. RCJ

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1	BLNK-PREP				ACIDIG02	LIQUID	~~100~~	0.100 (1 RKJ 2/1/96)	N/A	DF
		2	STD-PREP (5 ml → 100 ml)				ACIDIG02	LIQUID	20	20	N/A	DF
96000036	AP-104	3	SAMPLE (10 ml → 100 ml)	S96V000009	0	B	ACIDIG02	LIQUID	N/A	10		DF
96000036	AP-104	4	SAMPLE	S96V000009	0	B	DOSE-02	LIQUID	N/A	8		mrad/hour
96000036	AP-104	5	DUP (10 ml → 100 ml)	S96V000009	0	B	ACIDIG02	LIQUID	10	10	N/A	DF
96000036	AP-104	6	DUP	S96V000009	0	B	DOSE-02	LIQUID	8	6	N/A	mrad/hour
96000036	AP-104	7	SPK (10 ml → 100 ml)	S96V000009	0	B	ACIDIG02	LIQUID	20	20	N/A	DF
96000036	AP-104	8	SPK	S96V000009	0	B	DOSE-02	LIQUID	NA	~~10~~ 4.6 RMO 2-4-96	N/A	mrad/hour
96000036	AP-104	9	SAMPLE (10 ml → 100 ml)	S96V000010	0	B	ACIDIG02	LIQUID	N/A	10		DF
96000036	AP-104	10	SAMPLE	S96V000010	0	B	DOSE-02	LIQUID	N/A	3.6		mrad/hour
96000036	AP-104	11	DUP (10 ml → 100 ml)	S96V000010	0	B	ACIDIG02	LIQUID	10	10	N/A	DF
96000036	AP-104	12	DUP	S96V000010	0	B	DOSE-02	LIQUID	3.6	3.6	N/A	mrad/hour
96000036	AP-104	13	SAMPLE (10 ml → 100 ml)	S96V000011	0	B	ACIDIG02	LIQUID	N/A	10		DF
96000036	AP-104	14	SAMPLE	S96V000011	0	B	DOSE-02	LIQUID	N/A	3.5		mrad/hour
96000036	AP-104	15	DUP (10 ml → 100 ml)	S96V000011	0	B	ACIDIG02	LIQUID	10	10	N/A	DF
96000036	AP-104	16	DUP	S96V000011	0	B	DOSE-02	LIQUID	3.5	3.5	N/A	mrad/hour
96000036	AP-104	17	SAMPLE (10 ml → 100 ml)	S96V000013	0	B	ACIDIG02	LIQUID	N/A	10		DF
96000036	AP-104	18	SAMPLE	S96V000013	0	B	DOSE-02	LIQUID	N/A	3.3		mrad/hour

Data Entry Comments:

HPT: Darrel Hawes

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# 5320

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	-------TEST------	MATRIX	ACTUAL	FOUND	DL	UNIT
96000036	AP-104	19	DUP 10mL → 100mL	S96V000013	0	B	ACIDIG02	LIQUID	10	10	N/A	DF
96000036	AP-104	20	DUP	S96V000013	0	B	DOSE-02	LIQUID	3.3	3.3	N/A	mrad/hour
96000036	AP-104	21	SAMPLE 10mL → 100mL	S96V000015	0	B	ACIDIG02	LIQUID	N/A	10		DF
96000036	AP-104	22	SAMPLE	S96V000015	0	B	DOSE-02	LIQUID	N/A	2		mrad/hour
96000036	AP-104	23	DUP 10mL → 100mL	S96V000015	0	B	ACIDIG02	LIQUID	10	10	N/A	DF
96000036	AP-104	24	DUP	S96V000015	0	B	DOSE-02	LIQUID	2	1.3	N/A	mrad/hour

Final page for worklist # 5320

Analyst Signature Date: 2-4-96

Analyst Signature Date: 2/7/96

S96V000006 → 09 1C
07 → 10 2C
08 → 11 3C
12 → 13 4
14 → 15 1B1

Reviewed by RK Fuller 2/7/96

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 Data Entry Template for Worklist# 6099

Analyst: lmh **Instrument:** ACD01 NONE **Book #** NONE

Method: LA-505-158 Rev/Mod B.0

Worklist Comment: AP-104 EVAP FEED TK 4AP-96-4 ACID DIG. RERUN #1 BG

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1	BLNK-PREP				ACIDIG02	LIQUID	1	.050	N/A	DF
96000036	AP-104	2	SAMPLE	S96V000024	0	B	ACIDIG02	LIQUID	N/A	10		DF
			5 ml → 50 ml									
96000036	AP-104	3	SAMPLE	S96V000024	0	B	DOSE-02	LIQUID	N/A	2		mrad/hour
96000036	AP-104	4	DUP	S96V000024	0	B	ACIDIG02	LIQUID	10	10	N/A	DF
			5 ml → 50 ml									
96000036	AP-104	5	DUP	S96V000024	0	B	DOSE-02	LIQUID	2	2	N/A	mrad/hour

Final page for worklist # 6099

Analyst Signature Date 3-5-96

Analyst Signature Date 3/6/96

S96V000012 → S96V000024

Reviewed by RK Fuller 3/6/96

Data Entry Comments: < 1010 DCPMs HPT Dose Corbally

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.

SUPER SUPER RUSH
LABCORE Data Entry Template for Worklist# 6477

Analyst: lmh **Instrument:** ACD01 10016 **Book #** WHC1A/J6JWHC1AU5 WHC2/J6JWH2U2

Method: LA-505-158 Rev/Mod B-0 WHC-SD-WM-DP-142, REV. 1

Worklist Comment: AP-104(EVAP)(ID,4AP-96-3C)S96V000008->S96V000026)ACIDIG RTS!

GROUP	PROJECT	S TYPE	SAMPLE#	R	A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 BLNK-PREP				ACIDIG02	LIQUID	1	.100	N/A	DF
		2 STD-PREP 5ml → 100ml				ACIDIG02	LIQUID	20	20	N/A	DF
96000036	AP-104	3 SAMPLE 10ml → 100ml	S96V000026	0	B	ACIDIG02	LIQUID	N/A	10		DF
96000036	AP-104	4 SAMPLE	S96V000026	0	B	DOSE-02	LIQUID	N/A	3		mrad/hour
96000036	AP-104	5 DUP 10ml → 100ml	S96V000026	0	B	ACIDIG02	LIQUID	10	10	N/A	DF
96000036	AP-104	6 DUP	S96V000026	0	B	DOSE-02	LIQUID	3	3	N/A	mrad/hour
96000036	AP-104	7 SPK 10ml → 100ml + 5ml of spike	S96V000026	0	B	ACIDIG02	LIQUID	20	20	N/A	DF
96000036	AP-104	8 SPK	S96V000026	0	B	DOSE-02	LIQUID	3	3	N/A	mrad/hour
96000036	AP-104	9 SPK-DUP 10ml → 100ml + 5ml of spike	S96V000026	0	B	ACIDIG02	LIQUID	20	20	N/A	DF
96000036	AP-104	10 SPK-DUP	S96V000026	0	B	DOSE-02	LIQUID	3	3	N/A	mrad/hour

Final page for worklist # 6477

3-14-96
Analyst Signature **Date**

3/14/96
Analyst Signature **Date**

Reviewed by RK Fuller 3/14/96.

Data Entry Comments: HPT: Bill Bishop

On the Spike and Spike duplicate, the dilution factor for the sample = 10X, dilution factor for spike = 20X. RK Fuller 3/14/96.

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.

PHYSICAL ANALYSES

THIS PAGE WAS INTENTIONALLY LEFT BLANK

LABCORE Data Entry Template for Worklist# 5342

Analyst: SMF **Instrument:** DSC0 1 **Book #** 12N14B

Method: LA-514-113 Rev/Mod C-1

WHC-SD-WM-DP-142, REV. 1

Worklist Comment: AP-104 DSC RUN UNDER N2. RCJ

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1	STD				DSC-01	LIQUID	28.45	31.0	N/A	Joules/g
96000036	AP-104	2	SAMPLE	S96V000006	0		DSC-01	LIQUID	N/A	Ø		Joules/g
96000036	AP-104	3	DUP	S96V000006	0		DSC-01	LIQUID	Ø	Ø	N/A	Joules/g
		4	STD				DSC-01	LIQUID	28.45	27.8	N/A	Joules/g
96000036	AP-104	5	SAMPLE	S96V000007	0		DSC-01	LIQUID	N/A	Ø		Joules/g
96000036	AP-104	6	DUP	S96V000007	0		DSC-01	LIQUID	Ø	Ø	N/A	Joules/g
96000036	AP-104	7	SAMPLE	S96V000008	0		DSC-01	LIQUID	N/A	Ø		Joules/g
96000036	AP-104	8	DUP	S96V000008	0		DSC-01	LIQUID	Ø	Ø	N/A	Joules/g
96000036	AP-104	9	SAMPLE	S96V000012	0		DSC-01	LIQUID	N/A	Ø		Joules/g
96000036	AP-104	10	DUP	S96V000012	0		DSC-01	LIQUID	Ø	Ø	N/A	Joules/g

Final page for worklist # 5342

See attached for signatures

Analyst Signature **Date** 2/6/96 BDW

Verified by Blandina Valenzuela 2/12/96

Analyst Signature **Date**

S96V000006 produced an endotherm at 109.8°C with a delta H of 1798.5J/g
S96V000007 produced an endotherm at 107.8°C with a delta H of 2123.0J/g

Data Entry Comments: S96V000008 produced an endotherm at 109.8°C with a delta H of 2048.6 J/g.
S96V000012 produced an endotherm at 107.8°C with a delta H of 1841.4J/g

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

LABCORE Data Entry Template for Worklist# 5342

Analyst: SMF **Instrument:** DSC0 _____ **Book #** 12N14B

Method: LA-514-113 Rev/Mod _____ WHC-SD-WM-DP-142 REV. 1

Worklist Comment: AP-104 DSC RUN UNDER N2. RCJ

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1	STD				DSC-01	LIQUID			N/A	Joules/g
96000036	AP-104	2	SAMPLE	S96V000006	0		DSC-01	LIQUID	N/A			Joules/g
96000036	AP-104	3	DUP	S96V000006	0		DSC-01	LIQUID			N/A	Joules/g
96000036	AP-104	4	SAMPLE	S96V000007	0		DSC-01	LIQUID	N/A			Joules/g
96000036	AP-104	5	DUP	S96V000007	0		DSC-01	LIQUID			N/A	Joules/g
96000036	AP-104	6	SAMPLE	S96V000008	0		DSC-01	LIQUID	N/A			Joules/g
96000036	AP-104	7	DUP	S96V000008	0		DSC-01	LIQUID			N/A	Joules/g
96000036	AP-104	8	SAMPLE	S96V000012	0		DSC-01	LIQUID	N/A			Joules/g
96000036	AP-104	9	DUP	S96V000012	0		DSC-01	LIQUID			N/A	Joules/g

Final page for worklist # 5342

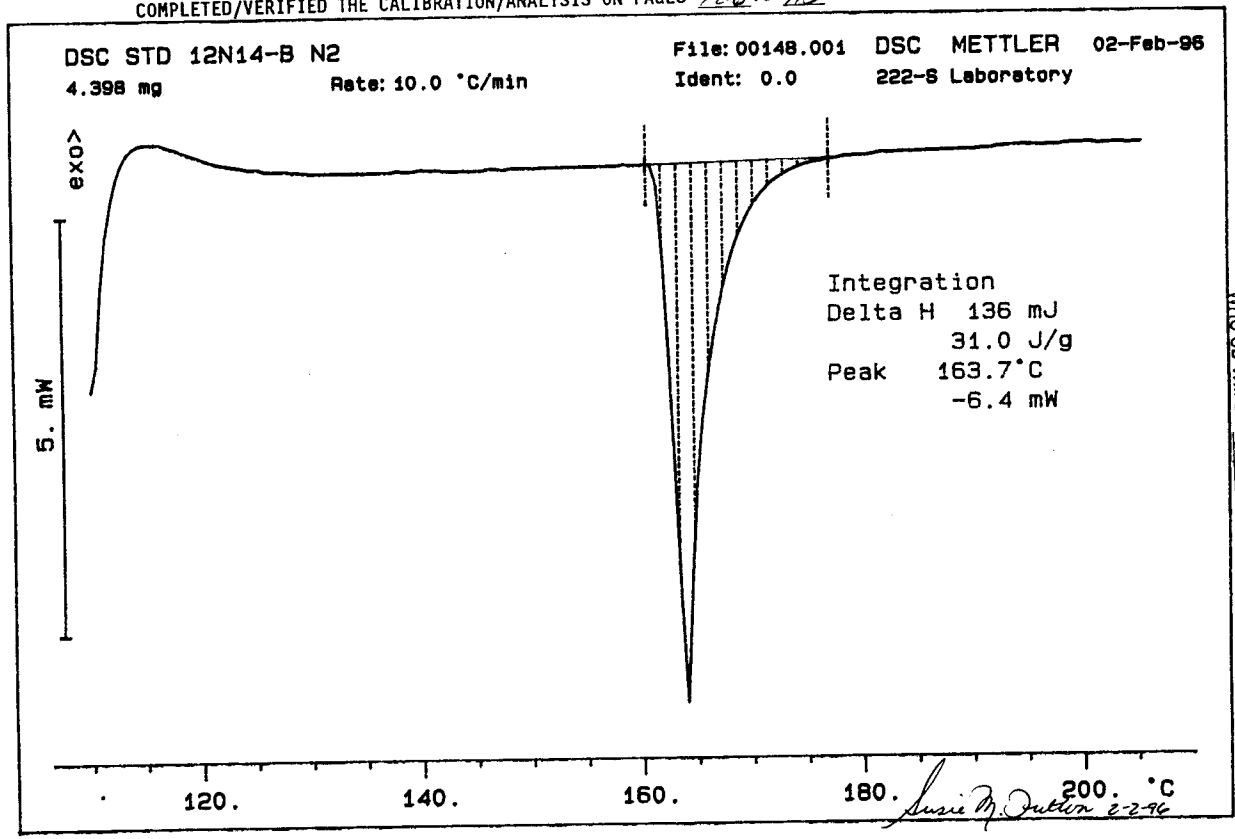
Susie M. Dalton 2-4-96
Analyst Signature **Date**

T E Wright 2/8/96
Analyst Signature **Date**

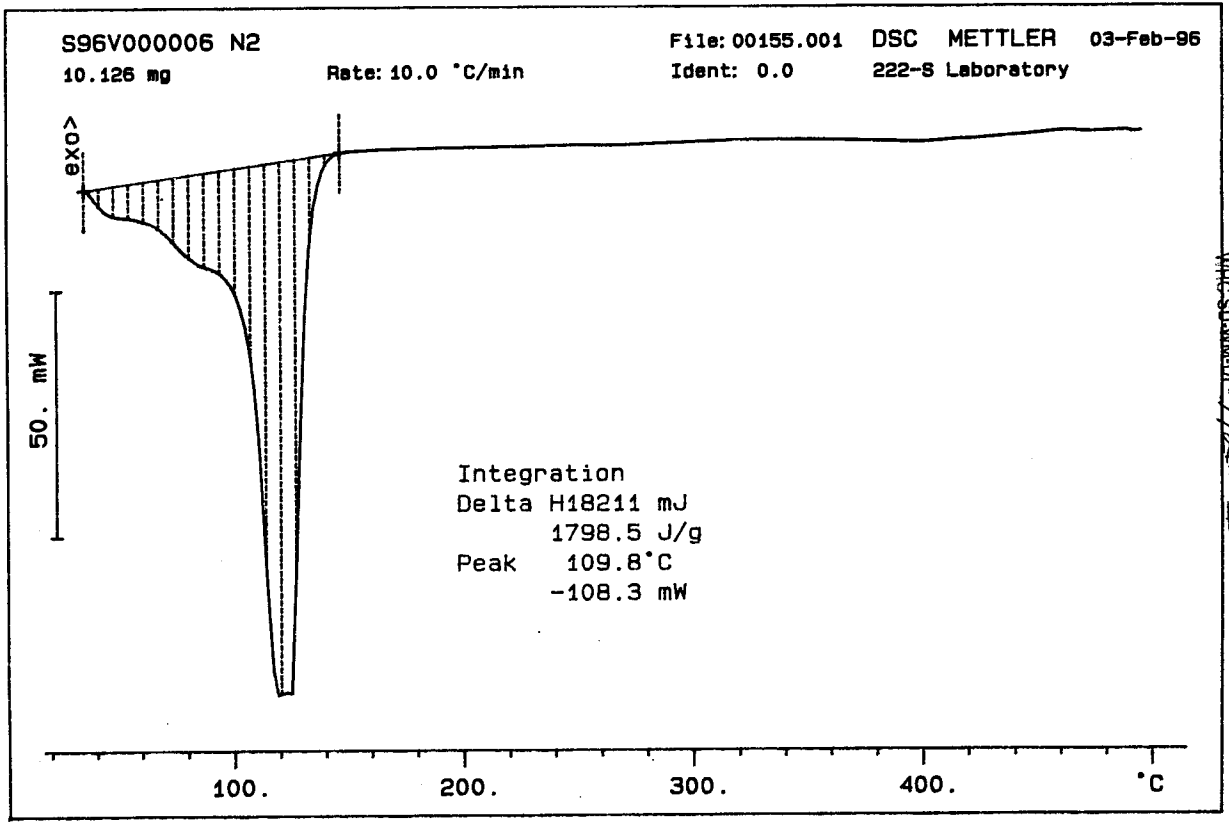
Data Entry Comments:

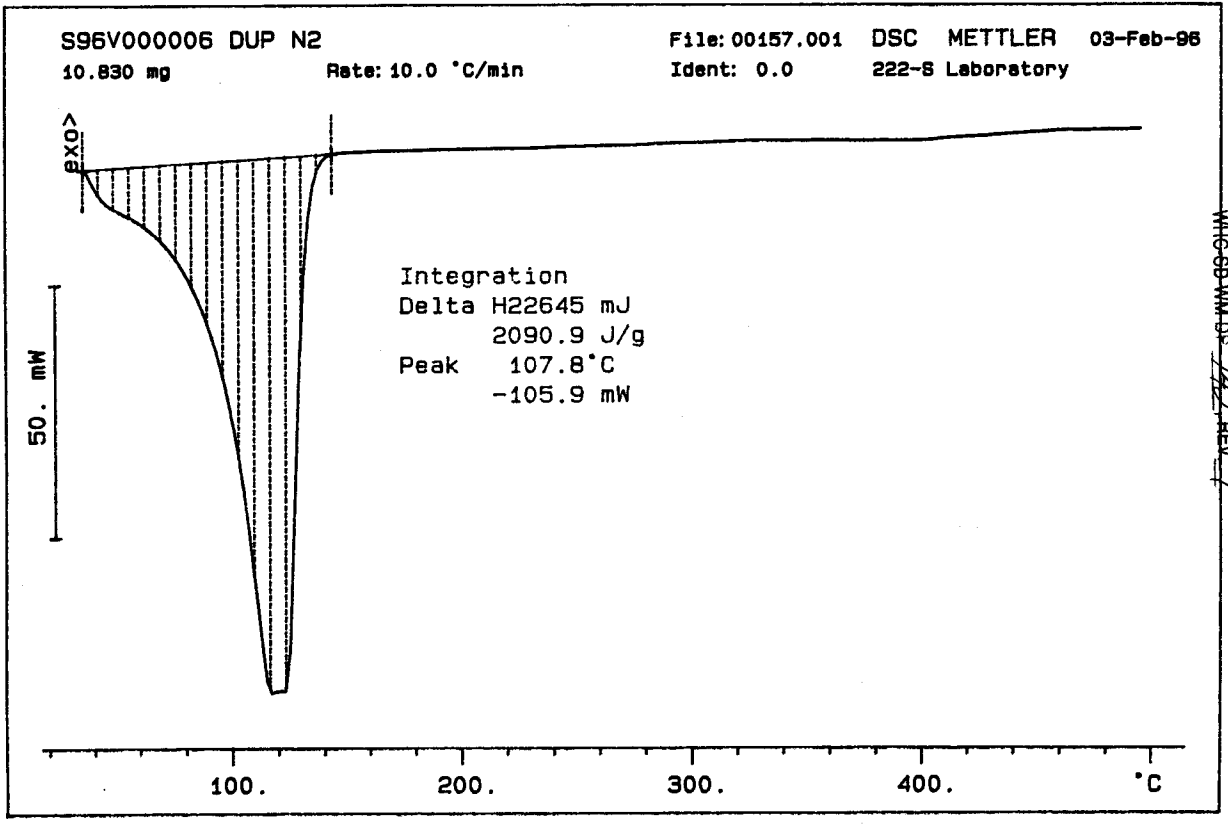
Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

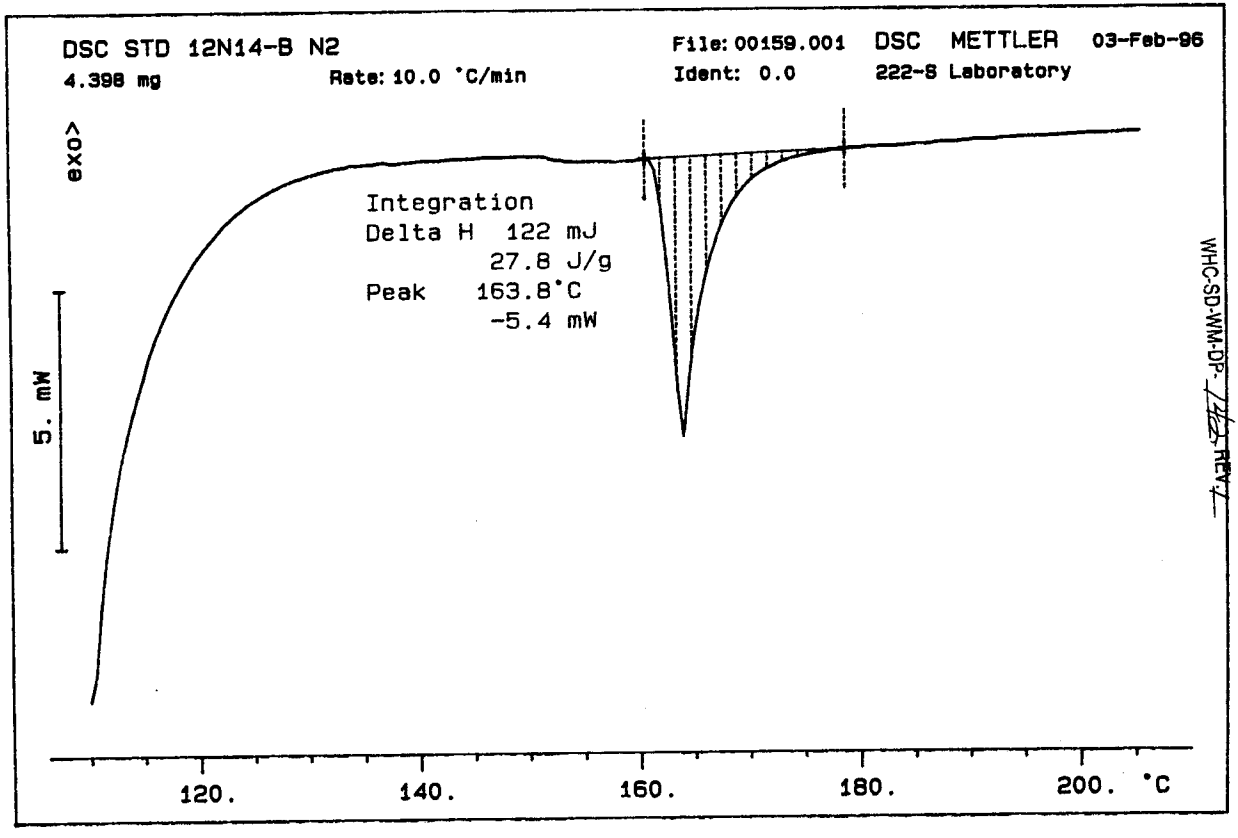
SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 106 TO 115.

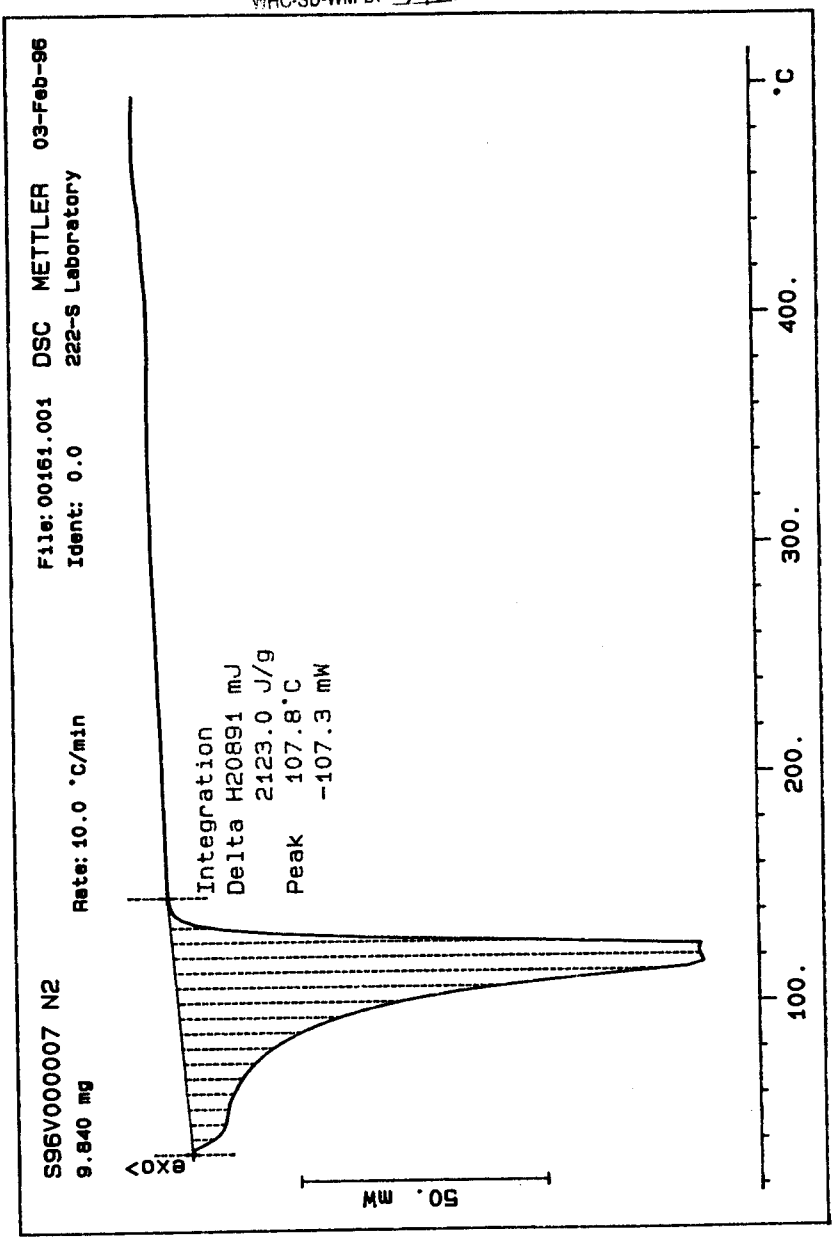


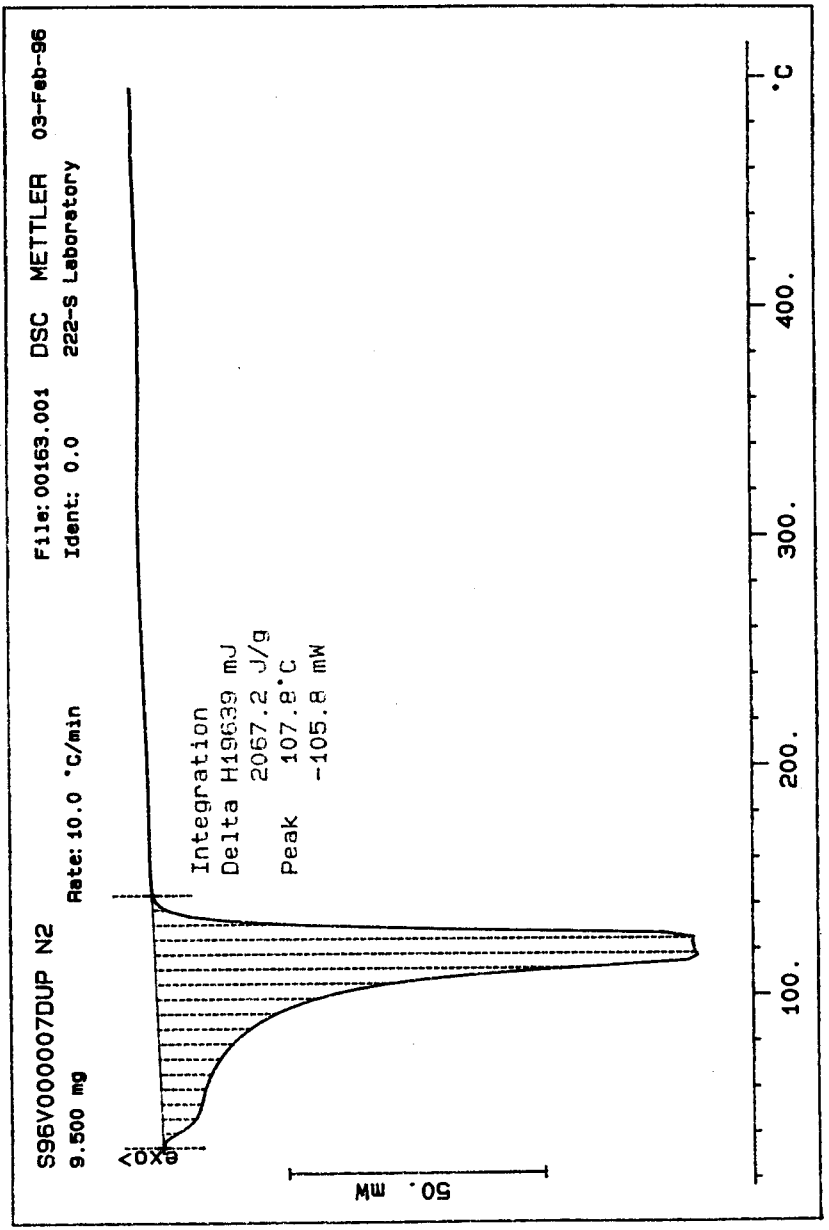
Susie M. Dutton 2-2-96

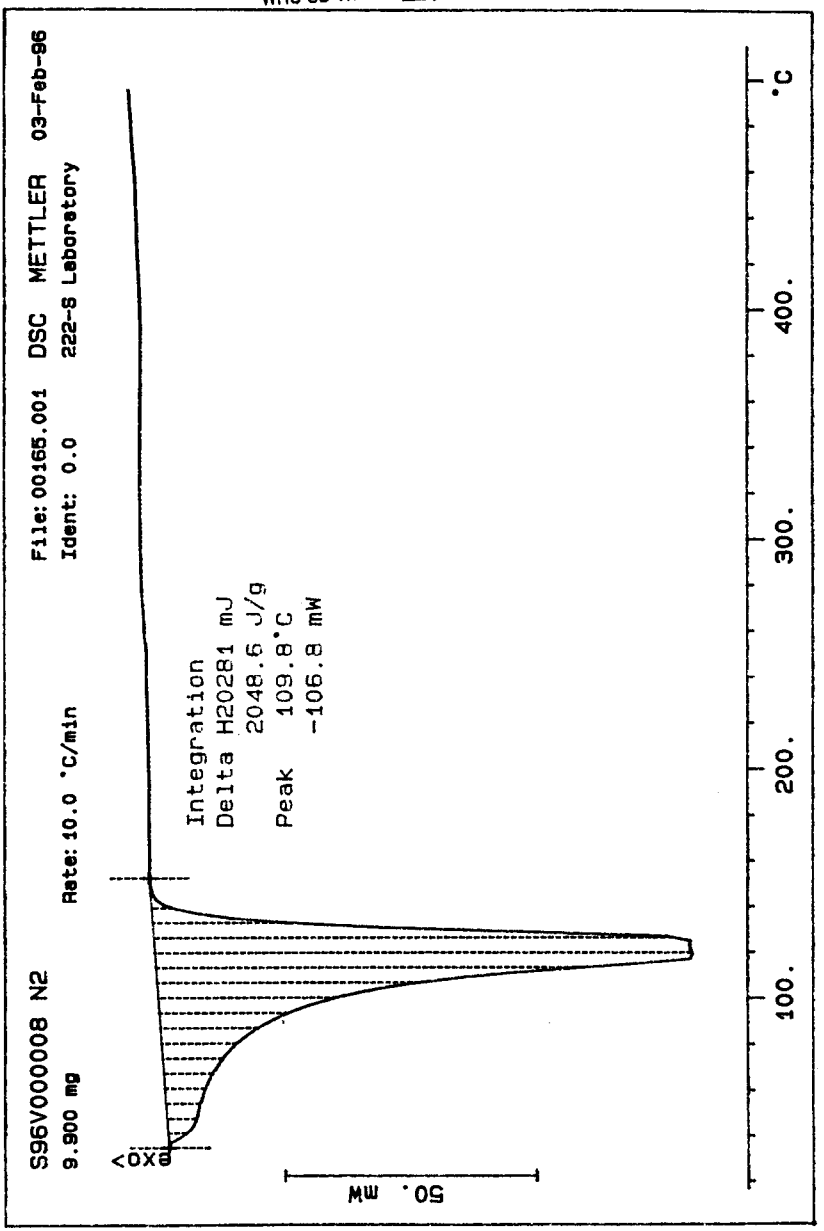


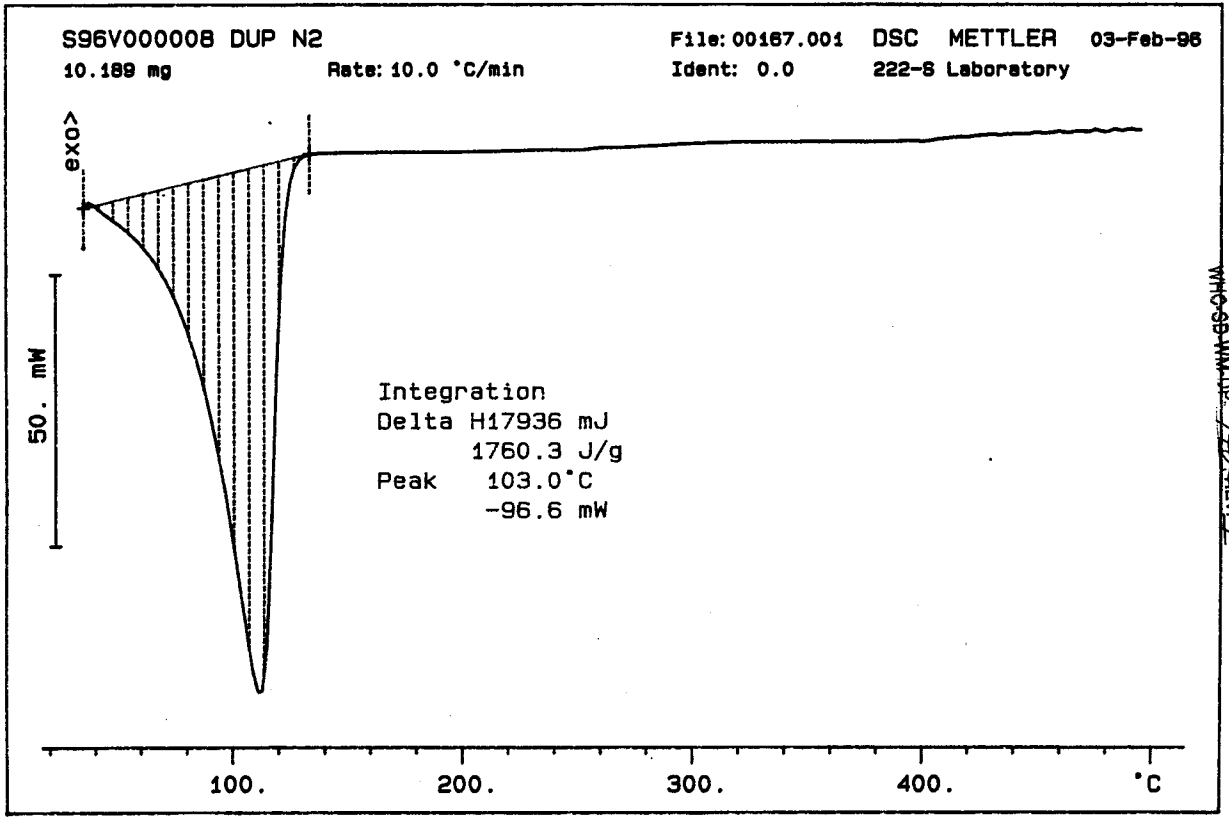


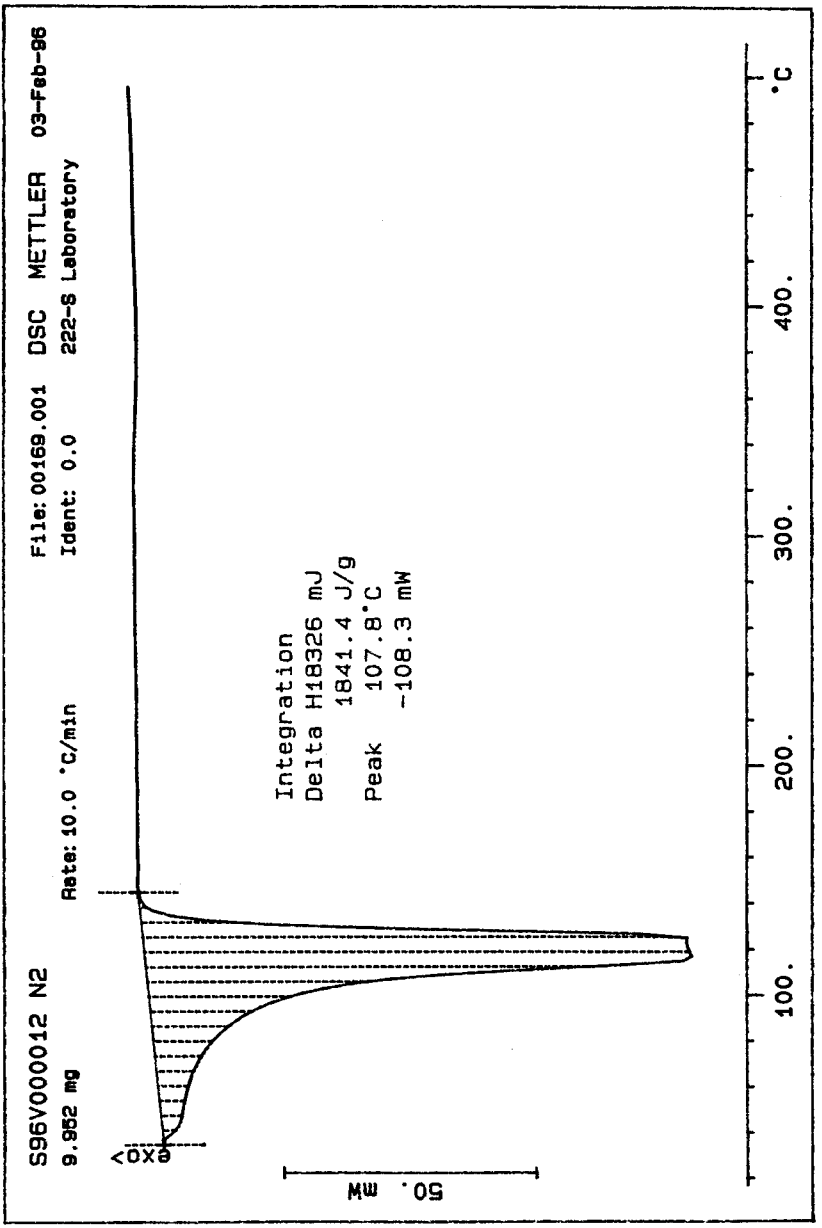

DSC STD 12N14-B N2
4.398 mg
Rate: 10.0 °C/min
File: 00159.001
Ident: 0.0
DSC METTLER
222-S Laboratory
03-Feb-96
exo>
Integration
Delta H 122 mJ
27.8 J/g
Peak 163.8°C
-5.4 mW
5. mW
120.
140.
160.
180.
200.
°C
WHC-SD-WM-DP-

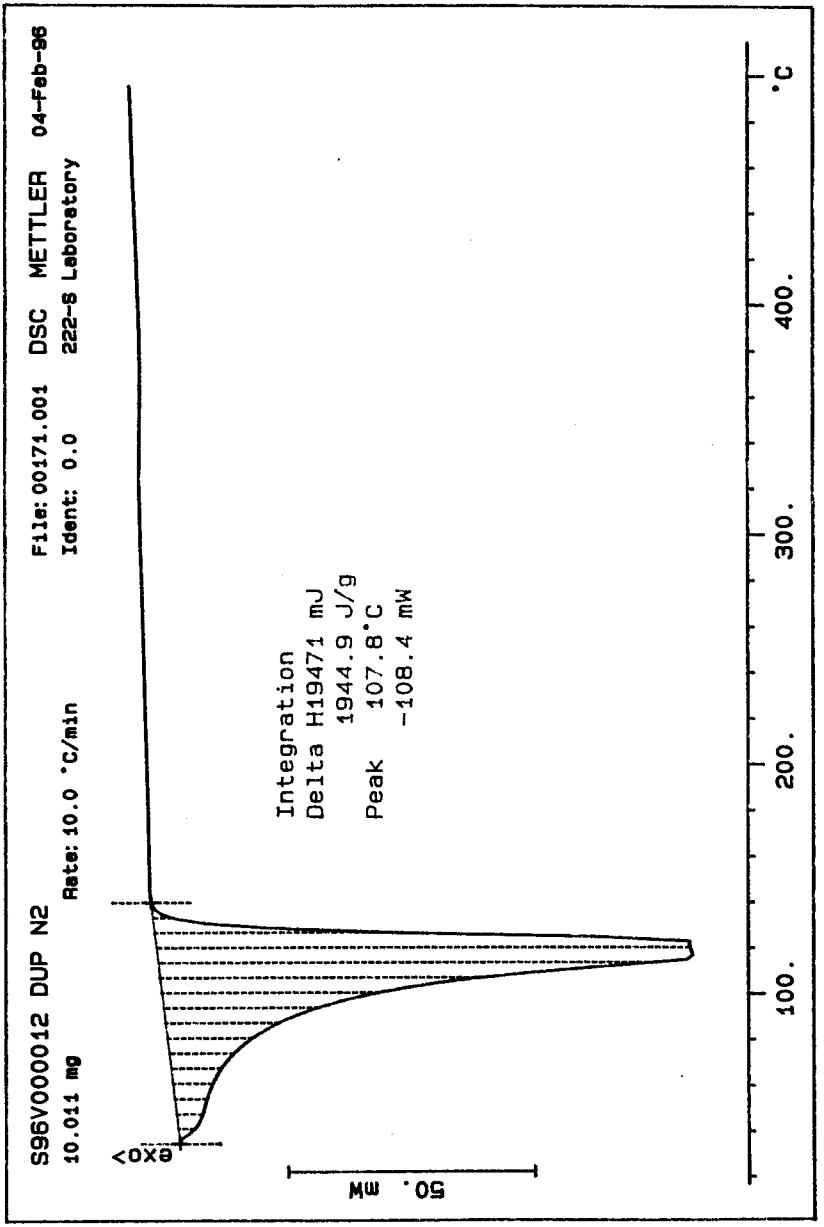

S96V000007 N2
9.840 mg
Rate: 10.0 °C/min
File: 00161.001 DSC METTLER 03-Feb-96
Ident: 0.0 222-S Laboratory
Integration
Delta H20891 mJ
2123.0 J/g
Peak 107.8°C
-107.3 mW
exo>
50. mW
100.
200.
300.
400.
°C


S96V000007DUP N2
9.500 mg
Rate: 10.0 °C/min
File: 00163.001 DSC METTLER 03-Feb-96
Ident: 0.0 222-S Laboratory
Integration
Delta H19639 mJ
2067.2 J/g
Peak 107.8°C
-105.8 mW
exo>
50. mW
100.
200.
300.
400.
°C


S96V000008 N2
9.900 mg
Rate: 10.0 °C/min
File: 00165.001 DSC METTLER 03-Feb-96
Ident: 0.0 222-S Laboratory
Integration
Delta H20281 mJ
2048.6 J/g
Peak 109.8°C
-106.8 mW
exo
50. mW
100.
200.
300.
400.
°C




S96V000012 N2
9.952 mg
Rate: 10.0 °C/min
File: 00169.001 DSC METTLER 03-Feb-96
Ident: 0.0 222-S Laboratory
Integration
Delta H18326 mJ
1841.4 J/g
Peak 107.8°C
-108.3 mW
exo>
50. mW
100.
200.
300.
400.
°C


S96V000012 DUP N2
10.011 mg
Rate: 10.0 °C/min
File: 00171.001 DSC METTLER 04-Feb-96
Ident: 0.0 222-S Laboratory
Integration
Delta H19471 mJ
1944.9 J/g
Peak 107.8°C
-108.4 mW
exo>
50. mW
100.
200.
300.
400.
°C

LABCORE Data Entry Template for Worklist# 5345

Analyst: SMF **Instrument:** TGA0 1 **Book #** 75N8A

Method: LA-560-112 Rev/Mod ~~C-1 B-1 C-1~~ B-1 2/6/96 BDV 2/12/96

Worklist Comment: AP-104 TGA RUN UNDER N2. RCJ

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1	STD				TGA-01	LIQUID	59.2	60.57	N/A	%
96000036	AP-104	2	SAMPLE	S96V000006	0		TGA-01	LIQUID	N/A	94.43		%
96000036	AP-104	3	DUP	S96V000006	0		TGA-01	LIQUID	94.43	93.87	N/A	%
		4	STD				TGA-01	LIQUID	59.2	59.75	N/A	%
96000036	AP-104	5	SAMPLE	S96V000007	0		TGA-01	LIQUID	N/A	98.71		%
96000036	AP-104	6	DUP	S96V000007	0		TGA-01	LIQUID	98.71	98.86	N/A	%
96000036	AP-104	7	SAMPLE	S96V000008	0		TGA-01	LIQUID	N/A	95.17		%
96000036	AP-104	8	DUP	S96V000008	0		TGA-01	LIQUID	95.17	94.78	N/A	%
96000036	AP-104	9	SAMPLE	S96V000012	0		TGA-01	LIQUID	N/A	98.83		%
96000036	AP-104	10	DUP	S96V000012	0		TGA-01	LIQUID	98.83	98.09	N/A	%

Final page for worklist # 5345

See attached for signatures
Analyst Signature **Date** 2/6/96

Verified by Blandina Valenzuela BDV 2/12/96

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.

LABCORE Data Entry Template for Worklist# 5345

Analyst: SMF **Instrument:** TGA0 **Book #** 75-N8-17

Method: LA-560-112 Rev/Mod

Worklist Comment: AP-104 TGA RUN UNDER N2. RCJ

GROUP	PROJECT	S TYPE	SAMPLE#	R	A	-------TEST------	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 STD				TGA-01	LIQUID			N/A	%
96000036	AP-104	2 SAMPLE	S96V000006	0		TGA-01	LIQUID	N/A			%
96000036	AP-104	3 DUP	S96V000006	0		TGA-01	LIQUID			N/A	%
96000036	AP-104	4 SAMPLE	S96V000007	0		TGA-01	LIQUID	N/A			%
96000036	AP-104	5 DUP	S96V000007	0		TGA-01	LIQUID			N/A	%
96000036	AP-104	6 SAMPLE	S96V000008	0		TGA-01	LIQUID	N/A			%
96000036	AP-104	7 DUP	S96V000008	0		TGA-01	LIQUID			N/A	%
96000036	AP-104	8 SAMPLE	S96V000012	0		TGA-01	LIQUID	N/A			%
96000036	AP-104	9 DUP	S96V000012	0		TGA-01	LIQUID			N/A	%

Final page for worklist # 5345

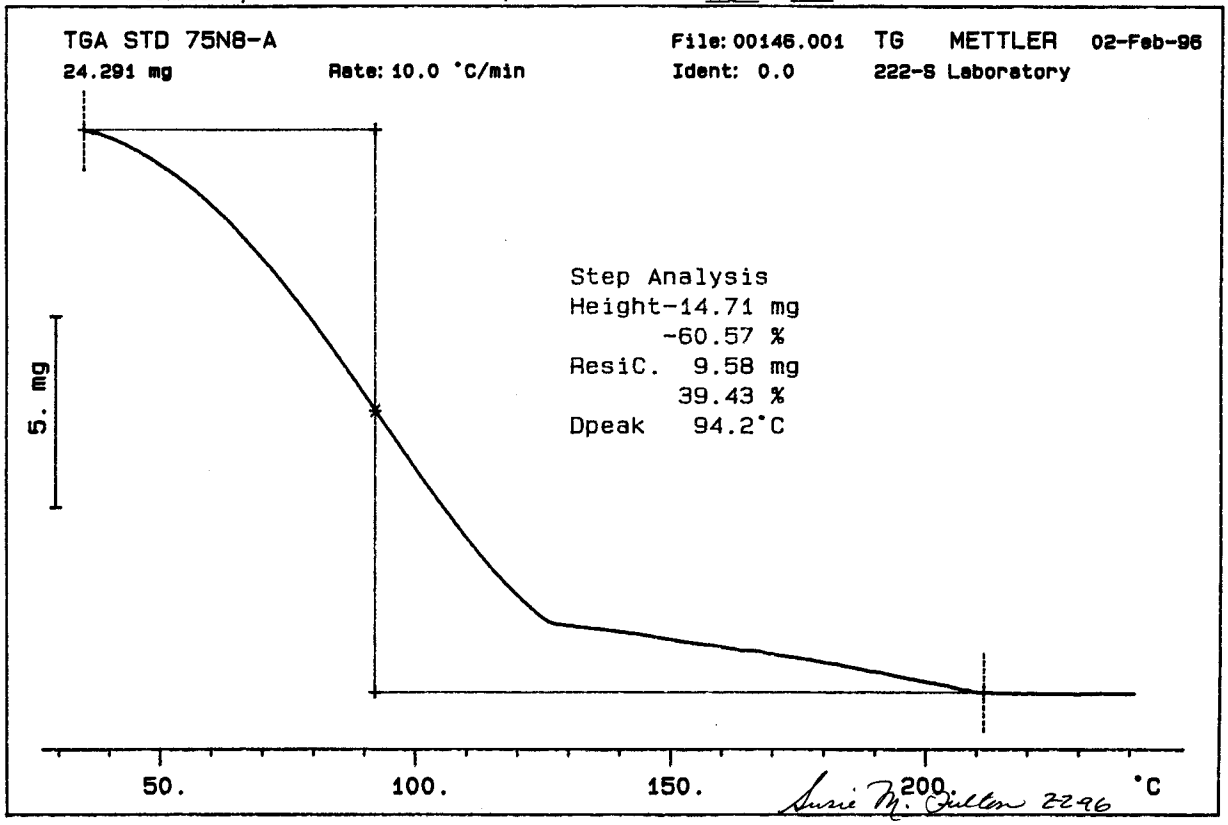
Susie M. Dalton 2-3-96
Analyst Signature **Date**

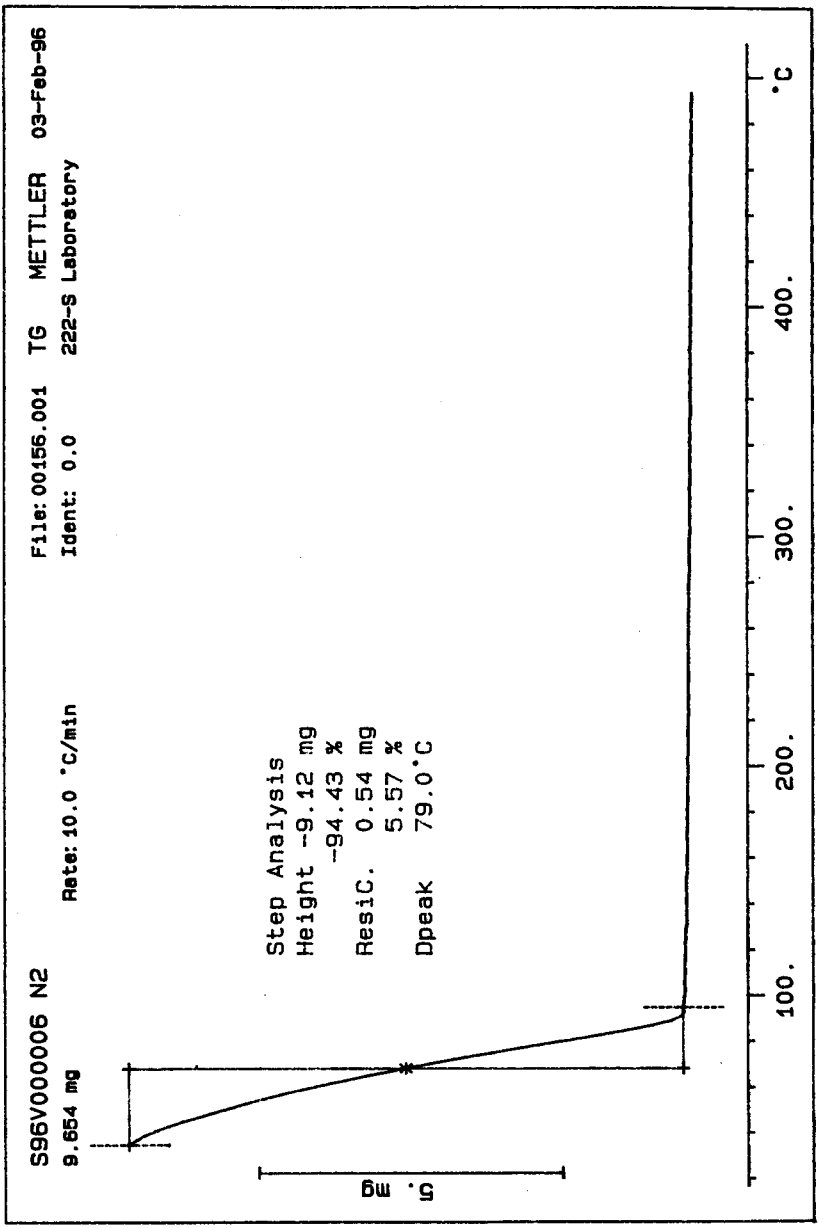
Analyst Signature **Date**

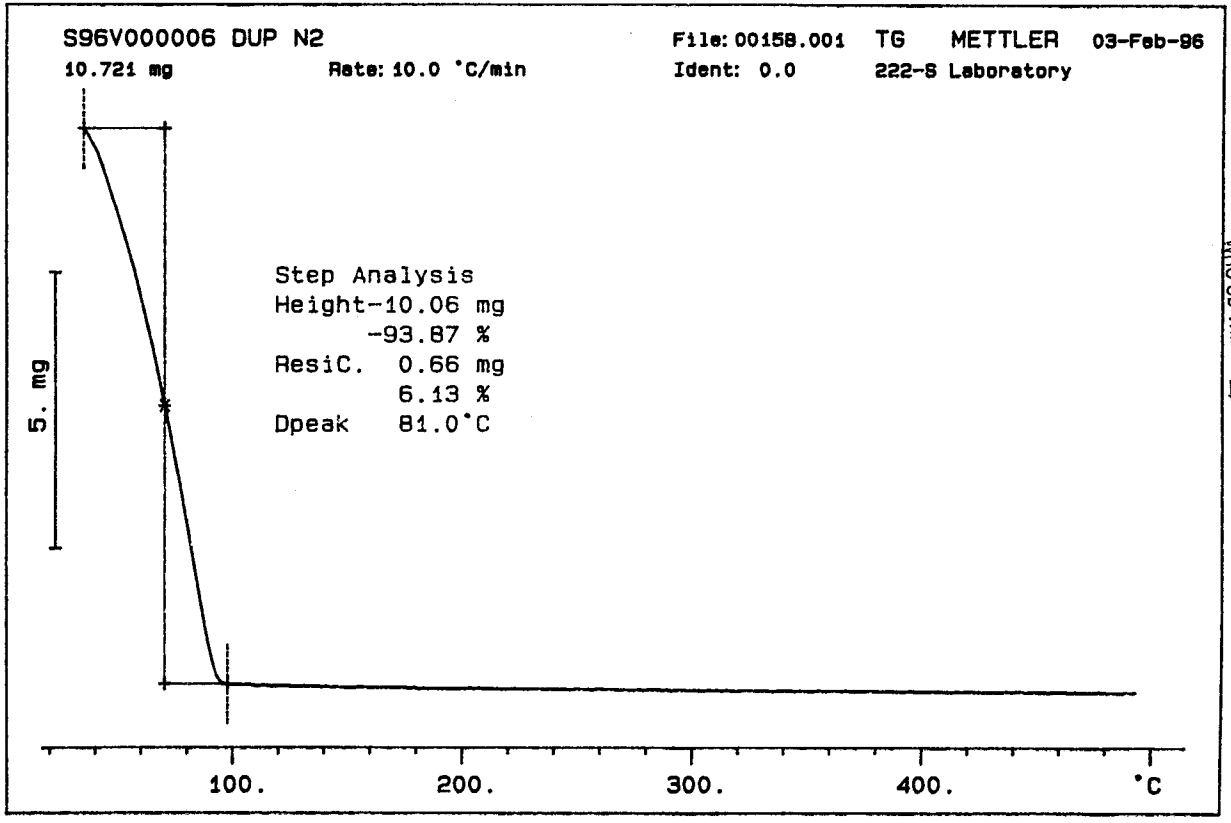
Data Entry Comments:

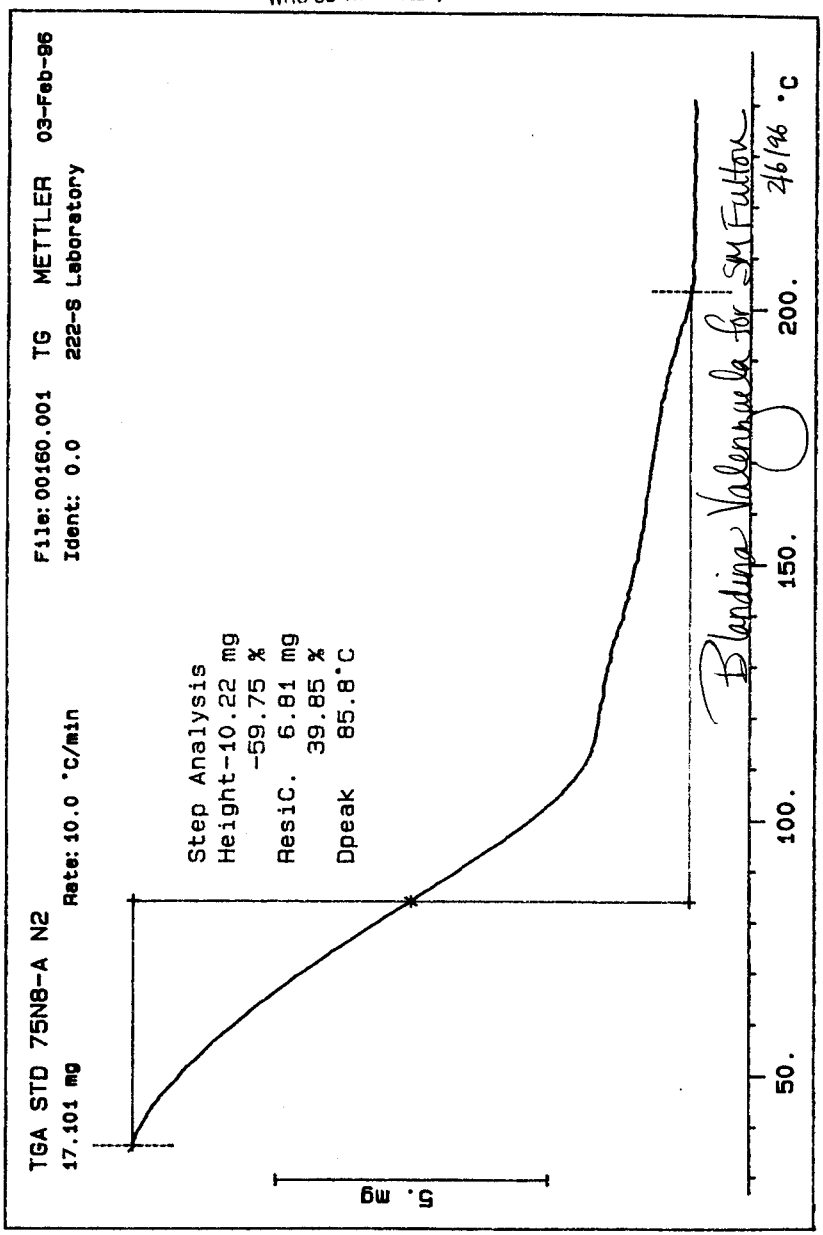
Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

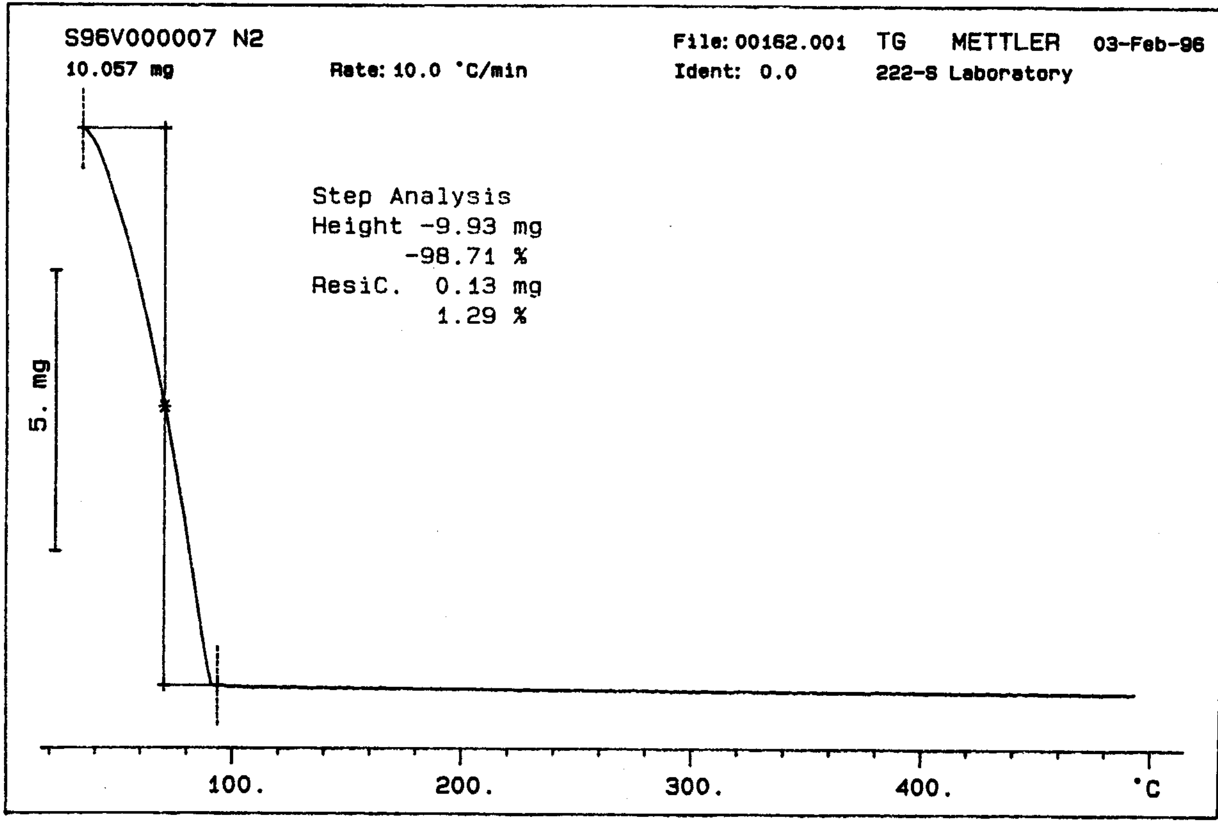
SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 118 TO 124.

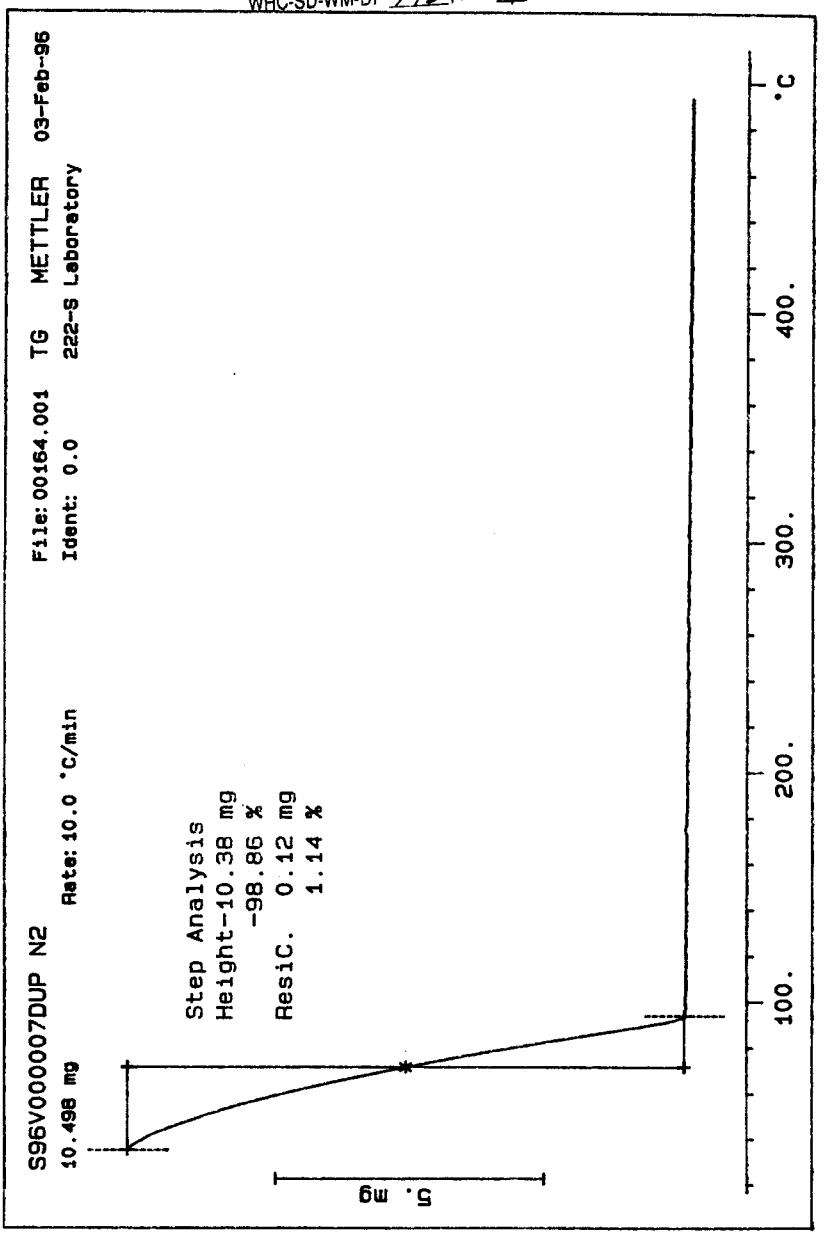


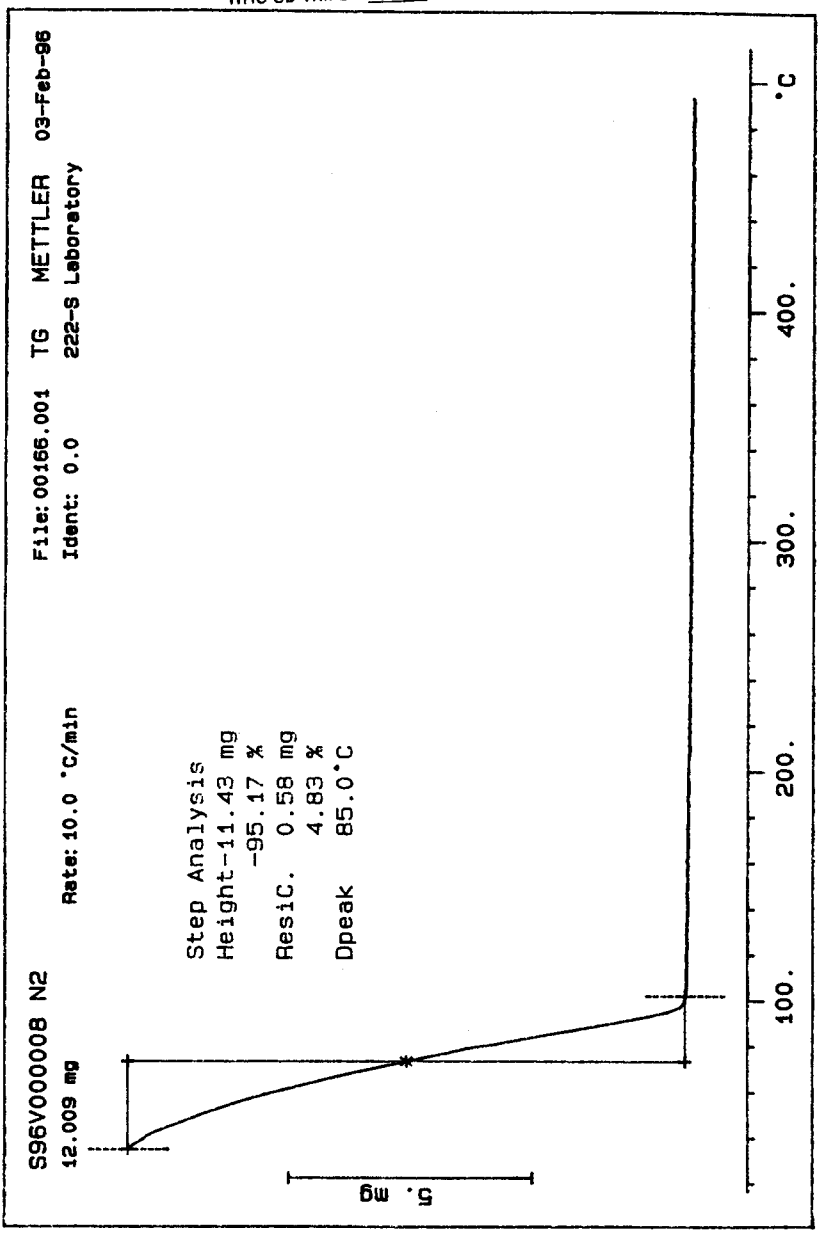

S96V000006 N2
9.654 mg
Rate: 10.0 °C/min
File: 00156.001 TG METTLER 03-Feb-96
Ident: 0.0 222-S Laboratory
Step Analysis
Height -9.12 mg
-94.43 %
ResiC. 0.54 mg
5.57 %
Dpeak 79.0°C
5. mg
100.
200.
300.
400.
°C

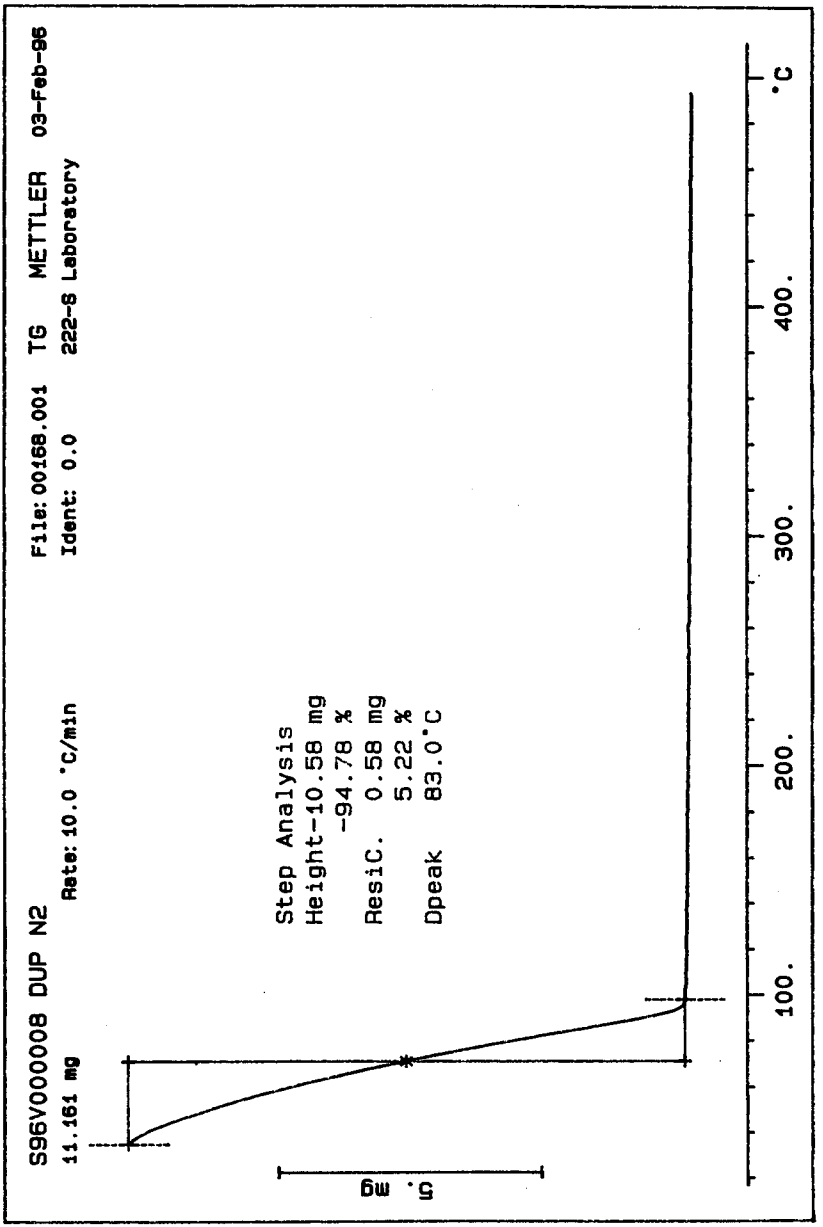

S96V000006 DUP N2
10.721 mg
Rate: 10.0 °C/min
File: 00158.001 TG METTLER 03-Feb-96
Ident: 0.0 222-S Laboratory
Step Analysis
Height-10.06 mg
-93.87 %
ResiC. 0.66 mg
6.13 %
Dpeak 81.0°C
5. mg
100.
200.
300.
400.
°C

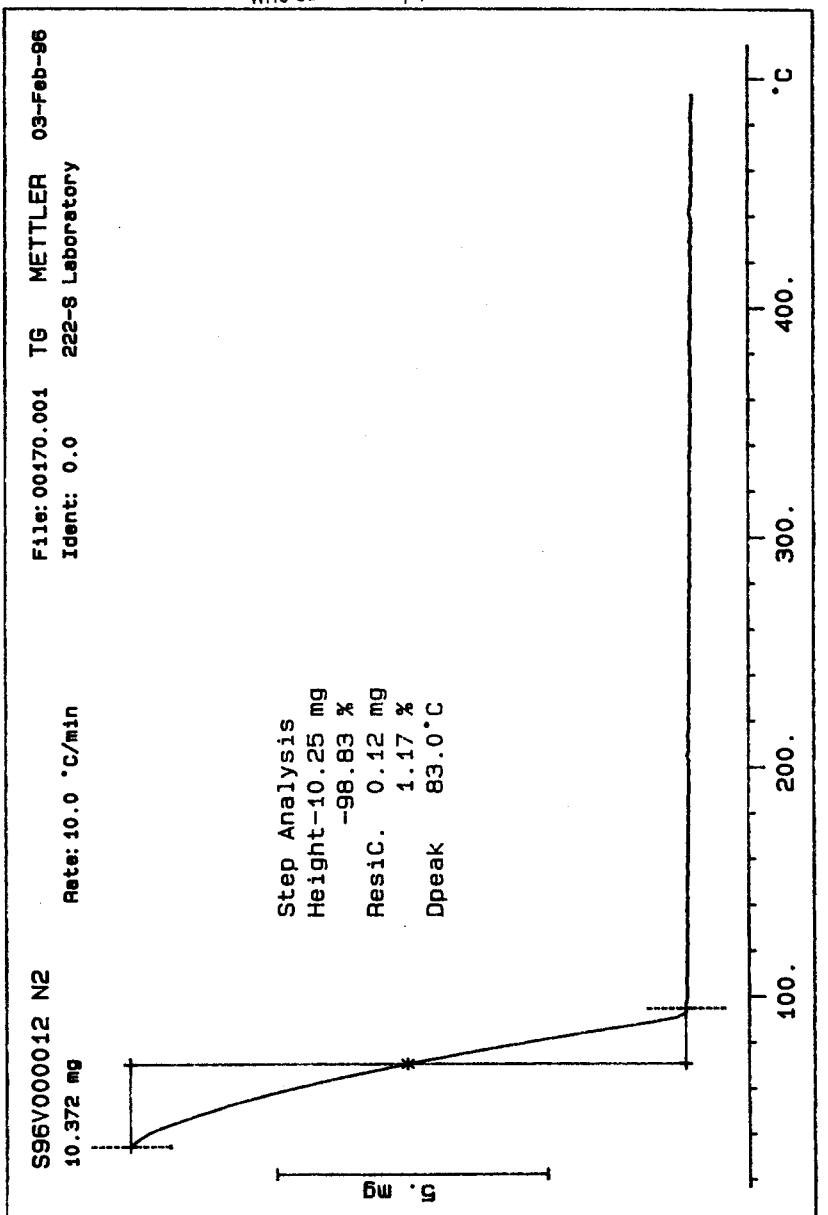

TGA STD 75N8-A N2
17.101 mg
Rate: 10.0 °C/min
File: 00160.001 TG METTLER 03-Feb-96
Ident: 0.0 222-S Laboratory
Step Analysis
Height -10.22 mg
-59.75 %
ResiC. 6.81 mg
39.85 %
Dpeak 85.8°C
5. mg
50.
100.
150.
200.
°C
Blandina Valenzuela for SM Fulton
2/6/96

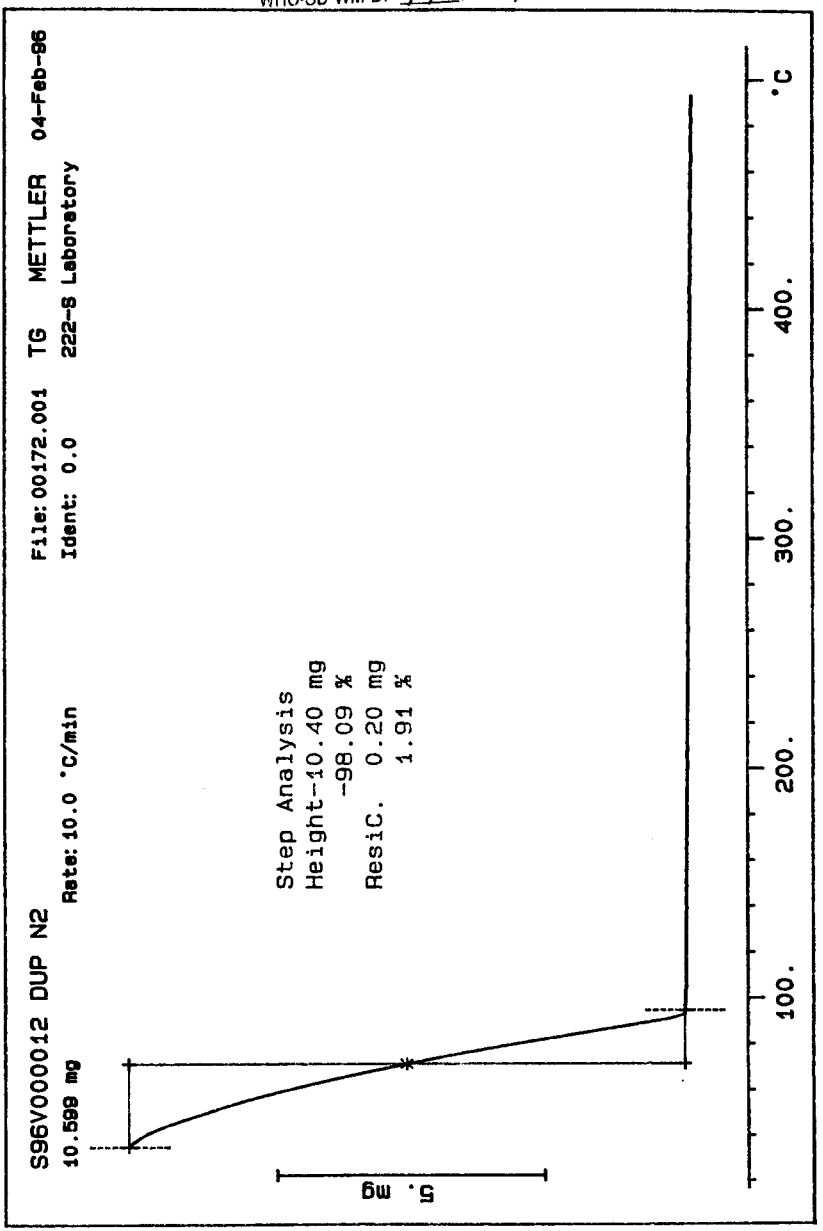

S96V000007 N2
10.057 mg
Rate: 10.0 °C/min
File: 00162.001
Ident: 0.0
TG
METTLER
222-S Laboratory
03-Feb-96
Step Analysis
Height -9.93 mg
-98.71 %
ResiC. 0.13 mg
1.29 %
5. mg
100.
200.
300.
400.
°C


S96V000007DUP N2
10.498 mg
Rate: 10.0 °C/min
File: 00164.001 TG METTLER 03-Feb-96
Ident: 0.0 222-S Laboratory
Step Analysis
Height-10.38 mg
-98.86 %
Resic. 0.12 mg
1.14 %
5. mg
100.
200.
300.
400.
°C


S96V000008 N2
12.009 mg
Rate: 10.0 °C/min
File: 00166.001 TG METTLER 03-Feb-96
Ident: 0.0 222-S Laboratory
Step Analysis
Height -11.43 mg
-95.17 %
ResiC. 0.58 mg
4.83 %
Dpeak 85.0°C
5. mg
100.
200.
300.
400.
°C


S96V00008 DUP N2
11.161 mg
Rate: 10.0 °C/min
File: 00168.001 TG METTLER 03-Feb-96
Ident: 0.0 222-S Laboratory
Step Analysis
Height -10.58 mg
-94.78 %
ResiC. 0.58 mg
5.22 %
Dpeak 83.0°C
5. mg
100.
200.
300.
400.
°C


S96V000012 N2
10.372 mg
Rate: 10.0 °C/min
File: 00170.001 TG METTLER 03-Feb-96
Ident: 0.0 222-S Laboratory
Step Analysis
Height -10.25 mg
-98.83 %
ResiC. 0.12 mg
1.17 %
Dpeak 83.0°C
5. mg
100.
200.
300.
400.
°C


S96V00012 DUP N2
10.598 mg
Rate: 10.0 °C/min
File: 00172.001 TG METTLER 04-Feb-96
Ident: 0.0 222-S Laboratory
Step Analysis
Height-10.40 mg
-98.09 %
ResiC. 0.20 mg
1.91 %
5. mg
100.
200.
300.
400.
°C

LABCORE Data Entry Template for Worklist# 5352

Analyst: ~~new~~ RWS 2/26/96 smf **Instrument:** BA001 **Book #** 133N16A

Method: LA-510-112 Rev/Mod C-3

Worklist Comment: AP-104 AND BY-106 SPG. RCJ

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1	STD				SPG-01	LIQUID	1.398	1.411	N/A	Sp.G.
										1.039	RWS 2/26/96	
96000036	AP-104	2	SAMPLE	S96V000006	0		SPG-01	LIQUID	N/A	~~1.035~~	0.01	Sp.G.
										1.039		
96000036	AP-104	3	DUP	S96V000006	0		SPG-01	RWS 2/26/96 LIQUID	~~1.035~~	1.031	N/A	Sp.G.
96000036	AP-104	4	SAMPLE	S96V000007	0		SPG-01	LIQUID	N/A	1.001	0.01	Sp.G.
96000036	AP-104	5	DUP	S96V000007	0		SPG-01	LIQUID	1.001	0.995	N/A	Sp.G.
96000036	AP-104	6	SAMPLE	S96V000008	0		SPG-01	LIQUID	N/A	1.021	0.01	Sp.G.
96000036	AP-104	7	DUP	S96V000008	0		SPG-01	LIQUID	1.021	1.035	N/A	Sp.G.
96000036	AP-104	8	SAMPLE	S96V000012	0		SPG-01	LIQUID	RWS 2/26/96 N/A	0.99~~55~~ 6	0.01	Sp.G.
96000036	AP-104	9	DUP	S96V000012	0		SPG-01	LIQUID	0.996	1.011	N/A	Sp.G.

Final page for worklist # 5352

See attached WL for analyst Signature
Analyst Signature **Date**
Rob Schweder 2/26/96

Robert W Schweder 2/26/96
Analyst Signature **Date**
Reviewed RWSchweder 2/26/96

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 Data Entry Template for Worklist# 5352

Analyst: SMF **Instrument:** BA001 **Book #** 13.3 N16-A

Method: LA-510-112 Rev/Mod

Worklist Comment: AP-104 AND BY-106 SPG. RCJ

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1	STD				SPG-01	LIQUID	1.3976	1.4[illegible]00 NW 2/22/96	N/A	Sp.G.
95000229	BY-106	2	SAMPLE	S96T000258	0	X	SPG-01	LIQUID	N/A	N/A		Sp.G.
95000229	BY-106	3	DUP	S96T000258	0		SPG-01	LIQUID	N/A	N/A	N/A	Sp.G.
96000036	AP-104	4	SAMPLE	S96V000006	0		SPG-01	LIQUID	N/A	1.04e00 NW 2/22/96		Sp.G.
96000036	AP-104	5	DUP	S96V000006	0		SPG-01	LIQUID	1.04e00 NW 2/22/96	1.03e00 NW 2/22/96	N/A	Sp.G.
96000036	AP-104	6	SAMPLE	S96V000007	0		SPG-01	LIQUID	N/A	1.00e00 NW 2/22/96		Sp.G.
96000036	AP-104	7	DUP	S96V000007	0		SPG-01	LIQUID	1.00e00 NW 2/22/96	9.90e-01 NW 2/22/96	N/A	Sp.G.
96000036	AP-104	8	SAMPLE	S96V000008	0		SPG-01	LIQUID	N/A	1.02e00 NW 2/22/96		Sp.G.
96000036	AP-104	9	DUP	S96V000008	0		SPG-01	LIQUID	1.02e00 NW 2/22/96	1.03e00 NW 2/22/96	N/A	Sp.G.
96000036	AP-104	10	SAMPLE	S96V000012	0		SPG-01	LIQUID	N/A	1.00e00 NW 2/22/96	9.96e-01	Sp.G.
96000036	AP-104	11	DUP	S96V000012	0		SPG-01	LIQUID	1.00e00 NW 2/22/96	1.01e00 NW 2/22/96	N/A	Sp.G.

Final page for worklist # 5352

Susie M. Fulton 2-21-96
Analyst Signature **Date**

Analyst Signature **Date**

Data Entry Comments: STD + Sampler .10002mL samp size.

X Unable to locate Sample # S96T000258

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.

SPECIFIC GRAVITY: LA-510-112 (C-3)

WORKLIST #	ANALYST SIGNATURE	ANALYSIS DATE	ANALYSIS TIME	INSTRUMENT CODE
5352	Amfulton	2-21-96	1700	

☐ SAMPLE ☒ STANDARD ☒ DUPLICATE

SAMPLE # = STD # = 133N16-A

		REPLICATE
TARE WEIGHT (g)	1.89326	1.86453
GROSS WEIGHT (g)	2.03946	2.00546
VOL. of SOLUTION (mL)	.10002	.10002

☒ SAMPLE ☒ DUPLICATE ☐ STANDARD

SAMPLE # = S96V000012 STD # =

		Dup REPLICATE
TARE WEIGHT (g)	1.83896	1.87058
GROSS WEIGHT (g)	1.93861	1.97168
VOL. of SOLUTION (mL)	.10002	.10002

☒ SAMPLE ☒ DUPLICATE ☐ STANDARD

130 SAMPLE # = S96V000006 STD # =

		Dup REPLICATE
TARE WEIGHT (g)	1.87779	1.82082
GROSS WEIGHT (g)	1.98166	1.92386
VOL. of SOLUTION (mL)	.10002	.10002

☐ SAMPLE ☐ DUPLICATE ☐ STANDARD

SAMPLE # = STD # =

	REPLICATE
TARE WEIGHT (g)	
GROSS WEIGHT (g)	
VOL. of SOLUTION (mL)	

☒ SAMPLE ☒ DUPLICATE ☐ STANDARD

SAMPLE # = S96V000007 STD # =

		Dup REPLICATE
TARE WEIGHT (g)	1.84358	1.83472
GROSS WEIGHT (g)	1.94367	1.93927
VOL. of SOLUTION (mL)	.10002	.10002

☐ SAMPLE ☐ DUPLICATE ☐ STANDARD

SAMPLE # = STD # =

	REPLICATE
TARE WEIGHT (g)	
GROSS WEIGHT (g)	
VOL. of SOLUTION (mL)	

☒ SAMPLE ☒ DUPLICATE ☐ STANDARD

SAMPLE # = S96V000008 STD # =

		Dup REPLICATE
TARE WEIGHT (g)	1.90876	1.82211
GROSS WEIGHT (g)	~~1.83211~~ 2.01087	1.92556
VOL. of SOLUTION (mL)	.10002	.10002

☐ SAMPLE ☐ DUPLICATE ☐ STANDARD

SAMPLE # = STD # =

	REPLICATE
TARE WEIGHT (g)	
GROSS WEIGHT (g)	
VOL. of SOLUTION (mL)	

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

SPECIFIC GRAVITY : LA-510-112 (C-3)

Type		STANDARD	STANDARD
STANDARD	Gross Weight (W2)	2.0345	2.0055
Work List	Tare Weight (W1)	1.8933	1.8645
5352	Weight of Solution (W2-W1)	0.1412	0.141
Test Code	Volume of Solution µL	100.0200	100.0200
BA001	Specific Gravity	1.4117	1.4097
Matrix	Specific Gravity (Average)	1.4107	
LIQUID			
Sample #			
133N16A			
Instrument Code	Gross Weight (W2) = Wt. of vial + cap + cotton + solution		
	Tare Weight (W1) = Wt. of vial + cap + cotton		
Analyst			
SM FULTON	Specific Gravity = [(W2-W1) * 1000 µL/mL] / [Vol. of Solution µL * 1.000 g/mL]		
Date			
02/21/96	v RESULT v		
Time	Specific Gravity Average =	1.411	

Data Entry by:	K C Wright	Date:	02/22/96
Approved by:	Rudy Edwards	Date:	2/26/96

Form 510112L1 Rev. 1.1

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

SPECIFIC GRAVITY : LA-510-112 (C-3)

Type		SAMPLE	~~REPLICATE~~ Duplicate
SAMPLE	Gross Weight (W2)	1.9817	1.9239
Work List	Tare Weight (W1)	1.8778	1.8208
5352	Weight of Solution (W2-W1)	0.1039	0.1031
Test Code	Volume of Solution µL	100.0200	100.0200
BA001	Specific Gravity	1.0388	1.0308
Matrix	Specific Gravity (Average)	1.0348	
LIQUID			
Sample #			
S96V000006			
Instrument Code	Gross Weight (W2) = Wt. of vial + cap + cotton + solution		
	Tare Weight (W1) = Wt. of vial + cap + cotton		
Analyst			
SM FULTON	Specific Gravity = [(W2-W1) * 1000 µL/mL] / [Vol. of Solution µL * 1.000 g/mL]		
Date			
02/21/96	v RESULT v		
Time	Specific Gravity Average =	1.035	

RWS 2/26/96

Data Entry by:	RE Wright	Date:	02/22/96
Approved by:	RW Schmoldt	Date:	2/26/96

Form 510112L1 Rev. 1.1

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-142 REV. 1

SPECIFIC GRAVITY : LA-510-112 (C-3)

Duplicate 2/26/96

Type		SAMPLE	~~REPLICATE~~
SAMPLE	Gross Weight (W2)	1.9437	1.9343
Work List	Tare Weight (W1)	1.8436	1.8348
5352	Weight of Solution (W2-W1)	0.10009	0.0995
Test Code	Volume of Solution µL	100.0200	100.0200
BA001	Specific Gravity	1.0007	0.9948
Matrix	Specific Gravity (Average)	0.9978	
LIQUID			
Sample #			
S96V000007			
Instrument Code	Gross Weight (W2) = Wt. of vial + cap + cotton + solution		
	Tare Weight (W1) = Wt. of vial + cap + cotton		
Analyst			
SM FULTON	Specific Gravity = [(W2-W1) * 1000 µL/mL] / [Vol. of Solution µL * 1.000 g/mL]		
Date			
02/21/96	v RESULT v		
Time	Specific Gravity Average =	0.998	

Data Entry by:	TE Wright	Date:	02/22/96
Approved by:	Ruy Schroeder	Date:	2/26/96

Form 510112L1 Rev. 1.1

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-142, REV. 1

SPECIFIC GRAVITY : LA-510-112 (C-3)

Duplicate PWS 2/26/96

Type		SAMPLE	REPLICATE
SAMPLE	Gross Weight (W2)	2.0109	1.9256
Work List	Tare Weight (W1)	1.9088	1.8221
5352	Weight of Solution (W2-W1)	0.1021	0.1035
Test Code	Volume of Solution µL	100.0200	100.0200
BA001	Specific Gravity	1.0208	1.0348
Matrix	Specific Gravity (Average)	1.0278	
LIQUID			
Sample #			
S96V000008			
Instrument Code	Gross Weight (W2) = Wt. of vial + cap + cotton + solution		
	Tare Weight (W1) = Wt. of vial + cap + cotton		
Analyst			
SM FULTON	Specific Gravity = [(W2-W1) * 1000 µL/mL] / [Vol. of Solution µL * 1.000 g/mL]		
Date			
02/21/96	v RESULT v		
Time	Specific Gravity Average =	1.028	

Data Entry by:	[signature]	Date:	02/22/96
Approved by:	[signature]	Date:	2/26/96

Form 510112L1 Rev. 1.1

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-~~142~~, REV. 1

SPECIFIC GRAVITY : LA-510-112 (C-3)

Duplicate 2/26/96

Type		SAMPLE	~~REPLICATE~~
SAMPLE	Gross Weight (W2)	1.9386	1.9717
Work List	Tare Weight (W1)	1.8390	1.8706
5352	Weight of Solution (W2-W1)	0.0996	0.1011
Test Code	Volume of Solution µL	100.0200	100.0200
BA001	Specific Gravity	0.9958	1.0108
Matrix	Specific Gravity (Average)	1.0033	
LIQUID			
Sample #			
S96V000012			
Instrument Code	Gross Weight (W2) = Wt. of vial + cap + cotton + solution		
	Tare Weight (W1) = Wt. of vial + cap + cotton		
Analyst			
SM FULTON	Specific Gravity = [(W2-W1) * 1000 µL/mL] / [Vol. of Solution µL * 1.000 g/mL]		
Date			
02/21/96	v RESULT v		
Time	Specific Gravity Average =	1.003	

Data Entry by: TEW Jay LT Date: 02/22/96

Approved by: Ray Schroeder Date: 2/26/96

Form 510112L1 Rev. 1.1

INORGANIC ANALYSES

THIS PAGE WAS INTENTIONALLY LEFT BLANK

LABCORE Data Entry Template for Worklist# 5357

Analyst: WGB **Instrument:** PH01 pH01<7 **Book #** 111 N16-6

Method: LA-212-106 Rev/Mod A-0

Worklist Comment: AP-104 PH-01 RCJ

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	-------TEST------	MATRIX	ACTUAL	FOUND	DL	UNIT
		1	STDPH				PH-01	LIQUID	6.00	6.02	N/A	pH
96000036	AP-104	2	SAMPLE	S96V000006	0		PH-01	LIQUID	N/A	12.74	0.01	pH
96000036	AP-104	3	SAMPLE	S96V000007	0		PH-01	LIQUID	N/A	12.23	0.01	pH
96000036	AP-104	4	SAMPLE	S96V000008	0		PH-01	LIQUID	N/A	12.88	0.01	pH

Final page for worklist # 5357

Raymond Burkhardt 2-2-96
Analyst Signature **Date**

R E Wright 2/2/96
Analyst Signature **Date**

Reviewed RW Schroeder 2/2/96

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 Data Entry Template for Worklist# 6850

Analyst: ADP **Instrument:** PH01 77 **Book #** 144N16D

Method: LA-212-106 Rev/Mod A-Ø1

Worklist Comment: AP-104 pH rerun#1 LAD 4-8-96

GROUP	PROJECT	S TYPE	SAMPLE#	R A	-------TEST------	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 STDPH			PH-01	LIQUID	8.00	8.054	N/A	pH
96000036	AP-104	2 SAMPLE	S96V000006	0	PH-01	LIQUID	N/A	12.938	0.01	pH
96000036	AP-104	3 DUP	S96V000006	0	PH-01	LIQUID	12.938	12.946	N/A	pH

Final page for worklist # 6850

Analyst Signature [signature] Date 3-27-96

Analyst Signature [signature] Date 3/27/96

Reviewed G. [signature] 3/27/96

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 Data Entry Template for Worklist# 5356

Analyst: RAW **Instrument:** PH01 WC06685 **Book #** 57N8

Method: LA-211-102 Rev/Mod C-0

Worklist Comment: AP-104 OH- RCJ

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1	STD				OH-01	LIQUID	1.6640	1.59^{+4}	N/A	ug/mL
		2	BLNK				OH-01	LIQUID	1	<42	N/A	ug/mL
96000036	AP-104	3	SAMPLE	S96V000006	0		OH-01	LIQUID	N/A	2.64^{+3}	6.25^{+2}	ug/mL
96000036	AP-104	4	DUP	S96V000006	0		OH-01	LIQUID	2.64^{+3}	2.64^{+3}	N/A	ug/mL
96000036	AP-104	5	SAMPLE	S96V000007	0		OH-01	LIQUID	N/A	4.64^{+2}	1.25^{+2}	ug/mL
96000036	AP-104	6	DUP	S96V000007	0		OH-01	LIQUID	4.64^{+2}	4.60^{+2}	N/A	ug/mL
96000036	AP-104	7	SAMPLE	S96V000008	0		OH-01	LIQUID	N/A	3.72^{+3}	6.25^{+2}	ug/mL
96000036	AP-104	8	DUP	S96V000008	0		OH-01	LIQUID	3.72^{+3}	3.65^{+3}	N/A	ug/mL
96000036	AP-104	9	SAMPLE	S96V000014	0		OH-01	LIQUID	N/A	<42	4.17^{+1}	ug/mL
96000036	AP-104	10	DUP	S96V000014	0		OH-01	LIQUID	<42	<42	N/A	ug/mL

Final page for worklist # 5356

R Jones FOR 2-12-96
Analyst Signature **Date**
R. WOODWARD

R S Jones 2-16-96
Analyst Signature **Date**
Approved by H Anastos 2-23-96

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.

This document was too large to scan as a whole document, therefore it required breaking into smaller sections.

Document number: SD-WM-DP-142

Section 2 **of** 10

Title: Final Characterization and Safety Screen Report of Double Shell Tank 241-AP-104 for 242-A Evaporator, Campaign 96-1

Date: 4/19/96 **Revision:** 1

Originator: (Miller), George L
Co:

Recipient:
Co:

References: ECN-629035

WHC-SD-WM-DP-142, REV. 1

LABCORE Data Entry Template for Worklist# 5356

Analyst: RAW **Instrument:** PH01 WC06695 **Book #** 57N8

Method: LA-211-102 Rev/Mod _____

Worklist Comment: AP-104 OH- RCJ

GROUP	PROJECT	S TYPE	SAMPLE#	R	A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 STD				OH-01	LIQUID			N/A	ug/mL
96000036	AP-104	2 SAMPLE	S96V000006	0		OH-01	LIQUID	N/A			ug/mL
96000036	AP-104	3 DUP	S96V000006	0		OH-01	LIQUID			N/A	ug/mL
96000036	AP-104	4 SAMPLE	S96V000007	0		OH-01	LIQUID	N/A			ug/mL
96000036	AP-104	5 DUP	S96V000007	0		OH-01	LIQUID			N/A	ug/mL
96000036	AP-104	6 SAMPLE	S96V000008	0		OH-01	LIQUID	N/A			ug/mL
96000036	AP-104	7 DUP	S96V000008	0		OH-01	LIQUID			N/A	ug/mL
96000036	AP-104	8 SAMPLE	S96V000014	0		OH-01	LIQUID	N/A			ug/mL
96000036	AP-104	9 DUP	S96V000014	0		OH-01	LIQUID			N/A	ug/mL

Final page for worklist # 5356

R. WENDLAND 2-12-96
Analyst Signature **Date**

Analyst Signature **Date**

Data Entry Comments: 6+8 = 200mL
7 = 1mL
14 = PH TOO LOW

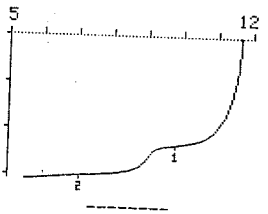
Units shown for QC (SPK & STD) may not reflect the actual units. DL = Detection Limit, S = Worklist Slot Number, R = Replicate Number, A = Aliquot Code.

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-142 REV. 1

```
date 96-02-12 time 09:44
GET pH          12  #   44
Id.#1           01
Id.#2        .2005
pH(init)    11.65
            V/ml          pH
EP1          .233        9.78
EP2          .301        7.06
manual stop
        ========
```

```
date 96-02-12 time 09:44
GET pH          12  #   44
.10ml/div       dpH=1/div
start V     .000 ml
```



OH (AUTO) : LA-211-102 (C-0)

Type	Sample Size (mL) SS	Standard
Standard	Concentration of HNO3 (Molarity)	0.2005
Work List	HNO3 Titrant at OH end-point in mL	0.233
5356	Dilution Factor DF	1
Test Code	Concentration of OH in Sample (Molarity)	9.34E-01
OH-01	OH in Sample in µg/mL (PPM)	1.59E+04
Matrix		
Liquid		
Sample #		
57N8		
Instrument Code		
WC06695		
Analyst	OH Molarity =((mL HNO3)*(M HNO3))/Sample Size in mL*Dilution Factor	
RA Wendland		
Date	OH in µg/mL = (OH MOLARITY)*(17.0g/mole)*((1000000µg/g)/(1000mL/L))	
02/12/96		
Time		

	Standard
Concentration of OH in Sample (Molarity)	9.34E-01
OH in Sample in µg/mL (PPM)	1.59E+04

Data Entry by:	RWS	Date:	02/16/96
Approved by:	H Winston	Date:	2-23-96

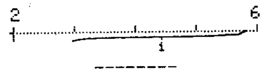
Form 211102_1 Rev. 1.3

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-142, REV. 1

```
date 96-02-12 time 09:45
GET pH         12  #   45
Id.#1          00
Id.#2       .2005
pH(init)     5.77
            V/ml         pH
EP1         .011       4.44
manual stop
         ========
```

```
date 96-02-12 time 09:45
GET pH         12  #   45
.10ml/div      ΔpH=1/div
start V    .000 ml
```



OH (AUTO) : LA-211-102 (C-0)

Type		Blank
Blank	Sample Size (mL) SS	3.000
Work List	Concentration of HNO3 (Molarity)	0.2005
5356	HNO3 Titrant at OH end-point in mL	0.000
Test Code	Dilution Factor DF	1
OH-01	Concentration of OH in Sample (Molarity)	0.00E+00
Matrix	OH in Sample in µg/mL (PPM)	0.00E+00
Liquid		
Sample #	Detection Limit = 125µg / SS * DF	
BLNK		
Instrument Code	Detection Limit (µg/mL)	4.17E+01
WC06695		
Analyst	OH Molarity =((mL HNO3)*(M HNO3))/Sample Size in mL*Dilution Factor	
RA Wendland		
Date	OH in µg/mL = (OH MOLARITY)*(17.0g/mole)*((1000000µg/g)/(1000mL/L))	
02/12/96		
Time		Blank
	Concentration of OH in Sample (Molarity)	0.00E+00
	OH in Sample in µg/mL (PPM)	<42

The Result is < Detection Limit

Data Entry by:	RWS	Date:	02/16/96
Approved by:	H Anastos	Date:	2-23-96

Form 211102_1 Rev. 1.3 Page 1 of 1

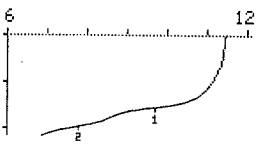
PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-~~142~~ REV. 1

Zoo

```
date 96-02-12 time 10:06
GET pH          12  #   48
Id.#1            6
Id.#2        .2005
pH(init)    11.42
             V/ml          pH
EP1          .155        9.69
EP2          .196        7.80
stop volt.reached
        ========
```

```
date 96-02-12 time 10:06
GET pH          12  #   48
.10ml/div       dpH=1/div
start V     .000 ml
```



OH (AUTO) : LA-211-102 (C-0)

		Sample
Type	Sample Size (mL) SS	0.200
Sample	Concentration of HNO3 (Molarity)	0.2005
Work List	HNO3 Titrant at OH end-point in mL	0.155
5356	Dilution Factor DF	1
Test Code	Concentration of OH in Sample (Molarity)	1.55E-01
OH-01	OH in Sample in µg/mL (PPM)	2.64E+03
Matrix		
Liquid		
Sample #	Detection Limit = 125µg / SS * DF	
S96V000006		
Instrument Code	Detection Limit (µg/mL)	6.25E+02
WC06695		
Analyst	OH Molarity =((mL HNO3)*(M HNO3))/Sample Size in mL*Dilution Factor	
RA Wendland		
Date	OH in µg/mL = (OH MOLARITY)*(17.0g/mole)*((1000000µg/g)/(1000mL/L))	
02/12/96		
Time		Sample
	Concentration of OH in Sample (Molarity)	1.55E-01
	OH in Sample in µg/mL (PPM)	2.64E+03

Data Entry by:	RWS	Date:	02/16/96
Approved by:	H Anesto	Date:	2-23-96

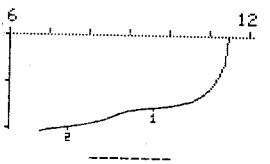
Form 211102_1 Rev. 1.3

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-142, REV. 1

```
date 96-02-12 time 10:10
GET pH          12  #   49
Id.#1            6
Id.#2        .2005
pH(init)    11.46
             V/ml          pH
EP1          .155        9.59
EP2          .197        7.48
stop volt.reached
         ========
```

```
date 96-02-12 time 10:11
GET pH          12  #   49
.10ml/div       dpH=1/div
start V    .000 ml
```



OH (AUTO) : LA-211-102 (C-0)

Type	Sample Size (mL) SS	Duplicate
Duplicate	Concentration of HNO3 (Molarity)	0.2005
Work List	HNO3 Titrant at OH end-point in mL	0.155
5356	Dilution Factor DF	1
Test Code	Concentration of OH in Sample (Molarity)	1.55E-01
OH-01	OH in Sample in µg/mL (PPM)	2.64E+03
Matrix		
Liquid		
Sample #	Detection Limit = 125µg / SS * DF	
S96V000006		
Instrument Code	Detection Limit (µg/mL)	6.25E+02
WC06695		
Analyst	OH Molarity =((mL HNO3)*(M HNO3))/Sample Size in mL*Dilution Factor	
RA Wendland		
Date	OH in µg/mL = (OH MOLARITY)*(17.0g/mole)*((1000000µg/g)/(1000mL/L))	
02/12/96		
Time		

	Duplicate
Concentration of OH in Sample (Molarity)	1.55E-01
OH in Sample in µg/mL (PPM)	2.64E+03

Data Entry by:	RWS	Date:	02/16/96
Approved by:	HAnastn	Date:	2-23-96

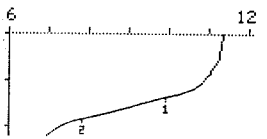
Form 211102_1 Rev. 1.3

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-142, REV. 1

```
date 96-02-12 time 10:22
GET pH        12  #   51
Id.#1          7
Id.#2       .2005
pH(init)   11.33
            V/ml        pH
EP1         .136      9.91
EP2         .184      7.82
stop volt.reached
========
```

```
date 96-02-12 time 10:22
GET pH        12  #   51
.10ml/div     dpH=1/div
start V    .000 ml
```



OH (AUTO) : LA-211-102 (C-0)

Type	Sample Size (mL) SS	Sample
Sample	Concentration of HNO3 (Molarity)	0.2005
Work List	HNO3 Titrant at OH end-point in mL	0.136
5356	Dilution Factor DF	1
Test Code	Concentration of OH in Sample (Molarity)	2.73E-02
OH-01	OH in Sample in µg/mL (PPM)	4.64E+02
Matrix		
Liquid		
Sample #	Detection Limit = 125µg / SS * DF	
S96V000007		
Instrument Code	Detection Limit (µg/mL)	1.25E+02
WC06695		
Analyst	OH Molarity =((mL HNO3)*(M HNO3))/Sample Size in mL*Dilution Factor	
RA Wendland		
Date	OH in µg/mL = (OH MOLARITY)*(17.0g/mole)*((1000000µg/g)/(1000mL/L))	
02/12/96		
Time		Sample
	Concentration of OH in Sample (Molarity)	2.73E-02
	OH in Sample in µg/mL (PPM)	4.64E+02

Data Entry by:	RWS	Date:	02/16/96
Approved by:	H Anaston	Date:	2-23-96

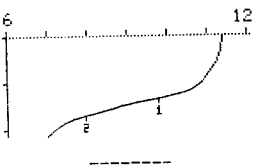
Form 211102_1 Rev. 1.3

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP- 142 REV. 1

```
date 96-02-12 time 10:26
GET pH          12  #   52
Id.#1             7
Id.#2         .2005
pH(init)     11.38
            V/ml          pH
EP1          .135        9.77
EP2          .171        7.95
stop volt.reached
        ========
```

```
date 96-02-12 time 10:27
GET pH          12  #   52
.10ml/div       ΔpH=1/div
start V    .000 ml
```



OH (AUTO) : LA-211-102 (C-0)

		Duplicate
Type	Sample Size (mL) SS	1.000
Duplicate	Concentration of HNO3 (Molarity)	0.2005
Work List	HNO3 Titrant at OH end-point in mL	0.135
5356	Dilution Factor DF	1
Test Code	Concentration of OH in Sample (Molarity)	2.71E-02
OH-01	OH in Sample in µg/mL (PPM)	4.60E+02
Matrix		
Liquid		
Sample #	Detection Limit = 125µg / SS * DF	
S96V000007		
Instrument Code	Detection Limit (µg/mL)	1.25E+02
WC06695		
Analyst	OH Molarity =((mL HNO3)*(M HNO3))/Sample Size in mL*Dilution Factor	
RA Wendland		
Date	OH in µg/mL = (OH MOLARITY)*(17.0g/mole)*((1000000µg/g)/(1000mL/L))	
02/12/96		
Time		Duplicate
	Concentration of OH in Sample (Molarity)	2.71E-02
	OH in Sample in µg/mL (PPM)	4.60E+02

Data Entry by:	RWS	Date:	02/16/96
Approved by:	H Anderson	Date:	2-23-96

Form 211102_1 Rev. 1.3

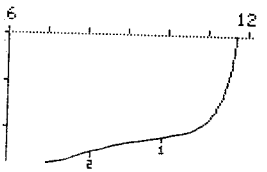
PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-142 REV. 1

200

```
date 96-02-12 time 10:37
GET pH          12  #   53
Id.#1            8
Id.#2         .2005
pH(init)     11.68
             V/ml          pH
EP1          .218         9.87
EP2          .252         8.07
stop volt.reached
========
```

```
date 96-02-12 time 10:38
GET pH          12  #   53
.10ml/div       dpH=1/div
start V    .000 ml
```



OH (AUTO) : LA-211-102 (C-0)

Type	Sample Size (mL) SS	Sample
Sample	Concentration of HNO3 (Molarity)	0.2005
Work List	HNO3 Titrant at OH end-point in mL	0.218
5356	Dilution Factor DF	1
Test Code	Concentration of OH in Sample (Molarity)	2.19E-01
OH-01	OH in Sample in µg/mL (PPM)	3.72E+03
Matrix		
Liquid		
Sample #	Detection Limit = 125µg / SS * DF	
S96V000008		
Instrument Code	Detection Limit (µg/mL)	6.25E+02
WC06695		
Analyst	OH Molarity =((mL HNO3)*(M HNO3))/Sample Size in mL*Dilution Factor	
RA Wendland		
Date	OH in µg/mL = (OH MOLARITY)*(17.0g/mole)*((1000000µg/g)/(1000mL/L))	
02/12/96		
Time		

	Sample
Concentration of OH in Sample (Molarity)	2.19E-01
OH in Sample in µg/mL (PPM)	3.72E+03

Data Entry by:	RWS	Date:	02/16/96
Approved by:	A Linnston	Date:	2-23-96

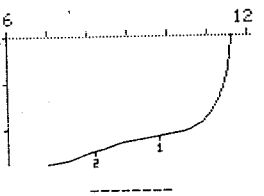
Form 211102_1 Rev. 1.3

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-142-REV-1

```
date 96-02-12 time 10:43
GET pH          12  #   54
Id.#1            8
Id.#2       .2005
pH(init)   11.58
           V/ml          pH
EP1         .214        9.78
EP2         .248        8.16
stop volt.reached
========
```

```
date 96-02-12 time 10:43
GET pH          12  #   54
.10ml/div       dpH=1/div
start V    .000 ml
```



OH (AUTO) : LA-211-102 (C-0)

Type	Sample Size (mL) SS	Duplicate
Duplicate	Concentration of HNO3 (Molarity)	0.2005
Work List	HNO3 Titrant at OH end-point in mL	0.214
5356	Dilution Factor DF	1
Test Code	Concentration of OH in Sample (Molarity)	2.15E-01
OH-01	OH in Sample in µg/mL (PPM)	3.65E+03
Matrix		
Liquid		
Sample #	Detection Limit = 125µg / SS * DF	
S96V000008		
Instrument Code	Detection Limit (µg/mL)	6.25E+02
WC06695		
Analyst	OH Molarity =((mL HNO3)*(M HNO3))/Sample Size in mL*Dilution Factor	
RA Wendland		
Date	OH in µg/mL = (OH MOLARITY)*(17.0g/mole)*((1000000µg/g)/(1000mL/L))	
02/12/96		
Time		Duplicate
	Concentration of OH in Sample (Molarity)	2.15E-01
	OH in Sample in µg/mL (PPM)	3.65E+03

Data Entry by:	RWS	Date:	02/16/96
Approved by:	H Anderson	Date:	2-23-96

Form 211102_1 Rev. 1.3

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-~~142~~ REV. 1

Id.#1 14

pH 9.54 W/BACK

pH 8.28 W/BACK

OH (AUTO) : LA-211-102 (C-0)

Type	Sample Size (mL) SS	Sample
Sample	Concentration of HNO3 (Molarity)	0.2005
Work List	HNO3 Titrant at OH end-point in mL	0.000
5356	Dilution Factor DF	1
Test Code	Concentration of OH in Sample (Molarity)	0.00E+00
OH-01	OH in Sample in µg/mL (PPM)	0.00E+00
Matrix		
Liquid		
Sample #	Detection Limit = 125µg / SS * DF	
S96V000014		
Instrument Code	Detection Limit (µg/mL)	4.17E+01
WC06695		
Analyst	OH Molarity =((mL HNO3)*(M HNO3))/Sample Size in mL*Dilution Factor	
RA Wendland		
Date	OH in µg/mL = (OH MOLARITY)*(17.0g/mole)*((1000000µg/g)/(1000mL/L))	
02/12/96		
Time		Sample
	Concentration of OH in Sample (Molarity)	0.00E+00
	OH in Sample in µg/mL (PPM)	<42

The Result is < Detection Limit

Data Entry by:	RWS	Date:	02/16/96
Approved by:	H Anesto	Date:	2-23-96

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP- 142 REV. 1

OH (AUTO) : LA-211-102 (C-0)

Type	Sample Size (mL) SS	Duplicate
Duplicate	Concentration of HNO3 (Molarity)	0.2005
Work List	HNO3 Titrant at OH end-point in mL	0.000
5356	Dilution Factor DF	1
Test Code	Concentration of OH in Sample (Molarity)	0.00E+00
OH-01	OH in Sample in µg/mL (PPM)	0.00E+00
Matrix		
Liquid		
Sample #	Detection Limit = 125µg / SS * DF	
S96V000014		
Instrument Code	Detection Limit (µg/mL)	4.17E+01
WC06695		
Analyst	OH Molarity =((mL HNO3)*(M HNO3))/Sample Size in mL*Dilution Factor	
RA Wendland		
Date	OH in µg/mL = (OH MOLARITY)*(17.0g/mole)*((1000000µg/g)/(1000mL/L))	
02/12/96		
Time		Duplicate
	Concentration of OH in Sample (Molarity)	0.00E+00
	OH in Sample in µg/mL (PPM)	<42

The Result is < Detection Limit

Data Entry by:	RWS	Date:	02/16/96
Approved by:	[signature]	Date:	2-23-96

Form 211102_1 Rev. 1.3

FILE # 09603078.TXT

02/15/96 11:56
A-0004-1

LABCORE Data Entry Template for Worklist# 5711

Analyst: B. Greene **Instrument:** ~~ICP01~~ ICP02 3-7-96 **Book#** 37849-1

Method: LA-505-~~151~~ 161 Rev/Mod EC 3-7-96 B-0

Worklist Comment: ICP AP-104 (ACID DIGEST) WHC-SD-WM-DP-142, REV. 1

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	ICV				@ICP-QC	QC		
2	ICB				@ICP-QC	QC		
3	ICSA				@ICP-QC	QC		
4	ICSAB				@ICP-QC	QC		
5	PREPSTDTJA				@ICP-B01	LIQUID		
6	PREPBLKTJA				@ICP-B01	LIQUID		
7	SAMPLE	S96V000009	0	B	@ICP-B01	LIQUID	96000036	AP-104
	Analytes Requested: AL-B-01 , CR-B-01 , FE-B-01 , MN-B-01 , NA-B-01 , NI-B-01 , SI-B-01 , U-B-01							
8	DUP	S96V000009	0	B	@ICP-B01	LIQUID		
9	SPK-PREDIG	S96V000009	0	B	@ICP-B01	LIQUID		
10	CCV				@ICP-QC	QC		
11	CCB				@ICP-QC	QC		
12	SAMPLE	S96V000010	0	B	@ICP-B01	LIQUID	96000036	AP-104
	Analytes Requested: AL-B-01 , CR-B-01 , FE-B-01 , MN-B-01 , NA-B-01 , NI-B-01 , SI-B-01 , U-B-01							
13	DUP	S96V000010	0	B	@ICP-B01	LIQUID		
14	SAMPLE	S96V000011	0	B	@ICP-B01	LIQUID	96000036	AP-104
	Analytes Requested: AL-B-01 , CR-B-01 , FE-B-01 , MN-B-01 , NA-B-01 , NI-B-01 , SI-B-01 , U-B-01							
15	DUP	S96V000011	0	B	@ICP-B01	LIQUID		
16	~~ccv~~ SP 3/11/96				@ICP-QC	QC		

Data Entry Comments:

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

LABCORE Data Entry Template for Worklist# 5711

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
~~17~~	~~CCB~~	3/11/96			@ICP-QC	QC	WHC-SD-WM-DP-142, REV. 1	
18	SAMPLE	S96V000013	0	B	@ICP-B01	LIQUID	96000036	AP-104
	Analytes Requested:	AL-B-01 , CR-B-01 , FE-B-01 , MN-B-01 , NA-B-01 , NI-B-01 , SI-B-01 , U-B-01						
19	DUP	S96V000013	0	B	@ICP-B01	LIQUID		
20	SAMPLE	S96V000015	0	B	@ICP-B01	LIQUID	96000036	AP-104
	Analytes Requested:	AL-B-01 , CR-B-01 , FE-B-01 , MN-B-01 , NA-B-01 , NI-B-01 , SI-B-01 , U-B-01						
21	DUP	S96V000015	0	B	@ICP-B01	LIQUID		
22	ICSA				@ICP-QC	QC		
23	ICSAB				@ICP-QC	QC		
24	CCV				@ICP-QC	QC		
25	CCB				@ICP-QC	QC		

Final page for worklist # 5711

Reviewed by:

Analyst Signature	Date		Analyst Signature	Date
	3-7-96			3/11/96
PREP STD TTA	1		S96V000013	1
PREP BLK TTA	1		S96V000013-D	1
S96V000009	5 (2nL-FnL)		S96V000015	1
S96V000009_D	5		S96V000015-D	1
S96V000009_S	5	spike		
S96V000009_A	5 (2nL-2-1-6nL)			
S96V000010	1			
S96V000010_D	1			
S96V000011	3.33			
S96V000011_D	3.33			

Data Entry Comments:

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

Analysis Report Summary Thu 03-07-96 02:40:12 PM page 1

#	Sample Name	File	Method	Date	Time	OpID	Type	Mode
1	ICV	960307B	ICP2	03/07/96	13:18	BJG	Q	CONC
2	ICB	960307B	ICP2	03/07/96	13:21	BJG	Q	CONC
3	ICSA	960307B	ICP2	03/07/96	13:25	BJG	Q	CONC
4	ICSAB	960307B	ICP2	03/07/96	13:28	BJG	Q	CONC
5	PREPSTDTJA	960307B	ICP2	03/07/96	13:31	BJG	S	CONC
6	PREPBLKTJA	960307B	ICP2	03/07/96	13:35	BJG	S	CONC
7	S96V000009	960307B	ICP2	03/07/96	13:39	BJG	S	CONC
8	S96V000009_D	960307B	ICP2	03/07/96	13:42	BJG	S	CONC
9	S96V000009_S	960307B	ICP2	03/07/96	13:46	BJG	S	CONC
10	S96V000009_A Post Spike	960307B	ICP2	03/07/96	13:50	BJG	S	CONC
11	CCV	960307B	ICP2	03/07/96	13:54	BJG	Q	CONC
12	CCB	960307B	ICP2	03/07/96	13:57	BJG	Q	CONC
13	S96V000010	960307B	ICP2	03/07/96	14:00	BJG	S	CONC
14	S96V000010_D	960307B	ICP2	03/07/96	14:03	BJG	S	CONC
15	S96V000011	960307B	ICP2	03/07/96	14:06	BJG	S	CONC
16	S96V000011_D	960307B	ICP2	03/07/96	14:10	BJG	S	CONC
17	S96V000013	960307B	ICP2	03/07/96	14:14	BJG	S	CONC
18	S96V000013_D	960307B	ICP2	03/07/96	14:17	BJG	S	CONC
19	S96V000015	960307B	ICP2	03/07/96	14:21	BJG	S	CONC
20	S96V000015_D	960307B	ICP2	03/07/96	14:24	BJG	S	CONC
21	ICSA	960307B	ICP2	03/07/96	14:27	BJG	Q	CONC
22	ICSAB	960307B	ICP2	03/07/96	14:30	BJG	Q	CONC
23	CCV	960307B	ICP2	03/07/96	14:33	BJG	Q	CONC
24	CCB	960307B	ICP2	03/07/96	14:36	BJG	Q	CONC

[signature]
3-7-96
RP-104 ACID DIGEST
S96V000008-11,13,15

SIGNATURE ABOVE REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 153 TO 157.

#	Sample Name	Ag	Al	As	B	Ba	Be
1	ICV	4.976	4.859	5.128	5.023	4.958	5.088
2	ICB	.0009	.0019	-.0067	.0079	-.0000	.0001
3	ICSA	.0009	233.9	-.0787	.0060	.0023	.0001
4	ICSAB	.9639	233.3	-.0830	.0080	.4744	.4688
5	PREPSTDTJA	.5965	5.190	5.077	6.083	4.860	5.176
6	PREPBLKTJA	-.0119	-.0520	-.0132	.2250	-.0008	-.0007
7	S96V000009	.1208	54.77	-.1871	.1570	.0008	.0003
8	S96V000009_D	.1209	54.93	-.1463	.1988	.0006	.0007
9	S96V000009_S	.6106	59.40	4.979	5.676	4.809	5.002
10	S96V000009_A	4.766	59.39	4.927	4.980	4.798	4.942
11	CCV	4.966	4.798	5.057	4.915	4.929	5.028
12	CCB	.0017	-.0005	-.0024	.0096	-.0001	.0001
13	S96V000010	.0421	4.107	-.0040	.5755	.0008	.0000
14	S96V000010_D	.0408	4.163	.0125	.5688	.0019	.0002
15	S96V000011	.1037	16.41	.0143	.8746	.0002	.0011
16	S96V000011_D	.1046	16.53	-.0068	.9832	.0005	.0009
17	S96V000013	.0392	3.323	.0031	.5877	.0006	.0001
18	S96V000013_D	.0397	3.286	.0028	.2431	.0005	.0002
19	S96V000015	.0015	.0465	-.0188	.3127	.0002	.0000
20	S96V000015_D	-.0001	.0239	-.0024	.1739	.0001	.0001
21	ICSA	.0015	236.8	-.0537	.0080	.0023	.0004
22	ICSAB	.9719	236.1	-.0395	.0020	.4795	.4858
23	CCV	5.037	4.917	5.233	5.130	5.066	5.246
24	CCB	.0018	.0033	-.0224	.0021	.0001	.0000

#	Sample Name	Bi	Ca	Cd	Ce	Co	Cr
1	ICV	5.041	4.982	5.001	5.065	5.044	5.049
2	ICB	.0028	-.0003	-.0000	-.0033	-.0013	.0008
3	ICSA	.0315	242.8	-.0019	.0141	.0005	.0013
4	ICSAB	.0111	244.5	.9422	.0182	.4653	.4765
5	PREPSTDTJA	4.950	5.091	4.955	4.993	5.018	5.003
6	PREPBLKTJA	.0124	.0447	-.0059	-.0534	.0019	.0029
7	S96V000009	.1602	.2295	.0218	.0193	-.0119	8.508
8	S96V000009_D	.1720	.2229	.0262	.0340	-.0042	8.539
9	S96V000009_S	5.048	5.294	4.992	5.025	5.030	13.41
10	S96V000009_A	5.203	5.265	4.960	4.965	4.962	13.47
11	CCV	5.068	5.078	4.996	5.023	5.047	5.059
12	CCB	.0251	.0023	-.0007	.0016	-.0023	.0000
13	S96V000010	.0183	.2228	.0107	.0095	.0012	1.692
14	S96V000010_D	.0364	.1000	.0113	.0033	.0009	1.731
15	S96V000011	.1711	.2431	.0062	-.0052	.0024	1.931
16	S96V000011_D	.0929	.1053	.0074	-.0002	-.0042	1.932
17	S96V000013	.0370	.1406	.0096	.0027	.0000	1.606
18	S96V000013_D	.0591	.2711	.0100	.0067	.0013	1.628
19	S96V000015	.0206	.1408	-.0015	.0048	.0001	.0024
20	S96V000015_D	-.0005	.1281	-.0009	-.0007	.0001	.0018
21	ICSA	.0348	250.3	-.0012	.0182	-.0001	.0014
22	ICSAB	.0135	249.2	.9656	.0159	.4755	.4841
23	CCV	5.132	5.153	5.121	5.174	5.141	5.156
24	CCB	.0427	.0003	-.0010	.0041	-.0005	-.0002

#	Sample Name	Cu	Eu	Fe	K	La	Li
1	ICV	5.152	-.0009	5.015	4.911	4.968	4.994
2	ICB	.0000	.0001	.0003	.0393	-.0007	.0007
3	ICSA	-.0115	-.0206	94.08	.1254	-.0044	.0038
4	ICSAB	.4737	-.0221	94.09	.0995	-.0043	.9594
5	PREPSTDTJA	4.950	.0000	4.932	5.022	4.907	4.854
6	PREPBLKTJA	.0079	.0014	-.0049	-1.210	-.0131	.0018
7	S96V000009	.0208	.0050	-.0716	339.7	.0020	.0099
8	S96V000009_D	.0153	.0065	-.0878	340.3	.0024	.0094
9	S96V000009_S	4.908	.0034	4.836	341.5	4.917	4.823
10	S96V000009_A	5.012	.0034	4.880	343.7	4.875	4.821
11	CCV	5.070	.0001	5.005	4.896	4.934	4.879
12	CCB	.0004	.0014	.0000	.2077	.0000	.0013
13	S96V000010	.0253	-.0008	.0147	59.39	.0016	.0833
14	S96V000010_D	.0283	-.0010	.0261	60.81	.0024	.0851
15	S96V000011	.0241	.0021	.0405	177.7	-.0004	.0066
16	S96V000011_D	.0306	.0024	-.0403	179.3	-.0002	.0069
17	S96V000013	.0315	-.0011	.0030	55.01	.0007	.0856
18	S96V000013_D	.0291	-.0012	.0085	55.60	.0009	.0872
19	S96V000015	.0099	.0000	.0103	.1526	.0005	.0002
20	S96V000015_D	.0074	.0000	-.0016	.0321	-.0011	-.0001
21	ICSA	-.0110	-.0294	96.26	.0905	-.0051	.0039
22	ICSAB	.4847	-.0257	95.96	.2601	-.0050	.9716
23	CCV	5.256	-.0005	5.114	4.852	5.085	5.066
24	CCB	.0000	.0007	.0040	.0443	.0006	.0010

#	Sample Name	Mg	Mn	Mo	Na	Nd	Ni
1	ICV	4.856	4.931	5.069	4.934	5.017	5.007
2	ICB	.0002	.0005	.0014	.0004	-.0004	.0084
3	ICSA	239.6	-.0067	-.0120	192.6	.0051	-.0008
4	ICSAB	239.8	.4447	-.0151	193.3	.0036	.9261
5	PREPSTDTJA	4.822	4.875	4.998	6.040	4.772	5.013
6	PREPBLKTJA	.0131	.0009	.0004	.2929	.0116	-.0055
7	S96V000009	-.0184	.0032	.1726	1639.	.0059	.0593
8	S96V000009_D	-.0543	.0026	.1834	1640.	-.0114	.0488
9	S96V000009_S	4.768	4.768	5.191	1633.	4.769	5.010
10	S96V000009_A	4.672	4.732	5.183	1636.	4.873	4.960
11	CCV	4.788	4.900	5.055	4.824	4.960	4.979
12	CCB	-.0022	.0008	.0002	.0107	.0002	.0119
13	S96V000010	-.0017	.0015	.0272	449.1	.0001	.0338
14	S96V000010_D	-.0088	.0052	.0264	457.6	-.0006	.0313
15	S96V000011	.0102	.0048	.0577	1394.	.0046	.0549
16	S96V000011_D	-.0389	.0015	.0659	1405.	.0038	.0306
17	S96V000013	-.0077	.0009	.0222	426.6	.0003	.0342
18	S96V000013_D	-.0075	.0011	.0213	430.0	-.0008	.0320
19	S96V000015	.0027	.0007	-.0015	.4013	.0028	.0102
20	S96V000015_D	-.0020	.0003	.0008	.3229	.0001	.0097
21	ICSA	242.9	-.0069	-.0117	194.1	.0040	-.0007
22	ICSAB	243.0	.4507	-.0138	195.0	.0060	.9272
23	CCV	4.896	5.004	5.172	4.979	5.112	5.105
24	CCB	-.0008	.0005	.0000	.0045	-.0000	.0062

#	Sample Name	P	Pb	S	Sb	Se	Si
1	ICV	5.078	4.983	4.960	4.848	4.898	4.851
2	ICB	.0043	.0084	-.0045	-.0113	.0017	.0121
3	ICSA	.0211	.0278	-.0422	-.0133	-.0473	-.0003
4	ICSAB	.0038	.9942	-.0396	.0049	-.0301	.0024
5	PREPSTDTJA	4.975	4.921	4.935	4.741	4.922	14.02
6	PREPBLKTJA	.0014	.0183	.0070	-.0196	.0212	.0250
7	S96V000009	32.12	-.0324	19.19	-.0233	.0692	1.177
8	S96V000009_D	32.01	.0192	19.19	.0022	.1029	1.412
9	S96V000009_S	37.01	5.018	24.04	4.773	5.000	11.27
10	S96V000009_A	37.54	5.033	24.23	4.771	4.790	6.033
11	CCV	5.032	4.993	4.935	4.794	4.826	4.834
12	CCB	-.0088	-.0107	.0018	-.0035	-.0016	.0153
13	S96V000010	17.56	-.0005	10.35	-.0025	-.0068	1.980
14	S96V000010_D	18.06	-.0006	10.62	.0003	.0075	2.037
15	S96V000011	10.88	.0434	8.101	-.0034	.0069	9.012
16	S96V000011_D	10.96	.0057	8.246	-.0207	-.0016	8.182
17	S96V000013	16.49	-.0076	10.23	.0039	-.0008	1.823
18	S96V000013_D	16.85	.0039	10.39	-.0020	.0046	.8058
19	S96V000015	-.0109	.0004	.0137	-.0131	-.0027	.0907
20	S96V000015_D	.0045	-.0025	.0230	-.0077	.0026	.0436
21	ICSA	.0287	.0220	-.0458	-.0017	-.0453	-.0014
22	ICSAB	.0129	1.028	-.0312	-.0077	-.0547	.0018
23	CCV	5.256	5.073	5.082	4.934	5.058	4.923
24	CCB	-.0091	-.0056	.0006	-.0072	-.0011	.0092

#	Sample Name	Sm	Sr	Th	Ti	Tl	U
1	ICV	4.845	4.887	.0369	4.872	4.827	9.534
2	ICB	.0009	.0002	-.0011	.0002	-.0017	.0071
3	ICSA	.0127	-.0023	.0172	.0009	-.0363	.1338
4	ICSAB	.0129	-.0024	.0182	.0009	-.0245	.1423
5	PREPSTDTJA	4.770	4.831	.0384	4.774	4.762	9.356
6	PREPBLKTJA	.0222	.0006	-.0519	.0007	-.0372	.1246
7	S96V000009	.0661	.0017	-.0004	-.0016	-.0553	.9943
8	S96V000009_D	.0894	.0014	-.0014	-.0027	-.0326	1.014
9	S96V000009_S	4.811	4.807	.0573	4.765	4.560	10.21
10	S96V000009_A	4.759	4.768	.0315	4.783	4.646	10.18
11	CCV	4.812	4.855	.0419	4.847	4.770	9.441
12	CCB	.0219	.0003	-.0009	-.0002	-.0251	.0838
13	S96V000010	.0031	.0006	.0143	.0014	-.0180	3.158
14	S96V000010_D	.0019	.0007	.0110	.0002	.0012	3.281
15	S96V000011	.0241	.0009	.0002	.0017	-.0949	1.135
16	S96V000011_D	.0523	.0009	-.0013	-.0013	-.0536	1.203
17	S96V000013	.0003	.0005	.0073	.0001	-.0217	3.426
18	S96V000013_D	-.0046	.0006	.0062	-.0004	-.0127	3.461
19	S96V000015	-.0010	.0002	.0005	.0000	-.0198	.0036
20	S96V000015_D	.0012	.0002	-.0031	-.0000	-.0120	.0071
21	ICSA	.0071	-.0024	.0216	.0007	-.0346	.0761
22	ICSAB	.0074	-.0025	.0244	.0008	-.0226	.0672
23	CCV	4.978	5.005	.0383	4.995	4.889	9.718
24	CCB	.0097	.0003	-.0033	-.0000	-.0279	.0284

#	Sample Name	V	Y	Zn	Zr
1	ICV	5.024	.0065	5.048	4.928
2	ICB	.0002	.0001	-.0001	.0004
3	ICSA	.0001	.0079	-.0010	-.0027
4	ICSAB	.4640	.0079	.9703	-.0026
5	PREPSTDTJA	4.874	.0060	4.949	4.850
6	PREPBLKTJA	.0037	.0008	.0046	.0058
7	S96V000009	.0179	.0027	.1629	.0104
8	S96V000009_D	.0196	.0031	.1659	.0138
9	S96V000009_S	4.892	.0082	5.181	4.833
10	S96V000009_A	4.954	.0090	5.178	4.842
11	CCV	5.011	.0071	5.038	4.910
12	CCB	.0031	.0008	-.0008	.0026
13	S96V000010	.0029	-.0001	.0355	.0013
14	S96V000010_D	.0027	-.0001	.0342	.0024
15	S96V000011	.0077	.0011	.1502	.0119
16	S96V000011_D	.0099	.0018	.1545	.0153
17	S96V000013	.0028	-.0002	.0316	.0012
18	S96V000013_D	.0024	-.0005	.0352	-.0011
19	S96V000015	.0002	-.0001	.0062	.0006
20	S96V000015_D	.0007	-.0001	.0049	.0006
21	ICSA	.0002	.0077	-.0004	-.0035
22	ICSAB	.4721	.0076	.9819	-.0038
23	CCV	5.129	.0065	5.116	5.045
24	CCB	.0017	.0004	-.0007	.0015

LABCORE Data Entry Template for Worklist# 6768

Analyst: D.K. Sato **Instrument:** ICP01 **Book#** 51B4RA

Method: LA-505-151/161 Rev/Mod D-3
3/25/96

Worklist Comment: ICP AP-104 (LIQUID ACID DIGEST)

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	ICV				@ICP-QC	QC		
2	ICB				@ICP-QC	QC		
3	ICSA				@ICP-QC	QC		
4	ICSAB				@ICP-QC	QC		
5	PREPSTDARL				@ICP-B01	LIQUID		
6	PREPBLKARL				@ICP-B01	LIQUID		
7	SAMPLE	S96V000026	0	B	@ICP-B01	LIQUID	96000036	AP-104
	Analytes Requested: AL-B-01 , CR-B-01 , FE-B-01 , MN-B-01 , NA-B-01 , NI-B-01 , SI-B-01 , U-B-01							
8	DUP	S96V000026	0	B	@ICP-B01	LIQUID		
9	SPK-PREDIG	S96V000026	0	B	@ICP-B01	LIQUID		
10	ICSA				@ICP-QC	QC		
11	ICSAB				@ICP-QC	QC		
12	CCV				@ICP-QC	QC		
13	CCB				@ICP-QC	QC		

Final page for worklist # 6768

Analyst Signature 03-18-96 Date

Reviewed by:
Analyst Signature 3/25/96 Date

Data Entry Comments:

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

WHC-SD-WM-DP-142 REV. 1 6768

LABCORE Data Entry Template for Worklist# 6452

S Type	Sample#	R	A	Test	Matrix	Group#	Project
Analyst Signature			Date			Analyst Signature	Date

596V000026_L	1-7-1-4	DF	40
596V000026	1-7		8
596V000026_D	1-7		8
596V000026_S	1-7		8
596V000026_SD	1-7		8

Data Entry Comments:

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

Identity 1: ICB Identity 2: Quality Control 9:56 AM March 18, 1996
Task name : OPTIMA
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-~~142~~ REV. 1

	Zr (ppm)	Sr (ppm)	Bi (ppm)	Si (ppm)	Al (ppm)	Co (ppm)	Cu (ppm)	Li (ppm)
Mean	0.004	0.001	-0.013	0.009	-0.010	0.002	0.003	0.001
S.D.	0.001	0.000	0.006	0.001	0.002	0.003	0.000	0.000
% R.S.D.	20.456	31.579	45.368	16.797	16.453	151.003	15.295	26.033

	Zn (ppm)	Ni (ppm)	La (ppm)	Fe (ppm)	Ca (ppm)	Cr (ppm)	Nd (ppm)	U (ppm)
Mean	0.002	-0.001	0.004	-0.003	0.002	-0.001	0.008	0.104
S.D.	0.000	0.002	0.001	0.002	0.000	0.001	0.005	0.009
% R.S.D.	21.449	259.561	21.322	83.618	19.907	99.626	65.201	8.602

	Ce (ppm)	Sm (ppm)	Ba (ppm)	P (ppm)	S (ppm)	Mg (ppm)	As (ppm)	Na (ppm)
Mean	-0.027	0.003	0.001	-0.022	-0.001	0.001	-0.006	-0.005
S.D.	0.003	0.003	0.000	0.002	0.001	0.000	0.005	0.003
% R.S.D.	11.226	102.263	44.018	7.715	158.402	25.000	82.717	76.375

	Mo (ppm)	Se (ppm)	Ag (ppm)	Pb (ppm)	Ti (ppm)	Cd (ppm)	B (ppm)	K (ppm)
Mean	-0.000	0.036	0.001	-0.010	0.003	0.002	0.005	-0.073
S.D.	0.000	0.007	0.000	0.007	0.001	0.000	0.000	0.008
% R.S.D.	50.917	19.243	56.755	69.031	19.096	18.269	5.753	10.959

	Mn (ppm)	Sb (ppm)	V (ppm)	Be (ppm)	Tl (ppm)
Mean	0.001	-0.055	-0.001	0.002	-0.054
S.D.	0.000	0.016	0.001	0.001	0.005
% R.S.D.	30.818	30.238	115.080	31.197	8.654

Identity 1: ICSA Identity 2: Quality Control 9:59 AM March 18, 1996
Task name : OPTIMA
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-142 REV. 1

	Zr (ppm)	Sr (ppm)	Bi (ppm)	Si (ppm)	Al (ppm)	Co (ppm)	Cu (ppm)	Li (ppm)
Mean	0.013	0.004	-0.033	0.028	195.902	-0.003	0.003	0.001
S.D.	0.003	0.003	0.010	0.003	1.877	0.003	0.003	0.003
% R.S.D.	20.348	78.598	30.470	10.665	0.958	108.678	102.820	442.181

	Zn (ppm)	Ni (ppm)	La (ppm)	Fe (ppm)	Ca (ppm)	Cr (ppm)	Nd (ppm)	U (ppm)
Mean	-0.002	0.009	0.008	98.667	101.201	0.003	0.017	0.190
S.D.	0.003	0.002	0.002	1.052	1.103	0.002	0.002	0.045
% R.S.D.	211.510	22.636	26.018	1.067	1.090	47.736	11.302	23.795

	Ce (ppm)	Sm (ppm)	Ba (ppm)	P (ppm)	S (ppm)	Mg (ppm)	As (ppm)	Na (ppm)
Mean	-0.026	0.035	0.004	0.022	-0.003	97.447	0.024	191.705
S.D.	0.014	0.010	0.003	0.005	0.006	1.054	0.006	1.506
% R.S.D.	52.311	28.634	66.340	23.506	179.644	1.082	25.692	0.786

	Mo (ppm)	Se (ppm)	Ag (ppm)	Pb (ppm)	Ti (ppm)	Cd (ppm)	B (ppm)	K (ppm)
Mean	-0.004	0.034	0.002	0.000	0.004	0.005	0.015	-0.138
S.D.	0.002	0.015	0.003	0.007	0.003	0.002	0.002	0.020
% R.S.D.	48.801	44.324	193.203	1382.806	81.586	44.742	15.983	14.608

	Mn (ppm)	Sb (ppm)	V (ppm)	Be (ppm)	Tl (ppm)
Mean	0.007	0.003	-0.001	0.005	-0.074
S.D.	0.004	0.015	0.004	0.003	0.021
% R.S.D.	54.715	451.663	378.768	57.019	28.130

Identity 1: ICSAB Identity 2: Quality Control 10:02 AM March 18, 1996
Task name : OPTIMA
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-142 REV. 1

	Zr (ppm)	Sr (ppm)	Bi (ppm)	Si (ppm)	Al (ppm)	Co (ppm)	Cu (ppm)	Li (ppm)
Mean	0.011	0.002	-0.051	0.019	196.219	0.496	0.505	0.923
S.D.	0.001	0.000	0.010	0.001	0.592	0.004	0.000	0.002
% R.S.D.	7.833	6.063	20.424	6.022	0.302	0.709	0.074	0.206

	Zn (ppm)	Ni (ppm)	La (ppm)	Fe (ppm)	Ca (ppm)	Cr (ppm)	Nd (ppm)	U (ppm)
Mean	0.989	0.980	0.002	98.879	101.341	0.505	0.040	0.286
S.D.	0.001	0.002	0.002	0.114	0.152	0.001	0.006	0.017
% R.S.D.	0.088	0.167	65.013	0.115	0.150	0.107	15.160	6.023

	Ce (ppm)	Sm (ppm)	Ba (ppm)	P (ppm)	S (ppm)	Mg (ppm)	As (ppm)	Na (ppm)
Mean	0.013	0.051	0.514	-0.000	-0.010	98.222	0.026	188.496
S.D.	0.007	0.008	0.001	0.006	0.002	0.097	0.006	0.314
% R.S.D.	51.605	16.066	0.116	2650.377	24.514	0.098	23.319	0.167

	Mo (ppm)	Se (ppm)	Ag (ppm)	Pb (ppm)	Ti (ppm)	Cd (ppm)	B (ppm)	K (ppm)
Mean	-0.003	0.029	1.014	0.990	0.002	1.007	0.015	-0.078
S.D.	0.001	0.014	0.001	0.005	0.000	0.003	0.000	0.006
% R.S.D.	49.273	46.395	0.074	0.554	11.115	0.281	2.450	8.077

	Mn (ppm)	Sb (ppm)	V (ppm)	Be (ppm)	Tl (ppm)
Mean	0.508	-0.028	0.499	0.508	0.006
S.D.	0.001	0.022	0.001	0.001	0.013
% R.S.D.	0.127	78.915	0.170	0.136	209.597

Identity 1: PREPSTDARL Identity 2: direct 10:08 AM March 18, 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	5.053	4.987	4.892	4.903	4.926	5.133	4.798	4.946
S.D.	0.016	0.020	0.036	0.020	0.010	0.026	0.017	0.019
% R.S.D.	0.322	0.407	0.743	0.407	0.201	0.507	0.359	0.385

	Zn (ppm)	Ni (ppm)	La (ppm)	Fe (ppm)	Ca (ppm)	Cr (ppm)	Nd (ppm)	U (ppm)
Mean	4.863	5.044	5.002	4.954	4.977	4.989	4.934	9.668
S.D.	0.015	0.007	0.009	0.013	0.016	0.016	0.019	0.031
% R.S.D.	0.310	0.135	0.172	0.256	0.327	0.318	0.395	0.316

	Ce (ppm)	Sm (ppm)	Ba (ppm)	P (ppm)	S (ppm)	Mg (ppm)	As (ppm)	Na (ppm)
Mean	5.239	5.024	5.005	5.242	5.249	4.856	5.076	5.015
S.D.	0.034	0.017	0.021	0.168	0.077	0.015	0.011	0.022
% R.S.D.	0.644	0.344	0.412	3.201	1.463	0.307	0.223	0.439

	Mo (ppm)	Se (ppm)	Ag (ppm)	Pb (ppm)	Ti (ppm)	Cd (ppm)	B (ppm)	K (ppm)
Mean	5.024	4.849	0.964	4.816	4.595	4.938	4.964	5.635
S.D.	0.013	0.023	0.002	0.031	0.018	0.012	0.014	0.057
% R.S.D.	0.249	0.464	0.214	0.637	0.392	0.244	0.272	1.003

	Mn (ppm)	Sb (ppm)	V (ppm)	Be (ppm)	Tl (ppm)
Mean	4.970	4.882	4.959	5.348	4.687
S.D.	0.015	0.040	0.015	0.018	0.023
% R.S.D.	0.293	0.820	0.294	0.336	0.487

Identity 1: PREPBLK Identity 2: Quality Control 10:14 AM March 18, 1996
Task name : OPTIMA
Sample Weight : 1.0000 Solution Volume : 1.00 WHC-SD-WM-DP-142 REV.1
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	0.002	0.000	0.023	0.027	0.010	-0.002	0.003	-0.001
S.D.	0.001	0.000	0.011	0.002	0.005	0.002	0.000	0.000
% R.S.D.	29.285	0.000	47.986	7.932	49.334	85.954	3.995	7.317

	Zn (ppm)	Ni (ppm)	La (ppm)	Fe (ppm)	Ca (ppm)	Cr (ppm)	Nd (ppm)	U (ppm)
Mean	0.012	0.004	0.002	0.037	0.229	0.008	-0.016	0.136
S.D.	0.001	0.001	0.002	0.004	0.000	0.005	0.009	0.016
% R.S.D.	4.831	29.562	67.544	10.990	0.205	66.902	57.822	11.554

	Ce (ppm)	Sm (ppm)	Ba (ppm)	P (ppm)	S (ppm)	Mg (ppm)	As (ppm)	Na (ppm)
Mean	-0.020	0.020	0.000	-0.023	0.132	0.018	0.004	0.160
S.D.	0.008	0.004	0.000	0.006	0.004	0.000	0.002	0.003
% R.S.D.	39.738	21.105	1249.000	25.396	2.805	1.478	46.179	2.183

	Mo (ppm)	Se (ppm)	Ag (ppm)	Pb (ppm)	Ti (ppm)	Cd (ppm)	B (ppm)	K (ppm)
Mean	-0.001	0.061	-0.001	-0.015	0.001	-0.000	0.009	0.416
S.D.	0.001	0.009	0.000	0.007	0.000	0.000	0.001	0.015
% R.S.D.	106.557	14.064	59.317	43.834	9.661	49.458	9.566	3.667

	Mn (ppm)	Sb (ppm)	V (ppm)	Be (ppm)	Tl (ppm)
Mean	0.001	-0.062	-0.002	0.000	-0.034
S.D.	0.000	0.008	0.000	0.000	0.011
% R.S.D.	29.508	12.265	10.077	140.847	32.360

Identity 1: S96V000026_L Identity 2: 1-7-1-4 ml 10:19 AM March 18, 1996
Task name : OPTIMA
Sample Weight : 1.0000 Solution Volume : 40.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-142 REV.1

	Zr (ppm)	Sr (ppm)	Bi (ppm)	Si (ppm)	Al (ppm)	Co (ppm)	Cu (ppm)	Li (ppm)
Mean	0.186	-0.006	-0.535	3.516	16.722	-0.042	0.288	-0.029
S.D.	0.034	0.003	0.051	0.064	0.249	0.000	0.008	0.003
% R.S.D.	18.401	49.487	9.452	1.821	1.487	0.554	2.905	11.537

	Zn (ppm)	Ni (ppm)	La (ppm)	Fe (ppm)	Ca (ppm)	Cr (ppm)	Nd (ppm)	U (ppm)
Mean	0.114	0.107	-0.089	0.183	0.431	1.866	0.298	10.499
S.D.	0.014	0.042	0.056	0.021	0.002	0.055	0.508	1.807
% R.S.D.	12.034	39.457	63.297	11.558	0.376	2.923	170.622	17.210

	Ce (ppm)	Sm (ppm)	Ba (ppm)	P (ppm)	S (ppm)	Mg (ppm)	As (ppm)	Na (ppm)
Mean	-0.356	1.116	-0.002	10.534	8.916	0.169	-0.265	1429.885
S.D.	0.382	0.378	0.009	0.853	0.276	0.004	0.057	6.487
% R.S.D.	107.514	33.866	450.333	8.100	3.092	2.341	21.293	0.454

	Mo (ppm)	Se (ppm)	Ag (ppm)	Pb (ppm)	Ti (ppm)	Cd (ppm)	B (ppm)	K (ppm)
Mean	-0.067	0.873	-0.064	-0.503	0.075	-0.010	0.141	173.722
S.D.	0.031	0.194	0.031	0.351	0.007	0.017	0.007	0.970
% R.S.D.	45.950	22.168	48.563	69.915	9.569	177.191	4.887	0.558

	Mn (ppm)	Sb (ppm)	V (ppm)	Be (ppm)	Tl (ppm)
Mean	0.010	-1.669	-0.074	0.001	-2.183
S.D.	0.006	0.110	0.016	0.009	0.422
% R.S.D.	66.135	6.583	22.264	719.447	19.337

Identity 1: S96V000026 Identity 2: 1-7 ml 10:26 AM March 18, 1996

Task name : OPTIMA

Sample Weight : 1.0000 Solution Volume : 8.00

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

Prep D.F. = 10

WHC-SD-WM-DP-142, REV. 1

	Zr (ppm)	Sr (ppm)	Bi (ppm)	Si (ppm)	Al (ppm)	Co (ppm)	Cu (ppm)	Li (ppm)
Mean	0.033	-0.000	-0.154	3.191	16.815	0.008	0.046	-0.005
S.D.	0.005	0.000	0.036	0.014	0.031	0.014	0.000	0.002
% R.S.D.	15.912	86.603	23.537	0.441	0.184	181.056	0.864	36.439

	Zn (ppm)	Ni (ppm)	La (ppm)	Fe (ppm)	Ce (ppm)	Cr (ppm)	Nd (ppm)	U (ppm)
Mean	0.098	0.066	0.016	0.048	0.357	1.936	0.044	2.814
S.D.	0.001	0.014	0.022	0.023	0.002	0.006	0.051	0.119
% R.S.D.	1.479	20.901	138.156	49.124	0.506	0.300	114.687	4.213

	Ce (ppm)	Sm (ppm)	Ba (ppm)	P (ppm)	S (ppm)	Mg (ppm)	As (ppm)	Na (ppm)
Mean	-0.132	0.261	-0.002	11.225	8.604	0.035	-0.030	1386.636
S.D.	0.034	0.024	0.001	0.154	0.016	0.002	0.017	6.975
% R.S.D.	25.418	9.296	42.857	1.373	0.186	6.030	56.532	0.503

	Mo (ppm)	Se (ppm)	Ag (ppm)	Pb (ppm)	Ti (ppm)	Cd (ppm)	B (ppm)	K (ppm)
Mean	0.044	0.261	-0.015	-0.050	0.014	0.030	0.130	171.099
S.D.	0.007	0.040	0.003	0.041	0.002	0.002	0.006	0.911
% R.S.D.	14.778	15.268	23.189	82.919	16.314	6.634	4.570	0.533

	Mn (ppm)	Sb (ppm)	V (ppm)	Be (ppm)	Tl (ppm)
Mean	-0.001	-0.098	-0.009	-0.001	-0.599
S.D.	0.001	0.154	0.008	0.003	0.151
% R.S.D.	211.019	156.948	91.970	301.735	25.234

3.18.96

Identity 1: S96V000026_3 Identity 2: 1-7 ml 10:29 AM March 18, 1996

Task name : OPTIMA

Sample Weight : 1.0000 Solution Volume : 8.00

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

WHC-SD-WM-DP-142-REV. 1

	Zr (ppm)	Sr (ppm)	Bi (ppm)	Si (ppm)	Al (ppm)	Co (ppm)	Cu (ppm)	Li (ppm)
Mean	0.027	-0.000	-0.003	2.931	17.195	-0.033	0.029	-0.002
S.D.	0.009	0.001	0.073	0.023	0.055	0.024	0.003	0.003
% R.S.D.	32.322	692.820	2589.150	0.773	0.318	74.233	9.788	191.169

	Zn (ppm)	Ni (ppm)	La (ppm)	Fe (ppm)	Ca (ppm)	Cr (ppm)	Nd (ppm)	U (ppm)
Mean	0.101	0.032	0.016	0.041	0.380	1.934	0.041	2.751
S.D.	0.004	0.014	0.011	0.031	0.002	0.013	0.047	0.269
% R.S.D.	3.634	43.760	69.233	74.256	0.443	0.674	115.782	9.775

	Ce (ppm)	Sm (ppm)	Ba (ppm)	P (ppm)	S (ppm)	Mg (ppm)	As (ppm)	Na (ppm)
Mean	-0.082	0.268	0.000	11.679	8.596	0.045	0.016	1411.615
S.D.	0.108	0.077	0.002	0.315	0.113	0.001	0.051	10.797
% R.S.D.	131.442	28.860	2443.358	2.694	1.316	1.767	313.426	0.765

	Mo (ppm)	Se (ppm)	Ag (ppm)	Pb (ppm)	Ti (ppm)	Cd (ppm)	B (ppm)	K (ppm)
Mean	0.065	0.162	0.003	0.135	0.007	0.025	0.067	170.174
S.D.	0.003	0.043	0.009	0.055	0.002	0.001	0.005	1.068
% R.S.D.	5.323	26.327	267.997	40.473	23.616	4.580	7.318	0.628

	Mn (ppm)	Sb (ppm)	V (ppm)	Be (ppm)	Tl (ppm)
Mean	0.002	-0.078	0.010	0.004	-0.458
S.D.	0.002	0.358	0.010	0.002	0.167
% R.S.D.	93.993	457.688	102.884	46.354	36.376

Identity 1: S96V000026_S Identity 2: 1-7 ml 10:32 AM March 18, 1996
Task name : OPTIMA
Sample Weight : 1.0000 Solution Volume : 8.00
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	5.140	4.845	8.116	22.501	5.289	4.971	4.939
S.D.	0.003	0.006	0.085	0.022	0.030	0.014	0.006	0.002
% R.S.D.	0.053	0.125	1.758	0.274	0.133	0.266	0.120	0.043

	Zn (ppm)	Ni (ppm)	La (ppm)	Fe (ppm)	Ca (ppm)	Cr (ppm)	Nd (ppm)	U (ppm)
Mean	5.149	5.226	5.122	5.151	5.341	7.076	5.049	11.513
S.D.	0.011	0.054	0.006	0.113	0.003	0.010	0.064	0.080
% R.S.D.	0.214	1.040	0.126	2.188	0.065	0.140	1.265	0.696

	Ce (ppm)	Sm (ppm)	Ba (ppm)	P (ppm)	S (ppm)	Mg (ppm)	As (ppm)	Na (ppm)
Mean	5.306	5.245	5.126	16.858	14.065	4.956	5.297	1441.557
S.D.	0.033	0.028	0.006	0.367	0.193	0.008	0.030	1.367
% R.S.D.	0.617	0.533	0.109	2.178	1.373	0.158	0.565	0.095

	Mo (ppm)	Se (ppm)	Ag (ppm)	Pb (ppm)	Ti (ppm)	Cd (ppm)	B (ppm)	K (ppm)
Mean	5.211	5.066	1.004	4.933	4.720	5.106	5.082	179.552
S.D.	0.018	0.084	0.004	0.145	0.010	0.009	0.008	0.762
% R.S.D.	0.349	1.655	0.420	2.949	0.217	0.169	0.152	0.425

	Mn (ppm)	Sb (ppm)	V (ppm)	Be (ppm)	Tl (ppm)
Mean	5.110	4.401	5.094	5.165	4.558
S.D.	0.005	0.218	0.019	0.006	0.043
% R.S.D.	0.093	4.962	0.382	0.113	0.937

Identity 1: S96V000026_SD Identity 2: 1-7 ml 10:36 AM March 18, 1996
Task name : OPTIMA
Sample Weight : 1.0000 Solution Volume : 8.00
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	5.062	5.006	4.852	8.424	21.968	5.216	4.832	4.777
S.D.	0.017	0.018	0.079	0.027	0.035	0.037	0.017	0.025
% R.S.D.	0.339	0.366	1.634	0.322	0.158	0.715	0.358	0.528

	Zn (ppm)	Ni (ppm)	La (ppm)	Fe (ppm)	Ca (ppm)	Cr (ppm)	Nd (ppm)	U (ppm)
Mean	5.096	5.170	5.040	4.990	5.067	6.991	4.999	11.945
S.D.	0.005	0.027	0.049	0.049	0.023	0.054	0.041	0.357
% R.S.D.	0.106	0.526	0.968	0.981	0.444	0.772	0.824	2.992

	Ce (ppm)	Sm (ppm)	Ba (ppm)	P (ppm)	S (ppm)	Mg (ppm)	As (ppm)	Na (ppm)
Mean	5.055	5.131	4.981	16.720	13.887	4.885	5.157	1401.682
S.D.	0.151	0.033	0.018	0.252	0.159	0.008	0.016	5.999
% R.S.D.	2.990	0.643	0.354	1.509	1.146	0.155	0.307	0.428

	Mo (ppm)	Se (ppm)	Ag (ppm)	Pb (ppm)	Tl (ppm)	Cd (ppm)	B (ppm)	K (ppm)
Mean	5.117	5.069	0.985	5.069	4.614	5.015	5.058	176.043
S.D.	0.038	0.021	0.005	0.129	0.006	0.022	0.029	0.569
% R.S.D.	0.743	0.416	0.509	2.546	0.131	0.445	0.565	0.323

	Mn (ppm)	Sb (ppm)	V (ppm)	Be (ppm)	Tl (ppm)
Mean	5.041	4.740	5.008	5.048	4.432
S.D.	0.014	0.258	0.018	0.018	0.165
% R.S.D.	0.273	5.444	0.364	0.347	3.720

Identity 1: ICSA Identity 2: Quality Control 10:41 AM March 18, 1996
Task name : OPTIMA
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-142, REV.1

	Zr (ppm)	Sr (ppm)	Bi (ppm)	Si (ppm)	Al (ppm)	Co (ppm)	Cu (ppm)	Li (ppm)
Mean	0.015	0.002	-0.024	0.032	200.412	-0.001	0.003	-0.002
S.D.	0.000	0.000	0.018	0.003	0.185	0.002	0.000	0.000
% R.S.D.	1.680	6.030	75.937	8.953	0.092	184.086	14.381	4.451

	Zn (ppm)	Ni (ppm)	La (ppm)	Fe (ppm)	Ca (ppm)	Cr (ppm)	Nd (ppm)	U (ppm)
Mean	-0.004	0.006	0.004	100.341	102.883	0.002	-0.004	0.317
S.D.	0.000	0.001	0.001	0.352	0.267	0.002	0.011	0.018
% R.S.D.	12.961	12.582	22.098	0.351	0.260	90.803	283.643	5.744

	Ce (ppm)	Sm (ppm)	Ba (ppm)	P (ppm)	S (ppm)	Mg (ppm)	As (ppm)	Na (ppm)
Mean	-0.021	0.063	0.002	0.001	0.022	102.496	0.024	192.638
S.D.	0.006	0.004	0.000	0.004	0.006	0.287	0.009	0.824
% R.S.D.	26.526	5.875	3.213	593.484	25.299	0.280	37.757	0.428

	Mo (ppm)	Se (ppm)	Ag (ppm)	Pb (ppm)	Ti (ppm)	Cd (ppm)	B (ppm)	K (ppm)
Mean	-0.002	0.032	-0.003	-0.002	0.003	0.002	0.015	0.052
S.D.	0.002	0.017	0.000	0.011	0.001	0.001	0.001	0.011
% R.S.D.	119.225	50.899	9.197	438.165	21.103	39.539	9.047	21.475

	Mn (ppm)	Sb (ppm)	V (ppm)	Be (ppm)	Tl (ppm)
Mean	0.005	-0.036	-0.002	0.003	-0.038
S.D.	0.000	0.019	0.001	0.000	0.025
% R.S.D.	7.409	52.370	49.143	0.083	65.806

Identity 1: ICSAB Identity 2: Quality Control 10:45 AM March 18, 1996
Task name : OPTIMA
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-142, REV. 1

	Zr (ppm)	Sr (ppm)	Bi (ppm)	Si (ppm)	Al (ppm)	Co (ppm)	Cu (ppm)	Li (ppm)
Mean	0.005	0.002	-0.067	0.009	199.103	0.506	0.505	0.937
S.D.	0.002	0.000	0.008	0.000	0.396	0.003	0.001	0.008
% R.S.D.	35.867	5.207	12.626	2.617	0.199	0.600	0.163	0.831

	Zn (ppm)	Ni (ppm)	La (ppm)	Fe (ppm)	Ca (ppm)	Cr (ppm)	Nd (ppm)	U (ppm)
Mean	1.010	0.992	-0.001	98.247	100.749	0.515	0.006	0.103
S.D.	0.003	0.003	0.002	0.038	0.185	0.003	0.008	0.053
% R.S.D.	0.281	0.263	356.780	0.039	0.184	0.618	139.871	51.289

	Ce (ppm)	Sm (ppm)	Ba (ppm)	P (ppm)	S (ppm)	Mg (ppm)	As (ppm)	Na (ppm)
Mean	-0.002	0.027	0.515	-0.010	0.021	100.997	0.024	192.432
S.D.	0.015	0.008	0.001	0.018	0.008	0.362	0.003	1.338
% R.S.D.	704.940	30.809	0.208	177.874	40.147	0.359	13.039	0.695

	Mo (ppm)	Se (ppm)	Ag (ppm)	Pb (ppm)	Ti (ppm)	Cd (ppm)	B (ppm)	K (ppm)
Mean	-0.000	0.011	1.022	1.008	0.001	1.011	0.015	0.089
S.D.	0.001	0.012	0.001	0.022	0.000	0.004	0.000	0.023
% R.S.D.	128.064	107.399	0.081	2.178	51.798	0.443	1.738	25.316

	Mn (ppm)	Sb (ppm)	V (ppm)	Be (ppm)	Tl (ppm)
Mean	0.509	-0.106	0.501	0.508	-0.020
S.D.	0.001	0.022	0.002	0.002	0.025
% R.S.D.	0.283	20.393	0.338	0.298	122.205

Identity 1: CCV Identity 2: Quality Control 10:49 AM March 18, 1996
Task name : OPTIMA
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-142, REV. 1

	Zr (ppm)	Sr (ppm)	Bi (ppm)	Si (ppm)	Al (ppm)	Co (ppm)	Cu (ppm)	Li (ppm)
Mean	4.930	4.951	4.964	4.746	5.036	5.109	4.962	4.866
S.D.	0.032	0.037	0.024	0.023	0.110	0.037	0.040	0.044
% R.S.D.	0.655	0.739	0.489	0.494	2.179	0.719	0.798	0.896

	Zn (ppm)	Ni (ppm)	La (ppm)	Fe (ppm)	Ca (ppm)	Cr (ppm)	Nd (ppm)	U (ppm)
Mean	5.077	4.984	4.931	5.059	4.980	5.054	4.940	9.595
S.D.	0.028	0.027	0.038	0.049	0.036	0.017	0.045	0.068
% R.S.D.	0.547	0.548	0.774	0.963	0.717	0.333	0.909	0.704

	Ce (ppm)	Sm (ppm)	Ba (ppm)	P (ppm)	S (ppm)	Mg (ppm)	As (ppm)	Na (ppm)
Mean	5.081	4.948	4.942	5.210	5.149	5.026	5.110	5.062
S.D.	0.045	0.034	0.039	0.157	0.086	0.041	0.016	0.111
% R.S.D.	0.888	0.687	0.783	3.005	1.676	0.821	0.313	2.192

	Mo (ppm)	Se (ppm)	Ag (ppm)	Pb (ppm)	Tl (ppm)	Cd (ppm)	B (ppm)	K (ppm)
Mean	5.139	4.899	4.904	4.988	4.913	5.004	4.975	4.933
S.D.	0.029	0.047	0.032	0.018	0.033	0.033	0.034	0.039
% R.S.D.	0.557	0.953	0.658	0.370	0.677	0.652	0.693	0.795

	Mn (ppm)	Sb (ppm)	V (ppm)	Be (ppm)	Tl (ppm)
Mean	5.003	4.672	5.053	5.114	4.731
S.D.	0.030	0.019	0.028	0.038	0.045
% R.S.D.	0.596	0.409	0.563	0.752	0.946

Identity 1: CCB Identity 2: Quality Control 10:52 AM March 18, 1996
Task name : OPTIMA
Sample Weight : 1.0000 Solution Volume : 1.00
On-Peak Integrations : 3 Off-Peak Integrations : 1

WHC-SD-WM-DP-142, REV. 1

	Zr (ppm)	Sr (ppm)	Bi (ppm)	Si (ppm)	Al (ppm)	Co (ppm)	Cu (ppm)	Li (ppm)
Mean	0.006	0.002	-0.007	0.013	0.030	0.001	0.005	0.002
S.D.	0.004	0.004	0.007	0.005	0.037	0.005	0.004	0.004
% R.S.D.	68.701	157.429	106.902	42.235	126.298	465.195	75.222	218.634

	Zn (ppm)	Ni (ppm)	La (ppm)	Fe (ppm)	Ca (ppm)	Cr (ppm)	Nd (ppm)	U (ppm)
Mean	0.003	0.003	0.003	0.018	0.018	0.001	-0.002	0.124
S.D.	0.004	0.005	0.004	0.020	0.020	0.004	0.014	0.044
% R.S.D.	130.692	152.233	111.407	113.376	109.656	497.830	579.312	35.614

	Ce (ppm)	Sm (ppm)	Ba (ppm)	P (ppm)	S (ppm)	Mg (ppm)	As (ppm)	Na (ppm)
Mean	-0.016	0.017	0.002	-0.027	0.005	0.017	-0.001	0.077
S.D.	0.009	0.007	0.004	0.009	0.005	0.020	0.006	0.038
% R.S.D.	56.623	41.268	171.387	32.596	114.827	116.594	449.251	49.434

	Mo (ppm)	Se (ppm)	Ag (ppm)	Pb (ppm)	Tl (ppm)	Cd (ppm)	B (ppm)	K (ppm)
Mean	0.003	0.019	0.002	-0.013	0.003	0.002	0.005	-0.013
S.D.	0.004	0.010	0.004	0.014	0.004	0.004	0.004	0.008
% R.S.D.	157.270	52.370	144.377	106.860	121.218	164.840	86.617	57.296

	Mn (ppm)	Sb (ppm)	V (ppm)	Be (ppm)	Tl (ppm)
Mean	0.003	-0.051	0.001	0.003	-0.057
S.D.	0.004	0.006	0.004	0.004	0.022
% R.S.D.	103.915	12.034	294.397	128.690	37.866

03-18-96

AP-104

S96V000026

WHC-SD-WM-DP-142, REV. 1

	Sample Result ug/mL	Spike % Rec	Spike dup % Rec	% RPD	Serial Dil.
Al	168.15	113.7	103.1	9.82	
Cr	19.36	102.8	101.1	1.67	
Fe	<	103.0	99.8	3.18	
Mn	<	102.2	100.8	1.36	
Na	13866.4	n/a	n/a	n/a	3.12 %D
Ni	<	104.6	103.4	1.14	
Si	31.91	98.5	104.7	6.06	
U	<	115.1	119.5	3.68	

WHC-SD-WM-DP-142, REV. 1

LABCORE Data Entry Template for Worklist# 7269

Analyst: raw **Instrument:** TOC01 **Book #** 16N12E std 11N12H spk

Method: LA-344-105 Rev/Mod C-0

Worklist Comment: AP-104 TOTC-01 Rerun #2

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1	BLNK				TOTC-01	LIQUID	1	0.6	N/A	ug/mL
		2	STD				TOTC-01	LIQUID	3.00e3	3.07e3	N/A	ug/mL
96000036	AP-104	3	SAMPLE	S96V000016	0		TOTC-01	LIQUID	N/A	<5.00ee	5.00ee	ug/mL
96000036	AP-104	4	SPK	S96V000016	0		TOTC-01	LIQUID	100	104.9	N/A	ug/mL
96000036	AP-104	5	SPK-DUP	S96V000016	0		TOTC-01	LIQUID	104.9	100.7	N/A	ug/mL

Final page for worklist # 7269

R. Wendland 4-1-96
Analyst Signature **Date**

D. Donahue 4-2-96
Analyst Signature **Date**

Reviewed RW Schroeder
4/2/96

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.

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-~~142~~, REV. 1

TOC : LA-344-105 (C-0) **LIQUIDS**

Type	Sample Volume in mL	(SS)	Blank
Blank	H2SO4 Volume in mL	(VR)	0.200
Work List	Volume Injected in mL	(VI)	0.000
7269	Dilution Factor	(DF)	0.200
Test Code	Digest Dilution Factor	(DDF)	1
TOTC-01	µg of Carbon in Sample	(C1)	1
Matrix	µg of Carbon in Blank	(C2)	0.9
Liquid	g of Carbon/L	=	2.5
Sample #			< ~~5.00E-05~~ RWS 4/2/96
BLNK			
Instrument Code			
WB39937			
Analyst			
RA Wendland			
Date			
04/01/96			
Time			

g of Carbon/L = $\frac{(C1-C2) * DF * DDF}{VI * 1000}$ 0.6

µg of Carbon/mL = g of Carbon/L * 1000000 µg/g / 1000 mL/L

Detection Level (µg/mL) = $\frac{1 \text{ µg C} * DF * DDF}{VI}$ $|0.9 - 2.5| = 0.6$

NOTE: Reported Result is Below Detection Level.

µg Carbon/mL =	0.6 < ~~5.00E+00~~ RWS 4/2/96	DETECTION LEVEL in µg/mL ~~5.00E+00~~ RWS 4/2/96

Data Entry by: RWS Date: 04/02/96

Approved by: Date:

Form 344105_C Rev. 1.1

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

TOC : LA-344-105 (C-0) LIQUIDS

Type
Standard
Work List
7269
Test Code
TOTC-01
Matrix
Liquid
Sample #
16N12E
Instrument Code
WB39937
Analyst
RA Wendland
Date
04/01/96
Time

			Standard
Sample Volume in mL	(SS)		0.200
H2SO4 Volume in mL	(VR)		2.000
Volume Injected in mL	(VI)		0.200
Dilution Factor	(DF)		11
Digest Dilution Factor	(DDF)		1
µg of Carbon in Sample	(C1)		58.4
µg of Carbon in Blank	(C2)		2.5
g of Carbon/L		=	3.07E+00

g of Carbon/L = $\frac{(C1-C2) * DF * DDF}{VI * 1000}$

µg of Carbon/mL = g of Carbon/L * 1000000 µg/g / 1000 mL/L

Detection Level (µg/mL) = $\frac{1 \text{ µg C} * DF * DDF}{VI}$

µg Carbon/mL =	3.07E+03	DETECTION LEVEL in µg/mL
		5.50E+01

Data Entry by: RWE Date: 04/02/96

Approved by: Date:

Form 344105_C Rev. 1.1

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

TOC : LA-344-105 (C-0) LIQUIDS

Type
Sample
Work List
7269
Test Code
TOTC-01
Matrix
Liquid
Sample #
S96V000016
Instrument Code
WB39937
Analyst
RA Wendland
Date
04/01/96
Time

			Sample
Sample Volume in mL	(SS)		0.200
H2SO4 Volume in mL	(VR)		0.000
Volume Injected in mL	(VI)		0.200
Dilution Factor	(DF)		1
Digest Dilution Factor	(DDF)		1
µg of Carbon in Sample	(C1)		3
µg of Carbon in Blank	(C2)		2.5
g of Carbon/L		<	5.00E-03

$$\text{g of Carbon/L} = \frac{(C1-C2) * DF * DDF}{VI * 1000}$$

$$\text{µg of Carbon/mL} = \text{g of Carbon/L} * 1000000\ \text{µg/g} / 1000\ \text{mL/L}$$

$$\text{Detection Level (µg/mL)} = \frac{1\ \text{µg C} * DF * DDF}{VI}$$

NOTE: Reported Result is Below Detection Level.

µg Carbon/mL =	< 5.00E+00	DETECTION LEVEL in µg/mL
		5.00E+00

Data Entry by: RWS Date: 04/02/96

Approved by: Date:

Form 344105_C Rev. 1.1

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

WHC-SD-WM-DP-142, REV. 1

TOC: LA-344-105 SPIKED SAMPLE

SPIKE

Type	>>>>>> Sample Vial Data <<<<<<		>>>>> Spiked Vial Data <<<<<	
SPIKE	Sample Volume in mL	0.200	Sample Size in mL (SS)	0.400
Work List	H2SO4 Volume in mL	0.000	Spike Volume in mL	0.400
7269	Volume Injected in mL	0.200	H2SO4 Volume in mL	0.000
Test Code	µg of Carbon in Sample	3	Volume Injected in mL	0.200
TOTC-01	µg of Carbon in Blank	2.5	Sample Pre-Spike Dil. Factor (PDF)	1
Matrix			Spike Value (µg/ml)	748
Liquid			µg C in Sample + Spike	81
Sample #			µg C in Blank	2.5
S96V000016				
Instrument Code				
WB39937				
Analyst				
RA Wendland				
Date				
04/01/96				
Time				

PERCENT SPIKE RE = $\frac{\text{µg Carbon Recovered from Spike} * 100}{\text{µg Carbon in Spike}}$

WHERE : µg Carbon Recovered from Spike =
[(µgC in sample + spike - µgC in blank) * (Spike Correction Factor)]
- [(µgC sample - µgC blank) * (Sample Correction Factor) * (Sample Size Correction Factor) * (PDF)]

Spike Correction Factor = $\frac{\text{Total volume in spiked sample vial (mL)}}{\text{Volume injected (mL)}}$

Sample Correction Factor = $\frac{\text{Total volume in sample vial (mL)}}{\text{Volume injected (mL)}}$

Sample Size Correction Factor = $\frac{\text{Sample size in (mL) in spiked vial}}{\text{Sample size (mL) in sample}}$

Sample Pre-Spike Dilution Factor = $\frac{1}{\text{Dilution of Sample Before Added to Spike Vial}}$

WHERE : µg Carbon in Spike = Spike Value (µg/mL) * Spike Volume (mL)

Percent Spike Recovery 104.9%

Data Entry by:	RWS	Date: 02-Apr-96
Approved by:		Date:

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

WHC-SD-WM-DP-142, REV. 1

TOC: LA-344-105 SPIKED SAMPLE

SPIKE

Type	>>>>>> Sample Vial Data <<<<<<		>>>>> Spiked Vial Data <<<<<	
SPIKE	Sample Volume in mL	0.200	Sample Size in mL (SS)	0.400
Work List	H2SO4 Volume in mL	0.000	Spike Volume in mL	0.400
7269	Volume Injected in mL	0.200	H2SO4 Volume in mL	0.000
Test Code	µg of Carbon in Sample	3	Volume Injected in mL	0.200
TOTC-01	µg of Carbon in Blank	2.5	Sample Pre-Spike Dil. Factor (PDF)	1
Matrix			Spike Value (µg/ml)	748
Liquid			µg C in Sample + Spike	77.8
Sample #			µg C in Blank	2.5
S96V000016SpKDu				
Instrument Code				
WB39937				
Analyst				
RA Wendland				
Date				
04/01/96				
Time				

PERCENT SPIKE RE = $\frac{\text{µg Carbon Recovered from Spike} * 100}{\text{µg Carbon in Spike}}$

WHERE : µg Carbon Recovered from Spike =

[(µgC in sample + spike - µgC in blank) * (Spike Correction Factor)]

- [(µgC sample - µgC blank) * (Sample Correction Factor) * (Sample Size Correction Factor) * (PDF)]

Spike Correction Factor = Total volume in spiked sample vial (mL) / Volume injected (mL)

Sample Correction Factor = Total volume in sample vial (mL) / Volume injected (mL)

Sample Size Correction Factor = Sample size in (mL) in spiked vial / Sample size (mL) in sample

Sample Pre-Spike Dilution Factor = 1 / Dilution of Sample Before Added to Spike Vial

WHERE : µg Carbon in Spike = Spike Value (µg/mL) * Spike Volume (mL)

Percent Spike Recovery 100.7%

Data Entry by:	RAW	Date: 02-Apr-96
Approved by:		Date:

Form X Rev. 1.1

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0 WHC-SD-WM-DP-142, REV. 1
<<< BLANK ANALYSIS >>>

Sample: BLK Date: 04/01/96 Time: 07:39:52

Sample Size = 200 uL
Dil Factor = 1
Blank ID # = BLK
Blank Value = N/A

Analyst : RA WENDLAND
Min Readings = 10
Max Readings = 10
% Difference = 10

Reading	Analysis Time	Coulometer	% Difference
1	0.51	0.00	0.00
2	1.01	1.40	100.00
3	1.51	2.00	30.00
4	2.01	2.10	4.76
5	2.51	2.20	4.55
6	3.01	2.30	4.35
7	3.51	2.30	0.00
8	4.01	2.40	4.17
9	4.51	2.40	0.00
10	5.01	2.50	4.00

SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 182 TO 187.

BLANK VALUE = 2.5 micrograms carbon
BLANK FACTOR = 2.5 / 5.005646 = +5.0E-01 ug/min Carbon

Sample Run By: Robert W Schneider for RA Wendland 4/15/96
RA WENDLAND 00000

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-142, REV. 1

Sample: BASE Date: 04/01/96 Time: 07:47:01

Sample Size = 200 uL
Dil Factor = 1
Blank ID # = BLK
Blank Value = .4994361 ug/minute C

Analyst : RA WENDLAND
Min Readings = 10
Max Readings = 10
% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.00	0.00
2	1.01	0.10	100.00
3	1.51	0.20	50.00
4	2.01	0.30	33.33
5	2.51	0.50	40.00
6	3.01	0.50	0.00
7	3.51	0.60	16.67
8	4.01	0.70	14.29
9	4.51	0.80	12.50
10	5.01	0.90	11.11

BLANK VALUE = 2.5 micrograms carbon
BLANK FACTOR = 2.5 / 5.005646 = +5.0E-01 ug/min Carbon

SAMPLE RESULTS:
(.9 - 2.500335)(1)/(200) = < 5.00 E-3 g/L Carbon
(.9 - 2.500335)(1)/(200)(12) = < 4.17 E-4 Molar Carbon
<<<< WARNING- PERCENT DIFFERENCE EXCEEDS 10 PERCENT >>>>

Sample Run By: RA WENDLAND 00000

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-142, REV. 1

Sample: STD Date: 04/01/96 Time: 08:18:37

Sample Size = 200 uL
Dil Factor = 1
Blank ID # = BLK
Blank Value = .4994361 ug/minute C

Analyst : RA WENDLAND
Min Readings = 10
Max Readings = 10
% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.00	0.00
2	1.01	29.60	100.00
3	1.51	48.00	38.33
4	2.01	53.80	10.78
5	2.51	56.00	3.93
6	3.01	57.00	1.75
7	3.51	57.50	0.87
8	4.01	57.80	0.52
9	4.51	58.20	0.69
10	5.01	58.40	0.34

BLANK VALUE = 2.5 micrograms carbon
BLANK FACTOR = 2.5 / 5.005646 = +5.0E-01 ug/min Carbon

SAMPLE RESULTS:
(58.4 - 2.5)(1)/(200) = +2.80E-01 g/L Carbon
(58.4 - 2.5)(1)/(200)(12) = +2.33E-02 Molar Carbon

Sample Run By: R. WENDLAND 4-1-96
RA WENDLAND 00000

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-142, REV. 1

Sample: 16 Date: 04/01/96 Time: 09:14:45

Sample Size = 200 uL
Dil Factor = 1
Blank ID # = BLK
Blank Value = .4994361 ug/minute C

Analyst : RA WENDLAND
Min Readings = 10
Max Readings = 10
% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.20	0.00
2	1.01	0.70	71.43
3	1.51	1.20	41.67
4	2.01	1.70	29.41
5	2.51	1.80	5.56
6	3.01	2.00	10.00
7	3.51	2.30	13.04
8	4.01	2.60	11.54
9	4.50	2.80	7.14
10	5.00	3.00	6.67

BLANK VALUE = 2.5 micrograms carbon
BLANK FACTOR = 2.5 / 5.005646 = +5.0E-01 ug/min Carbon

SAMPLE RESULTS:
(3 - 2.499527)(1)/(200) = < 5.00 E-3 g/L Carbon
(3 - 2.499527)(1)/(200)(12) = < 4.17 E-4 Molar Carbon

Sample Run By: _____
RA WENDLAND 00000

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-142, REV. /

Sample: 16SPK Date: 04/01/96 Time: 09:21:38

Sample Size = 200 uL
Dil Factor = 1
Blank ID # = BLK
Blank Value = .4994361 ug/minute C

Analyst : RA WENDLAND
Min Readings = 10
Max Readings = 10
% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.30	0.00
2	1.01	33.80	99.11
3	1.50	64.90	47.92
4	2.01	74.30	12.65
5	2.51	77.70	4.38
6	3.01	79.00	1.65
7	3.51	79.80	1.00
8	4.01	80.30	0.62
9	4.50	80.70	0.50
10	5.00	81.00	0.37

BLANK VALUE = 2.5 micrograms carbon
BLANK FACTOR = 2.5 / 5.005646 = +5.0E-01 ug/min Carbon

SAMPLE RESULTS:
(81 - 2.499466)(1)/(200) = +3.93E-01 g/L Carbon
(81 - 2.499466)(1)/(200)(12) = +3.27E-02 Molar Carbon

Sample Run By: _____
RA WENDLAND 00000

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0
WHC-SD-WM-DP-142, REV. 1

Sample: 16DSPK Date: 04/01/96 Time: 09:27:21

Sample Size = 200 uL
Dil Factor = 1
Blank ID # = BLK
Blank Value = .4994361 ug/minute C

Analyst : RA WENDLAND
Min Readings = 10
Max Readings = 10
% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.20	0.00
2	1.01	33.10	99.40
3	1.51	61.90	46.53
4	2.01	70.30	11.95
5	2.51	73.80	4.74
6	3.01	75.70	2.51
7	3.51	76.70	1.30
8	4.01	77.10	0.52
9	4.51	77.50	0.52
10	5.01	77.80	0.39

BLANK VALUE = 2.5 micrograms carbon
BLANK FACTOR = 2.5 / 5.005646 = +5.0E-01 ug/min Carbon

SAMPLE RESULTS:
(77.8 - 2.500412)(1)/(200) = +3.76E-01 g/L Carbon
(77.8 - 2.500412)(1)/(200)(12) = +3.14E-02 Molar Carbon

Sample Run By: _____
RA WENDLAND 00000

WHC-SD-WM-DP-142 REV. 1

LABCORE Data Entry Template for Worklist# 5351

Analyst: RAW **Instrument:** TOC01 WC39937 **Book #** 16N12-D
SPK 11N12-H

Method: LA-344-105 Rev/Mod C-0

Worklist Comment: AP-104 TOTAL CARBON "COMBUSTION-MAKE NECESSARY DILS IN H20

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1	BLNK				TOTC-01	LIQUID	(	1.1	N/A	ug/mL
		2	STD				TOTC-01	LIQUID	2999	$3.03e^3$	N/A	ug/mL
96000036	AP-104	3	SAMPLE	S96V000007	0		TOTC-01	LIQUID	N/A	$7.41e^2$	30	ug/mL
96000036	AP-104	4	DUP	S96V000007	0		TOTC-01	LIQUID	$7.41e^2$	$7.77e^2$	N/A	ug/mL
96000036	AP-104	5	SPK	S96V000007	0		TOTC-01	LIQUID	100	99.4	N/A	ug/mL
96000036	AP-104	6	SAMPLE	S96V000006	0		TOTC-01	LIQUID	N/A	$1.55e^3$	55	ug/mL
96000036	AP-104	7	DUP	S96V000006	0		TOTC-01	LIQUID	$1.55e^3$	$1.57e^3$	N/A	ug/mL
96000036	AP-104	8	SAMPLE	S96V000008	0		TOTC-01	LIQUID	N/A	$7.11e^2$	30	ug/mL
96000036	AP-104	9	DUP	S96V000008	0		TOTC-01	LIQUID	$7.11e^2$	$7.47e^2$	N/A	ug/mL
96000036	AP-104	10	SAMPLE	S96V000016	0		TOTC-01	LIQUID	N/A	$1.10e^1$ $1.10e^1$ HLA 3-7-96	5.5	ug/mL
96000036	AP-104	11	DUP	S96V000016	0		TOTC-01	LIQUID	$1.10e^1$	$1.10e^1$	N/A	ug/mL

Final page for worklist # 5351

R. Weyland 2-27-96
Analyst Signature **Date**

L. Jones 3-4-96
Analyst Signature **Date**

Reviewed RW Schwedo 3/11/96

Data Entry Comments: —SEE PRINTOUTS—

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

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-140, REV. 1

TOC : LA-344-105 (C-0) **LIQUIDS**

Type				BLANK
BLANK	Sample Volume in mL	(SS)		0.200
Work List	H2SO4 Volume in mL	(VR)		2.000
5351	Volume Injected in mL	(VI)		0.200
Test Code	Dilution Factor	(DF)		1
TOTC-01	Digest Dilution Factor	(DDF)		1
Matrix	µg of Carbon in Sample	(C1)		2
LIQUID	µg of Carbon in Blank	(C2)		3.1
Sample #	g of Carbon/L	=	<	5.00E-03
BLNK				
Instrument Code				
WC39937				
Analyst				
R. WENDLAND				
Date				
02/27/96				
Time				
07:20 AM				

g of Carbon/L = $\frac{(C1-C2) * DF * DDF}{VI * 1000}$

µg of Carbon/mL = g of Carbon/L * 1000000 µg/g / 1000 mL/L

Detection Level (µg/mL) = $\frac{1 \mu g\ C * DF * DDF}{VI}$

NOTE: Reported Result is Below Detection Level.

µg Carbon/mL =	< 5.00E+00	DETECTION LEVEL in µg/mL
		5.00E+00

Data Entry by:		Date:	02/28/96
Approved by:		Date:	3-1-96

Form 344105_C Rev. 1.1

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-142, REV. 1

TOC : LA-344-105 (C-0) **LIQUIDS**

Type	Sample Volume in mL	(SS)	STANDARD: 0.200
STANDARD	H2SO4 Volume in mL	(VR)	2.000
Work List	Volume Injected in mL	(VI)	0.200
5351	Dilution Factor	(DF)	11
Test Code	Digest Dilution Factor	(DDF)	1
TOTC-01	µg of Carbon in Sample	(C1)	58.2
Matrix	µg of Carbon in Blank	(C2)	3.1
LIQUID	g of Carbon/L	=	3.03E+00
Sample #			
16N12D			
Instrument Code			
WC39937			
Analyst			
R. WENDLAND			
Date			
02/27/96			
Time			
07:20 AM			

g of Carbon/L = $\frac{(C1-C2) * DF * DDF}{VI * 1000}$

µg of Carbon/mL = g of Carbon/L * 1000000 µg/g / 1000 mL/L

Detection Level (µg/mL) = $\frac{1 \text{ µg C} * DF * DDF}{VI}$

µg Carbon/mL =	3.03E+03	DETECTION LEVEL in µg/mL
		5.50E+01

Data Entry by: [signature] Date: 02/28/96

Approved by: [signature] Date: 3-1-96

Form 344105_C Rev. 1.1

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-142, REV. 1

TOC : LA-344-105 (C-0) **LIQUIDS**

			SAMPLE
Type	Sample Volume in mL	(SS)	0.200
SAMPLE	H2SO4 Volume in mL	(VR)	1.000
Work List	Volume Injected in mL	(VI)	0.200
5351	Dilution Factor	(DF)	6
Test Code	Digest Dilution Factor	(DDF)	1
TOTC-01	µg of Carbon in Sample	(C1)	27.8
Matrix	µg of Carbon in Blank	(C2)	3.1
LIQUID	g of Carbon/L	=	7.41E-01
Sample #			
S96V000007			
Instrument Code			
WC39937			
Analyst			
R. WENDLAND			
Date			
02/27/96			
Time			
08:36 AM			

g of Carbon/L = $\frac{(C1-C2) * DF * DDF}{VI * 1000}$

µg of Carbon/mL = g of Carbon/L * 1000000 µg/g / 1000 mL/L

Detection Level (µg/mL) = $\frac{1 \text{ µg C} * DF * DDF}{VI}$

µg Carbon/mL =	7.41E+02	DETECTION LEVEL in µg/mL
		3.00E+01

Data Entry by:	[signature]	Date:	03/01/96
Approved by:	[signature]	Date:	3-1-96

Form 344105_C Rev. 1.1

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-~~142~~, REV. 1

TOC : LA-344-105 (C-0) **LIQUIDS**

			DUPLICATE
Type	Sample Volume in mL	(SS)	0.200
DUPLICATE	H2SO4 Volume in mL	(VR)	1.000
Work List	Volume Injected in mL	(VI)	0.200
5351	Dilution Factor	(DF)	6
Test Code	Digest Dilution Factor	(DDF)	1
TOTC-01	µg of Carbon in Sample	(C1)	29
Matrix	µg of Carbon in Blank	(C2)	3.1
LIQUID	g of Carbon/L	=	7.77E-01
Sample #			
S96V000007DUP			
Instrument Code			
WC39937			
Analyst			
R. WENDLAND			
Date			
02/27/96			
Time			
08:36 AM			

g of Carbon/L = $\frac{(C1-C2) * DF * DDF}{VI * 1000}$

µg of Carbon/mL = g of Carbon/L * 1000000 µg/g / 1000 mL/L

Detection Level (µg/mL) = $\frac{1 \text{ µg C} * DF * DDF}{VI}$

µg Carbon/mL =	7.77E+02	DETECTION LEVEL in µg/mL
		3.00E+01

Data Entry by:	Date:	03/01/96
Approved by:	Date:	3-1-96

Form 344105_C Rev. 1.1

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

WHC-SD-WM-DP-142, REV. 1

TOC: LA-344-105 SPIKED SAMPLE

SPIKE

Type	>>>>>> Sample Vial Data <<<<<<		>>>>> Spiked Vial Data <<<<<	
SPIKE	Sample Volume in mL	0.200	Sample Size in mL (SS)	0.200
Work List	H2SO4 Volume in mL	1.000	Spike Volume in mL	0.200
5351	Volume Injected in mL	0.200	H2SO4 Volume in mL	0.000
Test Code	µg of Carbon in Sample	27.8	Volume Injected in mL	0.200
TOTC-01	µg of Carbon in Blank	3.1	Sample Pre-Spike Dil. Factor (PDF)	6
Matrix			Spike Value (µg/ml)	748
LIQUID			µg C in Sample + Spike	89.8
Sample #			µg C in Blank	3.1
S96V000007				
Instrument Code				
WC39937				
Analyst				
R. WENDLAND				
Date				
02/27/96				
Time				
08:36 AM				

PERCENT SPIKE RE = $\frac{\text{µg Carbon Recovered from Spike} * 100}{\text{µg Carbon in Spike}}$

WHERE : µg Carbon Recovered from Spike =

[(µgC in sample + spike - µgC in blank) * (Spike Correction Factor)]

- [(µgC sample - µgC blank) * (Sample Correction Factor) * (Sample Size Correction Factor) * (PDF)]

Spike Correction Factor = $\frac{\text{Total volume in spiked sample vial (mL)}}{\text{Volume injected (mL)}}$

Sample Correction Factor = $\frac{\text{Total volume in sample vial (mL)}}{\text{Volume injected (mL)}}$

Sample Size Correction Factor = $\frac{\text{Sample size in (mL) in spiked vial}}{\text{Sample size (mL) in sample}}$

Sample Pre-Spike Dilution Factor = $\frac{1}{\text{Dilution of Sample Before Added to Spike Vial}}$

WHERE : µg Carbon in Spike = Spike Value (µg/mL) * Spike Volume (mL)

Percent Spike Recovery 99.4%

Data Entry by:	HLA	Date: 01-Mar-96
Approved by:	HAnalyst	Date:

Form X Rev. 1.1

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-142, REV. 1

TOC : LA-344-105 (C-0) **LIQUIDS**

Type	Sample Volume in mL	(SS)	SAMPLE
SAMPLE	H2SO4 Volume in mL	(VR)	0.200
Work List	Volume Injected in mL	(VI)	2.000
5351	Dilution Factor	(DF)	0.200
Test Code	Digest Dilution Factor	(DDF)	11
TOTC-01	µg of Carbon in Sample	(C1)	1
Matrix	µg of Carbon in Blank	(C2)	31.2
LIQUID	g of Carbon/L	=	3.1
Sample #			1.55E+00
S96V000006			
Instrument Code			
WC39937			
Analyst			
R. WENDLAND			
Date			
02/27/96			
Time			
08:36 AM			

g of Carbon/L = $\frac{(C1-C2) * DF * DDF}{VI * 1000}$

µg of Carbon/mL = g of Carbon/L * 1000000 µg/g / 1000 mL/L

Detection Level (µg/mL) = $\frac{1 \text{ µg C} * DF * DDF}{VI}$

µg Carbon/mL =	1.55E+03	DETECTION LEVEL in µg/mL
		5.50E+01

Data Entry by:	[signature]	Date:	03/01/96
Approved by:	[signature]	Date:	3-1-96

Form 344105_C Rev. 1.1

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-142, REV. 1

TOC : LA-344-105 (C-0) **LIQUIDS**

Type	Sample Volume in mL	(SS)	DUPLICATE
DUPLICATE	H2SO4 Volume in mL	(VR)	2.000
Work List	Volume Injected in mL	(VI)	0.200
5351	Dilution Factor	(DF)	11
Test Code	Digest Dilution Factor	(DDF)	1
TOTC-01	µg of Carbon in Sample	(C1)	31.7
Matrix	µg of Carbon in Blank	(C2)	3.1
LIQUID	g of Carbon/L	=	1.57E+00
Sample #			
S96V000006DUP			
Instrument Code			
WC39937			
Analyst			
R. WENDLAND			
Date			
02/27/96			
Time			
08:36 AM			

g of Carbon/L = $\frac{(C1-C2) * DF * DDF}{VI * 1000}$

µg of Carbon/mL = g of Carbon/L * 1000000 µg/g / 1000 mL/L

Detection Level (µg/mL) = $\frac{1 \text{ µg C} * DF * DDF}{VI}$

µg Carbon/mL =	1.57E+03	DETECTION LEVEL in µg/mL
		5.50E+01

Data Entry by: [signature] Date: 03/01/96

Approved by: [signature] Date: 3-1-96

Form 344105_C Rev. 1.1

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-142 REV. 1

TOC : LA-344-105 (C-0) LIQUIDS

			SAMPLE
Type	Sample Volume in mL	(SS)	0.200
SAMPLE	H2SO4 Volume in mL	(VR)	1.000
Work List	Volume Injected in mL	(VI)	0.200
5351	Dilution Factor	(DF)	6
Test Code	Digest Dilution Factor	(DDF)	1
TOTC-01	µg of Carbon in Sample	(C1)	26.8
Matrix	µg of Carbon in Blank	(C2)	3.1
LIQUID	g of Carbon/L	=	7.11E-01
Sample #			
S96V000008			
Instrument Code			
WC39937			
Analyst			
R. WENDLAND			
Date			
02/27/96			
Time			
08:36 AM			

g of Carbon/L = $\frac{(C1-C2) * DF * DDF}{VI * 1000}$

µg of Carbon/mL = g of Carbon/L * 1000000 µg/g / 1000 mL/L

Detection Level (µg/mL) = $\frac{1 \text{ µg C} * DF * DDF}{VI}$

µg Carbon/mL =	7.11E+02	DETECTION LEVEL in µg/mL
		3.00E+01

Data Entry by: [signature] Date: 03/01/96

Approved by: [signature] Date: 3-1-96

Form 344105_C Rev. 1.1

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-142, REV. 1

TOC : LA-344-105 (C-0) **LIQUIDS**

			DUPLICATE
Sample Volume in mL	(SS)		0.200
H2SO4 Volume in mL	(VR)		1.000
Volume Injected in mL	(VI)		0.200
Dilution Factor	(DF)		6
Digest Dilution Factor	(DDF)		1
µg of Carbon in Sample	(C1)		28
µg of Carbon in Blank	(C2)		3.1
g of Carbon/L		=	7.47E-01

Type	DUPLICATE
Work List	5351
Test Code	TOTC-01
Matrix	LIQUID
Sample #	S96V000008DUP
Instrument Code	WC39937
Analyst	R. WENDLAND
Date	02/27/96
Time	08:36 AM

g of Carbon/L = $\frac{(C1-C2) * DF * DDF}{VI * 1000}$

µg of Carbon/mL = g of Carbon/L * 1000000 µg/g / 1000 mL/L

Detection Level (µg/mL) = $\frac{1 \text{ µg C} * DF * DDF}{VI}$

µg Carbon/mL =	7.47E+02	DETECTION LEVEL in µg/mL
		3.00E+01

Data Entry by:	[signature]	Date:	03/01/96
Approved by:	[signature]	Date:	3-1-96

Form 344105_C Rev. 1.1 Page 1 of 1

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-142, REV. 1

TOC : LA-344-105 (C-0) LIQUIDS

			SAMPLE
Type	Sample Volume in mL	(SS)	2.000
SAMPLE	H2SO4 Volume in mL	(VR)	0.200
Work List	Volume Injected in mL	(VI)	0.200
5351	Dilution Factor	(DF)	1.1
Test Code	Digest Dilution Factor	(DDF)	1
TOTC-01	µg of Carbon in Sample	(C1)	5.1
Matrix	µg of Carbon in Blank	(C2)	3.1
LIQUID	g of Carbon/L	=	1.10E-02
Sample #			
S96V000016			
Instrument Code			
WC39937			
Analyst			
R. WENDLAND			
Date			
02/27/96			
Time			
08:36 AM			

g of Carbon/L = $\frac{(C1-C2) * DF * DDF}{VI * 1000}$

µg of Carbon/mL = g of Carbon/L * 1000000 µg/g / 1000 mL/L

Detection Level (µg/mL) = $\frac{1 \text{ µg C} * DF * DDF}{VI}$

µg Carbon/mL =	1.10E+01	DETECTION LEVEL in µg/mL
		5.50E+00

Data Entry by:	[signature]	Date:	03/01/96
Approved by:	[signature]	Date:	3-1-96

Form 344105_C Rev. 1.1

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-142, REV. 1

TOC : LA-344-105 (C-0) LIQUIDS

Type	Work List	Test Code	Matrix	Sample #	Instrument Code	Analyst	Date	Time
DUPLICATE	5351	TOTC-01	LIQUID	S96V000016DUP	WC39937	R. WENDLAND	02/27/96	08:36 AM

			DUPLICATE
Sample Volume in mL	(SS)		2.000
H2SO4 Volume in mL	(VR)		0.200
Volume Injected in mL	(VI)		0.200
Dilution Factor	(DF)		1.1
Digest Dilution Factor	(DDF)		1
µg of Carbon in Sample	(C1)		5.1
µg of Carbon in Blank	(C2)		3.1
g of Carbon/L		=	1.10E-02

$$\text{g of Carbon/L} = \frac{(C1-C2) * DF * DDF}{VI * 1000}$$

$$\text{µg of Carbon/mL} = \text{g of Carbon/L} * 1000000\ \text{µg/g} / 1000\ \text{mL/L}$$

$$\text{Detection Level (µg/mL)} = \frac{1\ \text{µg C} * DF * DDF}{VI}$$

µg Carbon/mL =	1.10E+01	DETECTION LEVEL in µg/mL
		5.50E+00

Data Entry by:	[signature]	Date:	03/01/96
Approved by:	[signature]	Date:	3-1-96

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

WHC-SD-WM-DP-142, REV1

Sample: BLK *Date: 02/27/96* *Time: 07:17:53*

Sample Size = 200 uL *Analyst : RA WENDLAND*
Dil Factor = 1 *Min Readings = 10*
Blank ID # = BLK *Max Readings = 10*
Blank Value = N/A *% Difference = 10*

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.50	0.00
2	1.01	1.10	54.55
3	1.51	1.40	21.43
4	2.01	1.70	17.65
5	2.51	1.90	10.53
6	3.01	2.10	9.52
7	3.51	2.50	16.00
8	4.01	2.60	3.85
9	4.50	2.90	10.34
10	5.00	3.10	6.45

SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 200 TO 211.

BLANK VALUE = 3.1 micrograms carbon
BLANK FACTOR = 3.1 / 5.004486 = +6.2E-01 ug/min Carbon

Sample Run By: RW 2-27-96
RA WENDLAND *00000*

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-142, REV.1

Sample: BASE *Date: 02/27/96* *Time: 07:23:14*

Sample Size = 200 uL *Analyst : RA WENDLAND*
Dil Factor = 1 *Min Readings = 10*
Blank ID # = BLK *Max Readings = 10*
Blank Value = .6194442 ug/minute C *% Difference = 10*

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.20	0.00
2	1.01	0.30	33.33
3	1.51	0.60	50.00
4	2.01	0.80	25.00
5	2.51	1.00	20.00
6	3.01	1.20	16.67
7	3.51	1.40	14.29
8	4.01	1.60	12.50
9	4.51	1.80	11.11
10	5.01	2.00	10.00

BLANK VALUE = 3.1 micrograms carbon
BLANK FACTOR = 3.1 / 5.004486 = +6.2E-01 ug/min Carbon

SAMPLE RESULTS:
(2 - 3.100624)(1)/(200) = < 5.00 E-3 g/L Carbon
(2 - 3.100624)(1)/(200)(12) = < 4.17 E-4 Molar Carbon
< < < < WARNING- PERCENT DIFFERENCE EXCEEDS 10 PERCENT > > > >

Sample Run By: _____
RA WENDLAND *00000*

3.1 - 2 = 1.1

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: STD *Date: 02/27/96* *Time: 07:28:45* WHC-SD-WM-DP-142, REV. 1

Sample Size = 200 uL *Analyst : RA WENDLAND*
Dil Factor = 11 *Min Readings = 10*
Blank ID # = BLK *Max Readings = 10*
Blank Value = .6194442 ug/minute C *% Difference = 10*

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	1.40	0.00
2	1.01	34.90	95.99
3	1.51	50.80	31.30
4	2.01	55.10	7.80
5	2.51	56.40	2.30
6	3.01	57.10	1.23
7	3.51	57.50	0.70
8	4.01	57.70	0.35
9	4.50	58.00	0.52
10	5.00	58.20	0.34

BLANK VALUE = 3.1 micrograms carbon
BLANK FACTOR = 3.1 / 5.004486 = +6.2E-01 ug/min Carbon

SAMPLE RESULTS:
(58.2 - 3.100113)(11)/(200) = +3.03E+00 g/L Carbon
(58.2 - 3.100113)(11)/(200)(12) = +2.53E-01 Molar Carbon

Sample Run By: _____
RA WENDLAND *00000*

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-142, REV. 1

Sample: 7 *Date: 02/27/96* *Time: 08:36:59*

Sample Size = 200 uL *Analyst : RA WENDLAND*
Dil Factor = 1 *Min Readings = 10*
Blank ID # = BLK *Max Readings = 10*
Blank Value = .6194442 ug/minute C *% Difference = 10*

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	2.20	0.00
2	1.01	19.20	88.54
3	1.51	21.50	10.70
4	2.00	23.00	6.52
5	2.50	24.20	4.96
6	3.00	25.10	3.59
7	3.50	25.90	3.09
8	4.00	26.50	2.26
9	4.50	27.30	2.93
10	5.00	27.80	1.80

BLANK VALUE = 3.1 micrograms carbon
BLANK FACTOR = 3.1 / 5.004486 = +6.2E-01 ug/min Carbon

SAMPLE RESULTS:
(27.8 - 3.098998)(1)/(200) = +1.24E-01 g/L Carbon
(27.8 - 3.098998)(1)/(200)(12) = +1.03E-02 Molar Carbon

Sample Run By: _____
RA WENDLAND *00000*

203

df = 6

.200 (SAM) — 1 mL (H_2O) — .200 (INJ) RW

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-142, REV. 1

Sample: 7D *Date: 02/27/96* *Time: 08:42:38*

Sample Size = 200 uL *Analyst : RA WENDLAND*
Dil Factor = 1 *Min Readings = 10*
Blank ID # = BLK *Max Readings = 10*
Blank Value = .6194442 ug/minute C *% Difference = 10*

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	3.30	0.00
2	1.01	17.80	81.46
3	1.51	22.10	19.46
4	2.00	23.80	7.14
5	2.51	25.10	5.18
6	3.00	26.10	3.83
7	3.51	27.00	3.33
8	4.01	27.60	2.17
9	4.50	28.30	2.47
10	5.00	29.00	2.41

BLANK VALUE = 3.1 micrograms carbon
BLANK FACTOR = 3.1 / 5.004486 = +6.2E-01 ug/min Carbon

SAMPLE RESULTS:
(29 - 3.100094)(1)/(200) = +1.29E-01 g/L Carbon
(29 - 3.100094)(1)/(200)(12) = +1.08E-02 Molar Carbon

Sample Run By: _____
RA WENDLAND 00000

df = 6

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-142 REV. 1

Sample: 7S *Date: 02/27/96* *Time: 08:49:08*

Sample Size = 200 uL *Analyst : RA WENDLAND*
Dil Factor = 1 *Min Readings = 10*
Blank ID # = BLK *Max Readings = 10*
Blank Value = .6194442 ug/minute C *% Difference = 10*

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	7.30	0.00
2	1.01	67.60	89.20
3	1.51	76.40	11.52
4	2.00	80.80	5.45
5	2.50	83.60	3.35
6	3.00	85.50	2.22
7	3.50	87.00	1.72
8	4.00	88.00	1.14
9	4.50	89.00	1.12
10	5.00	89.80	0.89

BLANK VALUE = 3.1 micrograms carbon
BLANK FACTOR = 3.1 / 5.004486 = +6.2E-01 ug/min Carbon

SAMPLE RESULTS:
(89.8 - 3.099527)(1)/(200) = +4.34E-01 g/L Carbon
(89.8 - 3.099527)(1)/(200)(12) = +3.61E-02 Molar Carbon

Sample Run By: _____
RA WENDLAND *00000*

pdf = 6

205

.200 (DUP) - .200 (SPIKE) ~ (200 (INS) RW

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-142, REV. 1

Sample: 6 *Date: 02/27/96* *Time: 07:54:22*

Sample Size = 200 uL *Analyst : RA WENDLAND*
Dil Factor = 11 *Min Readings = 10*
Blank ID # = BLK *Max Readings = 10*
Blank Value = .6194442 ug/minute C *% Difference = 10*

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	1.10	0.00
2	1.01	18.20	93.96
3	1.51	26.00	30.00
4	2.01	28.30	8.13
5	2.51	29.40	3.74
6	3.01	29.80	1.34
7	3.51	30.20	1.32
8	4.01	30.60	1.31
9	4.50	30.90	0.97
10	5.00	31.20	0.96

BLANK VALUE = 3.1 micrograms carbon
BLANK FACTOR = 3.1 / 5.004486 = +6.2E-01 ug/min Carbon

SAMPLE RESULTS:
(31.2 - 3.099489)(11)/(200) = +1.55E+00 g/L Carbon
(31.2 - 3.099489)(11)/(200)(12) = +1.29E-01 Molar Carbon

Sample Run By: _____
RA WENDLAND *00000*

dF = 11

.200 (SAM) − 2mL(H_2O) − .200 (INJ) RW

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-~~142~~, REV. 1

Sample: 6D *Date: 02/27/96* *Time: 07:59:57*

Sample Size = 200 uL *Analyst : RA WENDLAND*
Dil Factor = 11 *Min Readings = 10*
Blank ID # = BLK *Max Readings = 10*
Blank Value = .6194442 ug/minute C *% Difference = 10*

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	1.20	0.00
2	1.01	20.90	94.26
3	1.51	26.50	21.13
4	2.01	28.50	7.02
5	2.51	29.50	3.39
6	3.01	30.10	1.99
7	3.51	30.50	1.31
8	4.01	31.00	1.61
9	4.51	31.40	1.27
10	5.01	31.70	0.95

BLANK VALUE = 3.1 micrograms carbon
BLANK FACTOR = 3.1 / 5.004486 = +6.2E-01 ug/min Carbon

SAMPLE RESULTS:
(31.7 - 3.100737)(11)/(200) = +1.57E+00 g/L Carbon
(31.7 - 3.100737)(11)/(200)(12) = +1.31E-01 Molar Carbon

Sample Run By: _____
RA WENDLAND *00000*

df=11

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-142, REV. 1

Sample: 8 *Date: 02/27/96* *Time: 08:10:00*

Sample Size = 200 uL *Analyst : RA WENDLAND*
Dil Factor = 1 *Min Readings = 10*
Blank ID # = BLK *Max Readings = 10*
Blank Value = .6194442 ug/minute C *% Difference = 10*

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	1.70	0.00
2	1.01	17.30	90.17
3	1.51	20.70	16.43
4	2.01	22.50	8.00
5	2.51	23.70	5.06
6	3.01	24.50	3.27
7	3.51	25.20	2.78
8	4.00	25.70	1.95
9	4.50	26.30	2.28
10	5.00	26.80	1.87

BLANK VALUE = 3.1 micrograms carbon
BLANK FACTOR = 3.1 / 5.004486 = +6.2E-01 ug/min Carbon

SAMPLE RESULTS:
(26.8 - 3.100094)(1)/(200) = +1.18E-01 g/L Carbon
(26.8 - 3.100094)(1)/(200)(12) = +9.87E-03 Molar Carbon

Sample Run By: _____
RA WENDLAND *00000*

df = 6

.200(Sam) − 1 mL(H_2O) − .200(INS) RW

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: 8D *Date: 02/27/96* *Time: 08:17:21* WHC-SD-WM-DP-142, REV. 1

Sample Size = 200 uL *Analyst : RA WENDLAND*
Dil Factor = 1 *Min Readings = 10*
Blank ID # = BLK *Max Readings = 10*
Blank Value = .6194442 ug/minute C *% Difference = 10*

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	2.10	0.00
2	1.01	18.50	88.65
3	1.51	21.20	12.74
4	2.00	22.90	7.42
5	2.50	24.30	5.76
6	3.00	25.20	3.57
7	3.50	26.10	3.45
8	4.00	26.80	2.61
9	4.50	27.40	2.19
10	5.00	28.00	2.14

BLANK VALUE = 3.1 micrograms carbon
BLANK FACTOR = 3.1 / 5.004486 = +6.2E-01 ug/min Carbon

SAMPLE RESULTS:
(28 - 3.099508)(1)/(200) = +1.25E-01 g/L Carbon
(28 - 3.099508)(1)/(200)(12) = +1.04E-02 Molar Carbon

Sample Run By: _____ .
RA WENDLAND *00000*

df=6

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: 16 *Date: 02/27/96* *Time: 08:22:57* WHC-SD-WM-DP-142, REV. 1

Sample Size = 200 uL *Analyst : RA WENDLAND*
Dil Factor = 1.1 *Min Readings = 10*
Blank ID # = BLK *Max Readings = 10*
Blank Value = .6194442 ug/minute C *% Difference = 10*

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.40	0.00
2	1.01	1.30	69.23
3	1.50	1.80	27.78
4	2.00	2.40	25.00
5	2.50	2.80	14.29
6	3.00	3.30	15.15
7	3.50	3.70	10.81
8	4.00	4.10	9.76
9	4.50	4.60	10.87
10	5.00	5.10	9.80

BLANK VALUE = 3.1 micrograms carbon
BLANK FACTOR = 3.1 / 5.004486 = +6.2E-01 ug/min Carbon

SAMPLE RESULTS:
(5.1 - 3.098979)(1.1)/(200) = +1.1E-02 g/L Carbon
(5.1 - 3.098979)(1.1)/(200)(12) = +9.2E-04 Molar Carbon

Sample Run By: _____
RA WENDLAND *00000*

df = 1.1

210

2 mL (Sam) — .200 (H_2O) — .200 (1-I) DW

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-142, REV. 1

Sample: 16D *Date: 02/27/96* *Time: 08:29:12*

Sample Size = 200 uL *Analyst : RA WENDLAND*
Dil Factor = 1.1 *Min Readings = 10*
Blank ID # = BLK *Max Readings = 10*
Blank Value = .6194442 ug/minute C *% Difference = 10*

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.50	0.00
2	1.01	1.30	61.54
3	1.51	1.80	27.78
4	2.01	2.30	21.74
5	2.51	2.80	17.86
6	3.01	3.20	12.50
7	3.51	3.70	13.51
8	4.00	4.10	9.76
9	4.50	4.60	10.87
10	5.00	5.10	9.80

BLANK VALUE = 3.1 micrograms carbon
BLANK FACTOR = 3.1 / 5.004486 = +6.2E-01 ug/min Carbon

SAMPLE RESULTS:
(5.1 - 3.100019)(1.1)/(200) = +1.1E-02 g/L Carbon
(5.1 - 3.100019)(1.1)/(200)(12) = +9.2E-04 Molar Carbon

Sample Run By: _____
RA WENDLAND *00000*

df=(.1

THE FOLLOWING ANALYSES WERE RERUN AND INCLUDED IN THE DATA PACKAGE, BUT THE RESULTS HAVE NOT BEEN REPORTED IN THE FINAL SUMMARY REPORTS.

LABCORE Data Entry Template for Worklist# 6859

Analyst: RAW **Instrument:** TOC01 WB39937 **Book #** STD-16N12-D SPK-11N12-H

Method: LA-344-105 Rev/Mod C-0

Worklist Comment: Total Carbon AP-104 (See sample size suggestions below)

GROUP	PROJECT	S TYPE	SAMPLE#	R A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT
		1 STD			TOTC-01	LIQUID	3.00e3	3.03e3	N/A	ug/mL
96000036	AP-104	2 SAMPLE	S96V000016	0	TOTC-01	LIQUID	N/A	<5.00e0	5.00	ug/mL
96000036	AP-104	3 SPK	S96V000016	0	TOTC-01	LIQUID	100	133.8	N/A	ug/mL
96000036	AP-104	4 SPK-DUP	S96V000016	0	TOTC-01	LIQUID	~~100~~ 133.8 RWS 3/29/96	116.2	N/A	ug/mL

Final page for worklist # 6859

R. Wendland 3/22/96
Analyst Signature **Date**

Entered & Reviewed & Rejected
Analyst Signature **Date**
RW Schroeder 3/29/96

S96V000016 use 0.200ml sample - Direct injection; No sparge.
Spike & spike dup. use
0.400ml sample + 0.400ml of (1ml TOC spike + 10ml H_2O, sparged 2 min) —
0.200ml inject.

DATA NOT USED IN PACKAGE

Data Entry Comments:

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

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-147, REV. 1

TOC : LA-344-105 (C-0) **LIQUIDS**

Type	Sample Volume in mL	(SS)	Blank
Blank	H2SO4 Volume in mL	(VR)	0 ~~0.200~~ RWS 3/29/96
Work List	Volume Injected in mL	(VI)	0.200
6859	Dilution Factor	(DF)	1
Test Code	Digest Dilution Factor	(DDF)	1
TOTC-01	µg of Carbon in Sample	(C1)	1.5
Matrix	µg of Carbon in Blank	(C2)	0.9
Liquid	g of Carbon/L	= <	5.00E-03
Sample #			
Blnk			
Instrument Code			
WB39937			
Analyst			
RA Wendland			
Date			
03/22/96			
Time			

g of Carbon/L = $\frac{(C1-C2) * DF * DDF}{VI * 1000}$

µg of Carbon/mL = g of Carbon/L * 1000000 µg/g / 1000 mL/L

Detection Level (µg/mL) = $\frac{1 \text{ µg C} * DF * DDF}{VI}$

DATA NOT USED IN PACKAGE

NOTE: Reported Result is Below Detection Level.

µg Carbon/mL =	< 5.00E+00	DETECTION LEVEL in µg/mL
		5.00E+00

Data Entry by:	RWS	Date:	03/29/96
Approved by:	RWS	Date:	3/29/96

Form 344105_C Rev. 1.1

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-142, REV. 1

TOC : LA-344-105 (C-0) LIQUIDS

Type	Standard
Work List	6859
Test Code	TOTC-01
Matrix	Liquid
Sample #	16N12D
Instrument Code	WB39937
Analyst	RA Wendland
Date	03/22/96
Time	

			Standard
Sample Volume in mL	(SS)		0.200
H2SO4 Volume in mL	(VR)		2.000
Volume Injected in mL	(VI)		0.200
Dilution Factor	(DF)		11
Digest Dilution Factor	(DDF)		1
µg of Carbon in Sample	(C1)		56.6
µg of Carbon in Blank	(C2)		1.5
g of Carbon/L		=	3.03E+00

g of Carbon/L = $\frac{(C1-C2) * DF * DDF}{VI * 1000}$

µg of Carbon/mL = g of Carbon/L * 1000000 µg/g / 1000 mL/L

Detection Level (µg/mL) = $\frac{1 \text{ µg C} * DF * DDF}{VI}$

DATA NOT USED IN PACKAGE

µg Carbon/mL =	3.03E+03	DETECTION LEVEL in µg/mL
		5.50E+01

Data Entry by:	RWS	Date:	03/29/96
Approved by:	RWS	Date:	3/29/96

Form 344105_C Rev. 1.1

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-142, REV. 1

TOC : LA-344-105 (C-0) **LIQUIDS**

Type				Sample
Sample	Sample Volume in mL	(SS)		0.200
Work List	H2SO4 Volume in mL	(VR)		0.000
6859	Volume Injected in mL	(VI)		0.200
Test Code	Dilution Factor	(DF)		1
TOTC-01	Digest Dilution Factor	(DDF)		1
Matrix	µg of Carbon in Sample	(C1)		1.5
Liquid	µg of Carbon in Blank	(C2)		1.5
Sample #	g of Carbon/L	=	<	5.00E-03
S96V000016				
Instrument Code				
WB39937				
Analyst				
RA Wendland				
Date				
03/22/96				
Time				

g of Carbon/L = $\frac{(C1-C2) * DF * DDF}{VI * 1000}$

µg of Carbon/mL = g of Carbon/L * 1000000 µg/g / 1000 mL/L

Detection Level (µg/mL) = $\frac{1 \text{ µg C} * DF * DDF}{VI}$

DATA NOT USED IN PACKAGE

NOTE: Reported Result is Below Detection Level.

µg Carbon/mL =	< 5.00E+00	DETECTION LEVEL in µg/mL
		5.00E+00

Data Entry by: RWS Date: 03/29/96

Approved by: RWS Date: 3/29/96

Form 344105_C Rev. 1.1

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

WHC-SD-WM-DP-142, REV. 1

TOC: LA-344-105

SPIKED SAMPLE

Type
SPIKE
Work List
6859
Test Code
TOTC-01
Matrix
Liquid
Sample #
S96V000016
Instrument Code
WB39937
Analyst
RA Wendland
Date
03/22/96
Time

>>>>>> Sample Vial Data <<<<<<	
Sample Volume in mL	0.200
H2SO4 Volume in mL	0.000
Volume Injected in mL	0.200
µg of Carbon in Sample	1.5
µg of Carbon in Blank	1.5

SPIKE	
>>>>> Spiked Vial Data <<<<<	
Sample Size in mL (SS)	0.400
Spike Volume in mL	0.400
H2SO4 Volume in mL	0.000
Volume Injected in mL	0.200
Sample Pre-Spike Dil. Factor (PDF)	1
Spike Value (µg/ml)	68
µg C in Sample + Spike	10.6
µg C in Blank	1.5

PERCENT SPIKE RE = $\frac{\text{µg Carbon Recovered from Spike} * 100}{\text{µg Carbon in Spike}}$

WHERE : µg Carbon Recovered from Spike =

[(µgC in sample + spike - µgC in blank) * (Spike Correction Factor)]

- [(µgC sample - µgC blank) * (Sample Correction Factor) * (Sample Size Correction Factor) * (PDF)]

Spike Correction Factor = $\frac{\text{Total volume in spiked sample vial (mL)}}{\text{Volume injected (mL)}}$

Sample Correction Factor = $\frac{\text{Total volume in sample vial (mL)}}{\text{Volume injected (mL)}}$

DATA NOT USED IN PACKAGE

Sample Size Correction Factor = $\frac{\text{Sample size in (mL) in spiked vial}}{\text{Sample size (mL) in sample}}$

Sample Pre-Spike Dilution Factor = $\frac{1}{\text{Dilution of Sample Before Added to Spike Vial}}$

WHERE : µg Carbon in Spike = Spike Value (µg/mL) * Spike Volume (mL)

Percent Spike Recovery 133.8%

Data Entry by:	RWS	Date: 29-Mar-96
Approved by:	RWS	Date: 3/29/96

Form X Rev. 1.1

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

WHC-SD-WM-DP-142, REV. 1

TOC: LA-344-105 SPIKED SAMPLE

Type
SPIKE
Work List
6859
Test Code
TOTC-01
Matrix
Liquid
Sample #
S96V000016DUP
Instrument Code
WB39937
Analyst
RA Wendland
Date
03/22/96
Time

>>>>>> Sample Vial Data <<<<<<	
Sample Volume in mL	0.200
H2SO4 Volume in mL	0.000
Volume Injected in mL	0.200
µg of Carbon in Sample	1.5
µg of Carbon in Blank	1.5

SPIKE	
>>>>> Spiked Vial Data <<<<<	
Sample Size in mL (SS)	0.400
Spike Volume in mL	0.400
H2SO4 Volume in mL	0.000
Volume Injected in mL	0.200
Sample Pre-Spike Dil. Factor (PDF)	1
Spike Value (µg/ml)	68
µg C in Sample + Spike	9.4
µg C in Blank	1.5

PERCENT SPIKE RE = $\frac{\text{µg Carbon Recovered from Spike} * 100}{\text{µg Carbon in Spike}}$

WHERE : µg Carbon Recovered from Spike =

[(µgC in sample + spike - µgC in blank) * (Spike Correction Factor)]

- [(µgC sample - µgC blank) * (Sample Correction Factor) * (Sample Size Correction Factor) * (PDF)]

Spike Correction Factor = Total volume in spiked sample vial (mL) / Volume injected (mL)

Sample Correction Factor = Total volume in sample vial (mL) / Volume injected (mL)

DATA NOT USED IN PACKAGE

Sample Size Correction Factor = Sample size in (mL) in spiked vial / Sample size (mL) in sample

Sample Pre-Spike Dilution Factor = 1 / Dilution of Sample Before Added to Spike Vial

WHERE : µg Carbon in Spike = Spike Value (µg/mL) * Spike Volume (mL)

Percent Spike Recovery 116.2%

Data Entry by:	RWS	Date: 29-Mar-96
Approved by:	RWS	Date: 5/29/96

P

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0 WHC-SD-WM-DP-142, REV. 1
<<< BLANK ANALYSIS >>>

Sample: BLK Date: 03/22/96 Time: 09:03:15

Sample Size = 200 uL
Dil Factor = 1
Blank ID # = BLK
Blank Value = N/A

Analyst : RA WENDLAND
Min Readings = 10
Max Readings = 10
% Difference = 10

Reading	Analysis Time	Coulometer	% Difference
1	0.51	0.10	0.00
2	1.01	0.60	83.33
3	1.51	0.80	25.00
4	2.01	0.90	11.11
5	2.51	1.00	10.00
6	3.01	1.10	9.09
7	3.51	1.20	8.33
8	4.01	1.30	7.69
9	4.51	1.40	7.14
10	5.01	1.50	6.67

DATA NOT USED IN PACKAGE

BLANK VALUE = 1.5 micrograms carbon
BLANK FACTOR = 1.5 / 5.005493 = +3.0E-01 ug/min Carbon

Sample Run By: _____
RA WENDLAND 00000

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-142, REV. 1

Sample: BASE Date: 03/22/96 Time: 09:08:46

Sample Size = 200 uL
Dil Factor = 1
Blank ID # = BLK
Blank Value = .2996708 ug/minute C

Analyst : RA WENDLAND
Min Readings = 10
Max Readings = 10
% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.10	0.00
2	1.01	0.10	0.00
3	1.51	0.30	66.67
4	2.01	0.30	0.00
5	2.51	0.40	25.00
6	3.01	0.50	20.00
7	3.51	0.60	16.67
8	4.01	0.70	14.29
9	4.50	0.80	12.50
10	5.00	0.90	11.11

DATA NOT USED IN PACKAGE

BLANK VALUE = 1.5 micrograms carbon
BLANK FACTOR = 1.5 / 5.005493 = +3.0E-01 ug/min Carbon

SAMPLE RESULTS:
(.9 - 1.499744)(1)/(200) = < 5.00 E-3 g/L Carbon
(.9 - 1.499744)(1)/(200)(12) = < 4.17 E-4 Molar Carbon
<<<< WARNING- PERCENT DIFFERENCE EXCEEDS 10 PERCENT >>>>

Sample Run By: _____
RA WENDLAND 00000

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0
WHC-SD-WM-DP-142, REV. 1

Sample: STD Date: 03/22/96 Time: 09:14:05

Sample Size = 200 uL
Dil Factor = 11
Blank ID # = BLK
Blank Value = .2996708 ug/minute C

Analyst : RA WENDLAND
Min Readings = 10
Max Readings = 10
% Difference = 10

Reading	Analysis Time	Coulometer	% Difference
1	0.51	2.10	0.00
2	1.01	41.20	94.90
3	1.51	52.30	21.22
4	2.01	54.90	4.74
5	2.51	55.60	1.26
6	3.01	56.00	0.71
7	3.51	56.30	0.53
8	4.01	56.40	0.18
9	4.50	56.50	0.18
10	5.00	56.60	0.18

DATA NOT USED IN PACKAGE

BLANK VALUE = 1.5 micrograms carbon
BLANK FACTOR = 1.5 / 5.005493 = +3.0E-01 ug/min Carbon

SAMPLE RESULTS:
(56.6 - 1.499689)(11)/(200) = +3.03E+00 g/L Carbon
(56.6 - 1.499689)(11)/(200)(12) = +2.53E-01 Molar Carbon

Sample Run By: R. WENDLAND 3/22/96
RA WENDLAND 00000

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0
WHC-SD-WM-DP-142, REV. 1

Sample: 16 Date: 03/22/96 Time: 09:19:26

Sample Size = 200 uL
Dil Factor = 1
Blank ID # = BLK
Blank Value = .2996708 ug/minute C

Analyst : RA WENDLAND
Min Readings = 10
Max Readings = 10
% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.20	0.00
2	1.01	0.60	66.67
3	1.51	0.80	25.00
4	2.01	0.90	11.11
5	2.51	1.10	18.18
6	3.00	1.10	0.00
7	3.50	1.20	8.33
8	4.00	1.30	7.69
9	4.50	1.40	7.14
10	5.00	1.50	6.67

DATA NOT USED IN PACKAGE

BLANK VALUE = 1.5 micrograms carbon
BLANK FACTOR = 1.5 / 5.005493 = +3.0E-01 ug/min Carbon

SAMPLE RESULTS:
(1.5 - 1.499433)(1)/(200) = < 5.00 E-3 g/L Carbon
(1.5 - 1.499433)(1)/(200)(12) = < 4.17 E-4 Molar Carbon

Sample Run By: _____
RA WENDLAND 00000

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-142, REV. 1

Sample: SPK16 Date: 03/22/96 Time: 09:25:09

Sample Size	= 200 uL	Analyst :	RA WENDLAND
Dil Factor	= 1	Min Readings	= 10
Blank ID #	= BLK	Max Readings	= 10
Blank Value	= .2996708 ug/minute C	% Difference	= 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.10	0.00
2	1.01	6.20	98.39
3	1.51	8.70	28.74
4	2.01	9.60	9.38
5	2.51	9.90	3.03
6	3.01	10.10	1.98
7	3.51	10.20	0.98
8	4.01	10.30	0.97
9	4.50	10.40	0.96
10	5.00	10.60	1.89

DATA NOT USED IN PACKAGE

BLANK VALUE = 1.5 micrograms carbon
BLANK FACTOR = 1.5 / 5.005493 = +3.0E-01 ug/min Carbon

SAMPLE RESULTS:
(10.6 - 1.499762)(1)/(200) = +4.55E-02 g/L Carbon
(10.6 - 1.499762)(1)/(200)(12) = +3.79E-03 Molar Carbon

Sample Run By: _____
RA WENDLAND 00000

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-142, REV. 1

Sample: SPK16-D Date: 03/22/96 Time: 09:30:36

Sample Size = 200 uL
Dil Factor = 1
Blank ID # = BLK
Blank Value = .2996708 ug/minute C

Analyst : RA WENDLAND
Min Readings = 10
Max Readings = 10
% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.80	0.00
2	1.01	6.40	87.50
3	1.51	7.90	18.99
4	2.01	8.50	7.06
5	2.51	8.70	2.30
6	3.01	8.90	2.25
7	3.51	9.10	2.20
8	4.01	9.20	1.09
9	4.51	9.20	0.00
10	5.01	9.40	2.13

DATA NOT USED IN PACKAGE

BLANK VALUE = 1.5 micrograms carbon
BLANK FACTOR = 1.5 / 5.005493 = +3.0E-01 ug/min Carbon

SAMPLE RESULTS:
(9.4 - 1.5)(1)/(200) = +3.9E-02 g/L Carbon
(9.4 - 1.5)(1)/(200)(12) = +3.3E-03 Molar Carbon

Sample Run By: _____
RA WENDLAND 00000

THE FOLLOWING ANALYSES WERE RERUN AND INCLUDED IN THE DATA PACKAGE, BUT THE RESULTS HAVE NOT BEEN REPORTED IN THE FINAL SUMMARY REPORTS.

LABCORE Data Entry Template for Worklist# 7120

Analyst: RAW **Instrument:** TOC01 WB39837 **Book #** 16N12-E

Method: LA-344-105 Rev/Mod C-0 WHC-SD-WM-DP-142, REV. 1

Worklist Comment: AP-104 Total Carbon (See sample size suggestions below)

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	-------TEST------	MATRIX	ACTUAL	FOUND	DL	UNIT
		1	BLNK				TOTC-01	LIQUID	1	0.1	N/A	ug/mL
		2	STD				TOTC-01	LIQUID	3.00e3	3.13e3	N/A	ug/mL
96000036	AP-104	3	SAMPLE	S96V000016	0		TOTC-01	LIQUID	N/A	6.50e0	5.00	ug/mL
96000036	AP-104	4	DUP	S96V000016	0		TOTC-01	LIQUID	6.50e0	7.00e0	N/A	ug/mL
96000036	AP-104	5	SPK	S96V000016	0		TOTC-01	LIQUID	100	72.3	N/A	ug/mL
96000036	AP-104	6	SPK-DUP	S96V000016	0		TOTC-01	LIQUID	72.3	71.6	N/A	ug/mL

Final page for worklist # 7120

R. WENDLAND 3-29-96
Analyst Signature Date

Analyst Signature Date 4-1-96

Approved by HAnastos 4-1-96

Rejected by HAnastos 4-1-96

recommended sample sizes:

S96V000016 - .200 direct, no sparge

S96V000016 spike & spike dup

0.400 ml sample + 0.400 ml of (.500 ml TOC STD RW 3-29-96 (16N12-E) spike + 1ml H_2O) sparge,

- 0.200ml inject.

DATA NOT USED IN PACKAGE

Data Entry Comments: No TOC SPIKE STD. AVAILABLE

Spk out of Control Sample will be rerun. HEA 4-1-96

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

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-142, REV. 1

TOC : LA-344-105 (C-0) **LIQUIDS**

Type	Sample Volume in mL	(SS)	Blank
Blank	H2SO4 Volume in mL	(VR)	0.000
Work List	Volume Injected in mL	(VI)	0.200
7120	Dilution Factor	(DF)	1
Test Code	Digest Dilution Factor	(DDF)	1
TOTC-01	µg of Carbon in Sample	(C1)	2.1
Matrix	µg of Carbon in Blank	(C2)	2
Liquid	g of Carbon/L	= <	5.00E-03
Sample #			
BLNK			
Instrument Code			
WB39937			
Analyst			
RA Wendland			
Date			
03/29/96			
Time			

g of Carbon/L = $\frac{(C1-C2) * DF * DDF}{VI * 1000}$

µg of Carbon/mL = g of Carbon/L * 1000000 µg/g / 1000 mL/L

Detection Level (µg/mL) = $\frac{1 \text{ µg C} * DF * DDF}{VI}$

DATA NOT USED IN PACKAGE

NOTE: Reported Result is Below Detection Level.

µg Carbon/mL =	< 5.00E+00	DETECTION LEVEL in µg/mL
		5.00E+00

Data Entry by:	RWS	Date:	04/01/96
Approved by:	RWS	Date:	4/1/96

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-142, REV. 1

TOC : LA-344-105 (C-0) LIQUIDS

Type	Sample Volume in mL	(SS)	Standard
Standard	H2SO4 Volume in mL	(VR)	0.200
Work List	Volume Injected in mL	(VI)	2.000
7120	Dilution Factor	(DF)	0.200
Test Code	Digest Dilution Factor	(DDF)	11
TOTC-01	µg of Carbon in Sample	(C1)	1
Matrix	µg of Carbon in Blank	(C2)	59
Liquid	g of Carbon/L	=	2.1
Sample #			3.13E+00
16N12E			
Instrument Code			
WB39937			
Analyst			
RA Wendland			
Date			
03/29/96			
Time			

g of Carbon/L = $\frac{(C1-C2) * DF * DDF}{VI * 1000}$

µg of Carbon/mL = g of Carbon/L * 1000000 µg/g / 1000 mL/L

Detection Level (µg/mL) = $\frac{1 \text{ µg C} * DF * DDF}{VI}$

DATA NOT USED IN PACKAGE

µg Carbon/mL =	3.13E+03	DETECTION LEVEL in µg/mL
		5.50E+01

Data Entry by:	RWS	Date:	04/01/96
Approved by:	RWS	Date:	4/1/96

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-142, REV. 1

TOC : LA-344-105 (C-0) LIQUIDS

Type	Sample Volume in mL	(SS)	Sample: 0.200
Sample	H2SO4 Volume in mL	(VR)	0.000
Work List	Volume Injected in mL	(VI)	0.200
7120	Dilution Factor	(DF)	1
Test Code	Digest Dilution Factor	(DDF)	1
TOTC-01	µg of Carbon in Sample	(C1)	3.4
Matrix	µg of Carbon in Blank	(C2)	2.1
Liquid	g of Carbon/L	=	6.50E-03
Sample #			
S96V000016			
Instrument Code			
WB39937			
Analyst			
RA Wendland			
Date			
03/29/96			
Time			

g of Carbon/L = (C1-C2) * DF * DDF / VI * 1000

µg of Carbon/mL = g of Carbon/L * 1000000 µg/g / 1000 mL/L

Detection Level (µg/mL) = 1 µg C * DF * DDF / VI

DATA NOT USED IN PACKAGE

µg Carbon/mL =	6.50E+00	DETECTION LEVEL in µg/mL: 5.00E+00

Data Entry by:	RWS	Date:	04/01/96
Approved by:	RWS	Date:	4/1/96

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-142-REV. 1

TOC : LA-344-105 (C-0) LIQUIDS

Type	Sample Volume in mL	(SS)	Sample: 0.200
Sample	H2SO4 Volume in mL	(VR)	0.000
Work List	Volume Injected in mL	(VI)	0.200
7120	Dilution Factor	(DF)	1
Test Code	Digest Dilution Factor	(DDF)	1
TOTC-01	µg of Carbon in Sample	(C1)	3.5
Matrix	µg of Carbon in Blank	(C2)	2.1
Liquid	g of Carbon/L	=	7.00E-03
Sample #			
S96V000016-DUP			
Instrument Code			
WB39937			
Analyst			
RA Wendland			
Date			
03/29/96			
Time			

g of Carbon/L = $\frac{(C1-C2) * DF * DDF}{VI * 1000}$

µg of Carbon/mL = g of Carbon/L * 1000000 µg/g / 1000 mL/L

Detection Level (µg/mL) = $\frac{1 \text{ µg C} * DF * DDF}{VI}$

DATA NOT USED IN PACKAGE

µg Carbon/mL =	7.00E+00	DETECTION LEVEL in µg/mL
		5.00E+00

Data Entry by:	RWS	Date:	04/01/96
Approved by:	RWS	Date:	4/1/96

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

WHC-SD-WM-DP-142, REV. 1

TOC: LA-344-105 SPIKED SAMPLE

SPIKE

Type	>>>>>> Sample Vial Data <<<<<<		>>>>> Spiked Vial Data <<<<<	
SPIKE	Sample Volume in mL	0.200	Sample Size in mL (SS)	0.400
Work List	H2SO4 Volume in mL	0.000	Spike Volume in mL	0.400
7120	Volume Injected in mL	0.200	H2SO4 Volume in mL	0.000
Test Code	µg of Carbon in Sample	3.4	Volume Injected in mL	0.200
TOTC-01	µg of Carbon in Blank	2.1	Sample Pre-Spike Dil. Factor (PDF)	1
Matrix			Spike Value (µg/ml)	1000
Liquid			µg C in Sample + Spike	75
Sample #			µg C in Blank	2.1
S96V000016				
Instrument Code				
WB39937				
Analyst				
RA Wendland				
Date				
03/29/96				
Time				

PERCENT SPIKE RE = $\frac{\text{µg Carbon Recovered from Spike} * 100}{\text{µg Carbon in Spike}}$

WHERE : µg Carbon Recovered from Spike =

[(µgC in sample + spike - µgC in blank) * (Spike Correction Factor)]

- [(µgC sample - µgC blank) * (Sample Correction Factor) * (Sample Size Correction Factor) * (PDF)]

Spike Correction Factor = Total volume in spiked sample vial (mL) / Volume injected (mL)

Sample Correction Factor = Total volume in sample vial (mL) / Volume injected (mL)

DATA NOT USED IN PACKAGE

Sample Size Correction Factor = Sample size in (mL) in spiked vial / Sample size (mL) in sample

Sample Pre-Spike Dilution Factor = 1 / Dilution of Sample Before Added to Spike Vial

WHERE : µg Carbon in Spike = Spike Value (µg/mL) * Spike Volume (mL)

Percent Spike Recovery 72.3%

Data Entry by:	RWS	Date: 01-Apr-96
Approved by:	RWS	Date: 4/1/96

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

WHC-SD-WM-DP-142, REV. 1

TOC: LA-344-105 SPIKED SAMPLE

SPIKE

Type	>>>>>> Sample Vial Data <<<<<<		>>>>> Spiked Vial Data <<<<<	
SPIKE	Sample Volume in mL	0.200	Sample Size in mL (SS)	0.400
Work List	H2SO4 Volume in mL	0.000	Spike Volume in mL	0.400
7120	Volume Injected in mL	0.200	H2SO4 Volume in mL	0.000
Test Code	µg of Carbon in Sample	3.4	Volume Injected in mL	0.200
TOTC-01	µg of Carbon in Blank	2.1	Sample Pre-Spike Dil. Factor (PDF)	1
Matrix			Spike Value (µg/ml)	1000
Liquid			µg C in Sample + Spike	74.3
Sample #			µg C in Blank	2.1
S96V000016-DUP				
Instrument Code				
WB39937				
Analyst				
RA Wendland				
Date				
03/29/96				
Time				

PERCENT SPIKE RE = $\frac{\text{µg Carbon Recovered from Spike} * 100}{\text{µg Carbon in Spike}}$

WHERE : µg Carbon Recovered from Spike =

[(µgC in sample + spike - µgC in blank) * (Spike Correction Factor)]

- [(µgC sample - µgC blank) * (Sample Correction Factor) * (Sample Size Correction Factor) * (PDF)]

DATA NOT USED IN PACKAGE

Spike Correction Factor = $\frac{\text{Total volume in spiked sample vial (mL)}}{\text{Volume injected (mL)}}$

Sample Correction Factor = $\frac{\text{Total volume in sample vial (mL)}}{\text{Volume injected (mL)}}$

Sample Size Correction Factor = $\frac{\text{Sample size in (mL) in spiked vial}}{\text{Sample size (mL) in sample}}$

Sample Pre-Spike Dilution Factor = $\frac{1}{\text{Dilution of Sample Before Added to Spike Vial}}$

WHERE : µg Carbon in Spike = Spike Value (µg/mL) * Spike Volume (mL)

Percent Spike Recovery 71.6%

Data Entry by:	RW Schneider	Date: 01-Apr-96
Approved by:	RW Schneider	Date: 4/1/96

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-142, REV.1

Sample: BASE Date: 03/29/96 Time: 06:46:12

Sample Size = 200 uL
Dil Factor = 1
Blank ID # = BLK
Blank Value = .4195237 ug/minute C

Analyst : RA WENDLAND
Min Readings = 10
Max Readings = 10
% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.10	0.00
2	1.01	0.20	50.00
3	1.51	0.40	50.00
4	2.01	0.70	42.86
5	2.51	0.80	12.50
6	3.01	1.10	27.27
7	3.51	1.30	15.38
8	4.01	1.50	13.33
9	4.50	1.70	11.76
10	5.00	2.00	15.00

DATA
NOT USED
IN PACKAGE

BLANK VALUE = 2.1 micrograms carbon
BLANK FACTOR = 2.1 / 5.005676 = +4.2E-01 ug/min Carbon

SAMPLE RESULTS:
(2 - 2.099565)(1)/(200) = < 5.00 E-3 g/L Carbon
(2 - 2.099565)(1)/(200)(12) = < 4.17 E-4 Molar Carbon
<<<< WARNING- PERCENT DIFFERENCE EXCEEDS 10 PERCENT >>>>

Sample Run By: _____
RA WENDLAND 00000

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0 WHC-SD-WM-DP-142, REV. 1
<<< BLANK ANALYSIS >>>

Sample: BLK Date: 03/29/96 Time: 06:36:19

Sample Size = 200 uL
Dil Factor = 1
Blank ID # = BLK
Blank Value = N/A

Analyst : RA WENDLAND
Min Readings = 10
Max Readings = 10
% Difference = 10

Reading	Analysis Time	Coulometer	% Difference
1	0.51	0.30	0.00
2	1.01	0.90	66.67
3	1.51	1.10	18.18
4	2.01	1.20	8.33
5	2.51	1.30	7.69
6	3.01	1.50	13.33
7	3.51	1.70	11.76
8	4.01	1.80	5.56
9	4.51	1.90	5.26
10	5.01	2.10	9.52

DATA
NOT USED
IN PACKAGE

BLANK VALUE = 2.1 micrograms carbon
BLANK FACTOR = 2.1 / 5.005676 = +4.2E-01 ug/min Carbon

Sample Run By: _____
RA WENDLAND 00000

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0 WHC-SD-WM-DP-142, REV. 1

Sample: STD Date: 03/29/96 Time: 06:57:19

Sample Size = 200 uL
Dil Factor = 11
Blank ID # = BLK
Blank Value = .4195237 ug/minute C

Analyst : RA WENDLAND
Min Readings = 10
Max Readings = 10
% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.60	0.00
2	1.01	37.50	98.40
3	1.51	52.60	28.71
4	2.01	56.10	6.24
5	2.51	57.20	1.92
6	3.01	57.80	1.04
7	3.51	58.10	0.52
8	4.01	58.40	0.51
9	4.51	58.70	0.51
10	5.01	59.00	0.51

DATA
NOT USED
IN PACKAGE

BLANK VALUE = 2.1 micrograms carbon
BLANK FACTOR = 2.1 / 5.005676 = +4.2E-01 ug/min Carbon

SAMPLE RESULTS:
(59 - 2.099923)(11)/(200) = +3.13E+00 g/L Carbon
(59 - 2.099923)(11)/(200)(12) = +2.61E-01 Molar Carbon

Sample Run By: R.A. WENDLAND 3-29-96
RA WENDLAND 00000

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0
WHC-SD-WM-DP-142, REV. 1

Sample: 16 Date: 03/29/96 Time: 12:37:39

Sample Size = 200 uL Analyst : RA WENDLAND
Dil Factor = 1 Min Readings = 10
Blank ID # = BLK Max Readings = 10
Blank Value = .4195237 ug/minute C % Difference = 10

Reading	Analysis Time	Coulometer	% Difference
1	0.51	0.50	0.00
2	1.01	0.80	37.50
3	1.51	1.10	27.27
4	2.00	1.50	26.67
5	2.50	1.80	16.67
6	3.00	2.10	14.29
7	3.50	2.40	12.50
8	4.00	2.80	14.29
9	4.50	3.10	9.68
10	5.00	3.40	8.82

DATA
NOT USED
IN PACKAGE

BLANK VALUE = 2.1 micrograms carbon
BLANK FACTOR = 2.1 / 5.005676 = +4.2E-01 ug/min Carbon

SAMPLE RESULTS:
(3.4 - 2.098822)(1)/(200) = +6.5E-03 g/L Carbon
(3.4 - 2.098822)(1)/(200)(12) = +5.4E-04 Molar Carbon

Sample Run By: _____
RA WENDLAND 00000

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0
WHC-SD-WM-DP-142, REV.1

Sample: 16D Date: 03/29/96 Time: 12:43:29

Sample Size = 200 uL
Dil Factor = 1
Blank ID # = BLK
Blank Value = .4195237 ug/minute C

Analyst : RA WENDLAND
Min Readings = 10
Max Readings = 10
% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.40	0.00
2	1.01	0.90	55.56
3	1.50	1.20	25.00
4	2.00	1.60	25.00
5	2.50	1.90	15.79
6	3.00	2.20	13.64
7	3.50	2.50	12.00
8	4.00	2.80	10.71
9	4.50	3.20	12.50
10	5.00	3.50	8.57

DATA
NOT USED
IN PACKAGE

BLANK VALUE = 2.1 micrograms carbon
BLANK FACTOR = 2.1 / 5.005676 = +4.2E-01 ug/min Carbon

SAMPLE RESULTS:
(3.5 - 2.099155)(1)/(200) = +7.0E-03 g/L Carbon
(3.5 - 2.099155)(1)/(200)(12) = +5.8E-04 Molar Carbon

Sample Run By: _____
RA WENDLAND 00000

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0
WHC-SD-WM-DP-142, REV. 1

Sample: 16SPK Date: 03/29/96 Time: 12:54:49

Sample Size = 200 uL
Dil Factor = 1
Blank ID # = BLK
Blank Value = .4195237 ug/minute C

Analyst : RA WENDLAND
Min Readings = 10
Max Readings = 10
% Difference = 10

== Reading	Analysis Time	Coulometer	% Difference ==
1	0.51	2.20	0.00
2	1.01	55.30	96.02
3	1.51	65.00	14.92
4	2.01	69.10	5.93
5	2.51	71.20	2.95
6	3.01	72.60	1.93
7	3.51	73.50	1.22
8	4.01	73.90	0.54
9	4.51	74.50	0.81
10	5.01	75.00	0.67

DATA NOT USED IN PACKAGE

BLANK VALUE = 2.1 micrograms carbon
BLANK FACTOR = 2.1 / 5.005676 = +4.2E-01 ug/min Carbon

SAMPLE RESULTS:
(75 - 2.100691)(1)/(200) = +3.64E-01 g/L Carbon
(75 - 2.100691)(1)/(200)(12) = +3.04E-02 Molar Carbon

Sample Run By: _____
RA WENDLAND 00000

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-142, REV.1

Sample: 16DSPK Date: 03/29/96 Time: 13:00:44

Sample Size = 200 uL
Dil Factor = 1
Blank ID # = BLK
Blank Value = .4195237 ug/minute C

Analyst : RA WENDLAND
Min Readings = 10
Max Readings = 10
% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	3.10	0.00
2	1.01	55.50	94.41
3	1.51	64.90	14.48
4	2.01	68.70	5.53
5	2.51	71.00	3.24
6	3.01	72.10	1.53
7	3.51	72.80	0.96
8	4.01	73.50	0.95
9	4.51	73.90	0.54
10	5.01	74.30	0.54

DATA
NOT USED
IN PACKAGE

BLANK VALUE = 2.1 micrograms carbon
BLANK FACTOR = 2.1 / 5.005676 = +4.2E-01 ug/min Carbon

SAMPLE RESULTS:
(74.3 - 2.099923)(1)/(200) = +3.61E-01 g/L Carbon
(74.3 - 2.099923)(1)/(200)(12) = +3.01E-02 Molar Carbon

Sample Run By: _____
RA WENDLAND 00000

LABCORE Data Entry Template for Worklist# 5346

Analyst: RAW **Instrument:** TIC01 WB39937 **Book #** 17N12-F

Method: LA-622-102 Rev/Mod C-0 WHC-SD-WM-DP-142, REV. 1

Worklist Comment: AP-104 TIC. RCJ

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	-------TEST------	MATRIX	ACTUAL	FOUND	DL	UNIT
		1	BLNK				TIC-01	LIQUID	1	0.7	N/A	ug/mL
		2	STD				TIC-01	LIQUID	601	5.85e2	N/A	ug/mL
96000036	AP-104	3	SAMPLE	S96V000016	0		TIC-01	LIQUID	N/A	<5.00	5.00	ug/mL
96000036	AP-104	4	SPK	S96V000016	0		TIC-01	LIQUID	100	99.7	N/A	ug/mL
96000036	AP-104	5	SPK-DUP	S96V000016	0		TIC-01	LIQUID	100	100.4	N/A	ug/mL
96000036	AP-104	6	SAMPLE	S96V000007	0		TIC-01	LIQUID	N/A	5.85e2 4.72e2	5.00	ug/mL
96000036	AP-104	7	SAMPLE	S96V000006	0		TIC-01	LIQUID	N/A	1.48e3 3.70e2 4.46e2	5.00	ug/mL
96000036	AP-104	8	SAMPLE	S96V000008	0		TIC-01	LIQUID	N/A	4.22e2	5.00	ug/mL

NLA 2-12-96
NLA 2-12-96
NLA 2-12-96

Final page for worklist # 5346

R. WENDLAND 2-6-96
Analyst Signature **Date**

T Ewing 2/8/96
Analyst Signature **Date**
Approved by H Anastos 2-12-96

Data Entry Comments: SPK - .400(SAM) - .200(17N12-F) - .200(INJ)
SAM - .050 INJ

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

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-142, REV. 1

TIC : LA-622-102 (C-0) LIQUIDS

			BLANK
Type	Sample Volume in mL	(SS)	0.200
BLANK	Dilution Factor	(DF)	1.000
Work List	Digest Dilution Factor	(DDF)	1.000
5346	µg of Carbon in Sample	(C1)	0.9
Test Code	µg of Carbon in Blank	(C2)	1.6
TIC01			
Matrix			
LIQUID	g of Carbon/L	= <	5.00E-03
Sample #			
	g of Carbon/L = $\frac{(C1-C2) * DF * DDF}{SS * 1000}$		
Instrument Code			
WC16130	µg of Carbon/mL = g of Carbon/L * 1000000 µg/g / 1000 m		
Analyst			
R. WENDLAND	Detection Level (µg/mL) = $\frac{1 µg C * DF * DDF}{SS}$		
Date			
02/06/96			
Time			
08:45 AM			

NOTE: Reported Result is Below Detection Level.

µg Carbon/mL =	< 5.00E+00	DETECTION LEVEL in µg/mL
		5.00E+00

Data Entry by:	[signature]	Date:	02/08/96
Approved by:	[signature]	Date:	2-12-96

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-142, REV. 1

TIC : LA-622-102 (C-0) LIQUIDS

			STANDARD
Type	Sample Volume in mL	(SS)	0.200
STANDARD	Dilution Factor	(DF)	1.000
Work List	Digest Dilution Factor	(DDF)	1.000
5346	µg of Carbon in Sample	(C1)	118.5
Test Code	µg of Carbon in Blank	(C2)	1.6
TIC01			
Matrix			
LIQUID	g of Carbon/L	=	5.85E-01
Sample #			
17N12F	g of Carbon/L =	(C1-C2) * DF * DDF / SS * 1000	
Instrument Code			
WC16130			
Analyst	µg of Carbon/mL =	g of Carbon/L * 1000000 µg/g / 1000 m	
R. WENDLAND			
Date			
02/06/96	Detection Level (µg/mL) =	1 µg C * DF * DDF / SS	
Time			
08:45 AM			

µg Carbon/mL =	5.85E+02	DETECTION LEVEL in µg/mL
		5.00E+00

Data Entry by:	[signature]	Date:	02/08/96
Approved by:	[signature]	Date:	2-12-96

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-142, REV. 1

TIC : LA-622-102 (C-0) LIQUIDS

			SAMPLE
Type	Sample Volume in mL	(SS)	0.200
SAMPLE	Dilution Factor	(DF)	1.000
Work List	Digest Dilution Factor	(DDF)	1.000
5346	µg of Carbon in Sample	(C1)	1.4
Test Code	µg of Carbon in Blank	(C2)	1.6
TIC01			
Matrix			
LIQUID	g of Carbon/L	= <	5.00E-03
Sample #			
S96V000016			
Instrument Code			
WC16130			
Analyst			
R. WENDLAND			
Date			
02/06/96			
Time			
08:45 AM			

g of Carbon/L = $\frac{(C1-C2) * DF * DDF}{SS * 1000}$

µg of Carbon/mL = g of Carbon/L * 1000000 µg/g / 1000 m

Detection Level (µg/mL) = $\frac{1 \text{ µg C} * DF * DDF}{SS}$

NOTE: Reported Result is Below Detection Level.

µg Carbon/mL =	< 5.00E+00	DETECTION LEVEL in µg/mL
		5.00E+00

Data Entry by:	RE Wendland	Date:	02/08/96
Approved by:	[illegible]	Date:	2-12-96

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-142, REV. 1

TIC : LA-622-102 (C-0) SPIKED SAMPLE

SPIKE

Type	>>>>>> Sample Vial Data <<<<<<		>>>>> Spiked Vial Data <<<<<	
SPIKE	Sample Volume in mL	0.200	Sample Volume in mL	0.400
Work List	µg of Carbon in Sample	1.4	Spike Volume in mL	0.200
5346	µg of Carbon in Blank	1.6	Volume Injected in mL	0.200
Test Code			Spike Value (µg/mL)	602
TIC01			µg C in Sample + Spike	41.6
Matrix			µg C in Blank	1.6
LIQUID				
Sample #				
S96V000016				
Instrument Code				
WC16130				
Analyst				
R. WENDLAND				
Date				
02/06/96				
Time				
09:00 AM				

PERCENT SPIKE RECOVERY = $\frac{\text{µg Carbon Recovered from Spike} * 100}{\text{µg Carbon in Spike}}$

WHERE : µg Carbon Recovered from Spike =
[(µgC in sample + spike - µgC in blank) * (Spike Correction Factor)]
- [(µgC sample - µgC blank) * (Sample Size Correction Factor)]

Spike Correction Factor = $\frac{\text{Total volume in spiked sample vial (mL)}}{\text{Volume injected (mL)}}$

Sample Size Correction Factor = $\frac{\text{Sample size (mL) in spiked vial}}{\text{Sample size (mL) in sample}}$

WHERE : µg Carbon in Spike =
[Spike Value (µg/mL) * Spike Volume (mL)]

Percent Spike Recovery = 99.7%

Data Entry by: [signature] Date: 02/08/96

Approved by: [signature] Date: 2-12-96

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0
WHC-SD-WM-DP-142, REV. 1

Sample: 16S Date: 02/06/96 Time: 09:00:55

Sample Size = 200 uL
Dil Factor = 1
Blank ID # = BLK
Blank Value = .3196488 ug/minute C

Analyst : RA WENDLAND
Min Readings = 10
Max Readings = 10
% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.10	0.00
2	1.01	5.00	98.00
3	1.51	18.90	73.54
4	2.01	30.20	37.42
5	2.51	36.60	17.49
6	3.01	39.30	6.87
7	3.51	40.50	2.96
8	4.01	41.30	1.94
9	4.50	41.50	0.48
10	5.00	41.60	0.24

BLANK VALUE = 1.6 micrograms carbon
BLANK FACTOR = 1.6 / 5.005493 = +3.2E-01 ug/min Carbon

SAMPLE RESULTS:
(41.6 - 1.599727)(1)/(200) = +2.00E-01 g/L Carbon
(41.6 - 1.599727)(1)/(200)(12) = +1.67E-02 Molar Carbon

Sample Run By: _____
RA WENDLAND 00000

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-142, REV. 1

TIC : LA-622-102 (C-0) SPIKED SAMPLE

SPIKE

Type	>>>>>> Sample Vial Data <<<<<<		>>>>> Spiked Vial Data <<<<<	
SPIKE	Sample Volume in mL	0.200	Sample Volume in mL	0.400
Work List	µg of Carbon in Sample	1.4	Spike Volume in mL	0.200
5346	µg of Carbon in Blank	1.6	Volume Injected in mL	0.200
Test Code			Spike Value (µg/mL)	602
TIC01			µg C in Sample + Spike	41.9
Matrix			µg C in Blank	1.6
LIQUID				
Sample #				
S96V000016 SPK-DUP				
Instrument Code				
WC16130				
Analyst				
R. WENDLAND				
Date				
02/06/96				
Time				
09:06 AM				

PERCENT SPIKE RECOVERY = $\frac{\text{µg Carbon Recovered from Spike} * 100}{\text{µg Carbon in Spike}}$

WHERE : µg Carbon Recovered from Spike =
[(µgC in sample + spike - µgC in blank) * (Spike Correction Factor)]
- [(µgC sample - µgC blank) * (Sample Size Correction Factor)]

Spike Correction Factor = $\frac{\text{Total volume in spiked sample vial (mL)}}{\text{Volume injected (mL)}}$

Sample Size Correction Factor = $\frac{\text{Sample size (mL) in spiked vial}}{\text{Sample size (mL) in sample}}$

WHERE : µg Carbon in Spike =
[Spike Value (µg/mL) * Spike Volume (mL)]

Percent Spike Recovery = 100.4%

Data Entry by: [signature] Date: 02/08/96

Approved by: [signature] Date: 2-12-96

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-142, REV. 1

TIC : LA-622-102 (C-0) LIQUIDS

			SAMPLE
Type	Sample Volume in mL	(SS)	0.050
SAMPLE	Dilution Factor	(DF)	1.000
Work List	Digest Dilution Factor	(DDF)	1.000
5346	µg of Carbon in Sample	(C1)	75.6
Test Code	µg of Carbon in Blank	(C2)	1.6
TIC-01			
Matrix			
LIQUID	g of Carbon/L	=	1.48E+00
Sample #			
S96V00006			
Instrument Code			
TIC01			
Analyst			
R. WENDLAND			
Date			
02/06/96			
Time			
08:45 AM			

g of Carbon/L = $\frac{(C1-C2) * DF * DDF}{SS * 1000}$

µg of Carbon/mL = g of Carbon/L * 1000000 µg/g / 1000 m

Detection Level (µg/mL) = $\frac{1 \text{ µg C} * DF * DDF}{SS}$

µg Carbon/mL =	1.48E+03	DETECTION LEVEL In µg/mL
		2.00E+01

Data Entry by:	H Unastor	Date:	02/12/96
Approved by:	Heather Unastor	Date:	2-12-96

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-142 REV. 1

TIC : LA-622-102 (C-0) LIQUIDS

			SAMPLE
Type	Sample Volume in mL	(SS)	0.050
SAMPLE	Dilution Factor	(DF)	1.000
Work List	Digest Dilution Factor	(DDF)	1.000
5346	μg of Carbon in Sample	(C1)	30.9
Test Code	μg of Carbon in Blank	(C2)	1.6
TIC-01			
Matrix			
LIQUID	g of Carbon/L	=	5.86E-01
Sample #			
S96V00007			
Instrument Code			
TIC01			
Analyst			
R. WENDLAND			
Date			
02/06/96			
Time			
08:45 AM			

$$\text{g of Carbon/L} = \frac{(C1-C2) * DF * DDF}{SS * 1000}$$

μg of Carbon/mL = g of Carbon/L * 1000000 μg/g / 1000 m

$$\text{Detection Level } (\mu g/mL) = \frac{1\ \mu g\ C * DF * DDF}{SS}$$

μg Carbon/mL =	5.86E+02	DETECTION LEVEL in μg/mL
		2.00E+01

Data Entry by:	HAnastos	Date:	02/12/96
Approved by:	Heather Anastos	Date:	2-12-96

Form 622102_C Rev. 1.1

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-K/2, REV. 1

TIC : LA-622-102 (C-0) LIQUIDS

			SAMPLE
Type #	Sample Volume in mL	(SS)	0.050
SAMPLE	Dilution Factor	(DF)	1.000
Work List	Digest Dilution Factor	(DDF)	1.000
5346	µg of Carbon in Sample	(C1)	23.9
Test Code	µg of Carbon in Blank	(C2)	1.6
TIC-01			
Matrix			
LIQUID	g of Carbon/L	=	4.46E-01
Sample #			
S96V00008	g of Carbon/L =	(C1-C2) * DF * DDF / SS * 1000	
Instrument Code			
TIC01			
Analyst	µg of Carbon/mL =	g of Carbon/L * 1000000 µg/g / 1000 m	
R. WENDLAND			
Date			
02/06/96	Detection Level (µg/mL) =	1 µg C * DF * DDF / SS	
Time			
08:45 AM			

µg Carbon/mL =	4.46E+02	DETECTION LEVEL in µg/mL
		2.00E+01

Data Entry by:	H Anastor	Date:	02/12/96
Approved by:	Heather Anastor	Date:	2-12-96

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-142, REV. 1

Sample: BASE Date: 02/06/96 Time: 12:53:29

Sample Size = 50 uL
Dil Factor = 1
Blank ID # = BLK
Blank Value = .3196488 ug/minute C

Analyst : RA WENDLAND
Min Readings = 10
Max Readings = 10
% Difference = 10

== Reading	Analysis Time	Coulometer	% Difference ==
1	0.51	0.00	0.00
2	1.01	0.10	100.00
3	1.51	0.30	66.67
4	2.01	0.30	0.00
5	2.51	0.40	25.00
6	3.01	0.60	33.33
7	3.51	0.70	14.29
8	4.01	0.70	0.00
9	4.51	0.80	12.50
10	5.01	0.90	11.11

SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 250 TO 257

BLANK VALUE = 1.6 micrograms carbon
BLANK FACTOR = 1.6 / 5.005493 = +3.2E-01 ug/min Carbon

SAMPLE RESULTS:
(.9 - 1.599981)(1)/(50) = < 5.00 E-3 g/L Carbon
(.9 - 1.599981)(1)/(50)(12) = < 4.17 E-4 Molar Carbon
<<<< WARNING- PERCENT DIFFERENCE EXCEEDS 10 PERCENT >>>>

Sample Run By: Robert Schroeder for RA Wendland 4/15/96
RA WENDLAND 00000

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0
<<< BLANK ANALYSIS >> WHC-SD-WM-DP-143, REV. 1

Sample: BLK Date: 02/06/96 Time: 08:33:37

Sample Size = 200 uL
Dil Factor = 1
Blank ID # = BLK
Blank Value = N/A

Analyst : RA WENDLAND
Min Readings = 10
Max Readings = 10
% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.20	0.00
2	1.01	0.30	33.33
3	1.51	0.50	40.00
4	2.01	0.70	28.57
5	2.51	0.90	22.22
6	3.01	1.10	18.18
7	3.51	1.20	8.33
8	4.01	1.30	7.69
9	4.51	1.50	13.33
10	5.01	1.60	6.25

BLANK VALUE = 1.6 micrograms carbon
BLANK FACTOR = 1.6 / 5.005493 = +3.2E-01 ug/min Carbon

Sample Run By: _____
RA WENDLAND 00000

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0
WHC-SD-WM-DP-142, REV. 1

Sample: STD Date: 02/06/96 Time: 08:45:39

Sample Size = 200 uL
Dil Factor = 1
Blank ID # = BLK
Blank Value = .3196488 ug/minute C

Analyst : RA WENDLAND
Min Readings = 10
Max Readings = 10
% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.30	0.00
2	1.01	9.50	96.84
3	1.51	40.80	76.72
4	2.01	70.30	41.96
5	2.51	91.20	22.92
6	3.01	104.10	12.39
7	3.51	111.80	6.89
8	4.00	115.80	3.45
9	4.50	117.60	1.53
10	5.00	118.50	0.76

BLANK VALUE = 1.6 micrograms carbon
BLANK FACTOR = 1.6 / 5.005493 = +3.2E-01 ug/min Carbon

SAMPLE RESULTS:
(118.5 - 1.599473)(1)/(200) = +5.845E-01 g/L Carbon
(118.5 - 1.599473)(1)/(200)(12) = +4.871E-02 Molar Carbon

Sample Run By: RW
RA WENDLAND 00000

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-142, REV. 1

Sample: 16 Date: 02/06/96 Time: 08:55:08

Sample Size = 200 uL
Dil Factor = 1
Blank ID # = BLK
Blank Value = .3196488 ug/minute C

Analyst : RA WENDLAND
Min Readings = 10
Max Readings = 10
% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.10	0.00
2	1.01	0.20	50.00
3	1.51	0.50	60.00
4	2.01	0.70	28.57
5	2.51	0.90	22.22
6	3.01	1.00	10.00
7	3.51	1.10	9.09
8	4.01	1.20	8.33
9	4.50	1.30	7.69
10	5.00	1.40	7.14

BLANK VALUE = 1.6 micrograms carbon
BLANK FACTOR = 1.6 / 5.005493 = +3.2E-01 ug/min Carbon

SAMPLE RESULTS:
(1.4 - 1.599727)(1)/(200) = < 5.00 E-3 g/L Carbon
(1.4 - 1.599727)(1)/(200)(12) = < 4.17 E-4 Molar Carbon

Sample Run By: RA WENDLAND 00000

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-142, REV. 1

Sample: 16SD Date: 02/06/96 Time: 09:06:16

Sample Size = 200 uL
Dil Factor = 1
Blank ID # = BLK
Blank Value = .3196488 ug/minute C

Analyst : RA WENDLAND
Min Readings = 10
Max Readings = 10
% Difference = 10

Reading	Analysis Time	Coulometer	% Difference
1	0.51	0.10	0.00
2	1.01	6.00	98.33
3	1.50	20.10	70.15
4	2.01	31.20	35.58
5	2.51	37.20	16.13
6	3.01	39.90	6.77
7	3.51	41.10	2.92
8	4.00	41.40	0.72
9	4.50	41.70	0.72
10	5.00	41.90	0.48

BLANK VALUE = 1.6 micrograms carbon
BLANK FACTOR = 1.6 / 5.005493 = +3.2E-01 ug/min Carbon

SAMPLE RESULTS:
(41.9 - 1.599727)(1)/(200) = +2.02E-01 g/L Carbon
(41.9 - 1.599727)(1)/(200)(12) = +1.68E-02 Molar Carbon

Sample Run By: _____
RA WENDLAND 00000

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-142, REV. 1

Sample: 6 Date: 02/06/96 Time: 12:24:06

Sample Size = 50 uL
Dil Factor = 1
Blank ID # = BLK
Blank Value = .3196488 ug/minute C

Analyst : RA WENDLAND
Min Readings = 10
Max Readings = 10
% Difference = 10

Reading	Analysis Time	Coulometer	% Difference
1	0.51	0.00	0.00
2	1.01	22.20	100.00
3	1.51	51.80	57.14
4	2.00	65.70	21.16
5	2.51	71.90	8.62
6	3.01	74.00	2.84
7	3.51	74.80	1.07
8	4.01	75.10	0.40
9	4.50	75.40	0.40
10	5.00	75.60	0.26

BLANK VALUE = 1.6 micrograms carbon
BLANK FACTOR = 1.6 / 5.005493 = +3.2E-01 ug/min Carbon

SAMPLE RESULTS:
(75.6 - 1.599746)(1)/(50) = +1.48E+00 g/L Carbon
(75.6 - 1.599746)(1)/(50)(12) = +1.23E-01 Molar Carbon

Sample Run By: _____
RA WENDLAND 00000

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-142, REV. 1

Sample: 7 Date: 02/06/96 Time: 12:29:46

Sample Size = 50 uL
Dil Factor = 1
Blank ID # = BLK
Blank Value = .3196488 ug/minute C

Analyst : RA WENDLAND
Min Readings = 10
Max Readings = 10
% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.20	0.00
2	1.01	10.00	98.00
3	1.51	22.30	55.16
4	2.01	27.50	18.91
5	2.51	29.20	5.82
6	3.01	30.10	2.99
7	3.51	30.40	0.99
8	4.01	30.60	0.65
9	4.51	30.70	0.33
10	5.01	30.90	0.65

BLANK VALUE = 1.6 micrograms carbon
BLANK FACTOR = 1.6 / 5.005493 = +3.2E-01 ug/min Carbon

SAMPLE RESULTS:
(30.9 - 1.599981)(1)/(50) = +5.86E-01 g/L Carbon
(30.9 - 1.599981)(1)/(50)(12) = +4.88E-02 Molar Carbon

Sample Run By: _____
RA WENDLAND 00000

TIC- TOTAL INORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-142, REV.1

Sample: 8 Date: 02/06/96 Time: 12:35:15

Sample Size = 50 uL
Dil Factor = 1
Blank ID # = BLK
Blank Value = .3196488 ug/minute C

Analyst : RA WENDLAND
Min Readings = 10
Max Readings = 10
% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.10	0.00
2	1.01	7.10	98.59
3	1.51	17.00	58.24
4	2.00	21.00	19.05
5	2.50	22.60	7.08
6	3.01	23.20	2.59
7	3.51	23.50	1.28
8	4.01	23.70	0.84
9	4.50	23.80	0.42
10	5.00	23.90	0.42

BLANK VALUE = 1.6 micrograms carbon
BLANK FACTOR = 1.6 / 5.005493 = +3.2E-01 ug/min Carbon

SAMPLE RESULTS:
(23.9 - 1.599746)(1)/(50) = +4.46E-01 g/L Carbon
(23.9 - 1.599746)(1)/(50)(12) = +3.72E-02 Molar Carbon

Sample Run By: _____
RA WENDLAND 00000

LABCORE Data Entry Template for Worklist# 5349

Analyst: KRM **Instrument:** TOC01 **Book #** 16N12 G

Method: LA-344-105 Rev/Mod C-D

Worklist Comment: AP-104 TOC-01. RCJ WHC-SD-WM-DP-142, REV. 1

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	-------TEST------	MATRIX	ACTUAL	FOUND	DL	UNIT
		1	BLNK				TOC-01	LIQUID	1	1.20E01	N/A	ug/mL
		2	STD				TOC-01	LIQUID	300E03	3.03E03	N/A	ug/mL
96000036	AP-104	3	SAMPLE	S96V000007	0		TOC-01	LIQUID	N/A	1.18E02	6.00	ug/mL
96000036	AP-104	4	SPK	S96V000007	0		TOC-01	LIQUID	100	94.7	N/A	ug/mL
96000036	AP-104	5	SPK-DUP	S96V000007	0		TOC-01	LIQUID	100	97.9	N/A	ug/mL
96000036	AP-104	6	SAMPLE	S96V000006	0		TOC-01	LIQUID	N/A	1.67E02	6.00	ug/mL
96000036	AP-104	7	SAMPLE	S96V000008	0		TOC-01	LIQUID	N/A	2.21E02	6.00	ug/mL
96000036	AP-104	8	SAMPLE	S96V000012	0		TOC-01	LIQUID	N/A	1.10E02	6.00	ug/mL
96000036	AP-104	9	SAMPLE	S96V000016	0		TOC-01	LIQUID	N/A	1.20E01	6.00	ug/mL

Final page for worklist # 5349

2-16-96
Analyst Signature **Date**

2-20-96
Analyst Signature **Date**

Approved by H Anastor 2-23-96

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.

TOC: LA-344-105 (C-0)

WORKLIST # 53499 | ANALYST SIGNATURE | ANALYSIS DATE 2-16-96 | ANALYSIS TIME | INSTRUMENT CODE

[ ] SAMPLE [X] STANDARD [ ] DUPLICATE [ ] BASELINE [ ] SPIKE [ ] BLANK [ ] TRIPLICATE

SAMPLE # = STD # =

Volume SAMPLE Used (mL)	.2
Volume H2SO4 Added to SAMPLE (mL)	2
Volume INJECTED (mL)	.2
Was Sample Dilution Used for SPIKE? Y or N	N
Amount SPIKE Standard Added (mL)	
Volume H2SO4 Added to SAMPLE + SPIKE (mL)	
Final Coulometer Reading in µg Carbon (Optional)	

[ ] SAMPLE [ ] STANDARD [ ] DUPLICATE [ ] BASELINE [X] SPIKE [X] BLANK [ ] TRIPLICATE

SAMPLE # = STD # =

Amount of SAMPLE Used (mL)	—
Volume H2SO4 Added to SAMPLE (mL)	2
Volume INJECTED (mL)	.2
Was Sample Dilution Used for SPIKE? Y or N	N
Amount SPIKE Standard Added (mL)	
Volume H2SO4 Added to SAMPLE + SPIKE (mL)	
Final Coulometer Reading in µg Carbon (Optional)	

[X] SAMPLE [ ] STANDARD [ ] DUPLICATE [ ] BASELINE [ ] SPIKE [ ] BLANK [ ] TRIPLICATE

SAMPLE # = 596U000007 STD # =

Amount of SAMPLE Used (mL)	2
Volume H2SO4 Added to SAMPLE (mL)	.4
Volume INJECTED (mL)	.2
Was Sample Dilution Used for SPIKE? Y or N	N
Amount SPIKE Standard Added (mL)	
Volume H2SO4 Added to SAMPLE + SPIKE (mL)	
Final Coulometer Reading in µg Carbon (Optional)	

[ ] SAMPLE [ ] STANDARD [ ] DUPLICATE [ ] BASELINE [X] SPIKE [X] BLANK [ ] TRIPLICATE

SAMPLE # = 596U000007 STD # = 11N12 H

Amount of SAMPLE Used (mL)	.4
Volume H2SO4 Added to SAMPLE (mL)	
Volume INJECTED (mL)	.2
Was Sample Dilution Used for SPIKE? Y or N	
Amount SPIKE Standard Added (mL)	.4
Volume H2SO4 Added to SAMPLE + SPIKE (mL)	
Final Coulometer Reading in µg Carbon (Optional)	

[ ] SAMPLE [ ] STANDARD [X] DUPLICATE [X] BASELINE [X] SPIKE [X] BLANK [ ] TRIPLICATE

SAMPLE # = 596U000007 STD # = 11N12 H

Amount of SAMPLE Used (mL)	.4
Volume H2SO4 Added to SAMPLE (mL)	
Volume INJECTED (mL)	.2
Was Sample Dilution Used for SPIKE? Y or N	
Amount SPIKE Standard Added (mL)	.4
Volume H2SO4 Added to SAMPLE + SPIKE (mL)	
Final Coulometer Reading in µg Carbon (Optional)	

[X] SAMPLE [ ] STANDARD [ ] DUPLICATE [ ] BASELINE [ ] SPIKE [ ] BLANK [ ] TRIPLICATE

SAMPLE # = 596U000006 STD # =

Amount of SAMPLE Used (mL)	2
Volume H2SO4 Added to SAMPLE (mL)	.4
Volume INJECTED (mL)	.2
Was Sample Dilution Used for SPIKE? Y or N	
Amount SPIKE Standard Added (mL)	
Volume H2SO4 Added to SAMPLE + SPIKE (mL)	
Final Coulometer Reading in µg Carbon (Optional)	

[X] SAMPLE [ ] STANDARD [ ] DUPLICATE [ ] BASELINE [ ] SPIKE [ ] BLANK [ ] TRIPLICATE

SAMPLE # = 596U000008 STD # =

Amount of SAMPLE Used (mL)	2
Volume H2SO4 Added to SAMPLE (mL)	.4
Volume INJECTED (mL)	.2
Was Sample Dilution Used for SPIKE? Y or N	N
Amount SPIKE Standard Added (mL)	
Volume H2SO4 Added to SAMPLE + SPIKE (mL)	
Final Coulometer Reading in µg Carbon (Optional)	

[X] SAMPLE [ ] STANDARD [ ] DUPLICATE [ ] BASELINE [ ] SPIKE [ ] BLANK [ ] TRIPLICATE

SAMPLE # = 596U000012 STD # =

Amount of SAMPLE Used (mL)	2
Volume H2SO4 Added to SAMPLE (mL)	.4
Volume INJECTED (mL)	.2
Was Sample Dilution Used for SPIKE? Y or N	N
Amount SPIKE Standard Added (mL)	
Volume H2SO4 Added to SAMPLE + SPIKE (mL)	
Final Coulometer Reading in µg Carbon (Optional)	

WHC-SD-WM-DP-[illegible], REV. [illegible]

TOC: LA-344-105 (C-0)

WORKLIST #	ANALYST SIGNATURE	ANALYSIS DATE	ANALYSIS TIME	INSTRUMENT CODE
5349		2-16-96		

☒ SAMPLE ☐ STANDARD ☐ DUPLICATE ☐ BASELINE ☐ SPIKE ☐ BLANK ☐ TRIPLICATE

SAMPLE # = S96U000016 STD # =

Volume SAMPLE Used (mL) 2
Volume H2SO4 Added to SAMPLE (mL) .4
Volume INJECTED (mL) .2
Was Sample Dilution Used for SPIKE? Y or N N
Amount SPIKE Standard Added (mL) ______
Volume H2SO4 Added to SAMPLE + SPIKE (mL) ______
Final Coulometer Reading in µg Carbon (Optional)

☐ SAMPLE ☐ STANDARD ☐ DUPLICATE ☐ BASELINE ☐ SPIKE ☐ BLANK ☐ TRIPLICATE

SAMPLE # = STD # =

Amount of SAMPLE Used (mL) ______
Volume H2SO4 Added to SAMPLE (mL) ______
Volume INJECTED (mL) ______
Was Sample Dilution Used for SPIKE? Y or N ______
Amount SPIKE Standard Added (mL) ______
Volume H2SO4 Added to SAMPLE + SPIKE (mL) ______
Final Coulometer Reading in µg Carbon (Optional)

☐ SAMPLE ☐ STANDARD ☐ DUPLICATE ☐ BASELINE ☐ SPIKE ☐ BLANK ☐ TRIPLICATE

SAMPLE # = STD # =

Amount of SAMPLE Used (mL) ______
Volume H2SO4 Added to SAMPLE (mL) ______
Volume INJECTED (mL) ______
Was Sample Dilution Used for SPIKE? Y or N ______
Amount SPIKE Standard Added (mL) ______
Volume H2SO4 Added to SAMPLE + SPIKE (mL) ______
Final Coulometer Reading in µg Carbon (Optional)

☐ SAMPLE ☐ STANDARD ☐ DUPLICATE ☐ BASELINE ☐ SPIKE ☐ BLANK ☐ TRIPLICATE

SAMPLE # = STD # =

Amount of SAMPLE Used (mL) ______
Volume H2SO4 Added to SAMPLE (mL) ______
Volume INJECTED (mL) ______
Was Sample Dilution Used for SPIKE? Y or N ______
Amount SPIKE Standard Added (mL) ______
Volume H2SO4 Added to SAMPLE + SPIKE (mL) ______
Final Coulometer Reading in µg Carbon (Optional)

☐ SAMPLE ☐ STANDARD ☐ DUPLICATE ☐ BASELINE ☐ SPIKE ☐ BLANK ☐ TRIPLICATE

SAMPLE # = STD # =

Amount of SAMPLE Used (mL) ______
Volume H2SO4 Added to SAMPLE (mL) ______
Volume INJECTED (mL) ______
Was Sample Dilution Used for SPIKE? Y or N ______
Amount SPIKE Standard Added (mL) ______
Volume H2SO4 Added to SAMPLE + SPIKE (mL) ______
Final Coulometer Reading in µg Carbon (Optional)

☐ SAMPLE ☐ STANDARD ☐ DUPLICATE ☐ BASELINE ☐ SPIKE ☐ BLANK ☐ TRIPLICATE

SAMPLE # = STD # =

Amount of SAMPLE Used (mL) ______
Volume H2SO4 Added to SAMPLE (mL) ______
Volume INJECTED (mL) ______
Was Sample Dilution Used for SPIKE? Y or N ______
Amount SPIKE Standard Added (mL) ______
Volume H2SO4 Added to SAMPLE + SPIKE (mL) ______
Final Coulometer Reading in µg Carbon (Optional)

☐ SAMPLE ☐ STANDARD ☐ DUPLICATE ☐ BASELINE ☐ SPIKE ☐ BLANK ☐ TRIPLICATE

SAMPLE # = STD # =

Amount of SAMPLE Used (mL) ______
Volume H2SO4 Added to SAMPLE (mL) ______
Volume INJECTED (mL) ______
Was Sample Dilution Used for SPIKE? Y or N ______
Amount SPIKE Standard Added (mL) ______
Volume H2SO4 Added to SAMPLE + SPIKE (mL) ______
Final Coulometer Reading in µg Carbon (Optional)

☐ SAMPLE ☐ STANDARD ☐ DUPLICATE ☐ BASELINE ☐ SPIKE ☐ BLANK ☐ TRIPLICATE

SAMPLE # = STD # =

Amount of SAMPLE Used (mL) ______
Volume H2SO4 Added to SAMPLE (mL) ______
Volume INJECTED (mL) ______
Was Sample Dilution Used for SPIKE? Y or N ______
Amount SPIKE Standard Added (mL) ______
Volume H2SO4 Added to SAMPLE + SPIKE (mL) ______
Final Coulometer Reading in µg Carbon (Optional)

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-142, REV. 1

TOC : LA-344-105 (C-0) **LIQUIDS**

Type	Sample Volume in mL	(SS)	BLANK: 0.200
BLANK	H2SO4 Volume in mL	(VR)	0.200
Work List	Volume Injected in mL	(VI)	0.200
5349	Dilution Factor	(DF)	1
Test Code	Digest Dilution Factor	(DDF)	1
TOC-01	µg of Carbon in Sample	(C1)	3.8
Matrix	µg of Carbon in Blank	(C2)	1.4
LIQUID	g of Carbon/L	=	1.20E-02

Sample #
BLNK
Instrument Code
TOC01
Analyst
K.R. MONTHIETH
Date
02/16/96
Time

g of Carbon/L = $\frac{(C1-C2) * DF * DDF}{VI * 1000}$

µg of Carbon/mL = g of Carbon/L * 1000000 µg/g / 1000 mL/L

Detection Level (µg/mL) = $\frac{1 \text{ µg C} * DF * DDF}{VI}$

µg Carbon/mL =	1.20E+01	DETECTION LEVEL in µg/mL: 5.00E+00

Data Entry by: [signature] Date: 02/20/96

Approved by: Date:

Form 344105_C Rev. 1.1

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-142, REV. 1

TOC : LA-344-105 (C-0) LIQUIDS

Type	Sample Volume in mL	(SS)	STANDARD
STANDARD	H2SO4 Volume in mL	(VR)	2.000
Work List	Volume Injected in mL	(VI)	0.200
5349	Dilution Factor	(DF)	11
Test Code	Digest Dilution Factor	(DDF)	1
TOC-01	µg of Carbon in Sample	(C1)	56.4
Matrix	µg of Carbon in Blank	(C2)	1.4
LIQUID	g of Carbon/L =		3.03E+00
Sample #			
STD			
Instrument Code			
TOC-01			
Analyst			
KR. MONTHIETH			
Date			
02/16/96			
Time			

g of Carbon/L = $\frac{(C1-C2) * DF * DDF}{VI * 1000}$

µg of Carbon/mL = g of Carbon/L * 1000000 µg/g / 1000 mL/L

Detection Level (µg/mL) = $\frac{1 \text{ µg C} * DF * DDF}{VI}$

µg Carbon/mL =	3.03E+03	DETECTION LEVEL in µg/mL
		5.50E+01

Data Entry by: [signature] Date: 02/20/96

Approved by: Date:

Form 344105_C Rev. 1.1

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-142, REV. 1

TOC : LA-344-105 (C-0) **LIQUIDS**

Type				SAMPLE
SAMPLE	Sample Volume in mL		(SS)	2.000
Work List	H2SO4 Volume in mL		(VR)	0.400
5349	Volume Injected in mL		(VI)	0.200
Test Code	Dilution Factor		(DF)	1.2
TOC-01	Digest Dilution Factor		(DDF)	1
Matrix	µg of Carbon in Sample		(C1)	21
LIQUID	µg of Carbon in Blank		(C2)	1.4
Sample #	g of Carbon/L	=		1.18E-01
S9RV000007				
Instrument Code				
TOC01				
Analyst				
K.R. MONTHIETH				
Date				
02/16/96				
Time				

g of Carbon/L = $\frac{(C1-C2) * DF * DDF}{VI * 1000}$

µg of Carbon/mL = g of Carbon/L * 1000000 µg/g / 1000 mL/L

Detection Level (µg/mL) = $\frac{1 \text{ µg C} * DF * DDF}{VI}$

µg Carbon/mL =	1.18E+02	DETECTION LEVEL in µg/mL
		6.00E+00

Data Entry by: [signature] Date: 02/20/96

Approved by: Date:

Form 344105_C Rev. 1.1

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

WHC-SD-WM-DP-142, REV. 1

TOC: LA-344-105 SPIKED SAMPLE

SPIKE

Type	>>>>>> Sample Vial Data <<<<<<		>>>>> Spiked Vial Data <<<<<	
SPIKE	Sample Volume in mL	2.000	Sample Size in mL (SS)	0.400
Work List	H2SO4 Volume in mL	0.400	Spike Volume in mL	0.400
5349	Volume Injected in mL	0.200	H2SO4 Volume in mL	0.000
Test Code	µg of Carbon in Sample	21	Volume Injected in mL	0.200
TOC-01	µg of Carbon in Blank	1.4	Sample Pre-Spike Dil. Factor (PDF)	1.2
Matrix			Spike Value (µg/ml)	748
LIQUID			µg C in Sample + Spike	82
Sample #			µg C in Blank	1.4
S96V000007				
Instrument Code				
TOC-01				
Analyst				
KR. MONTHIETH				
Date				
02/16/96				
Time				

PERCENT SPIKE RE = $\frac{\text{µg Carbon Recovered from Spike} * 100}{\text{µg Carbon in Spike}}$

WHERE : µg Carbon Recovered from Spike =

[(µgC in sample + spike - µgC in blank) * (Spike Correction Factor)]

- [(µgC sample - µgC blank) * (Sample Correction Factor) * (Sample Size Correction Factor) * (PDF)]

Spike Correction Factor = $\frac{\text{Total volume in spiked sample vial (mL)}}{\text{Volume injected (mL)}}$

Sample Correction Factor = $\frac{\text{Total volume in sample vial (mL)}}{\text{Volume injected (mL)}}$

Sample Size Correction Factor = $\frac{\text{Sample size in (mL) in spiked vial}}{\text{Sample size (mL) in sample}}$

Sample Pre-Spike Dilution Factor = $\frac{1}{\text{Dilution of Sample Before Added to Spike Vial}}$

WHERE : µg Carbon in Spike = Spike Value (µg/mL) * Spike Volume (mL)

Percent Spike Recovery 94.7%

Data Entry by:	Date: 20-Feb-96
Approved by:	Date:

Form X Rev. 1.1

PLACE ANALYTICAL CARD IN BOX BELOW-DO NOT WRITE IN SPACE

HC-SD-WM-DP-142, REV. 1

TOC: LA-344-105 SPIKED SAMPLE

SPIKE

Type	>>>>>> Sample Vial Data <<<<<<		>>>>> Spiked Vial Data <<<<<	
SPIKE	Sample Volume in mL	2.000	Sample Size in mL (SS)	0.400
Work List	H2SO4 Volume in mL	0.400	Spike Volume in mL	0.400
5349	Volume Injected in mL	0.200	H2SO4 Volume in mL	0.000
Test Code	µg of Carbon in Sample	21	Volume Injected in mL	0.200
TOC-01	µg of Carbon in Blank	1.4	Sample Pre-Spike Dil. Factor (PDF)	1.2
Matrix			Spike Value (µg/ml)	748
LIQUID			µg C in Sample + Spike	84.4
Sample #			µg C in Blank	1.4
S96V000007/DUP				
Instrument Code				
TOC-01				
Analyst				
KR. MONTHIETH				
Date				
02/16/96				
Time				

PERCENT SPIKE RE = $\frac{\text{µg Carbon Recovered from Spike} * 100}{\text{µg Carbon in Spike}}$

WHERE : µg Carbon Recovered from Spike =

[(µgC in sample + spike - µgC in blank) * (Spike Correction Factor)]

- [(µgC sample - µgC blank) * (Sample Correction Factor) * (Sample Size Correction Factor) * (PDF)]

Spike Correction Factor = $\frac{\text{Total volume in spiked sample vial (mL)}}{\text{Volume injected (mL)}}$

Sample Correction Factor = $\frac{\text{Total volume in sample vial (mL)}}{\text{Volume injected (mL)}}$

Sample Size Correction Factor = $\frac{\text{Sample size in (mL) in spiked vial}}{\text{Sample size (mL) in sample}}$

Sample Pre-Spike Dilution Factor = $\frac{1}{\text{Dilution of Sample Before Added to Spike Vial}}$

WHERE : µg Carbon in Spike = Spike Value (µg/mL) * Spike Volume (mL)

Percent Spike Recovery 97.9%

Data Entry by:	Date: 20-Feb-96
Approved by:	Date:

Form X Rev. 1.1

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-142, REV. 1

TOC : LA-344-105 (C-0) LIQUIDS

			SAMPLE
Type	Sample Volume in mL	(SS)	2.000
SAMPLE	H2SO4 Volume in mL	(VR)	0.400
Work List	Volume Injected in mL	(VI)	0.200
5349	Dilution Factor	(DF)	1.2
Test Code	Digest Dilution Factor	(DDF)	1
TOC-01	µg of Carbon in Sample	(C1)	29.2
Matrix	µg of Carbon in Blank	(C2)	1.4
LIQUID	g of Carbon/L =		1.67E-01
Sample #			
S9RV000006			
Instrument Code			
TOC01			
Analyst			
K.R. MONTHIETH			
Date			
02/16/96			
Time			

g of Carbon/L = $\frac{(C1-C2) * DF * DDF}{VI * 1000}$

µg of Carbon/mL = g of Carbon/L * 1000000 µg/g / 1000 mL/L

Detection Level (µg/mL) = $\frac{1 \text{ µg C} * DF * DDF}{VI}$

µg Carbon/mL =	1.67E+02	DETECTION LEVEL in µg/mL
		6.00E+00

Data Entry by:	Date:	02/20/96
Approved by:	Date:	

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-142, REV/

TOC : LA-344-105 (C-0) LIQUIDS

Type			SAMPLE
SAMPLE	Sample Volume in mL	(SS)	2.000
Work List	H2SO4 Volume in mL	(VR)	0.400
5349	Volume Injected in mL	(VI)	0.200
Test Code	Dilution Factor	(DF)	1.2
TOC-01	Digest Dilution Factor	(DDF)	1
Matrix	µg of Carbon in Sample	(C1)	38.2
LIQUID	µg of Carbon in Blank	(C2)	1.4
Sample #	g of Carbon/L =		2.21E-01
S9RV000008			
Instrument Code			
TOC01			
Analyst			
K.R. MONTHIETH			
Date			
02/16/96			
Time			

g of Carbon/L = $\frac{(C1-C2) * DF * DDF}{VI * 1000}$

µg of Carbon/mL = g of Carbon/L * 1000000 µg/g / 1000 mL/L

Detection Level (µg/mL) = $\frac{1 \text{ µg C} * DF * DDF}{VI}$

µg Carbon/mL =	2.21E+02	DETECTION LEVEL in µg/mL
		6.00E+00

Data Entry by:	Date:	02/20/96
Approved by:	Date:	

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-142, REV. 1

TOC : LA-344-105 (C-0) LIQUIDS

			SAMPLE
Type	Sample Volume in mL	(SS)	2.000
SAMPLE	H2SO4 Volume in mL	(VR)	0.400
Work List	Volume Injected in mL	(VI)	0.200
5349	Dilution Factor	(DF)	1.2
Test Code	Digest Dilution Factor	(DDF)	1
TOC-01	µg of Carbon in Sample	(C1)	19.7
Matrix	µg of Carbon in Blank	(C2)	1.4
LIQUID	g of Carbon/L	=	1.10E-01
Sample #			
S9RV000012			
Instrument Code			
TOC01			
Analyst			
K.R. MONTHIETH			
Date			
02/16/96			
Time			

g of Carbon/L = $\frac{(C1-C2) * DF * DDF}{VI * 1000}$

µg of Carbon/mL = g of Carbon/L * 1000000 µg/g / 1000 mL/L

Detection Level (µg/mL) = $\frac{1 \text{ µg C} * DF * DDF}{VI}$

µg Carbon/mL =	1.10E+02	DETECTION LEVEL in µg/mL
		6.00E+00

Data Entry by:	Date:	02/20/96
Approved by:	Date:	

PLACE ANALYTICAL CARD IN BOX BELOW OR ATTACH TRAVELER

WHC-SD-WM-DP-142, REV. 1

TOC : LA-344-105 (C-0) LIQUIDS

			SAMPLE
Type	Sample Volume in mL	(SS)	2.000
SAMPLE	H_2SO_4 Volume in mL	(VR)	0.400
Work List	Volume Injected in mL	(VI)	0.200
5349	Dilution Factor	(DF)	1.2
Test Code	Digest Dilution Factor	(DDF)	1
TOC-01	µg of Carbon in Sample	(C1)	3.4
Matrix	µg of Carbon in Blank	(C2)	1.4
LIQUID	g of Carbon/L	=	1.20E-02
Sample #			
S9RV000016			
Instrument Code			
TOC01			
Analyst			
K.R. MONTHIETH			
Date			
02/16/96			
Time			

g of Carbon/L = $\frac{(C1-C2) * DF * DDF}{VI * 1000}$

µg of Carbon/mL = g of Carbon/L * 1000000 µg/g / 1000 mL/L

Detection Level (µg/mL) = $\frac{1\ \mu g\ C * DF * DDF}{VI}$

µg Carbon/mL =	1.20E+01	DETECTION LEVEL in µg/mL
		6.00E+00

Data Entry by:	Date:	02/20/96
Approved by:	Date:	

P

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

WHC-SD-WM-DP-143, REV. 1

Sample: BLK *Date: 02/15/96* *Time: 21:20:02*

Sample Size = 200 uL *Analyst : KR MONTEITH*
Dil Factor = 1 *Min Readings = 12*
Blank ID # = BLK *Max Readings = 12*
Blank Value = N/A *% Difference = 10*

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.10	0.00
2	1.01	0.40	75.00
3	1.51	0.70	42.86
4	2.01	0.90	22.22
5	2.51	0.90	0.00
6	3.01	1.10	18.18
7	3.51	1.10	0.00
8	4.00	1.20	8.33
9	4.50	1.20	0.00
10	5.00	1.30	7.69
11	5.50	1.30	0.00
12	6.00	1.40	7.14

SIGNATURE BELOW REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 270 TO 278.

BLANK VALUE = 1.4 micrograms carbon
BLANK FACTOR = 1.4 / 6.004272 = +2.3E-01 ug/min Carbon

Sample Run By: 2-16-96
KR MONTEITH *00000*

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

Sample: R BLK Date: 02/16/96 Time: 00:57:21

Sample Size = 200 uL
Dil Factor = 1
Blank ID # = BLK
Blank Value = .2331673 ug/minute C

Analyst : KR MONTEITH
Min Readings = 12
Max Readings = 12
% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.20	0.00
2	1.01	0.80	75.00
3	1.50	1.20	33.33
4	2.01	1.50	20.00
5	2.51	1.80	16.67
6	3.00	2.10	14.29
7	3.50	2.40	12.50
8	4.00	2.70	11.11
9	4.50	2.90	6.90
10	5.00	3.20	9.37
11	5.50	3.40	5.88
12	6.00	3.80	10.53

BLANK VALUE = 1.4 micrograms carbon
BLANK FACTOR = 1.4 / 6.004272 = +2.3E-01 ug/min Carbon

SAMPLE RESULTS:
(3.8 - 1.399547)(1)/(200) = +1.2E-02 g/L Carbon
(3.8 - 1.399547)(1)/(200)(12) = +1.0E-03 Molar Carbon
<<<< WARNING- PERCENT DIFFERENCE EXCEEDS 10 PERCENT >>>>

Sample Run By: KR MONTEITH 00000

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0
WHC-SD-WM-DP-142, REV. 1

Sample: STD Date: 02/16/96 Time: 00:29:51

Sample Size = 200 uL
Dil Factor = 11
Blank ID # = BLK
Blank Value = .2331673 ug/minute C

Analyst : KR MONTEITH
Min Readings = 12
Max Readings = 12
% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.70	0.00
2	1.01	30.80	97.73
3	1.50	43.90	29.84
4	2.00	48.30	9.11
5	2.50	51.40	6.03
6	3.00	52.80	2.65
7	3.50	54.00	2.22
8	4.00	54.80	1.46
9	4.50	55.30	0.90
10	5.00	55.80	0.90
11	5.50	56.10	0.53
12	6.00	56.40	0.53

BLANK VALUE = 1.4 micrograms carbon
BLANK FACTOR = 1.4 / 6.004272 = +2.3E-01 ug/min Carbon

SAMPLE RESULTS:
(56.4 - 1.399801)(11)/(200) = +3.03E+00 g/L Carbon
(56.4 - 1.399801)(11)/(200)(12) = +2.52E-01 Molar Carbon

Sample Run By: _____
KR MONTEITH 00000

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-142, REV. 1

Sample: S95V7 Date: 02/16/96 Time: 02:01:58

Sample Size = 200 uL
Dil Factor = 1.2
Blank ID # = BLK
Blank Value = .2331673 ug/minute C

Analyst : KR MONTEITH
Min Readings = 12
Max Readings = 12
% Difference = 10

== Reading	Analysis Time	Coulometer	% Difference ==
1	0.51	0.60	0.00
2	1.01	12.20	95.08
3	1.51	14.80	17.57
4	2.01	16.40	9.76
5	2.51	17.60	6.82
6	3.01	18.30	3.83
7	3.51	18.90	3.17
8	4.00	19.40	2.58
9	4.50	19.90	2.51
10	5.01	20.30	1.97
11	5.51	20.60	1.46
12	6.01	21.00	1.90

BLANK VALUE = 1.4 micrograms carbon
BLANK FACTOR = 1.4 / 6.004272 = +2.3E-01 ug/min Carbon

SAMPLE RESULTS:
(21 - 1.400208)(1.2)/(200) = +1.18E-01 g/L Carbon
(21 - 1.400208)(1.2)/(200)(12) = +9.80E-03 Molar Carbon

Sample Run By: KR MONTEITH 00000

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-142, REV. 1

Sample: S96V7 SPK Date: 02/16/96 Time: 03:30:07

Sample Size = 200 uL
Dil Factor = 2.4
Blank ID # = BLK
Blank Value = .2331673 ug/minute C

Analyst : KR MONTEITH
Min Readings = 12
Max Readings = 12
% Difference = 10

Reading	Analysis Time	Coulometer	% Difference
1	0.51	1.10	0.00
2	1.01	48.20	97.72
3	1.51	66.20	27.19
4	2.01	72.60	8.82
5	2.51	76.10	4.60
6	3.01	78.40	2.93
7	3.51	79.50	1.38
8	4.01	80.40	1.12
9	4.51	81.00	0.74
10	5.01	81.50	0.61
11	5.51	81.80	0.37
12	6.01	82.00	0.24

BLANK VALUE = 1.4 micrograms carbon
BLANK FACTOR = 1.4 / 6.004272 = +2.3E-01 ug/min Carbon

SAMPLE RESULTS:
(82 - 1.40021)(2.4)/(200) = +9.67E-01 g/L Carbon
(82 - 1.40021)(2.4)/(200)(12) = +8.06E-02 Molar Carbon

Sample Run By: _____
KR MONTEITH 00000

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0
WHC-SD-WM-DP-162, REV.1

Sample: S96V7 SPK DUP Date: 02/16/96 Time: 03:37:43

Sample Size = 200 uL Analyst : KR MONTEITH
Dil Factor = 2.4 Min Readings = 12
Blank ID # = BLK Max Readings = 12
Blank Value = .2331673 ug/minute C % Difference = 10

Reading	Analysis Time	Coulometer	% Difference
1	0.51	0.70	0.00
2	1.01	46.60	98.50
3	1.51	68.20	31.67
4	2.01	75.00	9.07
5	2.50	78.50	4.46
6	3.00	80.50	2.48
7	3.51	81.80	1.59
8	4.00	82.80	1.21
9	4.50	83.20	0.48
10	5.00	83.70	0.60
11	5.50	84.20	0.59
12	6.00	84.40	0.24

BLANK VALUE = 1.4 micrograms carbon
BLANK FACTOR = 1.4 / 6.004272 = +2.3E-01 ug/min Carbon

SAMPLE RESULTS:
(84.4 - 1.400011)(2.4)/(200) = +9.96E-01 g/L Carbon
(84.4 - 1.400011)(2.4)/(200)(12) = +8.30E-02 Molar Carbon

Sample Run By: KR MONTEITH 00000

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-142, REV. 1

Sample: S96V6 Date: 02/16/96 Time: 01:54:47

Sample Size = 200 uL
Dil Factor = 1.2
Blank ID # = BLK
Blank Value = .2331673 ug/minute C

Analyst : KR MONTEITH
Min Readings = 12
Max Readings = 12
% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.40	0.00
2	1.01	13.40	97.01
3	1.51	18.60	27.96
4	2.01	21.70	14.29
5	2.51	23.80	8.82
6	3.01	25.20	5.56
7	3.51	26.10	3.45
8	4.00	27.00	3.33
9	4.50	27.70	2.53
10	5.00	28.20	1.77
11	5.51	28.80	2.08
12	6.01	29.20	1.37

BLANK VALUE = 1.4 micrograms carbon
BLANK FACTOR = 1.4 / 6.004272 = +2.3E-01 ug/min Carbon

SAMPLE RESULTS:
(29.2 - 1.40021)(1.2)/(200) = +1.67E-01 g/L Carbon
(29.2 - 1.40021)(1.2)/(200)(12) = +1.39E-02 Molar Carbon

Sample Run By: _____
KR MONTEITH 00000

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-~~142~~ REV. /

Sample: S96V8 Date: 02/16/96 Time: 01:40:22

Sample Size = 200 uL
Dil Factor = ~~1.1~~ 1.2
Blank ID # = BLK
Blank Value = .2331673 ug/minute C

Analyst : KR MONTEITH
Min Readings = 12
Max Readings = 12
% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	1.20	0.00
2	1.01	17.30	93.06
3	1.50	26.50	34.72
4	2.00	30.30	12.54
5	2.50	32.70	7.34
6	3.01	34.20	4.39
7	3.50	35.40	3.39
8	4.00	36.00	1.67
9	4.50	36.70	1.91
10	5.00	37.30	1.61
11	5.50	37.70	1.06
12	6.00	38.20	1.31

BLANK VALUE = 1.4 micrograms carbon
BLANK FACTOR = 1.4 / 6.004272 = +2.3E-01 ug/min Carbon

SAMPLE RESULTS:
(38.2 - 1.399781)(1.1)/(200) = ~~+2.02E-01~~ +2.02E-01 g/L Carbon
(38.2 - 1.399781)(1.1)/(200)(12) = +1.69E-02 Molar Carbon

Sample Run By: KR MONTEITH 00000

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0
WHC-SD-WM-DP-142, REV. 1

Sample: S96V12 Date: 02/16/96 Time: 03:53:18

Sample Size = 200 uL
Dil Factor = 1.2
Blank ID # = BLK
Blank Value = .2331673 ug/minute C

Analyst : KR MONTEITH
Min Readings = 12
Max Readings = 12
% Difference = 10

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	0.51	0.30	0.00
2	1.01	11.80	97.46
3	1.50	14.80	20.27
4	2.00	16.00	7.50
5	2.51	17.00	5.88
6	3.01	17.60	3.41
7	3.51	18.10	2.76
8	4.00	18.50	2.16
9	4.50	18.90	2.12
10	5.00	19.10	1.05
11	5.50	19.40	1.55
12	6.00	19.70	1.52

BLANK VALUE = 1.4 micrograms carbon
BLANK FACTOR = 1.4 / 6.004272 = +2.3E-01 ug/min Carbon

SAMPLE RESULTS:
(19.7 - 1.400014)(1.2)/(200) = +1.10E-01 g/L Carbon
(19.7 - 1.400014)(1.2)/(200)(12) = +9.15E-03 Molar Carbon

Sample Run By: KR MONTEITH 00000

TOC- TOTAL ORGANIC CARBON ANALYSIS REPORT
TICTOC REV 2.0

WHC-SD-WM-DP-142, REV. 1

Sample: S96V16 Date: 02/16/96 Time: 04:00:57

Sample Size = 200 uL
Dil Factor = 1.2
Blank ID # = BLK
Blank Value = .2331673 ug/minute C

Analyst : KR MONTEITH
Min Readings = 12
Max Readings = 12
% Difference = 10

Reading	Analysis Time	Coulometer	% Difference
1	0.51	0.20	0.00
2	1.01	0.80	75.00
3	1.51	1.10	27.27
4	2.01	1.40	21.43
5	2.51	1.70	17.65
6	3.01	1.90	10.53
7	3.51	2.20	13.64
8	4.01	2.50	12.00
9	4.51	2.60	3.85
10	5.01	2.90	10.34
11	5.51	3.20	9.37
12	6.01	3.40	5.88

BLANK VALUE = 1.4 micrograms carbon
BLANK FACTOR = 1.4 / 6.004272 = +2.3E-01 ug/min Carbon

SAMPLE RESULTS:
(3.4 - 1.40021)(1.2)/(200) = +1.2E-02 g/L Carbon
(3.4 - 1.40021)(1.2)/(200)(12) = +1.0E-03 Molar Carbon

Sample Run By: KR MONTEITH 00000

LABCORE Data Entry Template for Worklist# 5354

Analyst: JLS2 **Instrument:** NH301 **Book #** 145N16-A

1000 - 136N16B

Method: LA-631-001 Rev/Mod B-2

Worklist Comment: AP-104 AMMONIA BY ISE STD ADDITION. RCJ

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	-------TEST------	MATRIX	ACTUAL	FOUND	DL	UNIT
		1	BLNK				NH3-01	LIQUID	1	5.08	N/A RWS 2/16/96	ug/mL
		2	STD				NH3-01	LIQUID	395	~~374.9~~ 375	N/A	ug/mL
96000036	AP-104	3	SAMPLE	S96V000007	0		NH3-01	LIQUID	N/A RWS 2/16/96	~~15.35~~ 15.4	5.0	ug/mL
96000036	AP-104	4	SPK	S96V000007	0		NH3-01	LIQUID	100	~~88.61~~ 101	N/A RWS 2/16/96	ug/mL
96000036	AP-104	5	SPK-DUP	S96V000007	0		NH3-01	LIQUID	~~88.61~~ 101 RWS 2/16/96 ~~100~~ RJ 2-14-96	~~86.7~~ ~~45.3~~ <5.0	2.5 2-14-96 N/A	99.6 ug/mL
96000036	AP-104	6	SAMPLE	S96V000006	0		NH3-01	LIQUID	N/A	~~2.95~~ 1.33e2	5.0	ug/mL
96000036	AP-104	7	SAMPLE	S96V000008	0		NH3-01	LIQUID	N/A	~~33.2~~ <5.0	5.0	ug/mL
96000036	AP-104	8	SAMPLE	S96V000016	0		NH3-01	LIQUID	N/A	~~23.29~~	5.0	ug/mL
		9	STD				NH3-01	LIQUID	395	387.4	N/A	ug/mL

Final page for worklist # 5354

Analyst Signature 2-14-96 Date

FOR JACKIE STEELE

Analyst Signature 2-14-96 Date

Reviewed RW Schmoker 2/16/96

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.

WHC-SD-WM-DP-142, REV. 1

LABCORE Data Entry Template for Worklist# 5354

Analyst: JLS2 **Instrument:** NH301 _____ **Book #** 145N16-A
1000 - 136N16B

Method: LA-631-001 Rev/Mod B2

Worklist Comment: AP-104 AMMONIA BY ISE STD ADDITION. RCJ

GROUP	PROJECT	S	TYPE	SAMPLE#	R	A	TEST	MATRIX	ACTUAL	FOUND	DL	UNIT	
		1	BLNK				NH3-01	LIQUID	1	5.08	N/A	ug/mL	
		2	STD				NH3-01	LIQUID	395	374.9	N/A	ug/mL	
96000036	AP-104	3	SAMPLE	S96V000007	0		NH3-01	LIQUID	N/A	15.35		ug/mL	
96000036	AP-104	4	SPK	S96V000007	0		NH3-01	LIQUID	100		N/A	ug/mL	.87
96000036	AP-104	5	SPK-DUP	S96V000007	0		NH3-01	LIQUID	100		N/A	ug/mL	.87
96000036	AP-104	6	SAMPLE	S96V000006	0		NH3-01	LIQUID	N/A	2.95		ug/mL	
96000036	AP-104	7	SAMPLE	S96V000008	0		NH3-01	LIQUID	N/A	133.2		ug/mL	
96000036	AP-104	8	SAMPLE	S96V000016	0		NH3-01	LIQUID	N/A	-3.29		ug/mL	
				STD						387.4			

Final page for worklist # 5354

Jackie Steele 2/14/96

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.

NH3 by ISE: LA-631-001 (A-0)

WORKLIST #	ANALYST SIGNATURE	ANALYSIS DATE	ANALYSIS TIME	INSTRUMENT CODE
5354	Jaime Steele	2/15/96	1100	NH301

☐ SAMPLE ☐ STANDARD ☐ DUPLICATE ☐ PREP BLANK ☒ SPIKE ☐ REAGENT BLANK

SAMPLE # = STD # =

SAMPLE VOL. ADDED (mL) to 25mL VOL. FLASK 25
CONC. OF STANDARD REAGENT ADDED 1000 136N16B
SPIKE VOLUME (mL) _____

* ATTACH 1 PAGE PRINT OUT PER SAMPLE

$NH_3 = .203$ × 25

☐ SAMPLE ☐ STANDARD ☐ DUPLICATE ☐ PREP BLANK ☒ SPIKE dup ☐ REAGENT BLANK

SAMPLE # = S96V000007 STD # = 145N16-A

SAMPLE VOL. ADDED (mL) to 25mL VOL. FLASK 1.0ml
CONC. OF STANDARD REAGENT ADDED 1000
SPIKE VOLUME (mL) .100ml

* ATTACH 1 PAGE PRINT OUT PER SAMPLE

VAL x .1 → .239 − .203 = .817 × 25

$NH_3 = 2.39$

☒ SAMPLE ☐ STANDARD ☐ DUPLICATE ☐ PREP BLANK ☐ SPIKE ☐ REAGENT BLANK

SAMPLE # = 145N16-A STD # = 145N16-A

SAMPLE VOL. ADDED (mL) to 25mL VOL. FLASK 1.0ml
CONC. OF STANDARD REAGENT ADDED 1000
SPIKE VOLUME (mL) _____

* ATTACH 1 PAGE PRINT OUT PER SAMPLE

15.2 − .203 × 25

$NH_3 = 15.2$

☒ SAMPLE ☐ STANDARD ☐ DUPLICATE ☐ PREP BLANK ☐ SPIKE ☐ REAGENT BLANK

SAMPLE # = S96V000006 STD # =

SAMPLE VOL. ADDED (mL) to 25mL VOL. FLASK 1.0ml
CONC. OF STANDARD REAGENT ADDED 1000
SPIKE VOLUME (mL) _____

* ATTACH 1 PAGE PRINT OUT PER SAMPLE

.321 − .203 × 25

$NH_3 = .321$

WHC-SD-WM-DP-142 REV. 1

☒ SAMPLE ☐ STANDARD ☐ DUPLICATE ☐ PREP BLANK ☐ SPIKE ☐ REAGENT BLANK

SAMPLE # = S96V000007 STD # =

SAMPLE VOL. ADDED (mL) to 25mL VOL. FLASK 1.0ml
CONC. OF STANDARD REAGENT ADDED 1000
SPIKE VOLUME (mL) _____

* ATTACH 1 PAGE PRINT OUT PER SAMPLE

.817 − .203 × 25

$NH_3 = .817$

23T

☒ SAMPLE ☐ STANDARD ☐ DUPLICATE ☐ PREP BLANK ☐ SPIKE ☐ REAGENT BLANK

SAMPLE # = S96V000008 STD # =

SAMPLE VOL. ADDED (mL) to 25mL VOL. FLASK 1.0ml
CONC. OF STANDARD REAGENT ADDED 1000
SPIKE VOLUME (mL) _____

* ATTACH 1 PAGE PRINT OUT PER SAMPLE

.203 × 25

$NH_3 = 5.53$

35

☐ SAMPLE ☐ STANDARD ☐ DUPLICATE ☐ PREP BLANK ☒ SPIKE ☐ REAGENT BLANK

SAMPLE # = S96V000007 STD # = 145N16-A

SAMPLE VOL. ADDED (mL) to 25mL VOL. FLASK 1.0ml
CONC. OF STANDARD REAGENT ADDED 1000
SPIKE VOLUME (mL) .100ml

* ATTACH 1 PAGE PRINT OUT PER SAMPLE

VAL x .1 → .517 − .203 × 25

$NH_3 = 2.42$

35

☒ SAMPLE ☐ STANDARD ☐ DUPLICATE ☐ PREP BLANK ☐ SPIKE ☐ REAGENT BLANK

SAMPLE # = S96V000016 STD # =

SAMPLE VOL. ADDED (mL) to 25mL VOL. FLASK 1.0ml
CONC. OF STANDARD REAGENT ADDED 1000
SPIKE VOLUME (mL) _____

* ATTACH 1 PAGE PRINT OUT PER SAMPLE

$NH_3 = .0718$

Blank
1000 - 136N16-B
Q. Steele


```
DOUBLE KNOWN ADDITION SELECTED
AT 09:19, 02-14-96

SAMPLE VOL= 25.000 AT 09:19, 02-14-96
ENTERED

EMF= 163.6 mV AT 09:25, 02-14-96

EMF= 163.9 mV AT 09:25, 02-14-96

EMF= 164.7 mV AT 09:26, 02-14-96

EMF= 164.4 mV AT 09:26, 02-14-96

EMF= 164.5 mV AT 09:27, 02-14-96

EMF= 164.6 mV AT 09:27, 02-14-96

EMF= 164.8 mV AT 09:28, 02-14-96

EMF= 164.9 mV AT 09:28, 02-14-96

EMF= 165.1 mV AT 09:29, 02-14-96
ENTERED

STD CONCN= 1000 AT 09:30, 02-14-96
ENTERED

STD VOL= .25000 AT 09:30, 02-14-96
ENTERED

EMF= 68.9 mV AT 09:31, 02-14-96

EMF= 68.6 mV AT 09:32, 02-14-96

EMF= 68.5 mV AT 09:32, 02-14-96

EMF= 68.5 mV AT 09:32, 02-14-96

EMF= 68.4 mV AT 09:33, 02-14-96

EMF= 68.5 mV AT 09:33, 02-14-96
ENTERED

STD VOL= 2.5000 AT 09:33, 02-14-96
ENTERED

EMF= 12.4 mV AT 09:35, 02-14-96

EMF= 12.0 mV AT 09:35, 02-14-96

EMF= 11.8 mV AT 09:36, 02-14-96

EMF= 11.8 mV AT 09:36, 02-14-96

EMF= 12.0 mV AT 09:37, 02-14-96

EMF= 12.0 mV AT 09:37, 02-14-96
ENTERED
```

1:NH3 SLOPE=-56.9 mV/DEC
AT 09:37, 02-14-96

1:NH3 CONCN= .203

DOUBLE KNOWN ADDITION SELECTED
AT 09:38, 02-14-96

WHC-SD-WM-DP-243, REV. 1

STD
145N16.A 1ml
1000 - 136N16B
Jackie Steele

SAMPLE VOL= 25.000 AT 09:43, 02-14-96
ENTERED

EMF= 60.3 mV AT 09:44, 02-14-96

EMF= 59.9 mV AT 09:45, 02-14-96

EMF= 59.8 mV AT 09:46, 02-14-96

EMF= 59.8 mV AT 09:48, 02-14-96
ENTERED

STD CONCN= 1000 AT 09:48, 02-14-96
ENTERED

STD VOL= .25000 AT 09:48, 02-14-96
ENTERED

EMF= 47.3 mV AT 09:50, 02-14-96

EMF= 47.2 mV AT 09:50, 02-14-96

EMF= 47.2 mV AT 09:52, 02-14-96

EMF= 47.2 mV AT 09:52, 02-14-96
ENTERED

STD VOL= 2.5000 AT 09:52, 02-14-96
ENTERED

EMF= 9.3 mV AT 09:53, 02-14-96

EMF= 9.2 mV AT 09:54, 02-14-96

EMF= 9.1 mV AT 09:54, 02-14-96

EMF= 8.9 mV AT 09:55, 02-14-96

EMF= 8.9 mV AT 09:55, 02-14-96

EMF= 8.9 mV AT 09:55, 02-14-96
ENTERED

1:NH3 SLOPE=-58.4 mV/DEC
AT 09:55, 02-14-96

1:NH3 CONCN= 15.2

S96N000007
1.0mL

1000-136N16B

Jackie Steele

DOUBLE KNOWN ADDITION SELECTED
AT 10:06, 02-14-96

SAMPLE VOL= 25.000 AT 10:06, 02-14-96
ENTERED

EMF= 133.2 mV AT 10:11, 02-14-96

EMF= 133.6 mV AT 10:12, 02-14-96

EMF= 133.9 mV AT 10:12, 02-14-96

EMF= 134.4 mV AT 10:13, 02-14-96

EMF= 134.8 mV AT 10:14, 02-14-96

EMF= 134.9 mV AT 10:15, 02-14-96

EMF= 134.9 mV AT 10:15, 02-14-96
ENTERED

STD CONCN= 1000 AT 10:15, 02-14-96
ENTERED

STD VOL= .25000 AT 10:16, 02-14-96
ENTERED

EMF= 69.5 mV AT 10:17, 02-14-96

EMF= 69.3 mV AT 10:18, 02-14-96

EMF= 69.2 mV AT 10:18, 02-14-96

EMF= 69.2 mV AT 10:19, 02-14-96
ENTERED

STD VOL= 2.5000 AT 10:19, 02-14-96
ENTERED

EMF= 12.3 mV AT 10:20, 02-14-96

EMF= 12.1 mV AT 10:21, 02-14-96

EMF= 12.2 mV AT 10:22, 02-14-96

EMF= 12.2 mV AT 10:23, 02-14-96

EMF= 12.2 mV AT 10:23, 02-14-96
ENTERED

1:NH3 SLOPE=-58.8 mV/DEC
AT 10:23, 02-14-96

1:NH3 CONCN= .817

S96N000007
Spike
1 ml +
.100 ml 145N16A

1000 - 136N16B

Jackie Steele

DOUBLE KNOWN ADDITION SELECTED
AT 10:28, 02-14-96

SAMPLE VOL= 25.000 AT 10:28, 02-14-96
ENTERED

EMF= 110.6 mV AT 10:30, 02-14-96

EMF= 110.5 mV AT 10:31, 02-14-96

EMF= 110.6 mV AT 10:31, 02-14-96

EMF= 110.3 mV AT 10:32, 02-14-96

EMF= 110.4 mV AT 10:33, 02-14-96

EMF= 110.5 mV AT 10:33, 02-14-96
ENTERED

STD CONCN= 1000 AT 10:34, 02-14-96
ENTERED

STD VOL= .25000 AT 10:34, 02-14-96
ENTERED

EMF= 69.4 mV AT 10:36, 02-14-96

EMF= 69.1 mV AT 10:37, 02-14-96

EMF= 69.1 mV AT 10:37, 02-14-96

EMF= 69.1 mV AT 10:37, 02-14-96
ENTERED

STD VOL= 2.5000 AT 10:37, 02-14-96
ENTERED

EMF= 16.0 mV AT 10:39, 02-14-96

EMF= 15.5 mV AT 10:39, 02-14-96

EMF= 15.4 mV AT 10:40, 02-14-96

EMF= 15.4 mV AT 10:41, 02-14-96
ENTERED

1:NH3 SLOPE=-58.6 mV/DEC
AT 10:41, 02-14-96

1:NH3 CONCN= 2.42

$2.42 - .817 = 1.603 \times 25 = \frac{40.075}{395 \times .1} \times 100 = 101.4\%$ Rec

WHC-SD-WM-DP-142, REV. 1

S96V000007
Spike - dup
1.0 mL +
.100 mL 145N16-A
1000 = 136N16B
Jackie Steele

DOUBLE KNOWN ADDITION SELECTED
AT 10:43, 02-14-96

SAMPLE VOL= 25.000 AT 10:44, 02-14-96
ENTERED

EMF= 110.4 mV AT 10:47, 02-14-96

EMF= 110.7 mV AT 10:48, 02-14-96

EMF= 110.9 mV AT 10:48, 02-14-96

EMF= 111.2 mV AT 10:48, 02-14-96

EMF= 111.4 mV AT 10:49, 02-14-96

EMF= 111.6 mV AT 10:50, 02-14-96
ENTERED

STD CONCN= 1000 AT 10:50, 02-14-96
ENTERED

STD VOL= .25000 AT 10:50, 02-14-96
ENTERED

EMF= 69.5 mV AT 10:52, 02-14-96

EMF= 69.3 mV AT 10:52, 02-14-96

EMF= 69.3 mV AT 10:53, 02-14-96

EMF= 69.4 mV AT 10:54, 02-14-96

EMF= 69.5 mV AT 10:55, 02-14-96

EMF= 69.6 mV AT 10:55, 02-14-96
ENTERED

STD VOL= 2.5000 AT 10:55, 02-14-96
ENTERED

EMF= 15.6 mV AT 10:57, 02-14-96

EMF= 15.4 mV AT 10:57, 02-14-96

EMF= 15.4 mV AT 10:58, 02-14-96

EMF= 15.4 mV AT 10:58, 02-14-96

EMF= 15.4 mV AT 10:58, 02-14-96
ENTERED

1:NH3 SLOPE=-59.1 mV/DEC
AT 10:58, 02-14-96

1:NH3 CONCN= 2.39 − .817 = 1.573 x 25 = 39.325 / 287 / 395 x .1 x 100 = 99.6

S96V000006
1.0 mL
1000 = 136N16B
Jackie Steele

DOUBLE KNOWN ADDITION SELECTED
AT 11:01, 02-14-96

SAMPLE VOL= 25.000 AT 11:01, 02-14-96
ENTERED

EMF= 157.7 mV AT 11:05, 02-14-96

EMF= 162.0 mV AT 11:07, 02-14-96

EMF= 162.4 mV AT 11:08, 02-14-96

EMF= 162.7 mV AT 11:08, 02-14-96

EMF= 162.9 mV AT 11:09, 02-14-96

EMF= 161.8 mV AT 11:09, 02-14-96

EMF= 162.1 mV AT 11:10, 02-14-96
ENTERED

STD CONCN= 1000 AT 11:10, 02-14-96
ENTERED

STD VOL= .25000 AT 11:10, 02-14-96
ENTERED

EMF= 73.4 mV AT 11:12, 02-14-96

EMF= 73.2 mV AT 11:12, 02-14-96

EMF= 73.0 mV AT 11:13, 02-14-96

EMF= 73.1 mV AT 11:13, 02-14-96

EMF= 73.1 mV AT 11:14, 02-14-96

EMF= 73.1 mV AT 11:15, 02-14-96
ENTERED

STD VOL= 2.5000 AT 11:15, 02-14-96
ENTERED

EMF= 16.1 mV AT 11:17, 02-14-96

EMF= 15.6 mV AT 11:17, 02-14-96

EMF= 14.9 mV AT 11:18, 02-14-96

EMF= 14.7 mV AT 11:18, 02-14-96

EMF= 14.6 mV AT 11:19, 02-14-96

EMF= 14.6 mV AT 11:19, 02-14-96
ENTERED

1:NH3 SLOPE=-59.2 mV/DEC
AT 11:19, 02-14-96

1:NH3 CONCN= .921

596N000008
1.0 ml
1000 = 136N16B
Jackie Steele

DOUBLE KNOWN ADDITION SELECTED
AT 11:21, 02-14-96

SAMPLE VOL= 25.000 AT 11:21, 02-14-96
ENTERED

EMF= 89.1 mV AT 11:24, 02-14-96

EMF= 89.3 mV AT 11:24, 02-14-96

EMF= 89.4 mV AT 11:24, 02-14-96

EMF= 89.6 mV AT 11:35, 02-14-96

EMF= 89.6 mV AT 11:36, 02-14-96
ENTERED

STD CONCN= 1000 AT 11:26, 02-14-96
ENTERED

STD VOL= .25000 AT 11:26, 02-14-96
ENTERED

EMF= 63.4 mV AT 11:27, 02-14-96

EMF= 63.2 mV AT 11:28, 02-14-96

EMF= 63.2 mV AT 11:29, 02-14-96

EMF= 63.3 mV AT 11:30, 02-14-96
ENTERED

STD VOL= 2.5000 AT 11:30, 02-14-96
ENTERED

EMF= 14.2 mV AT 11:32, 02-14-96

EMF= 14.1 mV AT 11:32, 02-14-96

EMF= 14.1 mV AT 11:33, 02-14-96

EMF= 14.1 mV AT 11:33, 02-14-96
ENTERED

1:NH3 SLOPE=-59.2 mV/DEC
AT 11:33, 02-14-96

1:NH3 CONCN= 5.53

This document was too large to scan as a whole document, therefore it required breaking into smaller sections.

Document number: SD-WM-DP-142

Section 3 **of** 10

Title: Final Characterization and Safety Screen Report of Double Shell Tank 241-AP-104 for 242-A Evaporator, Campaign 96-1

Date: 4/19/96 **Revision:** 1

Originator: Miller, George L
Co:

Recipient:
Co:

References: ECN-629035

S96V000016
1.0mL

1000 = 136N16B

Jackie Steele

DOUBLE KNOWN ADDITION SELECTED
AT 11:36, 02-14-96

SAMPLE VOL= 25.000 AT 11:36, 02-14-96
ENTERED

EMF= 199.0 mV AT 11:43, 02-14-96

EMF= 199.5 mV AT 11:44, 02-14-96

EMF= 200.0 mV AT 11:45, 02-14-96

EMF= 200.1 mV AT 11:45, 02-14-96

EMF= 200.1 mV AT 11:45, 02-14-96
ENTERED

STD CONCN= 1000 AT 11:46, 02-14-96
ENTERED

STD VOL= .25000 AT 11:46, 02-14-96
ENTERED

EMF= 74.1 mV AT 11:48, 02-14-96

EMF= 73.9 mV AT 11:48, 02-14-96

EMF= 73.8 mV AT 11:48, 02-14-96

EMF= 73.8 mV AT 11:48, 02-14-96
ENTERED

STD VOL= 2.5000 AT 11:49, 02-14-96
ENTERED

EMF= 15.3 mV AT 11:50, 02-14-96

EMF= 15.1 mV AT 11:51, 02-14-96

EMF= 15.0 mV AT 11:51, 02-14-96

EMF= 15.0 mV AT 11:52, 02-14-96
ENTERED

1:NH3 SLOPE=-58.9 mV/DEC
AT 11:52, 02-14-96

1:NH3 CONCN= .0718

DOUBLE KNOWN ADDITION SELECTED
AT 12:04, 02-14-96

SAMPLE VOL= 25.000 AT 12:05, 02-14-96
ENTERED

EMF= 62.1 mV AT 12:06, 02-14-96

EMF= 62.4 mV AT 12:07, 02-14-96

EMF= 62.5 mV AT 12:07, 02-14-96

EMF= 62.7 mV AT 12:08, 02-14-96

EMF= 62.6 mV AT 12:08, 02-14-96
ENTERED

STD CONCN= 1000 AT 12:09, 02-14-96
ENTERED

STD VOL= .25000 AT 12:09, 02-14-96
ENTERED

EMF= 50.4 mV AT 12:10, 02-14-96

EMF= 50.2 mV AT 12:10, 02-14-96

EMF= 50.1 mV AT 12:11, 02-14-96

EMF= 50.2 mV AT 12:11, 02-14-96
ENTERED

STD VOL= 2.5000 AT 12:11, 02-14-96
ENTERED

EMF= 11.8 mV AT 12:13, 02-14-96

EMF= 11.7 mV AT 12:14, 02-14-96

EMF= 11.7 mV AT 12:15, 02-14-96

EMF= 11.7 mV AT 12:15, 02-14-96

EMF= 11.8 mV AT 12:16, 02-14-96

EMF= 11.9 mV AT 12:16, 02-14-96
ENTERED

1:NH3 SLOPE=-59.0 mV/DEC
AT 12:16, 02-14-96

1:NH3 CONCN= 15.7

STD
1.0ml 145N16-A
1000 - 136N16B
Jackie Steele

worklistdata Version 0.0 05/16/95
04/09/96 09:59

LABCORE Completed Worklist Report for Worklist# 5387

Analyst: rwk **Instrument:** IC01 **Book#** 122N9E

Method: 64-533-103 Rev/Mod D-1

Worklist Comment: AP-104 FOR IC RTS!

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
1	CCB			0	@IC-QC F	QC	1	<1.30e-2		ug/mL
1	CCB			0	@IC-QC CL	QC	1	<1.70e-2		ug/mL
1	CCB			0	@IC-QC NO2	QC	1	<1.07e-1		ug/mL
1	CCB			0	@IC-QC BR	QC	1	<1.26e-1		ug/mL
1	CCB			0	@IC-QC NO3	QC	1	2.29e-01	0.230	ug/mL
1	CCB			0	@IC-QC PO4	QC	1	<1.19e-1		ug/mL
1	CCB			0	@IC-QC SO4	QC	1	<1.36e-1		ug/mL
1	CCB			0	@IC-QC OXALATE2	QC	1	<1.05e-1		ug/mL
2	CCV			0	@IC-QC F	QC	59	5.42e+01	91.860	% Recovery
2	CCV			0	@IC-QC CL	QC	79	7.40e+01	93.670	% Recovery
2	CCV			0	@IC-QC NO2	QC	534	4.97e+02	93.070	% Recovery
2	CCV			0	@IC-QC BR	QC	575	5.42e+02	94.260	% Recovery
2	CCV			0	@IC-QC NO3	QC	614	5.88e+02	95.770	% Recovery
2	CCV			0	@IC-QC PO4	QC	546	5.22e+02	95.600	% Recovery
2	CCV			0	@IC-QC SO4	QC	631	6.07e+02	96.200	% Recovery
2	CCV			0	@IC-QC OXALATE2	QC	526	5.09e+02	96.770	% Recovery
3	SAMPLE	S96V000006		0	@IC-01 F-02	LIQUID	N/A	5.612e+02	66.960	ug/mL
3	REJECT	S96V000006		0	@IC-01 F-02	LIQUID	N/A	5.612e+02		ug/mL
3	SAMPLE	S96V000006		0	@IC-01 NO2-02	LIQUID	N/A	3.344e+03	551.200	ug/mL
3	REJECT	S96V000006		0	@IC-01 NO2-02	LIQUID	N/A	3.344e+03		ug/mL
3	SAMPLE	S96V000006		0	@IC-01 NO3-02	LIQUID	N/A	1.717e+04	721.100	ug/mL
3	REJECT	S96V000006		0	@IC-01 NO3-02	LIQUID	N/A	1.717e+04		ug/mL
3	SAMPLE	S96V000006		0	@IC-01 PO4-02	LIQUID	N/A	1.582e+03	618.100	ug/mL
3	REJECT	S96V000006		0	@IC-01 PO4-02	LIQUID	N/A	1.582e+03		ug/mL
3	SAMPLE	S96V000006		0	@IC-01 SO4-02	LIQUID	N/A	1.485e+03	700.500	ug/mL
3	REJECT	S96V000006		0	@IC-01 SO4-02	LIQUID	N/A	1.485e+03		ug/mL
4	SPK	S96V000006		0	@IC-01 F-02	LIQUID	100	92.1	92.100	% Recovery
4	SPK	S96V000006		0	@IC-01 NO2-02	LIQUID	100	93.8	93.800	% Recovery
4	SPK	S96V000006		0	@IC-01 NO3-02	LIQUID	100	97.9	97.900	% Recovery
4	SPK	S96V000006		0	@IC-01 PO4-02	LIQUID	100	94.4	94.400	% Recovery
4	SPK	S96V000006		0	@IC-01 SO4-02	LIQUID	100	95.2	95.200	% Recovery
5	SPK-DUP	S96V000006		0	@IC-01 F-02	LIQUID	92.1	92.0	0.110	RPD
5	SPK-DUP	S96V000006		0	@IC-01 NO2-02	LIQUID	93.8	92.7	1.180	RPD
5	SPK-DUP	S96V000006		0	@IC-01 NO3-02	LIQUID	97.9	98.1	0.200	RPD
5	SPK-DUP	S96V000006		0	@IC-01 PO4-02	LIQUID	94.4	94.5	0.110	RPD
5	SPK-DUP	S96V000006		0	@IC-01 SO4-02	LIQUID	95.2	95.0	0.210	RPD
6	DUP	S96V000006		0	@IC-01 F-02	LIQUID	5.61e+02	5.58e+02	0.540	RPD
6	DUP	S96V000006		0	@IC-01 NO2-02	LIQUID	3.34e+03	3.31e+03	0.900	RPD
6	DUP	S96V000006		0	@IC-01 NO3-02	LIQUID	1.72e+04	1.71e+04	0.580	RPD
6	DUP	S96V000006		0	@IC-01 PO4-02	LIQUID	1.58e+03	1.62e+03	2.500	RPD
6	DUP	S96V000006		0	@IC-01 SO4-02	LIQUID	1.48e+03	1.51e+03	2.010	RPD

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

LABCORE Completed Worklist Report for Worklist# 5387

Seq	Type	Sample#	R	A	Test		Matrix	Actual	Found	DL or Yield	Unit
7	REJECT	S96V000007	0		@IC-01	F-02	LIQUID	N/A	2.222e+02		ug/mL
7	SAMPLE	S96V000007	0		@IC-01	F-02	LIQUID	N/A	1.139e+02	18.820	ug/mL
7	REJECT	S96V000007	0		@IC-01	NO2-02	LIQUID	N/A	2.408e+03		ug/mL
7	SAMPLE	S96V000007	0		@IC-01	NO2-02	LIQUID	N/A	1.090e+03	154.900	ug/mL
7	REJECT	S96V000007	0		@IC-01	NO3-02	LIQUID	N/A	5.201e+03		ug/mL
7	SAMPLE	S96V000007	0		@IC-01	NO3-02	LIQUID	N/A	2.928e+03	202.700	ug/mL
7	REJECT	S96V000007	0		@IC-01	PO4-02	LIQUID	N/A	1.795e+03		ug/mL
7	SAMPLE	S96V000007	0		@IC-01	PO4-02	LIQUID	N/A	6.595e+02	173.700	ug/mL
7	REJECT	S96V000007	0		@IC-01	SO4-02	LIQUID	N/A	2.383e+03		ug/mL
7	SAMPLE	S96V000007	0		@IC-01	SO4-02	LIQUID	N/A	5.573e+02	196.900	ug/mL
8	DUP	S96V000007	0		@IC-01	F-02	LIQUID	1.14e+02	1.12e+02	1.770	RPD
8	DUP	S96V000007	0		@IC-01	NO2-02	LIQUID	1.09e+03	1.08e+03	0.920	RPD
8	DUP	S96V000007	0		@IC-01	NO3-02	LIQUID	2.93e+03	2.96e+03	1.020	RPD
8	DUP	S96V000007	0		@IC-01	PO4-02	LIQUID	6.60e+02	6.55e+02	0.760	RPD
8	DUP	S96V000007	0		@IC-01	SO4-02	LIQUID	5.57e+02	5.62e+02	0.890	RPD

Final page for worklist# 5387

Analyst Signature **Date**

Analyst Signature **Date**

Joan M. Fuyr 4/9/96

Reviewer Signature **Date**

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

LABCORE Completed Worklist Report for Worklist# 5387

Analyst: rwk **Instrument:** IC01 **Book#** 12219E

Method: A-533-102 Rev/Mod D-1

Copy included to document change in QC tables. JMF 4/18/96

Worklist Comment: AP-104 FOR IC RTS!

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
1	CCB			0	@IC-QC F	QC	1	<1.30e-2		ug/mL
1	CCB			0	@IC-QC CL	QC	1	<1.70e-2		ug/mL
1	CCB			0	@IC-QC NO2	QC	1	<1.07e-1		ug/mL
1	CCB			0	@IC-QC BR	QC	1	<1.26e-1		ug/mL
1	CCB			0	@IC-QC NO3	QC	1	2.29e-01	0.230	ug/mL
1	CCB			0	@IC-QC PO4	QC	1	<1.19e-1		ug/mL
1	CCB			0	@IC-QC SO4	QC	1	<1.36e-1		ug/mL
1	CCB			0	@IC-QC OXALATE2	QC	1	<1.05e-1		ug/mL
2	CCV			0	@IC-QC F	QC	59	5.42e+01	91.860	% Recovery
2	CCV			0	@IC-QC CL	QC	79	7.40e+01	93.670	% Recovery
2	CCV			0	@IC-QC NO2	QC	534	4.97e+02	93.070	% Recovery
2	CCV			0	@IC-QC BR	QC	575	5.42e+02	94.260	% Recovery
2	CCV			0	@IC-QC NO3	QC	614	5.88e+02	95.770	% Recovery
2	CCV			0	@IC-QC PO4	QC	546	5.22e+02	95.600	% Recovery
2	CCV			0	@IC-QC SO4	QC	631	6.07e+02	96.200	% Recovery
2	CCV			0	@IC-QC OXALATE2	QC	526	5.09e+02	96.770	% Recovery
3	SAMPLE	S96V000006		0	@IC-01 F-02	LIQUID	N/A	5.612e+02	66.960	ug/mL
3	REJECT	S96V000006		0	@IC-01 F-02	LIQUID	N/A	5.612e+02		ug/mL
3	SAMPLE	S96V000006		0	@IC-01 NO2-02	LIQUID	N/A	3.344e+03	551.200	ug/mL
3	REJECT	S96V000006		0	@IC-01 NO2-02	LIQUID	N/A	3.344e+03		ug/mL
3	SAMPLE	S96V000006		0	@IC-01 NO3-02	LIQUID	N/A	1.717e+04	721.100	ug/mL
3	REJECT	S96V000006		0	@IC-01 NO3-02	LIQUID	N/A	1.717e+04		ug/mL
3	SAMPLE	S96V000006		0	@IC-01 PO4-02	LIQUID	N/A	1.582e+03	618.100	ug/mL
3	REJECT	S96V000006		0	@IC-01 PO4-02	LIQUID	N/A	1.582e+03		ug/mL
3	SAMPLE	S96V000006		0	@IC-01 SO4-02	LIQUID	N/A	1.485e+03	700.500	ug/mL
3	REJECT	S96V000006		0	@IC-01 SO4-02	LIQUID	N/A	1.485e+03		ug/mL
4	SPK	S96V000006		0	@IC-01 F-02	LIQUID	100	92.1	92.100	% Recovery
4	SPK	S96V000006		0	@IC-01 NO2-02	LIQUID	100	93.8	93.800	% Recovery
4	SPK	S96V000006		0	@IC-01 NO3-02	LIQUID	100	97.9	97.900	% Recovery
4	SPK	S96V000006		0	@IC-01 PO4-02	LIQUID	100	94.4	94.400	% Recovery
4	SPK	S96V000006		0	@IC-01 SO4-02	LIQUID	100	95.2	95.200	% Recovery
5	SPK-DUP	S96V000006		0	@IC-01 F-02	LIQUID	100	92.0	92.000	RPD
5	SPK-DUP	S96V000006		0	@IC-01 NO2-02	LIQUID	100	92.7	92.700	RPD
5	SPK-DUP	S96V000006		0	@IC-01 NO3-02	LIQUID	100	98.1	98.100	RPD
5	SPK-DUP	S96V000006		0	@IC-01 PO4-02	LIQUID	100	94.5	94.500	RPD
5	SPK-DUP	S96V000006		0	@IC-01 SO4-02	LIQUID	100	95.0	95.000	RPD
6	DUP	S96V000006		0	@IC-01 F-02	LIQUID	5.61e+02	5.58e+02	0.540	RPD
6	DUP	S96V000006		0	@IC-01 NO2-02	LIQUID	3.34e+03	3.31e+03	0.900	RPD
6	DUP	S96V000006		0	@IC-01 NO3-02	LIQUID	1.72e+04	1.71e+04	0.580	RPD
6	DUP	S96V000006		0	@IC-01 PO4-02	LIQUID	1.58e+03	1.62e+03	2.500	RPD
6	DUP	S96V000006		0	@IC-01 SO4-02	LIQUID	1.48e+03	1.51e+03	2.010	RPD

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

LABCORE Completed Worklist Report for Worklist# 5387

Seq	Type	Sample#	R	A	Test		Matrix	Actual	Found	DL or Yield	Unit
7	REJECT	S96V000007	0		@IC-01	F-02	LIQUID	N/A	2.222e+02		ug/mL
7	SAMPLE	S96V000007	0		@IC-01	F-02	LIQUID	N/A	1.139e+02	18.820	ug/mL
7	REJECT	S96V000007	0		@IC-01	NO2-02	LIQUID	N/A	2.408e+03		ug/mL
7	SAMPLE	S96V000007	0		@IC-01	NO2-02	LIQUID	N/A	1.090e+03	154.900	ug/mL
7	REJECT	S96V000007	0		@IC-01	NO3-02	LIQUID	N/A	5.201e+03		ug/mL
7	SAMPLE	S96V000007	0		@IC-01	NO3-02	LIQUID	N/A	2.928e+03	202.700	ug/mL
7	REJECT	S96V000007	0		@IC-01	PO4-02	LIQUID	N/A	1.795e+03		ug/mL
7	SAMPLE	S96V000007	0		@IC-01	PO4-02	LIQUID	N/A	6.595e+02	173.700	ug/mL
7	REJECT	S96V000007	0		@IC-01	SO4-02	LIQUID	N/A	2.383e+03		ug/mL
7	SAMPLE	S96V000007	0		@IC-01	SO4-02	LIQUID	N/A	5.573e+02	196.900	ug/mL
8	DUP	S96V000007	0		@IC-01	F-02	LIQUID	1.14e+02	1.12e+02	1.770	RPD
8	DUP	S96V000007	0		@IC-01	NO2-02	LIQUID	1.09e+03	1.08e+03	0.920	RPD
8	DUP	S96V000007	0		@IC-01	NO3-02	LIQUID	2.93e+03	2.96e+03	1.020	RPD
8	DUP	S96V000007	0		@IC-01	PO4-02	LIQUID	6.60e+02	6.55e+02	0.760	RPD
8	DUP	S96V000007	0		@IC-01	SO4-02	LIQUID	5.57e+02	5.62e+02	0.890	RPD

Final page for worklist# 5387

Analyst Signature **Date**

Analyst Signature **Date**

James M. Luyc 3/13/96
Reviewer Signature **Date**

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

96021701.D03→D14

02/01/96 13:35
A-0004-1

LABCORE Data Entry Template for Worklist# 5387

Analyst: BK **Instrument:** IC01 ________ **Book#** 12209-E

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

Worklist Comment: AP-104 FOR IC RTS! WHC-SD-WM-DP-142, REV. 1

S	Type	Sample#	R A	Test	Matrix	Group#	Project
1	CCB			@IC-QC	QC		
2	CCV			@IC-QC	QC		
3	SAMPLE	S96V000006	0	@IC-01	LIQUID	96000036	AP-104
		Analytes Requested:		F-02	, NO2-02	, NO3-02	, PO4-02 , SO4-02
4	SPK	S96V000006	0	@IC-01	LIQUID		
5	SPK-DUP	S96V000006	0	@IC-01	LIQUID		
6	DUP	S96V000006	0	@IC-01	LIQUID		
7	SAMPLE	S96V000007	0	@IC-01	LIQUID	96000036	AP-104
		Analytes Requested:		F-02	, NO2-02	, NO3-02	, PO4-02 , SO4-02
8	DUP	S96V000007	0	@IC-01	LIQUID		

Final page for worklist # 5387

Nob King 2/17/96
Analyst Signature **Date**

Analyst Signature **Date**

Existing In Shell again
uploaded 3/5/96 n-smith
Re uploaded 3/13/96 Joan Fuye – due to problem with spike + spiked dup calculation
See ace form, will correction QC tables.

Data Entry Comments:

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

A-0010-IC DATA FILE/WORKLIST RESOLUTION 13-Mar-96

Worklist#: 5387

	Seq	Type	Sample #
=>	1	CCB	
=>	2	CCV	
=>	3	SAMPLE	S96V000006
=>	4	SPK	S96V000006
=>	5	SPK-DUP	S96V000006
=>	6	DUP	S96V000006
=>	7	SAMPLE	S96V000007
=>	8	DUP	S96V000007

Data File: 5387NEW.CSV

Seq#	Data File	Sample Name		Dilution
	96021701.d01	INSTRA BLK		1.00
	96021701.d02	INSTRA BLK		1.00
1	96021701.d03	INSTRA BLK		1.00
2	96021701.d04	STD 122N9-E		101.00
	96021701.d05	PREP BLK		1.00
	96021701.d06	S96V000006		10201.00
3	96021701.d07	S96V000006		5151.00
6	96021701.d08	S96V000006	DUP	5151.00
4	96021701.d09	S96V000006	SPIK	5151.00
5	96021701.d10	S96V000006	SPIK	5151.00
	96021701.d11	S96V000007		10201.00
	96021701.d12	S96V000007		2121.00
7	96021701.d13	S96V000007		1447.66
8	96021701.d14	S96V000007	DUP	1447.66

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

WHC-SD-WM-DP-148, REV. 1

WKL 5387 RPD's on Spike-Dup

F $\frac{|92.1 - 92.0|}{(92.1 + 92.0)/2} \times 100 = \frac{0.100}{92.05} \times 100 = 0.1086$

NO_2 $\frac{|93.8 - 92.7|}{(93.8 + 92.7)/2} \times 100 = \frac{1.100}{93.25} \times 100 = 1.1796$

NO_3 $\frac{|97.9 - 98.1|}{(97.9 + 98.1)/2} \times 100 = \frac{0.200}{98.00} \times 100 = 0.2041$

PO_4 $\frac{|94.4 - 94.5|}{(94.4 + 94.5)/2} \times 100 = \frac{0.1000}{94.45} \times 100 = 0.1059$

SO_4 $\frac{|95.2 - 95.0|}{(95.2 + 95.0)/2} \times 100 = \frac{0.200}{95.100} \times 100 = 0.2103$

A-0010-1 WORKLIST DATA ENTRY USING SODIUM::LIMS3 13-Mar-96

PROTOCOL DETAIL INFORMATION

Seq: 4 Type: SPK Sample#: S96V000006 Aliquot: Rep: 0

Code	Name	Actual	Raw Found		Found		Yield	Q
F-02	Fluoride-IC-Di	59	3306.75	<	6.70e1	<	113.559	N
NO2-02	Nitrite-IC - D	534	28633.8	<	5.51e2	<	103.184	N
NO3-02	Nitrate-IC - D	614	47539.5	<	7.21e2	<	117.427	N
PO4-02	Phosphate-IC-D	546	27613.2	<	6.18e2	<	113.187	N
SO4-02	Sulfate by IC-	631	31810.8	<	7.00e2	<	110.935	N

<Alt-Enter> Clear from cursor/move to next <Tab> Move to next

QC Chart(F5) Defaults(F6) ClearRow(F7) Delete Row(F8) >

Wrong
It was incorrectly comparing to det. limit & substituting the meth. det. limit for the spike found.
I corrected it in QC tables.
JMF 3/13/96

WHC-SD-WM-DP-142, REV. 1

LAB LEADER INFO	
Method:	ia-533-105
Matrix:	liquid
Test Code:	@ic-01
Work List #:	5367
Batch #:	
Result Units	
(µg/g or µg/mL):	µg/mL
Spike Book Number:	122n9e
Spike Sample #:	1
Prepared By:	Jann Frye
Prepared Date:	03/13/96
Chemist:	Jann Frye
Analyst:	Rob King
Analysis Date:	02/17/96
Time Complete:	
Instrument Code:	ic01
Rerun:	0
Sample Prep:	direct
Sample Point:	AP104
Sample Type	
STANDARD	122n9e
SAMPLE 1	S96V000006
DUPLICATE 1	
SAMPLE 2	
DUPLICATE 2	
SAMPLE 3	
DUPLICATE 3	
SAMPLE 4	
DUPLICATE 4	
SPIKE	S96V000006spike
SPIKE DUPLICATE	

PRINT

Spike

TECH INFO	Fluoride	Chloride	Nitrite	Nitrate	Phosphate	Sulfate	Bromide	Oxalate
Blank Data (µg/mL)								
Standard Data (µg/mL)								
Sample 1 Data (µg/mL)	5.61E+02	2.42E+02	3.34E+03	1.72E+04	1.58E+03	1.49E+03		
Sample 1 Dilution Factor	5151	5151	5151	5151	5151	5151		
Sample 1 Prep DF	1	1	1	1	1	1	1	1
Duplicate 1 Data (µg/mL)								
Duplicate 1 Dilution Factor								
Duplicate 1 Prep DF								
Sample 2 Data (µg/mL)								
Sample 2 Dilution Factor								
Sample 2 Prep DF								
Duplicate 2 Data (µg/mL)								
Duplicate 2 Dilution Factor								
Duplicate 2 Prep DF								
Sample 3 Data (µg/mL)								
Sample 3 Dilution Factor								
Sample 3 Prep DF								
Duplicate 3 Data (µg/mL)								
Duplicate 3 Dilution Factor								
Duplicate 3 Prep DF								
Sample 4 Data (µg/mL)								
Sample 4 Dilution Factor								
Sample 4 Prep DF								
Duplicate 4 Data (µg/mL)								
Duplicate 4 Dilution Factor								
Duplicate 4 Prep DF								
Spike + Sample 1 (µg/mL)	3.31E+03	3.87E+03	2.86E+04	4.75E+04	2.76E+04	3.18E+04		
Spike + Dup 1 (µg/mL)								
Spike Volume (mL)	1.00E-01	1.00E-01	1.00E-01	1.00E-01	1.00E-01	1.00E-01		
Total Volume (mL)	10.20	10.20	10.20	10.20	10.20	10.20		
Std. Conc. (µg/mL)	59	79	534	614	546	631		
Detection Limit	0.013	0.017	0.107	0.140	0.119	0.136		
Matrix Detection Limit 1	6.70E+01	8.76E+01	5.61E+02	7.21E+02	6.13E+02	7.01E+02	0.00E+00	0.00E+00
Matrix Detection Limit 2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Matrix Detection Limit 3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Matrix Detection Limit 4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Spike Recovery = [((Spike+Sample)-(Sample)*(Total Volume))/((Spike Vol.)*(Spike Std.)*(Sample DF))]*100%
Note: (For spike recovery when the sample conc. is less than detection limit you do NOT subtract sample conc.)
Duplicate Relative % Difference = ((Sample - Duplicate) / ((Sample + Duplicate) / 2) * 100%)
Less than Values are Calculated from the Detection Limit* Dilution Factor

v RESULTS v	Fluoride	Chloride	Nitrite	Nitrate	Phosphate	Sulfate	Bromide	Oxalate
Sample 1 in µg/mL	5.61E+02	2.42E+02	3.34E+03	1.72E+04	1.58E+03	1.49E+03	<0.00	<0.00
Duplicate 1 in µg/mL	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00
Duplicate 1 RPD	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sample 2 in µg/mL	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00
Duplicate 2 in µg/mL	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00
Duplicate 2 RPD	N/A	N/A	N/A	N/A	N/A	N/A	ERR	ERR
Spike % Recovery	92.1%	90.9%	93.6%	97.9%	94.4%	95.2%		

Data Entry by: Jann Frye Date: 03/13/96
Approved by: Jann Frye Date: 3/13/96
Form DIONEX.WB1 Rev. 1.3

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY
INORGANIC ANALYTICAL BATCH AND SUMMARY SHEET

ANION ANALYSIS ON DIONEX

SAMPLE #:	S96V000006		
TEST CODE:	@ic-01	ANALYST:	Rob King
INSTRUMENT:	ic01	ANALYSIS DATE:	02/17/96
WORK LIST #:	5387	SAMPLE POINT:	AP104
BATCH ID:		SAMPLE PREP:	direct

Result Units µg/mL	Fluoride	Chloride	Nitrite	Nitrate	Phosphate	Sulfate	Bromide	Oxalate
122n9e								
S96V000006	5.61E+02	2.42E+03	3.34E+03	1.72E+04	1.58E+03	1.49E+03	<0.00	<0.00
	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00
Duplicate 1 RPD	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00
	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00
Duplicate 2 RPD	N/A	N/A	N/A	N/A	N/A	N/A	ERR	ERR
S96V000006spkdup	92.1%	90.9%	93.8%	97.9%	94.4%	95.2%		

NARRATIVE: Analyst Comments:

Chemist Comments:

Spike

Form Completed By:		Date: 3/13/96
Chemist Approval:		Date: 3/13/96

LAB LEADER INFO	
Method:	ia-533-105
Matrix:	liquid
Test Code:	@ic-01
Work List #:	5387
Batch #:	
Result Units	
(µg/g or µg/mL):	µg/mL
Spike Book Number:	122n9e
Spike Sample #:	1
Prepared By:	Jann Frye
Prepared Date:	03/13/96
Chemist:	Jann Frye
Analyst:	Rob King
Analysis Date:	02/17/96
Time Complete:	
Instrument Code:	ic01
Rerun:	0
Sample Prep:	direct
Sample Point:	AP104
Sample Type	
STANDARD	122n9e
SAMPLE 1	S96V000006
DUPLICATE 1	
SAMPLE 2	
DUPLICATE 2	
SAMPLE 3	
DUPLICATE 3	
SAMPLE 4	
DUPLICATE 4	
SPIKE	S96V000006spkdu
SPIKE DUPLICATE	

PRINT

Spike Dup

TECH INFO	Fluoride	Chloride	Nitrite	Nitrate	Phosphate	Sulfate	Bromide	Oxalate
Blank Data (µg/mL)								
Standard Data (µg/mL)								
Sample 1 Data (µg/mL)	5.61E+02	2.42E+02	3.34E+03	1.72E+04	1.68E+03	1.49E+03		
Sample 1 Dilution Factor	5151	5151	5151	5151	5151	5151		
Sample 1 Prep DF	1	1	1	1	1	1	1	1
Duplicate 1 Data (µg/mL)								
Duplicate 1 Dilution Factor								
Duplicate 1 Prep DF								
Sample 2 Data (µg/mL)								
Sample 2 Dilution Factor								
Sample 2 Prep DF								
Duplicate 2 Data (µg/mL)								
Duplicate 2 Dilution Factor								
Duplicate 2 Prep DF								
Sample 3 Data (µg/mL)								
Sample 3 Dilution Factor								
Sample 3 Prep DF								
Duplicate 3 Data (µg/mL)								
Duplicate 3 Dilution Factor								
Duplicate 3 Prep DF								
Sample 4 Data (µg/mL)								
Sample 4 Dilution Factor								
Sample 4 Prep DF								
Duplicate 4 Data (µg/mL)								
Duplicate 4 Dilution Factor								
Duplicate 4 Prep DF								
Spike + Sample 1 (µg/mL)	3.30E+03	3.86E+03	2.83E+04	4.76E+04	2.76E+04	3.18E+04		
Spike + Dup 1 (µg/mL)								
Spike Volume (mL)	1.00E-01	1.00E-01	1.00E-01	1.00E-01	1.00E-01	1.00E-01		
Total Volume (mL)	10.20	10.20	10.20	10.20	10.20	10.20		
Std. Conc. (µg/mL)	59	79	534	614	546	631		
Detection Limit	0.013	0.017	0.107	0.140	0.119	0.136		
Matrix Detection Limit 1	6.70E+01	8.76E+01	5.61E+02	7.21E+02	6.13E+02	7.01E+02	0.00E+00	0.00E+00
Matrix Detection Limit 2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Matrix Detection Limit 3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Matrix Detection Limit 4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Spike Recovery = [((Spike+Sample)-(Sample)*(Total Volume))/((Spike Vol.)*(Spike Std.)*(Sample DF))]*100%
Note: (For spike recovery when the sample conc. is less than detection limit you do NOT subtract sample conc.)
Duplicate Relative % Difference = ((Sample - Duplicate) / ((Sample + Duplicate) / 2) * 100%)
Less than Values are Calculated from the Detection Limit*Dilution Factor

v RESULTS v	Fluoride	Chloride	Nitrite	Nitrate	Phosphate	Sulfate	Bromide	Oxalate
Sample 1 in µg/mL	5.61E+02	2.42E+02	3.34E+03	1.72E+04	1.68E+03	1.49E+03	<0.00	<0.00
Duplicate 1 in µg/mL	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00
Duplicate 1 RPD	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sample 2 in µg/mL	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00
Duplicate 2 in µg/mL	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00
Duplicate 2 RPD	N/A	N/A	N/A	N/A	N/A	N/A	ERR	ERR
Spike % Recovery	92.0%	90.6%	92.7%	98.1%	94.6%	96.0%		

Data Entry by: Jann Frye Date: 03/13/96
Approved by: Jann Frye Date: 3/13/96
Form DIONEX.WB1 Rev. 1.3

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY WHC-SD-WM-DP-142, REV. 1
INORGANIC ANALYTICAL BATCH AND SUMMARY SHEET

ANION ANALYSIS ON DIONEX

SAMPLE #:	S96V000006		
TEST CODE:	@ic-01	ANALYST:	Rob King
INSTRUMENT:	ic01	ANALYSIS DATE:	02/17/96
WORK LIST #:	5387	SAMPLE POINT:	AP104
BATCH ID:		SAMPLE PREP:	direct

Result Units µg/mL	Fluoride	Chloride	Nitrite	Nitrate	Phosphate	Sulfate	Bromide	Oxalate
122n9e								
S96V000006	5.61E+02	2.42E+02	3.34E+03	1.72E+04	1.58E+03	1.49E+03	<0.00	<0.00
	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00
Duplicate 1 RPD	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00
	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00
Duplicate 2 RPD	N/A	N/A	N/A	N/A	N/A	N/A	ERR	ERR
S96V000006spkdup	92.0%	90.6%	92.7%	98.1%	94.5%	95.0%		

NARRATIVE: **Analyst Comments:**

Chemist Comments:

Spike dup calculation JMF

Form Completed By: [signature] Date: 3/13/96
Chemist Approval: [signature] Date: 3/13/96

Data Reprocessed On 02/27/1996 15:27:57

Sample Name: STD 122N9-E Date: 02/17/1996 07:31:22
Data File : C:\DX\DATA\96021701.d04
Method : C:\DX\METHOD\KIT.MET WHC-SD-WM-DP-142,REV. 1
ACI Address: 1 System: 1 Inject#: 4 Detector: CDM-2
Analyst : Column: AG4A/AS4A anion column

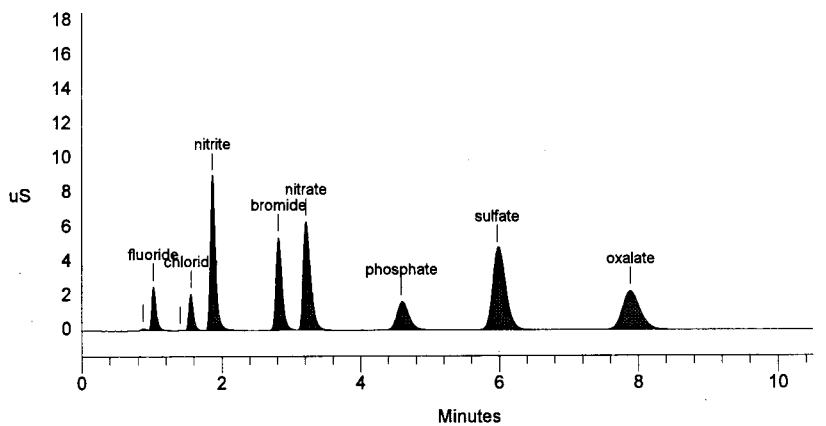
2/17/96

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area Reject
External	1	101	3150	5Hz	0.00	10.50	20000

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.87		0.000	84263	361756	2	
2	1.02	fluoride	54.170	2495846	11412967	2	0.99
3	1.41		0.000	11178	49148	1	
4	1.56	chloride	73.997	2095951	9784338	1	-0.64
5	1.87	nitrite	496.744	8910607	47469244	1	-2.27
6	2.81	bromide	541.747	5376659	33580532	1	-0.24
7	3.21	nitrate	588.161	6270380	47229554	1	1.80
8	4.59	phosphate	521.892	1618285	20703628	1	-2.20
9	5.97	sulfate	606.550	4731607	63761386	1	-3.50
10	7.89	oxalate	509.377	2247894	40085060	1	-2.67
		Totals	3392.637	33842670	274437612		

File: 96021701.d04 Sample: STD 122N9-E



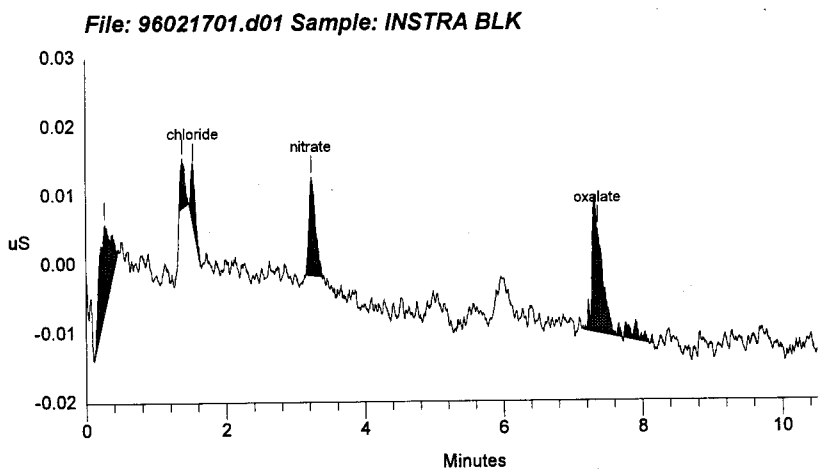
Data Reprocessed On 02/27/1996 15:27:50

Sample Name: INSTRA BLK Date: 02/17/1996 06:43:23
Data File : C:\DX\DATA\96021701.d01
Method : C:\DX\METHOD\KIT.MET WHC-SD-WM-DP-142, REV.1
ACI Address: 1 System: 1 Inject#: 1 Detector:CDM-2
Analyst : [illegible] 2/17/96 Column: AG4A/AS4A anion column

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area Reject
External	1	1	3150	5Hz	0.00	10.50	20000

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.27		0.000	12611	146666	1	
2	1.38		0.000	6920	32514	1	
3	1.54	chloride	0.013	8477	36448	1	-1.91
4	3.23	nitrate	0.233	14002	91784	1	2.65
5	7.36	oxalate	0.053	14990	217520	1	-9.25
		Totals	0.299	57000	524932		



Data Reprocessed On 02/27/1996 15:27:52

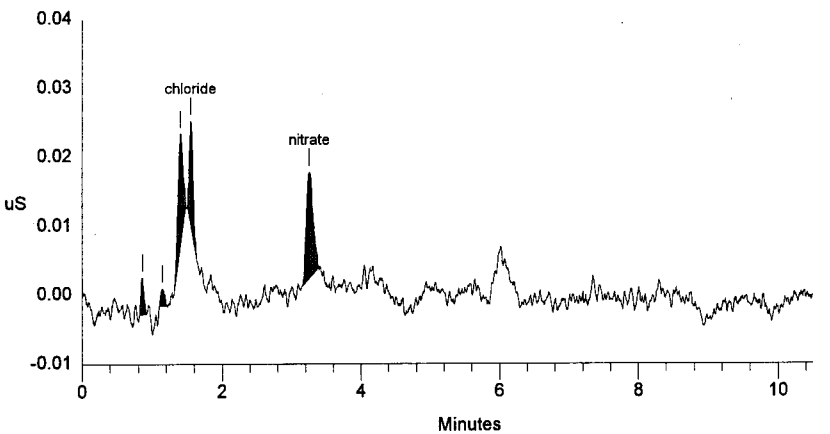
Sample Name: INSTRA BLK Date: 02/17/1996 07:02:44
Data File : C:\DX\DATA\96021701.d02
Method : C:\DX\METHOD\KIT.MET WHC-SD-WM-DP-142, REV. 0
ACI Address: 1 System: 1 Inject#: 2 Detector:CDM-2
Analyst Column: AG4A/AS4A anion column

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area Reject
External	1	1	3150	5Hz	0.00	10.50	20000

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
3	1.41		0.000	16262	82606	1	
4	1.55	chloride	0.014	14933	57332	1	-1.06
5	3.25	nitrate	0.235	15364	106106	1	3.28
		Totals	0.249	46559	246044		

File: 96021701.d02 Sample: INSTRA BLK



Data Reprocessed On 02/27/1996 15:27:55

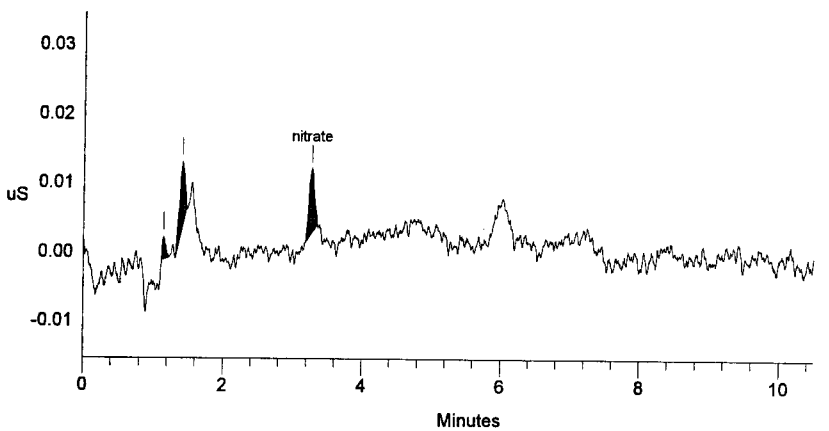
Sample Name: INSTRA BLK
Data File : C:\DX\DATA\96021701.d03
Method : C:\DX\METHOD\KIT.MET
ACI Address: 1 System: 1 Inject#: 3
Analyst : Hal Smith 2/27/96
Date: 02/17/1996 07:16:37
WHC-SD-WM-DP-142, REV. 1
Detector: CDM-2
Column: AG4A/AS4A anion column

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area Reject
External	1	1	3150	5Hz	0.00	10.50	20000

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
2	1.41		0.000	9600	51194	1	
3	3.27	nitrate	0.229	9281	51186	1	3.70
		Totals	0.229	18881	102380		

File: 96021701.d03 Sample: INSTRA BLK



Data Reprocessed On 02/27/1996 15:27:59

Sample Name: PREP BLK
Data File : C:\DX\DATA\96021701.d05
Method : C:\DX\METHOD\KIT.MET
ACI Address: 1 System: 1 Inject#: 5
Analyst : Paul Smith 2/17/96 Column: AG4A/AS4A anion column

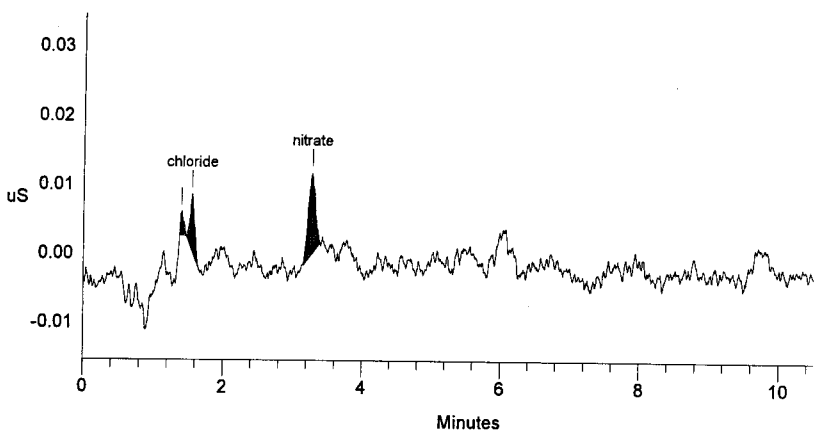
Date: 02/17/1996 07:44:44
WHC-SD-WM-DP-142, REV. 1
Detector: CDM-2

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area Reject
External	1	1	3150	5Hz	0.00	10.50	20000

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
2	1.55	chloride	0.013	8248	37912	1	-1.06
3	3.27	nitrate	0.232	11757	82640	1	3.92
		Totals	0.245	20005	120552		

File: 96021701.d05 Sample: PREP BLK



Data Reprocessed On 02/27/1996 15:28:02

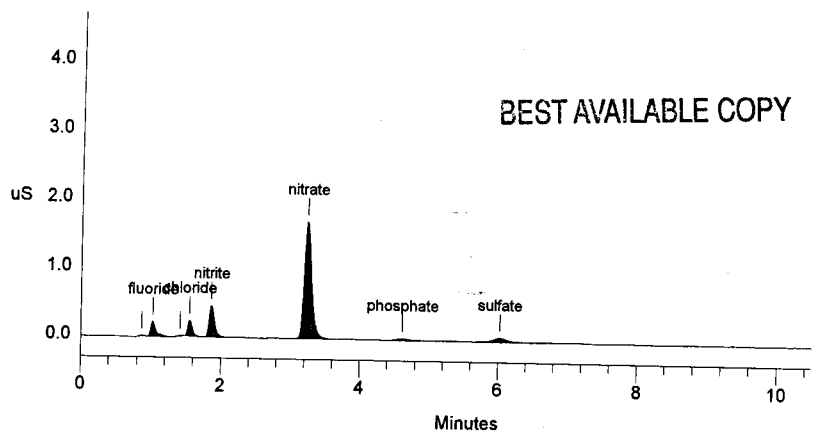
Sample Name: S96V000006
Data File : C:\DX\DATA\96021701.d06
Method : C:\DX\METHOD\KIT.MET
ACI Address: 1 System: 1 Inject#: 6
Analyst : Joel Smith 2/17/96
Date: 02/17/1996 08:04:27
WHC-SD-WM-DP-142, REV.)
Detector:CDM-2
Column: AG4A/AS4A anion column

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area Reject
External	1	10201	3150	5Hz	0.00	10.50	20000

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.87		0.000	10114	46030	2	
2	1.03	fluoride	682.279	217014	1105408	2	1.65
3	1.42		0.000	10863	53288	1	
4	1.55	chloride	911.148	230931	1067940	1	-1.06
5	1.86	nitrite	4114.857	457618	2476214	1	-2.62
6	3.23	nitrate	17558.843	1708599	12523056	1	2.65
7	4.61	phosphate	2181.471	27716	363800	1	-1.63
8	6.03	sulfate	2544.054	59628	797454	1	-2.64
		Totals	27992.652	2722483	18433191		

File: 96021701.d06 Sample: S96V000006



Data Reprocessed On 02/27/1996 15:28:04

Sample Name: S96V000006
Data File : C:\DX\DATA\96021701.d07
Method : C:\DX\METHOD\KIT.MET
ACI Address: 1 System: 1 Inject#: 7
Analyst : Paul Smith 2/27/96 Column: AG4A/AS4A anion column

Date: 02/17/1996 09:21:57

WHC-SD-WM-DP-142, REV. 1

Detector: CDM-2

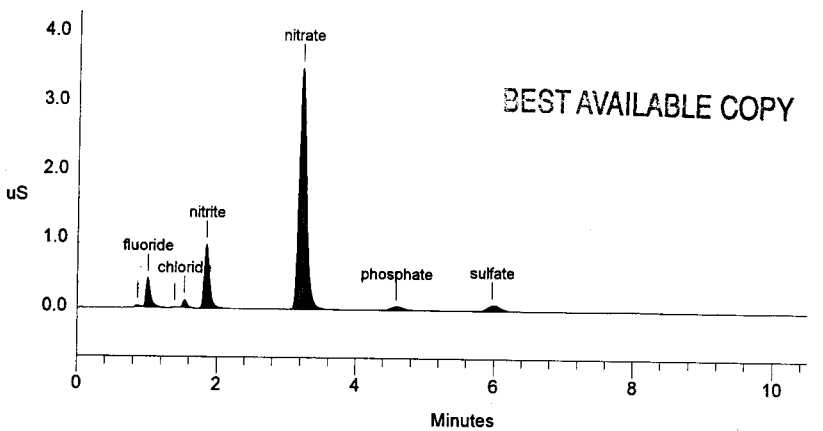
Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area Reject
External	1	5151	3150	5Hz	0.00	10.50	20000

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.86		0.000	25362	113711	2	
2	1.01	fluoride	561.150	427067	2026843	2	-0.33
3	1.39		0.000	11114	52484	1	
4	1.53	chloride	242.184	111541	499156	1	-2.34
5	1.85	nitrite	3343.741	932273	4918260	1	-3.32
6	3.21	nitrate	17168.542	3507780	26082752	1	1.80
7	4.59	phosphate	1582.364	54478	741598	1	-2.20
8	5.97	sulfate	1485.368	84603	1217148	1	-3.50
		Totals	24383.349	5154218	35651952		

File: 96021701.d07 Sample: S96V000006

10.2



Data Reprocessed On 02/27/1996 15:28:07

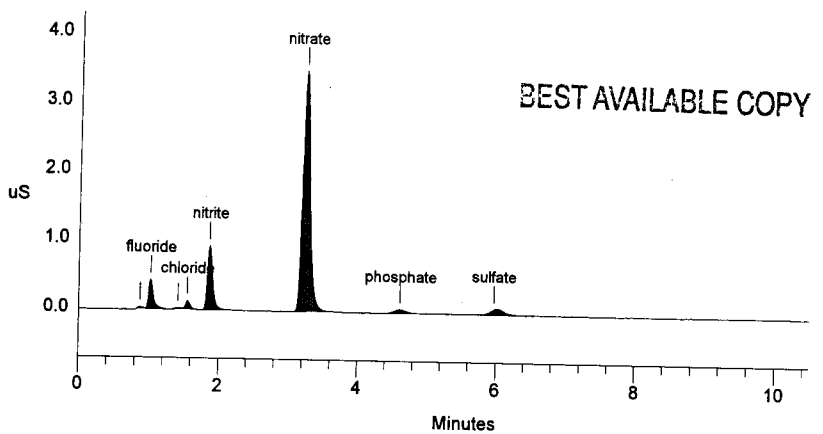
Sample Name: S96V000006 DUP
Data File : C:\DX\DATA\96021701.d08
Method : C:\DX\METHOD\KIT.MET
ACI Address: 1 System: 1 Inject#: 8
Analyst : [illegible] 2/17/96 Column: AG4A/AS4A anion column
Date: 02/17/1996 09:44:25
WHC-SD-WM-DP-142, REV. 1
Detector: CDM-2

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area Reject
External	1	5151	3150	5Hz	0.00	10.50	20000

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.87		0.000	23891	101593	2	
2	1.03	fluoride	557.981	422647	2013362	2	1.65
3	1.42		0.000	17280	89260	1	
4	1.55	chloride	245.109	115187	506786	1	-1.06
5	1.87	nitrite	3309.862	926865	4852896	1	-2.27
6	3.23	nitrate	17067.333	3493265	25916858	1	2.43
7	4.61	phosphate	1616.619	57970	768520	1	-1.63
8	5.97	sulfate	1508.283	78040	1265062	1	-3.50
		Totals	24305.186	5135144	35514337		

File: 96021701.d08 Sample: S96V000006 DUP



Data Reprocessed On 02/27/1996 15:28:09

Sample Name: S96V000006 SPIKE
Data File : C:\DX\DATA\96021701.d09
Method : C:\DX\METHOD\KIT.MET
ACI Address: 1 System: 1 Inject#: 9
Analyst : [signature]
Date: 02/17/1996 10:03:46
WHC-SD-WM-DP-142, REV.1
Detector:CDM-2
Column: AG4A/AS4A anion column

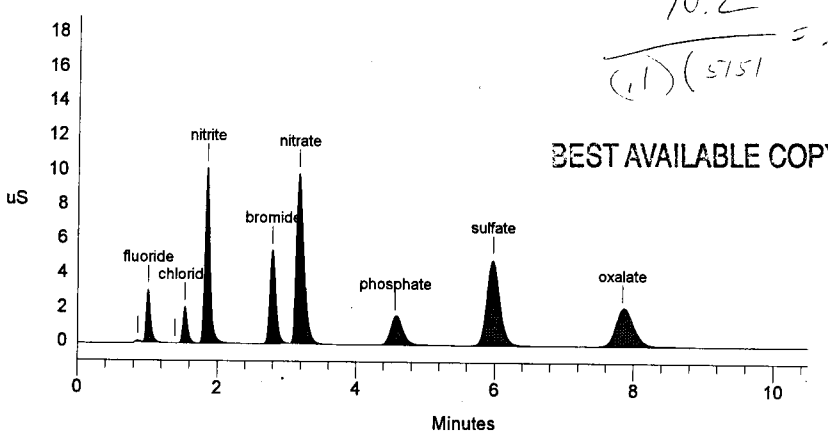
Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area Reject
External	1	5151	3150	5Hz	0.00	10.50	20000

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.86		0.000	95980	403347	2	
2	1.01	fluoride	3306.751	3080201	13739020	2	-0.33
3	1.39		0.000	5821	21932	1	
4	1.53	chloride	3870.539	2112650	10040534	1	-2.34
5	1.85	nitrite	28633.828	10203893	53876046	1	-3.32
6	2.79	bromide	27862.157	5441852	33877968	1	-1.18
7	3.17	nitrate	47539.549	9913103	76548654	1	0.53
8	4.56	phosphate	27613.217	1661016	21510652	1	-2.77
9	5.97	sulfate	31810.821	4982093	65654262	1	-3.50
10	7.84	oxalate	26234.165	2205586	40484676	1	-3.33
		Totals	196871.027	39702195	316157090		

File: 96021701.d09 Sample: S96V000006 SPIKE

$\frac{10.2}{(.1)(5151)} = .0198$



Data Reprocessed On 02/27/1996 15:28:12

Sample Name: S96V000006 SPIKE DUP
Data File : C:\DX\DATA\96021701.d10
Method : C:\DX\METHOD\KIT.MET
ACI Address: 1 System: 1 Inject#: 10
Analyst [signature] 2/27/96 Column: AG4A/AS4A anion column

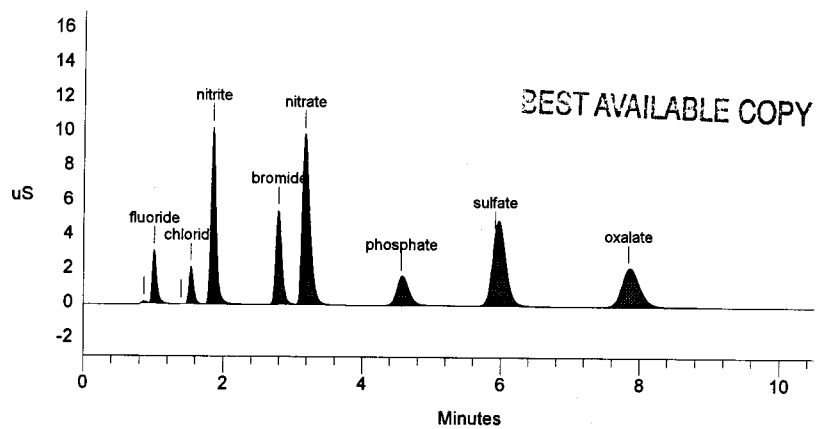
Date: 02/17/1996 10:15:44
WHC-SD-WM-DP-142, REV. 1
Detector:CDM-2

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area Reject
External	1	5151	3150	5Hz	0.00	10.50	20000

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.86		0.000	95983	413511	2	
2	1.01	fluoride	3300.966	3078937	13714276	2	-0.33
3	1.39		0.000	9682	41400	1	
4	1.53	chloride	3857.700	2138716	10006504	1	-2.34
5	1.85	nitrite	28331.702	10267724	53289226	1	-3.32
6	2.79	bromide	27858.907	5475970	33873820	1	-1.18
7	3.16	nitrate	47586.279	9893772	76627382	1	0.32
8	4.56	phosphate	27649.135	1659792	21539752	1	-2.77
9	5.92	sulfate	31758.665	4144114	65541610	1	-4.36
10	7.84	oxalate	26242.020	2210724	40496942	1	-3.33
		Totals	196585.374	38975416	315544423		

File: 96021701.d10 Sample: S96V000006 SPIKE DUP



Data Reprocessed On 02/27/1996 15:28:14

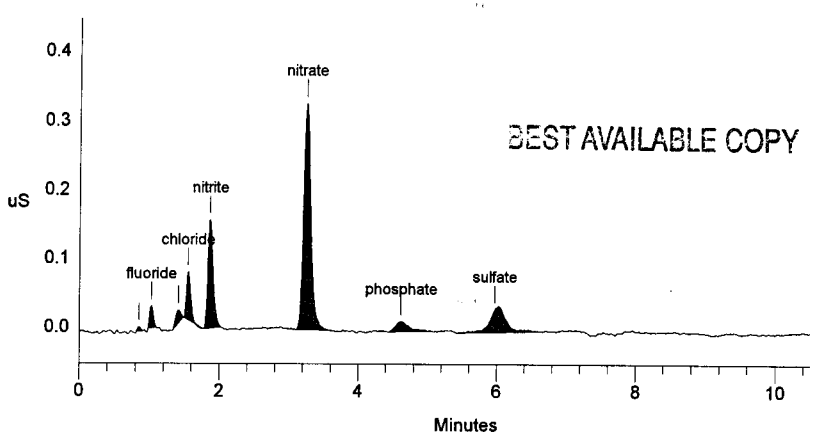
Sample Name: S96V000007
Data File : C:\DX\DATA\96021701.d11
Method : C:\DX\METHOD\KIT.MET
ACI Address: 1 System: 1 Inject#: 11
Analyst : [signature] 2/17/96
Date: 02/17/1996 10:30:57
WHC-SD-WM-DP-142, REV. 1
Detector: CDM-2
Column: AG4A/AS4A anion column

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area Reject
External	1	10201	3150	5Hz	0.00	10.50	20000

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
2	1.03	fluoride	222.247	31734	117792	1	1.65
3	1.41		0.000	19142	96508	1	
4	1.55	chloride	318.650	69639	287122	1	-1.06
5	1.87	nitrite	2408.058	157327	814144	1	-2.27
6	3.25	nitrate	5200.827	329413	2395170	1	3.07
7	4.61	phosphate	1795.156	14871	210588	1	-1.63
8	5.97	sulfate	2382.673	33030	627112	1	-3.50
		Totals	12327.611	655154	4548436		

File: 96021701.d11 Sample: S96V000007



Data Reprocessed On 02/27/1996 15:28:17

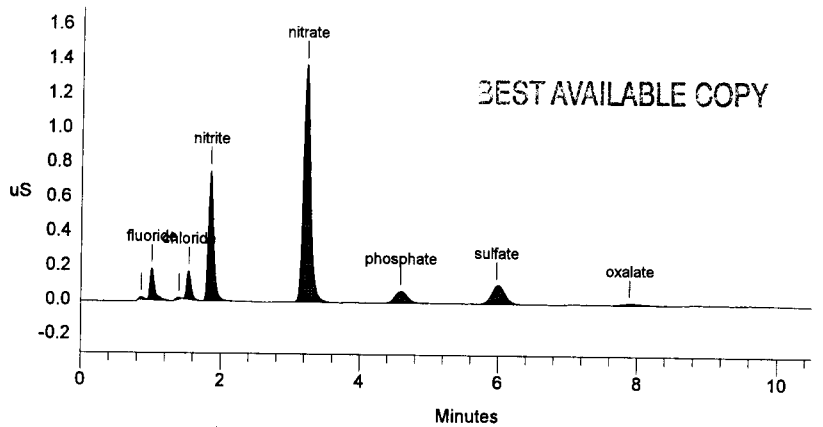
Sample Name: S96V000007
Data File : C:\DX\DATA\96021701.d12
Method : C:\DX\METHOD\KIT.MET
ACI Address: 1 System: 1 Inject#: 12
Analyst :
Date: 02/17/1996 10:49:37
WHC-SD-WM-DP-142, REV. /
Detector:CDM-2
Column: AG4A/AS4A anion column

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area Reject
External	1	2121	3150	5Hz	0.00	10.50	20000

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.86		0.000	16646	73655	2	
2	1.01	fluoride	124.239	185067	923433	2	-0.33
3	1.40		0.000	11478	55564	1	
4	1.54	chloride	141.352	166545	762990	1	-1.91
5	1.85	nitrite	1193.793	756707	4060652	1	-3.32
6	3.21	nitrate	3036.417	1379467	10096260	1	2.01
7	4.59	phosphate	732.198	68795	895526	1	-2.20
8	5.97	sulfate	666.043	107002	1493510	1	-3.50
9	7.89	oxalate	121.958	11621	254536	1	-2.67
		Totals	6016.000	2703327	18616126		

File: 96021701.d12 Sample: S96V000007



Data Reprocessed On 02/27/1996 15:28:19

Sample Name: S96V000007

Date: 02/17/1996 11:07:45

Data File : C:\DX\DATA\96021701.d13

Method : C:\DX\METHOD\KIT.MET

WHC-SD-WM-DP-142, REV. 1

ACI Address: 1 System: 1 Inject#: 13

Detector: CDM-2

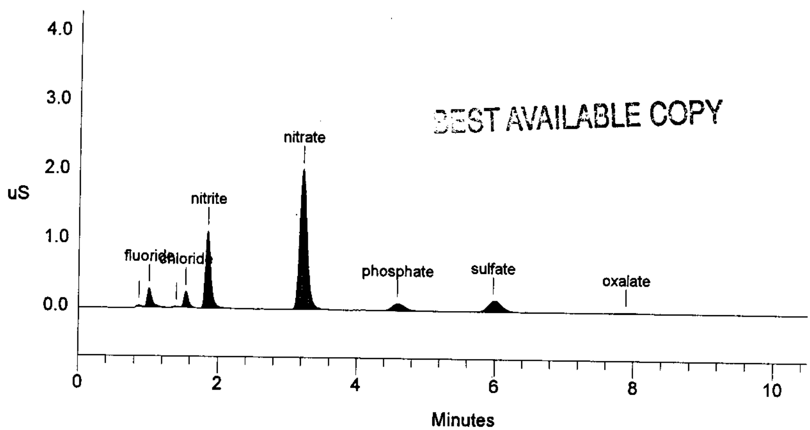
Analyst : Yoel Smith 2/17/96 Column: AG4A/AS4A anion column

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area Reject
External	1	1447.66	3150	5Hz.	0.00	10.50	20000

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.86		0.000	21858	94407	2	
2	1.01	fluoride	113.880	277060	1363496	2	-0.33
3	1.40		0.000	12404	63940	1	
4	1.53	chloride	125.870	232327	1036030	1	-2.34
5	1.85	nitrite	1090.065	1128069	5950312	1	-3.32
6	3.21	nitrate	2927.945	2029626	15050020	1	-3.32
7	4.59	phosphate	659.520	104530	1342556	1	1.80
8	5.97	sulfate	557.264	159438	2257554	1	-2.20
9	7.89	oxalate	84.307	13882	260384	1	-3.50
		Totals	5558.852	3979193	27418699		-2.67

File: 96021701.d13 Sample: S96V000007



Data Reprocessed On 02/27/1996 15:28:21

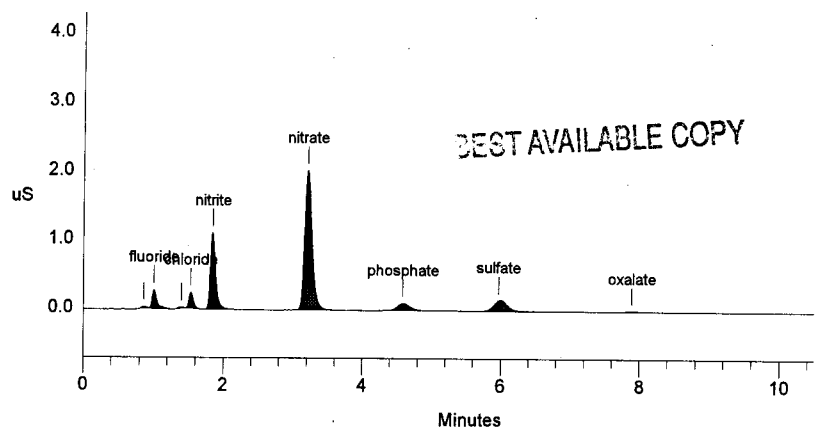
Sample Name: S96V000007 DUP
Data File : C:\DX\DATA\96021701.d14
Method : C:\DX\METHOD\KIT.MET
ACI Address: 1 System: 1 Inject#: 14
Analyst : [signature]
Date: 02/17/1996 11:21:02
WHC-SD-WM-DP-142, REV. 1
Detector:CDM-2
Column: AG4A/AS4A anion column

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area Reject
External	1	1447.66	3150	5Hz	0.00	10.50	20000

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.86		0.000	24438	109300	2	
2	1.01	fluoride	112.489	274008	1342447	2	-0.33
3	1.40		0.000	16716	89608	1	
4	1.53	chloride	125.048	233200	1028394	1	-2.34
5	1.85	nitrite	1079.994	1108245	5881164	1	-3.32
6	3.21	nitrate	2955.642	2028788	15210622	1	1.80
7	4.59	phosphate	654.550	105162	1328646	1	-2.20
8	5.97	sulfate	562.183	157316	2294172	1	-3.50
9	7.89	oxalate	96.201	14327	325584	1	-2.67
		Totals	5586.107	3962199	27609936		

File: 96021701.d14 Sample: S96V000007 DUP



worklistdata Version 0.0 05/16/95
04/09/96 10:01

LABCORE Completed Worklist Report for Worklist# 5388

Analyst: rwk **Instrument:** IC01 **Book#** 122WE

Method: IA-503-025 Rev/Mod D-1

Worklist Comment: AP-104 FOR IC RTS!

Seq	Type	Sample#	R	A	Test	Matrix	Actual		Found	DL or Yield	Unit
1	CCB		0		@IC-QC F	QC	1		<1.30e-2		ug/mL
1	CCB		0		@IC-QC CL	QC	1		<1.70e-2		ug/mL
1	CCB		0		@IC-QC NO2	QC	1		<1.07e-1		ug/mL
1	CCB		0		@IC-QC BR	QC	1		<1.26e-1		ug/mL
1	CCB		0		@IC-QC NO3	QC	1		2.30e-01	0.230	ug/mL
1	CCB		0		@IC-QC PO4	QC	1		<1.19e-1		ug/mL
1	CCB		0		@IC-QC SO4	QC	1		<1.36e-1		ug/mL
1	CCB		0		@IC-QC OXALATE2	QC	1		<1.05e-1		ug/mL
2	CCV		0		@IC-QC F	QC	59		5.72e+01	96.950	% Recovery
2	CCV		0		@IC-QC CL	QC	79		7.27e+01	92.030	% Recovery
2	CCV		0		@IC-QC NO2	QC	534		5.02e+02	94.010	% Recovery
2	CCV		0		@IC-QC BR	QC	575		5.60e+02	97.390	% Recovery
2	CCV		0		@IC-QC NO3	QC	614		6.00e+02	97.700	% Recovery
2	CCV		0		@IC-QC PO4	QC	546		5.32e+02	97.440	% Recovery
2	CCV		0		@IC-QC SO4	QC	631		6.10e+02	96.670	% Recovery
2	CCV		0		@IC-QC OXALATE2	QC	526		5.14e+02	97.720	% Recovery
3	SAMPLE	S96V000008	0		@IC-01 F-02	LIQUID	N/A		6.557e+02	18.820	ug/mL
3	SAMPLE	S96V000008	0		@IC-01 NO2-02	LIQUID	N/A		1.437e+03	154.900	ug/mL
3	SAMPLE	S96V000008	0		@IC-01 NO3-02	LIQUID	N/A		1.956e+04	202.700	ug/mL
3	SAMPLE	S96V000008	0		@IC-01 PO4-02	LIQUID	N/A		3.674e+02	173.700	ug/mL
3	SAMPLE	S96V000008	0		@IC-01 SO4-02	LIQUID	N/A		4.950e+02	196.900	ug/mL
4	SPK	S96V000008	0		@IC-01 F-02	LIQUID	59		56.709	96.120	% Recovery
4	SPK	S96V000008	0		@IC-01 NO2-02	LIQUID	534		494.372	92.580	% Recovery
4	SPK	S96V000008	0		@IC-01 NO3-02	LIQUID	614		655.957	106.830	% Recovery
4	SPK	S96V000008	0		@IC-01 PO4-02	LIQUID	546		514.396	94.210	% Recovery
4	SPK	S96V000008	0		@IC-01 SO4-02	LIQUID	631		591.744	93.780	% Recovery
5	SPK-DUP	S96V000008	0		@IC-01 F-02	LIQUID	96.12		93.9	2.340	RPD
5	SPK-DUP	S96V000008	0		@IC-01 NO2-02	LIQUID	92.58		92.5	9.000e-002	RPD
5	SPK-DUP	S96V000008	0		@IC-01 NO3-02	LIQUID	106.83		110.7	3.560	RPD
5	SPK-DUP	S96V000008	0		@IC-01 PO4-02	LIQUID	94.21		94.9	1.000e-002	RPD
5	SPK-DUP	S96V000008	0		@IC-01 SO4-02	LIQUID	93.78		93.6	0.190	RPD
6	DUP	S96V000008	0		@IC-01 F-02	LIQUID	6.56e+02		6.49e+02	1.070	RPD
6	DUP	S96V000008	0		@IC-01 NO2-02	LIQUID	1.44e+03		1.45e+03	0.690	RPD
6	DUP	S96V000008	0		@IC-01 NO3-02	LIQUID	1.96e+04		1.96e+04	0.000	RPD
6	DUP	S96V000008	0		@IC-01 PO4-02	LIQUID	3.67e+02		3.76e+02	2.420	RPD
6	DUP	S96V000008	0		@IC-01 SO4-02	LIQUID	4.95e+02		4.94e+02	0.200	RPD
7	SAMPLE	S96V000014	0		@IC-01 F-02	LIQUID	N/A	<	1.300e-02	1.300e-002	ug/mL
7	SAMPLE	S96V000014	0		@IC-01 NO2-02	LIQUID	N/A	<	1.070e-01	0.107	ug/mL
7	SAMPLE	S96V000014	0		@IC-01 NO3-02	LIQUID	N/A		2.300e-01	0.140	ug/mL
7	SAMPLE	S96V000014	0		@IC-01 PO4-02	LIQUID	N/A	<	LDL	0.120	ug/mL
7	SAMPLE	S96V000014	0		@IC-01 SO4-02	LIQUID	N/A		1.960e-01	0.136	ug/mL

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

LABCORE Completed Worklist Report for Worklist# 5388

Seq	Type	Sample#	R	A	Test		Matrix	Actual	Found	DL or Yield	Unit
8	DUP	S96V000014		0	@IC-01	F-02	LIQUID	<1.30e-2	<1.30e-2		RPD
8	DUP	S96V000014		0	@IC-01	NO2-02	LIQUID	<1.07e-1	<1.07e-1		RPD
8	DUP	S96V000014		0	@IC-01	NO3-02	LIQUID	2.30e-01	2.33e-01	1.300	RPD
8	DUP	S96V000014		0	@IC-01	PO4-02	LIQUID	<1.20e-1	<1.20e-1		RPD
8	DUP	S96V000014		0	@IC-01	SO4-02	LIQUID	1.96e-01	1.85e-01	5.770	RPD

Final page for worklist# 5388

Analyst Signature **Date**

Analyst Signature **Date**

Jenn M. Fuge 4/9/96
Reviewer Signature **Date**

LABCORE Completed Worklist Report for Worklist# 5388

Analyst: rwk **Instrument:** IC01 **Book#** 122N9E

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

Worklist Comment: AP-104 FOR IC RTS!

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
1	CCB			0	@IC-QC F	QC	1	<1.30e-2		ug/mL
1	CCB			0	@IC-QC CL	QC	1	<1.70e-2		ug/mL
1	CCB			0	@IC-QC NO2	QC	1	<1.07e-1		ug/mL
1	CCB			0	@IC-QC BR	QC	1	<1.26e-1		ug/mL
1	CCB			0	@IC-QC NO3	QC	1	2.30e-01	0.230	ug/mL
1	CCB			0	@IC-QC PO4	QC	1	<1.19e-1		ug/mL
1	CCB			0	@IC-QC SO4	QC	1	<1.36e-1		ug/mL
1	CCB			0	@IC-QC OXALATE2	QC	1	<1.05e-1		ug/mL
2	CCV			0	@IC-QC F	QC	59	5.72e+01	96.950	% Recovery
2	CCV			0	@IC-QC CL	QC	79	7.27e+01	92.030	% Recovery
2	CCV			0	@IC-QC NO2	QC	534	5.02e+02	94.010	% Recovery
2	CCV			0	@IC-QC BR	QC	575	5.60e+02	97.390	% Recovery
2	CCV			0	@IC-QC NO3	QC	614	6.00e+02	97.700	% Recovery
2	CCV			0	@IC-QC PO4	QC	546	5.32e+02	97.440	% Recovery
2	CCV			0	@IC-QC SO4	QC	631	6.10e+02	96.670	% Recovery
2	CCV			0	@IC-QC OXALATE2	QC	526	5.14e+02	97.720	% Recovery
3	SAMPLE	S96V000008		0	@IC-01 F-02	LIQUID	N/A	6.557e+02	18.820	ug/mL
3	SAMPLE	S96V000008		0	@IC-01 NO2-02	LIQUID	N/A	1.437e+03	154.900	ug/mL
3	SAMPLE	S96V000008		0	@IC-01 NO3-02	LIQUID	N/A	1.956e+04	202.700	ug/mL
3	SAMPLE	S96V000008		0	@IC-01 PO4-02	LIQUID	N/A	3.674e+02	173.700	ug/mL
3	SAMPLE	S96V000008		0	@IC-01 SO4-02	LIQUID	N/A	4.950e+02	196.900	ug/mL
4	SPK	S96V000008		0	@IC-01 F-02	LIQUID	59	56.709	96.120	% Recovery
4	SPK	S96V000008		0	@IC-01 NO2-02	LIQUID	534	494.372	92.580	% Recovery
4	SPK	S96V000008		0	@IC-01 NO3-02	LIQUID	614	655.957	106.830	% Recovery
4	SPK	S96V000008		0	@IC-01 PO4-02	LIQUID	546	514.396	94.210	% Recovery
4	SPK	S96V000008		0	@IC-01 SO4-02	LIQUID	631	591.744	93.780	% Recovery
5	SPK-DUP	S96V000008		0	@IC-01 F-02	LIQUID	59	55.225	~~94.700 RPD4.9%~~	93.6 % Rec
5	SPK-DUP	S96V000008		0	@IC-01 NO2-02	LIQUID	534	493.630	~~92.300 RPD~~	92.4 % Rec
5	SPK-DUP	S96V000008		0	@IC-01 NO3-02	LIQUID	614	678.217	~~110.200 RPD~~	110.9 % Rec
5	SPK-DUP	S96V000008		0	@IC-01 PO4-02	LIQUID	546	518.106	~~94.800 RPD~~	94.9 % Rec
5	SPK-DUP	S96V000008		0	@IC-01 SO4-02	LIQUID	631	590.260	~~93.600 RPD~~	93.5 % Rec
6	DUP	S96V000008		0	@IC-01 F-02	LIQUID	6.56e+02	6.49e+02	1.070	RPD
6	DUP	S96V000008		0	@IC-01 NO2-02	LIQUID	1.44e+03	1.45e+03	0.690	RPD
6	DUP	S96V000008		0	@IC-01 NO3-02	LIQUID	1.96e+04	1.96e+04	0.000	RPD
6	DUP	S96V000008		0	@IC-01 PO4-02	LIQUID	3.67e+02	3.76e+02	2.420	RPD
6	DUP	S96V000008		0	@IC-01 SO4-02	LIQUID	4.95e+02	4.94e+02	0.200	RPD
7	SAMPLE	S96V000014		0	@IC-01 F-02	LIQUID	N/A <	1.300e-02	1.300e-002	ug/mL
7	SAMPLE	S96V000014		0	@IC-01 NO2-02	LIQUID	N/A <	1.070e-01	0.107	ug/mL
7	SAMPLE	S96V000014		0	@IC-01 NO3-02	LIQUID	N/A	2.300e-01	0.140	ug/mL
7	SAMPLE	S96V000014		0	@IC-01 PO4-02	LIQUID	N/A <	LDL	0.120	ug/mL
7	SAMPLE	S96V000014		0	@IC-01 SO4-02	LIQUID	N/A	1.960e-01	0.136	ug/mL

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

LABCORE Completed Worklist Report for Worklist# 5388

Seq Type	Sample#	R	A	Test		Matrix	Actual	Found	DL or Yield	Unit
8 DUP	S96V000014	0		@IC-01	F-02	LIQUID	<1.30e-2	<1.30e-2		RPD
8 DUP	S96V000014	0		@IC-01	NO2-02	LIQUID	<1.07e-1	<1.07e-1		RPD
8 DUP	S96V000014	0		@IC-01	NO3-02	LIQUID	2.30e-01	2.33e-01	1.300	RPD
8 DUP	S96V000014	0		@IC-01	PO4-02	LIQUID	<1.20e-1	<1.20e-1		RPD
8 DUP	S96V000014	0		@IC-01	SO4-02	LIQUID	1.96e-01	1.85e-01	5.770	RPD

Final page for worklist# 5388

Analyst Signature **Date**

Analyst Signature **Date**

Jason M. Luse 3/21/96
Reviewer Signature **Date**

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

LABCORE Completed Worklist Report for Worklist# 5388

Analyst: rwk **Instrument:** IC01 **Book#** 122N9-E

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

Worklist Comment: AP-104 FOR IC RTS!

Seq	Type	Sample#	R	A	Test	Matrix	Actual		Found	DL or Yield	Unit
1	CCB			0	@IC-QC F	QC	1		<1.30e-2		ug/mL
1	CCB			0	@IC-QC CL	QC	1		<1.70e-2		ug/mL
1	CCB			0	@IC-QC NO2	QC	1		<1.07e-1		ug/mL
1	CCB			0	@IC-QC BR	QC	1		<1.26e-1		ug/mL
1	CCB			0	@IC-QC NO3	QC	1		2.30e-01	0.230	ug/mL
1	CCB			0	@IC-QC PO4	QC	1		<1.19e-1		ug/mL
1	CCB			0	@IC-QC SO4	QC	1		<1.36e-1		ug/mL
1	CCB			0	@IC-QC OXALATE2	QC	1		<1.05e-1		ug/mL
2	CCV			0	@IC-QC F	QC	59		5.72e+01	96.950	% Recovery
2	CCV			0	@IC-QC CL	QC	79		7.27e+01	92.030	% Recovery
2	CCV			0	@IC-QC NO2	QC	534		5.02e+02	94.010	% Recovery
2	CCV			0	@IC-QC BR	QC	575		5.60e+02	97.390	% Recovery
2	CCV			0	@IC-QC NO3	QC	614		5.91e+02	96.250	% Recovery
2	CCV			0	@IC-QC PO4	QC	546		5.32e+02	97.440	% Recovery
2	CCV			0	@IC-QC SO4	QC	631		6.10e+02	96.670	% Recovery
2	CCV			0	@IC-QC OXALATE2	QC	526		5.14e+02	97.720	% Recovery
3	SAMPLE	S96V000008		0	@IC-01 F-02	LIQUID	N/A		6.557e+02	16.820	ug/mL
3	SAMPLE	S96V000008		0	@IC-01 NO2-02	LIQUID	N/A		1.437e+03	154.900	ug/mL
3	SAMPLE	S96V000008		0	@IC-01 NO3-02	LIQUID	N/A		1.956e+04	202.700	ug/mL
3	SAMPLE	S96V000008		0	@IC-01 PO4-02	LIQUID	N/A		3.674e+02	173.700	ug/mL
3	SAMPLE	S96V000008		0	@IC-01 SO4-02	LIQUID	N/A		4.950e+02	196.900	ug/mL
4	SPK	S96V000008		0	@IC-01 F-02	LIQUID	59		56.709	96.120	% Recovery
4	SPK	S96V000008		0	@IC-01 NO2-02	LIQUID	534		494.372	92.580	% Recovery
4	SPK	S96V000008		0	@IC-01 NO3-02	LIQUID	614		655.957	106.830	% Recovery
4	SPK	S96V000008		0	@IC-01 PO4-02	LIQUID	546		514.396	94.210	% Recovery
4	SPK	S96V000008		0	@IC-01 SO4-02	LIQUID	631		591.744	93.780	% Recovery
5	SPK-DUP	S96V000008		0	@IC-01 F-02	LIQUID	59		55.225	94.700	RPD
5	SPK-DUP	S96V000008		0	@IC-01 NO2-02	LIQUID	534		493.630	92.300	RPD
5	SPK-DUP	S96V000008		0	@IC-01 NO3-02	LIQUID	614		678.217	110.200	RPD
5	SPK-DUP	S96V000008		0	@IC-01 PO4-02	LIQUID	546		518.106	94.800	RPD
5	SPK-DUP	S96V000008		0	@IC-01 SO4-02	LIQUID	631		590.260	93.600	RPD
6	DUP	S96V000008		0	@IC-01 F-02	LIQUID	6.56e+02		6.49e+02	1.070	RPD
6	DUP	S96V000008		0	@IC-01 NO2-02	LIQUID	1.44e+03		1.45e+03	0.690	RPD
6	DUP	S96V000008		0	@IC-01 NO3-02	LIQUID	1.96e+04		1.96e+04	0.000	RPD
6	DUP	S96V000008		0	@IC-01 PO4-02	LIQUID	3.67e+02		3.76e+02	2.420	RPD
6	DUP	S96V000008		0	@IC-01 SO4-02	LIQUID	4.95e+02		4.94e+02	0.200	RPD
7	SAMPLE	S96V000014		0	@IC-01 F-02	LIQUID	N/A	<	1.300e-02	1.300e-002	ug/mL
7	SAMPLE	S96V000014		0	@IC-01 NO2-02	LIQUID	N/A	<	1.070e-01	0.107	ug/mL
7	SAMPLE	S96V000014		0	@IC-01 NO3-02	LIQUID	N/A		2.300e-01	0.140	ug/mL
7	SAMPLE	S96V000014		0	@IC-01 PO4-02	LIQUID	N/A	<	LDL	0.120	ug/mL
7	SAMPLE	S96V000014		0	@IC-01 SO4-02	LIQUID	N/A		1.960e-01	0.136	ug/mL

← This Standard value and RPD was corrected to 6.00e2 and 97.7% Rec in QC Tables 3/21/96.

See repeated worklist for correct printout.

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

LABCORE Completed Worklist Report for Worklist# 5388

Seq	Type	Sample#	R	A	Test		Matrix	Actual	Found	DL or Yield	Unit
8	DUP	S96V000014	0		@IC-01	F-02	LIQUID	<1.30e-2	<1.30e-2		RPD
8	DUP	S96V000014	0		@IC-01	NO2-02	LIQUID	<1.07e-1	<1.07e-1		RPD
8	DUP	S96V000014	0		@IC-01	NO3-02	LIQUID	2.30e-01	2.33e-01	1.300	RPD
8	DUP	S96V000014	0		@IC-01	PO4-02	LIQUID	<1.20e-1	<1.20e-1		RPD
8	DUP	S96V000014	0		@IC-01	SO4-02	LIQUID	1.96e-01	1.85e-01	5.770	RPD

Final page for worklist# 5388

Analyst Signature Date

Analyst Signature Date

Reviewer Signature Date 2/26/96

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

96021711. D69 → D31

02/01/96 13:37
A-0004-1

WHC-SD-WM-DP-142, REV. 1

LABCORE Data Entry Template for Worklist# 5388

Analyst: RK **Instrument:** IC01 _____ **Book#** 12819-E

Method: LA-533-105 Rev/Mod 0-1

Worklist Comment: AP-104 FOR IC RTS!

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	CCB				@IC-QC	QC		
2	CCV				@IC-QC	QC		
3	SAMPLE	S96V000008	0		@IC-01	LIQUID	96000036	AP-104
	Analytes Requested:	F-02 , NO2-02 , NO3-02 , PO4-02 , SO4-02						
4	SPK	S96V000008	0		@IC-01	LIQUID		
5	SPK-DUP	S96V000008	0		@IC-01	LIQUID		
6	DUP	S96V000008	0		@IC-01	LIQUID		
7	SAMPLE	S96V000014	0		@IC-01	LIQUID	96000036	AP-104
	Analytes Requested:	F-02 , NO2-02 , NO3-02 , PO4-02 , SO4-02						
8	DUP	S96V000014	0		@IC-01	LIQUID		

Final page for worklist # 5388

Rob King 2/17/96
Analyst Signature **Date**

Analyst Signature **Date**

In shell - sent out

Uploaded 2/26/96 JM Fuge

Spike dups calculated incorrectly in upload shell
They were calculated by ACE form + RL entered on QC-Edit!
2/26/96 JM Fuge
printed

Data Entry Comments:

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

A-0010-IC DATA FILE/WORKLIST RESOLUTION 26-Feb-96

Worklist#: 5388

	Seq	Type	Sample #
=>	1	CCB	
=>	2	CCV	
=>	3	SAMPLE	S96V000008
=>	4	SPK	S96V000008
=>	5	SPK-DUP	S96V000008
=>	6	DUP	S96V000008
=>	7	SAMPLE	S96V000014
=>	8	DUP	S96V000014

Data File: 5388FEB.CSV

Seq#	Data File	Sample Name	Dilution
1	96021711.d19	INSTRA BLK	1.00
	96021711.d20	PREP BLK	1.00
	96021711.d21	STD 122N9-E	101.00
2	96021711.d22	STD 122N9-E	101.00
	96021711.d23	S96V000008	10201.00
	96021711.d24	S96V000008	2121.00
3	96021711.d25	S96V000008	~~14.33~~ 1447.66
6	96021711.d26	S96V000008 DUP	~~14.33~~ 1447.66
4	96021711.d27	S96V000008 SPIKE	1447.66
5	96021711.d28	S96V000008 SPIKE	1447.66
	96021711.d29	S96V0000014	11.00
7	96021711.d30	S96V0000014	1.00
8	96021711.d31	S96V0000014 DUP	1.00

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

gmf 2/26/96

The correct DF was used when the data was uploaded gmf

WESTINGHOUSE HANFORD COMPANY
222-S LABORATORY
INORGANIC ANALYTICAL BATCH AND SUMMARY SHEET

ANION ANALYSIS ON DIONEX

SAMPLE #:	S96V000008		
TEST CODE:	@ic-01	ANALYST:	Rob King
INSTRUMENT:	ic01	ANALYSIS DATE:	02/17/96
WORK LIST #:	5388	SAMPLE POINT:	ap-104
BATCH ID:		SAMPLE PREP:	direct

Result Units µg/mL	Fluoride	Chloride	Nitrite	Nitrate	Phosphate	Sulfate	Bromide	Oxalate
122N9e								
S96V000008	6.56E+02	<0.00	1.44E+03	1.96E+04	3.67E+02	4.95E+02	<0.00	<0.00
	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00
Duplicate 1 RPD	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00
	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00
Duplicate 2 RPD	N/A	ERR	N/A	N/A	N/A	N/A	ERR	ERR
	93.9%		92.5%	110.7%	94.9%	93.6%		
s96v000008skdp								

NARRATIVE: **Analyst Comments:**

Chemist Comments:

Spike dup calculation from spiked sample.

Form Completed By:		Date: 4/9/96
Chemist Approval:		Date: 4/9/96

LAB LEADER INFO	
Method:	La -533-105
Matrix:	liquid
Test Code:	ic-01
Work List #:	5388
Batch #:	
Result Units	
(µg/g or µg/mL):	µg/mL
Spike Book Number:	122N9E
Spike Sample #:	1
Prepared By:	Jann Frye
Prepared Date:	04/09/96
Chemist:	Jann Frye
Analyst:	Rob King
Analysis Date:	02/17/96
Time Complete:	
Instrument Code:	ic01
Rerun:	
Sample Prep:	direct
Sample Point:	sp-104
Sample Type	
STANDARD	122N9e
SAMPLE 1	S96V000008
DUPLICATE 1	
SAMPLE 2	
DUPLICATE 2	
SAMPLE 3	
DUPLICATE 3	
SAMPLE 4	
DUPLICATE 4	
SPIKE	
SPIKE DUPLICATE	s96v000008skdp

PRINT

TECH INFO	Fluoride	Chloride	Nitrite	Nitrate	Phosphate	Sulfate	Bromide	Oxalate
Blank Data (µg/mL)								
Standard Data (µg/mL)								
Sample 1 Data (µg/mL)	6.56E+02		1.44E+03	1.96E+04	3.67E+02	4.95E+02		
Sample 1 Dilution Factor	1447.66		1447.66	1447.66	1447.66	1447.66		
Sample 1 Prep DF	1	1	1	1	1	1	1	1
Duplicate 1 Data (µg/mL)								
Duplicate 1 Dilution Factor								
Duplicate 1 Prep DF								
Sample 2 Data (µg/mL)								
Sample 2 Dilution Factor								
Sample 2 Prep DF								
Duplicate 2 Data (µg/mL)								
Duplicate 2 Dilution Factor								
Duplicate 2 Prep DF								
Sample 3 Data (µg/mL)								
Sample 3 Dilution Factor								
Sample 3 Prep DF								
Duplicate 3 Data (µg/mL)								
Duplicate 3 Dilution Factor								
Duplicate 3 Prep DF								
Sample 4 Data (µg/mL)								
Sample 4 Dilution Factor								
Sample 4 Prep DF								
Duplicate 4 Data (µg/mL)								
Duplicate 4 Dilution Factor								
Duplicate 4 Prep DF								
Spike + Sample 1 (µg/mL)	1.40E+03		8.09E+03	2.87E+04	7.35E+03	8.45E+03		
Spike + Dup 1 (µg/mL)								
Spike Volume (mL)	1.00E-01		1.00E-01	1.00E-01	1.00E-01	1.00E-01		
Total Volume (mL)	10.75		10.75	10.75	10.75	10.75		
Std. Conc. (µg/mL)	59		534	514	546	631		
Detection Limit	0.013		0.107	0.140	0.119	0.136		
Matrix Detection Limit 1	1.88E+01	0.00E+00	1.58E+02	2.03E+02	1.72E+02	1.97E+02	0.00E+00	0.00E+00
Matrix Detection Limit 2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Matrix Detection Limit 3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Matrix Detection Limit 4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Spike Recovery = [((Spike+Sample)-(Sample)*(Total Volume))/((Spike Vol.)*(Spike Std.)*(Sample DF))]*100%
Note: (For spike recovery when the sample conc. is less than detection limit you do NOT subtract sample conc.)
Duplicate Relative % Difference = ((Sample - Duplicate) / ((Sample + Duplicate) / 2) * 100%)
Less than Values are Calculated from the Detection Limit*Dilution Factor

v RESULTS v	Fluoride	Chloride	Nitrite	Nitrate	Phosphate	Sulfate	Bromide	Oxalate
Sample 1 in µg/mL	6.56E+02	<0.00	1.44E+03	1.96E+04	3.67E+02	4.95E+02	<0.00	<0.00
Duplicate 1 in µg/mL	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00
Duplicate 1 RPD	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sample 2 in µg/mL	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00
Duplicate 2 in µg/mL	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00	<0.00
Duplicate 2 RPD	N/A	ERR	N/A	N/A	N/A	N/A	ERR	ERR
Spike % Recovery	93.9%		92.6%	110.7%	94.9%	93.6%		

Data Entry by: Jann Frye Date: 04/09/96

Approved by: Jann Frye Date: 4/9/96

Form DIONEX.WB1 Rev. 1.3

WKL 5388

RPD's Between Spike & Spike Dup % Rec.

F $\frac{|96.12 - 93.9|}{(96.12 + 93.9)/2} \times 100 = \frac{2.22}{95.01} \times 100 = 2.336$ RPD

NO_2 $\frac{|92.58 - 92.5|}{(92.58 + 92.5)/2} \times 100 = \frac{0.08}{92.54} \times 100 = .086$ RPD

NO_3 $\frac{|106.83 - 110.7|}{(106.83 + 110.7)/2} \times 100 = \frac{3.87}{108.76} \times 100 = 3.558$ RPD

PO_4 $\frac{|94.21 - 94.9|}{(94.21 + 94.9)/2} \times 100 = \frac{0.010}{94.555} \times 100 = 0.0106$ RPD

SO_4 $\frac{|93.78 - 93.6|}{(93.78 + 93.5)/2} \times 100 = \frac{0.180}{93.69} \times 100 = 0.192$ RPD

4/9/96

Data Reprocessed On 03/21/1996 10:41:29

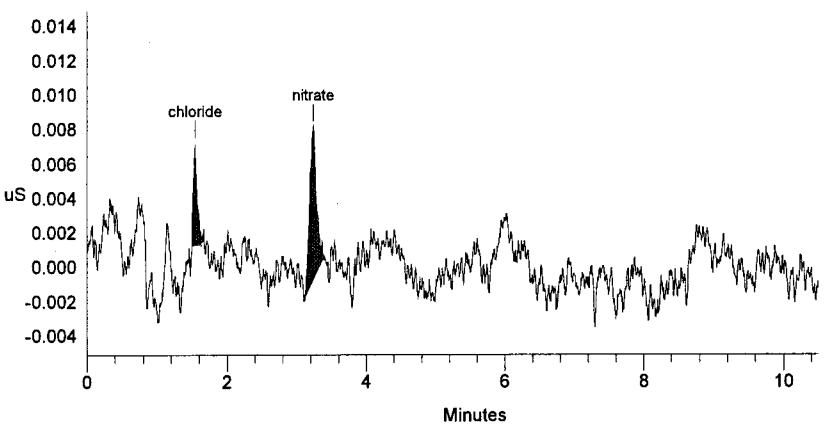
Sample Name: INSTRA BLK Date: 02/17/1996 13:26:26
Data File : C:\DX\DATA\96021711.d19
Method : C:\DX\METHOD\KIT.MET WHC-SD-WM-DP-142, REV. 1
ACI Address: 1 System: 1 Inject#: 19 Detector:CDM-2
Analyst : James Lenz for Rob King 3/21/96 Column: AG4A/AS4A anion column

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area Reject
External	1	1	3150	5Hz	0.00	10.50	20000

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	1.55	chloride	0.012	5877	22140	1	-1.49
2	3.24	nitrate	0.230	8823	60526	1	2.86
		Totals	0.241	14700	82666		

File: 96021711.d19 Sample: INSTRA BLK



SIGNATURE ABOVE REPRESENTS CHEMICAL TECHNOLOGIST/CHEMIST THAT COMPLETED/VERIFIED THE CALIBRATION/ANALYSIS ON PAGES 329 TO 341.

Data Reprocessed On 03/21/1996 10:41:32

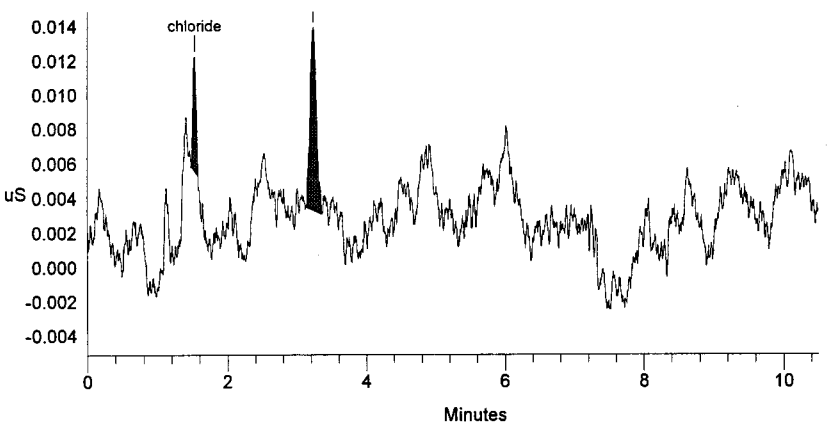
Sample Name: PREP BLK Date: 02/17/1996 13:42:27
Data File : C:\DX\DATA\96021711.d20
Method : C:\DX\METHOD\KIT.MET
WHC-SD-WM-DP-142 REV. 0
ACI Address: 1 System: 1 Inject#: 20 Detector:CDM-2
Analyst : Column: AG4A/AS4A anion column

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area Reject
External	1	1	3150	5Hz	0.00	10.50	20000

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	1.53	chloride	0.012	6550	22108	1	-2.34
2	3.23	nitrate	0.231	10545	67826	1	2.65
		Totals	0.242	17096	89934		

File: 96021711.d20 Sample: PREP BLK



Not used
GMF

Data Reprocessed On 03/21/1996 10:41:34

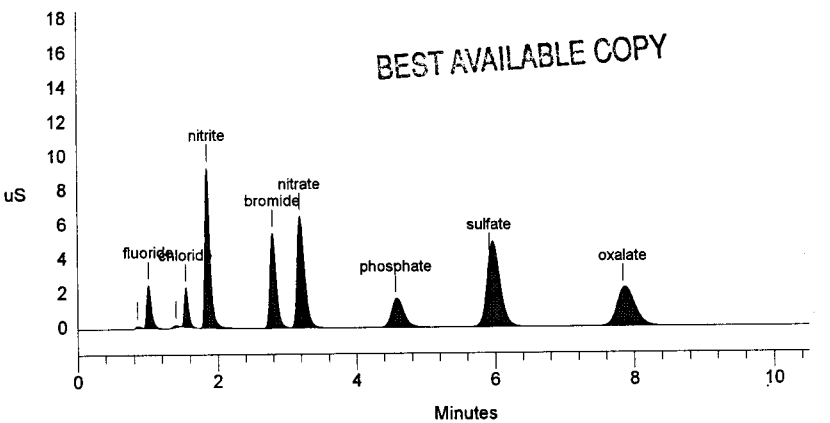
Sample Name: STD 122N9-E Date: 02/17/1996 13:55:22
Data File : C:\DX\DATA\96021711.d21
Method : C:\DX\METHOD\KIT.MET WHC-SD-WM-DP-142, REV.1
ACI Address: 1 System: 1 Inject#: 21 Detector:CDM-2
Analyst : Column: AG4A/AS4A anion column

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area Reject
External	1	101	3150	5Hz	0.00	10.50	20000

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.85		0.000	102611	450233	2	
2	1.01	fluoride	55.052	2465022	11605223	2	-0.33
3	1.40		0.000	123873	622935	1	
4	1.54	chloride	71.819	2233296	9490089	1	-1.91
5	1.85	nitrite	497.198	9322419	47514216	1	-2.97
6	2.79	bromide	559.582	5487683	34741748	1	-1.18
7	3.18	nitrate	599.042	6439604	48149832	1	0.95
8	4.56	phosphate	531.329	1607778	21093194	1	-2.77
9	5.92	sulfate	613.331	4047779	64507792	1	-4.36
10	7.84	oxalate	521.717	2180133	41067756	1	-3.33
		Totals	3449.070	34010198	279243017		

File: 96021711.d21 Sample: STD 122N9-E



Data Reprocessed On 03/21/1996 10:41:37

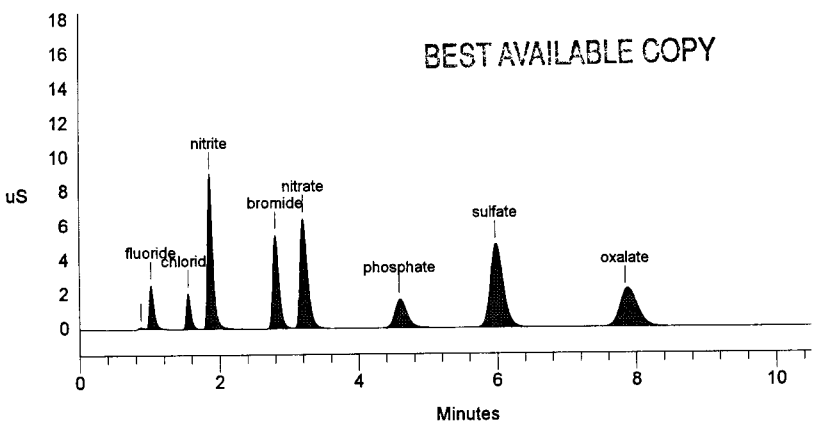
Sample Name: STD 122N9-E Date: 02/17/1996 14:10:11
Data File : C:\DX\DATA\96021711.d22 WHC-SD-WM-DP-142, REV. 1
Method : C:\DX\METHOD\KIT.MET
ACI Address: 1 System: 1 Inject#: 22 Detector:CDM-2
Analyst : Column: AG4A/AS4A anion column

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area Reject
External	1	101	3150	5Hz	0.00	10.50	20000

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.87		0.000	74644	318053	2	
2	1.02	fluoride	57.156	2549002	12063902	2	0.99
3	1.55	chloride	72.736	2078559	9613926	1	-1.06
4	1.86	nitrite	501.994	8960188	47988872	1	-2.62
5	2.80	bromide	559.885	5441216	34761528	1	-0.71
6	3.20	nitrate	599.519	6407658	48190214	1	1.59
7	4.59	phosphate	531.673	1651212	21107412	1	-2.20
8	5.97	sulfate	610.370	4837179	64181880	1	-3.50
9	7.84	oxalate	513.575	2133706	40419320	1	-3.33
		Totals	3446.909	34133363	278645107		

File: 96021711.d22 Sample: STD 122N9-E



Data Reprocessed On 03/21/1996 10:41:39

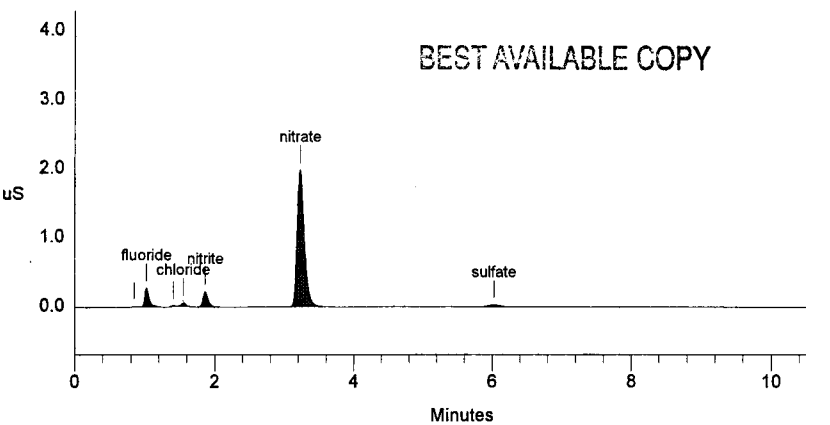
Sample Name: S96V000008 Date: 02/17/1996 14:25:18
Data File : C:\DX\DATA\96021711.d23
Method : C:\DX\METHOD\KIT.MET WHC-SD-WM-DP-142, REV. 1
ACI Address: 1 System: 1 Inject#: 23 Detector:CDM-2
Analyst : Column: AG4A/AS4A anion column

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area Reject
External	1	10201	3150	5Hz	0.00	10.50	20000

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.85		0.000	6831	22772	1	
2	1.03	fluoride	744.771	273650	1239602	1	1.65
3	1.41		0.000	14460	69664	1	
4	1.55	chloride	276.933	53983	232184	1	-1.06
5	1.87	nitrite	2782.265	222592	1178512	1	-2.27
6	3.23	nitrate	20160.468	1994263	14662148	1	2.43
7	6.03	sulfate	2273.029	33544	511388	1	-2.64
		Totals	26237.467	2599323	17916270		

File: 96021711.d23 Sample: S96V000008



Data Reprocessed On 03/21/1996 10:41:42

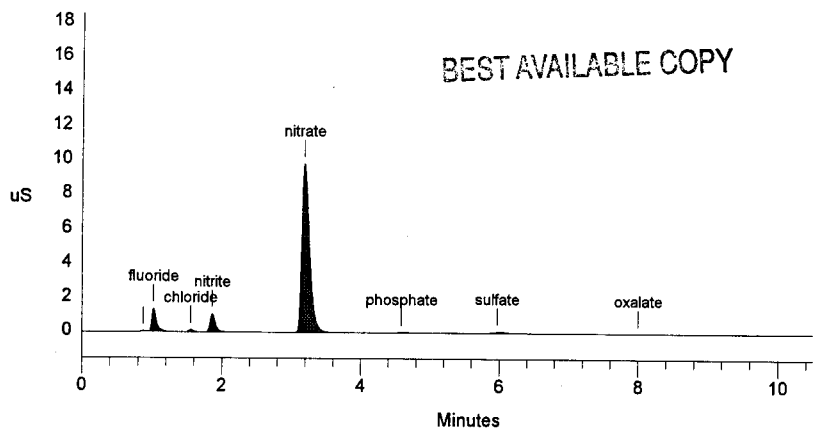
Sample Name: S96V000008
Data File : C:\DX\DATA\96021711.d24
Method : C:\DX\METHOD\KIT.MET
ACI Address: 1 System: 1 Inject#: 24
Analyst :
Date: 02/17/1996 14:41:15
WHC-SD-WM-DP-142, REV. 1
Detector:CDM-2
Column: AG4A/AS4A anion column

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area Reject
External	1	2121	3150	5Hz	0.00	10.50	20000

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.87		0.000	41025	180073	2	
2	1.02	fluoride	659.200	1345567	6454853	2	0.99
3	1.55	chloride	120.816	138844	632826	1	-1.06
4	1.86	nitrite	1537.465	1065448	5670948	1	-2.62
5	3.18	nitrate	19725.542	9835326	77164252	1	0.95
6	4.59	phosphate	459.896	29654	375862	1	-2.20
7	5.97	sulfate	622.505	83117	1272412	1	-3.50
8	8.00	oxalate	114.094	6724	225112	1	-1.36
		Totals	23239.519	12545705	91976338		

File: 96021711.d24 Sample: S96V000008



Data Reprocessed On 03/21/1996 10:41:44

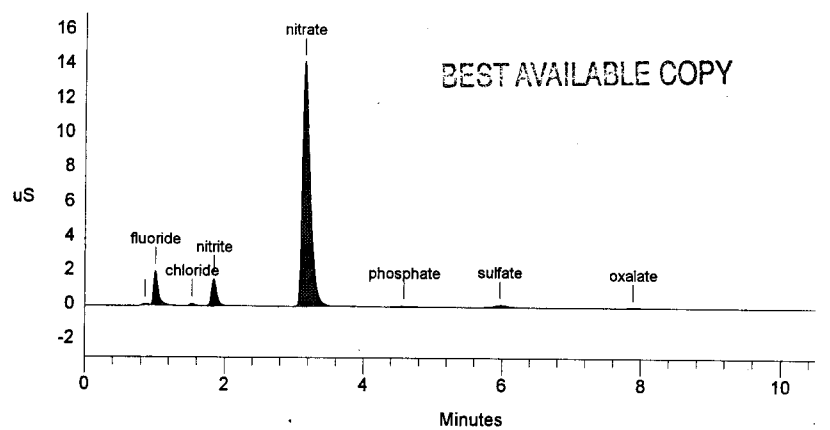
Sample Name: S96V000008
Data File : C:\DX\DATA\96021711.d25
Method : C:\DX\METHOD\KIT.MET
ACI Address: 1 System: 1 Inject#: 25
Analyst :
Date: 02/17/1996 14:56:55
WHC-SD-WM-DP-142,REV.1
Detector:CDM-2
Column: AG4A/AS4A anion column

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area Reject
External	1	1447.66	3150	5Hz	0.00	10.50	20000

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.86		0.000	62348	281284	2	
2	1.01	fluoride	655.725	1993158	9578707	2	-0.33
3	1.53	chloride	96.252	154355	760892	1	-2.34
4	1.85	nitrite	1437.302	1559362	8334804	1	-3.32
5	3.14	nitrate	19559.607	14206043	114095810	1	-0.32
6	4.59	phosphate	367.443	42415	525542	1	-2.20
7	5.97	sulfate	495.009	125257	1794216	1	-3.50
8	7.89	oxalate	89.076	12243	286524	1	-2.67
		Totals	22700.415	18155180	135657779		

File: 96021711.d25 Sample: S96V000008



Data Reprocessed On 03/21/1996 10:41:47

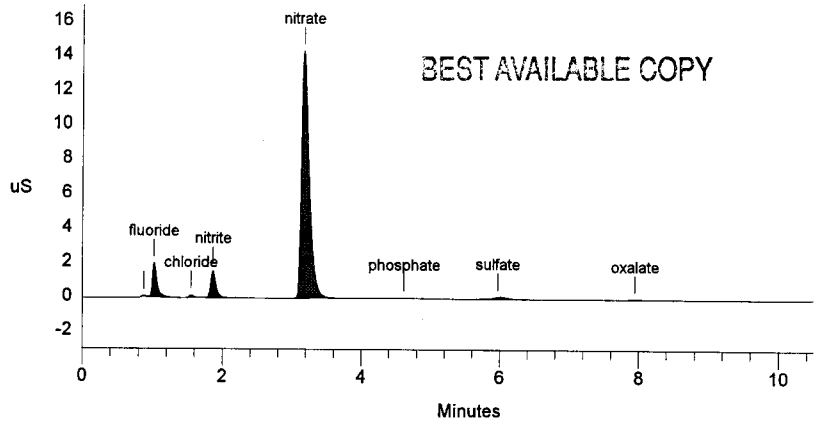
Sample Name: S96V000008 DUP
Data File : C:\DX\DATA\96021711.d26
Method : C:\DX\METHOD\KIT.MET
ACI Address: 1 System: 1 Inject#: 26
Analyst : Column: AG4A/AS4A anion column
Date: 02/17/1996 15:10:38
WHC-SD-WM-DP-142, REV. 1
Detector:CDM-2

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area Reject
External	1	1447.66	3150	5Hz	0.00	10.50	20000

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.87		0.000	55821	246614	2	
2	1.02	fluoride	649.399	1966223	9482621	2	0.99
3	1.55	chloride	95.091	161592	750106	1	-1.06
4	1.87	nitrite	1450.733	1576542	8427052	1	-2.27
5	3.17	nitrate	19600.982	14365673	114349084	1	0.53
6	4.61	phosphate	376.340	41679	550416	1	-1.63
7	5.97	sulfate	493.798	117721	1785202	1	-3.50
8	7.95	oxalate	70.394	11994	184112	1	-2.01
		Totals	22736.739	18297245	135775206		

File: 96021711.d26 Sample: S96V000008 DUP



Data Reprocessed On 03/21/1996 10:41:49

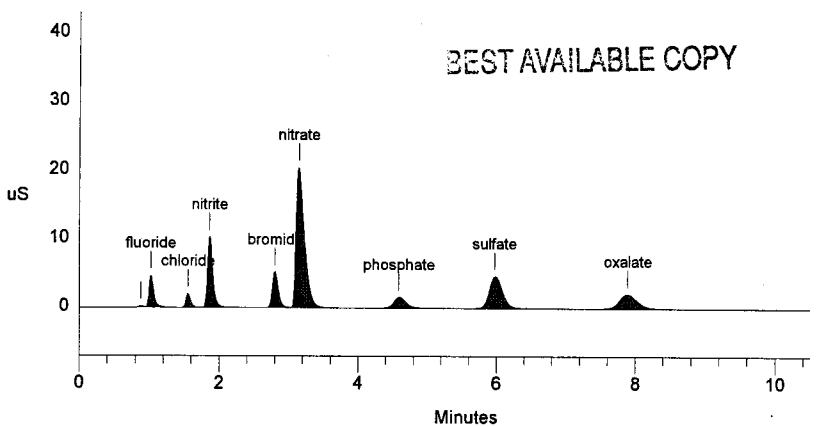
Sample Name: S96V000008 SPIKE
Data File : C:\DX\DATA\96021711.d27
Method : C:\DX\METHOD\KIT.MET
ACI Address: 1 System: 1 Inject#: 27
Analyst : Column: AG4A/AS4A anion column
Date: 02/17/1996 15:25:48
WHC-SD-WM-DP-142, REV.
Detector:CDM-2

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area Reject
External	1	1447.66	3150	5Hz	0.00	10.50	20000

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.87		0.000	128424	566605	2	
2	1.02	fluoride	1418.362	4602020	21194364	2	0.99
3	1.55	chloride	1045.085	2054446	9637872	1	-1.06
4	1.86	nitrite	8100.571	10288145	54243684	1	-2.62
5	2.80	bromide	7318.377	5222590	31554890	1	-0.71
6	3.14	nitrate	28416.106	20437343	169158230	1	-0.32
7	4.59	phosphate	7298.647	1589520	20180476	1	-2.20
8	5.97	sulfate	8465.096	4667368	62005878	1	-3.50
9	7.89	oxalate	6996.169	2140420	38391968	1	-2.67
		Totals	69058.412	51130275	406933967		

File: 96021711.d27 Sample: S96V000008 SPIKE



Data Reprocessed On 03/21/1996 10:41:52

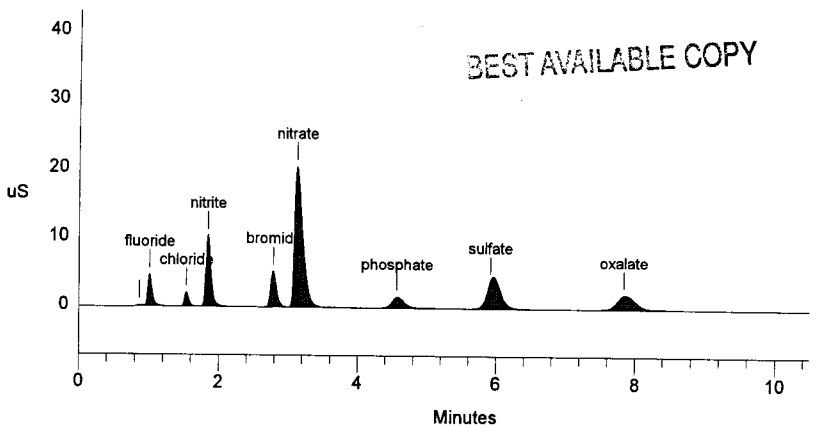
Sample Name: S96V000008 SPIKE DUP Date: 02/17/1996 15:39:00
Data File : C:\DX\DATA\96021711.d28
Method : C:\DX\METHOD\KIT.MET
ACI Address: 1 System: 1 Inject#: 28 Detector:CDM-2
Analyst : Column: AG4A/AS4A anion column

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area Reject
External	1	1447.66	3150	5Hz	0.00	10.50	20000

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	0.86		0.000	128804	549652	2	
2	1.01	fluoride	1401.921	4636404	20943291	2	-0.33
3	1.53	chloride	1042.494	2085327	9613458	1	-2.34
4	1.84	nitrite	8090.166	10304825	54171768	1	-3.66
5	2.78	bromide	7365.067	5241762	31766468	1	-1.42
6	3.12	nitrate	28715.987	20480735	171053452	1	-0.95
7	4.56	phosphate	7345.930	1576906	20316522	1	-2.77
8	5.92	sulfate	8449.214	4080285	61884054	1	-4.36
9	7.84	oxalate	7027.546	2079610	38566176	1	-3.33
		Totals	69438.325	50614659	408864840		

File: 96021711.d28 Sample: S96V000008 SPIKE DUP



Data Reprocessed On 03/21/1996 10:41:54

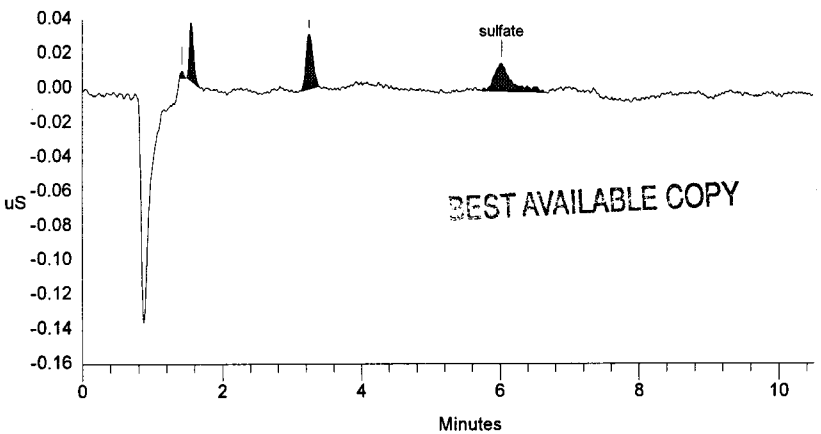
Sample Name: S96V0000014 Date: 02/17/1996 15:52:37
Data File : C:\DX\DATA\96021711.d29
Method : C:\DX\METHOD\KIT.MET
ACI Address: 1 System: 1 Inject#: 29 Detector:CDM-2
Analyst : Column: AG4A/AS4A anion column

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area Reject
External	1	11	3150	5Hz	0.00	10.50	20000

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
2	1.55	chloride	0.228	34017	145560	1	-1.06
3	3.25	nitrate	2.744	31753	225608	1	3.07
4	6.03	sulfate	2.224	16118	289356	1	-2.64
		Totals	5.196	81888	660524		

File: 96021711.d29 Sample: S96V0000014



Data Reprocessed On 03/21/1996 10:41:57

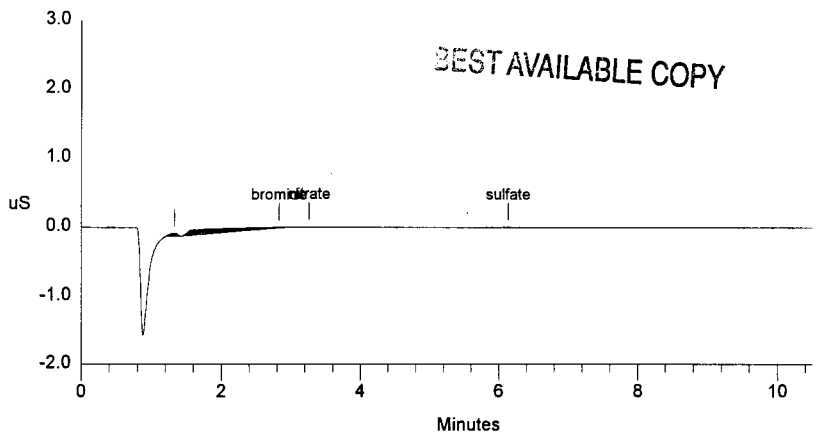
Sample Name: S96V0000014 Date: 02/17/1996 16:05:25
Data File : C:\DX\DATA\96021711.d30
Method : C:\DX\METHOD\KIT.MET WHC-SD-WM-DP-142, REV 1
ACI Address: 1 System: 1 Inject#: 30 Detector:CDM-2
Analyst : Column: AG4A/AS4A anion column

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area Reject
External	1	1	3150	5Hz	0.00	10.50	20000

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	1.33		0.000	43793	334292	1	
2	2.83	bromide	0.823	13728	4156415	1	0.24
3	3.26	nitrate	0.230	9340	63184	1	3.49
4	6.13	sulfate	0.196	6966	222758	1	-0.92
		Totals	1.249	73827	4776649		

File: 96021711.d30 Sample: S96V0000014



Data Reprocessed On 03/21/1996 10:41:59

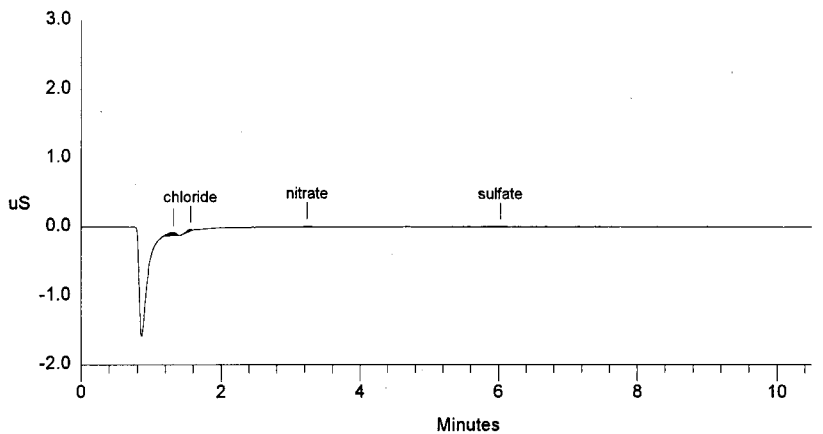
Sample Name: S96V0000014 DUP
Data File : C:\DX\DATA\96021711.d31
Method : C:\DX\METHOD\KIT.MET
ACI Address: 1 System: 1 Inject#: 31
Analyst : Column: AG4A/AS4A anion column
Date: 02/17/1996 16:45:07
WHC-SD-WM-DP-142 REV. 1
Detector:CDM-2

Calibration	Volume	Dilution	Points	Rate	Start	Stop	Area Reject
External	1	1	3150	5Hz	0.00	10.50	20000

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

Pk. Num	Ret Time	Component Name	Concentration ug/ml	Height	Area	Bl. Code	%Delta
1	1.32		0.000	45085	349470	1	
2	1.56	chloride	0.020	22123	130860	1	-0.64
3	3.23	nitrate	0.233	12033	88646	1	2.65
4	6.03	sulfate	0.185	6774	100628	1	-2.64
		Totals	0.437	86016	669604		

File: 96021711.d31 Sample: S96V0000014 DUP



RADIOCHEMICAL ANALYSES

THIS PAGE WAS INTENTIONALLY LEFT BLANK

W H C 2 2 2 - S L A B O R A T O R Y
TANK AP-104, GROUP 96000036

SDG 96000036	Client 242-A Evaporator
Contact G. L. Miller	Tank AP-104

WHC-SD-WM-DP-142, REV. 1

S U M M A R Y D A T A S E C T I O N

T A B L E O F C O N T E N T S

F i n a l R e p o r t

Reviewed by

Approved by

Lab id	222-S
Protocol	CT
Version	1.0
Form	DVD-TOC
Version	3.08
Report date	04/09/96

WHC 222-S LABORATORY

TANK AP-104, GROUP 96000036

SDG 96000036
Contact G. L. Miller

REPORT GUIDE

Client 242-A Evaporator
Tank AP-104

WHC-SD-WM-DP-142, REV. 1

ABOUT THE DATA SUMMARY SECTION

The Data Summary Section of a Data Package has all data, in several useful orders, necessary for first level, routine review of the data package for a Sample Delivery Group (SDG). This section follows the Data Package Narrative, which has an overview of the data package and a discussion of special problems. It is followed by the Raw Data Section, which has full details.

The Data Summary Section has several groups of reports:

SAMPLE SUMMARIES

The Sample and QC Summary Reports show all samples, including QC samples, reported in one SDG. These reports cross-reference client and lab sample identifiers.

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches (lab groupings reflecting how work was organized) relevant to the reported SDG with information necessary to check the completeness and consistency of the SDG.

WORK SUMMARY

The Work Summary Report shows all samples and work done on them relevant to the reported SDG.

METHOD BLANKS

The Method Blank Reports, one for each Method Blank relevant to the SDG, show all results and primary supporting information for the blanks.

LAB CONTROL SAMPLES

The Lab Control Sample Reports, one for each Lab Control Sample relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

DUPLICATES

SDG 96000036
Contact G. L. Miller

GUIDE, cont.
WHC-SD-WM-DP-143, REV. 1

Client 242-A Evaporator
Tank AP-104

ABOUT THE DATA SUMMARY SECTION

The Duplicate Reports, one for each Duplicate and Original sample pair relevant to the SDG, show all results, differences and primary supporting information for these QC samples.

MATRIX SPIKES

The Matrix Spike Reports, one for each Spiked and Original sample pair relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

DATA SHEETS

The Data Sheet Reports, one for each client sample in the SDG, show all results and primary supporting information for these samples.

METHOD SUMMARIES

The Method Summary Reports, one for each test used in the SDG, show all results, QC and method performance data for one analyte on one or two pages. (A test is a short code for the method used to do certain work to the client's specification.)

REPORT GUIDES

The Report Guides, one for each of the above groups of reports, have documentation on how to read the associated reports.

WHC 222-S LABORATORY

TANK AP-104, GROUP 96000036

SDG 96000036
Contact G. L. Miller

SAMPLE SUMMARY

Client 242-A Evaporator
Tank AP-104

WHC-SD-WM-DP-~~142~~, REV. 1

CLIENT SAMPLE ID	LOCATION		MATRIX	LEVEL	LAB SAMPLE ID	PRIORITY	COLLECTED	RECEIVED
AP-104 4AP-96-1C			LIQUID		S96V000006		01/23/96 13:30	01/24/96 17:45
AP-104 4AP-96-1C-SPK			LIQUID		S96V000006S		01/23/96 13:30	
AP-104 4AP-96-2C			LIQUID		S96V000007		01/23/96 13:00	01/24/96 14:00
AP-104 4AP-96-3C			LIQUID		S96V000008		01/23/96 19:20	01/24/96 22:22
AP-104 4AP-96-4		ACIDIG	LIQUID		S96V000013			
AP-104 4AP-96-4-DUP		ACIDIG	LIQUID		S96V000013D			
AP-104 4AP-96-IB1			LIQUID		S96V000014		01/18/96 12:48	01/19/96 14:25
AP-104 4AP-96-1C	R: S: C:	ACIDIG	LIQUID		S96V000009			
AP-104 4AP-96-1C-DUP	R: S: C:	ACIDIG	LIQUID		S96V000009D			
AP-104 4AP-96-1C-SPK	R: S: C:	ACIDIG	LIQUID		S96V000009S			
AP-104 4AP-96-2C	R: S: C:	ACIDIG	LIQUID		S96V000010			
AP-104 4AP-96-2C-DUP	R: S: C:	ACIDIG	LIQUID		S96V000010D			
AP-104 4AP-96-2C-SPK	R: S: C:	ACIDIG	LIQUID		S96V000010S			
AP-104 4AP-96-3C	R: S: C:	ACIDIG	LIQUID		S96V000011			
AP-104 4AP-96-3C-DUP	R: S: C:	ACIDIG	LIQUID		S96V000011D			
AP-104 4AP-96-IB1	R: S: C:	ACIDIG	LIQUID		S96V000015			
AP-104 4AP-96-IB1-DUP	R: S: C:	ACIDIG	LIQUID		S96V000015D			
Method Blank			LIQUID		B5685-1			
DI Blank			LIQUID		B5403-2			
Method Blank			LIQUID		B5579-2			
Method Blank			LIQUID		B5605-2			
Method Blank			LIQUID		B5616-2			
Method Blank			LIQUID		B5636-2			
Method Blank			LIQUID		B5637-2			
Method Blank			LIQUID		B5688-2			
Method Blank			LIQUID		B5908-2			
Method Blank			LIQUID		B5998-2			
DI Blank			LIQUID		B6495-2			
Lab Control Sample			LIQUID		S5403-1			
Lab Control Sample			LIQUID		S5579-1			
Lab Control Sample			LIQUID		S5605-1			
Lab Control Sample			LIQUID		S5616-1			
Lab Control Sample			LIQUID		S5636-1			
Lab Control Sample			LIQUID		S5637-1			
Lab Control Sample			LIQUID		S5688-1			
Lab Control Sample			LIQUID		S5998-1			
Lab Control Sample			LIQUID		S6495-1			
Dup spike (S96V000006S)			LIQUID		S96V000006T		01/23/96 13:30	
Dup spike (S96V000009S)	R: S: C:	ACIDIG	LIQUID		S96V000009T			

Final Report

SAMPLE SUMMARY
Page 1
SUMMARY DATA SECTION
Page 3

Lab id 222-S
Protocol CT
Version 1.0
Form DVD-CS
Version 3.08
Report date 04/09/96

SDG 96000036
Contact G. L. Miller

SAMPLE SUMMARY, cont.

Client 242-A Evaporator
Tank AP-104

WHC-SD-WM-DP-142, REV. 1

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	PRIORITY	COLLECTED	RECEIVED
Dup spike (S96V000010S)	R: S: C:	ACIDIG	LIQUID	S96V000010T			

WHC 222-S LABORATORY

TANK AP-104, GROUP 96000036

SDG 96000036
Contact G. L. Miller

QC SUMMARY

WHC-SD-WM-DP-142, REV. 1

Client 242-A Evaporator
Tank AP-104

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID		MATRIX	% MOIST	SAMPLE AMOUNT	BASIS AMOUNT	DAYS FROM/TO COLL RCVD	DAYS FROM/TO RCVD RPTD	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
96000036-B		AP-104 4AP-96-4	ACIDIG	LIQUID						S96V000013	
	n/a	AP-104 4AP-96-1C	ACIDIG	LIQUID						S96V000009	
		AP-104 4AP-96-2C	ACIDIG	LIQUID						S96V000010	
		AP-104 4AP-96-3C	ACIDIG	LIQUID						S96V000011	
		AP-104 4AP-96-IB1	ACIDIG	LIQUID						S96V000015	
		AP-104 4AP-96-4-DUP	ACIDIG	LIQUID						S96V000013D	
		AP-104 4AP-96-1C-DUP	ACIDIG	LIQUID						S96V000009D	
		AP-104 4AP-96-1C-SPK	ACIDIG	LIQUID						S96V000009S	
		AP-104 4AP-96-2C-DUP	ACIDIG	LIQUID						S96V000010D	
		AP-104 4AP-96-2C-SPK	ACIDIG	LIQUID						S96V000010S	
		AP-104 4AP-96-3C-DUP	ACIDIG	LIQUID						S96V000011D	
		AP-104 4AP-96-IB1-DUP	ACIDIG	LIQUID						S96V000015D	
		Dup spike (S96V000009S)	ACIDIG	LIQUID						S96V000009T	
		Dup spike (S96V000010S)	ACIDIG	LIQUID						S96V000010T	
96000036-L		AP-104 4AP-96-1C		LIQUID				1	76	S96V000006	
		AP-104 4AP-96-2C		LIQUID				1	76	S96V000007	
		AP-104 4AP-96-3C		LIQUID				1	76	S96V000008	
		AP-104 4AP-96-IB1		LIQUID				1	81	S96V000014	
		AP-104 4AP-96-1C-SPK		LIQUID				1	76	S96V000006S	
		Dup spike (S96V000006S)		LIQUID				1	76	S96V000006T	
96001260-L		Method Blank		LIQUID						B5685-1	
LIQUID		DI Blank		LIQUID						B5403-2	
		Method Blank		LIQUID						B5579-2	
		Method Blank		LIQUID						B5605-2	
		Method Blank		LIQUID						B5616-2	
		Method Blank		LIQUID						B5636-2	
		Method Blank		LIQUID						B5637-2	
		Method Blank		LIQUID						B5688-2	
		Method Blank		LIQUID						B5908-2	
		Method Blank		LIQUID						B5998-2	
		DI Blank		LIQUID						B6495-2	
		Lab Control Sample		LIQUID						S5403-1	
		Lab Control Sample		LIQUID						S5579-1	
		Lab Control Sample		LIQUID						S5605-1	
		Lab Control Sample		LIQUID						S5616-1	
		Lab Control Sample		LIQUID						S5636-1	

Final Report

QC SUMMARY
Page 1
SUMMARY DATA SECTION
Page 5

Lab id 222-S
Protocol CT
Version 1.0
Form DVD-QS
Version 3.08
Report date 04/09/96

SDG 96000036
Contact G. L. Miller

QC SUMMARY, cont.

WHC-SD-WM-DP-142, REV. 1

Client 242-A Evaporator
Tank AP-104

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% MOIST	SAMPLE AMOUNT	BASIS AMOUNT	DAYS FROM/TO COLL RCVD	DAYS FROM/TO RCVD RPTD	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
		Lab Control Sample	LIQUID						S5637-1	
		Lab Control Sample	LIQUID						S5688-1	
		Lab Control Sample	LIQUID						S5998-1	
		Lab Control Sample	LIQUID						S6495-1	

WHC 222-S LABORATORY

TANK AP-104, GROUP 96000036

SDG 96000036
Contact G. L. Miller

PREP BATCH SUMMARY

WHC-SD-WM-DP-142, REV. 1

Client 242-A Evaporator
Tank AP-104

TEST	MATRIX	METHOD	PREPARATION BATCH	ERROR 2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Alpha Proportional Counter												
NP	LIQUID	Neptunium-237	96001198	15.0	4			1	1	2/2	1/1	
Alpha Spectroscopy												
AM	LIQUID	Americium-241	96001197	15.0	4			1	1	2/2	1/1	
PU	LIQUID	Plutonium-239	96001177	15.0	4			1	1	2/2	1/1	
Gas Proportional Counting												
SR	LIQUID	Strontium-89/90	96001628	15.0	4			1	1	2/2	1/1	
Gas Proportional Counting												
AB	LIQUID	Alpha/Beta Analysis	96001182	15.0	4			1	1	4/4	1/1	
			96001530	15.0	1			1		1/1		
Gamma Energy Analysis												
GEA	LIQUID	Gamma Spectroscopy	96001135	15.0	4			1	1	1/1		
Kinetic Phosphorescence Anlzr												
U	LIQUID	Uranium	96001644	15.0	4			1	1	1/1	1/1	
Liquid Scintillation												
H	LIQUID	Tritium	96002180	15.0	1			1	1	1/1	1/1	
SE	LIQUID	Selenium 79	96001260	15.0	4			1		1/1		X
TC	LIQUID	Technetium	96001263	15.0	4			1	1	1/1	1/1	

Duplicates and Matrix Spikes are those with original (Client) sample in this Sample Delivery Group.
Blank and LCS planchets are those in the same preparation batch as some Client, Duplicate or Spike sample.

Final Report

PREP BATCH SUMMARY
Page 1
SUMMARY DATA SECTION
Page 7

Lab id 222-S
Protocol CT
Version 1.0
Form DVD-PBS
Version 3.08
Report date 04/09/96

WHC 222-S LABORATORY

TANK AP-104, GROUP 96000036

WORK SUMMARY

SDG 96000036
Contact G. L. Miller

Client 242-A Evaporator
Tank AP-104

WHC-SD-WM-DP-142, REV. 1

CLIENT SAMPLE ID / LOCATION / CUSTODY	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
AP-104 4AP-96-1C		S96V000006	6495-3	H		03/17/96		JLS	Tritium
	LIQUID	01/23/96	5403-3	U		02/17/96		JLS	Uranium
		01/24/96							
AP-104 4AP-96-1C-SPK		S96V000006S	6495-4	H		03/17/96		JLS	Tritium
	LIQUID	01/23/96	5403-4	U		02/17/96		JLS	Uranium
		01/24/96							
AP-104 4AP-96-2C		S96V000007	5403-6	U		02/17/96		JLS	Uranium
	LIQUID	01/23/96							
		01/24/96							
AP-104 4AP-96-3C		S96V000008	5403-7	U		02/17/96		JLS	Uranium
	LIQUID	01/23/96							
		01/24/96							
AP-104 4AP-96-4	ACIDIG	S96V000013	5616-12	AB		02/21/96		SLF	Alpha/Beta Analysis
	LIQUID								
AP-104 4AP-96-4-DUP	ACIDIG	S96V000013D	5616-13	AB		02/21/96		SLF	Alpha/Beta Analysis
	LIQUID								
AP-104 4AP-96-IB1		S96V000014	5403-8	U		02/17/96		JLS	Uranium
	LIQUID	01/18/96							
		01/19/96							
AP-104 4AP-96-1C	ACIDIG	S96V000009	5616-4	AB		02/21/96		SLF	Alpha/Beta Analysis
R: S: C:	LIQUID		5636-3	AM		02/15/96		LLF	Americium-241
n/a			5579-3	GEA		02/12/96		PPB	Gamma Spectroscopy
			5637-3	NP		02/15/96		JLS	Neptunium-237
			5605-3	PU		02/14/96		LLF	Plutonium-239
			5685-2	SE		03/02/96		JLS	Selenium 79
			5998-4	SR	01	03/02/96		SLF	Strontium-89/90
			5688-3	TC		03/06/96		JLS	Technetium

Final Report

WORK SUMMARY
Page 1
SUMMARY DATA SECTION
Page 8

Lab id 222-S
Protocol CT
Version 1.0
Form DVD-CWS
Version 3.08
Report date 04/09/96

SDG 96000036
Contact G. L. Miller

WORK SUMMARY, cont.

Client 242-A Evaporator
Tank AP-104

WHC-SD-WM-DP-142, REV.1

CLIENT SAMPLE ID / LOCATION / CUSTODY / Priority	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
AP-104 4AP-96-1C-DUP	ACIDIG	S96V000009D	5616-5	AB		02/21/96		SLF	Alpha/Beta Analysis
R: S: C:	LIQUID		5579-4	GEA		02/12/96		PPB	Gamma Spectroscopy
			5685-3	SE		03/02/96		JLS	Selenium 79
			5998-5	SR	01	03/02/96		SLF	Strontium-89/90
			5688-4	TC		03/06/96		JLS	Technetium
AP-104 4AP-96-1C-SPK	ACIDIG	S96V000009S	5998-6	SR	01	03/02/96		SLF	Strontium-89/90
R: S: C:	LIQUID		5688-5	TC		03/06/96		JLS	Technetium
AP-104 4AP-96-2C	ACIDIG	S96V000010	5616-6	AB		02/21/96		SLF	Alpha/Beta Analysis
R: S: C:	LIQUID		5636-4	AM		02/15/96		LLF	Americium-241
n/a			5579-5	GEA		02/12/96		PPB	Gamma Spectroscopy
			5637-4	NP		02/15/96		JLS	Neptunium-237
			5605-4	PU		02/14/96		LLF	Plutonium-239
			5685-4	SE		03/02/96		JLS	Selenium 79
			5998-8	SR	01	03/02/96		SLF	Strontium-89/90
			5688-7	TC		03/06/96		JLS	Technetium
AP-104 4AP-96-2C-DUP	ACIDIG	S96V000010D	5616-7	AB		02/21/96		SLF	Alpha/Beta Analysis
R: S: C:	LIQUID		5636-5	AM		02/15/96		LLF	Americium-241
			5637-5	NP		02/15/96		JLS	Neptunium-237
			5605-5	PU		02/14/96		LLF	Plutonium-239
AP-104 4AP-96-2C-SPK	ACIDIG	S96V000010S	5616-8	AB		02/21/96		SLF	Alpha/Beta Analysis
R: S: C:	LIQUID		5636-6	AM		02/15/96		LLF	Americium-241
			5637-6	NP		02/15/96		JLS	Neptunium-237
			5605-6	PU		02/14/96		LLF	Plutonium-239
AP-104 4AP-96-3C	ACIDIG	S96V000011	5616-10	AB		02/21/96		SLF	Alpha/Beta Analysis
R: S: C:	LIQUID		5636-8	AM		02/15/96		LLF	Americium-241
n/a			5579-6	GEA		02/12/96		PPB	Gamma Spectroscopy
			5637-8	NP		02/15/96		JLS	Neptunium-237
			5605-8	PU		02/14/96		LLF	Plutonium-239
			5685-5	SE		03/02/96		JLS	Selenium 79
			5998-9	SR	01	03/02/96		SLF	Strontium-89/90
			5688-8	TC		03/06/96		JLS	Technetium
AP-104 4AP-96-3C-DUP	ACIDIG	S96V000011D	5616-11	AB		02/21/96		SLF	Alpha/Beta Analysis
R: S: C:	LIQUID								

SDG 96000036
Contact G. L. Miller

WORK SUMMARY, cont.

Client 242-A Evaporator
Tank AP-104

WHC-SD-WM-DP-142, REV. 1

CLIENT SAMPLE ID / LOCATION / CUSTODY / Priority	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
AP-104 4AP-96-IB1	ACIDIG	S96V000015	5908-4	AB	01	02/26/96		SLF	Alpha/Beta Analysis
R: S: C:	LIQUID		5636-9	AM		02/15/96		LLF	Americium-241
n/a			5579-7	GEA		02/12/96		PPB	Gamma Spectroscopy
			5637-9	NP		02/15/96		JLS	Neptunium-237
			5605-9	PU		02/14/96		LLF	Plutonium-239
			5685-6	SE		03/02/96		JLS	Selenium 79
			5998-10	SR	01	03/02/96		SLF	Strontium-89/90
			5688-9	TC		03/06/96		JLS	Technetium
AP-104 4AP-96-IB1-DUP	ACIDIG	S96V000015D	5908-5	AB	01	02/26/96		SLF	Alpha/Beta Analysis
R: S: C:	LIQUID								
DI Blank		B5403-2	5403-2	U		02/17/96		JLS	Uranium
	LIQUID								
Method Blank		B5579-2	5579-2	GEA		02/12/96		PPB	Gamma Spectroscopy
	LIQUID								
Method Blank		B5605-2	5605-2	PU		02/14/96		LLF	Plutonium-239
	LIQUID								
Method Blank		B5616-2	5616-2	AB		02/21/96		SLF	Alpha/Beta Analysis
	LIQUID								
Method Blank		B5636-2	5636-2	AM		02/15/96		LLF	Americium-241
	LIQUID								
Method Blank		B5637-2	5637-2	NP		02/15/96		JLS	Neptunium-237
	LIQUID								
Method Blank		B5685-1	5685-1	SE		03/02/96		JLS	Selenium 79
	LIQUID								
Method Blank		B5688-2	5688-2	TC		03/06/96		JLS	Technetium
	LIQUID								
Method Blank		B5908-2	5908-2	AB		02/26/96		SLF	Alpha/Beta Analysis
	LIQUID								

SDG 96000036
Contact G. L. Miller

WORK SUMMARY, cont.

Client 242-A Evaporator
Tank AP-104

WHC-SD-WM-DP-142, REV. 1

CLIENT SAMPLE ID / LOCATION / CUSTODY	Priority	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
Method Blank		LIQUID	B5998-2	5998-2	SR		03/02/96		SLF	Strontium-89/90
DI Blank		LIQUID	B6495-2	6495-2	H		03/17/96		JLS	Tritium
Lab Control Sample		LIQUID	S5403-1	5403-1	U		02/17/96		JLS	Uranium
Lab Control Sample		LIQUID	S5579-1	5579-1	GEA		02/12/96		PPB	Gamma Spectroscopy
Lab Control Sample		LIQUID	S5605-1	5605-1	PU		02/14/96		LLF	Plutonium-239
Lab Control Sample		LIQUID	S5616-1	5616-1	AB		02/21/96		SLF	Alpha/Beta Analysis
Lab Control Sample		LIQUID	S5636-1	5636-1	AM		02/15/96		LLF	Americium-241
Lab Control Sample		LIQUID	S5637-1	5637-1	NP		02/15/96		JLS	Neptunium-237
Lab Control Sample		LIQUID	S5688-1	5688-1	TC		03/06/96		JLS	Technetium
Lab Control Sample		LIQUID	S5998-1	5998-1	SR		03/02/96		SLF	Strontium-89/90
Lab Control Sample		LIQUID	S6495-1	6495-1	H		03/17/96		JLS	Tritium
Dup spike (S96V000006S)		LIQUID	S96V000006T 01/23/96 01/24/96	6495-5 5403-5	H U		03/17/96 02/17/96		JLS JLS	Tritium Uranium
Dup spike (S96V000009S) R: S: C:		ACIDIG LIQUID	S96V000009T	5998-7	SR	01	03/02/96		SLF	Strontium-89/90

Final Report

Lab id 222-S
Protocol CT
Version 1.0
Form DVD-CWS
Version 3.08
Report date 04/09/96

SDG 96000036
Contact G. L. Miller

WORK SUMMARY, cont.

Client 242-A Evaporator
Tank AP-104

WHC-SD-WM-DP-142, REV. 1

CLIENT SAMPLE ID / LOCATION / CUSTODY	Priority	MATRIX	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
Dup spike (S96V000010S)		ACIDIG	S96V000010T	5636-7	AM		02/15/96		LLF	Americium-241
R: S: C:		LIQUID		5637-7	NP		02/15/96		JLS	Neptunium-237
				5605-7	PU		02/14/96		LLF	Plutonium-239

COUNTS OF TESTS BY SAMPLE TYPE

TEST	Priority	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP	SPIKE	TOTAL
AB		Alpha/Beta Analysis	222-S Lab Analytical Procedure	5			2	1	5	1	14
AM		Americium-241	222-S Lab Analytical Procedure	4			1	1	2	1	9
GEA		Gamma Spectroscopy	222-S Lab Analytical Procedure	4			1	1	1		7
H		Tritium	222-S Lab Analytical Procedure	1			1	1	1	1	5
NP		Neptunium-237	222-S Lab Analytical Procedure	4			1	1	2	1	9
PU		Plutonium-239	222-S Lab Analytical Procedure	4			1	1	2	1	9
SE		Selenium 79	222-S Lab Analytical Procedure	4			1		1		6
SR		Strontium-89/90	222-S Lab Analytical Procedure	4			1	1	2	1	9
TC		Technetium	222-S Lab Analytical Procedure	4			1	1	1	1	8
U		Uranium	222-S Lab Analytical Procedure	4			1	1	1	1	8
TOTALS				38			11	9	18	8	84

WHC 222-S LABORATORY

TANK AP-104, GROUP 96000036

SDG 96000036
Contact G. L. Miller

BLANKS

Client 242-A Evaporator
Tank AP-104

WHC-SD-WM-DP-142, REV. 1

Lab sample id B5579-2
Dept sample id

Client sample id Method Blank
Material/Matrix LIQUID

ANALYTE	CAS NO	RESULT µCi/mL	2σ TPU %	MDA µCi/mL	RDL µCi/mL	QUALIFIERS	TEST	PREP BATCH
GEA Analytes								
Cobalt 60	10198-40-0	<2.0E-04		2.0E-04		U	GEA	96001135
Niobium 94	14681-63-1	<2.7E-04		2.7E-04		U	GEA	96001135
Ruthenium/Rh 106		<4.2E-03		4.2E-03		U	GEA	96001135
Cesium 134	13967-70-9	<2.6E-04		2.6E-04		U	GEA	96001135
Cesium 137	10045-97-3	<7.0E-04		7.0E-04		U	GEA	96001135
Cerium/Pr 144		<2.8E-03		2.8E-03		U	GEA	96001135
Europium 154	15585-10-1	<5.2E-04		5.2E-04		U	GEA	96001135
Europium 155	14391-16-3	<8.1E-04		8.1E-04		U	GEA	96001135
Radium 226	13982-63-3	<4.2E-03		4.2E-03		U	GEA	96001135

Lab sample id B5605-2
Dept sample id

Client sample id Method Blank
Material/Matrix LIQUID

ANALYTE	CAS NO	RESULT µCi/mL	2σ TPU %	MDA µCi/mL	RDL µCi/mL	QUALIFIERS	TEST	PREP BATCH
Plutonium 239/240		<4.4E-05		4.4E-05		U	PU	96001177
Plutonium 238	13981-16-3	<4.4E-05		4.4E-05		U	PU	96001177

Lab sample id B5616-2
Dept sample id

Client sample id Method Blank
Material/Matrix LIQUID

ANALYTE	CAS NO	RESULT µCi/mL	2σ TPU %	MDA µCi/mL	RDL µCi/mL	QUALIFIERS	TEST	PREP BATCH
Total Alpha	12587-46-1	<1.5E-04		1.5E-04		U	AB	96001182
Total Beta	12587-47-2	<7.2E-04		7.2E-04		U	AB	96001182

Final Report

BLANKS
Page 1
SUMMARY DATA SECTION
Page 13

Lab id 222-S
Protocol CT
Version 1.0
Form DVD-BLANK
Version 3.08
Report date 04/09/96

SDG 96000036
Contact G. L. Miller

BLANKS

Client 242-A Evaporator
Tank AP-104

WHC-SD-WM-DP-142, REV. 1

Lab sample id B5636-2
Dept sample id
Client sample id Method Blank
Material/Matrix LIQUID

ANALYTE	CAS NO	RESULT µCi/mL	2σ TPU %	MDA µCi/mL	RDL µCi/mL	QUALIFIERS	TEST	PREP BATCH
Americium 241	14596-10-2	<1.3E-04		1.3E-04		U	AM	96001197

Lab sample id B5637-2
Dept sample id
Client sample id Method Blank
Material/Matrix LIQUID

ANALYTE	CAS NO	RESULT µCi/mL	2σ TPU %	MDA µCi/mL	RDL µCi/mL	QUALIFIERS	TEST	PREP BATCH
Neptunium 237	13994-20-2	<3.4E-04		3.4E-04		UL	NP	96001198

Lab sample id B5685-1
Dept sample id
Client sample id Method Blank
Material/Matrix LIQUID

ANALYTE	CAS NO	RESULT µCi/mL	2σ TPU %	MDA µCi/mL	RDL µCi/mL	QUALIFIERS	TEST	PREP BATCH
Selenium 79	15758-45-9	2.92E-07	15	2.9E-07		X	SE	96001260

Lab sample id B5688-2
Dept sample id
Client sample id Method Blank
Material/Matrix LIQUID

ANALYTE	CAS NO	RESULT µCi/mL	2σ TPU %	MDA µCi/mL	RDL µCi/mL	QUALIFIERS	TEST	PREP BATCH
Technetium 99	14133-76-7	<3.7E-04		3.7E-04		U	TC	96001263

WHC 222-S LABORATORY

TANK AP-104, GROUP 96000036

BLANKS

SDG 96000036
Contact G. L. Miller

Client 242-A Evaporator
Tank AP-104

WHC-SD-WM-DP-142, REV. 1

Lab sample id B5908-2
Dept sample id

Client sample id Method Blank
Material/Matrix LIQUID

ANALYTE	CAS NO	RESULT µCi/mL	2σ TPU %	MDA µCi/mL	RDL µCi/mL	QUALIFIERS	TEST	PREP BATCH
Total Alpha	12587-46-1	4.35E-06	92	5.1E-06		U	AB	96001530
Total Beta	12587-47-2	<3.6E-05		3.6E-05		U	AB	96001530

Lab sample id B5998-2
Dept sample id

Client sample id Method Blank
Material/Matrix LIQUID

ANALYTE	CAS NO	RESULT µCi/mL	2σ TPU %	MDA µCi/mL	RDL µCi/mL	QUALIFIERS	TEST	PREP BATCH
Strontium 90	10098-97-2	2.08E-04	100	2.8E-04		U	SR	96001628

Lab sample id B6495-2
Dept sample id

Client sample id DI Blank
Material/Matrix LIQUID

ANALYTE	CAS NO	RESULT µCi/mL	2σ TPU %	MDA µCi/mL	RDL µCi/mL	QUALIFIERS	TEST	PREP BATCH
Tritium	10028-17-8	5.49E-05	16	2.1E-05			H	96002180

SDG 96000036
Contact G. L. Miller

WHC 222-S LABORATORY

TANK AP-104, GROUP 96000036

LAB CONTROL SAMPLES

WHC-SD-WM-DP-142, REV. 1

Client 242-A Evaporator
Tank AP-104

Lab sample id S5579-1
Dept sample id _____

Client sample id Lab Control Sample
Material/Matrix _____ LIQUID

ANALYTE	RESULT µCi/mL	2σ TPU %	MDA µCi/mL	RDL µCi/mL	QUALIFIERS	TEST	ADDED µCi/mL	2σ ERR %	REC %	3σ LMTS (TOTAL)	LIMITS	PROTOCOL PREP BATCH
GEA Analytes												
Cobalt 60	2.58E-01	15				GEA	2.63E-1	5.0	98	77-123	92-111	96001135
Cesium 137	2.70E-01	15				GEA	2.72E-1	5.0	99	76-124	82-122	96001135

Lab sample id S5605-1
Dept sample id _____

Client sample id Lab Control Sample
Material/Matrix _____ LIQUID

ANALYTE	RESULT µCi/mL	2σ TPU %	MDA µCi/mL	RDL µCi/mL	QUALIFIERS	TEST	ADDED µCi/mL	2σ ERR %	REC %	3σ LMTS (TOTAL)	LIMITS	PROTOCOL PREP BATCH
Plutonium 239/240	1.25E 00	15	1.1E-01			PU	1.28E00	5.0	98	77-123	80-114	96001177

Lab sample id S5616-1
Dept sample id _____

Client sample id Lab Control Sample
Material/Matrix _____ LIQUID

ANALYTE	RESULT µCi/mL	2σ TPU %	MDA µCi/mL	RDL µCi/mL	QUALIFIERS	TEST	ADDED µCi/mL	2σ ERR %	REC %	3σ LMTS (TOTAL)	LIMITS	PROTOCOL PREP BATCH
Total Alpha	1.42E-04	15	6.8E-07			AB	1.66E-4	5.0	86	79-121	70-123	96001182
Total Beta	2.23E-03	15	3.3E-06			AB	2.36E-3	5.0	94	77-123	91-118	96001182

Final Report

LAB CONTROL SAMPLES
Page 1
SUMMARY DATA SECTION
Page 16

Lab id 222-S
Protocol CT
Version 1.0
Form DVD-LCS
Version 3.08
Report date 04/09/96

SDG 96000036
Contact G. L. Miller

WHC 222-S LABORATORY

TANK AP-104, GROUP 96000036

LAB CONTROL SAMPLES

WHC-SD-WM-DP-142, REV. 1

Client 242-A Evaporator
Tank AP-104

Lab sample id S5636-1
Dept sample id

Client sample id Lab Control Sample
Material/Matrix LIQUID

ANALYTE	RESULT µCi/mL	2σ TPU %	MDA µCi/mL	RDL µCi/mL	QUALIFIERS	TEST	ADDED µCi/mL	2σ ERR %	REC %	3σ LMTS (TOTAL)	LIMITS	PROTOCOL PREP BATCH
Americium 241	2.74E-01	15	3.3E-02			AM	3.07E-1	5.0	89	79-121	66-120	96001197

Lab sample id S5637-1
Dept sample id

Client sample id Lab Control Sample
Material/Matrix LIQUID

ANALYTE	RESULT µCi/mL	2σ TPU %	MDA µCi/mL	RDL µCi/mL	QUALIFIERS	TEST	ADDED µCi/mL	2σ ERR %	REC %	3σ LMTS (TOTAL)	LIMITS	PROTOCOL PREP BATCH
Neptunium 237	2.67E-01	15	3.4E-04			NP	3.85E-1	5.0	69	83-117	44-114	96001198

Lab sample id S5688-1
Dept sample id

Client sample id Lab Control Sample
Material/Matrix LIQUID

ANALYTE	RESULT µCi/mL	2σ TPU %	MDA µCi/mL	RDL µCi/mL	QUALIFIERS	TEST	ADDED µCi/mL	2σ ERR %	REC %	3σ LMTS (TOTAL)	LIMITS	PROTOCOL PREP BATCH
Technetium 99	4.07E-02	15	3.7E-04			TC	3.80E-2	5.0	107	75-125	76-122	96001263

Lab sample id S5998-1
Dept sample id

Client sample id Lab Control Sample
Material/Matrix LIQUID

ANALYTE	RESULT µCi/mL	2σ TPU %	MDA µCi/mL	RDL µCi/mL	QUALIFIERS	TEST	ADDED µCi/mL	2σ ERR %	REC %	3σ LMTS (TOTAL)	LIMITS	PROTOCOL PREP BATCH
Strontium 90	1.25E-02	15	2.7E-05			SR	1.23E-2	5.0	102	76-124	79-112	96001628

Final Report

Lab id 222-S
Protocol CT
Version 1.0
Form DVD-LCS
Version 3.08
Report date 04/09/96

WHC 222-S LABORATORY

TANK AP-104, GROUP 96000036

SDG 96000036
Contact G. L. Miller

LAB CONTROL SAMPLES

Client 242-A Evaporator
Tank AP-104

WHC-SD-WM-DP-162, REV. 1

Lab sample id S6495-1
Dept sample id

Client sample id Lab Control Sample
Material/Matrix LIQUID

ANALYTE	RESULT µCi/mL	2σ TPU %	MDA µCi/mL	RDL µCi/mL	QUALIFIERS	TEST	ADDED µCi/mL	2σ ERR %	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS	PREP BATCH
Tritium	8.29E-04	14	3.8E-06		B	H	7.81E-4	5.0	106	75-125	80-116	96002180

Final Report

LAB CONTROL SAMPLES
Page 3
SUMMARY DATA SECTION
Page 18

Lab id 222-S
Protocol CT
Version 1.0
Form DVD-LCS
Version 3.08
Report date 04/09/96

S96V000006T

WHC 222-S LABORATORY

TANK AP-104, GROUP 96000036

AP-104 4AP-96-1C

DUPLICATE

WHC-SD-WM-DP-142, REV. 1

SDG 96000036
Contact G. L. Miller

DUPLICATE	ORIGINAL	
Lab sample id S96V000006T	Lab sample id S96V000006S	Client sample id AP-104 4AP-96-1C
Dept sample id	Dept sample id	Location/Matrix LIQUID
	Received 01/24/96	Collected 01/23/96 13:30
		Chain of custody id

Client 242-A Evaporator
Tank AP-104

ANALYTE	DUPLICATE µCi/mL	2σ TPU %	MDA µCi/mL	RDL µCi/mL	QUALIFIERS	TEST	ORIGINAL µCi/mL	2σ TPU %	MDA µCi/mL	QUALIFIERS	RPD %	3σ TOT	PROJ LIMIT
Tritium	1.19E-03				B	H	1.23E-03			B	3	32	25

Final Report

DUPLICATES
Page 1
SUMMARY DATA SECTION
Page 19

Lab id 222-S
Protocol CT
Version 1.0
Form DVD-DUP
Version 3.08
Report date 04/09/96

S96V000009D

WHC 222-S LABORATORY

TANK AP-104, GROUP 96000036

DUPLICATE

AP-104 4AP-96-1C

WHC-SD-WM-DP-142, REV. 1

SDG 96000036
Contact G. L. Miller

DUPLICATE	ORIGINAL
Lab sample id S96V000009D	Lab sample id S96V000009
Dept sample id	Dept sample id
	Received

Client 242-A Evaporator
Tank AP-104

Client sample id AP-104 4AP-96-1C ACIDIG
Location/Matrix R: S: C: LIQUID
Collected
Chain of custody id n/a

ANALYTE	DUPLICATE µCi/mL	2σ TPU %	MDA µCi/mL	RDL µCi/mL	QUALIFIERS	TEST	ORIGINAL µCi/mL	2σ TPU %	MDA µCi/mL	QUALIFIERS	RPD %	3σ TOT	PROT LIMIT
Total Alpha	2.29E-04	74	1.5E-04			AB	2.36E-04	59	1.5E-04		3	146	129
Total Beta	6.23E 00	15	7.2E-04			AB	6.25E 00	15	7.2E-04		0	32	25
Selenium 79	5.73E-07	16	2.8E-07		BX	SE	4.23E-07	15	2.7E-07	BX	30	33	110
Technetium 99	5.46E-03	15	3.7E-04			TC	5.21E-03	15	3.7E-04		5	33	20
Strontium 90	9.94E-02	15	2.6E-04			SR	1.13E-01	15	2.8E-04		13	32	20
GEA Analytes													
Cobalt 60	<4.9E-04		4.9E-04		U	GEA	<4.9E-04		4.9E-04	U	-		
Niobium 94	<7.4E-04		7.4E-04		U	GEA	<7.4E-04		7.4E-04	U	-		
Ruthenium/Rh 106	<4.6E-02		4.6E-02		U	GEA	<4.6E-02		4.6E-02	U	-		
Cesium 134	<2.4E-03		2.4E-03		U	GEA	<2.4E-03		2.4E-03	U	-		
Cesium 137	6.19E 00	15	0.0E 00			GEA	6.15E 00	15	0.0E 00		1	32	25
Cerium/Pr 144	<3.0E-02		3.0E-02		U	GEA	<3.0E-02		3.0E-02	U	-		
Europium 154	<1.3E-03		1.3E-03		U	GEA	<1.3E-03		1.3E-03	U	-		
Europium 155	<8.2E-03		8.2E-03		U	GEA	<8.2E-03		8.2E-03	U	-		
Radium 226	<6.4E-02		6.4E-02		U	GEA	<6.4E-02		6.4E-02	U	-		

Final Report

DUPLICATES
Page 2
SUMMARY DATA SECTION
Page 20

Lab id 222-S
Protocol CT
Version 1.0
Form DVD-DUP
Version 3.08
Report date 04/09/96

S96V000009T

WHC 222-S LABORATORY

TANK AP-104, GROUP 96000036

DUPLICATE

AP-104 4AP-96-1C

WHC-SD-WM-DP-142, REV. 1

SDG 96000036
Contact G. L. Miller

DUPLICATE	ORIGINAL	
Lab sample id S96V000009T	Lab sample id S96V000009S	Client sample id AP-104 4AP-96-1C ACIDIG
Dept sample id	Dept sample id	Location/Matrix R: S: C: LIQUID
	Received	Collected
		Chain of custody id n/a

Client 242-A Evaporator
Tank AP-104

ANALYTE	DUPLICATE µCi/mL	2σ TPU %	MDA µCi/mL	RDL µCi/mL	QUALIFIERS	TEST	ORIGINAL µCi/mL	2σ TPU %	MDA µCi/mL	QUALIFIERS	RPD %	3σ TOT	PROT LIMIT
Strontium 90	1.24E-01					SR	1.26E-01				2	32	20

Final Report

DUPLICATES
Page 3
SUMMARY DATA SECTION
Page 21

Lab id 222-S
Protocol CT
Version 1.0
Form DVD-DUP
Version 3.08
Report date 04/09/96

WHC 222-S LABORATORY

TANK AP-104, GROUP 96000036

S96V000010D

DUPLICATE

AP-104 4AP-96-2C

WHC-SD-WM-DP-142, REV. 1

SDG 96000036
Contact G. L. Miller

DUPLICATE	ORIGINAL	
Lab sample id S96V000010D	Lab sample id S96V000010	Client sample id AP-104 4AP-96-2C ACIDIG
Dept sample id	Dept sample id	Location/Matrix R: S: C: LIQUID
	Received	Collected
		Chain of custody id n/a

Client 242-A Evaporator
Tank AP-104

ANALYTE	DUPLICATE µCi/mL	2σ TPU %	MDA µCi/mL	RDL µCi/mL	QUALIFIERS	TEST	ORIGINAL µCi/mL	2σ TPU %	MDA µCi/mL	QUALIFIERS	RPD %	3σ TOT	PROT LIMIT
Total Alpha	4.65E-04	43	1.5E-04			AB	4.51E-04	44	1.5E-04		3	94	66
Total Beta	3.98E 00	15	7.2E-04			AB	3.86E 00	15	7.2E-04		3	32	25
Neptunium 237	<3.4E-04		3.4E-04		UL	NP	<3.4E-04		3.4E-04	UL	-		
Americium 241	<1.4E-04		1.4E-04		U	AM	<1.5E-04		1.5E-04	U	-		
Plutonium 239/240	<3.6E-05		3.6E-05		U	PU	<3.6E-05		3.6E-05	U	-		
Plutonium 238	<3.6E-05		3.6E-05		U	PU	4.26E-05	17	3.6E-05		17	142	183

Final Report

DUPLICATES
Page 4
SUMMARY DATA SECTION
Page 22

Lab id 222-S
Protocol CT
Version 1.0
Form DVD-DUP
Version 3.08
Report date 04/09/96

S96V000010T

WHC 222-S LABORATORY

TANK AP-104, GROUP 96000036

DUPLICATE

WHC-SD-WM-DP-112, REV. 1

AP-104 4AP-96-2C

SDG 96000036
Contact G. L. Miller

DUPLICATE	ORIGINAL	
Lab sample id S96V000010T	Lab sample id S96V000010S	Client sample id AP-104 4AP-96-2C ACIDIG
Dept sample id	Dept sample id	Location/Matrix R: S: C: LIQUID
	Received	Collected
		Chain of custody id n/a

Client 242-A Evaporator
Tank AP-104

ANALYTE	DUPLICATE µCi/mL	2σ TPU %	MDA µCi/mL	RDL µCi/mL	QUALIFIERS	TEST	ORIGINAL µCi/mL	2σ TPU %	MDA µCi/mL	QUALIFIERS	RPD %	3σ TOT	PROT LIMIT
Neptunium 237	2.80E-01				L	NP	2.79E-01			L	0	32	20
Americium 241	2.56E-01					AM	2.68E-01				5	32	20
Plutonium 239/240	1.36E 00					PU	1.22E 00				11	32	25

Final Report

DUPLICATES
Page 5
SUMMARY DATA SECTION
Page 23

Lab id 222-S
Protocol CT
Version 1.0
Form DVD-DUP
Version 3.08
Report date 04/09/96

S96V000011D

WHC 222-S LABORATORY

TANK AP-104, GROUP 96000036

DUPLICATE

WHC-SD-WM-DP-142, REV. 1

AP-104 4AP-96-3C

SDG 96000036
Contact G. L. Miller

DUPLICATE	ORIGINAL	
Lab sample id S96V000011D	Lab sample id S96V000011	Client sample id AP-104 4AP-96-3C ACIDIG
Dept sample id	Dept sample id	Location/Matrix R: S: C: LIQUID
	Received	Collected
		Chain of custody id n/a

Client 242-A Evaporator
Tank AP-104

ANALYTE	DUPLICATE µCi/mL	2σ TPU %	MDA µCi/mL	RDL µCi/mL	QUALIFIERS	TEST	ORIGINAL µCi/mL	2σ TPU %	MDA µCi/mL	QUALIFIERS	RPD %	3σ TOT	PROT LIMIT
Total Alpha	3.40E-04	91	1.5E-04			AB	3.61E-04	47	1.5E-04		6	153	86
Total Beta	3.97E 00	15	7.2E-04			AB	4.00E 00	15	7.2E-04		1	32	25

Lab id 222-S
Protocol CT
Version 1.0
Form DVD-DUP
Version 3.08
Report date 04/09/96

S96V000013D

WHC 222-S LABORATORY

TANK AP-104, GROUP 96000036

DUPLICATE

AP-104 4AP-96-4

WHC-SD-WM-DP-142, REV. 1

SDG 96000036
Contact G. L. Miller

DUPLICATE	ORIGINAL	
Lab sample id S96V000013D	Lab sample id S96V000013	Client sample id AP-104 4AP-96-4 ACIDIG
Dept sample id	Dept sample id	Location/Matrix LIQUID
	Received	Collected
		Chain of custody id

Client 242-A Evaporator
Tank AP-104

ANALYTE	DUPLICATE µCi/mL	2σ TPU %	MDA µCi/mL	RDL µCi/mL	QUALIFIERS	TEST	ORIGINAL µCi/mL	2σ TPU %	MDA µCi/mL	QUALIFIERS	RPD %	3σ TOT	PROT LIMIT
Total Alpha	2.36E-04	59	1.5E-04			AB	3.05E-04	56	1.5E-04		26	122	111
Total Beta	3.79E 00	15	7.2E-04			AB	3.75E 00	15	7.2E-04		1	32	25

Final Report

DUPLICATES
Page 7
SUMMARY DATA SECTION
Page 25

Lab id 222-S
Protocol CT
Version 1.0
Form DVD-DUP
Version 3.08
Report date 04/09/96

S96V000015D

WHC 222-S LABORATORY

TANK AP-104, GROUP 96000036

DUPLICATE

WHC-SD-WM-DP-142, REV. 1

AP-104 4AP-96-1B1

SDG 96000036
Contact G. L. Miller

DUPLICATE
Lab sample id S96V000015D
Dept sample id _____

ORIGINAL
Lab sample id S96V000015
Dept sample id _____
Received _____

Client 242-A Evaporator
Tank AP-104

Client sample id AP-104 4AP-96-1B1 ACIDIG
Location/Matrix R: S: C: LIQUID
Collected _____
Chain of custody id n/a

ANALYTE	DUPLICATE µCi/mL	2σ TPU %	MDA µCi/mL	RDL µCi/mL	QUALI-FIERS	TEST	ORIGINAL µCi/mL	2σ TPU %	MDA µCi/mL	QUALI-FIERS	RPD %	3σ PROT TOT	3σ PROT LIMIT
Total Alpha	<5.1E-06		5.1E-06		U	AB	<5.1E-06		5.1E-06	U	-		
Total Beta	4.07E-04	17	3.6E-05			AB	<3.6E-05		3.6E-05	U	168	53	33

Final Report

DUPLICATES
Page 8
SUMMARY DATA SECTION
Page 26

Lab id 222-S
Protocol CT
Version 1.0
Form DVD-DUP
Version 3.08
Report date 04/09/96

S96V000006S

WHC 222-S LABORATORY

TANK AP-104, GROUP 96000036

MATRIX SPIKE

WHC-SD-WM-DP-142, REV 1

AP-104 4AP-96-1C

SDG 96000036
Contact G. L. Miller

MATRIX SPIKE
Lab sample id S96V000006S
Dept sample id _____

ORIGINAL
Lab sample id S96V000006
Dept sample id _____
Received 01/24/96

Client 242-A Evaporator
Tank AP-104

Client sample id AP-104 4AP-96-1C
Location/Matrix _____ LIQUID
Collected 01/23/96 13:30
Chain of custody id _____

ANALYTE	SPIKE µCi/mL	2σ TPU %	MDA µCi/mL	RDL µCi/mL	QUALIFIERS	TEST	ADDED µCi/mL	2σ ERR %	ORIGINAL µCi/mL	2σ TPU %	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	1.23E-03				B	H	7.81E-4	5.0	3.27E-04	15	116	63-137	70-130

Final Report

MATRIX SPIKES
Page 1
SUMMARY DATA SECTION
Page 27

Lab id 222-S
Protocol CT
Version 1.0
Form DVD-MS
Version 3.08
Report date 04/09/96

S96V000009S

WHC 222-S LABORATORY

TANK AP-104, GROUP 96000036

MATRIX SPIKE

WHC-SD-WM-DP-142, REV. 1

AP-104 4AP-96-1C

SDG 96000036
Contact G. L. Miller

MATRIX SPIKE	ORIGINAL	
Lab sample id S96V000009S	Lab sample id S96V000009	Client sample id AP-104 4AP-96-1C ACIDIG
Dept sample id	Dept sample id	Location/Matrix R: S: C: LIQUID
	Received	Collected
		Chain of custody id n/a

Client 242-A Evaporator
Tank AP-104

ANALYTE	SPIKE µCi/mL	2σ TPU %	MDA µCi/mL	RDL µCi/mL	QUALIFIERS	TEST	ADDED µCi/mL	2σ ERR %	ORIGINAL µCi/mL	2σ TPU %	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Technetium 99	4.72E-02					TC	3.80E-2	5.0	5.21E-03	15	110	71-129	75-125
Strontium 90	1.26E-01					SR	1.23E-2	5.0	1.13E-01	15	106		

Final Report

MATRIX SPIKES
Page 2
SUMMARY DATA SECTION
Page 28

Lab id 222-S
Protocol CT
Version 1.0
Form DVD-MS
Version 3.08
Report date 04/09/96

S96V000010S

WHC 222-S LABORATORY

TANK AP-104, GROUP 96000036

AP-104 4AP-96-2C

MATRIX SPIKE

WHC-SD-WM-DP-142, REV/

SDG 96000036
Contact G. L. Miller

MATRIX SPIKE
Lab sample id S96V000010S
Dept sample id

ORIGINAL
Lab sample id S96V000010
Dept sample id
Received

Client 242-A Evaporator
Tank AP-104
Client sample id AP-104 4AP-96-2C ACIDIG
Location/Matrix R: S: C: LIQUID
Collected
Chain of custody id n/a

ANALYTE	SPIKE µCi/mL	2σ TPU %	MDA µCi/mL	RDL µCi/mL	QUALIFIERS	TEST	ADDED µCi/mL	2σ ERR %	ORIGINAL µCi/mL	2σ TPU %	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Total Alpha						AB			4.51E-04	42			
Total Beta	5.51E 00					AB	1.69E00	5.0	3.86E 00	15	98	10-190	70-130
Neptunium 237	2.79E-01				L	NP	3.85E-1	5.0			72	82-118	70-130
Americium 241	2.68E-01					AM	3.07E-1	5.0			87	79-121	70-130
Plutonium 239/240	1.22E 00					PU	1.28E00	5.0			95	77-123	70-130
Plutonium 238						PU			4.26E-05	17			

Final Report

MATRIX SPIKES
Page 3
SUMMARY DATA SECTION
Page 29

Lab id 222-S
Protocol CT
Version 1.0
Form DVD-MS
Version 3.08
Report date 04/09/96

S96V000006T

WHC 222-S LABORATORY

TANK AP-104, GROUP 96000036

AP-104 4AP-96-1C

DUPLICATE SPIKE

WHC-SD-WM-DP-142, REV. 1

SDG 96000036
Contact G. L. Miller

MATRIX SPIKE	ORIGINAL	
Lab sample id S96V000006T	Lab sample id S96V000006	Client sample id AP-104 4AP-96-1C
Dept sample id	Dept sample id	Location/Matrix LIQUID
	Received 01/24/96	Collected 01/23/96 13:30
		Chain of custody id

Client 242-A Evaporator
Tank AP-104

ANALYTE	SPIKE µCi/mL	2σ TPU %	MDA µCi/mL	RDL µCi/mL	QUALIFIERS	TEST	ADDED µCi/mL	2σ ERR %	ORIGINAL µCi/mL	2σ TPU %	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	1.19E-03				B	H	7.81E-4	5.0	3.27E-04	15	110	64-136	70-130

Final Report

DUPLICATE SPIKES
Page 1
SUMMARY DATA SECTION
Page 30

Lab id 222-S
Protocol CT
Version 1.0
Form DVD-MS
Version 3.08
Report date 04/09/96

S96V000009T

WHC 222-S LABORATORY

TANK AP-104, GROUP 96000036

DUPLICATE SPIKE

WHC-SD-WM-DP-142, REV. 1

AP-104 4AP-96-1C

SDG 96000036
Contact G. L. Miller

MATRIX SPIKE
Lab sample id S96V000009T
Dept sample id _____

ORIGINAL
Lab sample id S96V000009
Dept sample id _____
Received _____

Client 242-A Evaporator
Tank AP-104
Client sample id AP-104 4AP-96-1C ACIDIG
Location/Matrix R: S: C: LIQUID
Collected _____
Chain of custody id n/a

ANALYTE	SPIKE µCi/mL	2σ TPU %	MDA µCi/mL	RDL µCi/mL	QUALI-FIERS	TEST	ADDED µCi/mL	2σ ERR %	ORIGINAL µCi/mL	2σ TPU %	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Strontium 90	1.24E-01					SR	1.23E-2	5.0	1.13E-01	15	89		

Final Report

DUPLICATE SPIKES
Page 2
SUMMARY DATA SECTION
Page 31

Lab id 222-S
Protocol CT
Version 1.0
Form DVD-MS
Version 3.08
Report date 04/09/96

S96V000010T

WHC 222-S LABORATORY

TANK AP-104, GROUP 96000036

DUPLICATE SPIKE

AP-104 4AP-96-2C

WHC-SD-WM-DP-142, REV. 1

SDG 96000036
Contact G. L. Miller

Client 242-A Evaporator
Tank AP-104

MATRIX SPIKE	ORIGINAL		
Lab sample id S96V000010T	Lab sample id S96V000010	Client sample id AP-104 4AP-96-2C	ACIDIG
Dept sample id	Dept sample id	Location/Matrix R: S: C:	LIQUID
	Received	Collected	
		Chain of custody id n/a	

ANALYTE	SPIKE µCi/mL	2σ TPU %	MDA µCi/mL	RDL µCi/mL	QUALIFIERS	TEST	ADDED µCi/mL	2σ ERR %	ORIGINAL µCi/mL	2σ TPU %	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Americium 241	2.56E-01					AM	3.07E-1	5.0			83	80-120	70-130

Final Report

DUPLICATE SPIKES
Page 3
SUMMARY DATA SECTION
Page 32

Lab id 222-S
Protocol CT
Version 1.0
Form DVD-MS
Version 3.08
Report date 04/09/96

WHC 222-S LABORATORY

S96V000006	TANK AP-104, GROUP 96000036 **DATA SHEET**	AP-104 4AP-96-1C

WHC-SD-WM-DP-142, REV. 1

SDG	96000036	Client	242-A Evaporator
Contact	G. L. Miller	Tank	AP-104
Lab sample id	S96V000006	Client sample id	AP-104 4AP-96-1C
Dept sample id		Location/Matrix	LIQUID
Received	01/24/96	Collected	01/23/96 13:30
		Chain of custody id	

ANALYTE	CAS NO	RESULT µCi/mL	2σ TPU %	MDA µCi/mL	RDL µCi/mL	QUALI-FIERS	TEST
Tritium	10028-17-8	3.27E-04	15	2.2E-05		B	H

Final Report

DATA SHEETS
Page 1
SUMMARY DATA SECTION
Page 33

Lab id	222-S
Protocol	CT
Version	1.0
Form	DVD-DS
Version	3.08
Report date	04/09/96

WHC 222-S LABORATORY

S96V000013

TANK AP-104, GROUP 96000036

DATA SHEET

AP-104 4AP-96-4

WHC-SD-WM-DP-142, REV. 1

SDG 96000036 Client 242-A Evaporator
Contact G. L. Miller Tank AP-104

Lab sample id S96V000013 Client sample id AP-104 4AP-96-4 ACIDIG
Dept sample id _____ Location/Matrix _____ LIQUID
Received _____ Collected _____
Chain of custody id _____

ANALYTE	CAS NO	RESULT µCi/mL	2σ TPU %	MDA µCi/mL	RDL µCi/mL	QUALIFIERS	TEST
Total Alpha	12587-46-1	3.05E-04	56	1.5E-04			AB
Total Beta	12587-47-2	3.75E 00	15	7.2E-04			AB

Final Report

DATA SHEETS
Page 2
SUMMARY DATA SECTION
Page 34

Lab id 222-S
Protocol CT
Version 1.0
Form DVD-DS
Version 3.08
Report date 04/09/96

WHC 222-S LABORATORY

TANK AP-104, GROUP 96000036

S96V000009

AP-104 4AP-96-1C

DATA SHEET

WHC-SD-WM-DP-142, REV. 1

SDG 96000036 Client 242-A Evaporator

Contact G. L. Miller Tank AP-104

Lab sample id S96V000009 Client sample id AP-104 4AP-96-1C ACIDIG

Dept sample id _____ Location/Matrix R: S: C: LIQUID

Received _____ Collected _____

Chain of custody id n/a

ANALYTE	CAS NO	RESULT µCi/mL	2σ TPU %	MDA µCi/mL	RDL µCi/mL	QUALIFIERS	TEST
Total Alpha	12587-46-1	2.36E-04	59	1.5E-04			AB
Total Beta	12587-47-2	6.25E 00	15	7.2E-04			AB
Selenium 79	15758-45-9	4.23E-07	15	2.7E-07		BX	SE
Technetium 99	14133-76-7	5.21E-03	15	3.7E-04			TC
Strontium 90	10098-97-2	1.13E-01	15	2.8E-04			SR
Neptunium 237	13994-20-2	2.02E-04	99	3.4E-04		UL	NP
Americium 241	14596-10-2	<1.5E-04		1.5E-04		U	AM
Plutonium 239/240		<3.7E-05		3.7E-05		U	PU
Plutonium 238	13981-16-3	<3.7E-05		3.7E-05		U	PU
GEA Analytes							
Cobalt 60	10198-40-0	<4.9E-04		4.9E-04		U	GEA
Niobium 94	14681-63-1	<7.4E-04		7.4E-04		U	GEA
Ruthenium/Rh 106		<4.6E-02		4.6E-02		U	GEA
Cesium 134	13967-70-9	<2.4E-03		2.4E-03		U	GEA
Cesium 137	10045-97-3	6.15E 00	15	0.0E 00			GEA
Cerium/Pr 144		<3.0E-02		3.0E-02		U	GEA
Europium 154	15585-10-1	<1.3E-03		1.3E-03		U	GEA
Europium 155	14391-16-3	<8.2E-03		8.2E-03		U	GEA
Radium 226	13982-63-3	<6.4E-02		6.4E-02		U	GEA

WHC 222-S LABORATORY

TANK AP-104, GROUP 96000036

S96V000010

DATA SHEET

WHC-SD-WM-DP-142, REV. 1

AP-104 4AP-96-2C

SDG 96000036 Client 242-A Evaporator

Contact G. L. Miller Tank AP-104

Lab sample id S96V000010 Client sample id AP-104 4AP-96-2C ACIDIG

Dept sample id _____ Location/Matrix R: S: C: LIQUID

Received _____ Collected _____

Chain of custody id n/a

ANALYTE	CAS NO	RESULT µCi/mL	2σ TPU %	MDA µCi/mL	RDL µCi/mL	QUALIFIERS	TEST
Total Alpha	12587-46-1	4.51E-04	44	1.5E-04			AB
Total Beta	12587-47-2	3.86E 00	15	7.2E-04			AB
Selenium 79	15758-45-9	3.37E-07	15	3.4E-07		UX	SE
Technetium 99	14133-76-7	7.24E-04	17	4.1E-04			TC
Strontium 90	10098-97-2	7.81E-02	15	2.6E-04			SR
Neptunium 237	13994-20-2	<3.4E-04		3.4E-04		UL	NP
Americium 241	14596-10-2	<1.5E-04		1.5E-04		U	AM
Plutonium 239/240		<3.6E-05		3.6E-05		U	PU
Plutonium 238	13981-16-3	4.26E-05	17	3.6E-05			PU
GEA Analytes							
Cobalt 60	10198-40-0	<3.2E-04		3.2E-04		U	GEA
Niobium 94	14681-63-1	<5.1E-04		5.1E-04		U	GEA
Ruthenium/Rh 106		<3.6E-02		3.6E-02		U	GEA
Cesium 134	13967-70-9	1.83E-03	31	0.0E 00			GEA
Cesium 137	10045-97-3	3.67E 00	15	0.0E 00			GEA
Cerium/Pr 144		<2.4E-02		2.4E-02		U	GEA
Europium 154	15585-10-1	<9.6E-04		9.6E-04		U	GEA
Europium 155	14391-16-3	<6.4E-03		6.4E-03		U	GEA
Radium 226	13982-63-3	<4.9E-02		4.9E-02		U	GEA

Lab id 222-S
Protocol CT
Version 1.0
Form DVD-DS
Version 3.08
Report date 04/09/96

WHC 222-S LABORATORY

TANK AP-104, GROUP 96000036

S96V000011

AP-104 4AP-96-3C

DATA SHEET

WHC-SD-WM-DP-142, REV. 1

SDG 96000036 Client 242-A Evaporator

Contact G. L. Miller Tank AP-104

Lab sample id S96V000011 Client sample id AP-104 4AP-96-3C ACIDIG

Dept sample id Location/Matrix R: S: C: LIQUID

Received Collected

Chain of custody id n/a

ANALYTE	CAS NO	RESULT µCi/mL	2σ TPU %	MDA µCi/mL	RDL µCi/mL	QUALIFIERS	TEST
Total Alpha	12587-46-1	3.61E-04	47	1.5E-04			AB
Total Beta	12587-47-2	4.00E 00	15	7.2E-04			AB
Selenium 79	15758-45-9	2.83E-73	>1000	2.8E-07		UX	SE
Technetium 99	14133-76-7	2.76E-03	16	4.1E-04			TC
Strontium 90	10098-97-2	4.05E-02	15	2.6E-04			SR
Neptunium 237	13994-20-2	1.87E-04	110	3.4E-04		UL	NP
Americium 241	14596-10-2	<1.5E-04		1.5E-04		U	AM
Plutonium 239/240		<3.3E-05		3.3E-05		U	PU
Plutonium 238	13981-16-3	<3.3E-05		3.3E-05		U	PU
GEA Analytes							
Cobalt 60	10198-40-0	<5.0E-04		5.0E-04		U	GEA
Niobium 94	14681-63-1	<5.1E-04		5.1E-04		U	GEA
Ruthenium/Rh 106		<3.7E-02		3.7E-02		U	GEA
Cesium 134	13967-70-9	6.58E-03	18	0.0E 00			GEA
Cesium 137	10045-97-3	3.88E 00	15	0.0E 00			GEA
Cerium/Pr 144		<2.4E-02		2.4E-02		U	GEA
Europium 154	15585-10-1	<1.2E-03		1.2E-03		U	GEA
Europium 155	14391-16-3	<6.5E-03		6.5E-03		U	GEA
Radium 226	13982-63-3	<5.1E-02		5.1E-02		U	GEA

Final Report

DATA SHEETS
Page 5
SUMMARY DATA SECTION
Page 37

Lab id 222-S
Protocol CT
Version 1.0
Form DVD-DS
Version 3.08
Report date 04/09/96

WHC 222-S LABORATORY

TANK AP-104, GROUP 96000036

S96V000015

AP-104 4AP-96-IB1

DATA SHEET

WHC-SD-WM-DP-142, REV. 1

SDG 96000036 Client 242-A Evaporator
Contact G. L. Miller Tank AP-104

Lab sample id S96V000015 Client sample id AP-104 4AP-96-IB1 ACIDIG
Dept sample id _____ Location/Matrix R: S: C: LIQUID
Received _____ Collected _____
Chain of custody id n/a

ANALYTE	CAS NO	RESULT µCi/mL	2σ TPU %	MDA µCi/mL	RDL µCi/mL	QUALI-FIERS	TEST
Total Alpha	12587-46-1	<5.1E-06		5.1E-06		U	AB
Total Beta	12587-47-2	<3.6E-05		3.6E-05		U	AB
Selenium 79	15758-45-9	3.31E-07	16	3.3E-07		BX	SE
Technetium 99	14133-76-7	<4.1E-04		4.1E-04		U	TC
Strontium 90	10098-97-2	<1.1E-04		1.1E-04		U	SR
Neptunium 237	13994-20-2	1.87E-04	110	3.4E-04		UL	NP
Americium 241	14596-10-2	<1.3E-04		1.3E-04		U	AM
Plutonium 239/240		<3.7E-05		3.7E-05		U	PU
Plutonium 238	13981-16-3	<3.7E-05		3.7E-05		U	PU
GEA Analytes							
Cobalt 60	10198-40-0	<1.8E-04		1.8E-04		U	GEA
Niobium 94	14681-63-1	<2.3E-04		2.3E-04		U	GEA
Ruthenium/Rh 106		<4.3E-03		4.3E-03		U	GEA
Cesium 134	13967-70-9	<2.5E-04		2.5E-04		U	GEA
Cesium 137	10045-97-3	<6.0E-04		6.0E-04		U	GEA
Cerium/Pr 144		<2.0E-03		2.0E-03		U	GEA
Europium 154	15585-10-1	<8.1E-04		8.1E-04		U	GEA
Europium 155	14391-16-3	<6.3E-04		6.3E-04		U	GEA
Radium 226	13982-63-3	<4.6E-03		4.6E-03		U	GEA

Final Report

DATA SHEETS
Page 6
SUMMARY DATA SECTION
Page 38

Lab id 222-S
Protocol CT
Version 1.0
Form DVD-DS
Version 3.08
Report date 04/09/96

Test NP Matrix LIQUID
SDG 96000036
Contact G. L. Miller

WHC 222-S LABORATORY

TANK AP-104, GROUP 96000036

METHOD SUMMARY

NEPTUNIUM-237
ALPHA PROPORTIONAL COUNTER

Client 242-A Evaporator
Tank AP-104

WHC-SD-WM-DP-147, REV. 1

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Neptunium 237
Preparation batch 96001198					
AP-104 4AP-96-1C ACIDIG	S96V000009			5637-3	U
AP-104 4AP-96-2C ACIDIG	S96V000010			5637-4	U
AP-104 4AP-96-2C-DUP ACI	S96V000010D			5637-5	- U
AP-104 4AP-96-2C-SPK ACI	S96V000010S			5637-6	LOW
AP-104 4AP-96-3C ACIDIG	S96V000011			5637-8	U
AP-104 4AP-96-IB1 ACIDIG	S96V000015			5637-9	U
Method Blank	B5637-2			5637-2	U
Lab Control Sample	S5637-1			5637-1	LOW
Dup Spike (S96V000010S)	S96V000010T			5637-7	LOW
Nominal values and limits from method				RDLs (µCi/mL)	

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MDA µCi/mL	ALIQ ml	PREP FAC	DILU- TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL- YZED	DETECTOR
Preparation batch 96001198	2σ prep error 15.0 %		Reference													
AP-104 4AP-96-1C ACIDIG	S96V000009			3.4E-04	0.250	10.0	1.00		50	30				02/07/96	02/15	AL10540
AP-104 4AP-96-2C ACIDIG	S96V000010			3.4E-04	0.250	10.0	1.00		50	30				02/07/96	02/15	AL10540
AP-104 4AP-96-2C-DUP ACI	S96V000010D			3.4E-04	0.250	10.0	1.00		50	30				02/07/96	02/15	AL10540
AP-104 4AP-96-2C-SPK ACI	S96V000010S				0.250	10.0	1.00		50					02/07/96	02/15	AL10540
AP-104 4AP-96-3C ACIDIG	S96V000011			3.4E-04	0.250	10.0	1.00		50	30				02/07/96	02/15	AL10540
AP-104 4AP-96-IB1 ACIDIG	S96V000015			3.4E-04	0.250	10.0	1.00		50	30				02/07/96	02/15	AL10540
Method Blank	B5637-2			3.4E-04	0.250	10.0	1.00		50	30					02/15/96	AL10540
Lab Control Sample	S5637-1			3.4E-04	0.250	10.0	1.00		50	30					02/15/96	AL10540
Dup Spike (S96V000010S)	S96V000010T				0.250	10.0	1.00		50					02/07/96	02/15	AL10540
Nominal values and limits from method					0.100				20-55	30						

Final Report

METHOD SUMMARIES
Page 1
SUMMARY DATA SECTION
Page 39

Lab id 222-S
Protocol CT
Version 1.0
Form DVD-CMS
Version 3.08
Report date 04/09/96

WHC 222-S LABORATORY

TANK AP-104, GROUP 96000036

Test NP Matrix LIQUID
SDG 96000036
Contact G. L. Miller

METHOD SUMMARY, cont.

NEPTUNIUM-237
ALPHA PROPORTIONAL COUNTER

Client 242-A Evaporator
Tank AP-104

WHC-SD-WM-DP-142, REV. 1

PROCEDURES	REFERENCE	222-S Lab Analytical Procedure
	LO-160-103	Core Segment Extrusion Process and Sample Preparation, rev 17
	LA-505-158	Acid Digestion of Aqueous Samples and Extracts for Total Metals for Analysis by FLAA or ICP Spectroscopy

AVERAGES ± 2 SD FOR 9 SAMPLES
MDA 3.4E-04 ± 0.0E 00
EFFICIENCY 50 ± 0

Final Report

METHOD SUMMARIES
Page 2
SUMMARY DATA SECTION
Page 40

Lab id 222-S
Protocol CT
Version 1.0
Form DVD-CMS
Version 3.08
Report date 04/09/96

WHC 222-S LABORATORY

TANK AP-104, GROUP 96000036

Test AM Matrix LIQUID
SDG 96000036
Contact G. L. Miller

METHOD SUMMARY

AMERICIUM-241
ALPHA SPECTROSCOPY

Client 242-A Evaporator
Tank AP-104

WHC-SD-WM-DP-142, REV. 1

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Americium 241	
Preparation batch 96001197						
AP-104 4AP-96-1C ACIDIG	S96V000009			5636-3	U	
AP-104 4AP-96-2C ACIDIG	S96V000010			5636-4	U	
AP-104 4AP-96-2C-DUP ACI	S96V000010D			5636-5	-	U
AP-104 4AP-96-2C-SPK ACI	S96V000010S			5636-6	ok	
AP-104 4AP-96-3C ACIDIG	S96V000011			5636-8	U	
AP-104 4AP-96-IB1 ACIDIG	S96V000015			5636-9	U	
Method Blank	B5636-2			5636-2	U	
Lab Control Sample	S5636-1			5636-1	ok	
Dup Spike (S96V000010S)	S96V000010T			5636-7	ok	
Nominal values and limits from method				RDLs (µCi/mL)		

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MDA µCi/mL	ALIQ ml	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL- YZED	DETECTOR
Preparation batch 96001197	2σ prep error 15.0 %	Reference														
AP-104 4AP-96-1C ACIDIG	S96V000009			1.5E-04	1.00	10.0	1.00	70	50	30				02/07/96	02/15	AL105413
AP-104 4AP-96-2C ACIDIG	S96V000010			1.5E-04	1.00	10.0	1.00	67	50	30				02/07/96	02/15	AL105402
AP-104 4AP-96-2C-DUP ACI	S96V000010D			1.4E-04	1.00	10.0	1.00	72	50	30				02/07/96	02/15	AL105413
AP-104 4AP-96-2C-SPK ACI	S96V000010S				1.00	10.0	1.00			480				02/07/96	02/15	AL10540
AP-104 4AP-96-3C ACIDIG	S96V000011			1.5E-04	1.00	10.0	1.00	66	50	30				02/07/96	02/15	AL105391
AP-104 4AP-96-IB1 ACIDIG	S96V000015			1.3E-04	1.00	10.0	1.00	80	50	30				02/07/96	02/15	AL105413
Method Blank	B5636-2			1.3E-04	1.00	10.0	1.00	74	50	30					02/15/96	AL105402
Lab Control Sample	S5636-1			3.3E-02	1.00	10.0	101	75	50	30					02/15/96	AL105391
Dup Spike (S96V000010S)	S96V000010T				1.00	10.0	1.00			480				02/07/96	02/15	AL10541
Nominal values and limits from method					0.100			30-105 20-55		30						

Final Report

METHOD SUMMARIES
Page 3
SUMMARY DATA SECTION
Page 41

Lab id 222-S
Protocol CT
Version 1.0
Form DVD-CMS
Version 3.08
Report date 04/09/96

WHC 222-S LABORATORY

TANK AP-104, GROUP 96000036

METHOD SUMMARY, cont.

AMERICIUM-241

ALPHA SPECTROSCOPY

Test AM Matrix LIQUID
SDG 96000036
Contact G. L. Miller

Client 242-A Evaporator
Tank AP-104

WHC-SD-WM-DP-162, REV. C

PROCEDURES	REFERENCE	222-S Lab Analytical Procedure
	TRACER	Americium 243
	LO-160-103	Core Segment Extrusion Process and Sample Preparation, rev 17
	LA-505-158	Acid Digestion of Aqueous Samples and Extracts for Total Metals for Analysis by FLAA or ICP Spectroscopy

AVERAGES ± 2 SD FOR 7 SAMPLES	MDA	4.8E-03 ± 2.5E-02
	YIELD	72 ± 10
	EFFICIENCY	50 ± 0

Lab id 222-S
Protocol CT
Version 1.0
Form DVD-CMS
Version 3.08
Report date 04/09/96

WHC 222-S LABORATORY

TANK AP-104, GROUP 96000036

Test PU Matrix LIQUID
SDG 96000036
Contact G. L. Miller

METHOD SUMMARY

PLUTONIUM-239
ALPHA SPECTROSCOPY

Client 242-A Evaporator
Tank AP-104

WHC-SD-WM-DP-162 REV. 1

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Plutonium 239/240		Plutonium 238	
Preparation batch 96001177								
AP-104 4AP-96-1C ACIDIG	S96V000009			5605-3	U		U	
AP-104 4AP-96-2C ACIDIG	S96V000010			5605-4	U		4.26E-05	
AP-104 4AP-96-2C-DUP ACI	S96V000010D			5605-5	-	U	ok	U
AP-104 4AP-96-2C-SPK ACI	S96V000010S			5605-6	ok		No data	
AP-104 4AP-96-3C ACIDIG	S96V000011			5605-8	U		U	
AP-104 4AP-96-1B1 ACIDIG	S96V000015			5605-9	U		U	
Method Blank	B5605-2			5605-2	U		U	
Lab Control Sample	S5605-1			5605-1	ok			
Dup Spike (S96V000010S)	S96V000010T			5605-7	ok			
Nominal values and limits from method				RDLs (µCi/mL)				

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MAX MDA µCi/mL	ALIQ ml	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL- YZED	DETECTOR
Preparation batch 96001177	2σ prep error 15.0 %		Reference													
AP-104 4AP-96-1C ACIDIG	S96V000009			3.7E-05	1.00	10.0	1.00	93	50	30				02/07/96	02/14	AL105413
AP-104 4AP-96-2C ACIDIG	S96V000010			3.6E-05	1.00	10.0	1.00	96	50	30				02/07/96	02/14	AL105391
AP-104 4AP-96-2C-DUP ACI	S96V000010D			3.6E-05	1.00	10.0	1.00	96	50	30				02/07/96	02/14	AL105402
AP-104 4AP-96-2C-SPK ACI	S96V000010S				1.00	10.0	101			480				02/07/96	02/14	AL10541
AP-104 4AP-96-3C ACIDIG	S96V000011			3.3E-05	1.00	10.0	1.00	103	50	30				02/07/96	02/14	AL105402
AP-104 4AP-96-1B1 ACIDIG	S96V000015			3.7E-05	1.00	10.0	1.00	92	50	30				02/07/96	02/14	AL105413
Method Blank	B5605-2			4.4E-05	1.00	10.0	1.00	86	50	30				02/14/96		AL105402
Lab Control Sample	S5605-1			1.1E-01	0.100	10.0	101	80	50	30				02/14/96		AL105391
Dup Spike (S96V000010S)	S96V000010T				1.00	10.0	101			480				02/07/96	02/14	AL10539
Nominal values and limits from method					0.100			30-105 20-55		30						

Final Report

METHOD SUMMARIES
Page 5
SUMMARY DATA SECTION
Page 43

Lab id 222-S
Protocol CT
Version 1.0
Form DVD-CMS
Version 3.08
Report date 04/09/96

WHC 222-S LABORATORY

TANK AP-104, GROUP 96000036

Test PU Matrix LIQUID
SDG 96000036
Contact G. L. Miller

METHOD SUMMARY, cont.

PLUTONIUM-239
ALPHA SPECTROSCOPY

Client 242-A Evaporator
Tank AP-104

WHC-SD-WM-DP-162, REV. 1

PROCEDURES	REFERENCE	222-S Lab Analytical Procedure
	TRACER	Plutonium 236
	LO-160-103	Core Segment Extrusion Process and Sample Preparation, rev 17
	LA-505-158	Acid Digestion of Aqueous Samples and Extracts for Total Metals for Analysis by FLAA or ICP Spectroscopy

AVERAGES ± 2 SD FOR 7 SAMPLES	MDA	1.6E-02 ± 8.3E-02
	YIELD	92 ± 15
	EFFICIENCY	50 ± 0

Final Report

METHOD SUMMARIES
Page 6
SUMMARY DATA SECTION
Page 44

Lab id 222-S
Protocol CT
Version 1.0
Form DVD-CMS
Version 3.08
Report date 04/09/96

WHC 222-S LABORATORY

TANK AP-104, GROUP 96000036

Test SR Matrix LIQUID
SDG 96000036
Contact G. L. Miller

METHOD SUMMARY

STRONTIUM-89/90
GAS PROPORTIONAL COUNTING

Client 242-A Evaporator
Tank AP-104

WHC-SD-WM-DP-142, REV. 1

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Strontium 90
Preparation batch 96001628					
AP-104 4AP-96-1C ACIDIG	S96V000009		01	5998-4	1.13E-01
AP-104 4AP-96-1C-DUP ACI	S96V000009D		01	5998-5	ok
AP-104 4AP-96-1C-SPK ACI	S96V000009S		01	5998-6	ok
AP-104 4AP-96-2C ACIDIG	S96V000010		01	5998-8	7.81E-02
AP-104 4AP-96-3C ACIDIG	S96V000011		01	5998-9	4.05E-02
AP-104 4AP-96-IB1 ACIDIG	S96V000015		01	5998-10	U
Method Blank	B5998-2			5998-2	U
Lab Control Sample	S5998-1			5998-1	ok
Dup Spike (S96V000009S)	S96V000009T		01	5998-7	HIGH
Nominal values and limits from method				RDLs (µCi/mL)	

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA µCi/mL	ALIQ ml	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 96001628	2σ prep error 15.0 %		Reference													
AP-104 4AP-96-1C ACIDIG	S96V000009		01	2.8E-04	0.100	10.0	1.00	82	42	10				02/07/96	03/02	WB2781112
AP-104 4AP-96-1C-DUP ACI	S96V000009D		01	2.6E-04	0.100	10.0	1.00	86	42	10				02/07/96	03/02	WB2781112
AP-104 4AP-96-1C-SPK ACI	S96V000009S		01		0.100	10.0	1.00							02/07/96	03/02	WB27811
AP-104 4AP-96-2C ACIDIG	S96V000010		01	2.6E-04	0.100	10.0	1.00	85	42	10				02/07/96	03/02	WB2781112
AP-104 4AP-96-3C ACIDIG	S96V000011		01	2.6E-04	0.100	10.0	1.00	84	42	10				02/07/96	03/02	WB2781112
AP-104 4AP-96-IB1 ACIDIG	S96V000015		01	1.1E-04	0.250	10.0	1.00	83	42	10				02/07/96	03/02	WB2781112
Method Blank	B5998-2			2.8E-04	0.100	10.0	1.00	82	42	10					03/02/96	WB2781112
Lab Control Sample	S5998-1			2.7E-05	1.00	10.0	1.00	85	42	10					03/02/96	WB2781112
Dup Spike (S96V000009S)	S96V000009T		01		0.100	10.0	1.00							02/07/96	03/02	WB27811
Nominal values and limits from method					0.100			30-105	20-55	10						

Final Report

METHOD SUMMARIES
Page 7
SUMMARY DATA SECTION
Page 45

Lab id 222-S
Protocol CT
Version 1.0
Form DVD-CMS
Version 3.08
Report date 04/09/96

Test SR Matrix LIQUID
SDG 96000036
Contact G. L. Miller

WHC 222-S LABORATORY

TANK AP-104, GROUP 96000036

METHOD SUMMARY, cont.

STRONTIUM-89/90

GAS PROPORTIONAL COUNTING

Client 242-A Evaporator
Tank AP-104

WHC-SD-WM-DP-142, REV. 1

PROCEDURES	REFERENCE	222-S Lab Analytical Procedure
	LO-160-103	Core Segment Extrusion Process and Sample Preparation, rev 17
	LA-505-158	Acid Digestion of Aqueous Samples and Extracts for Total Metals for Analysis by FLAA or ICP Spectroscopy

AVERAGES ± 2 SD FOR 7 SAMPLES			
	MDA	2.1E-04	± 2.0E-04
	YIELD	84	± 3
	EFFICIENCY	42	± 0

Lab id 222-S
Protocol CT
Version 1.0
Form DVD-CMS
Version 3.08
Report date 04/09/96

Test AB Matrix LIQUID
SDG 96000036
Contact G. L. Miller

WHC 222-S LABORATORY

TANK AP-104, GROUP 96000036

METHOD SUMMARY

ALPHA/BETA ANALYSIS
GAS PROPORTIONAL COUNTING

Client 242-A Evaporator
Tank AP-104

RESULTS

WHC-SD-WM-DP-142, REV. 1

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	1: Total Alpha	2: Total Beta	3: Sum, Alpha Emitters	4: Sum, Beta Emitters	RESULT RATIOS (%) 3÷1	2σ	4÷2	2σ
Preparation batch 96001182												
AP-104 4AP-96-4 ACIDIG	S96V000013			5616-12	3.05E-04	3.75E 00						
AP-104 4AP-96-4-DUP ACI	S96V000013D			5616-13	ok	ok						
AP-104 4AP-96-1C ACIDIG	S96V000009			5616-4	2.36E-04	6.25E 00		6.15E 00			98	21
AP-104 4AP-96-1C-DUP ACI	S96V000009D			5616-5	ok	ok		6.19E 00			99	21
AP-104 4AP-96-2C ACIDIG	S96V000010			5616-6	4.51E-04	3.86E 00		3.67E 00			95	20
AP-104 4AP-96-2C-DUP ACI	S96V000010D			5616-7	ok	ok						
AP-104 4AP-96-2C-SPK ACI	S96V000010S			5616-8	No data	ok						
AP-104 4AP-96-3C ACIDIG	S96V000011			5616-10	3.61E-04	4.00E 00		3.89E 00			97	21
AP-104 4AP-96-3C-DUP ACI	S96V000011D			5616-11	ok	ok						
Method Blank	B5616-2			5616-2	U	U						
Lab Control Sample	S5616-1			5616-1	ok	ok						
Preparation batch 96001530												
AP-104 4AP-96-1B1 ACIDIG	S96V000015	01		5908-4	U	U		6.62E-08				
AP-104 4AP-96-1B1-DUP AC	S96V000015D	01		5908-5	- U	OUT						
Method Blank	B5908-2			5908-2	U	U						
Nominal values and limits from method		RDLs (μCi/mL)							80		80	
								Averages			98	

Final Report

METHOD SUMMARIES
Page 9
SUMMARY DATA SECTION
Page 47

Lab id 222-S
Protocol CT
Version 1.0
Form DVD-CMS
Version 3.08
Report date 04/09/96

WHC 222-S LABORATORY

TANK AP-104, GROUP 96000036

Test AB Matrix LIQUID
SDG 96000036
Contact G. L. Miller

METHOD SUMMARY

ALPHA/BETA ANALYSIS
GAS PROPORTIONAL COUNTING

Client 242-A Evaporator
Tank AP-104

WHC-SD-WM-DP-142, REV. 1

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MAX MDA µCi/mL	ALIQ ml	PREP FAC	DILU- TION	RESID mg	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL- YZED	DETECTOR
Preparation batch 96001182 2σ prep error 15.0 % Reference																
AP-104 4AP-96-4 ACIDIG	S96V000013			7.2E-04	0.500	10.0	11.0		42	30				02/07/96	02/21	WB26872
AP-104 4AP-96-4-DUP ACI	S96V000013D			7.2E-04	0.500	10.0	11.0		42	30				02/07/96	02/21	WB26872
AP-104 4AP-96-1C ACIDIG	S96V000009			7.2E-04	0.500	10.0	11.0		42	30				02/07/96	02/21	WB26872
AP-104 4AP-96-1C-DUP ACI	S96V000009D			7.2E-04	0.500	10.0	11.0		42	30				02/07/96	02/21	WB26872
AP-104 4AP-96-2C ACIDIG	S96V000010			7.2E-04	0.500	10.0	11.0		42	30				02/07/96	02/21	WB26872
AP-104 4AP-96-2C-DUP ACI	S96V000010D			7.2E-04	0.500	10.0	11.0		42	30				02/07/96	02/21	WB26872
AP-104 4AP-96-2C-SPK ACI	S96V000010S				0.500	10.0	1.00		42	10				02/07/96	02/21	WB26872
AP-104 4AP-96-3C ACIDIG	S96V000011			7.2E-04	0.500	10.0	11.0		42	30				02/07/96	02/21	WB26872
AP-104 4AP-96-3C-DUP ACI	S96V000011D			7.2E-04	0.500	10.0	11.0		42	30				02/07/96	02/21	WB26872
Method Blank	B5616-2			7.2E-04	0.500	10.0	11.0		42	30					02/21/96	WB26872
Lab Control Sample	S5616-1			3.3E-06	10.0	10.0	1.00		42	30					02/21/96	WB26872
Preparation batch 96001530 2σ prep error 15.0 % Reference																
AP-104 4AP-96-1B1 ACIDIG	S96V000015		01	3.6E-05	1.00	10.0	1.00		42	30				02/07/96	02/26	WB27806
AP-104 4AP-96-1B1-DUP AC	S96V000015D		01	3.6E-05	1.00	10.0	1.00		42	30				02/07/96	02/26	WB27806
Method Blank	B5908-2			3.6E-05	1.00	10.0	1.00		42	30					02/26/96	WB27806
Nominal values and limits from method					0.100				20-55	30						

PROCEDURES REFERENCE 222-S Lab Analytical Procedure
LO-160-103 Core Segment Extrusion Process and Sample Preparation, rev 17
LA-505-158 Acid Digestion of Aqueous Samples and Extracts for Total Metals for Analysis by FLAA or ICP Spectroscopy

AVERAGES ± 2 SD FOR 14 SAMPLES
MDA 5.1E-04 ± 6.7E-04
EFFICIENCY 42 ± 0

Final Report

METHOD SUMMARIES
Page 10
SUMMARY DATA SECTION
Page 48

Lab id 222-S
Protocol CT
Version 1.0
Form DVD-CMS
Version 3.08
Report date 04/09/96

Test GEA Matrix LIQUID
SDG 96000036
Contact G. L. Miller

WHC 222-S LABORATORY

TANK AP-104, GROUP 96000036

METHOD SUMMARY

GAMMA SPECTROSCOPY
GAMMA ENERGY ANALYSIS

Client 242-A Evaporator
Tank AP-104

RESULTS

WHC-SD-WM-DP-142, REV. 1

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Cobalt 60	Cesium 137	Europium 154	Europium 155	Americium 241
Preparation batch 96001135									
AP-104 4AP-96-1C ACIDIG	S96V000009			5579-3	U	6.15E 00	U	U	
AP-104 4AP-96-1C-DUP ACI	S96V000009D			5579-4	- U	ok	- U	- U	
AP-104 4AP-96-2C ACIDIG	S96V000010			5579-5	U	3.67E 00	U	U	
AP-104 4AP-96-3C ACIDIG	S96V000011			5579-6	U	3.88E 00	U	U	
AP-104 4AP-96-IB1 ACIDIG	S96V000015			5579-7	U	U	U	U	
Method Blank	B5579-2			5579-2	U	U	U	U	
Lab Control Sample	S5579-1			5579-1	ok	ok			
Nominal values and limits from method					RDLs (µCi/mL)				

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MAX MDA µCi/mL	ALIQ ml	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL- YZED	DETECTOR
Preparation batch 96001135	2σ prep error 15.0 %			Reference												
AP-104 4AP-96-1C ACIDIG	S96V000009			6.4E-02		10.0								02/07/96	02/12	GEA03
AP-104 4AP-96-1C-DUP ACI	S96V000009D			6.4E-02		10.0								02/07/96	02/12	GEA03
AP-104 4AP-96-2C ACIDIG	S96V000010			4.9E-02		10.0								02/07/96	02/12	GEA03
AP-104 4AP-96-3C ACIDIG	S96V000011			5.1E-02		10.0								02/07/96	02/12	GEA03
AP-104 4AP-96-IB1 ACIDIG	S96V000015			4.6E-03		10.0								02/07/96	02/12	GEA03
Method Blank	B5579-2			4.2E-03		10.0									02/12/96	GEA03
Lab Control Sample	S5579-1					10.0									02/12/96	GEA03
Nominal values and limits from method					0.100				50							

PROCEDURES
- REFERENCE 222-S Lab Analytical Procedure
- LO-160-103 Core Segment Extrusion Process and Sample Preparation, rev 17
- LA-505-158 Acid Digestion of Aqueous Samples and Extracts for Total Metals for Analysis by FLAA or ICP Spectroscopy

AVERAGES ± 2 SD FOR 6 SAMPLES
MDA 3.9E-02 ± 5.6E-02
YIELD _____ ± _____

Final Report

METHOD SUMMARIES
Page 11
SUMMARY DATA SECTION
Page 49

Lab id 222-S
Protocol CT
Version 1.0
Form DVD-CMS
Version 3.08
Report date 04/09/96

WHC 222-S LABORATORY

TANK AP-104, GROUP 96000036

METHOD SUMMARY

URANIUM

KINETIC PHOSPHORESCENCE ANLZR

Test U Matrix LIQUID
SDG 96000036
Contact G. L. Miller

Client 242-A Evaporator
Tank AP-104

WHC-SD-WM-DP-142, REV. 1

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MDA µCi/mL	ALIQ ml	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL- YZED	DETECTOR
Preparation batch 96001644 2σ prep error 15.0 % Reference																
AP-104 4AP-96-1C	S96V000006			4.1E-03	1.00	1.00	110						25		02/17/96	U01
AP-104 4AP-96-1C-SPK	S96V000006S				1.00	1.00	1210						25		02/17/96	U01
AP-104 4AP-96-2C	S96V000007			3.7E-04	1.00	1.00	10.0						25		02/17/96	U01
AP-104 4AP-96-3C	S96V000008			3.7E-04	1.00	1.00	10.0						25		02/17/96	U01
AP-104 4AP-96-IB1	S96V000014			3.7E-04	1.00	1.00	10.0						30		02/17/96	U01
DI Blank	B5403-2			3.7E-04	1.00		10.0								02/17/96	U01
Lab Control Sample	S5403-1			3.7E-05	1.00	1.00	1.00								02/17/96	U01
Dup Spike (S96V000006S)	S96V000006T				1.00	1.00	110						25		02/17/96	U01
Nominal values and limits from method					0.100											

PROCEDURES REFERENCE 222-S Lab Analytical Procedure
LO-160-103 Core Segment Extrusion Process and Sample Preparation, rev 17
LA-925-009 Determination of Uranium by Kinetic Phosphorescence, rev 11

AVERAGES ± 2 SD FOR 6 SAMPLES
MDA 9.4E-04 ± 3.1E-03
YIELD _____ ± _____

Final Report

METHOD SUMMARIES
Page 12
SUMMARY DATA SECTION
Page 50

Lab id 222-S
Protocol CT
Version 1.0
Form DVD-CMS
Version 3.08
Report date 04/09/96

Test H Matrix LIQUID
SDG 96000036
Contact G. L. Miller

WHC 222-S LABORATORY

TANK AP-104, GROUP 96000036

METHOD SUMMARY

TRITIUM
LIQUID SCINTILLATION

Client 242-A Evaporator
Tank AP-104

RESULTS

WHC-SD-WM-DP-140, REV.1

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Tritium
Preparation batch 96002180					
AP-104 4AP-96-1C	S96V000006			6495-3	3.27E-04
AP-104 4AP-96-1C-SPK	S96V000006S			6495-4	ok
DI Blank	B6495-2			6495-2	5.49E-05
Lab Control Sample	S6495-1			6495-1	ok
Dup Spike (S96V000006S)	S96V000006T			6495-5	HIGH
Nominal values and limits from method				RDLs (µCi/mL)	

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MDA µCi/mL	ALIQ ml	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL- YZED	DETECTOR
Preparation batch 96002180	2σ prep error 15.0 %	Reference														
AP-104 4AP-96-1C	S96V000006			2.2E-05	2.00	1.00	11.0		44	50			54		03/17/96	WC51586
AP-104 4AP-96-1C-SPK	S96V000006S				1.00	1.00							54		03/17/96	WC51586
DI Blank	B6495-2			2.1E-05	2.00		11.0		45	50					03/17/96	WC51586
Lab Control Sample	S6495-1			3.8E-06	1.00	1.00	1.00		47	50					03/17/96	WC51586
Dup Spike (S96V000006S)	S96V000006T				1.00	1.00							54		03/17/96	WC51586
Nominal values and limits from method					0.100					50						
									10-60							

PROCEDURES	REFERENCE	222-S Lab Analytical Procedure
	LO-160-103	Core Segment Extrusion Process and Sample Preparation, rev 17
	LA-218-114	Tritium by Lachat Micro-Dist and Liquid Scintillation Counting, rev 24
	LA-508-121	Operation of the Beckman Liquid Scintillation Counters, rev 22

AVERAGES ± 2 SD FOR 3 SAMPLES
MDA 1.6E-05 ± 2.0E-05
EFFICIENCY 45 ± 3.1

Final Report

METHOD SUMMARIES
Page 13
SUMMARY DATA SECTION
Page 51

Lab id 222-S
Protocol CT
Version 1.0
Form DVD-CMS
Version 3.08
Report date 04/09/96

WHC 222-S LABORATORY

TANK AP-104, GROUP 96000036

Test SE Matrix LIQUID
SDG 96000036
Contact G. L. Miller

METHOD SUMMARY

SELENIUM 79
LIQUID SCINTILLATION

Client 242-A Evaporator
Tank AP-104

WHC-SD-WM-DP-147, REV. 1

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Selenium 79	
Preparation batch 96001260						
AP-104 4AP-96-1C ACIDIG	S96V000009			5685-2	4.23E-07	X
AP-104 4AP-96-1C-DUP ACI	S96V000009D			5685-3	ok	X
AP-104 4AP-96-2C ACIDIG	S96V000010			5685-4	U	X
AP-104 4AP-96-3C ACIDIG	S96V000011			5685-5	U	X
AP-104 4AP-96-IB1 ACIDIG	S96V000015			5685-6	3.31E-07	X
Method Blank	B5685-1			5685-1	2.92E-07	X
Nominal values and limits from method				RDLs (µCi/mL)		

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MDA µCi/mL	ALIQ ml	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL- YZED	DETECTOR
Preparation batch 96001260	2σ prep error 15.0 %			Reference												
AP-104 4AP-96-1C ACIDIG	S96V000009			2.7E-07	10.0	10.0	1.00	80	87	50				03/01/96	03/02	WB27818
AP-104 4AP-96-1C-DUP ACI	S96V000009D			2.8E-07	10.0	10.0	1.00	85	88	50				03/01/96	03/02	WB27818
AP-104 4AP-96-2C ACIDIG	S96V000010			3.4E-07	10.0	10.0	1.00	70	88	50				03/01/96	03/02	WB27818
AP-104 4AP-96-3C ACIDIG	S96V000011			2.8E-07	10.0	10.0	1.00	84	87	50				03/01/96	03/02	WB27818
AP-104 4AP-96-IB1 ACIDIG	S96V000015			3.3E-07	10.0	10.0	1.00	71	88	50				03/01/96	03/02	WB27818
Method Blank	B5685-1			2.9E-07	10.0	1.00	1.00	80	88	50				03/01/96	03/02	WB27818
Nominal values and limits from method					1.00			50-100		50						

PROCEDURES	REFERENCE	
	LO-160-103	222-S Lab Analytical Procedure Core Segment Extrusion Process and Sample Preparation, rev 17
	LA-365-132	Determination of Selenium 79, rev B-2
	LA-508-121	Operation of the Beckman Liquid Scintillation Counters, rev 22

AVERAGES ± 2 SD FOR 6 SAMPLES		
MDA	2.3E-07	± 3.7E-07
YIELD	78	± 13
EFFICIENCY	88	± 1.0

Final Report

METHOD SUMMARIES
Page 14
SUMMARY DATA SECTION
Page 52

Lab id 222-S
Protocol CT
Version 1.0
Form DVD-CMS
Version 3.08
Report date 04/09/96

WHC 222-S LABORATORY

TANK AP-104, GROUP 96000036

Test TC Matrix LIQUID
SDG 96000036
Contact G. L. Miller

METHOD SUMMARY

TECHNETIUM
LIQUID SCINTILLATION

Client 242-A Evaporator
Tank AP-104

WHC-SD-WM-DP-142, REV 1

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Technetium 99
Preparation batch 96001263					
AP-104 4AP-96-1C ACIDIG	S96V000009			5688-3	5.21E-03
AP-104 4AP-96-1C-DUP ACI	S96V000009D			5688-4	ok
AP-104 4AP-96-1C-SPK ACI	S96V000009S			5688-5	ok
AP-104 4AP-96-2C ACIDIG	S96V000010			5688-7	7.24E-04
AP-104 4AP-96-3C ACIDIG	S96V000011			5688-8	2.76E-03
AP-104 4AP-96-IB1 ACIDIG	S96V000015			5688-9	U
Method Blank	B5688-2			5688-2	U
Lab Control Sample	S5688-1			5688-1	ok
Nominal values and limits from method				RDLs (µCi/mL)	

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA µCi/mL	ALIQ ml	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 96001263	2σ prep error 15.0 % Reference															
AP-104 4AP-96-1C ACIDIG	S96V000009			3.7E-04	0.250	10.0	1.00	57		20				02/07/96	03/06	WC16085
AP-104 4AP-96-1C-DUP ACI	S96V000009D			3.7E-04	0.250	10.0	1.00	57		20				02/07/96	03/06	WC16085
AP-104 4AP-96-1C-SPK ACI	S96V000009S				0.250	10.0	1.00							02/07/96	03/06	WC16085
AP-104 4AP-96-2C ACIDIG	S96V000010			4.1E-04	0.250	10.0	1.00	51		20				02/07/96	03/06	WC16085
AP-104 4AP-96-3C ACIDIG	S96V000011			4.1E-04	0.250	10.0	1.00	51		20				02/07/96	03/06	WC16085
AP-104 4AP-96-IB1 ACIDIG	S96V000015			4.1E-04	0.250	10.0	1.00	52		20				02/07/96	03/06	WC16085
Method Blank	B5688-2			3.7E-04	0.250	10.0	1.00	57		20					03/06/96	WC16085
Lab Control Sample	S5688-1			3.7E-04	0.250	10.0	1.00	57		20					03/06/96	WC16085
Nominal values and limits from method					0.100			30-80 50-100		20						

Final Report

METHOD SUMMARIES
Page 15
SUMMARY DATA SECTION
Page 53

Lab id 222-S
Protocol CT
Version 1.0
Form DVD-CMS
Version 3.08
Report date 04/09/96

WHC 222-S LABORATORY

TANK AP-104, GROUP 96000036

METHOD SUMMARY, cont.

TECHNETIUM

LIQUID SCINTILLATION

Test TC Matrix LIQUID
SDG 96000036
Contact G. L. Miller

Client 242-A Evaporator
Tank AP-104

WHC-SD-WM-DP-142, REV. 1

PROCEDURES	REFERENCE	222-S Lab Analytical Procedure
	LO-160-103	Core Segment Extrusion Process and Sample Preparation, rev 17
	LA-505-158	Acid Digestion of Aqueous Samples and Extracts for Total Metals for Analysis by FLAA or ICP Spectroscopy

AVERAGES ± 2 SD FOR 7 SAMPLES
MDA 3.9E-04 ± 4.3E-05
YIELD 55 ± 6

Final Report

METHOD SUMMARIES
Page 16
SUMMARY DATA SECTION
Page 54

Lab id 222-S
Protocol CT
Version 1.0
Form DVD-CMS
Version 3.08
Report date 04/09/96

SDG 96000036
Contact G. L. Miller

REPORT GUIDE

WHC-SD-WM-DP-142, REV. 1

Client 242-A Evaporator
Tank AP-104

SAMPLE SUMMARY

The Sample and QC Summary Reports show all samples, including QC samples, reported in one Sample Delivery Group (SDG).

The Sample Summary Report fully identifies client samples and gives the corresponding lab sample identification. The QC Summary Report shows at the sample level how the lab organized the samples into batches and generated QC samples. The Preparation Batch and Method Summary Reports show this at the analysis level.

The following notes apply to these reports:

* LAB SAMPLE ID is the lab's primary identification for a sample.

* DEPARTMENT SAMPLE ID is an alternate lab id, for example one assigned by a radiochemistry department in a lab.

* CLIENT SAMPLE ID is the client's primary identification for a sample. It includes any sample preparation done by the client that is necessary to identify the sample.

* QC BATCH is a lab assigned code that groups samples to be processed and QCed together. These samples should have similar matrices.

  QC BATCH is not necessarily the same as SDG, which reflects samples received and reported together.

* All Lab Control Samples, Method Blanks, Duplicates and Matrix Spikes are shown that QC any of the samples. Due to possible reanalyses, not all results for all these QC samples may be relevant to the SDG. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

SDG 96000036
Contact G. L. Miller

REPORT GUIDE

WHC-SD-WM-DP-142, REV.1

Client 242-A Evaporator
Tank AP-104

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches in one Sample Delivery Group (SDG) with information necessary to check the completeness and consistency of the SDG.

The following notes apply to this report:

* The preparation batches are shown in the same order as the Method Summary Reports are printed.

* Only analyses of planchets relevant to the SDG are included.

* Each preparation batch should have at least one Method Blank and LCS in it to validate client sample results.

* The QUALIFIERS shown are all qualifiers other than U, J, B, L and H that occur on any analysis in the preparation batch. The Method Summary Report has these qualifiers on a per sample basis.

  These qualifiers should be reviewed as follows:

  X Some data has been manually entered or modified. Transcription errors are possible.

  P One or more results are 'preliminary'. The data is not ready for final reporting.

  2 There were two or more results for one analyte on one planchet imported at one time. The results in DVD may not be the same as on the raw data sheets.

  Other lab defined qualifiers may occur. In general, these should be addressed in the SDG narrative.

WHC 222-S LABORATORY
TANK AP-104, GROUP 96000036

SDG 96000036
Contact G. L. Miller

REPORT GUIDE
WHC-SD-WM-DP-142, REV 1

Client 242-A Evaporator
Tank AP-104

WORK SUMMARY

The Work Summary Report shows all samples, including QC samples, and all relevant analyses in one Sample Delivery Group (SDG). This report is often useful as supporting documentation for an invoice.

The following notes apply to this report:

* TEST is a code for the method used to measure associated analytes. Results and related information for each analyte are on the Data Sheet Report. In special cases, a test code used in the summary data section is not the same as in associated raw data. In this case, both codes are shown on the Work Summary.

* SUFFIX is the lab's code to distinguish multiple analyses (recounts, reworks, reanalyses) of a fraction of the sample. The suffix indicates which result is being reported. An empty suffix normally identifies the first attempt to analyze the sample.

* The LAB SAMPLE ID, TEST and SUFFIX uniquely identify all supporting data for a result. The Method Summary Report for each TEST has method performance data, such as yield, for each lab sample id and suffix and procedures used in the method.

* PLANCHET is an alternate lab identifier for work done for one test. It, combined with the TEST and SUFFIX, may be the best link to raw data.

* For QC samples, only analyses that directly QC some regular sample are shown. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

* The SAS (Special Analytical Services) Number is a client or lab assigned code that reflects special processing for samples, such as rapid turn around. Counts of tests done are lists by SAS number since it is likely to affect prices.

Final Report

Lab id 222-S
Protocol CT
Version 1.0
Form DVD-RG
Version 3.08
Report date 04/09/96

SDG 96000036
Contact G. L. Miller

REPORT GUIDE

WHC-SD-WM-DP-142, REV. 1

DATA SHEET

Client 242-A Evaporator
Tank AP-104

The Data Sheet Report shows all results and primary supporting information for one client sample or Method Blank. This report corresponds to both the CLP Inorganics and Organics Data Sheet.

The following notes apply to this report:

* TEST is a code for the method used to measure an analyte. If the TEST is empty, no data is available; the analyte was not analyzed for.

* The LAB SAMPLE ID and TEST uniquely identify work within the Summary Data Section of a Data Package. The Work Summary and Method Summary Reports further identify raw data that underlies this work.

  The Method Summary Report for each TEST has method performance data, such as yield, for each Lab Sample ID and a list of procedures used in the method.

* ERRORs can be labeled TOTAL or COUNT. TOTAL implies a preparation (non-counting method) error has been added, as square root of sum of squares, to the counting error denoted by COUNT. The preparation errors, which may vary by preparation batch, are shown on the Method Summary Report.

* A RESULT can be 'N.R.' (Not Reported). This means the lab did this work but chooses not to report it now, possibly because it was reported at another time.

* When reporting a Method Blank, a RESULT can be 'N.A.' (Not Applicable). This means there is no reported client sample work in the same preparation batch as the Blank's result. This is likely to occur when the Method Blank is associated with reanalyses of selected work for a few samples in the SDG.

The following qualifiers are defined by the DVD system:

U The RESULT is less than the MDA (Minimum Detectable Activity). If the MDA is blank, the ERROR is used as the limit.

Lab id 222-S
Protocol CT
Version 1.0
Form DVD-RG
Version 3.08
Report date 04/09/96

J The RESULT is less than the RDL (Required Detection Limit) and no U qualifier is assigned.

B A Method Blank associated with this sample had a result without a U flag and, after correcting for possibly different aliquots, that result is greater than or equal to the MDA for this sample.

Normally, B is not assigned if U is. When method blank subtraction is shown on this report, B flags are assigned based on the unsubtracted values while U's are assigned based on the subtracted ones. Both flags can be assigned in this case.

For each sample result, all Method Blank results in the same preparation batch are compared. The Method Summary Report documents this and other QC relationships.

L Some Lab Control Sample that QC's this sample had a low recovery. The lab can disable assignment of this qualifier.

H Similar to 'L' except the recovery was high.

P The RESULT is 'preliminary'.

X Some data necessary to compute the RESULT, ERROR or MDA was manually entered or modified.

2 There were two or more results available for this analyte. The reported result may not be the same as in the raw data.

Other qualifiers are lab defined. Definitions should be in the SDG narrative.

The following values are underlined to indicate possible problems:

* An MDA is underlined if it is bigger than its RDL.

* An ERROR is underlined if the 1.645 sigma counting error is bigger than both the MDA and the RESULT, implying that the MDA

SDG 96000036
Contact G. L. Miller

GUIDE, cont.
WHC-SD-WM-DP-142, REV. 1

Client 242-A Evaporator
Tank AP-104

DATA SHEET

may not be a good estimate of the 'real' minimum detectable activity.

* A negative RESULT is underlined if it is less than the negative of its 2 sigma counting ERROR.

* When reporting a Method Blank, a RESULT is underlined if greater than its MDA. If the MDA is blank, the 2 sigma counting error is used in the comparison.

SDG 96000036
Contact G. L. Miller

REPORT GUIDE

Client 242-A Evaporator
Tank AP-104

WHC-SD-WM-DP-142, REV. 1

LAB CONTROL SAMPLE

The Lab Control Sample Report shows all results, recoveries and primary supporting information for one Lab Control Sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. Refer to its Report Guide for details.

* An amount ADDED is the lab's value for the actual amount spiked into this sample with its ERROR an estimate of the error of this amount.

  An amount added is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

* REC (Recovery) is RESULT divided by ADDED expressed as a percent.

* The first, computed limits for the recovery reflect:

  1. The error of RESULT, including that introduced by rounding the result prior to printing.

     If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

  2. The error of ADDED.

  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

* The second limits are protocol defined upper and lower QC limits for the recovery.

* The recovery is underlined if it is outside either of these ranges.

SDG 96000036
Contact G. L. Miller

REPORT GUIDE

WHC-SD-WM-DP-142, REV. 1

Client 242-A Evaporator
Tank AP-104

DUPLICATE

The Duplicate Report shows all results, differences and primary supporting information for one Duplicate and associated Original sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. This applies both to the Duplicate and Original sample data. Refer to the Data Sheet Report Guide for details.

  If the Duplicate has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

* The RPD (Relative Percent Difference) is the absolute value of the difference of the RESULTs divided by their average expressed as a percent.

  If both RESULTs are less than their MDAs, no RPD is computed and a '-' is printed.

  For an analyte, if the lab did work for both samples but has data for only one, the MDA from the sample with data is used as the other's result in the RPD.

* The first, computed limit is the sum, as square root of sum of squares, of the errors of the results divided by the average result as a percent, hence the relative error of the difference rather than the error of the relative difference. The errors include those introduced by rounding the RESULTs prior to printing.

  If this limit is labeled TOT, it includes the preparation error in the RESULTs. If labeled CNT, it does not.

  This value reported for this limit is at most 999.

* The second limit for the RPD is the larger of:

  1. A fixed percentage specified in the protocol.

2. A protocol factor (typically 2) times the average MDA as a percent of the average result. This limit applies when the results are close to the MDAs.

* The RPD is underlined if it is greater than either limit.

* If specified by the lab, the second limit column is replaced by the Difference Error Ratio (DER), which is the absolute value of the difference of the results divided by the quadratic sum of their one sigma errors, the same errors as used in the first limit.

  Except for differences due to rounding, the DER is the same as the RPD divided by the first RPD limit with the limit scaled to 1 sigma.

* The DER is underlined if it is greater than the sigma factor, typically 2 or 3, shown in the header for the first RPD limit.

SDG 96000036
Contact G. L. Miller

REPORT GUIDE

WHC-SD-WM-DP-142, REV. 1

MATRIX SPIKE

Client 242-A Evaporator
Tank AP-104

The Matrix Spike Report shows all results, recoveries and primary supporting information for one Matrix Spike and associated Original sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. This applies both to the Spiked and Original sample data. Refer to the Data Sheet Report Guide for details.

  If the Spike has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

* An amount ADDED is the lab's value for the actual amount spiked into the Spike sample with its ERROR an estimate of the error of this amount.

  An amount is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

* REC (Recovery) is the Spike RESULT minus the Original RESULT divided by ADDED expressed as a percent.

* The first, computed limits for the recovery reflect:

  1. The errors of the two RESULTs, including those introduced by rounding them prior to printing.

     If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

  2. The error of ADDED.

  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

* The second limits are protocol defined upper and lower QC limits for the recovery.

SDG 96000036
Contact G. L. Miller

GUIDE, cont.
WHC-SD-WM-DP-142, REV.1
MATRIX SPIKE

Client 242-A Evaporator
Tank AP-104

These limits are left blank if the Original RESULT is more than a protocol defined factor (typically 4) times ADDED. This is a way of accounting for that when the spike is small compared to the amount in the original sample, the recovery is unreliable.

* The recovery is underlined (out of spec) if it is outside either of these ranges.

SDG 96000036
Contact G. L. Miller

REPORT GUIDE

WHC-SD-WM-DP-142, REV. 1

METHOD SUMMARY

Client 242-A Evaporator
Tank AP-104

The Method Summary Report has two tables. One shows up to five results measured using one method. The other has performance data for the method. There is one report for each TEST, as used on the Data Sheet Report.

The following notes apply to this report:

* Each table is subdivided into sections, one for each preparation batch. A preparation batch is a group of aliquots prepared at roughly the same time in one work area of the lab using the same method.

  There should be Lab Control Sample and Method Blank results in each preparation batch since this close correspondence makes the QC meaningful. Depending on lab policy, Duplicates need not occur in each batch since they QC sample dependencies such as matrix effects.

* The RAW TEST column shows the test code used in the raw data to identify a particular analysis if it is different than the test code in the header of the report. This occurs in special cases due to method specific details about how the lab labels work.

  The Lab Sample or Planchet ID combined with the (Raw) Test Code and Suffix uniquely identify the raw data for each analysis.

* If a result is less than both its MDA and RDL, it is replaced by just 'U' on this report. If it is greater than or equal to the RDL but less than the MDA, the result is shown with a 'U' flag.

  The J and X flags are as on the data sheet.

* Non-U results for Method Blanks are underlined to indicate possible contamination of other samples in the preparation batch. The Method Blank Report has supporting data.

* Lab Control Sample and Matrix Spike results are shown as: ok, No data, LOW or HIGH, with the last two underlined. 'No data' means no amount ADDED was specified. 'LOW' and 'HIGH'

correspond to when the recovery is underlined on the Lab Control Sample or Matrix Spike Report. See these reports for supporting data.

* Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.

* If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.

  MDAs are underlined if greater than the printed RDL.

* Aliquots are underlined if less than the nominal value specified for the method.

* Preparation factors are underlined if greater than the nominal value specified for the QC batch.

* Dilution factors are underlined if greater than the nominal value specified for the method.

* Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.

* Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.

* Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

* Count times are underlined if less than the nominal value

specified for the method.

* Resolutions (as FWHM; Full Width at Half Max) are underlined if greater than the method specified limit.

* Tracer drifts are underlined if their absolute values are greater than the method specified limit. Tracer drifts are not printed if percent moistures are.

* Days Held (Analyzed - Collected) are underlined if greater than the holding time specified in the protocol.

* Analysis dates are underlined if before their planchet's preparation date or, if a limit is specified, too far after it.

For some methods, ratios as percentages and error estimates for them are computed for pairs of results. A ratio column header like '1÷3' means the ratio of the first result column and the third result column.

Ratios are not computed for Lab Control Sample, Method Blank or Matrix Spike results since their matrices are not necessarily similar to client samples'.

The error estimate for a ratio of results from one planchet reflects only counting errors since other errors should be correlated. For a ratio involving different planchets, if QC limits are computed based on total errors, the error for the ratio allows for the preparation errors for the planchets.

The ratio is underlined (out of spec) if the absolute value of its difference from the nominal value is greater than its error estimate. If no nominal value is specified, this test is not done.

For Gross Alpha or Gross Beta results, there may be a column showing the sum of other Alpha or Beta emitters. This sum includes all relevant results in the DVD database, whether reported or not. Results in the sum are weighted by a particles/decay value specified by the lab for each relevant analyte. Results less than their MDA are not included.

SDG 96000036
Contact G. L. Miller

GUIDE, cont.
WHC-SD-WM-DP-143, REV. 1

Client 242-A Evaporator
Tank AP-104

METHOD SUMMARY

No sums are computed for Lab Control, Method Blank or Matrix Spike samples since their various planchets may not be physically related.

If a ratio of total isotopic to Gross Alpha or Beta is shown, the error for the ratio reflects both the error in the Gross result and the sum, as square root of sum of squares, of the errors in the isotopic results.

For total elemental uranium or thorium results, there may be a column showing the total weight computed from associated isotopic results. Ignoring results less than their MDAs, this is a weighted sum of the isotopic results. The weights depend on the molecular weight and half-life of each isotope so as to convert activities (decays) to weight (atoms).

If a ratio of total computed to measured elemental uranium or thorium is shown, the error for the ratio reflects the errors in all the measurements.

LABCORE Completed Worklist Report for Worklist# 5403

Analyst: dgg **Instrument:** U01 **Book#** 22856

Method: LA-925-009 Rev/Mod A-1

Worklist Comment: 1-10 ml Sample Prep (if spike: use 0.1ml spike) new

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
1	STD		0	aU-01	U-02	LIQUID	.0638	.0637	99.840	% Recovery
2	BLNK		0	aU-01	U-02	LIQUID	1	3.02e-3	0.000	ug/mL
3	SAMPLE	S96V000006	0	aU-01	U-02	LIQUID	N/A	9.41	4.070e-003	ug/mL
3	SAMPLE	S96V000006	0	aU-01	U-02E	LIQUID	N/A	3.3	0.000	% Inst Error
4	SPK	S96V000006	0	aU-01	U-02	LIQUID	100	103	103.000	% Recovery
5	SPK-DUP	S96V000006	0	aU-01	U-02	LIQUID	103	82.2	22.460	RPD
6	SAMPLE	S96V000007	0	aU-01	U-02	LIQUID	N/A	3.42e+1	3.700e-004	ug/mL
6	SAMPLE	S96V000007	0	aU-01	U-02E	LIQUID	N/A	3.3	0.000	% Inst Error
7	SAMPLE	S96V000008	0	aU-01	U-02	LIQUID	N/A	9.76	3.700e-004	ug/mL
7	SAMPLE	S96V000008	0	aU-01	U-02E	LIQUID	N/A	3.8	0.000	% Inst Error
8	SAMPLE	S96V000014	0	aU-01	U-02	LIQUID	N/A	3.91e-3	3.700e-004	ug/mL
8	SAMPLE	S96V000014	0	aU-01	U-02E	LIQUID	N/A	2.3	0.000	% Inst Error

Final page for worklist# 5403

Analyst Signature Date

Analyst Signature Date

Reviewer Signature 2/29/96 Date

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

LABCORE Data Entry Template for Worklist# 5403

Analyst: dgg **Instrument:** U01 _____ **Book#** 23856

Method: LA-925-009 Rev/Mod A-1

Worklist Comment: 1-10 ml Sample Prep (if spike: use 0.1ml spike) new

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				@U-01	LIQUID		
2	BLNK				@U-01	LIQUID		
3	SAMPLE	S96V000006	0		@U-01	LIQUID	96000036	AP-104
		Analytes Requested:			U-02	, U-02E		
4	SPK	S96V000006	0		@U-01	LIQUID		
5	SPK-DUP	S96V000006	0		@U-01	LIQUID		
6	SAMPLE	S96V000007	0		@U-01	LIQUID	96000036	AP-104
		Analytes Requested:			U-02	, U-02E		
7	SAMPLE	S96V000008	0		@U-01	LIQUID	96000036	AP-104
		Analytes Requested:			U-02	, U-02E		
8	SAMPLE	S96V000014	0		@U-01	LIQUID	96000036	AP-104
		Analytes Requested:			U-02	, U-02E		

Final page for worklist # 5403

Analyst Signature 2-17-96 1150 Date

Analyst Signature 2/29/96 Date

Data Entry Comments:

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

Uranium Data Collection Sheet

WHC-SD-WM-DP- 142 REV. 1

Download File Name: I:\925009\in\5403.txt **Output Name:** _____

Spike Book Number: 22B55 **Spike Volume:** .100ml **Date/Time:** 2-17-96 / 1150

Sample Type	Sample Number	Sample Size	Preparation Factor	Dilution Factor	Digest Factor	Comments
STD	22B56	1ml	10-10	—	NA	
BLNK		1ml	1-10	—		
SAM	596V000006	1ml	1-10	1-10		
SPK DUP	596V000006	1ml	1-10	1-10		
SPK	596V000006	1ml	1-10	1-10-1-10		
SAM	596V000007	1ml	1-10	—		
DUP						
SPK						
SAM	596V000008	1ml	1-10	—		
DUP						
SAM						
DUP						
SAM	596V000014	1ml	1-10	—		

URANIUM ANALYSIS

Sample ID 22B56 Date/Time 02/17/96/11:23:34
Description LMCS STD. Cal Y=6.57E+07X-9.77E-04
Ref. Ratio 1.04 Intensity 3578 (t= 39 us)
Laser Pulses 500 Conc 6.37E-05 + 2.05E-06 ug/L
Lifetime 255 + 1.538 us Dilution Factor 1 mL/mL
R2 .9984
Integrated 61983 FINAL RESULT 6.37E-05 + 2.05E-06 ~~ug/L~~ U.S.S g/L
Range: HIGH

Sample ID BLANK Date/Time 02/17/96/11:26:33
Description AP-104 Cal Y=4.60E+07X-4.88E-04
Ref. Ratio 1.054 Intensity 1789 (t= 39 us)
Laser Pulses 500 Conc 3.02E-07 + 7.55E-09 ug/L
Lifetime 269 + 4.021 us Dilution Factor 1 mL/mL
R2 .9994
Integrated 71956 FINAL RESULT 3.02E-07 + 7.55E-09 ~~ug/L~~ U.S.S g/L
Range: LOW

Sample ID S96V000006 Date/Time 02/17/96/11:34:39
Description AP-104 Cal Y=6.57E+07X-9.77E-04
Ref. Ratio 1.038 Intensity 4475 (t= 39 us)
Laser Pulses 500 Conc 8.55E-05 + 2.85E-06 ug/L
Lifetime 161 + .852 us Dilution Factor 1 mL/mL
R2 .9989
Integrated 81487 FINAL RESULT 8.55E-05 + 2.85E-06 ~~ug/L~~ U.S.S g/L
Range: HIGH
Dilution 1-10

Sample ID S96V000006-SPK Date/Time 02/17/96/12:02:48
Description AP-104 Cal Y=4.60E+07X-4.88E-04
Ref. Ratio 1.075 Intensity 46519 (t= 39 us)
Laser Pulses 500 Conc 1.26E-03 + 1.89E-07 ug/L
Lifetime 708 + .798 us Dilution Factor 1 mL/mL
R2 .9994
Integrated 703686 FINAL RESULT 1.26E-03 + 1.89E-07 ~~ug/L~~ U.S.S g/L
Range: LOW
Dilution 1-10-1-10

Sample ID S96V000006-SPK Dup Date/Time 02/17/96/12:07:44
Description AP-104 Cal Y=6.57E+07X-9.77E-04
Ref. Ratio 1.047 Intensity 6597 (t= 39 us)
Laser Pulses 500 Conc 1.28E-04 + 4.21E-06 ug/L
Lifetime 195 + 1.057 us Dilution Factor 1 mL/mL
R2 .9986
Integrated 95502 FINAL RESULT 1.28E-04 + 4.21E-06 ~~ug/L~~ U.S.S g/L
Range: HIGH
Dilution 1-10

Sample ID S96V000007 Date/Time 02/17/96/12:12:14
Description AP-104 Cal Y=6.57E+07X-9.77E-04
Ref. Ratio 1.057 Intensity 47868 (t= 260 us)
Laser Pulses 500 Conc 3.42E-03 + 1.12E-04 ug/L
Lifetime 173 + .539 us Dilution Factor 1 mL/mL
R2 .9996
Integrated 624176 FINAL RESULT 3.42E-03 + 1.12E-04 ~~ug/L~~ U.S.S g/L
Range: HIGH

Sample ID S96V000008
Description AP-104
Ref. Ratio 1.048
Laser Pulses 500
Lifetime 167 + 1.578 us
R2`.9962 .
Integrated 533694
Range: HIGH

Date/Time 02/17/96/12:16:23
Cal Y=6.57E+07X-9.77E-04
Intensity 46760 (t= 65 us)
Conc 9.76E-04 + 3.74E-05 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 9.76E-04 + 3.74E-05 ~~ug/L~~ ND B.B g/L

Sample ID S96V000014
Description AP-104
Ref. Ratio 1.088
Laser Pulses 500
Lifetime 223 + 2.422 us
R2 .9949 .
Integrated 23506
Range: LOW

Date/Time 02/17/96/12:20:59
Cal Y=4.60E+09X-4.88E-04
Intensity 1575 (t= 39 us)
Conc 3.91E-07 + 8.88E-09 ug/L
Dilution Factor 1 mL/mL

FINAL RESULT 3.91E-07 + 8.88E-09 ~~ug/L~~ ND B.B g/L

WORKBOOK PAGE: STD1

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type
STD
Work List
5403
Test Code
@U-01
Matrix
LIQUID
Batch Number
96001644
Rerun
0
Sample Prep
N/A
Sample #
WL5403
Instrument Code
U01
Prepared By
JLS
Chemist
JLS
Analyst
DGG
Date Complete
02/29/96
Analysis Date
02/17/96
Analysis Time
11:50 AM
Sample Point
AP-104

		STANDARD
STANDARD BOOK #		22B56
VOLUME OF SAMPLE (mL)	(SS)	1.00
DILUTION FACTOR OF SAMPLE	(DF)	1.00
PREPARATION FACTOR OF SAMPLE	(PF)	1.00
LIFETIME IN MICROSECONDS		255.00
R2 VALUE		0.9984
RANGE (HIGH OR LOW)		HIGH
INSTRUMENT UNCERTAINTY	(IU)	2.05E-06
INSTRUMENT RESULT	(IR)	6.37E-05
DETECTION LEVEL (µg/mL)		3.70E-05
RESULT (µg/mL)		6.37E-02
VALUE OF STANDARD		6.38E-02
%RECOVERY		99.84
RELATIVE % UNCERTAINTY		3.2

Result = DF * PF * IR * 1000

Detection Level = 3.70 E-08 * DF * PF * 1000

% Recovery = Result / Value of Standard * 100

Relative % Uncertainty = IU / IR * 100

Analyst:		DGG	Date: 29-Feb-96
Signature of Chemist:		JLS	Date: 2/29/96

STANDARD.WB1 REV 1.2 925009ML

WORKBOOK PAGE: BLANK2

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type
BLNK
Work List
5403
Test Code
@U-01
Matrix
LIQUID
Batch Number
96001644
Rerun
0
Sample Prep
N/A
Sample #
WL5403
Instrument Code
U01
Prepared By
JLS
Chemist
JLS
Analyst
DGG
Date Complete
02/29/96
Analysis Date
02/17/96
Analysis Time
11:50 AM
Sample Point
AP-104

		BLANK
VOLUME OF SAMPLE (mL)	(SS)	1.00
DILUTION FACTOR OF SAMPLE	(DF)	1.00
PREPARATION FACTOR OF SAMPLE	(PF)	10.00
DIGEST DILUTION FACTOR	(DDF)	1.0000
LIFETIME IN MICROSECONDS		268.00
R2 VALUE		0.9904
RANGE (HIGH OR LOW)		LOW
INSTRUMENT UNCERTAINTY	(IU)	7.55E-09
INSTRUMENT RESULT	(IR)	3.02E-07
DETECTION LEVEL (µg/mL)		3.70E-04
RESULT (µg/mL)		3.02E-03
RELATIVE % UNCERTAINTY		2.5

Result = DF * PF * DDF * IR * 1000

Detection Level = 3.70 E-08 * DF * PF * DDF * 1000

Relative % Uncertainty = IU / IR * 100

Analyst:		DGG	Date: 29-Feb-96
Signature of Chemist:		JLS	Date: 2/29/96

BLANK.WB1 REV 1.2 925009ML

WORKBOOK PAGE: SAM3

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type	SAMPLE
Work List	5403
Test Code	@U-01
Matrix	LIQUID
Batch Number	96001644
Rerun #	0
Sample Prep	N/A
Sample #	S96V000006
Instrument Code	U01
Prepared By	JLS
Chemist	JLS
Analyst	DGG
Data Complete	02/29/96
Analysis Date	02/17/96
Analysis Time	11:50 AM
Sample Point	AP-104

		SAMPLE
VOLUME OF SAMPLE (mL)	(SS)	1.00
DILUTION FACTOR OF SAMPLE	(DF)	11.00
PREPARATION FACTOR OF SAMPLE	(PF)	10.00
DIGEST DILUTION FACTOR	(DDF)	1.0000
LIFETIME IN MICROSECONDS		161.00
R2 VALUE		0.9989
RANGE (HIGH OR LOW)		HIGH
INSTRUMENT UNCERTAINTY	(IU)	2.85E-06
INSTRUMENT RESULT	(IR)	8.55E-05
DETECTION LEVEL (µg/mL)		4.07E-03
CONCENTRATION IN SOLUTION (g/L)		9.41E-03
RESULT (µg/mL)		9.41E+00
RELATIVE % UNCERTAINTY		3.3

Result = DF * PF * DDF * IR * 1000

Detection Level = 3.70 E-08 * DF * PF * DDF * 1000

Relative % Uncertainty = IU / IR * 100

Analyst:		DGG	Date: 29-Feb-96
Signature of Chemist:		JLS	Date: 2/29/96

SAMPLE.WB1 REV 1.2 925009ML

WORKBOOK PAGE: SPIKE4

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			SPIKE
SPK	SPIKE BOOK #		22B65
Work List	VOLUME OF SAMPLE + SPIKE (mL)	(SS)	1.00
5403	DILUTION FACTOR OF SAMPLE + SPIKE	(DF)	121.00
Lab Code	PREPARATION FACTOR OF SAMPLE + SPIKE	(PF)	10.00
@U-01	DIGEST DILUTION FACTOR OF SAMPLE	(DDF)	1.0000
Matrix	LIFETIME IN MICROSECONDS		208.00
LIQUID	R2 VALUE		0.9994
Batch Number	RANGE (HIGH OR LOW)		LOW
96001644	INSTRUMENT RESULT	(IR)	1.26E-05
Rerun	CONCENTRATION IN SOLUTION (g/L)	(CONC)	1.52E-02
0	SPIKE VALUE (g/L)	(SV)	5.69E-02
Sample Prep	INITIAL VOLUME OF SPIKE (mL)	(IV)	0.10
N/A	ORIGINAL SAMPLE VOLUME BEFORE PREP (mL)	(OSV)	1.00
Sample Number	CONCENTRATION IN SOLUTION (g/L) FROM SAMPLE FOR	(SR)	9.41E-03
S96V000006			
Instrument Code			
U01	Concentration = IR * DF * PF		
Prepared By			
JLS	QC Actual (µg/mL) = SV (g/L) * 1000		
Chemist			
JLS	QC Found (µg/mL) = (CONC - SR) * OSV / IV * 1000		
Analyst			
DGG	% Recovery = QC FOUND / QC ACTUAL		
Date Complete			
02/29/96			
Analysis Date			
02/17/96	QC ACTUAL	=	5.69E+01 µg/mL
Analysis Time	QC FOUND	=	5.84E+01 µg/mL
11:50 AM	% SPIKE RECOVERY	=	102.7%
Sample Point			
AP-104			

Analyst: DGG Date: 29-Feb-96

Signature of Chemist: JLS Date: 2/29/96

SPIKE.WB1 REV 1.2 925009ML

WORKBOOK PAGE: SP_DUP5

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type			
SPK-DUP	SPIKE BOOK #		22B55
Work List	VOLUME OF SAMPLE + SPIKE (mL)	(SS)	1.00
5403	DILUTION FACTOR OF SAMPLE + SPIKE	(DF)	11.00
Test Code	PREPARATION FACTOR OF SAMPLE + SPIKE	(PF)	10.00
@U-01	DIGEST DILUTION FACTOR OF SAMPLE	(DDF)	1.0000
Matrix	LIFETIME IN MICROSECONDS		195.00
LIQUID	R2 VALUE		0.9986
Batch Number	RANGE (HIGH OR LOW)		HIGH
96001644	INSTRUMENT RESULT	(IR)	1.28E-04
Replicate	CONCENTRATION IN SOLUTION (g/L)	(CONC)	1.41E-02
0	SPIKE VALUE (g/L)	(SV)	5.69E-02
Sample Prep	INITIAL VOLUME OF SPIKE (mL)	(IV)	0.10
N/A	ORIGINAL SAMPLE VOLUME BEFORE PREP (mL)	(OSV)	1.00
Sample Number	CONCENTRATION IN SOLUTION (g/L) FROM SAMPLE FOR	(SR)	9.41E-03
S96V000006			
Instrument Code			
U01			
Prepared By			
JLS			
Chemist			
JLS			
Analyst			
DGG			
Date Complete			
02/29/96			
Analysis Date			
02/17/96			
Analysis Time			
11:50 AM			
Sample Point			
AP-104			

Concentration = IR * DF * PF

QC Actual (µg/mL) = SV (g/L) * 1000

QC Found (µg/mL) = (CONC - SR) * OSV / IV * 1000

% Recovery = QC FOUND / QC ACTUAL

QC ACTUAL	=	5.69E+01	µg/mL
QC FOUND	=	4.67E+01	µg/mL
% SPIKE RECOVERY	=	82.2%	

Analyst: DGG Date: 29-Feb-96

Signature of Chemist: JLS Date: 2/29/96

SPIKE.WB1 REV 1.2 925009ML

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type
SAMPLE
Work List
5403
Test Code
@U-01
Matrix
LIQUID
Batch Number
96001644
Rerun
0
Sample Prep
N/A
Sample #
S96V000007
Instrument Code
U01
Prepared By
JLS
Chemist
JLS
Analyst
DGG
Date Complete
02/29/96
Analysis Date
02/17/96
Analysis Time
11:50 AM
Sample Point
AP-104

		SAMPLE
VOLUME OF SAMPLE (mL)	(SS)	1.00
DILUTION FACTOR OF SAMPLE	(DF)	1.00
PREPARATION FACTOR OF SAMPLE	(PF)	10.00
DIGEST DILUTION FACTOR	(DDF)	1.0000
LIFETIME IN MICROSECONDS		173.00
R2 VALUE		0.9996
RANGE (HIGH OR LOW)		HIGH
INSTRUMENT UNCERTAINTY	(IU)	1.12E-04
INSTRUMENT RESULT	(IR)	3.42E-03
DETECTION LEVEL (µg/mL)		3.70E-04
CONCENTRATION IN SOLUTION (g/L)		3.42E-02
RESULT (µg/mL)		3.42E+01
RELATIVE % UNCERTAINTY		3.3

Result = DF * PF * DDF * IR * 1000

Detection Level = 3.70 E-08 * DF * PF * DDF * 1000

Relative % Uncertainty = IU / IR * 100

Analyst: DGG Date: 29-Feb-96

Signature of Chemist: JLS Date: 2/29/96

SAMPLE.WB1 REV 1.2 925009ML

WORKBOOK PAGE: SAM7

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type	SAMPLE
Work List	5403
Test Code	@U-01
Matrix	LIQUID
Batch Number	96001644
Rerun	0
Sample Prep	N/A
Sample #	S96V000008
Instrument Code	U01
Prepared By	JLS
Chemist	JLS
Analyst	DGG
Date Complete	02/29/96
Analysis Date	02/17/96
Analysis Time	11:50 AM
Sample Point	AP-104

		SAMPLE
VOLUME OF SAMPLE (mL)	(SS)	1.00
DILUTION FACTOR OF SAMPLE	(DF)	1.00
PREPARATION FACTOR OF SAMPLE	(PF)	10.00
DIGEST DILUTION FACTOR	(DDF)	1.0000
LIFETIME IN MICROSECONDS		167.00
R2 VALUE		0.9962
RANGE (HIGH OR LOW)		HIGH
INSTRUMENT UNCERTAINTY	(IU)	3.74E-05
INSTRUMENT RESULT	(IR)	9.76E-04
DETECTION LEVEL (µg/mL)		3.70E-04
CONCENTRATION IN SOLUTION (g/L)		9.76E-03
RESULT (µg/mL)		9.76E+00
RELATIVE % UNCERTAINTY		3.8

Result = DF * PF * DDF * IR * 1000

Detection Level = 3.70 E-08 * DF * PF * DDF * 1000

Relative % Uncertainty = IU / IR * 100

Analyst: DGG Date: 29-Feb-96

Signature of Chemist: JLS Date: 2/29/96

SAMPLE.WB1 REV 1.2 925009ML

WORKBOOK PAGE: SAM8

Uranium by Phosphorescence: LA-925-009 (A-1) LIQUID/SOLID

Type
SAMPLE
Work List
5403
Test Code
@U-01
Matrix
LIQUID
Batch Number
96001644
Rerun
0
Sample Prep
N/A
Sample #
S96V000014
Instrument Code
U01
Prepared By
JLS
Chemist
JLS
Analyst
DGG
Date Complete
02/29/96
Analysis Date
02/17/96
Analysis Time
11:50 AM
Sample Point
AP-104

		SAMPLE
VOLUME OF SAMPLE (mL)	(SS)	1.00
DILUTION FACTOR OF SAMPLE	(DF)	1.00
PREPARATION FACTOR OF SAMPLE	(PF)	10.00
DIGEST DILUTION FACTOR	(DDF)	1.0000
LIFETIME IN MICROSECONDS		223.00
R2 VALUE		0.9949
RANGE (HIGH OR LOW)		LOW
INSTRUMENT UNCERTAINTY	(IU)	8.88E-09
INSTRUMENT RESULT	(IR)	3.91E-07
DETECTION LEVEL (µg/mL)		3.70E-04
CONCENTRATION IN SOLUTION (g/L)		3.91E-06
RESULT (µg/mL)		3.91E-03
RELATIVE % UNCERTAINTY		2.3

Result = DF * PF * DDF * IR * 1000

Detection Level = 3.70 E-08 * DF * PF * DDF * 1000

Relative % Uncertainty = IU / IR * 100

Analyst:	DGG	Date:	29-Feb-96
Signature of Chemist:	JLS	Date:	2/29/96

SAMPLE.WB1 REV 1.2 925009ML

LABCORE Data Entry Template for Worklist# 5616

Analyst: ALL **Instrument:** AB00 15 **Book#** 33856

Method: LA-508-101 Rev/Mod 0-2

Worklist Comment: Determine sample size using Ludlum. Use 0.1mL spk. skm

S	Type	Sample#	R	A	Test	Matrix	Group#	Project
1	STD				@AB-01	LIQUID		
2	BLNK-PREP				@AB-01	LIQUID		
3	BLNK/BKG				@AB-01	LIQUID		
4	SAMPLE	S96V000009	0	B	@AB-01	LIQUID	96000036	AP-104
	Analytes Requested: ALPHA01 , ALPHA01E, BETA-01 , BETA-01E							
5	DUP	S96V000009	0	B	@AB-01	LIQUID		
6	SAMPLE	S96V000010	0	B	@AB-01	LIQUID	96000036	AP-104
	Analytes Requested: ALPHA01 , ALPHA01E, BETA-01 , BETA-01E							
7	DUP	S96V000010	0	B	@AB-01	LIQUID		
8	SPK	S96V000010	0	B	@AB-01	LIQUID		
9	SPK-DUP	S96V000010	0	B	@AB-01	LIQUID		
10	SAMPLE	S96V000011	0	B	@AB-01	LIQUID	96000036	AP-104
	Analytes Requested: ALPHA01 , ALPHA01E, BETA-01 , BETA-01E							
11	DUP	S96V000011	0	B	@AB-01	LIQUID		
12	SAMPLE	S96V000013	0	B	@AB-01	LIQUID	96000036	AP-104
	Analytes Requested: ALPHA01 , ALPHA01E, BETA-01 , BETA-01E							
13	DUP	S96V000013	0	B	@AB-01	LIQUID		
14	SAMPLE	S96V000015	0	B	@AB-01	LIQUID	96000036	AP-104
	Analytes Requested: ALPHA01 , ALPHA01E, BETA-01 , BETA-01E							
15	DUP	S96V000015	0	B	@AB-01	LIQUID		

Data Entry Comments:

Sample & dup results indicated possible contamination.
Sample will be rerun. [signature] 2/26/96

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

WHC-SD-WM-DP-142, REV.1

LABCORE Data Entry Template for Worklist# 5616

S Type	Sample#	R	A	Test	Matrix	Group#	Project

Final page for worklist # 5616

G Lewis 2/21/96
Analyst Signature Date

Analyst Signature Date 2/23/96

Data Entry Comments:

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

LABCORE Completed Worklist Report for Worklist# 5616

Analyst: akl **Instrument:** AB15 **Book#** _____

Method: _____ Rev/Mod _____

Worklist Comment: Determine sample size using Ludlum. Use 0.1mL spk. skm

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
1	STD		0	@AB-01	ALPHA01	LIQUID	1.66E-05	1.42E-5	85.540	% Recovery
1	STD		0	@AB-01	ALPHA01E	LIQUID	1	4.18E+00	4.180	% Ct. Error
1	STD		0	@AB-01	BETA-01	LIQUID	2.36E-04	2.23E-4	94.490	% Recovery
1	STD		0	@AB-01	BETA-01E	LIQUID	1	7.90E-01	0.790	% Ct. Error
2	BLNK-PREP		0	@AB-01	ALPHA01	LIQUID	1	<9.72E-5		uCi/mL
2	BLNK-PREP		0	@AB-01	ALPHA01E	LIQUID	1.00	5.00E+02	500.000	% Ct. Error
2	BLNK-PREP		0	@AB-01	BETA-01	LIQUID	1	<4.77E-4		uCi/mL
2	BLNK-PREP		0	@AB-01	BETA-01E	LIQUID	1.00	5.00E+02	500.000	% Ct. Error
3	BLNK/BKG		0	@AB-01	ALPHA01	LIQUID	1.00E+00	2.50E+00	2.500	uCi/mL
3	BLNK/BKG		0	@AB-01	BETA-01	LIQUID	1.00E+00	1.04E+00	1.040	uCi/mL
4	SAMPLE	S96V000009	0	@AB-01	ALPHA01	LIQUID	N/A	2.36E-04	1.500e-004	uCi/mL
4	SAMPLE	S96V000009	0	@AB-01	ALPHA01E	LIQUID	N/A	5.99E+01	0.000	% Ct. Error
4	SAMPLE	S96V000009	0	@AB-01	BETA-01	LIQUID	N/A	6.25E+00	7.170e-004	uCi/mL
4	SAMPLE	S96V000009	0	@AB-01	BETA-01E	LIQUID	N/A	2.20E-01	0.000	% Ct. Error
5	DUP	S96V000009	0	@AB-01	ALPHA01	LIQUID	2.36E-4	2.29E-4	3.010	RPD
5	DUP	S96V000009	0	@AB-01	ALPHA01E	LIQUID	1.00	7.35E+01	73.500	% Ct. Error
5	DUP	S96V000009	0	@AB-01	BETA-01	LIQUID	6.25E+0	6.23E+0	0.320	RPD
5	DUP	S96V000009	0	@AB-01	BETA-01E	LIQUID	1.00	2.21E-01	0.220	% Ct. Error
6	SAMPLE	S96V000010	0	@AB-01	ALPHA01	LIQUID	N/A	4.51E-04	1.500e-004	uCi/mL
6	SAMPLE	S96V000010	0	@AB-01	ALPHA01E	LIQUID	N/A	4.26E+01	0.000	% Ct. Error
6	SAMPLE	S96V000010	0	@AB-01	BETA-01	LIQUID	N/A	3.86E+00	7.170e-004	uCi/mL
6	SAMPLE	S96V000010	0	@AB-01	BETA-01E	LIQUID	N/A	2.80E-01	0.000	% Ct. Error
7	DUP	S96V000010	0	@AB-01	ALPHA01	LIQUID	4.51E-4	4.65E-4	3.060	RPD
7	DUP	S96V000010	0	@AB-01	ALPHA01E	LIQUID	1.00	4.17E+01	41.700	% Ct. Error
7	DUP	S96V000010	0	@AB-01	BETA-01	LIQUID	3.86E+0	3.98E+0	3.060	RPD
7	DUP	S96V000010	0	@AB-01	BETA-01E	LIQUID	1.00	2.76E-01	0.280	% Ct. Error
8	SPK	S96V000010	0	@AB-01	ALPHA01	LIQUID	3.92E-02	3.76E-02	95.920	% Recovery
8	SPK	S96V000010	0	@AB-01	BETA-01	LIQUID	1.69E-01	1.65E-01	97.630	% Recovery
9	SPK-DUP	S96V000010	0	@AB-01	ALPHA01	LIQUID	3.76E-02	3.94E-02	4.680	RPD
9	SPK-DUP	S96V000010	0	@AB-01	BETA-01	LIQUID	1.65E-01	1.77E-01	7.020	RPD
10	SAMPLE	S96V000011	0	@AB-01	ALPHA01	LIQUID	N/A	3.61E-04	1.500e-004	uCi/mL
10	SAMPLE	S96V000011	0	@AB-01	ALPHA01E	LIQUID	N/A	4.37E+01	0.000	% Ct. Error
10	SAMPLE	S96V000011	0	@AB-01	BETA-01	LIQUID	N/A	4.00E+00	7.170e-004	uCi/mL
10	SAMPLE	S96V000011	0	@AB-01	BETA-01E	LIQUID	N/A	2.75E-01	0.000	% Ct. Error
11	DUP	S96V000011	0	@AB-01	ALPHA01	LIQUID	3.61E-4	3.40E-4	5.990	RPD
11	DUP	S96V000011	0	@AB-01	ALPHA01E	LIQUID	1.00	9.17E+01	91.700	% Ct. Error
11	DUP	S96V000011	0	@AB-01	BETA-01	LIQUID	4.00E+0	3.97E+0	0.750	RPD
11	DUP	S96V000011	0	@AB-01	BETA-01E	LIQUID	1.00	2.76E-01	0.280	% Ct. Error
12	SAMPLE	S96V000013	0	@AB-01	ALPHA01	LIQUID	N/A	3.05E-04	1.500e-004	uCi/mL
12	SAMPLE	S96V000013	0	@AB-01	ALPHA01E	LIQUID	N/A	5.16E+01	0.000	% Ct. Error
12	SAMPLE	S96V000013	0	@AB-01	BETA-01	LIQUID	N/A	3.75E+00	7.170e-004	uCi/mL

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

LABCORE Completed Worklist Report for Worklist# 5616

Seq	Type	Sample#	R	A	Test	Matrix	Actual	Found	DL or Yield	Unit
12	SAMPLE	S96V000013	0	B @AB-01	BETA-01E	LIQUID	N/A	2.86E-01	0.000	% Ct. Error
13	DUP	S96V000013	0	B @AB-01	ALPHA01	LIQUID	3.05E-4	2.36E-4	25.510	RPD
13	DUP	S96V000013	0	B @AB-01	ALPHA01E	LIQUID	1.00	5.75E+01	57.500	% Ct. Error
13	DUP	S96V000013	0	B @AB-01	BETA-01	LIQUID	3.75E+0	3.79E+0	1.060	RPD
13	DUP	S96V000013	0	B @AB-01	BETA-01E	LIQUID	1.00	2.84E-01	0.280	% Ct. Error
14	SAMPLE	S96V000015	0	B @AB-01	ALPHA01	LIQUID	N/A <	5.02E-06	6.820e-006	uCi/mL
14	SAMPLE	S96V000015	0	B @AB-01	ALPHA01E	LIQUID	N/A	5.00E+02	0.000	% Ct. Error
14	SAMPLE	S96V000015	0	B @AB-01	BETA-01	LIQUID	N/A <	3.12E-05	3.260e-005	uCi/mL
14	SAMPLE	S96V000015	0	B @AB-01	BETA-01E	LIQUID	N/A	1.29E+02	0.000	% Ct. Error
15	DUP	S96V000015	0	B @AB-01	ALPHA01	LIQUID	<5.02E-6	<6.94E-6		RPD
15	DUP	S96V000015	0	B @AB-01	ALPHA01E	LIQUID	1.00	1.96E+02	196.000	% Ct. Error
15	DUP	S96V000015	0	B @AB-01	BETA-01	LIQUID	<3.12E-5	3.57E-4		RPD
15	DUP	S96V000015	0	B @AB-01	BETA-01E	LIQUID	1.00	8.37E+00	8.370	% Ct. Error

Final page for worklist# 5616

Analyst Signature Date

Analyst Signature Date

Reviewer Signature 2/26/96 Date

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

WORKBOOK PAGE: STD1

TB : LA-508-101 (D-2) STANDARD

Type	STD
Work List	5616
AT or TB ?	TB
Test Code	@AB-01
Matrix	LIQUID
Batch Number	96001182
Rerun	0
Sample Prep	N/A
Sample #	WL5616
Instrument Code	WB26872
Prepared By	MCB
Chemist	SLF
Analyst	AKL
Date Complete	02/23/96
Analysis Date	02/21/96
Analysis Time	03:30 PM
Sample Point	AP-104

		STANDARD	REPLICATE
DETECTOR NUMBER		15	15
DISH SIZE (1 , 2 , or 5)	(MS)	2	2
GROSS COUNTS	(GC)	62727	62698
COUNT TIME in MINUTES	(CT)	30	30
BACKGROUND in cpm	(BKG)	12	12
SAMPLE SIZE in mL	(SS)	10.000	10.000
DILUTION FACTOR	(DF)	1	1
STANDARD BOOK NUMBER	(Std BN)	33B56	33B56
EFFICIENCY FACTOR	(EFF)	0.4207	0.4207
Lc, Rmax, or Rs,(SAMPLE RATE) as APPROPRIATE		2078.900	2077.933
Standard Value in µCi/mL		2.36E-04	
Concentration in µCi/L	=	2.23E-01	
Replicate Concentration in µCi/L	=	2.22E-01	
AVERAGE CONCENTRATION in µCi/L	=	2.2254E-01	

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

TOTAL BETA µCi/L = Rs * 1000mL/L * DF / (EFF * SS * 2220000dpm/µCi)

TOTAL BETA µCi/mL = TOTAL BETA µCi/L / 1000mL/L

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

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

			DETECTION LEVEL
TOTAL BETA CONTRATION in µCi/mL		2.23E-04	
RELATIVE COUNTING ERROR	=	0.8%	3.26E-07 µCi/mL

Analyst: MCB Date: 23-Feb-96

Signature of Chemist: SLF Date: 2/26/96

STANDARD.WB1 Rev. 1.0 508101ML

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

			STANDARD	REPLICATE
DETECTOR NUMBER			15	15
DISH SIZE (1 , 2 , or 5)		(MS)	2	2
GROSS COUNTS		(GC)	2209	2296
COUNT TIME in MINUTES		(CT)	30	30
BACKGROUND in cpm		(BKG)	0.1	0.1
SAMPLE SIZE in mL		(SS)	10.000	10.000
DILUTION FACTOR		(DF)	1	1
STANDARD BOOK NUMBER		(Std BN)	33B56	33B56
EFFICIENCY FACTOR		(EFF)	0.2380	0.2380
Lc, Rmax, or Rs,(SAMPLE RATE) as APPROPRIATE			73.533	76.433
Standard Value in µCi/mL			1.66E-05	
Concentration in µCi/L	=		1.39E-02	
Replicate Concentration in µCi/L	=		1.45E-02	
AVERAGE CONCENTRATION in µCi/L	=		1.4192E-02	

Type	STD
Work List	5616
AT or TB ?	AT
Test Code	@AB-01
Matrix	LIQUID
Batch Number	96001182
Rerun	0
Sample Prep	N/A
Sample #	WL5616
Instrument Code	WB26872
Prepared By	MCB
Chemist	SLF
Analyst	AKL
Date Complete	02/23/96
Analysis Date	02/21/96
Analysis Time	03:30 PM
Sample Point	AP-104

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

ALPHA TOTAL µCi/L = Rs * 1000mL/L * DF / (EFF * SS * 2220000dpm/µCi)

ALPHA TOTAL µCi/mL = ALPHA TOTAL µCi/L / 1000mL/L

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

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

			DETECTION LEVEL
ALPHA TOTAL CONCENTRATION in µCi/mL		1.42E-05	
RELATIVE COUNTING ERROR	=	4.2%	6.82E-08 µCi/mL

Analyst:	MCB	Date:	23-Feb-96
Signature of Chemist:	SLF	Date:	2/26/96

STANDARD.WB1 Rev. 1.0 508101ML

WORKBOOK PAGE: BLANK3

TB : LA-508-101 (D-2) LIQUIDS

			BLNK-PREP	REPLICATE
Type	DETECTOR NUMBER		15	15
BLNK-PREP	DISH SIZE (1, 2, or 5)	(MS)	2	2
Work List	GROSS COUNTS	(GC)	376	375
5616	COUNT TIME in MINUTES	(CT)	30	30
AT or TB ?	BACKGROUND in cpm	(BKG)	12	12
TB	SAMPLE SIZE in mL	(SS)	0.500	0.500
Test Code	DILUTION FACTOR	(DF)	11	11
@AB-01	DIGEST DILUTION FACTOR	(DDF)	10	10
Matrix	EFFICIENCY FACTOR	(EFF)	0.4207	0.4207
LIQUID	Lc, Rmax, or Rs,(SAMPLE RATE) as APPROPRIATE		2.025	1.991
Batch Number				
96001182	Blank Concentration in µCi/L	<	4.77E-01	
Rerun	Replicate Concentration in µCi/L	<	4.69E-01	
0	Maximum Concentration in µCi/L	<	4.7711E-01	
Sample Prep				
N/A	Rs (Sample Count Rate) = (TC / CT) - BKG			
Sample #	TOTAL BETA µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)			
WL5616	TOTAL BETA µCi/mL = TOTAL BETA µCi/L / 1000mL/L			
Instrument Code	Relative Counting Error = [|(The Square Root of TC + BKG * CT) / (TC - BKG * CT)|] * 1.96 * 100			
WB26872	Detection Levels and Less Than Values are determined from Procedure LA-508-002.			
Prepared By				
MCB				
Chemist				
SLF	TOTAL BETA in µCi/mL (Maximum) =		< 4.77E-04	DETECTION LEVEL
Analyst				
AKL	LESS THAN Value was Determined from Rmax.			7.17E-04 µCi/mL
Date Complete				
02/23/96	RELATIVE COUNTING ERROR		500.0%	
Analysis Date				
02/21/96				
Analysis Time				
03:30 PM				
Sample Point				
AP-104				

Analyst:		AKL	Date: 23-Feb-96
Signature of Chemist:		SLF	Date: 2/26/96

BLANK.WB1 Rev. 1.0 508101ML

WORKBOOK PAGE: BLANK4

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

Type			BLNK-PREP	REPLICATE
BLNK-PREP	DETECTOR NUMBER		15	15
Work List	DISH SIZE (1 , 2 , or 5)	(MS)	2	2
5616	GROSS COUNTS	(GC)	5	10
AT or TB ?	COUNT TIME in MINUTES	(CT)	30	30
AT	BACKGROUND in cpm	(BKG)	0.1	0.1
Test Code	SAMPLE SIZE in mL	(SS)	0.500	0.500
@AB-01	DILUTION FACTOR	(DF)	11	11
Matrix	DIGEST DILUTION FACTOR	(DDF)	10	10
LIQUID	EFFICIENCY FACTOR	(EFF)	0.2380	0.2380
Batch Number	Lc, Rmax, or Rs,(SAMPLE RATE) as APPROPRIATE		0.222	0.233
96001182	Blank Concentration in µCi/L	<	9.25E-02	
Rerun	Replicate Concentration in µCi/L		9.72E-02	
0	Maximum Concentration in µCi/L	<	9.7156E-02	
Sample Prep				
N/A	Rs (Sample Count Rate) = (TC / CT) - BKG			
Sample #	ALPHA TOTAL µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)			
WL5616	ALPHA TOTAL µCi/mL = ALPHA TOTAL µCi/L / 1000mL/L			
Instrument Code	Relative Counting Error = [|(The Square Root of TC + BKG * CT) / (TC - BKG * CT)|] * 1.96 * 100			
WB26872	Detection Levels and Less Than Values are determined from Procedure LA-508-002.			
Prepared By				
MCB				
Chemist				
SLF	ALPHA TOTAL in µCi/mL (Maximum) = < 9.72E-05			DETECTION LEVEL
Analyst				
AKL	LESS THAN Value was Determined from Rmax.			1.50E-04 µCi/mL
Date Complete				
02/23/96	RELATIVE COUNTING ERROR 500.0%			
Analysis Date				
02/21/96				
Analysis Time				
03:30 PM				
Sample Point				
AP-104				

Analyst:		AKL	Date: 23-Feb-96
Signature of Chemist:		SLF	Date: 2/26/96

BLANK.WB1 Rev. 1.0 508101ML

WORKBOOK PAGE: SAM7 WHC-SD-WM-DP-~~142~~, REV. 1

TB : LA-508-101 (D-2) LIQUIDS

			SAMPLE	REPLICATE
Type	DETECTOR NUMBER		15	15
SAMPLE	DISH SIZE (1 , 2 , or 5)	(MS)	2	2
Work List	GROSS COUNTS	(GC)	792032	801324
5616	COUNT TIME In MINUTES	(CT)	30	30
AT or TB ?	BACKGROUND In cpm	(BKG)	12	12
TB	SAMPLE SIZE In mL	(SS)	0.500	0.500
Test Code	DILUTION FACTOR	(DF)	11	11
@AB-01	DIGEST DILUTION FACTOR	(DDF)	10	10
Matrix	EFFICIENCY FACTOR	(EFF)	0.4207	0.4207
LIQUID	Lc, Rmax, or Rs,(SAMPLE RATE) as APPROPRIATE		26389.067	26698.800
Batch Number				
96001182	Blank Concentration In µCi/L		6.22E+03	
Rerun	Replicate Concentration In µCi/L		6.29E+03	
0	Average Concentration In µCi/L		6.2526E+03	

Sample Prep	
ACIDIG02	Rs (Sample Count Rate) = (TC / CT) - BKG
Sample #	TOTAL BETA µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)
S96V000009	TOTAL BETA µCi/mL = TOTAL BETA µCi/L / 1000mL/L
Instrument Code	Relative Counting Error = [ ](The Square Root of TC + BKG * CT) / (TC - BKG * CT)]] * 1.96 * 100
WB26872	Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Prepared By	
MCB	
Chemist	
SLF	TOTAL BETA In µCi/mL (Average) = 6.25E+00
Analyst	
AKL	
Date Complete	
02/23/96	RELATIVE COUNTING ERROR 0.2%
Analysis Date	
02/21/96	
Analysis Time	
03:30 PM	
Sample Point	
AP-104	

DETECTION LEVEL
7.17E-04 µCi/mL

Analyst:		AKL	Date: 23-Feb-96
Signature of Chemist:		SLF	Date: 2/26/96

SAMPLE.WB1 Rev. 1.0 508101ML

WORKBOOK PAGE: SAM8

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

Type	DETECTOR NUMBER		SAMPLE	REPLICATE
SAMPLE	DISH SIZE (1 , 2 , or 5)	(MS)	2	2
Work List	GROSS COUNTS	(GC)	22	18
5616	COUNT TIME in MINUTES	(CT)	30	30
AT or TB ?	BACKGROUND in cpm	(BKG)	0.1	0.1
AT	SAMPLE SIZE in mL	(SS)	0.500	0.500
Test Code	DILUTION FACTOR	(DF)	11	11
@AB-01	DIGEST DILUTION FACTOR	(DDF)	10	10
Matrix	EFFICIENCY FACTOR	(EFF)	0.2380	0.2380
LIQUID	Lc, Rmax, or Rs,(SAMPLE RATE) as APPROPRIATE		0.633	0.500

Batch Number		
96001182	Blank Concentration in µCi/L	2.64E-01
Rerun	Replicate Concentration in µCi/L	2.08E-01
0	Average Concentration in µCi/L	2.3595E-01

Sample Prep	
ACIDIG02	Rs (Sample Count Rate) = (TC / CT) - BKG
Sample #	ALPHA TOTAL µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)
S96V000009	ALPHA TOTAL µCi/mL = ALPHA TOTAL µCi/L / 1000mL/L
Instrument Code	Relative Counting Error = [|(The Square Root of TC + BKG * CT) / (TC - BKG * CT)|] * 1.96 * 100
WB26872	Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Prepared By				
MCB				
Chemist				
SLF	ALPHA TOTAL in µCi/mL (Average)	=	2.36E-04	DETECTION LEVEL
Analyst				
AKL				1.50E-04
Date Complete				µCi/mL
02/23/96	RELATIVE COUNTING ERROR		59.9%	
Analysis Date				
02/21/96				
Analysis Time				
03:30 PM				
Sample Point				
AP-104				

Analyst:		AKL	Date: 23-Feb-96
Signature of Chemist:		SLF	Date: 2/26/96

SAMPLE.WB1 Rev. 1.0 508101ML

WORKBOOK PAGE: DUP9 WHC-SD-WM-DP-142-REV.1

TB : LA-508-101 (D-2) LIQUIDS

			DUP	REPLICATE
Type	DETECTOR NUMBER		15	15
DUP	DISH SIZE (1 , 2 , or 5)	(MS)	2	2
Work List	GROSS COUNTS	(GC)	798475	788239
5616	COUNT TIME In MINUTES	(CT)	30	30
AT or TB ?	BACKGROUND in cpm	(BKG)	12	12
TB	SAMPLE SIZE in mL	(SS)	0.500	0.500
Test Code	DILUTION FACTOR	(DF)	11	11
@AB-01	DIGEST DILUTION FACTOR	(DDF)	10	10
Matrix	EFFICIENCY FACTOR	(EFF)	0.4207	0.4207
LIQUID	Lc, Rmax, or Rs,(SAMPLE RATE) as APPROPRIATE		26603.833	26262.633

Batch Number		
96001182	Blank Concentration In µCi/L	6.27E+03
Rerun	Replicate Concentration In µCi/L	6.19E+03
0	Average Concentration In µCi/L	6.2266E+03

Sample Prep	
ACIDIG02	Rs (Sample Count Rate) = (TC / CT) - BKG
Sample #	TOTAL BETA µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)
S96V000009	TOTAL BETA µCi/mL = TOTAL BETA µCi/L / 1000mL/L
Instrument Code	Relative Counting Error = [|(The Square Root of TC + BKG * CT) / (TC - BKG * CT)|] * 1.96 * 100
WB26872	Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Prepared By	
MCB	
Chemist	
SLF	
Analyst	
AKL	
Date Complete	
02/23/96	
Analysis Date	
02/21/96	
Analysis Time	
03:30 PM	
Sample Point	
AP-104	

TOTAL BETA in µCi/mL (Average)	=	6.23E+00	DETECTION LEVEL
RELATIVE COUNTING ERROR		0.2%	7.17E-04 µCi/mL

Analyst:		AKL	Date: 23-Feb-96
Signature of Chemist:		SLF	Date: 2/26/96

SAMPLE.WB1 Rev. 1.0 508101ML

WORKBOOK PAGE: DUP1

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

Type	DETECTOR NUMBER		DUP	REPLICATE
DUP	DISH SIZE (1 , 2 , or 5)	(MS)	2	2
Work List	GROSS COUNTS	(GC)	14	25
5616	COUNT TIME in MINUTES	(CT)	30	30
AT or TB ?	BACKGROUND in cpm	(BKG)	0.1	0.1
AT	SAMPLE SIZE in mL	(SS)	0.500	0.500
Test Code	DILUTION FACTOR	(DF)	11	11
@AB-01	DIGEST DILUTION FACTOR	(DDF)	10	10
Matrix	EFFICIENCY FACTOR	(EFF)	0.2380	0.2380
LIQUID	Lc, Rmax, or Rs,(SAMPLE RATE) as APPROPRIATE		0.367	0.733

Batch Number		
96001182	Blank Concentration in µCi/L	1.53E-01
Rerun	Replicate Concentration in µCi/L	3.05E-01
0	Average Concentration in µCi/L	2.2901E-01

Sample Prep	
ACIDIG02	Rs (Sample Count Rate) = (TC / CT) - BKG
Sample #	ALPHA TOTAL µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)
S96V000009	ALPHA TOTAL µCi/mL = ALPHA TOTAL µCi/L / 1000mL/L
Instrument Code	Relative Counting Error = [ ](The Square Root of TC + BKG * CT) / (TC - BKG * CT)[ ] * 1.96 * 100
WB26872	Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Prepared By	
MCB	
Chemist	
SLF	
Analyst	
AKL	
Date Complete	
02/23/96	
Analysis Date	
02/21/96	
Analysis Time	
03:30 PM	
Sample Point	
AP-104	

ALPHA TOTAL in µCi/mL (Average) =	2.29E-04	DETECTION LEVEL
		1.50E-04 µCi/mL
RELATIVE COUNTING ERROR	73.5%	

Analyst:		AKL	Date: 23-Feb-96
Signature of Chemist:		SLF	Date: 2/26/96

SAMPLE.WB1 Rev. 1.0 508101ML

TB : LA-508-101 (D-2) LIQUIDS

			SAMPLE	REPLICATE
Type	DETECTOR NUMBER		15	15
SAMPLE	DISH SIZE (1 , 2 , or 5)	(MS)	2	2
Work List	GROSS COUNTS	(GC)	491313	492922
5616	COUNT TIME in MINUTES	(CT)	30	30
AT or TB ?	BACKGROUND in cpm	(BKG)	12	12
TB	SAMPLE SIZE in mL	(SS)	0.500	0.500
Test Code	DILUTION FACTOR	(DF)	11	11
@AB-01	DIGEST DILUTION FACTOR	(DDF)	10	10
Matrix	EFFICIENCY FACTOR	(EFF)	0.4207	0.4207
LIQUID	Lc, Rmax, or Rs,(SAMPLE RATE) as APPROPRIATE		16365.100	16418.733

Batch Number	
96001182	Blank Concentration in µCi/L 3.85E+03
Rerun	Replicate Concentration in µCi/L 3.87E+03
0	Average Concentration in µCi/L 3.8612E+03
Sample Prep	
ACIDIG02	Rs (Sample Count Rate) = (TC / CT) - BKG
Sample #	TOTAL BETA µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)
S96V000010	TOTAL BETA µCi/mL = TOTAL BETA µCi/L / 1000mL/L
Instrument Code	Relative Counting Error = [|(The Square Root of TC + BKG * CT) / (TC - BKG * CT)|] * 1.96 * 100
WB26872	Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Prepared By	
MCB	
Chemist	
SLF	TOTAL BETA in µCi/mL (Average) = 3.86E+00
Analyst	
AKL	
Date Complete	
02/23/96	RELATIVE COUNTING ERROR 0.3%
Analysis Date	
02/21/96	
Analysis Time	
03:30 PM	
Sample Point	
AP-104	

DETECTION LEVEL
7.17E-04 µCi/mL

Analyst: AKL Date: 23-Feb-96

Signature of Chemist: SLF Date: 2/26/96

SAMPLE.WB1 Rev. 1.0 508101ML

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

Type	DETECTOR NUMBER		SAMPLE	REPLICATE
SAMPLE	DISH SIZE (1 , 2 , or 5)	(MS)	2	2
Work List	GROSS COUNTS	(GC)	42	29
5616	COUNT TIME in MINUTES	(CT)	30	30
AT or TB ?	BACKGROUND in cpm	(BKG)	0.1	0.1
AT	SAMPLE SIZE in mL	(SS)	0.500	0.500
Test Code	DILUTION FACTOR	(DF)	11	11
@AB-01	DIGEST DILUTION FACTOR	(DDF)	10	10
Matrix	EFFICIENCY FACTOR	(EFF)	0.2380	0.2380
LIQUID	Lc, Rmax, or Rs,(SAMPLE RATE) as APPROPRIATE		1.300	0.867

Batch Number		
96001182	Blank Concentration in µCi/L	5.41E-01
Rerun	Replicate Concentration in µCi/L	3.61E-01
0	Average Concentration in µCi/L	4.5108E-01

Sample Prep	
ACIDIG02	Rs (Sample Count Rate) = (TC / CT) - BKG
Sample #	ALPHA TOTAL µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)
S96V000010	ALPHA TOTAL µCi/mL = ALPHA TOTAL µCi/L / 1000mL/L
Instrument Code	Relative Counting Error = [|(The Square Root of TC + BKG * CT) / (TC - BKG * CT)|] * 1.96 * 100
WB26872	Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Prepared By				
MCB				
Chemist				DETECTION LEVEL
SLF	ALPHA TOTAL in µCi/mL (Average)	=	4.51E-04	
Analyst				
AKL				1.50E-04 µCi/mL
Date Complete				
02/23/96	RELATIVE COUNTING ERROR		42.6%	
Analysis Date				
02/21/96				
Analysis Time				
03:30 PM				
Sample Point				
AP-104				

Analyst:		AKL	Date: 23-Feb-96
Signature of Chemist:		SLF	Date: 2/26/96

SAMPLE.WB1 Rev. 1.0 508101ML

WORKBOOK PAGE: DUP1

TB : LA-508-101 (D-2) LIQUIDS

Type	DETECTOR NUMBER		DUP	REPLICATE
DUP	DISH SIZE (1, 2, or 5)	(MS)	2	2
Work List	GROSS COUNTS	(GC)	504264	508991
5616	COUNT TIME in MINUTES	(CT)	30	30
AT or TB ?	BACKGROUND in cpm	(BKG)	12	12
TB	SAMPLE SIZE in mL	(SS)	0.500	0.500
Test Code	DILUTION FACTOR	(DF)	11	11
@AB-01	DIGEST DILUTION FACTOR	(DDF)	10	10
Matrix	EFFICIENCY FACTOR	(EFF)	0.4207	0.4207
LIQUID	Lc, Rmax, or Rs,(SAMPLE RATE) as APPROPRIATE		16796.800	16954.367

Batch Number		
96001182	Blank Concentration in µCi/L	3.96E+03
Rerun	Replicate Concentration in µCi/L	3.99E+03
0	Average Concentration in µCi/L	3.9752E+03

Sample Prep	
ACIDIG02	Rs (Sample Count Rate) = (TC / CT) - BKG
Sample #	TOTAL BETA µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)
S96V000010	TOTAL BETA µCi/mL = TOTAL BETA µCi/L / 1000mL/L
Instrument Code	Relative Counting Error = [|(The Square Root of TC + BKG * CT) / (TC - BKG * CT)|] * 1.96 * 100
WB26872	Detection Levels and Less Than Values are determined from Procedure LA-508-002.

Prepared By				
MCB				
Chemist				
SLF	TOTAL BETA in µCi/mL (Average)	=	3.98E+00	DETECTION LEVEL
Analyst				
AKL				7.17E-04 µCi/mL
Date Complete				
02/23/96	RELATIVE COUNTING ERROR		0.3%	
Analysis Date				
02/21/96				
Analysis Time				
03:30 PM				
Sample Point				
AP-104				

Analyst:		AKL	Date: 23-Feb-96
Signature of Chemist:		SLF	Date: 2/26/96

SAMPLE.WB1 Rev. 1.0 508101ML

WORKBOOK PAGE: DUP1 WHC-SD-WM-DP-142, REV. 1

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

			DUP	REPLICATE
Type	DETECTOR NUMBER		15	15
DUP	DISH SIZE (1, 2, or 5)	(MS)	2	2
Work List	GROSS COUNTS	(GC)	30	43
5616	COUNT TIME in MINUTES	(CT)	30	30
AT or TB ?	BACKGROUND in cpm	(BKG)	0.1	0.1
AT	SAMPLE SIZE in mL	(SS)	0.500	0.500
Test Code	DILUTION FACTOR	(DF)	11	11
@AB-01	DIGEST DILUTION FACTOR	(DDF)	10	10
Matrix	EFFICIENCY FACTOR	(EFF)	0.2380	0.2380
LIQUID	Lc, Rmax, or Rs,(SAMPLE RATE) as APPROPRIATE		0.900	1.333

Batch Number		
96001182	Blank Concentration in µCi/L	3.75E-01
Rerun	Replicate Concentration in µCi/L	5.55E-01
0	Average Concentration in µCi/L	4.6496E-01

Sample Prep	
ACIDIG02	Rs (Sample Count Rate) = (TC / CT) - BKG
Sample #	ALPHA TOTAL µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)
S96V000010	ALPHA TOTAL µCi/mL = ALPHA TOTAL µCi/L / 1000mL/L
Instrument Code	Relative Counting Error = [|(The Square Root of TC + BKG * CT) / (TC - BKG * CT)|] * 1.96 * 100
WB26872	Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Prepared By	
MCB	
Chemist	
SLF	
Analyst	
AKL	
Date Complete	
02/23/96	
Analysis Date	
02/21/96	
Analysis Time	
03:30 PM	
Sample Point	
AP-104	

		DETECTION LEVEL
ALPHA TOTAL in µCi/mL (Average) =	4.65E-04	
		1.50E-04 µCi/mL
RELATIVE COUNTING ERROR	41.7%	

Analyst:		AKL	Date: 23-Feb-96
Signature of Chemist:		SLF	Date: 2/26/96

SAMPLE.WB1 Rev. 1.0 508101ML

WORKBOOK PAGE: SPIKE15 "/HC-SD-WM-DP-142, REV. 1

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

			SPIKE	REPLICATE
DETECTOR NUMBER			15	15
DISH SIZE 1 , 2 , or 5		(MS)	2	2
TOTAL COUNTS		(TC)	313859	321822
COUNT TIME in MINUTES		(CT)	10	10
BACKGROUND in cpm		(BKG)	12	12
SAMPLE VOLUME in mL	(Spiked Vial)	(SS)	0.500	0.500
SAMPLE DILUTION FACTOR	(Spiked Vial)	(DF)	11	11
DIGEST DILUTION FACTOR		(DDF)	10	10
SPIKE VOLUME in mL		(SVol)	0.100	0.100
SPIKE DILUTION FACTOR		(SDF)	1	1
SPIKE BOOK NUMBER		(Spk BN)	86B52	86B52
SPIKE VALUE in µCi/mL		(SVal)	1.6895E-01	1.6895E-01
INSTRUMENT EFFICIENCY FACTOR		(EFF)	0.4207	0.4207
SAMPLE + SPIKE µCi/mL		(S+S)	7.39E+00	7.58E+00
AVERAGE or MAXIMUM µCi/mL in SAMPLE			3.8612E+00	

Type	SPK
Work List	5616
AT or TB ?	TB
Test Code	@AB-01
Matrix	LIQUID
Batch Number	96001182
Rerun	0
Sample Prep	ACIDIG02
Sample #	S96V000010
Instrument Code	WB26872
Prepared By	MCB
Chemist	SLF
Analyst	AKL
Date Complete	02/23/96
Analysis Date	02/21/96
Analysis Time	03:30 PM
Sample Point	AP-104

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

SAMPLE + SPIKE µCi/mL = Rs * DF * DDF / (EFF * SS * 2220000dpm/µCi)

QC ACTUAL = SVal

QC FOUND = (((S+S µCi/mL - SAMPLE µCi/mL) * ((SDF/SVol)/(DF*DDF/SS))))

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

QC ACTUAL	=	1.69E-01
QC FOUND	=	1.65E-01
AVG. PERCENT SPIKE RECOVERY	=	97.5%

Analyst:	MCB	Date: 23-Feb-96
Signature of Chemist:	SLF	Date: 2/26/96

SPIKE.WB1 Rev. 1.0 508101ML

WORKBOOK PAGE: SPIKE16

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

Type	DETECTOR NUMBER		SPIKE	REPLICATE
SPK	DISH SIZE 1 , 2 , or 5	(MS)	2	2
Work List	TOTAL COUNTS	(TC)	57644	61677
5616	COUNT TIME in MINUTES	(CT)	30	30
AT or TB ?	BACKGROUND in cpm	(BKG)	0.1	0.1
AT	SAMPLE VOLUME in mL (Spiked Vial)	(SS)	0.500	0.500
Test Code	SAMPLE DILUTION FACTOR (Spiked Vial)	(DF)	11	11
@AB-01	DIGEST DILUTION FACTOR	(DDF)	10	10
Matrix	SPIKE VOLUME in mL	(SVol)	0.100	0.100
LIQUID	SPIKE DILUTION FACTOR	(SDF)	1	1
Batch Number	SPIKE BOOK NUMBER	(Spk BN)	119B43	119B43
96001182	SPIKE VALUE in µCi/mL	(SVal)	3.9204E-02	3.9204E-02
Rerun	INSTRUMENT EFFICIENCY FACTOR	(EFF)	0.238	0.238
0	SAMPLE + SPIKE µCi/mL	(S+S)	8.00E-01	8.56E-01
Sample Prep	AVERAGE or MAXIMUM µCi/mL in SAMPLE		4.5108E-04	
ACIDIG02				
Sample #				
S96V000010	Rs (Sample Count Rate) = (TC / CT) - BKG			
Instrument Code	SAMPLE + SPIKE µCi/mL = Rs * DF * DDF / (EFF * SS * 2220000dpm/µCi)			
WB26872	QC ACTUAL = SVal			
Prepared By	QC FOUND = (((S+S µCi/mL - SAMPLE µCi/mL) * ((SDF/SVol)/(DF*DDF/SS))))			
MCB	PERCENT SPIKE RECOVERY = (QC FOUND / QC ACTUAL) *100			
Chemist				
SLF				
Analyst				
AKL				
Date Complete				
02/23/96				
Analysis Date				
02/21/96	QC ACTUAL	=	3.92E-02	
Analysis Time	QC FOUND	=	3.76E-02	
03:30 PM	AVG. PERCENT SPIKE RECOVERY	=	95.9%	
Sample Point				
AP-104				

Analyst:		MCB	Date: 23-Feb-96
Signature of Chemist:		SLF	Date: 2/24/96

SPIKE.WB1 Rev. 1.0 508101ML

WORKBOOK PAGE: SP_DUP17

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

Type	DETECTOR NUMBER		SPIKE	REPLICATE
SPK-DUP	DISH SIZE 1 , 2 , or 5	(MS)	2	2
Work List	TOTAL COUNTS	(TC)	328026	329903
5616	COUNT TIME in MINUTES	(CT)	10	10
AT or TB ?	BACKGROUND in cpm	(BKG)	12	12
TB	SAMPLE VOLUME in mL (Spiked Vial)	(SS)	0.500	0.500
Test Code	SAMPLE DILUTION FACTOR (Spiked Vial)	(DF)	11	11
@AB-01	DIGEST DILUTION FACTOR	(DDF)	10	10
Matrix	SPIKE VOLUME in mL	(SVol)	0.100	0.100
LIQUID	SPIKE DILUTION FACTOR	(SDF)	1	1
Batch Number	SPIKE BOOK NUMBER	(Spk BN)	86B52	86B52
96001182	SPIKE VALUE in µCi/mL	(SVal)	1.6895E-01	1.6895E-01
Rerun	INSTRUMENT EFFICIENCY FACTOR	(EFF)	0.4207	0.4207
0	SAMPLE + SPIKE µCi/mL	(S+S)	7.72E+00	7.77E+00
Sample Prep	AVERAGE or MAXIMUM µCi/mL in SAMPLE		3.8612E+00	
ACIDIG02				
Sample #				
S96V000010	Rs (Sample Count Rate) = (TC / CT) - BKG			
Instrument Code	SAMPLE + SPIKE µCi/mL = Rs * DF * DDF / (EFF * SS * 2220000dpm/µCi)			
WB26872	QC ACTUAL = SVal			
Prepared By	QC FOUND = (((S+S µCi/mL - SAMPLE µCi/mL) * ((SDF/SVol)/(DF*DDF/SS))))			
MCB	PERCENT SPIKE RECOVERY = (QC FOUND / QC ACTUAL) *100			
Chemist				
SLF				
Analyst				
AKL				
Date Complete				
02/23/96				
Analysis Date				
02/21/96	QC ACTUAL	=	1.69E-01	
Analysis Time	QC FOUND	=	1.77E-01	
03:30 PM	AVG. PERCENT SPIKE RECOVERY	=	104.5%	
Sample Point				
AP-104				

Analyst:		MCB	Date: 23-Feb-96
Signature of Chemist:		SLF	Date: 2/26/96

SPIKE.WB1 Rev. 1.0 508101ML()

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

Type	SPK-DUP
Work List	5616
AT or TB ?	AT
Test Code	@AB-01
Matrix	LIQUID
Batch Number	96001182
Rerun	0
Sample Prep	ACIDIG02
Sample #	S96V000010
Instrument Code	WB26872
Prepared By	MCB
Chemist	SLF
Analyst	AKL
Date Complete	02/23/96
Analysis Date	02/21/96
Analysis Time	03:30 PM
Sample Point	AP-104

			SPIKE	REPLICATE
DETECTOR NUMBER			15	15
DISH SIZE 1 , 2 , or 5		(MS)	2	2
TOTAL COUNTS		(TC)	61970	63036
COUNT TIME in MINUTES		(CT)	30	30
BACKGROUND in cpm		(BKG)	0.1	0.1
SAMPLE VOLUME in mL	(Spiked Vial)	(SS)	0.500	0.500
SAMPLE DILUTION FACTOR	(Spiked Vial)	(DF)	11	11
DIGEST DILUTION FACTOR		(DDF)	10	10
SPIKE VOLUME in mL		(SVol)	0.100	0.100
SPIKE DILUTION FACTOR		(SDF)	1	1
SPIKE BOOK NUMBER		(Spk BN)	119B43	119B43
SPIKE VALUE in µCi/mL		(SVal)	3.9204E-02	3.9204E-02
INSTRUMENT EFFICIENCY FACTOR		(EFF)	0.238	0.238
SAMPLE + SPIKE µCi/mL		(S+S)	8.60E-01	8.75E-01
AVERAGE or MAXIMUM µCi/mL in SAMPLE			4.5108E-04	

Rs (Sample Count Rate) = (TC / CT) - BKG
SAMPLE + SPIKE µCi/mL = Rs * DF * DDF / (EFF * SS * 2220000dpm/µCi)
QC ACTUAL = SVal
QC FOUND = (((S+S µCi/mL - SAMPLE µCi/mL) * ((SDF/SVol)/(DF*DDF/SS))))
PERCENT SPIKE RECOVERY = (QC FOUND / QC ACTUAL) *100

QC ACTUAL	=	3.92E-02
QC FOUND	=	3.94E-02
AVG. PERCENT SPIKE RECOVERY	=	100.5%

Analyst:		MCB	Date: 23-Feb-96
Signature of Chemist:		SLF	Date: 2/26/96

SPIKE.WB1 Rev. 1.0 508101ML

TB : LA-508-101 (D-2) LIQUIDS

Type			SAMPLE	REPLICATE
SAMPLE	DETECTOR NUMBER		15	15
Work List	DISH SIZE (1 , 2 , or 5)	(MS)	2	2
5616	GROSS COUNTS	(GC)	507218	513508
AT or TB ?	COUNT TIME in MINUTES	(CT)	30	30
TB	BACKGROUND in cpm	(BKG)	12	12
Test Code	SAMPLE SIZE in mL	(SS)	0.500	0.500
@AB-01	DILUTION FACTOR	(DF)	11	11
Matrix	DIGEST DILUTION FACTOR	(DDF)	10	10
LIQUID	EFFICIENCY FACTOR	(EFF)	0.4207	0.4207
Batch Number	Lc, Rmax, or Rs,(SAMPLE RATE) as APPROPRIATE		16895.267	17104.933
96001182	Blank Concentration in µCi/L		3.98E+03	
Rerun	Replicate Concentration in µCi/L		4.03E+03	
0	Average Concentration in µCi/L		4.0045E+03	
Sample Prep				
ACIDIG02	Rs (Sample Count Rate) = (TC / CT) - BKG			
Sample #	TOTAL BETA µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)			
S96V000011	TOTAL BETA µCi/mL = TOTAL BETA µCi/L / 1000mL/L			
Instrument Code	Relative Counting Error = [|(The Square Root of TC + BKG * CT) / (TC - BKG * CT)|] * 1.96 * 100			
WB26872	Detection Levels and Less Than Values are determined from Procedure LA-508-002.			
Prepared By				
MCB				
Chemist				
SLF	TOTAL BETA in µCi/mL (Average) =		4.00E+00	DETECTION LEVEL
Analyst				
AKL				7.17E-04 µCi/mL
Date Complete				
02/23/96	RELATIVE COUNTING ERROR		0.3%	
Analysis Date				
02/21/96				
Analysis Time				
03:30 PM				
Sample Point				
AP-104				

Analyst:		AKL	Date: 23-Feb-96
Signature of Chemist:		SLF	Date: 2/26/96

SAMPLE.WB1 Rev. 1.0 508101ML

WORKBOOK PAGE: SAM2

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

			SAMPLE	REPLICATE
Type	DETECTOR NUMBER		15	15
SAMPLE	DISH SIZE (1 , 2 , or 5)	(MS)	2	2
Work List	GROSS COUNTS	(GC)	28	30
5616	COUNT TIME in MINUTES	(CT)	30	30
AT or TB ?	BACKGROUND in cpm	(BKG)	0.1	0.1
AT	SAMPLE SIZE in mL	(SS)	0.500	0.500
Test Code	DILUTION FACTOR	(DF)	11	11
@AB-01	DIGEST DILUTION FACTOR	(DDF)	10	10
Matrix	EFFICIENCY FACTOR	(EFF)	0.2380	0.2380
LIQUID	Lc, Rmax, or Rs,(SAMPLE RATE) as APPROPRIATE		0.833	0.900
Batch Number				
96001182	Blank Concentration in µCi/L		3.47E-01	
Rerun	Replicate Concentration in µCi/L		3.75E-01	
0	Average Concentration in µCi/L		3.6087E-01	
Sample Prep				
ACIDIG02	Rs (Sample Count Rate) = (TC / CT) - BKG			
Sample #	ALPHA TOTAL µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)			
S96V000011	ALPHA TOTAL µCi/mL = ALPHA TOTAL µCi/L / 1000mL/L			
Instrument Code	Relative Counting Error = [|(The Square Root of TC + BKG * CT) / (TC - BKG * CT)|] * 1.96 * 100			
WB26872	Detection Levels and Less Than Values are determined from Procedure LA-508-002.			
Prepared By				
MCB				
Chemist				
SLF	ALPHA TOTAL in µCi/mL (Average) =		3.61E-04	DETECTION LEVEL
Analyst				
AKL				1.50E-04
Date Complete	RELATIVE COUNTING ERROR		43.7%	µCi/mL
02/23/96				
Analysis Date				
02/21/96				
Analysis Time				
03:30 PM				
Sample Point				
AP-104				

Analyst:		AKL	Date: 23-Feb-96
Signature of Chemist:		SLF	Date: 2/26/96

SAMPLE.WB1 Rev. 1.0 508101ML

WORKBOOK PAGE: DUP2

TB : LA-508-101 (D-2) LIQUIDS

Type	DETECTOR NUMBER		DUP	REPLICATE
DUP	DISH SIZE (1 , 2 , or 5)	(MS)	2	2
Work List	GROSS COUNTS	(GC)	503831	506967
5616	COUNT TIME In MINUTES	(CT)	30	30
AT or TB ?	BACKGROUND In cpm	(BKG)	12	12
TB	SAMPLE SIZE In mL	(SS)	0.500	0.500
Test Code	DILUTION FACTOR	(DF)	11	11
@AB-01	DIGEST DILUTION FACTOR	(DDF)	10	10
Matrix	EFFICIENCY FACTOR	(EFF)	0.4207	0.4207
LIQUID	Lc, Rmax, or Rs,(SAMPLE RATE) as APPROPRIATE		16782.367	16886.900

Batch Number		
96001182	Blank Concentration In µCi/L	3.95E+03
Rerun	Replicate Concentration In µCi/L	3.98E+03
0	Average Concentration In µCi/L	3.9655E+03

Sample Prep	
ACIDIG02	Rs (Sample Count Rate) = (TC / CT) - BKG
Sample #	TOTAL BETA µCi/L = Rs * 1000mL/L * DF * DDF / (EFF * SS * 2220000dpm/µCi)
S96V000011	TOTAL BETA µCi/mL = TOTAL BETA µCi/L / 1000mL/L
Instrument Code	Relative Counting Error = [|(The Square Root of TC + BKG * CT) / (TC - BKG * CT)|] * 1.96 * 100
WB26872	Detection Levels and Less Than Values are determined from Procedure LA-508-002.
Prepared By	
MCB	
Chemist	
SLF	
Analyst	
AKL	
Date Complete	
02/23/96	
Analysis Date	
02/21/96	
Analysis Time	
03:30 PM	
Sample Point	
AP-104	

TOTAL BETA in µCi/mL (Average) =	3.97E+00	DETECTION LEVEL
RELATIVE COUNTING ERROR	0.3%	7.17E-04 µCi/mL

Analyst:		AKL	Date: 23-Feb-96
Signature of Chemist:		SLF	Date: 2/26/96

SAMPLE.WB1 Rev. 1.0 508101ML