0012368

SINGLE-SHELL TANK WASTE CHARACTERIZATION FOR TANK 241-U-110 CORE 12
SEGMENT 2 3 4

DATA PACKAGE

SECTION

5 OF 10

219

012368

5 of 10

Westinghouse
Hanford Company

P.O. Box 1970 Richland, WA 99352

OCT 1990
RECEIVED
J.H. KESSNER

222-S/RCRA Analytical Laboratories

Project:	Single-Shell Tank Waste Characterization
Tank:	241-U-110
Core:	12
Segment:	3
Customer Id. Number:	89-071
Report Revision:	1
Date Printed:	October 29, 1990

Hanford Operations and Engineering Contractor for the US Department of Energy

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This report consists of pages 1 - 178.
The appendix consists of pages 1 - 41.

I have reviewed this report and certify that the package is in compliance with "Quality Assurance Project Plan for the Chemical Analysis of Highly Radioactive Samples in Support of Enviromental Activities on the Hanford Site" - WHC-SD-CP-QAPP-002. I found it to be a true and accurate accounting both technically and for completeness of the laboratory analyses performed on this sample.

Dennis K. Sato — Date 10-16-90

Dennis K. Sato
Data Coordinator

Cary M Seidel — Date 10-16-90

Cary M. Seidel
Unit Manager

L. H. Taylor — Date 10-30-90

Larry H. Taylor
Laboratory Q.A. Officer

INTRODUCTION

INTRODUCTION

Westinghouse Hanford Company Analytical Laboratories are supporting the characterization efforts of the single shell tanks. The characterization of tank 241-U-110 was performed under Phase 1A and 1B of the "Waste Characterization Plan for the Hanford Site Single-Shelled Tanks" (WHC-EP-0210).

Tank 241-U-110 has a 500,000 gallon capacity. Construction was completed in 1944. The tank received first cycle waste, REDOX high-level waste, coating waste, and laboratory waste until 1975. Between July 7, 1975 and February 2, 1976, P-10 pumps were installed, and 41,700 gallons of liquid waste were pumped from the tank. Tank 241-U-110 still contains an estimated 195,000 gallons of waste.

Analytical Laboratories performs all analytical analysis to the specifications of the "Quality Assurance Project Plan for the Chemical Analysis of Highly Radioactive Samples in Support of Environmental Activities on the Hanford Site", WHC-SD-CP-QAPP-002. In accordance with WHC-SD-CP-QAPP-002, the following laboratory policies are being followed. Spikes are performed on either the undissolved sample, or the sample after dissolution, as directed by the chemist. If the spike addition is found to be less than 20% of an analyte concentration, the spike recovery is not reported due to errors introduced by the precision of the sample analysis. The concentration of spike additions will be re-evaluated before the start of phase 1C. Two spiking routines are being used during phase 1A and 1B. For the following analyses, Ion Chromatography, Inductively Coupled Plasma, Mercury Hydride, Total Organic Carbon, and Carbonate analyses the solid sample is spiked independently from the sample digestion. Any non-homogeneity of the sample could adversely affect the spike recoveries. For the radio-isotopic analysis and other analyses not specified above, the spikes were performed by spiking an aliquot of sample after digestion.

The laboratory does not report sample results from batch analyses that are questionable. The results from questionable batches are discarded and the analysis is repeated. Sample cards (laboratory travelers) for the repeated analysis are reissued for analysis after they have been stamped "rerun". Laboratory travelers are issued using a computerized routine according to a "sample point". This sample point label (segment-n) on the Laboratory travelers and on the GEA analysis reports has no relationship to the sampling activities or the sample identification. All results in this data package relate only to the sample identified as segment 3 from core 12 taken from tank 241-U-110.

The organic analysis of this sample will be performed by Pacific Northwest Laboratories (PNL). Due to instrument and procedure problems, PNL has been unable to separate organics from the normal paraffin hydrocarbon present in the samples. The results from the organic analysis will be provided when available.

All sample results reported here by weight are reported as the "wet weight" of the sample. Some samples did noticeably lose moisture during the process of aliquoting and weighing the sample for digestion. In order to minimize errors due to loss of moisture, the percent moisture was determined at the earliest

opportunity. Attemps to dry the sample before analysis resulted in approximately a ten fold increase in radiation levels. In order to reduce and control radiation exposure to laboratory personnel, the samples were not dried before aliquoting and digestion. This may result in some laboratory results being biased high.

This report is formatted into sections corresponding to the type of dissolutions performed prior to analysis. A brief summary of analytical results is reported, followed by calibration data and an analysis are noted on the batch report. Any notable observations regarding an analysis are noted on the batch report for that analysis. Copies of laboratory travelers can be found in Appendix A.

SAMPLING AND CUSTODY DATA

CHAIN-OF-CUSTODY RECORD FOR CORE SAMPLING

(1) Shipment Number S-032-89 (2) Sample Number 89-071 (3) Supervisor DC Hartley

(4) Tank 110 4 (5) Riser #2 (6) Segment #3 (7) Cask Serial Number 1013C

Radiation Survey Data:	(8) FIELD	(20) LABORATORY
Over Top Dose Rate	<0.5 mr/hr	
Side Dose Rate	4 mr/hr	4 mr/hr
Bottom Dose Rate	1.5 mr/hr	
Smearable Contamination	<DET (alpha)	<Det (alpha)
	<DET (beta-gamma)	<Det (beta-gamma)
	RPT BJH (Signature)	RPT [illegible] (Signature)

(9) Shipment Description:

A. Work Package Number	2W-89-01060/W
B. Cask Seal Number	For Future Use
C. Sampler Number Used	47
D. Date and Time Sampler Unseated	11-29-89, 1446
E. Expected Liquid Content	10%
F. Expected Solid Content	90%
G. Dose Rate Through Drill String	130 mr/hr
H. Expected Sample Length	19'

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

Core #12 WHC-EP-0210 Waste Characterization Plan for the Hanford Site Single Shell Tanks

*Reference laboratory work request, if available.

Comments:

(11) POINT OF ORIGIN	(12) SENDER NAME / SENDER SIGNATURE	(13) DATE AND TIME RELEASED	(14) DESTINATION	(16) RECIPIENT NAME / RECIPIENT SIGNATURE	(17) DATE AND TIME RECEIVED
241-4 110	DC Hartley / DC Hartley	11-29-89 2045	2225 200 West	John C Abercrombie / [signature]	11/29/89 21:19

(15) Seal Intact Upon Release?	(18) Seal Intact Upon Receipt?	(19) Seal Data Consistent with this Record? Shipment No.	Sample No.
☒ Yes ☐ No	☒ Yes ☐ No	☒ Yes ☐ No	☒ Yes ☐ No

Single Shell Tank Waste Characterization
Summary of Core Sample

Tank ID:	241-U-110
Riser ID:	#2
Core ID:	#12

Date Sampling Initiated:	11-29-89
Date Sampling Completed:	11-29-89

Segment		
1	Lab Serial No.	F0393
	Customer ID No.	89-069
	Last Segment?	NO
2	Lab Serial No.	F0417
	Customer ID No.	89-070
	Last Segment?	NO
3	Lab Serial No.	F0441
	Customer ID No.	89-071
	Last Segment?	NO
4	Lab Serial No.	F0465
	Customer ID No.	89-072
	Last Segment?	YES
5	Lab Serial No.	
	Customer ID No.	
	Last Segment?	
6	Lab Serial No.	
	Customer ID No.	
	Last Segment?	
7	Lab Serial No.	
	Customer ID No.	
	Last Segment?	

Segment		
8	Lab Serial No.	
	Customer ID No.	
	Last Segment?	
9	Lab Serial No.	
	Customer ID No.	
	Last Segment?	
10	Lab Serial No.	
	Customer ID No.	
	Last Segment?	
11	Lab Serial No.	
	Customer ID No.	
	Last Segment?	
12	Lab Serial No.	
	Customer ID No.	
	Last Segment?	
13	Lab Serial No.	
	Customer ID No.	
	Last Segment?	
14	Lab Serial No.	
	Customer ID No.	
	Last Segment?	

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SAMPLE DATA SUMMARY

SUMMARY DATA REPORT

Reported results are wet sample weight

Single Shell Tank Project Phase 1B

Tank: 241-U-110
Core: 12
Segment: 4
Customer ID: 89-072

Untreated Sample Results

	Sample	Duplicate
pH	12.53	12.53
%Water	44.10%	44.36%

Fusion Analysis Results

	Sample		Duplicate	
Fusion Digestion	2.88	g/L	3.52	g/L
Total Alpha	5.97E-01	uci/g	<5.00E-01	uci/g
Total Beta	2.05E+03	uci/g	1.98E+03	uci/g
GEA				
Cs-137	2.36E-01	uci/g	2.24E+01	uci/g
Uranium	7.33E+03	ug/g	6.62E+03	ug/g

Water Digestion Results

	Sample		Duplicate	
Water Digestion	9.80	g/L	1.00E+01	g/L
Ion Chromatograph				
Fluoride	1.91E+03	ug/g	1.42E+03	ug/g
Chloride	<1.03E+03	ug/g	1.65E+03	ug/g
Nitrate	6.10E+04	ug/g	4.70E+04	ug/g
Phosphate	<1.03E+04	ug/g	<1.01E+04	ug/g
Sulfate	4.16E+03	ug/g	3.56E+03	ug/g
Total Organic Carbon	8.98E+02	ug/g	7.15E+02	ug/g

ICP Analytical Results

	Sample	Duplicate
Aluminum	36826 ug/g	48263 ug/g
Arsenic	165 ug/g	LT
Barium	78 ug/g	51 ug/g
Beryllium	5 ug/g	3 ug/g
Bismuth	6354 ug/g	5393 ug/g
Boron	968 ug/g	66 ug/g
Cadmium	28 ug/g	LT
Calcium	492 ug/g	515 ug/g
Cerium	1272 ug/g	LT
Chromium	794 ug/g	825 ug/g
Copper	112 ug/g	LT
Europium	21 ug/g	LT
Iron	6842 ug/g	8395 ug/g
Lanthanum	129 ug/g	LT
Lead	675 ug/g	175 ug/g
Lithium	39 ug/g	LT
Magnesium	1155 ug/g	173 ug/g
Manganese	5412 ug/g	6982 ug/g
Mercury	1477 ug/g	1374 ug/g
Molybdenum	58 ug/g	22 ug/g
Nickel	234 ug/g	166 ug/g
Phosphorous	2159 ug/g	1567 ug/g
Potassium	1560 ug/g	LT
Samarium	1239 ug/g	LT
Selenium	1188 ug/g	703 ug/g
Silver	98 ug/g	LT
Sodium	43084 ug/g	56657 ug/g
Strontium	526 ug/g	656 ug/g
Sulfur	928 ug/g	708 ug/g
Tantalum	256 ug/g	LT
Thallium	5297 ug/g	1093 ug/g
Thorium	2829 ug/g	185 ug/g
Tin	141 ug/g	69 ug/g
Titanium	61 ug/g	24 ug/g
Uranium	15299 ug/g	8549 ug/g
Vanadium	100 ug/g	52 ug/g
Zinc	104 ug/g	56 ug/g
Zirconium	260 ug/g	129 ug/g

LT Less then instrument detection limit.

PHYSICAL TEST RESULTS

Single Shell Tank
Extrusion of Segment -- Physical Tests

LAB SEGMENT SERIAL #: F0441 CUSTOMER ID: 89-071

ANALYST: Richard L. Weiss DATE EXTRUDED: January 29, 1990

DRAINABLE LIQUID Liquid Submitted for Segment Analysis? -- NO

GROSS <10ml	TARE		NET
SERIAL	DATE/TIME		ESTIMATED
SPECIFIC	CALCULATED		

APPEARANCE OF LIQUID: No liquid was collected

DIMENSIONS OF SEGMENT

Completed Segment Obtained? No	LENGTH: 12.0 inches	CALCULATED VOLUME: 9.4 in^3
REMARKS None		

APPEARANCE OF SOLIDS: Very dark brown color with firm solids.

PENETROMETER	10.0 lbs/sq in	REMARKS: None

HOMOGENIZATION

PROCEDURE: T038A-00712 REVISION: F	QUANTITY OF MATERIAL: 154.68 GRAMS
DATE HOMOGENIZED: 02-14-90	TIME HOMOGENIZED: 5.0 MINUTES
OPERATOR: K. J. Patterson	

LABORATORY NOTEBOOK REFERENCE	WHC-N-313-4	26 and 27
	Notebook No.	Page No.

Single Shell Tank
Segment -- Subsamples

Lab Segment Serial #:	F0441	Customer ID:	89-071

Volatile Organic Analysis

VOA Sample	Lab Serial #: 89-071-286	Date Sampled: 01-29-90

Sample shipped to PNL for analysis.

Particle Size Distribution Analysis

Particle Size Sample	Lab Serial #: F0441	Date Sampled: 01-29-90

Homogenized Solids

Undigested Solids Analysis

Laboratory Serial Number For Sample:	F0441	Date Sampled: 02-14-90
Laboratory Serial Number of Duplicate Sample:	F0442	

Fusion Analysis of Solids

Laboratory Serial Number of Sample:	F0446	Date Sampled: 02-14-90
Laboratory Serial Number of Duplicate Sample:	F0447	
Laboratory Serial Number of Spiked Sample:	F0448	

Acid Digestion Analysis of Solids

Laboratory Serial Number of Sample:	F0456	Date Sampled: 02-14-90
Laboratory Serial Number of Duplicate Sample:	F0457	
Laboratory Serial Number of Spiked Sample:	F0458	

Water Digestion Analysis of Solids

Laboratory Serial Number of Sample:	F0451	Date Sampled: 02-14-90
Laboratory Serial Number of Duplicate Sample:	F0452	
Laboratory Serial Number of Spiked Sample:	F0453	

Laboratory Notebook Reference	WHC-N-313-4	26 and 27
	Notebook No.	Page No.

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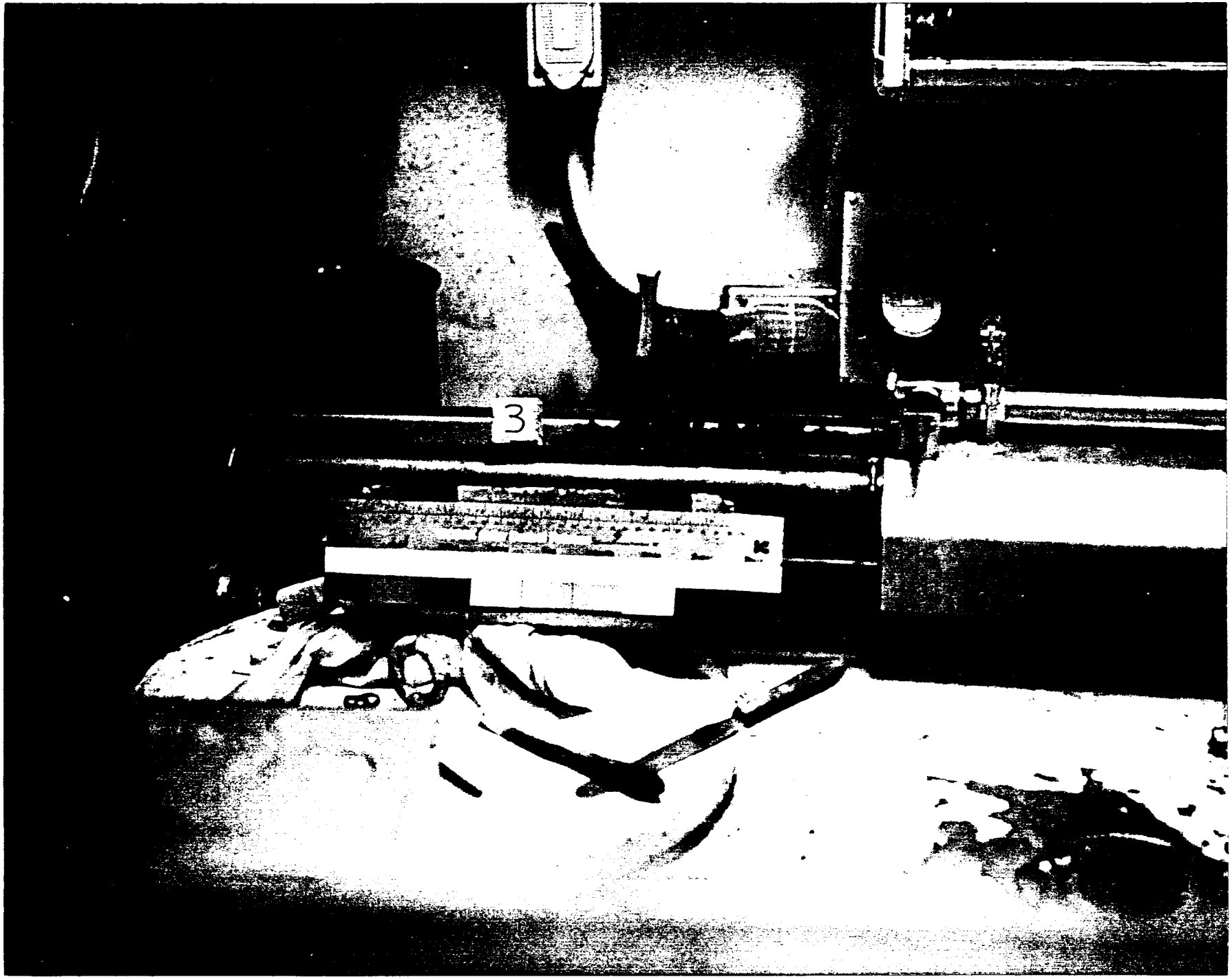


TANK 241-U-110, CORE 12, SEGMENT 3

B r i n k m a n n

Particle Size Analyzer

PROCESS CHEMISTRY LABS PARTICLE ANALYSIS
VIA BRINKMANN 2010
STATISTICS

SAMPLE NAME : SST,B000285,F0441,GLY,ETOH,SBK
FILE NAME : F0441.001

DATE	: 22/02/1990	ACQ. RANGE	: 0.5-150	COUNTS	: 180798
TIME	: 14:16	ACQ. MODE	: SAMPLE	S.N.F.	: 0.93
CONFIG.	: 1 (0.7 S1)	ACQ. TIME	: 849 SEC	S.D.U.	: 3441
CELL TYPE	: MAGNETIC (3)	SAMPLE SIZE	: 4	CONCENTR.	: 2.6E+06 #/ml
SAMPLE TYPE	: REGULAR	REQ. CONF.	: 95.00%(V)	SOLIDS	: 9.2E-03 %

		MEAN Diameter	S.D.
Number, Length	:	1.76 µm	1.80 µm
Number, Area	:	2.51 µm	1.95 µm
Number, Volume	:	4.07 µm	2.93 µm
Length, Area	:	3.60 µm	5.05 µm
Length, Volume	:	6.20 µm	5.68 µm
Area, Volume	:	10.68 µm	20.02 µm
Volume, Moment	:	48.22 µm	50.85 µm

		MEDIAN Diameter	MODE	CONFIDENCE
Number	:	0.99 µm	0.75 µm	100.00%
Area	:	4.84 µm	4.75 µm	75.19%
Volume	:	27.02 µm	143.20 µm	95.99%

Organics present in sample; dispersed in EtOH-glycerine

SAMPLE NAME : SST,B000285,F0441,GLY,ETOH,SBK
FILE NAME : F0441.001

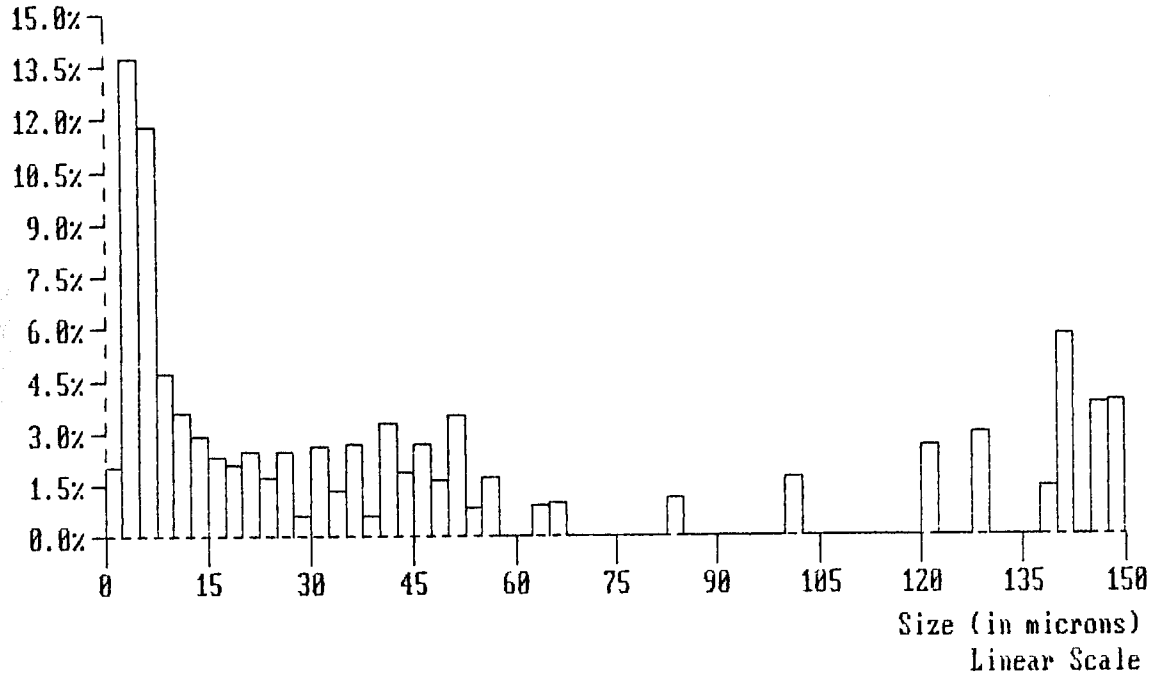
DATE	: 22/02/1990	ACQ. RANGE	: 0.5-150	COUNTS	: 180798
TIME	: 14:16	ACQ. MODE	: SAMPLE	S.N.F.	: 0.93
CONFIG.	: 1 (0.7 S1)	ACQ. TIME	: 849 SEC	S.D.U.	: 3441
CELL TYPE	: MAGNETIC (3)	SAMPLE SIZE	: 4	CONCENTR.	: 2.6E+06 #/ml
SAMPLE TYPE	: REGULAR	REQ. CONF.	: 95.00%(V)	SOLIDS	: 9.2E-03 %

PROBABILITY VOLUME DENSITY GRAPH

Name: SST,B000285,F0441,GLY,ETOH,SBK
9.2E-05 cc/ml(100.0%)
Mode at 3.75 µm
<< SCALE RANGE (µm): ADJUSTED >>

Mean(nv): 4.07µm
S.D.(nv): 2.93µm

Median : 27.02µm
Mean(vm): 48.22µm
S.D.(vm): 50.85µm
Conf(vm): 95.99 %



SAMPLE NAME : SST,B000285,F0441,GLY,ETOH,SBK
FILE NAME : F0441.001

DATE	: 22/02/1990	ACQ. RANGE	: 0.5-150	COUNTS	: 180798
TIME	: 14:16	ACQ. MODE	: SAMPLE	S.N.F.	: 0.93
CONFIG.	: 1 (0.7 S1)	ACQ. TIME	: 849 SEC	S.D.U.	: 3441
CELL TYPE	: MAGNETIC (3)	SAMPLE SIZE	: 4	CONCENTR.	: 2.6E+06 #/ml
SAMPLE TYPE	: REGULAR	REQ. CONF.	: 95.00%(V)	SOLIDS	: 9.2E-03 %

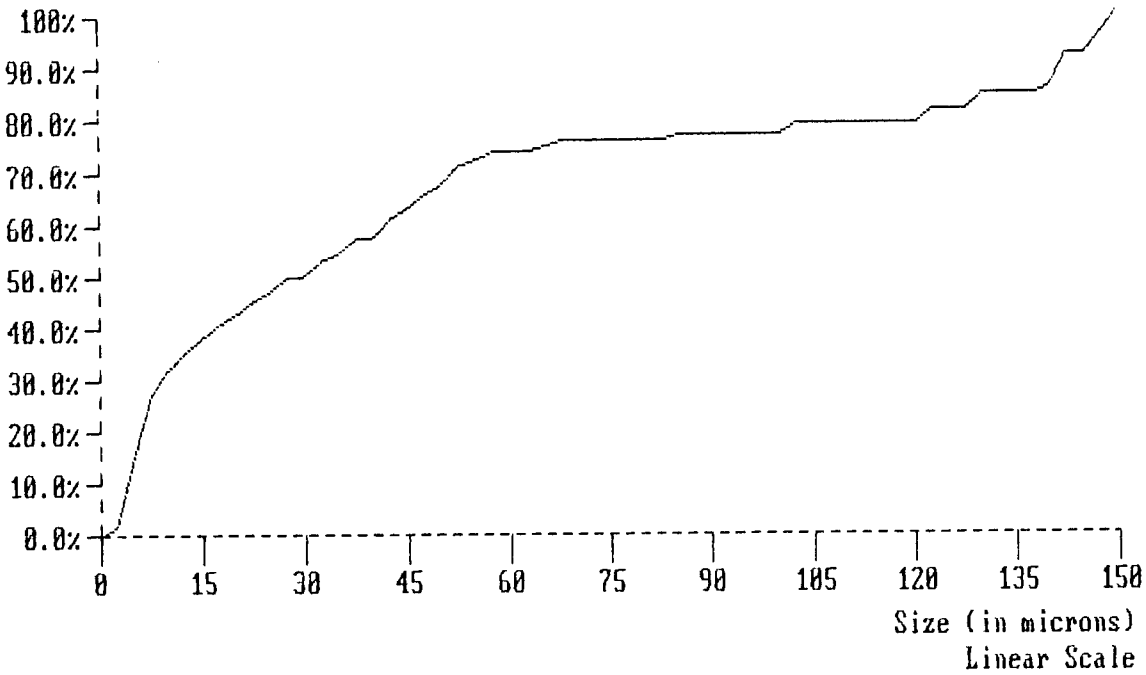
PROBABILITY VOLUME DISTRIBUTION GRAPH

Name: SST,B000285,F0441,GLY,ETOH,SBK
9.2E-05 cc/ml(100.0%)

Mean(nv): 4.07μm
S.D.(nv): 2.93μm

Median : 27.02μm
Mean(vm): 48.22μm
S.D.(vm): 50.85μm
Conf(vm): 95.99 %

<< SCALE RANGE (μm): ADJUSTED >>



B r i n k m a n n

Particle Size Analyzer

PROCESS CHEMISTRY LABS PARTICLE ANALYSIS VIA BRINKMANN 2010

STATISTICS

SAMPLE NAME : SST,B000285,F0441,GLY,ETOH,SBK
FILE NAME : F0441.002

DATE	: 22/02/1990	ACQ. RANGE	: 0.5-60	COUNTS	: 159505
TIME	: 14:34	ACQ. MODE	: SAMPLE	S.N.F.	: 0.84
CONFIG.	: 1 (0.7 S1)	ACQ. TIME	: 728 SEC	S.D.U.	: 4856
CELL TYPE	: MAGNETIC (3)	SAMPLE SIZE	: 4	CONCENTR.	: 3.4E+06 #/ml
SAMPLE TYPE	: REGULAR	REQ. CONF.	: 95.00%(V)	SOLIDS	: 7.4E-03 %

	MEAN Diameter	S.D.
Number, Length :	1.59 µm	1.68 µm
Number, Area :	2.32 µm	1.83 µm
Number, Volume :	3.47 µm	2.52 µm
Length, Area :	3.36 µm	3.86 µm
Length, Volume :	5.12 µm	4.24 µm
Area, Volume :	7.80 µm	9.71 µm
Volume, Moment :	19.88 µm	17.11 µm

	MEDIAN Diameter	MODE	CONFIDENCE
Number :	0.92 µm	0.55 µm	100.00%
Area :	4.73 µm	4.86 µm	91.81%
Volume :	12.63 µm	35.75 µm	98.81%

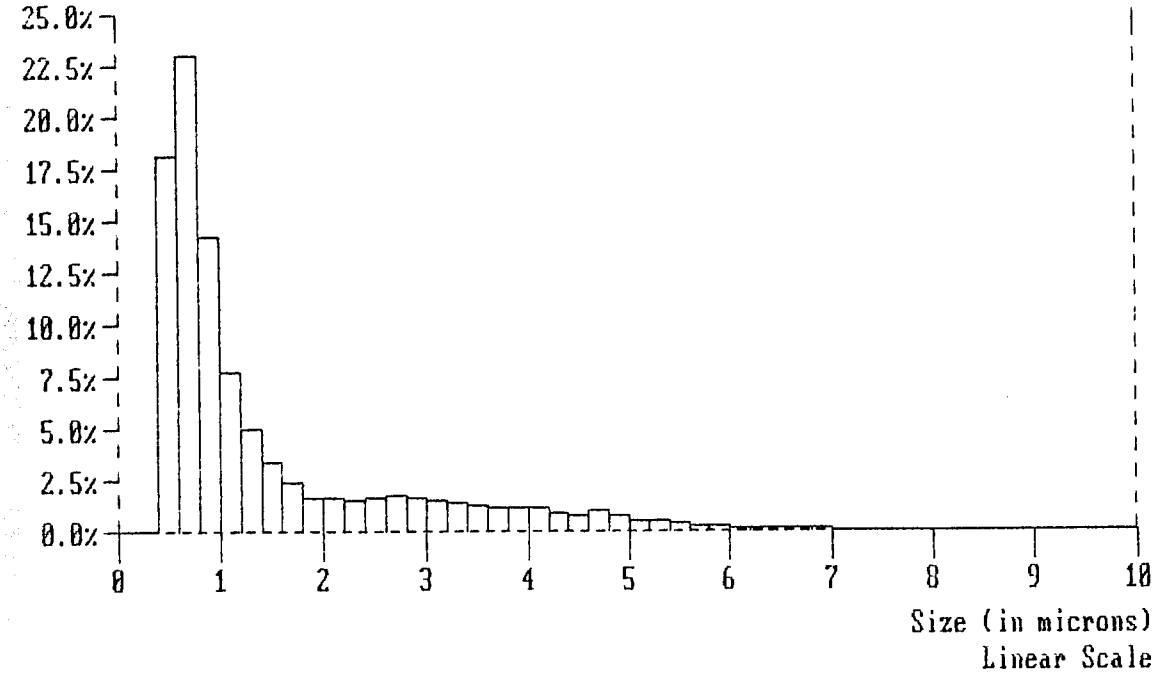
SAMPLE NAME : SST,B000285,F0441,GLY,ETOH,SBK
FILE NAME : F0441.002

DATE	: 22/02/1990	ACQ. RANGE	: 0.5-60	COUNTS	: 159505
TIME	: 14:34	ACQ. MODE	: SAMPLE	S.N.F.	: 0.84
CONFIG.	: 1 (0.7 S1)	ACQ. TIME	: 728 SEC	S.D.U.	: 4856
CELL TYPE	: MAGNETIC (3)	SAMPLE SIZE	: 4	CONCENTR.	: 3.4E+06 #/ml
SAMPLE TYPE	: REGULAR	REQ. CONF.	: 95.00%(V)	SOLIDS	: 7.4E-03 %

PROBABILITY NUMBER DENSITY GRAPH

Name: SST,B000285,F0441,GLY,ETOH,SBK
3.4E+06 #/ml(99.7%)
Mode at 0.70 µm
<< SCALE RANGE (µm): 0 - 10 >>

Local Median : 0.92µm
Local Mean(nl): 1.55µm
Local S.D.(nl): 1.43µm
Local Conf(nl):100.00 %



SAMPLE NAME : SST,B000285,F0441,GLY,ETOH,SBK
FILE NAME : F0441.002

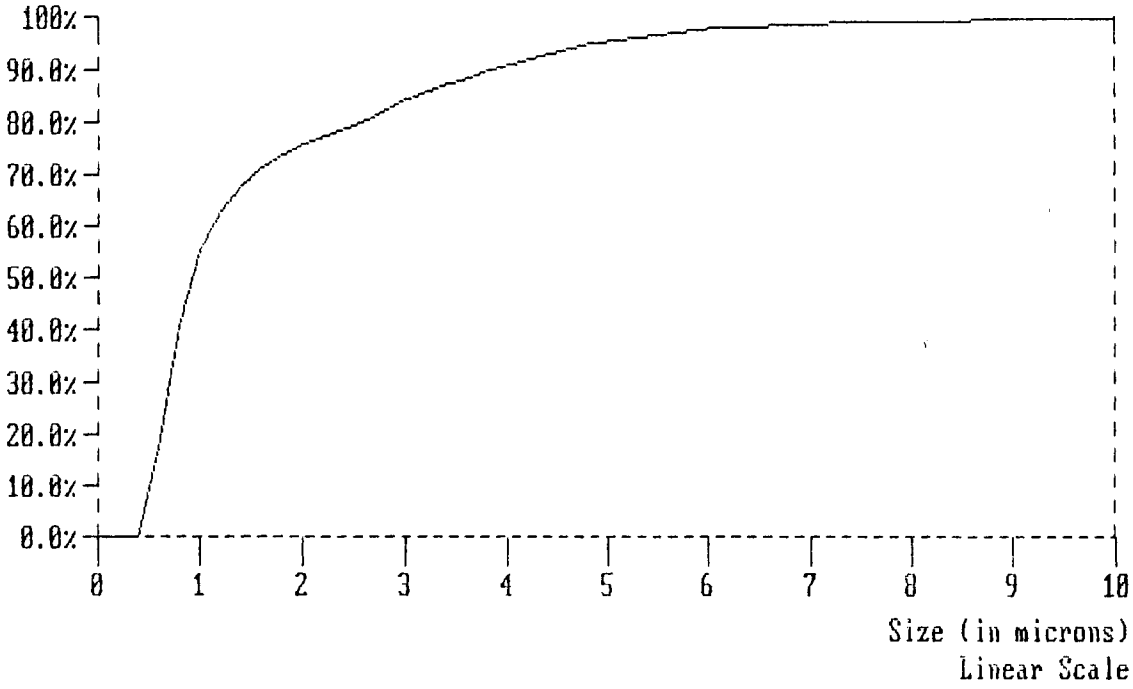
DATE	: 22/02/1990	ACQ. RANGE	: 0.5-60	COUNTS	: 159505
TIME	: 14:34	ACQ. MODE	: SAMPLE	S.N.F.	: 0.84
CONFIG.	: 1 (0.7 S1)	ACQ. TIME	: 720 SEC	S.D.U.	: 4956
CELL TYPE	: MAGNETIC (3)	SAMPLE SIZE	: 4	CONCENTR.	: 3.4E+06 #/ml
SAMPLE TYPE	: REGULAR	REQ. CONF.	: 95.00%(V)	SOLIDS	: 7.4E-03 %

PROBABILITY NUMBER DISTRIBUTION GRAPH

Name: SST,B000285,F0441,GLY,ETOH,SBK
3.4E+06 #/ml(99.7%)

Local Median : 0.92μm
Local Mean(nl): 1.55μm
Local S.D.(nl): 1.43μm
Local Conf(nl):100.00 %

<< SCALE RANGE (μm): 0 - 10 >>



UNDIGESTED SAMPLE ANALYSIS

Single Shell Tank Project

Untreated Sample Results

Tank: 241-U-110
Core: 12
Segment: 3
Customer ID: 89-071

	Check Standard	Blank	Sample	Sample Duplicate	Check Standard
Laboratory ID:	F0440	F0461	F0441	F0442	F0444
pH	100.60%	6.05	12.49	13.09	99.90%
Laboratory ID:	F0416	F0437	F0441	F0442	F0564
%Water	98.30%	6.2mg	39.06%	39.04%	96.95%

Analytical Batch

LAB SEGMENT SERIAL #:F0441

CUSTOMER ID:89-071

INSTRUMENT	WA77509
PROCEDURE/REV	LA-212-103/A-1
TECHNOLOGIST	M. Franz
DATE	March 05, 1990
TEMPERATURE	24.50 C
STARTING TIME	0800
ENDING TIME	1300
CHEMIST	R. E. Brandt

pH analysis of the solid sample

	DESCRIPTION	LAB ID
1	Initial LMCS Check Std.	F0440
2	Reagent Blank	F0461
3	Sample 89-071	F0441
4	Duplicate Sample 89-071	F0442
5	Final LMCS Check Std.	F0444
6		
7		
8		
9		
10		
11		

	DESCRIPTION	LAB ID
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		

STANDARD TYPE	PRIMARY BOOK # & ALIQUOT VOL.	SECOND BOOK # & ALIQUOT VOL.	THIRD BK# & ALQT.VOL.	FINAL VOL. OF STD.
LMCS Check Standard	72C11-B/1.0ml			1.0ml

SST-102 Rev. F 9/7/90 Interim

Analytical Batch

LAB SEGMENT SERIAL #:F0441

CUSTOMER ID:89-071

INSTRUMENT	N/A
PROCEDURE/REV	LA-564-101/D-1
TECHNOLOGIST	R. D. Hale
DATE	March 05,1990
TEMPERATURE	120 C
STARTING TIME	1400 03-01-90
ENDING TIME	1430 03-02-90
CHEMIST	R. E. Brandt

% water in sample

	DESCRIPTION		LAB ID
1	Initial LMCS Check Std.		F0416
2	Reagent Blank		F0437
3	Sample	89-070	F0417
4	Duplicate Sample	89-070	F0418
5	Sample	89-071	F0441
6	Duplicate Sample	89-071	F0442
7	Sample	89-072	F0465
8	Duplicate Sample	89-072	F0466
9	Sample	89-073	F0489
10	Duplicate Sample	89-073	F0490
11	Sample	89-074	F0513

	DESCRIPTION		LAB ID
12	Duplicate Sample	89-074	F0514
13	Sample	89-075	F0537
14	Duplicate Sample	89-075	F0538
15	Sample	89-076	F0561
16	Duplicate Sample	89-076	F0562
17	Final LMCS Check Std.		F0564
18			
19			
20			
21			
22			

STANDARD TYPE	PRIMARY BOOK # & ALIQUOT VOL.	SECOND BOOK # & ALIQUOT VOL.	THIRD BK# & ALQT.VOL.	FINAL VOL. OF STD.
LMCS Check Standard	11C11AH/1ml			1ml

SST-102 Rev. F 9/7/90 Interim

KOH FUSION ANALYSIS

Single Shell Tank Project

Fusion Analysis

Laboratory Results of Solids

Units Are Sample Wet Weight

Tank: 241-U-110
Core: 12
Segment: 3
Customer ID: 89-071

	Check Standard	Blank		Sample		Sample Duplicate		Spike of Sample	Check Standard
Laboratory ID:		F0436		F0446		F0447			
Fusion Dissolution		Completed		2.82	g/L	2.52	g/L		
Laboratory ID:	F0445	F0460		F0446		F0447		F0448	F0449
Total Alpha	96.70%	<1.83E-04	uci/L	4.29E-01	uci/g	4.44E-01	uci/g	105.00%	104.60%
Total Beta	101.30%	<9.94E-04	uci/L	8.51E+02	uci/g	9.68E+02	uci/g	99.10%	104.30%
Laboratory ID:	F0421	F0460		F0446		F0447		F0568	F0569
GEA Cs-137	98.30%	<4.81E-04	uci/L	6.35E+01	uci/g	5.44E+01	uci/g	93.50%	97.30%
Laboratory ID:	F0445	F0460		F0446		F0447		F0448	F0449
Uranium	86.00%	<1.10E+02	ug/L	2.15E+03	ug/g	1.63E+03	ug/g	91.40%	87.30%

Single Shell Tank Project

Fusion Analysis

Results of the Laboratory Digestions

Tank: 241-U-110
Core: 12
Segment: 3
Customer ID: 89-071

	Check Standard	Blank		Sample		Sample Duplicate		Spike of Sample	Check Standard
Laboratory ID:		F0436		F0446		F0447			
Fusion Dissolution		Completed		2.82	g/L	2.52	g/L		
Laboratory ID:	F0445	F0460		F0446		F0447		F0448	F0449
Total Alpha	96.70%	<1.83E-04	uci/L	1.21	uci/L	1.12	uci/L	105.00%	104.60%
Total Beta	101.30%	<9.94E-04	uci/L	2.40E+03	uci/L	2.44E+03	uci/L	99.10%	104.30%
Laboratory ID:	F0421	F0436		F0446		F0447		F0568	F0569
GEA Cs-137	98.30%	<4.81E-04	uci/L	1.79E+02	uci/L	1.37E+02	uci/L	93.50%	97.30%
Laboratory ID:	F0445	F0460		F0446		F0447		F0448	F0449
Uranium	86.00%	<1.10E+02	ug/L	6.06E-03	g/L	4.12E-03	g/L	91.40%	87.30%

Analytical Batch

LAB SEGMENT SERIAL #:F0441

CUSTOMER ID:89-071

INSTRUMENT	N/A
PROCEDURE/REV	LA-549-141/A-1
TECHNOLOGIST	R. D. Hale
DATE	March 10, 1990
TEMPERATURE	450 C
STARTING TIME	0800
ENDING TIME	1200
CHEMIST	S. A. Catlow

Fusion Dissolution

	DESCRIPTION		LAB ID
1	Reagent Blank		F0436
2	Sample	89-070	F0422
3	Duplicate Sample	89-070	F0423
4	Sample	89-071	F0446
5	Duplicate Sample	89-071	F0447
6	Sample	89-072	F0470
7	Duplicate Sample	89-072	F0471
8	Sample	89-075	F0542
9	Duplicate Sample	89-075	F0543
10	Sample	89-076	F0566
11	Duplicate Sample	89-076	F0567

	DESCRIPTION		LAB ID
12	Sample	89-077	F1095
13	Duplicate Sample	89-077	F1096
14	Sample	89-078	F1119
15	Duplicate Sample	89-078	F1120
16	Sample	89-079	F1143
17	Duplicate Sample	89-079	F1144
18	Sample	89-080	F1167
19	Duplicate Sample	89-080	F1168
20			
21			
22			

STANDARD TYPE	PRIMARY BOOK # & ALIQUOT VOL.	SECOND BOOK # & ALIQUOT VOL.	THIRD BK# & ALQT.VOL.	FINAL VOL. OF STD.
N/A				

SST-102 Rev. F 9/7/90 Interim

Analytical Batch

LAB SEGMENT SERIAL #:F0441

CUSTOMER ID:89-071

INSTRUMENT	WA57276
PROCEDURE/REV	LA-508-101/C-2
TECHNOLOGIST	Mary Franz
DATE	March 23, 1990
TEMPERATURE	N/A
STARTING TIME	0830
ENDING TIME	1030
CHEMIST	S. A. Catlow

Total Beta & Total Alpha
Analysis of the Fusion
Dissolution.
Detector #14.
Samples were prepared in batch,
but counted randomly.

	DESCRIPTION	LAB ID
1	Initial LMCS Check Std.	F0445
2	Reagent Blank	F0460
3	Sample 89-071	F0446
4	Duplicate Sample 89-071	F0447
5	Spike of Sample 89-071	F0448
6	Final LMCS Check Std.	F0449
7		
8		
9		
10		
11		

	DESCRIPTION	LAB ID
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		

STANDARD TYPE	PRIMARY BOOK # & ALIQUOT VOL.	SECOND BOOK # & ALIQUOT VOL.	THIRD BK# & ALQT. VOL.	FINAL VOL. OF STD.
LMCS Check Standard	132B44/10 mL			N/A
Spike	132B44/10 mL	F0446/2.5 uL		N/A

SST-102 Rev. F 9/7/90 Interim

Single Shell Tank
Calibration Record

ANALYTE:	Am^{241}		
PROCEDURE:	LQ-508-002	REVISION:	A-0
INSTRUMENT:	Detector #14	PROPERTY NUMBER:	WA45709
TECHNOLOGIST:	R.A. Jones	PAYROLL NUMBER:	65801
DATE:	November 28,1988		
CALIBRATION STANDARD ID:	36B40A8; 36B40B7; 36B40C7; 36B40A3; 36B40B3; 36B40C3; 36B40A6;36B40B6; 36B40C5		
ANALYTE CONCENTRATION:	N/A		
TYPE OF CALIBRATION:	Efficiency		

SST-103 Rev. (Draft) 9/15/90 Short Interim

CALIBRATION SHEET FOR ALPHA/BETA SYSTEMS: USING PROCEDURE LQ-508-002

DETECTOR No. 14

TIME ZERO DATE (HD): 15897

RADIONUCLIDE: Am-241
HALF LIFE: 154497
COUNT TIME: 5
CPM BKG: 0.5

DATE COUNTED (HD): 16135

CALIBRATED BY: RA JONES HD 0 = 09/25/44

STANDARD ID	SIZE	DATE	TIME	COUNTS @ 0 DEG.	COUNTS @ 90 DEG.	COUNTS @ 180 DEG.	COUNTS @ 270 DEG.
36B40A8	1	11/28/88	1115	83719	83889	83820	84087
36B40B7	1	11/28/88	1128	147778	147414	147378	147313
36B40C7	1	11/28/88	1142	212324	211727	211106	211442
36B40A3	2	11/28/88	1155	67029	66485	66532	66137
36B40B3	2	11/28/88	1207	116432	117580	116643	116507
36B40C3	2	11/28/88	1221	167025	166472	166682	166167
36B40A6	5	11/28/88	1234	64835	64744	63542	64860
36B40B6	5	11/28/88	1246	132366	127335	127267	127511
36B40C5	5	11/28/88	1300	176904	172226	170187	173840

STANDARD ID	SIZE	STD VALUE	AVE CPM	DECAY CORR	DECAY CORR CPM	EFFICIENCY
36B40A8	1"	60570	16775	1.00	16793	0.2773
36B40B7	1"	109900	29494	1.00	29525	0.2687
36B40C7	1"	159700	42329	1.00	42375	0.2653

AVERAGE, 1" = 0.2704 +/- @95% 0.0121 4.46 % ON 11/28/88

STANDARD ID		STD VALUE	AVE CPM	DECAY CORR	DECAY CORR CPM	EFFICIENCY
36B40A3	2"	61800	13309	1.00	13323	0.2156
36B40B3	2"	110700	23358	1.00	23383	0.2112
36B40C3	2"	161400	33317	1.00	33352	0.2066

AVERAGE, 2" = 0.2111 +/- @95% 0.0088 4.15 % ON 11/28/88

STANDARD ID		STD VALUE	AVE CPM	DECAY CORR	DECAY CORR CPM	EFFICIENCY
36B40A6	5"	59470	12899	1.00	12912	0.2171
36B40B6	5"	109800	25723	1.00	25751	0.2345
36B40C5	5"	160100	34657	1.00	34694	0.2167

AVERAGE, 5" = 0.2228 +/- @95% 0.0199 8.95 % ON 11/28/88

NEW EFFS FOR DET 14 Am-241 1" = 0.2704 2" = 0.2111

5" = 0.2228

Single Shell Tank
Calibration Record

ANALYTE:	Co^{60}		
PROCEDURE:	LQ-508-002	REVISION:	A-0
INSTRUMENT:	Detector #14	PROPERTY NUMBER:	WA57276
TECHNOLOGIST:	R.A. Jones	PAYROLL NUMBER:	65801
DATE:	November 28, 1988		

CALIBRATION STANDARD ID: 32B40A8; 32B40B7; 32B40C7; 32B40A4; 32B40B3; 32B40C4; 32B40A5; 32B40B6; 32B40C5

ANALYTE CONCENTRATION: N/A

TYPE OF CALIBRATION: Efficiency

SST-103 Rev. (Draft) 9/15/90 Short Interim

CALIBRATION SHEET FOR ALPHA/BETA SYSTEMS: USING PROCEDURE LQ-508-002

DETECTOR No. 14

		2",5" STD TIME ZERO DATE (HD):	15883
RADIONUCLIDE:	Co-60	1" STD TIME ZERO DATE (HD):	15883
HALF LIFE:	1925	DATE COUNTED (HD):	16135
COUNT TIME:	5	DATE COUNTED 1" (HD)	16135
CPM BKG:	19		
CPM 1" BKG:	19		

CALIBRATED BY: RA JONES HD 0 = 09/25/44

STANDARD ID	SIZE	DATE	TIME	COUNTS @ 0 DEG.	COUNTS @ 90 DEG.	COUNTS @ 180 DEG.	COUNTS @ 270 DEG.
32B40A8	1	11/28/88	1313	94851	93909	94136	94073
32B40B7	1	11/28/88	1325	180320	178550	178878	179065
32B40C7	1	11/28/88	1338	260104	258654	259795	259469
32B40A4	2	11/28/88	1349	90411	89596	89705	90717
32B40B3	2	11/28/88	1527	170657	169556	169500	170301
32B40C4	2	11/28/88	1540	244082	244246	243016	249016
32B40A5	5	11/28/88	1551	83403	82448	82728	84312
32B40B6	5	11/28/88	1603	160402	163149	162823	159622
32B40C5	5	11/28/88	1616	237343	232578	231827	23179

STANDARD ID	SIZE	STD VALUE	AVE CPM	DECAY CORR	DECAY CORR CPM	EFFICIENCY
32B40A8	1"	69550	18829	1.09	20618	0.2964
32B40B7	1"	134700	35822	1.09	39224	0.2912
32B40C7	1"	201000	51882	1.09	56810	0.2826

AVERAGE, 1" = 0.2901 +/- @95% 0.0137 4.71 % ON 11/28/88

STANDARD ID		STD VALUE	AVE CPM	DECAY CORR	DECAY CORR CPM	EFFICIENCY
32B40A4	2"	70480	18002	1.09	19712	0.2797
32B40B3	2"	135100	33982	1.09	37209	0.2754
32B40C4	2"	202400	48999	1.09	53653	0.2651

AVERAGE, 2" = 0.2734 +/- @95% 0.0147 5.38 % ON 11/28/88

STANDARD ID		STD VALUE	AVE CPM	DECAY CORR	DECAY CORR CPM	EFFICIENCY
32B40A5	5"	70160	16626	1.09	18205	0.2595
32B40B6	5"	135700	32281	1.09	35347	0.2605
32B40C5	5"	201900	46658	1.09	51090	0.2530

AVERAGE, 5" = 0.2577 +/- @95% 0.0079 3.07 % ON 11/28/88

NEW EFFS FOR DET 14 Co-60 1" = 0.2901 2" = 0.2734

5" = 0.2577

Analytical Batch

LAB SEGMENT SERIAL #:F0441

CUSTOMER ID:89-071

INSTRUMENT	401934
PROCEDURE/REV	LA-548-121/C-2
TECHNOLOGIST	R. D. Hale
DATE	March 14, 1990
TEMPERATURE	23 C
STARTING TIME	0900
ENDING TIME	1000
CHEMIST	S. A. Catlow

GEA Analysis
Fusion Dissolution
Samples are prepared in batch,
but counted randomly.
GEA Detector #1

	DESCRIPTION		LAB ID
1	Initial LMCS Check Std.		F0421
2	Reagent Blank		F0436
3	Sample	89-070	F0422
4	Duplicate Sample	89-070	F0423
5	Sample	89-071	F0446
6	Duplicate Sample	89-071	F0447
7	Sample	89-072	F0470
8	Duplicate Sample	89-072	F0471
9	Sample	89-075	F0542
10	Duplicate Sample	89-075	F0543
11	Sample	89-076	F0566

	DESCRIPTION		LAB ID
12	Duplicate Sample	89-076	F0567
13	Spike	89-076	F0568
14	Final LMCS Check Std.		F0569
15			
16			
17			
18			
19			
20			
21			
22			

STANDARD TYPE	PRIMARY BOOK # & ALIQUOT VOL.	SECOND BOOK # & ALIQUOT VOL.	THIRD BK# & ALQT. VOL.	FINAL VOL. OF STD.
LMCS Check Standard	122B44/500 uL			22 mL
Spike	122B44/500 uL	F0447/50 uL		22 mL

SST-102 Rev. F 9/7/90 Interim

Single Shell Tank
Calibration Record

ANALYTE: Isotope, Mixed Gamma	
PROCEDURE: LQ-508-003	REVISION: A-0
INSTRUMENT: GEA Detector #1	PROPERTY NUMBER: 401934
TECHNOLOGIST: J. L. Anderson	PAYROLL NUMBER: 61413
DATE: February 14, 1989	
CALIBRATION STANDARD ID: 56B40 D1	
ANALYTE CONCENTRATION: N/A	
TYPE OF CALIBRATION: Gamma Energy Analysis (Efficiency)	

COMMENTS:

SST-103 Rev. (Draft) 9/4/90 Interim

DETECTOR: 1
GEOMETRY CODE: 42
GEOMETRY DECSRIPTION: 22 ML LIQUID, POS 2
CALIBRATION DATE: 14-Feb-89
ANALYST(S): J. L. ANDERSON/M. R. DOWELL
STANDARD ID: 56840 D1

ENERGY (KEV)	EFFICIENCY (COUNTS/GAMMA)
59.536	5.721347E-03
88.032	1.512568E-02
122.0614	2.041950E-02
165.853	1.856472E-02
279.1967	
391.668	1.042777E-02
513.99	7.856059E-03
661.65	6.838966E-03
898.021	5.300244E-03
1173.237	4.218416E-03
1332.501	3.785537E-03
1836.129	2.931033E-03

EQUATION 0-165 KEV

```
LOG(EFF) =    -5.343694E+01
          +    2.034704E+01 *LOG(ENERGY)
          +   -2.088264E+00 *LOG(ENERGY)^2
```

EQUATION 165-1836 KEV

```
LOG(EFF) =     8.372735E+00
          +   -7.762489E+00 *LOG(ENERGY)
          +    2.017698E+00 *LOG(ENERGY)^2
          +   -2.447560E-01 *LOG(ENERGY)^3
          +    1.067720E-02 *LOG(ENERGY)^4
```

GEA CALIBRATION RECORD PROCEDURE LQ-508-003

DETECTOR: 1
GEOMETRY CODE: 43
GEOMETRY DECSRIPTION: 22 ML LIQUID, POS 3
CALIBRATION DATE: 16-Feb-89
ANALYST(S): J. L. ANDERSON/M. R. DOWELL
STANDARD ID: 56840 D1

ENERGY (KEV)	EFFICIENCY (COUNTS/GAMMA)
59.536	1.397695E-03
88.032	3.641448E-03
122.0614	5.035820E-03
165.853	4.620516E-03
279.1967	
391.668	2.619018E-03
513.99	1.890740E-03
661.65	1.782478E-02
898.021	1.392563E-03
1173.237	1.117189E-03
1332.501	1.007670E-03
1836.129	7.782502E-04

EQUATION 0-165 KEV

```
LOG(EFF) =    -5.354869E+01
```

```
                    +    1.975356E+01 *LOG(ENERGY)
                    +   -2.020850E+00 *LOG(ENERGY)^2
```

EQUATION 165-1836 KEV

```
LOG(EFF) =          4.001880E+01
                    +   -2.057555E+01 *LOG(ENERGY)
                    +    6.740440E+00 *LOG(ENERGY)^2
                    +    7.173093E-01 *LOG(ENERGY)^3
                    +    2.821780E-02 *LOG(ENERGY)^4
```

GEA CALIBRATION RECORD PROCEDURE LQ-508-003

```
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *
*                                                                     *
*          G A M M A   S P E C T R U M   A N A L Y S I S              *
*                                                                     *
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

CANBERRA SPECTRAN-F V2.06  SOFTWARE

222-S COUNTING ROOM                                 27-AUG-90  13:08:43


                A N A L Y S I S   P A R A M E T E R S

MCA UNIT NUMBER:   2     /     ADC UNIT NUMBER: 1.0
DETECTOR NUMBER:    1    /     GEOMETRY NUMBER:  42
SPECTRUM SIZE:  4096 CHANNELS
ORDER OF SMOOTHING FUNCTION:     5
NUMBER OF BACKGROUND CHANNELS:  4 ON EACH SIDE OF PEAK
PEAK CONFIDENCE FACTOR: 85.0%
IDENTIFICATION ENERGY WINDOW: +- 1.50 KEV
ERROR QUOTATION: 1.96 SIGMA UNCERTAINTY

ENVIRONMENTAL BACKGROUND SUBTRACTED
LLD CALCULATION PERFORMED
MEASURED ENERGY DIFFERENCES LISTED
MULTIPLET ANALYSIS PERFORMED

ANALYSIS OF SPECTRUM SAVED IN DISK FILE: SD1070
ANALYZED BY:        VR

SAMPLE DESCRIPTION: F421 SEG F
GEOMETRY DESCRIPTION:
SAMPLE SIZE:   1.0000E-03 LI       / CONVERSION FACTOR: 5.0000E-01
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL000

COLLECT STARTED ON 14-MAR-90 AT 11:00:58

COLLECT LIVE TIME:    3000. SECONDS
        REAL TIME:    3005. SECONDS
        DEAD TIME:     0.17 %

 DECAYED TO      0. DAYS,  0.0000 HOURS BEFORE THE START OF COLLECT

ENERGY CALIBRATION PERFORMED 23-NOV-89
EFFICIENCY CALIBRATION PERFORMED  2-MAR-89
```

222-S COUNTING ROOM 27-AUG-90 13:08:43

P E A K A N A L Y S I S

PK	CENTROID CHANNEL	ENERGY KEV	FWHM KEV	BACKGND COUNTS	NET AREA COUNTS	ERROR %	NUCLIDES
1C	1127.46	563.20	1.34	417.	456.	13.9	CS-134, EU-152
2C	1139.52	569.23	1.34	456.	822.	12.2	CS-134, BI-207
3C	1210.35	604.63	1.41	394.	5339.	3.3	CS-134
4C	1219.45	609.18	1.41	323.	79.	30.4	BI-214, RU-103
5	1324.22	661.55	1.47	366.	9209.	2.1	CS-137
5B		661.82			35.	46.4	
6C	1592.53	795.69	1.55	258.	3769.	4.0	CS-134
7C	1604.74	801.80	1.55	227.	359.	14.3	CS-134
8	2347.09	1173.10	1.74	186.	4807.	3.0	CO-60
9	2665.49	1332.42	1.97	37.	4508.	3.0	CO-60
10	2731.21	1365.31	2.48	13.	101.	22.6	CS-134
11	2921.74	1460.68	2.12	11.	187.	15.5	K-40
11B		1461.77			182.	11.2	

ERROR QUOTATION AT 1.96 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

C - MULTIPLET ANALYSIS CONVERGED NORMALLY
B - ENVIRONMENTAL BACKGROUND PEAK

BACKGROUND SUBTRACTION PERFORMED USING FILE BK0011
BACKGROUND DESCRIPTION: BK0011
BACKGROUND COLLECT STARTED ON 10-JAN-85 AT 12:00:00
BACKGROUND LIVE TIME: 6000. SECONDS

222-S COUNTING ROOM 27-AUG-90 13:08:43

SAMPLE: F421 SEG F
DATA COLLECTED ON 14-MAR-90 AT 11:00:58
DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT.

R A D I O N U C L I D E A N A L Y S I S R E P O R T

NUCLIDE	ACTIVITY CONCENTRATION IN uCi/LI MEASURED	ERROR	DECAY CORRECTED	ERROR	ENERGY COMPARISON (KEV) EXPECT	DIFF
AC-228	LLD<7.86E-01		LLD<7.86E-01		911.07	
AG-108M	LLD<1.96E-01		LLD<1.96E-01		433.94	
AG-110M	LLD<8.94E-01		LLD<8.94E-01		657.76	
AM-241	LLD<8.34E-01		LLD<8.34E-01		59.54	
AM-243	LLD<2.10E-01		LLD<2.10E-01		74.67	
AR-41	LLD<1.48E-01		LLD<1.48E-01		1293.64	
AU-198	LLD<1.70E-01		LLD<1.70E-01		411.80	
BA-133	LLD<2.57E-01		LLD<2.57E-01		356.02	
BA-139	LLD<5.05E-01		LLD<5.05E-01		165.85	
BA-140	LLD<7.04E-01		LLD<7.04E-01		537.27	
BA-141	LLD<5.12E-01		LLD<5.12E-01		190.23	
BE-7	LLD<1.78E+00		LLD<1.78E+00		477.59	
BI-207	LLD<1.69E-01		LLD<1.69E-01		569.70	
BI-212	LLD<2.47E+00		LLD<2.47E+00		727.27	
BI-214	1.70E-01	+-1.58E-01	1.70E-01	+-1.58E-01	609.32	-0.14
CD-109	LLD<3.08E+00		LLD<3.08E+00		88.03	
CE-139	LLD<1.14E-01		LLD<1.14E-01		165.85	
CE-141	LLD<1.77E-01		LLD<1.77E-01		145.44	
CEPR144	LLD<1.51E+00		LLD<1.51E+00		133.51	
CO-56	LLD<1.88E-01		LLD<1.88E-01		846.76	
CO-57	LLD<9.58E-02		LLD<9.58E-02		122.06	
CO-58	LLD<1.83E-01		LLD<1.83E-01		810.75	
CO-60	2.14E+01	+-6.73E-01	2.14E+01	+-6.73E-01	1332.50	-0.08
					1173.24	-0.14
CR-51	LLD<1.38E+00		LLD<1.38E+00		320.09	
CS-134	1.36E+01	+-5.63E-01	1.36E+01	+-5.63E-01	795.84	-0.15
					604.70	-0.07
CS-136	LLD<1.85E-01		LLD<1.85E-01		818.51	
CS-137	2.85E+01	+-7.04E-01	2.85E+01	+-7.04E-01	661.65	-0.10
CS-138	LLD<1.38E-01		LLD<1.38E-01		1435.86	
EU-152	LLD<3.23E-01		LLD<3.23E-01		1408.01	
EU-154	LLD<3.09E-01		LLD<3.09E-01		1274.45	
EU-155	LLD<3.73E-01		LLD<3.73E-01		105.31	
FE-59	LLD<4.20E-01		LLD<4.20E-01		1099.25	
HF-181	LLD<1.95E-01		LLD<1.95E-01		482.20	
HG-203	LLD<1.60E-01		LLD<1.60E-01		279.20	
I-131	LLD<1.97E-01		LLD<1.97E-01		364.48	
I-132	LLD<2.60E-01		LLD<2.60E-01		667.69	
I-133	LLD<1.90E-01		LLD<1.90E-01		529.69	
I-134	LLD<2.70E-01		LLD<2.70E-01		847.03	
I-135	LLD<4.06E-01		LLD<4.06E-01		1260.41	
K-40	LLD<1.90E+00		LLD<1.90E+00		1460.75	
KR-85	LLD<4.08E+01		LLD<4.08E+01		513.99	
KR-85M	LLD<1.12E-01		LLD<1.12E-01		151.17	
KR-87	LLD<4.37E-01		LLD<4.37E-01		402.58	
KR-89	LLD<6.52E+00		LLD<6.52E+00		220.90	
LA-140	LLD<7.35E-02		LLD<7.35E-02		1596.20	

LA-142	LLD<3.84E-01	LLD<3.84E-01	641.83
MN-54	LLD<1.75E-01	LLD<1.75E-01	834.83
MN-56	LLD<2.12E-01	LLD<2.12E-01	846.76
NA-22	LLD<1.03E-01	LLD<1.03E-01	1274.55
NA-24	LLD<1.68E-01	LLD<1.68E-01	1368.60
NB-94	LLD<1.59E-01	LLD<1.59E-01	702.63
NB-95	LLD<1.60E-01	LLD<1.60E-01	765.78
NB-97	LLD<1.08E+00	LLD<1.08E+00	657.92
NP-238	LLD<8.25E-01	LLD<8.25E-01	984.45
NP-239	LLD<8.99E-01	LLD<8.99E-01	277.60
PA-233	LLD<4.03E-01	LLD<4.03E-01	311.98
PA-234M	LLD<3.46E+01	LLD<3.46E+01	1001.03
PB-210	LLD<4.65E+00	LLD<4.65E+00	465.03
PB-212	LLD<2.86E-01	LLD<2.86E-01	239.00
PB-214	LLD<4.25E-01	LLD<4.25E-01	351.92
PO-210	LLD<1.64E+04	LLD<1.64E+04	804.00
PO-214	LLD<6.88E+03	LLD<6.88E+03	799.70
PO-216	LLD<1.32E+04	LLD<1.32E+04	804.90
PU-239	LLD<1.30E+03	LLD<1.30E+03	129.30
PU-241	LLD<4.57E+04	LLD<4.57E+04	148.57
RA-224	LLD<3.12E+00	LLD<3.12E+00	240.99
RA-226	LLD<2.72E+00	LLD<2.72E+00	186.10
RB-88	LLD<6.32E-01	LLD<6.32E-01	1836.00
RB-89	LLD<9.12E-01	LLD<9.12E-01	1031.88
RN-220	LLD<1.46E+02	LLD<1.46E+02	549.73
RU-103	LLD<1.78E-01	LLD<1.78E-01	497.08
RURH106	LLD<3.28E+00	LLD<3.28E+00	621.80
SB-124	LLD<3.08E-01	LLD<3.08E-01	602.72
SB-125	LLD<1.46E+00	LLD<1.46E+00	176.33
SC-46	LLD<2.22E-01	LLD<2.22E-01	1120.45
SE-75	LLD<2.20E-01	LLD<2.20E-01	264.66
SN-113	LLD<2.49E-01	LLD<2.49E-01	391.67
SR-85	LLD<1.79E-01	LLD<1.79E-01	513.99
SR-91	LLD<3.03E-01	LLD<3.03E-01	555.60
SR-92	LLD<7.70E-02	LLD<7.70E-02	1383.94
TA-182	LLD<6.21E-01	LLD<6.21E-01	1121.30
TC-99M	LLD<1.02E-01	LLD<1.02E-01	140.51
TE-123M	LLD<1.09E-01	LLD<1.09E-01	159.00
TE-125M	LLD<2.77E+01	LLD<2.77E+01	109.27
TE-132	LLD<1.34E-01	LLD<1.34E-01	228.16
TH-228	LLD<9.61E+00	LLD<9.61E+00	84.37
TL-208	LLD<2.18E-01	LLD<2.18E-01	583.14
U-235	LLD<1.81E-01	LLD<1.81E-01	185.71
U-237	LLD<5.53E-01	LLD<5.53E-01	208.00
W-187	LLD<5.51E-01	LLD<5.51E-01	685.74
XE-131M	LLD<4.72E+00	LLD<4.72E+00	163.98
XE-133	LLD<3.42E-01	LLD<3.42E-01	81.00
XE-133M	LLD<1.18E+00	LLD<1.18E+00	233.21
XE-135	LLD<1.44E-01	LLD<1.44E-01	249.79
XE-138	LLD<1.09E+00	LLD<1.09E+00	258.41
Y-88	LLD<6.00E-02	LLD<6.00E-02	1836.06
Y-91	LLD<4.84E+01	LLD<4.84E+01	1204.90
Y-91M	LLD<2.29E-01	LLD<2.29E-01	555.60
ZN-65	LLD<4.36E-01	LLD<4.36E-01	1115.55
ZR-95	LLD<3.02E-01	LLD<3.02E-01	756.73
ZR-97	LLD<1.59E-01	LLD<1.59E-01	743.33
	---	---	
TOTAL	6.37E+01 +-1.14E+00	6.37E+01 +-1.14E+00	

STANDARD DEVIATION = 0.04

EBAR = ***** MEV/DISINTEGRATION
MAXIMUM PERMISSABLE ACTIVITY = 1.44E-09 UC/LI
TOTAL MEASURED ACTIVITY = 6.37E+01 (+-1.14E+00) UC/LI
% TECH. SPEC. = ****** (+-****)

ERROR QUOTATION AT 1.96 SIGMA
LLD CONFIDENCE LEVEL AT 85.0%

PEAKS NOT USED IN ANALYSIS

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
1127.46	563.20	456.	13.9	1.95E+01
1139.52	569.23	822.	12.2	3.55E+01
1604.74	801.80	359.	14.3	2.06E+01
2731.21	1365.31	101.	22.6	9.06E+00

PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
2921.74	1460.68	187.	15.5	1.77E+01

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*                                                                     *
*          G A M M A   S P E C T R U M   A N A L Y S I S              *
*                                                                     *
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

CANBERRA SPECTRAN-F V2.06  SOFTWARE

222-S COUNTING ROOM                                 27-AUG-90  13:13:16


                A N A L Y S I S   P A R A M E T E R S

MCA UNIT NUMBER:   2     /     ADC UNIT NUMBER: 1.0
DETECTOR NUMBER:    1    /     GEOMETRY NUMBER:  42
SPECTRUM SIZE:  4096 CHANNELS
ORDER OF SMOOTHING FUNCTION:     5
NUMBER OF BACKGROUND CHANNELS:  4 ON EACH SIDE OF PEAK
PEAK CONFIDENCE FACTOR: 85.0%
IDENTIFICATION ENERGY WINDOW: +- 1.50 KEV
ERROR QUOTATION: 1.96 SIGMA UNCERTAINTY

ENVIRONMENTAL BACKGROUND SUBTRACTED
LLD CALCULATION PERFORMED
MEASURED ENERGY DIFFERENCES LISTED
MULTIPLET ANALYSIS PERFORMED

ANALYSIS OF SPECTRUM SAVED IN DISK FILE: SD1071
ANALYZED BY:        JLA

SAMPLE DESCRIPTION: F-436 SEGMENT-U
GEOMETRY DESCRIPTION:
SAMPLE SIZE:   1.0000E-01 LI       / CONVERSION FACTOR: 1.0000E+00
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL000

COLLECT STARTED ON 14-MAR-90 AT 12:26:23

COLLECT LIVE TIME:    3000. SECONDS
        REAL TIME:    3001. SECONDS
        DEAD TIME:     0.03 %

 DECAYED TO      0. DAYS,  0.0000 HOURS BEFORE THE START OF COLLECT

ENERGY CALIBRATION PERFORMED 23-NOV-89
EFFICIENCY CALIBRATION PERFORMED  2-MAR-89
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222-S COUNTING ROOM 27-AUG-90 13:13:16

P E A K A N A L Y S I S

PK	CENTROID CHANNEL	ENERGY KEV	FWHM KEV	BACKGND COUNTS	NET AREA COUNTS	ERROR %	NUCLIDES
1	1324.38	661.63	1.53	40.	52.	45.6	CS-137
1B		661.82			35.	46.4	
2	2922.13	1460.87	2.07	8.	194.	14.8	K-40
2B		1461.77			182.	11.2	

ERROR QUOTATION AT 1.96 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

B - ENVIRONMENTAL BACKGROUND PEAK

BACKGROUND SUBTRACTION PERFORMED USING FILE BK0011
BACKGROUND DESCRIPTION: BK0011
BACKGROUND COLLECT STARTED ON 10-JAN-85 AT 12:00:00
BACKGROUND LIVE TIME: 6000. SECONDS

222-S COUNTING ROOM 27-AUG-90 13:13:16

SAMPLE: F-436 SEGMENT-U
DATA COLLECTED ON 14-MAR-90 AT 12:26:23
DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT.

R A D I O N U C L I D E A N A L Y S I S R E P O R T

NUCLIDE	ACTIVITY CONCENTRATION IN uCi/LI MEASURED	ERROR	DECAY CORRECTED	ERROR	ENERGY COMPARISON (KEV) EXPECT	DIFF
AC-228	LLD<1.24E-03		LLD<1.24E-03		911.07	
AG-108M	LLD<2.52E-04		LLD<2.52E-04		433.94	
AG-110M	LLD<4.41E-04		LLD<4.41E-04		657.76	
AM-241	LLD<1.52E-03		LLD<1.52E-03		59.54	
AM-243	LLD<4.29E-04		LLD<4.29E-04		74.67	
AR-41	LLD<3.67E-04		LLD<3.67E-04		1293.64	
AU-198	LLD<2.12E-04		LLD<2.12E-04		411.80	
BA-133	LLD<4.21E-04		LLD<4.21E-04		356.02	
BA-139	LLD<9.27E-04		LLD<9.27E-04		165.85	
BA-140	LLD<8.81E-04		LLD<8.81E-04		537.27	
BA-141	LLD<9.08E-04		LLD<9.08E-04		190.23	
BE-7	LLD<2.21E-03		LLD<2.21E-03		477.59	
BI-207	LLD<2.47E-04		LLD<2.47E-04		569.70	
BI-212	LLD<3.74E-03		LLD<3.74E-03		727.27	
BI-214	LLD<8.46E-04		LLD<8.46E-04		609.32	
CD-109	LLD<5.88E-03		LLD<5.88E-03		88.03	
CE-139	LLD<2.10E-04		LLD<2.10E-04		165.85	
CE-141	LLD<3.38E-04		LLD<3.38E-04		145.44	
CEPR144	LLD<2.82E-03		LLD<2.82E-03		133.51	
CO-56	LLD<2.05E-04		LLD<2.05E-04		846.76	
CO-57	LLD<1.79E-04		LLD<1.79E-04		122.06	
CO-58	LLD<2.81E-04		LLD<2.81E-04		810.75	
CO-60	LLD<3.73E-04		LLD<3.73E-04		1332.50	
CR-51	LLD<2.03E-03		LLD<2.03E-03		320.09	
CS-134	LLD<3.00E-04		LLD<3.00E-04		795.84	
CS-136	LLD<2.68E-04		LLD<2.68E-04		818.51	
CS-137	LLD<4.81E-04		LLD<4.81E-04		661.65	
CS-138	LLD<7.32E-04		LLD<7.32E-04		1435.86	
EU-152	LLD<1.04E-03		LLD<1.04E-03		1408.01	
EU-154	LLD<1.01E-03		LLD<1.01E-03		1274.45	
EU-155	LLD<7.24E-04		LLD<7.24E-04		105.31	
FE-59	LLD<4.30E-04		LLD<4.30E-04		1099.25	
HF-181	LLD<2.61E-04		LLD<2.61E-04		482.20	
HG-203	LLD<2.61E-04		LLD<2.61E-04		279.20	
I-131	LLD<2.93E-04		LLD<2.93E-04		364.48	
I-132	LLD<2.98E-04		LLD<2.98E-04		667.69	
I-133	LLD<2.29E-04		LLD<2.29E-04		529.69	
I-134	LLD<3.08E-04		LLD<3.08E-04		847.03	
I-135	LLD<1.49E-03		LLD<1.49E-03		1260.41	
K-40	LLD<9.27E-03		LLD<9.27E-03		1460.75	
KR-85	LLD<7.79E-02		LLD<7.79E-02		513.99	
KR-85M	LLD<2.17E-04		LLD<2.17E-04		151.17	
KR-87	LLD<5.54E-04		LLD<5.54E-04		402.58	
KR-89	LLD<1.15E-02		LLD<1.15E-02		220.90	
LA-140	LLD<4.13E-04		LLD<4.13E-04		1596.20	
LA-142	LLD<6.29E-04		LLD<6.29E-04		641.83	
MN-54	LLD<2.72E-04		LLD<2.72E-04		834.83	

MN-56	LLD<2.31E-04	LLD<2.31E-04	846.76
NA-22	LLD<3.24E-04	LLD<3.24E-04	1274.55
NA-24	LLD<3.15E-04	LLD<3.15E-04	1368.60
NB-94	LLD<3.18E-04	LLD<3.18E-04	702.63
NB-95	LLD<2.93E-04	LLD<2.93E-04	765.78
NB-97	LLD<5.34E-04	LLD<5.34E-04	657.92
NP-238	LLD<1.38E-03	LLD<1.38E-03	984.45
NP-239	LLD<1.46E-03	LLD<1.46E-03	277.60
PA-233	LLD<6.42E-04	LLD<6.42E-04	311.98
PA-234M	LLD<5.40E-02	LLD<5.40E-02	1001.03
PB-210	LLD<6.01E-03	LLD<6.01E-03	465.03
PB-212	LLD<4.55E-04	LLD<4.55E-04	239.00
PB-214	LLD<6.66E-04	LLD<6.66E-04	351.92
PO-210	LLD<2.27E+01	LLD<2.27E+01	804.00
PO-214	LLD<2.22E+00	LLD<2.22E+00	799.70
PO-216	LLD<1.39E+01	LLD<1.39E+01	804.90
PU-239	LLD<2.35E+00	LLD<2.35E+00	129.30
PU-241	LLD<8.31E+01	LLD<8.31E+01	148.57
RA-224	LLD<5.60E-03	LLD<5.60E-03	240.99
RA-226	LLD<4.92E-03	LLD<4.92E-03	186.10
RB-88	LLD<1.98E-03	LLD<1.98E-03	1836.00
RB-89	LLD<1.01E-03	LLD<1.01E-03	1031.88
RN-220	LLD<2.10E-01	LLD<2.10E-01	549.73
RU-103	LLD<2.45E-04	LLD<2.45E-04	497.08
RURH106	LLD<5.76E-03	LLD<5.76E-03	621.80
SB-124	LLD<2.54E-04	LLD<2.54E-04	602.72
SB-125	LLD<2.64E-03	LLD<2.64E-03	176.33
SC-46	LLD<3.04E-04	LLD<3.04E-04	1120.45
SE-75	LLD<3.31E-04	LLD<3.31E-04	264.66
SN-113	LLD<3.25E-04	LLD<3.25E-04	391.67
SR-85	LLD<3.42E-04	LLD<3.42E-04	513.99
SR-91	LLD<4.47E-04	LLD<4.47E-04	555.60
SR-92	LLD<5.12E-04	LLD<5.12E-04	1383.94
TA-182	LLD<9.06E-04	LLD<9.06E-04	1121.30
TC-99M	LLD<1.87E-04	LLD<1.87E-04	140.51
TE-123M	LLD<2.02E-04	LLD<2.02E-04	159.00
TE-125M	LLD<4.76E-02	LLD<4.76E-02	109.27
TE-132	LLD<2.38E-04	LLD<2.38E-04	228.16
TH-228	LLD<1.86E-02	LLD<1.86E-02	84.37
TL-208	LLD<2.78E-04	LLD<2.78E-04	583.14
U-235	LLD<3.30E-04	LLD<3.30E-04	185.71
U-237	LLD<9.03E-04	LLD<9.03E-04	208.00
W-187	LLD<9.68E-04	LLD<9.68E-04	685.74
XE-131M	LLD<9.89E-03	LLD<9.89E-03	163.98
XE-133	LLD<7.16E-04	LLD<7.16E-04	81.00
XE-133M	LLD<2.05E-03	LLD<2.05E-03	233.21
XE-135	LLD<2.36E-04	LLD<2.36E-04	249.79
XE-138	LLD<1.79E-03	LLD<1.79E-03	258.41
Y-88	LLD<1.88E-04	LLD<1.88E-04	1836.06
Y-91	LLD<1.39E-01	LLD<1.39E-01	1204.90
Y-91M	LLD<3.38E-04	LLD<3.38E-04	555.60
ZN-65	LLD<7.69E-04	LLD<7.69E-04	1115.55
ZR-95	LLD<4.59E-04	LLD<4.59E-04	756.73
ZR-97	LLD<3.07E-04	LLD<3.07E-04	743.33
	---	---	
TOTAL	0.00E-01 +-0.00E-01	0.00E-01 +-0.00E-01	

ERROR QUOTATION AT 1.96 SIGMA
LLD CONFIDENCE LEVEL AT 85.0%

ALL DETECTED PEAKS WERE USED IN THE ANALYSIS

PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
1324.38	661.63	52.	45.6	2.55E+00
2922.13	1460.87	194.	14.8	1.84E+01

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*                                                                   *
*          G A M M A   S P E C T R U M   A N A L Y S I S            *
*                                                                   *
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CANBERRA SPECTRAN-F V2.06 SOFTWARE

222-S COUNTING ROOM 29-AUG-90 14:24:30

A N A L Y S I S P A R A M E T E R S

MCA UNIT NUMBER: 2 / ADC UNIT NUMBER: 1.0
DETECTOR NUMBER: 1 / GEOMETRY NUMBER: 42
SPECTRUM SIZE: 4096 CHANNELS
ORDER OF SMOOTHING FUNCTION: 5
NUMBER OF BACKGROUND CHANNELS: 4 ON EACH SIDE OF PEAK
PEAK CONFIDENCE FACTOR: 85.0%
IDENTIFICATION ENERGY WINDOW: +- 1.50 KEV
ERROR QUOTATION: 1.96 SIGMA UNCERTAINTY

ENVIRONMENTAL BACKGROUND SUBTRACTED
LLD CALCULATION PERFORMED
MEASURED ENERGY DIFFERENCES LISTED
MULTIPLET ANALYSIS PERFORMED

ANALYSIS OF SPECTRUM SAVED IN DISK FILE: SD1075
ANALYZED BY: EMB

SAMPLE DESCRIPTION: F446
GEOMETRY DESCRIPTION:
SAMPLE SIZE: 1.0000E-03 LI / CONVERSION FACTOR: 5.0000E-02
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL000

COLLECT STARTED ON 14-MAR-90 AT 16:16:21

COLLECT LIVE TIME: 3000. SECONDS
REAL TIME: 3001. SECONDS
DEAD TIME: 0.03 %

DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT

ENERGY CALIBRATION PERFORMED 23-NOV-89
EFFICIENCY CALIBRATION PERFORMED 2-MAR-89

222-S COUNTING ROOM 29-AUG-90 14:24:30

P E A K A N A L Y S I S

PK	CENTROID CHANNEL	ENERGY KEV	FWHM KEV	BACKGND COUNTS	NET AREA COUNTS	ERROR %	NUCLIDES
1	1324.30	661.59	1.48	73.	5809.	2.6	CS-137
1B		661.82			35.	46.4	
2	2922.02	1460.82	2.19	9.	176.	15.7	K-40
2B		1461.77			182.	11.2	

ERROR QUOTATION AT 1.96 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

B - ENVIRONMENTAL BACKGROUND PEAK

BACKGROUND SUBTRACTION PERFORMED USING FILE BK0011
BACKGROUND DESCRIPTION: BK0011
BACKGROUND COLLECT STARTED ON 10-JAN-85 AT 12:00:00
BACKGROUND LIVE TIME: 6000. SECONDS

222-S COUNTING ROOM 29-AUG-90 14:24:30

SAMPLE: F446
DATA COLLECTED ON 14-MAR-90 AT 16:16:21
DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT.

R A D I O N U C L I D E A N A L Y S I S R E P O R T

NUCLIDE	ACTIVITY CONCENTRATION IN uCi/LI MEASURED	ERROR	DECAY CORRECTED	ERROR	ENERGY COMPARISON (KEV) EXPECT	DIFF
AC-228	LLD<1.65E+00		LLD<1.65E+00		911.07	
AG-108M	LLD<1.11E+00		LLD<1.11E+00		433.94	
AG-110M	LLD<6.98E+00		LLD<6.98E+00		657.76	
AM-241	LLD<4.70E+00		LLD<4.70E+00		59.54	
AM-243	LLD<1.33E+00		LLD<1.33E+00		74.67	
AR-41	LLD<6.55E-01		LLD<6.55E-01		1293.64	
AU-198	LLD<8.82E-01		LLD<8.82E-01		411.80	
BA-133	LLD<1.39E+00		LLD<1.39E+00		356.02	
BA-139	LLD<3.01E+00		LLD<3.01E+00		165.85	
BA-140	LLD<3.22E+00		LLD<3.22E+00		537.27	
BA-141	LLD<2.99E+00		LLD<2.99E+00		190.23	
BE-7	LLD<1.03E+01		LLD<1.03E+01		477.59	
BI-207	LLD<7.29E-01		LLD<7.29E-01		569.70	
BI-212	LLD<7.68E+00		LLD<7.68E+00		727.27	
BI-214	LLD<2.24E+00		LLD<2.24E+00		609.32	
CD-109	LLD<1.96E+01		LLD<1.96E+01		88.03	
CE-139	LLD<6.82E-01		LLD<6.82E-01		165.85	
CE-141	LLD<1.06E+00		LLD<1.06E+00		145.44	
CEPR144	LLD<8.76E+00		LLD<8.76E+00		133.51	
CO-56	LLD<5.19E-01		LLD<5.19E-01		846.76	
CO-57	LLD<5.60E-01		LLD<5.60E-01		122.06	
CO-58	LLD<5.48E-01		LLD<5.48E-01		810.75	
CO-60	LLD<6.79E-01		LLD<6.79E-01		1332.50	
CR-51	LLD<7.17E+00		LLD<7.17E+00		320.09	
CS-134	LLD<7.44E-01		LLD<7.44E-01		795.84	
CS-136	LLD<5.78E-01		LLD<5.78E-01		818.51	
CS-137	1.79E+02	+-5.21E+00	1.79E+02	+-5.21E+00	661.65	-0.06
CS-138	LLD<1.07E+00		LLD<1.07E+00		1435.86	
EU-152	LLD<2.83E+00		LLD<2.83E+00		1408.01	
EU-154	LLD<1.75E+00		LLD<1.75E+00		1274.45	
EU-155	LLD<2.39E+00		LLD<2.39E+00		105.31	
FE-59	LLD<1.06E+00		LLD<1.06E+00		1099.25	
HF-181	LLD<1.10E+00		LLD<1.10E+00		482.20	
HG-203	LLD<8.79E-01		LLD<8.79E-01		279.20	
I-131	LLD<1.03E+00		LLD<1.03E+00		364.48	
I-132	LLD<1.72E+00		LLD<1.72E+00		667.69	
I-133	LLD<9.11E-01		LLD<9.11E-01		529.69	
I-134	LLD<8.29E-01		LLD<8.29E-01		847.03	
I-135	LLD<2.09E+00		LLD<2.09E+00		1260.41	
K-40	LLD<1.85E+01		LLD<1.85E+01		1460.75	
KR-85	LLD<2.17E+02		LLD<2.17E+02		513.99	
KR-85M	LLD<6.72E-01		LLD<6.72E-01		151.17	
KR-87	LLD<2.33E+00		LLD<2.33E+00		402.58	
KR-89	LLD<3.63E+01		LLD<3.63E+01		220.90	
LA-140	LLD<5.72E-01		LLD<5.72E-01		1596.20	
LA-142	LLD<1.80E+00		LLD<1.80E+00		641.83	
MN-54	LLD<6.15E-01		LLD<6.15E-01		834.83	

MN-56	LLD<5.86E-01	LLD<5.86E-01	846.76
NA-22	LLD<5.85E-01	LLD<5.85E-01	1274.55
NA-24	LLD<7.08E-01	LLD<7.08E-01	1368.60
NB-94	LLD<4.93E-01	LLD<4.93E-01	702.63
NB-95	LLD<5.66E-01	LLD<5.66E-01	765.78
NB-97	LLD<8.46E+00	LLD<8.46E+00	657.92
NP-238	LLD<2.11E+00	LLD<2.11E+00	984.45
NP-239	LLD<4.98E+00	LLD<4.98E+00	277.60
PA-233	LLD<2.15E+00	LLD<2.15E+00	311.98
PA-234M	LLD<1.18E+02	LLD<1.18E+02	1001.03
PB-210	LLD<2.82E+01	LLD<2.82E+01	465.03
PB-212	LLD<1.68E+00	LLD<1.68E+00	239.00
PB-214	LLD<2.30E+00	LLD<2.30E+00	351.92
PO-210	LLD<4.19E+04	LLD<4.19E+04	804.00
PO-214	LLD<5.81E+03	LLD<5.81E+03	799.70
PO-216	LLD<2.70E+04	LLD<2.70E+04	804.90
PU-239	LLD<7.62E+03	LLD<7.62E+03	129.30
PU-241	LLD<2.62E+05	LLD<2.62E+05	148.57
RA-224	LLD<1.68E+01	LLD<1.68E+01	240.99
RA-226	LLD<1.61E+01	LLD<1.61E+01	186.10
RB-88	LLD<6.32E+00	LLD<6.32E+00	1836.00
RB-89	LLD<2.87E+00	LLD<2.87E+00	1031.88
RN-220	LLD<6.47E+02	LLD<6.47E+02	549.73
RU-103	LLD<9.36E-01	LLD<9.36E-01	497.08
RURH106	LLD<1.55E+01	LLD<1.55E+01	621.80
SB-124	LLD<7.79E-01	LLD<7.79E-01	602.72
SB-125	LLD<8.52E+00	LLD<8.52E+00	176.33
SC-46	LLD<6.32E-01	LLD<6.32E-01	1120.45
SE-75	LLD<1.15E+00	LLD<1.15E+00	264.66
SN-113	LLD<1.22E+00	LLD<1.22E+00	391.67
SR-85	LLD<9.53E-01	LLD<9.53E-01	513.99
SR-91	LLD<1.26E+00	LLD<1.26E+00	555.60
SR-92	LLD<6.62E-01	LLD<6.62E-01	1383.94
TA-182	LLD<1.81E+00	LLD<1.81E+00	1121.30
TC-99M	LLD<5.74E-01	LLD<5.74E-01	140.51
TE-123M	LLD<6.49E-01	LLD<6.49E-01	159.00
TE-125M	LLD<1.62E+02	LLD<1.62E+02	109.27
TE-132	LLD<7.51E-01	LLD<7.51E-01	228.16
TH-228	LLD<5.95E+01	LLD<5.95E+01	84.37
TL-208	LLD<8.63E-01	LLD<8.63E-01	583.14
U-235	LLD<1.05E+00	LLD<1.05E+00	185.71
U-237	LLD<3.00E+00	LLD<3.00E+00	208.00
W-187	LLD<1.74E+00	LLD<1.74E+00	685.74
XE-131M	LLD<2.91E+01	LLD<2.91E+01	163.98
XE-133	LLD<2.14E+00	LLD<2.14E+00	81.00
XE-133M	LLD<6.93E+00	LLD<6.93E+00	233.21
XE-135	LLD<7.89E-01	LLD<7.89E-01	249.79
XE-138	LLD<6.09E+00	LLD<6.09E+00	258.41
Y-88	LLD<6.00E-01	LLD<6.00E-01	1836.06
Y-91	LLD<1.96E+02	LLD<1.96E+02	1204.90
Y-91M	LLD<9.56E-01	LLD<9.56E-01	555.60
ZN-65	LLD<1.75E+00	LLD<1.75E+00	1115.55
ZR-95	LLD<1.04E+00	LLD<1.04E+00	756.73
ZR-97	LLD<6.13E-01	LLD<6.13E-01	743.33
TOTAL	1.79E+02 +-5.21E+00	1.79E+02 +-5.21E+00	

EBAR = ***** MEV/DISINTEGRATION
MAXIMUM PERMISSABLE ACTIVITY = 1.16E-08 UC/LI
TOTAL MEASURED ACTIVITY = 1.79E+02 (+-5.21E+00) UC/LI

% TECH. SPEC. = ****** (+-****)

ERROR QUOTATION AT 1.96 SIGMA
LLD CONFIDENCE LEVEL AT 85.0%

ALL DETECTED PEAKS WERE USED IN THE ANALYSIS

PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
2922.02	1460.82	176.	15.7	1.67E+01

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*                                                                     *
*          G A M M A   S P E C T R U M   A N A L Y S I S              *
*                                                                     *
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CANBERRA SPECTRAN-F V2.06 SOFTWARE

222-S COUNTING ROOM 29-AUG-90 14:28:14

A N A L Y S I S P A R A M E T E R S

MCA UNIT NUMBER: 2 / ADC UNIT NUMBER: 1.0
DETECTOR NUMBER: 1 / GEOMETRY NUMBER: 42
SPECTRUM SIZE: 4096 CHANNELS
ORDER OF SMOOTHING FUNCTION: 5
NUMBER OF BACKGROUND CHANNELS: 4 ON EACH SIDE OF PEAK
PEAK CONFIDENCE FACTOR: 85.0%
IDENTIFICATION ENERGY WINDOW: +- 1.50 KEV
ERROR QUOTATION: 1.96 SIGMA UNCERTAINTY

ENVIRONMENTAL BACKGROUND SUBTRACTED
LLD CALCULATION PERFORMED
MEASURED ENERGY DIFFERENCES LISTED
MULTIPLET ANALYSIS PERFORMED

ANALYSIS OF SPECTRUM SAVED IN DISK FILE: SD1076
ANALYZED BY: EMB

SAMPLE DESCRIPTION: F447
GEOMETRY DESCRIPTION:
SAMPLE SIZE: 1.0000E-03 LI / CONVERSION FACTOR: 5.0000E-02
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL000

COLLECT STARTED ON 14-MAR-90 AT 18:34:50

COLLECT LIVE TIME: 3000. SECONDS
REAL TIME: 3001. SECONDS
DEAD TIME: 0.03 %

DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT

ENERGY CALIBRATION PERFORMED 23-NOV-89
EFFICIENCY CALIBRATION PERFORMED 2-MAR-89

222-S COUNTING ROOM 29-AUG-90 14:28:14

P E A K A N A L Y S I S

PK	CENTROID CHANNEL	ENERGY KEV	FWHM KEV	BACKGND COUNTS	NET AREA COUNTS	ERROR %	NUCLIDES
1	93.81	46.81	1.14	117.	67.	50.8	
2	1324.29	661.59	1.54	47.	4447.	3.0	CS-137
2B		661.82			35.	46.4	
3	2922.16	1460.89	1.91	7.	174.	15.6	K-40
3B		1461.77			182.	11.2	
4	3527.58	1764.02	2.29	4.	18.	57.9	BI-214

ERROR QUOTATION AT 1.96 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

B - ENVIRONMENTAL BACKGROUND PEAK

BACKGROUND SUBTRACTION PERFORMED USING FILE BK0011
BACKGROUND DESCRIPTION: BK0011
BACKGROUND COLLECT STARTED ON 10-JAN-85 AT 12:00:00
BACKGROUND LIVE TIME: 6000. SECONDS

222-S COUNTING ROOM 29-AUG-90 14:28:14

SAMPLE: F447
DATA COLLECTED ON 14-MAR-90 AT 18:34:50
DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT.

R A D I O N U C L I D E A N A L Y S I S R E P O R T

NUCLIDE	ACTIVITY CONCENTRATION IN uCi/LI MEASURED	ERROR	DECAY CORRECTED	ERROR	ENERGY COMPARISON (KEV) EXPECT	DIFF
AC-228	LLD<1.41E+00		LLD<1.41E+00		911.07	
AG-108M	LLD<9.85E-01		LLD<9.85E-01		433.94	
AG-110M	LLD<6.09E+00		LLD<6.09E+00		657.76	
AM-241	LLD<4.51E+00		LLD<4.51E+00		59.54	
AM-243	LLD<1.21E+00		LLD<1.21E+00		74.67	
AR-41	LLD<8.06E-01		LLD<8.06E-01		1293.64	
AU-198	LLD<8.28E-01		LLD<8.28E-01		411.80	
BA-133	LLD<1.32E+00		LLD<1.32E+00		356.02	
BA-139	LLD<2.87E+00		LLD<2.87E+00		165.85	
BA-140	LLD<2.85E+00		LLD<2.85E+00		537.27	
BA-141	LLD<2.86E+00		LLD<2.86E+00		190.23	
BE-7	LLD<8.92E+00		LLD<8.92E+00		477.59	
BI-207	LLD<7.13E-01		LLD<7.13E-01		569.70	
BI-212	LLD<7.88E+00		LLD<7.88E+00		727.27	
BI-214	LLD<2.04E+00		LLD<2.04E+00		609.32	
CD-109	LLD<1.73E+01		LLD<1.73E+01		88.03	
CE-139	LLD<6.50E-01		LLD<6.50E-01		165.85	
CE-141	LLD<9.27E-01		LLD<9.27E-01		145.44	
CEPR144	LLD<7.80E+00		LLD<7.80E+00		133.51	
CO-56	LLD<6.60E-01		LLD<6.60E-01		846.76	
CO-57	LLD<5.40E-01		LLD<5.40E-01		122.06	
CO-58	LLD<6.27E-01		LLD<6.27E-01		810.75	
CO-60	LLD<5.64E-01		LLD<5.64E-01		1332.50	
CR-51	LLD<6.62E+00		LLD<6.62E+00		320.09	
CS-134	LLD<6.43E-01		LLD<6.43E-01		795.84	
CS-136	LLD<5.92E-01		LLD<5.92E-01		818.51	
CS-137	1.37E+02	+-4.46E+00	1.37E+02	+-4.46E+00	661.65	-0.06
CS-138	LLD<1.38E+00		LLD<1.38E+00		1435.86	
EU-152	LLD<3.23E+00		LLD<3.23E+00		1408.01	
EU-154	LLD<2.02E+00		LLD<2.02E+00		1274.45	
EU-155	LLD<2.00E+00		LLD<2.00E+00		105.31	
FE-59	LLD<1.06E+00		LLD<1.06E+00		1099.25	
HF-181	LLD<1.04E+00		LLD<1.04E+00		482.20	
HG-203	LLD<7.50E-01		LLD<7.50E-01		279.20	
I-131	LLD<9.36E-01		LLD<9.36E-01		364.48	
I-132	LLD<1.41E+00		LLD<1.41E+00		667.69	
I-133	LLD<8.32E-01		LLD<8.32E-01		529.69	
I-134	LLD<9.44E-01		LLD<9.44E-01		847.03	
I-135	LLD<2.78E+00		LLD<2.78E+00		1260.41	
K-40	LLD<1.87E+01		LLD<1.87E+01		1460.75	
KR-85	LLD<2.32E+02		LLD<2.32E+02		513.99	
KR-85M	LLD<6.14E-01		LLD<6.14E-01		151.17	
KR-87	LLD<2.22E+00		LLD<2.22E+00		402.58	
KR-89	LLD<3.42E+01		LLD<3.42E+01		220.90	
LA-140	LLD<7.35E-01		LLD<7.35E-01		1596.20	
LA-142	LLD<1.80E+00		LLD<1.80E+00		641.83	
MN-54	LLD<5.59E-01		LLD<5.59E-01		834.83	

MN-56	LLD<7.44E-01	LLD<7.44E-01	846.76
NA-22	LLD<6.77E-01	LLD<6.77E-01	1274.55
NA-24	LLD<6.70E-01	LLD<6.70E-01	1368.60
NB-94	LLD<5.75E-01	LLD<5.75E-01	702.63
NB-95	LLD<4.46E-01	LLD<4.46E-01	765.78
NB-97	LLD<7.38E+00	LLD<7.38E+00	657.92
NP-238	LLD<1.87E+00	LLD<1.87E+00	984.45
NP-239	LLD<4.64E+00	LLD<4.64E+00	277.60
PA-233	LLD<1.95E+00	LLD<1.95E+00	311.98
PA-234M	LLD<1.21E+02	LLD<1.21E+02	1001.03
PB-210	LLD<2.58E+01	LLD<2.58E+01	465.03
PB-212	LLD<1.46E+00	LLD<1.46E+00	239.00
PB-214	LLD<2.20E+00	LLD<2.20E+00	351.92
PO-210	LLD<5.73E+04	LLD<5.73E+04	804.00
PO-214	LLD<5.92E+03	LLD<5.92E+03	799.70
PO-216	LLD<3.68E+04	LLD<3.68E+04	804.90
PU-239	LLD<7.01E+03	LLD<7.01E+03	129.30
PU-241	LLD<2.54E+05	LLD<2.54E+05	148.57
RA-224	LLD<1.53E+01	LLD<1.53E+01	240.99
RA-226	LLD<1.53E+01	LLD<1.53E+01	186.10
RB-88	LLD<5.29E+00	LLD<5.29E+00	1836.00
RB-89	LLD<2.69E+00	LLD<2.69E+00	1031.88
RN-220	LLD<5.16E+02	LLD<5.16E+02	549.73
RU-103	LLD<8.09E-01	LLD<8.09E-01	497.08
RURH106	LLD<1.23E+01	LLD<1.23E+01	621.80
SB-124	LLD<6.89E-01	LLD<6.89E-01	602.72
SB-125	LLD<7.75E+00	LLD<7.75E+00	176.33
SC-46	LLD<6.32E-01	LLD<6.32E-01	1120.45
SE-75	LLD<1.03E+00	LLD<1.03E+00	264.66
SN-113	LLD<1.25E+00	LLD<1.25E+00	391.67
SR-85	LLD<1.02E+00	LLD<1.02E+00	513.99
SR-91	LLD<1.27E+00	LLD<1.27E+00	555.60
SR-92	LLD<9.07E-01	LLD<9.07E-01	1383.94
TA-182	LLD<1.95E+00	LLD<1.95E+00	1121.30
TC-99M	LLD<5.34E-01	LLD<5.34E-01	140.51
TE-123M	LLD<5.81E-01	LLD<5.81E-01	159.00
TE-125M	LLD<1.68E+02	LLD<1.68E+02	109.27
TE-132	LLD<7.00E-01	LLD<7.00E-01	228.16
TH-228	LLD<5.33E+01	LLD<5.33E+01	84.37
TL-208	LLD<8.42E-01	LLD<8.42E-01	583.14
U-235	LLD<1.02E+00	LLD<1.02E+00	185.71
U-237	LLD<2.80E+00	LLD<2.80E+00	208.00
W-187	LLD<2.08E+00	LLD<2.08E+00	685.74
XE-131M	LLD<2.62E+01	LLD<2.62E+01	163.98
XE-133	LLD<1.89E+00	LLD<1.89E+00	81.00
XE-133M	LLD<6.03E+00	LLD<6.03E+00	233.21
XE-135	LLD<7.14E-01	LLD<7.14E-01	249.79
XE-138	LLD<5.25E+00	LLD<5.25E+00	258.41
Y-88	LLD<5.03E-01	LLD<5.03E-01	1836.06
Y-91	LLD<2.48E+02	LLD<2.48E+02	1204.90
Y-91M	LLD<9.63E-01	LLD<9.63E-01	555.60
ZN-65	LLD<1.88E+00	LLD<1.88E+00	1115.55
ZR-95	LLD<1.01E+00	LLD<1.01E+00	756.73
ZR-97	LLD<5.69E-01	LLD<5.69E-01	743.33
	---	---	
TOTAL	1.37E+02 +-4.46E+00	1.37E+02 +-4.46E+00	

EBAR = ***** MEV/DISINTEGRATION
MAXIMUM PERMISSABLE ACTIVITY = 1.16E-08 UC/LI
TOTAL MEASURED ACTIVITY = 1.37E+02 (+-4.46E+00) UC/LI

% TECH. SPEC. = ****** (+-****)

ERROR QUOTATION AT 1.96 SIGMA
LLD CONFIDENCE LEVEL AT 85.0%

PEAKS NOT USED IN ANALYSIS

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
93.81	46.81	67.	50.8	9.68E+00
3527.58	1764.02	18.	57.9	2.01E+00

PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
2922.16	1460.89	174.	15.6	1.65E+01

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*                                                                     *
*          G A M M A   S P E C T R U M   A N A L Y S I S              *
*                                                                     *
* * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * * *

CANBERRA SPECTRAN-F V2.06  SOFTWARE

222-S COUNTING ROOM                                 27-AUG-90  13:22:40

                A N A L Y S I S   P A R A M E T E R S

MCA UNIT NUMBER:   2     /     ADC UNIT NUMBER: 1.0
DETECTOR NUMBER:    1    /     GEOMETRY NUMBER:  42
SPECTRUM SIZE:  4096 CHANNELS
ORDER OF SMOOTHING FUNCTION:     5
NUMBER OF BACKGROUND CHANNELS:  4 ON EACH SIDE OF PEAK
PEAK CONFIDENCE FACTOR: 85.0%
IDENTIFICATION ENERGY WINDOW: +- 1.50 KEV
ERROR QUOTATION: 1.96 SIGMA UNCERTAINTY

ENVIRONMENTAL BACKGROUND SUBTRACTED
LLD CALCULATION PERFORMED
MEASURED ENERGY DIFFERENCES LISTED
MULTIPLET ANALYSIS PERFORMED

ANALYSIS OF SPECTRUM SAVED IN DISK FILE: SD1084
ANALYZED BY:        MAX

SAMPLE DESCRIPTION: F568
GEOMETRY DESCRIPTION:
SAMPLE SIZE:   1.0000E-03 LI       / CONVERSION FACTOR: 5.0000E-02
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL000

COLLECT STARTED ON 15-MAR-90 AT 04:41:44

COLLECT LIVE TIME:    3000. SECONDS
        REAL TIME:    3006. SECONDS
        DEAD TIME:     0.20 %

 DECAYED TO      0. DAYS,  0.0000 HOURS BEFORE THE START OF COLLECT

ENERGY CALIBRATION PERFORMED 23-NOV-89
EFFICIENCY CALIBRATION PERFORMED  2-MAR-89
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222-S COUNTING ROOM 27-AUG-90 13:22:40

P E A K A N A L Y S I S

PK	CENTROID CHANNEL	ENERGY KEV	FWHM KEV	BACKGND COUNTS	NET AREA COUNTS	ERROR %	NUCLIDES
1C	1127.31	563.13	1.39	475.	428.	17.4	CS-134, EU-152
2C	1139.70	569.32	1.39	485.	740.	14.4	CS-134, BI-207
3	1210.36	604.64	1.47	520.	4961.	3.1	CS-134
4	1324.22	661.55	1.53	326.	13178.	1.8	CS-137
4B		661.82			35.	46.4	
5C	1592.50	795.68	1.50	258.	3527.	4.2	CS-134
6C	1604.72	801.79	1.50	246.	368.	13.7	CS-134
7	2347.08	1173.09	1.79	210.	4735.	3.0	CO-60
8	2665.49	1332.42	1.86	39.	4119.	3.1	CO-60
9	2730.86	1365.14	1.58	7.	99.	21.4	CS-134
10	2922.13	1460.87	2.48	10.	172.	16.0	K-40
10B		1461.77			182.	11.2	

ERROR QUOTATION AT 1.96 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

C - MULTIPLET ANALYSIS CONVERGED NORMALLY
B - ENVIRONMENTAL BACKGROUND PEAK

BACKGROUND SUBTRACTION PERFORMED USING FILE BK0011
BACKGROUND DESCRIPTION: BK0011
BACKGROUND COLLECT STARTED ON 10-JAN-85 AT 12:00:00
BACKGROUND LIVE TIME: 6000. SECONDS

222-S COUNTING ROOM 27-AUG-90 13:22:40

SAMPLE: F568
DATA COLLECTED ON 15-MAR-90 AT 04:41:44
DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT.

R A D I O N U C L I D E A N A L Y S I S R E P O R T

NUCLIDE	ACTIVITY CONCENTRATION IN uCi/LI MEASURED	ERROR	DECAY CORRECTED	ERROR	ENERGY COMPARISON (KEV) EXPECT	DIFF
AC-228	LLD<7.40E+00		LLD<7.40E+00		911.07	
AG-108M	LLD<2.06E+00		LLD<2.06E+00		433.94	
AG-110M	LLD<1.06E+01		LLD<1.06E+01		657.76	
AM-241	LLD<8.73E+00		LLD<8.73E+00		59.54	
AM-243	LLD<2.29E+00		LLD<2.29E+00		74.67	
AR-41	LLD<1.23E+00		LLD<1.23E+00		1293.64	
AU-198	LLD<1.86E+00		LLD<1.86E+00		411.80	
BA-133	LLD<2.82E+00		LLD<2.82E+00		356.02	
BA-139	LLD<5.43E+00		LLD<5.43E+00		165.85	
BA-140	LLD<6.94E+00		LLD<6.94E+00		537.27	
BA-141	LLD<5.59E+00		LLD<5.59E+00		190.23	
BE-7	LLD<1.93E+01		LLD<1.93E+01		477.59	
BI-207	LLD<1.78E+00		LLD<1.78E+00		569.70	
BI-212	LLD<2.31E+01		LLD<2.31E+01		727.27	
BI-214	LLD<1.01E+01		LLD<1.01E+01		609.32	
CD-109	LLD<3.37E+01		LLD<3.37E+01		88.03	
CE-139	LLD<1.23E+00		LLD<1.23E+00		165.85	
CE-141	LLD<1.90E+00		LLD<1.90E+00		145.44	
CEPR144	LLD<1.58E+01		LLD<1.58E+01		133.51	
CO-56	LLD<1.78E+00		LLD<1.78E+00		846.76	
CO-57	LLD<1.03E+00		LLD<1.03E+00		122.06	
CO-58	LLD<1.76E+00		LLD<1.76E+00		810.75	
CO-60	1.96E+02	+-6.41E+00	1.96E+02	+-6.41E+00	1332.50	-0.08
					1173.24	-0.15
CR-51	LLD<1.43E+01		LLD<1.43E+01		320.09	
CS-134	1.27E+02	+-5.53E+00	1.27E+02	+-5.53E+00	795.84	-0.17
					604.70	-0.06
CS-136	LLD<1.79E+00		LLD<1.79E+00		818.51	
CS-137	4.08E+02	+-8.75E+00	4.08E+02	+-8.75E+00	661.65	-0.10
CS-138	LLD<1.38E+00		LLD<1.38E+00		1435.86	
EU-152	LLD<3.04E+00		LLD<3.04E+00		1408.01	
EU-154	LLD<3.24E+00		LLD<3.24E+00		1274.45	
EU-155	LLD<4.02E+00		LLD<4.02E+00		105.31	
FE-59	LLD<4.53E+00		LLD<4.53E+00		1099.25	
HF-181	LLD<2.13E+00		LLD<2.13E+00		482.20	
HG-203	LLD<1.65E+00		LLD<1.65E+00		279.20	
I-131	LLD<2.07E+00		LLD<2.07E+00		364.48	
I-132	LLD<2.80E+00		LLD<2.80E+00		667.69	
I-133	LLD<1.94E+00		LLD<1.94E+00		529.69	
I-134	LLD<2.53E+00		LLD<2.53E+00		847.03	
I-135	LLD<4.50E+00		LLD<4.50E+00		1260.41	
K-40	LLD<1.85E+01		LLD<1.85E+01		1460.75	
KR-85	LLD<4.26E+02		LLD<4.26E+02		513.99	
KR-85M	LLD<1.22E+00		LLD<1.22E+00		151.17	
KR-87	LLD<4.55E+00		LLD<4.55E+00		402.58	
KR-89	LLD<6.73E+01		LLD<6.73E+01		220.90	
LA-140	LLD<6.86E-01		LLD<6.86E-01		1596.20	

LA-142	LLD<3.84E+00	LLD<3.84E+00	641.83
MN-54	LLD<1.73E+00	LLD<1.73E+00	834.83
MN-56	LLD<2.01E+00	LLD<2.01E+00	846.76
NA-22	LLD<1.07E+00	LLD<1.07E+00	1274.55
NA-24	LLD<1.50E+00	LLD<1.50E+00	1368.60
NB-94	LLD<1.58E+00	LLD<1.58E+00	702.63
NB-95	LLD<1.63E+00	LLD<1.63E+00	765.78
NB-97	LLD<1.28E+01	LLD<1.28E+01	657.92
NP-238	LLD<7.72E+00	LLD<7.72E+00	984.45
NP-239	LLD<9.48E+00	LLD<9.48E+00	277.60
PA-233	LLD<4.17E+00	LLD<4.17E+00	311.98
PA-234M	LLD<3.77E+02	LLD<3.77E+02	1001.03
PB-210	LLD<4.92E+01	LLD<4.92E+01	465.03
PB-212	LLD<3.06E+00	LLD<3.06E+00	239.00
PB-214	LLD<4.56E+00	LLD<4.56E+00	351.92
PO-210	LLD<1.62E+05	LLD<1.62E+05	804.00
PO-214	LLD<6.74E+04	LLD<6.74E+04	799.70
PO-216	LLD<1.36E+05	LLD<1.36E+05	804.90
PU-239	LLD<1.38E+04	LLD<1.38E+04	129.30
PU-241	LLD<4.87E+05	LLD<4.87E+05	148.57
RA-224	LLD<3.34E+01	LLD<3.34E+01	240.99
RA-226	LLD<2.90E+01	LLD<2.90E+01	186.10
RB-88	LLD<9.27E+00	LLD<9.27E+00	1836.00
RB-89	LLD<9.20E+00	LLD<9.20E+00	1031.88
RN-220	LLD<1.53E+03	LLD<1.53E+03	549.73
RU-103	LLD<1.87E+00	LLD<1.87E+00	497.08
RURH106	LLD<3.23E+01	LLD<3.23E+01	621.80
SB-124	LLD<3.09E+00	LLD<3.09E+00	602.72
SB-125	LLD<1.54E+01	LLD<1.54E+01	176.33
SC-46	LLD<2.20E+00	LLD<2.20E+00	1120.45
SE-75	LLD<2.27E+00	LLD<2.27E+00	264.66
SN-113	LLD<2.55E+00	LLD<2.55E+00	391.67
SR-85	LLD<1.87E+00	LLD<1.87E+00	513.99
SR-91	LLD<3.06E+00	LLD<3.06E+00	555.60
SR-92	LLD<1.10E+00	LLD<1.10E+00	1383.94
TA-182	LLD<6.32E+00	LLD<6.32E+00	1121.30
TC-99M	LLD<1.06E+00	LLD<1.06E+00	140.51
TE-123M	LLD<1.14E+00	LLD<1.14E+00	159.00
TE-125M	LLD<3.04E+02	LLD<3.04E+02	109.27
TE-132	LLD<1.44E+00	LLD<1.44E+00	228.16
TH-228	LLD<9.91E+01	LLD<9.91E+01	84.37
TL-208	LLD<2.21E+00	LLD<2.21E+00	583.14
U-235	LLD<1.94E+00	LLD<1.94E+00	185.71
U-237	LLD<5.64E+00	LLD<5.64E+00	208.00
W-187	LLD<5.34E+00	LLD<5.34E+00	685.74
XE-131M	LLD<5.26E+01	LLD<5.26E+01	163.98
XE-133	LLD<3.69E+00	LLD<3.69E+00	81.00
XE-133M	LLD<1.26E+01	LLD<1.26E+01	233.21
XE-135	LLD<1.48E+00	LLD<1.48E+00	249.79
XE-138	LLD<1.12E+01	LLD<1.12E+01	258.41
Y-88	LLD<8.79E-01	LLD<8.79E-01	1836.06
Y-91	LLD<4.23E+02	LLD<4.23E+02	1204.90
Y-91M	LLD<2.32E+00	LLD<2.32E+00	555.60
ZN-65	LLD<4.60E+00	LLD<4.60E+00	1115.55
ZR-95	LLD<3.07E+00	LLD<3.07E+00	756.73
ZR-97	LLD<1.49E+00	LLD<1.49E+00	743.33
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TOTAL	7.31E+02 +-1.22E+01	7.31E+02 +-1.22E+01	

STANDARD DEVIATION = 0.05

EBAR = ***** MEV/DISINTEGRATION
MAXIMUM PERMISSABLE ACTIVITY = 1.73E-09 UC/LI
TOTAL MEASURED ACTIVITY = 7.31E+02 (+-1.22E+01) UC/LI
% TECH. SPEC. = ****** (+-****)

ERROR QUOTATION AT 1.96 SIGMA
LLD CONFIDENCE LEVEL AT 85.0%

PEAKS NOT USED IN ANALYSIS

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
1127.31	563.13	428.	17.4	1.83E+01
1139.70	569.32	740.	14.4	3.20E+01
1604.72	801.79	368.	13.7	2.11E+01
2730.86	1365.14	99.	21.4	8.84E+00

PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
2922.13	1460.87	172.	16.0	1.63E+01

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*                                                                     *
*          G A M M A   S P E C T R U M   A N A L Y S I S              *
*                                                                     *
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CANBERRA SPECTRAN-F V2.06 SOFTWARE

222-S COUNTING ROOM 27-AUG-90 13:28:16

A N A L Y S I S P A R A M E T E R S

MCA UNIT NUMBER: 2 / ADC UNIT NUMBER: 1.0
DETECTOR NUMBER: 1 / GEOMETRY NUMBER: 42
SPECTRUM SIZE: 4096 CHANNELS
ORDER OF SMOOTHING FUNCTION: 5
NUMBER OF BACKGROUND CHANNELS: 4 ON EACH SIDE OF PEAK
PEAK CONFIDENCE FACTOR: 85.0%
IDENTIFICATION ENERGY WINDOW: +- 1.50 KEV
ERROR QUOTATION: 1.96 SIGMA UNCERTAINTY

ENVIRONMENTAL BACKGROUND SUBTRACTED
LLD CALCULATION PERFORMED
MEASURED ENERGY DIFFERENCES LISTED
MULTIPLET ANALYSIS PERFORMED

ANALYSIS OF SPECTRUM SAVED IN DISK FILE: SD1087
ANALYZED BY: MAX

SAMPLE DESCRIPTION: F569
GEOMETRY DESCRIPTION:
SAMPLE SIZE: 1.0000E-03 LI / CONVERSION FACTOR: 5.0000E-01
STANDARD SIZE: 1.0000E+00 EA
ANALYSIS LIBRARY FILE: ANL000

COLLECT STARTED ON 15-MAR-90 AT 07:10:10

COLLECT LIVE TIME: 3254. SECONDS
REAL TIME: 199. SECONDS
DEAD TIME: -1535.18 %

DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT

ENERGY CALIBRATION PERFORMED 23-NOV-89
EFFICIENCY CALIBRATION PERFORMED 2-MAR-89

222-S COUNTING ROOM 27-AUG-90 13:28:16

P E A K A N A L Y S I S

PK	CENTROID CHANNEL	ENERGY KEV	FWHM KEV	BACKGND COUNTS	NET AREA COUNTS	ERROR %	NUCLIDES
1C	1127.55	563.25	1.38	459.	523.	12.7	CS-134, EU-152
2C	1139.64	569.29	1.38	494.	890.	11.4	CS-134, BI-207
3	1210.42	604.67	1.52	526.	5470.	2.9	CS-134
4	1324.31	661.60	1.59	393.	9861.	2.1	CS-137
4B		661.82			38.	46.4	
5C	1592.64	795.75	1.54	258.	3854.	4.0	CS-134
6C	1604.90	801.88	1.54	258.	405.	14.2	CS-134
7	2347.09	1173.10	1.83	230.	5233.	2.9	CO-60
8	2665.64	1332.50	1.90	72.	4671.	2.9	CO-60
9	2730.89	1365.15	1.76	20.	92.	25.4	CS-134
10	2922.37	1460.99	2.02	11.	178.	15.9	K-40
10B		1461.77			197.	11.2	

ERROR QUOTATION AT 1.96 SIGMA
PEAK CONFIDENCE LEVEL AT 85.0%

C - MULTIPLET ANALYSIS CONVERGED NORMALLY
B - ENVIRONMENTAL BACKGROUND PEAK

BACKGROUND SUBTRACTION PERFORMED USING FILE BK0011
BACKGROUND DESCRIPTION: BK0011
BACKGROUND COLLECT STARTED ON 10-JAN-85 AT 12:00:00
BACKGROUND LIVE TIME: 6000. SECONDS

222-S COUNTING ROOM 27-AUG-90 13:28:16

SAMPLE: F569
DATA COLLECTED ON 15-MAR-90 AT 07:10:10
DECAYED TO 0. DAYS, 0.0000 HOURS BEFORE THE START OF COLLECT.

R A D I O N U C L I D E A N A L Y S I S R E P O R T

NUCLIDE	ACTIVITY CONCENTRATION IN uCi/LI MEASURED	ERROR	DECAY CORRECTED	ERROR	ENERGY COMPARISON (KEV) EXPECT	DIFF
AC-228	LLD<7.24E-01		LLD<7.24E-01		911.07	
AG-108M	LLD<1.84E-01		LLD<1.84E-01		433.94	
AG-110M	LLD<8.41E-01		LLD<8.41E-01		657.76	
AM-241	LLD<7.59E-01		LLD<7.59E-01		59.54	
AM-243	LLD<2.01E-01		LLD<2.01E-01		74.67	
AR-41	LLD<1.15E-01		LLD<1.15E-01		1293.64	
AU-198	LLD<1.64E-01		LLD<1.64E-01		411.80	
BA-133	LLD<2.45E-01		LLD<2.45E-01		356.02	
BA-139	LLD<4.12E-01		LLD<4.12E-01		165.85	
BA-140	LLD<6.21E-01		LLD<6.21E-01		537.27	
BA-141	LLD<2.36E-01		LLD<2.36E-01		190.23	
BE-7	LLD<1.72E+00		LLD<1.72E+00		477.59	
BI-207	LLD<1.70E-01		LLD<1.70E-01		569.70	
BI-212	LLD<2.23E+00		LLD<2.23E+00		727.27	
BI-214	LLD<1.00E+00		LLD<1.00E+00		609.32	
CD-109	LLD<2.87E+00		LLD<2.87E+00		88.03	
CE-139	LLD<1.12E-01		LLD<1.12E-01		165.85	
CE-141	LLD<1.72E-01		LLD<1.72E-01		145.44	
CEPR144	LLD<1.43E+00		LLD<1.43E+00		133.51	
CO-56	LLD<1.73E-01		LLD<1.73E-01		846.76	
CO-57	LLD<9.28E-02		LLD<9.28E-02		122.06	
CO-58	LLD<1.69E-01		LLD<1.69E-01		810.75	
CO-60	2.05E+01	+-6.38E-01	2.05E+01	+-6.38E-01	1332.50	-0.00
					1173.24	-0.14
CR-51	LLD<1.27E+00		LLD<1.27E+00		320.09	
CS-134	1.28E+01	+-5.38E-01	1.28E+01	+-5.38E-01	795.84	-0.10
					604.70	-0.03
CS-136	LLD<1.71E-01		LLD<1.71E-01		818.51	
CS-137	2.81E+01	+-6.78E-01	2.81E+01	+-6.78E-01	661.65	-0.05
CS-138	LLD<9.04E-02		LLD<9.04E-02		1435.86	
EU-152	LLD<3.59E-01		LLD<3.59E-01		1408.01	
EU-154	LLD<2.89E-01		LLD<2.89E-01		1274.45	
EU-155	LLD<3.56E-01		LLD<3.56E-01		105.31	
FE-59	LLD<3.89E-01		LLD<3.89E-01		1099.25	
HF-181	LLD<1.81E-01		LLD<1.81E-01		482.20	
HG-203	LLD<1.50E-01		LLD<1.50E-01		279.20	
I-131	LLD<1.91E-01		LLD<1.91E-01		364.48	
I-132	LLD<2.26E-01		LLD<2.26E-01		667.69	
I-133	LLD<1.76E-01		LLD<1.76E-01		529.69	
I-134	LLD<1.83E-01		LLD<1.83E-01		847.03	
I-135	LLD<3.87E-01		LLD<3.87E-01		1260.41	
K-40	LLD<1.82E+00		LLD<1.82E+00		1460.75	
KR-85	LLD<3.74E+01		LLD<3.74E+01		513.99	
KR-85M	LLD<1.02E-01		LLD<1.02E-01		151.17	
KR-87	LLD<3.42E-01		LLD<3.42E-01		402.58	
KR-89	LLD<7.88E-01		LLD<7.88E-01		220.90	
LA-140	LLD<6.32E-02		LLD<6.32E-02		1596.20	

LA-142	LLD<3.12E-01	LLD<3.12E-01	641.83
MN-54	LLD<1.66E-01	LLD<1.66E-01	834.83
MN-56	LLD<1.74E-01	LLD<1.74E-01	846.76
NA-22	LLD<9.83E-02	LLD<9.83E-02	1274.55
NA-24	LLD<1.44E-01	LLD<1.44E-01	1368.60
NB-94	LLD<1.53E-01	LLD<1.53E-01	702.63
NB-95	LLD<1.62E-01	LLD<1.62E-01	765.78
NB-97	LLD<8.22E-01	LLD<8.22E-01	657.92
NP-238	LLD<7.78E-01	LLD<7.78E-01	984.45
NP-239	LLD<8.62E-01	LLD<8.62E-01	277.60
PA-233	LLD<3.87E-01	LLD<3.87E-01	311.98
PA-234M	LLD<3.57E+01	LLD<3.57E+01	1001.03
PB-210	LLD<4.39E+00	LLD<4.39E+00	465.03
PB-212	LLD<2.70E-01	LLD<2.70E-01	239.00
PB-214	LLD<4.18E-01	LLD<4.18E-01	351.92
PO-210	LLD<1.54E+04	LLD<1.54E+04	804.00
PO-214	LLD<6.40E+03	LLD<6.40E+03	799.70
PO-216	LLD<1.30E+04	LLD<1.30E+04	804.90
PU-239	LLD<1.24E+03	LLD<1.24E+03	129.30
PU-241	LLD<4.57E+04	LLD<4.57E+04	148.57
RA-224	LLD<2.96E+00	LLD<2.96E+00	240.99
RA-226	LLD<2.64E+00	LLD<2.64E+00	186.10
RB-88	LLD<3.44E-01	LLD<3.44E-01	1836.00
RB-89	LLD<3.82E-01	LLD<3.82E-01	1031.88
RN-220	LLD<1.44E+02	LLD<1.44E+02	549.73
RU-103	LLD<1.71E-01	LLD<1.71E-01	497.08
RURH106	LLD<3.00E+00	LLD<3.00E+00	621.80
SB-124	LLD<3.09E-01	LLD<3.09E-01	602.72
SB-125	LLD<1.38E+00	LLD<1.38E+00	176.33
SC-46	LLD<2.04E-01	LLD<2.04E-01	1120.45
SE-75	LLD<2.02E-01	LLD<2.02E-01	264.66
SN-113	LLD<2.33E-01	LLD<2.33E-01	391.67
SR-85	LLD<1.64E-01	LLD<1.64E-01	513.99
SR-91	LLD<2.80E-01	LLD<2.80E-01	555.60
SR-92	LLD<7.87E-02	LLD<7.87E-02	1383.94
TA-182	LLD<5.90E-01	LLD<5.90E-01	1121.30
TC-99M	LLD<9.22E-02	LLD<9.22E-02	140.51
TE-123M	LLD<1.03E-01	LLD<1.03E-01	159.00
TE-125M	LLD<2.66E+01	LLD<2.66E+01	109.27
TE-132	LLD<1.28E-01	LLD<1.28E-01	228.16
TH-228	LLD<9.26E+00	LLD<9.26E+00	84.37
TL-208	LLD<1.96E-01	LLD<1.96E-01	583.14
U-235	LLD<1.76E-01	LLD<1.76E-01	185.71
U-237	LLD<5.18E-01	LLD<5.18E-01	208.00
W-187	LLD<5.18E-01	LLD<5.18E-01	685.74
XE-131M	LLD<4.68E+00	LLD<4.68E+00	163.98
XE-133	LLD<3.20E-01	LLD<3.20E-01	81.00
XE-133M	LLD<1.15E+00	LLD<1.15E+00	233.21
XE-135	LLD<1.35E-01	LLD<1.35E-01	249.79
XE-138	LLD<3.99E-01	LLD<3.99E-01	258.41
Y-88	LLD<6.95E-02	LLD<6.95E-02	1836.06
Y-91	LLD<4.43E+01	LLD<4.43E+01	1204.90
Y-91M	LLD<1.61E-01	LLD<1.61E-01	555.60
ZN-65	LLD<4.48E-01	LLD<4.48E-01	1115.55
ZR-95	LLD<2.81E-01	LLD<2.81E-01	756.73
ZR-97	LLD<1.49E-01	LLD<1.49E-01	743.33
TOTAL	6.14E+01 +-1.07E+00	6.14E+01 +-1.07E+00	

STANDARD DEVIATION = 0.05

EBAR = ***** MEV/DISINTEGRATION
MAXIMUM PERMISSABLE ACTIVITY = 1.46E-09 UC/LI
TOTAL MEASURED ACTIVITY = 6.14E+01 (+-1.07E+00) UC/LI
% TECH. SPEC. = ****** (+-****)

ERROR QUOTATION AT 1.96 SIGMA
LLD CONFIDENCE LEVEL AT 85.0%

PEAKS NOT USED IN ANALYSIS

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
1127.55	563.25	523.	12.7	2.06E+01
1139.64	569.29	890.	11.4	3.54E+01
1604.90	801.88	405.	14.2	2.14E+01
2730.89	1365.15	92.	25.4	7.57E+00

PEAKS ELIMINATED BY BACKGROUND SUBTRACTION

CENTROID CHANNEL	ENERGY KEV	NET AREA COUNTS	ERROR %	GAMMAS/SEC
2922.37	1460.99	178.	15.9	1.55E+01

Analytical Batch

Lab Segment Serial #:F0441

Customer ID:89-071

Instrument	WA77344
Procedure/Rev	LA-925-106/A-2
Technologist	R. D. Hale
Date	July 11, 1990
Temperature	N/A
Starting Time	1000
Ending Time	1045
Chemist	S. A. Catlow

Uranium Analysis of Fusion Dissolution

	Description	Lab ID
1	Initial LMCS Check Std.	F0445
2	Reagent Blank	F0460
3	Sample 89-071	F0446
4	Duplicate Sample 89-071	F0447
5	Spike of Sample 89-071	F0448
6	Final LMCS Check Std.	F0449
7		
8		
9		
10		
11		

	Description	Lab ID
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		

Standard Type	Primary Book # & Aliquot Vol.	Second Book # & Aliquot Vol.	Third Bk# & Alqt. Vol.	Final Vol. of Std.
LMCS Check Standard	58B38/1 uL			5.70 mL
Spike	58B38/2.45 uL	F0446/2.45 uL		5.85 mL

SST-102 Rev. F 9/7/90 Interim

WATER DIGESTION TEST ANALYSIS

Single Shell Tank Project

Water Digestion
Sample Results on Solid Weight

Tank : 241-U-110
Core: 12
Segment: 3
Customer ID: 89-071

Laboratory Segment Serial No: F0441

		Check Standard	Blank		Sample		Sample Duplicate		Spike of Sample	Check Standard
Laboratory ID:			F0462		F0451		F0452		F0453	
Water Digestion			Complete		10.03	g/L	9.74	g/L	10.13	
Laboratory ID:		F0426	F0438		F0451		F0452		F0429	F0574
Ion Chromatograph										
Fluoride	2nd Run	90.80%	<.1	ppm	1.58E+04	ug/g	1.54E+04	ug/g	85.60%	91.80%
Chloride	1st Run	99.70%	0.202	ppm	2.00E+03	ug/g	1.94E+03	ug/g	102.40%	97.50%
Nitrate	1st Run	101.90%	<1.0	ppm	6.31E+04	ug/g	7.66E+04	ug/g	108.40%	102.70%
Phosphate	1st Run	100.80%	<1.0	ppm	5.43E+04	ug/g	4.67E+04	ug/g	105.60%	101.50%
Sulfate	1st Run	100.80%	<1.0	ppm	5.21E+03	ug/g	4.65E+03	ug/g	110.30%	100.50%
Laboratory ID:		F0450	F0462		F0451		F0452		F0453	F0454
Total Organic Carbon		95.70%	3	ug	7.13E+02	ug/g	7.34E+02	ug/g	97.70%	98.10%

Single Shell Tank Project

Water Digestion
Sample Results on Laboratory Digestion

Tank : 241-U-110
Core: 12
Segment: 3
Customer ID: 89-071

Laboratory Segment Serial No.: F0441

		Check Standard	Blank		Sample		Sample Duplicate		Spike of Sample		Check Standard
Laboratory ID:			F0462		F0451		F0452		F0453		
Water Digestion			Complete		10.03	g/L	9.74	g/L	10.13	g/L	
Laboratory I.D.		F0426	F0438		F0451		F0452		F0429		F0574
Ion Chromatograph											
Fluoride	2nd Run	90.80%	<1.0E-01	ppm	1.58E+02	ppm	1.50E+02	ppm	85.60%		91.80%
Chloride	1st Run	99.70%	2.02E-01	ppm	2.01E+01	ppm	1.89E+01	ppm	102.40%		97.50%
Nitrate	1st Run	101.90%	<1.0	ppm	6.33E+02	ppm	7.46E+02	ppm	108.40%		102.70%
Phosphate	1st Run	100.80%	<1.0	ppm	5.45E+02	ppm	4.55E+02	ppm	105.60%		101.50%
Sulfate	1st Run	100.80%	<1.0	ppm	5.23E+01	ppm	4.53E+01	ppm	110.30%		100.50%
Laboratory ID:		F0450	F0462		F0451		F0452		F0453		F0454
Total Organic Carbon		95.70%	3	ug	7.15E-03	g/L	7.15E-03	g/L	97.70%		98.10%

Analytical Batch

Lab Segment Serial #: F0441

Customer ID: 89-071

Instrument	N/A
Procedure/Rev	LA-504-101/A-2
Technologist	S. Cervantes
Date	March 06, 1990
Temperature	25 C
Starting Time	0800 03-05-90
Ending Time	1000 03-06-90
Chemist	H. S. Rich

Water Digestion

NOTE: Sample is not spiked prior to digestion. This procedure provides a sample to be spiked later with the appropriate elements.

	Description	Lab ID
1	Reagent Blank	F0462
2	Sample 89-071	F0451
3	Duplicate Sample 89-071	F0452
4	Spike Sample 89-071	F0453
5		
6		
7		
8		
9		
10		
11		

	Description	Lab ID
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		

Standard Type	Primary Book # & Aliquot Vol.	Second Book # & Aliquot Vol.	Third Book # & Aliquot Vol.	Final Vol. of Std.
N/A				
Spike (see note)				

SST-102 Rev. I 10/2/90 Interim

Analytical Batch

Lab Segment Serial #: F0441

Customer ID: 89-071

Instrument	Dionex 4000
Procedure/Rev	LA-533-105/A-3
Technologist	N. E. Wright
Date	April 06, 1990
Temperature	22 C
Starting Time	1100
Ending Time	1515
Chemist	H. S. Rich

Ion Chromatograph Analysis
Water Digestion

	Description	Lab ID
1	Initial LMCS Check Std	F0426
2	Reagent Blank	F0438
3	Sample 89-070	F0427
4	Duplicate Sample 89-070	F0428
5	Spike Sample 89-070	F0429
6	Sample 89-071	F0451
7	Duplicate Sample 89-071	F0452
8	Sample 89-072	F0475
9	Duplicate Sample 89-072	F0476
10	Sample 89-075	F0547
11	Duplicate Sample 89-075	F0548

	Description	Lab ID
12	Sample 89-076	F0571
13	Duplicate Sample 89-076	F0572
14	Sample Comp 07	F0983
15	Duplicate Sample Comp 07	F0984
16	Duplicate Sample Comp 06	F0064
17	Final LMCS Check Std	F0574
18		
19		
20		
21		
22		

Standard Type	Primary Book # & Aliquot Vol.	Second Book # & Aliquot Vol.	Third Book # & Aliquot Vol.	Final Vol. of Std.
LMCS Check Std	6C11HO/100 uL			10.1 mL
Spike	35C9-77/300 uL	F0427/50 uL		5.3 mL

SST-102 Rev. I 10/2/90 Interim

Single Shell Tank
Calibration Record

ANALYTE:	Ion Chromatograph		
PROCEDURE:	LA-533-105	REVISION:	A-3
INSTRUMENT:	Dionex 4000	PROPERTY NUMBER:	WB24721
TECHNOLOGIST:	N. E. Wright	PAYROLL NUMBER:	6B107
DATE:	April 03, 1990		

CALIBRATION STANDARD ID: 35C9-78 issued April 02, 1990

ANALYTE CONCENTRATION: F 50 Cl 65 NO_3 600 SO_4 594 PO_4 608 ppm

TYPE OF CALIBRATION: Linear

COMMENTS: See Attached Sheets

SST-103 Rev. C 10/9/90 Interim

Detector Parameters

Number of Detectors	1
Detector 1 Type	CDM

Report Options

Run Time (minutes)	11.50
Detector 1 real time plot scale	20.00
Print Report	Yes
Print Replot	Yes
AutoScale Replot to Highest Peak	Yes
Print Retention Times on Chromatogram	Yes
List Peaks Not Found in this run	No
Report Unknowns found in run	Yes
Record Raw Data	Yes
Raw Data File Name: A:\90040300.D05	
Record Result Data	No

Integration Parameters

Sampling Rate (seconds)	0.20
Peak Threshold (mV or uS/data pt interval)	0.400
Starting Peak Width (seconds)	10.0
Peak Area Reject	1000

Integration Timed Events

Time	Description

Calibration Parameters

External or Internal Calibration	External
Calibrate by Area or Height	Height
Replace Or Average Calibrations	Replace
Number Of Levels for Calibration	6
Calibration fit type	Quadratic
Response Factor for unknown peaks	0.0
Default Injection Volume	1.0
Default Dilution Factor	1.0
Area Reject for Reference Peaks	1000
Percent Retention Time Window for Reference Peaks	5.0

Component # 1 FLUORIDE Retention Time 1.02
Reference Peak C:\WINDOWS\AI400\METHOD\SST.MET Window Size
Least Squares Slope = 4.11817E-004
Least Squares Intercept = -6.11181E-002
Ka = -3.36922E-010

Level	Amount	Area	Height
1	1.19800E-001	1733	320
2	2.98500E-001	4705	821
3	5.94100E-001	9348	1644
4	1.17650E+000	21998	3547
5	2.30800E+000	37180	5315
6	4.44440E+000	74116	11092

Component # 2 CHLORIDE Retention Time 1.62
Reference Peak C:\WINDOWS\AI400\METHOD\SST.MET Window Size
Least Squares Slope = 7.20825E-004
Least Squares Intercept = -7.89437E-002
Ka = -1.05413E-008

Level	Amount	Area	Height
1	1.51700E-001	1456	241
2	3.78110E-001	4024	594
3	7.52480E-001	8080	1191
4	1.49020E+000	17215	2702
5	2.92300E+000	28370	4066
6	5.62950E+000	59291	9183

Component # 3 NITRITE Retention Time 1.95
Reference Peak C:\WINDOWS\AI400\METHOD\SST.MET Window Size
Least Squares Slope = 6.03697E-004
Least Squares Intercept = 4.43064E-001
Ka = 3.82504E-009

Level	Amount	Area	Height
1	1.06990E+000	9937	1360
2	2.66670E+000	25698	3515
3	5.30700E+000	53506	7323
4	1.05099E+001	114215	15244
5	2.06146E+001	218918	28443
6	3.97026E+001	440177	49476

Component # 4 BROMIDE Retention Time 3.00
Reference Peak FLUORIDE Window Size 5.00%
Least Squares Slope = 1.66948E-003
Least Squares Intercept = 2.80223E-001
Ka = -5.76698E-010

Level	Amount	Area	Height
1	1.00100E+000	0	495
2	2.49500E+000	0	1341
3	4.96500E+000	0	2740
4	9.86850E+000	0	5689
5	1.92877E+001	0	11502
6	3.71471E+001	0	22240

Component # 5 NITRATE Retention Time 3.70
Reference Peak C:\WINDOWS\AI400\METHOD\SST.MET Window Size
Least Squares Slope = 2.26506E-003
Least Squares Intercept = -5.58779E-001
Ka = 2.11324E-008

Level	Amount	Area	Height
1	1.21960E+000	7363	607
2	3.03970E+000	19564	1518
3	6.04950E+000	39111	2906
4	1.19805E+001	83794	5858
5	2.34991E+001	132213	9250
6	4.52580E+001	274103	17468

Component # 6 PHOSPHATE Retention Time 6.03
Reference Peak C:\WINDOWS\AI400\METHOD\SST.MET Window Size
Least Squares Slope = 6.51026E-003
Least Squares Intercept = -2.98628E-001
Ka = -1.07878E-007

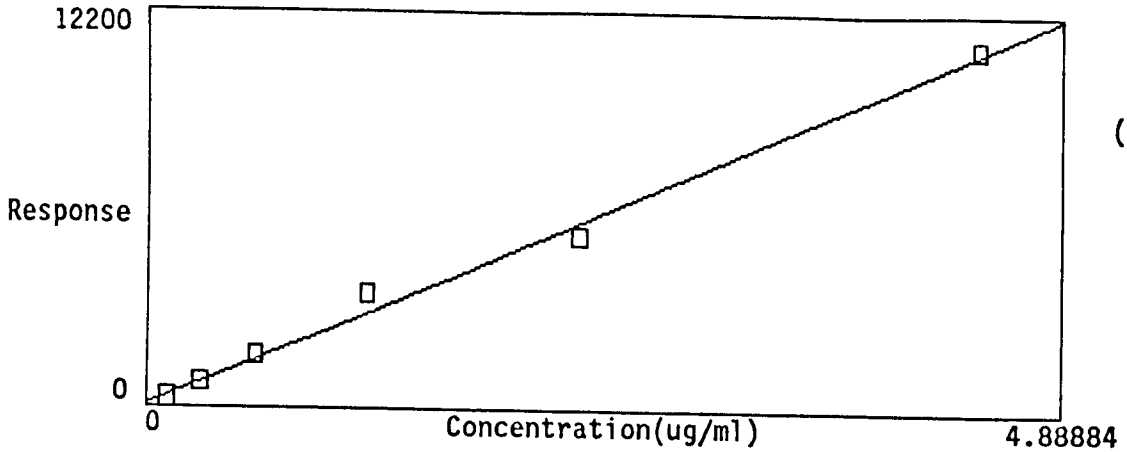
Level	Amount	Area	Height
1	1.20960E+000	3420	198
2	3.01490E+000	9585	519
3	6.00000E+000	19755	1057
4	1.18824E+001	32539	1886
5	2.33068E+001	69406	3876
6	4.48876E+001	142872	8003

Component # 7 SULFATE Retention Time 7.48
Reference Peak C:\WINDOWS\AI400\METHOD\SST.MET Window Size
Least Squares Slope = 3.09635E-003
Least Squares Intercept = -7.42866E-001
Ka = -2.82182E-008

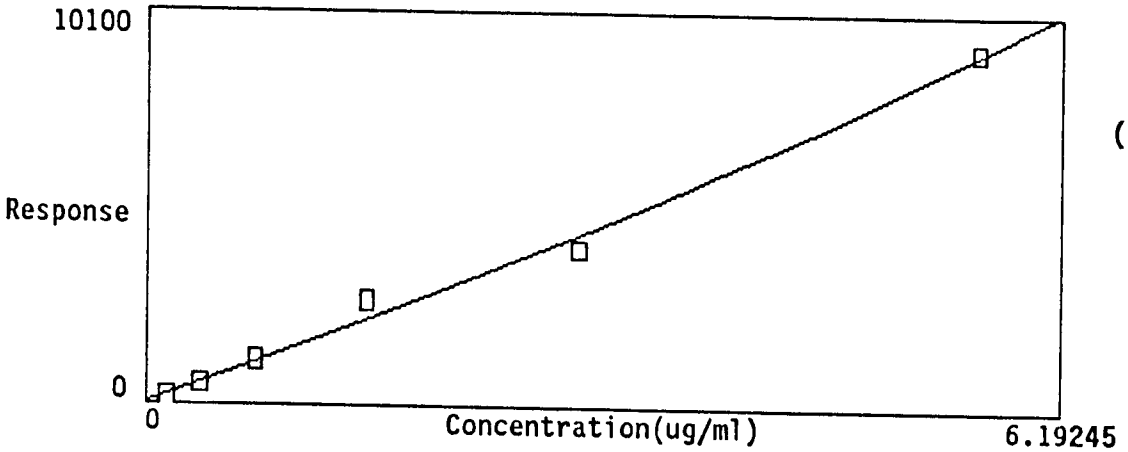
Level	Amount	Area	Height
1	1.17560E+000	10745	515
2	2.93030E+000	26326	1236
3	5.83170E+000	50588	2357
4	1.15491E+001	79004	4005
5	2.26530E+001	163581	8158
6	4.36284E+001	343157	16953

Component # 8 Oxalate Retention Time 9.77
Reference Peak FLUORIDE Window Size 10.00%
Least Squares Slope = 0.00000E+000
Least Squares Intercept = 0.00000E+000
Ka = 0.00000E+000

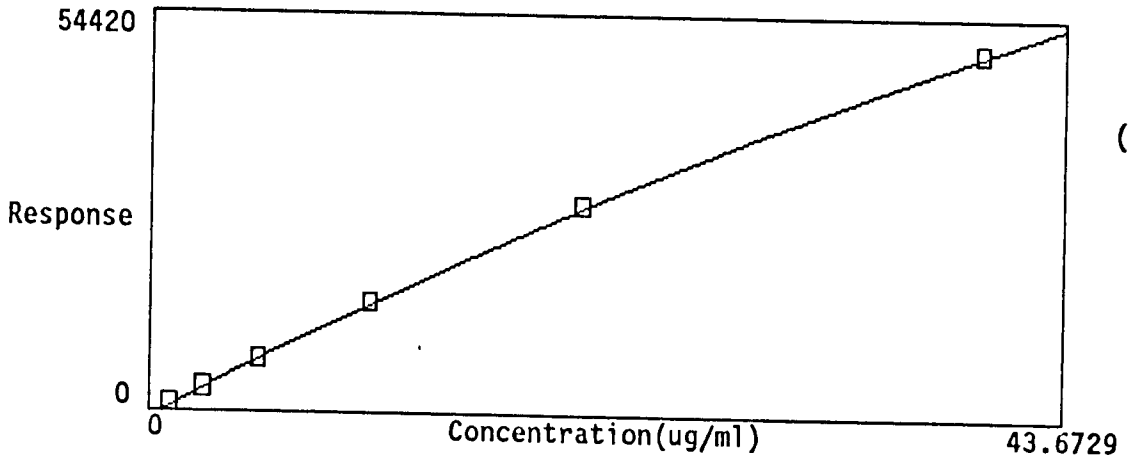
Level	Amount	Area	Height
1	0.00000E+000	0	0
2	0.00000E+000	0	0
3	0.00000E+000	0	0
4	0.00000E+000	0	0
5	0.00000E+000	0	0
6	0.00000E+000	98993	5848



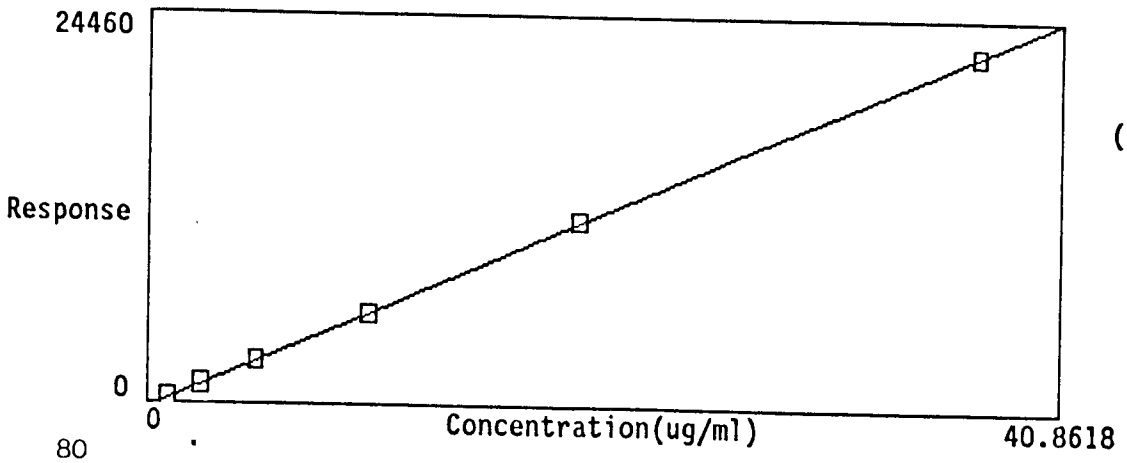
Component: FLUORIDE
Fit Type: Quadratic
Conc = (-3.369224e-010
(4.118173e-004 * Resp)+



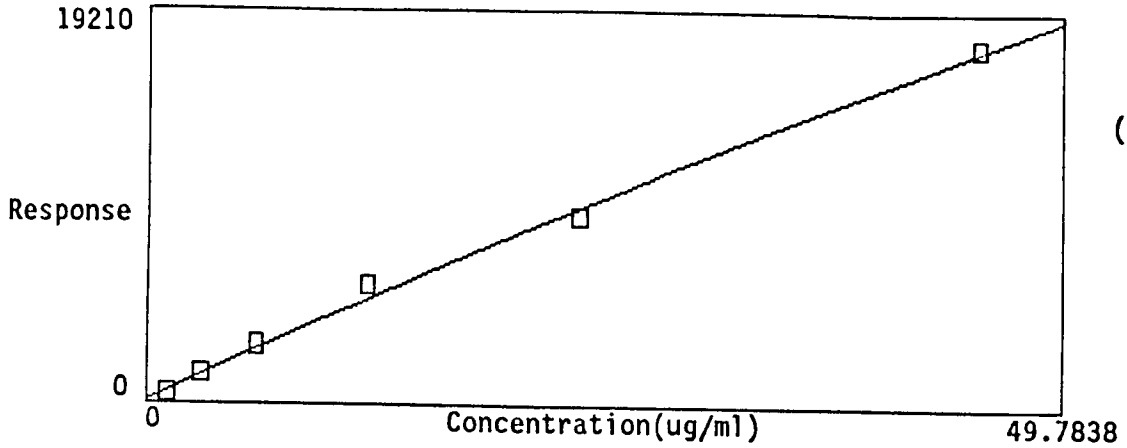
Component: CHLORIDE
Fit Type: Quadratic
Conc = (-1.054134e-008
(7.208249e-004 * Resp)+



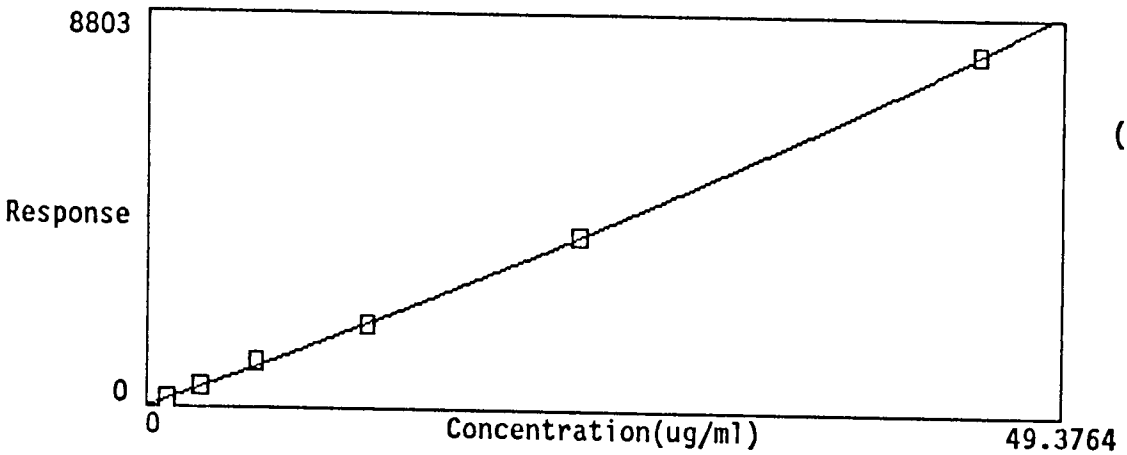
Component: NITRITE
Fit Type: Quadratic
Conc = (3.824921e-009 *
(6.037006e-004 * Resp)+



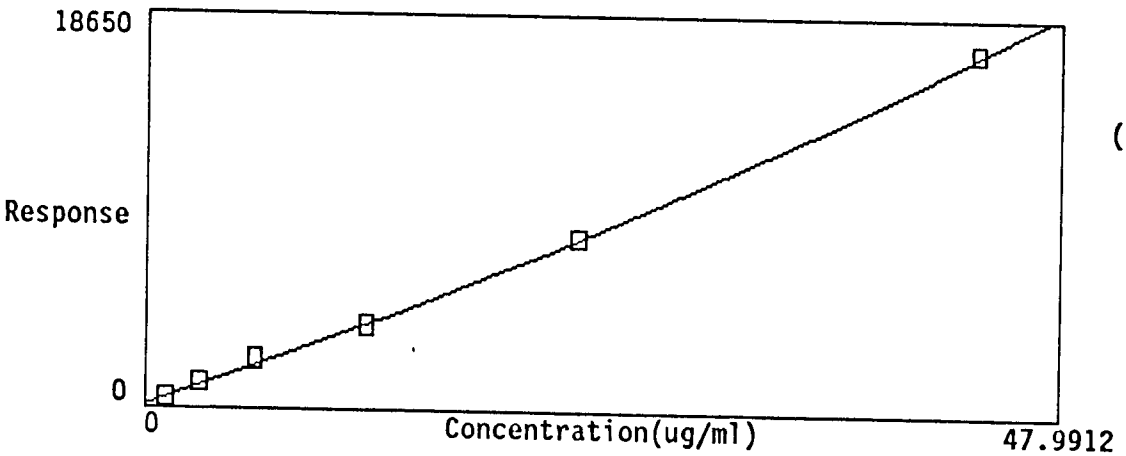
Component: BROMIDE
Fit Type: Quadratic
Conc = (-5.766983e-010
(1.669477e-003 * Resp)+



Component: NITRATE
Fit Type: Quadratic
Conc = (2.113242e-008 *
(2.265060e-003 * Resp)+



Component: PHOSPHATE
Fit Type: Quadratic
Conc = (-1.078779e-007
(6.510264e-003 * Resp)+



Component: SULFATE
Fit Type: Quadratic
Conc = (-2.821818e-008
(3.096352e-003 * Resp)+

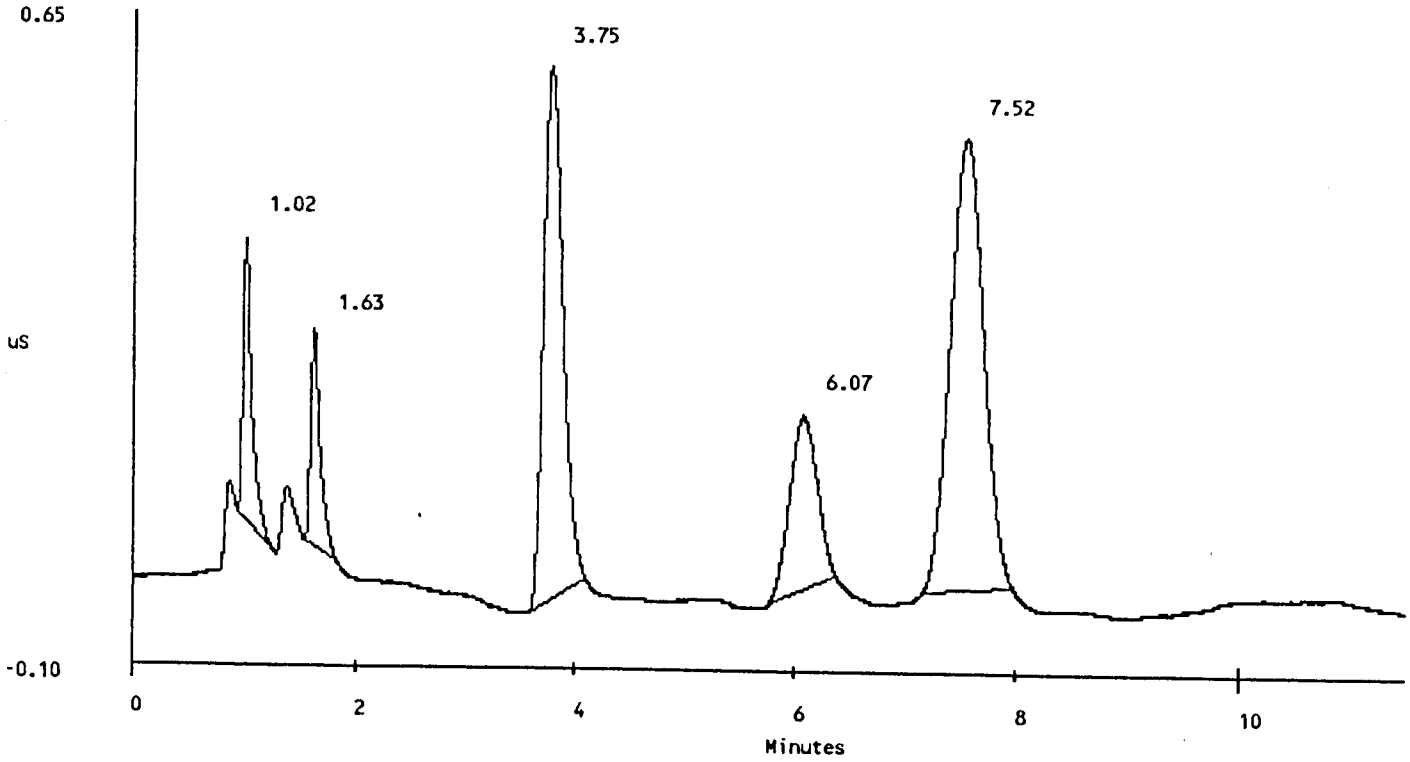
DATA REPROCESSED ON Mon Jul 02 13:05:05 1990

Sample Name: AUTOCAL1R Date: Tue Apr 03 10:17:01 1990
Data File : A:\90040300.D03
Method : C:\WINDOWS\AI400\METHOD\SST.MET
CIM Address: 1 System : 1 Cycle#: 3 Detector: CDM

********** EXTERNAL STANDARD REPORT **********

Stop time = 11.50 Minutes Number of Data Points = 3451
Area reject = 1000 One Data Point per 0.2 seconds
Amount Injected = 1 Dilution factor = 1

PEAK NUM	RET TIME	PEAK NAME	CONC. in ug/ml	AREA	HEIGHT	BL	REF PEAK	% DELTA RET TIME
1	1.02	FLUORIDE	1.198e-001	1.733e+003	320	1	0	0.00%
2	1.63	CHLORIDE	1.517e-001	1.456e+003	241	1	0	0.00%
3	3.75	NITRATE	1.220e+000	7.363e+003	607	1	0	0.00%
4	6.07	PHOSPHATE	1.210e+000	3.420e+003	198	1	0	0.00%
5	7.52	SULFATE	1.176e+000	1.075e+004	515	1	0	0.00%



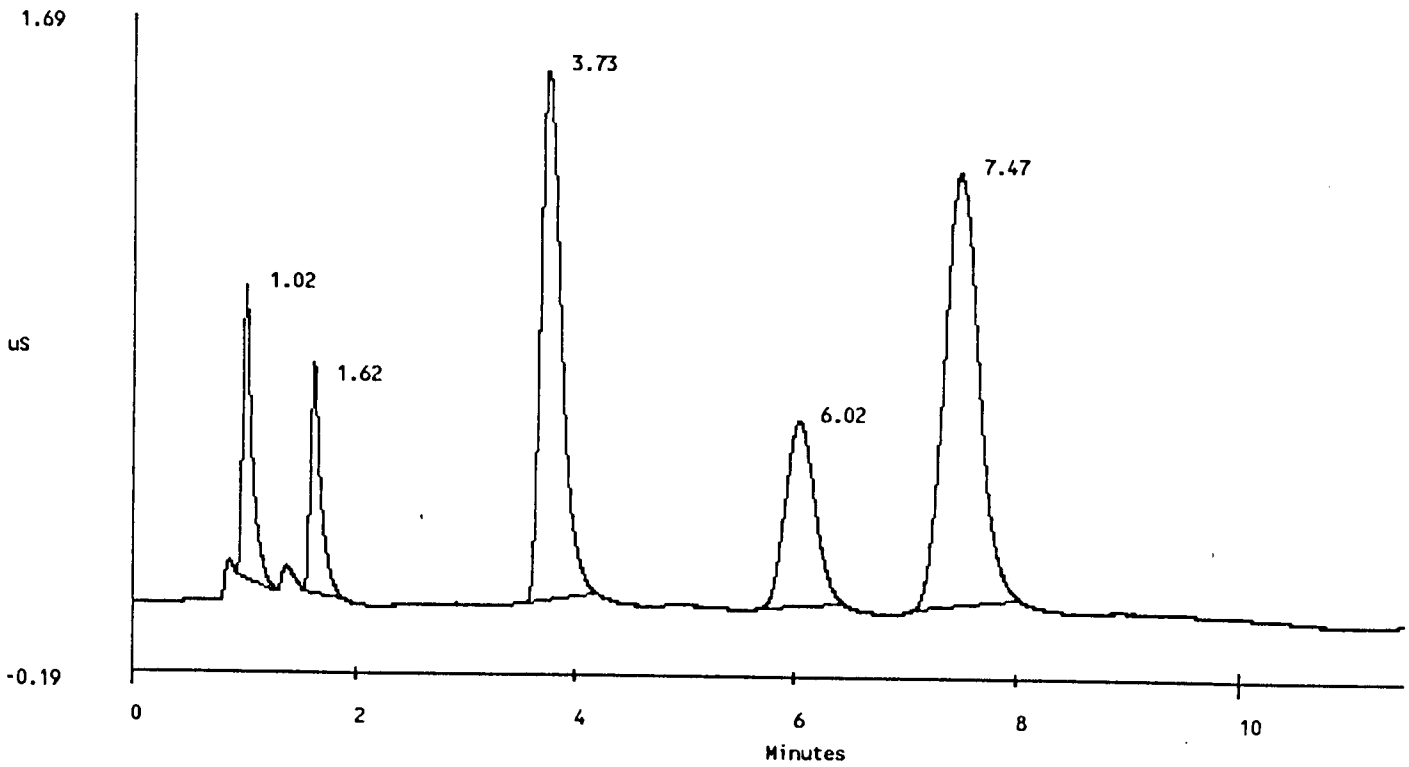
DATA REPROCESSED ON Mon Jul 02 14:37:19 1990

Sample Name: AUTOCAL2R Date: Tue Apr 03 10:29:21 1990
Data File : A:\90040300.D04
Method : C:\WINDOWS\AI400\METHOD\SST.MET
CIM Address: 1 System : 1 Cycle#: 4 Detector: CDM

********** EXTERNAL STANDARD REPORT **********

Stop time = 11.50 Minutes Number of Data Points = 3451
Area reject = 1000 One Data Point per 0.2 seconds
Amount Injected = 1 Dilution factor = 1

PEAK NUM	RET TIME	PEAK NAME	CONC. in ug/ml	AREA	HEIGHT	BL	REF PEAK	% DELTA RET TIME
1	1.02	FLUORIDE	2.984e-001	4.705e+003	821	1	0	0.00%
2	1.62	CHLORIDE	3.783e-001	4.024e+003	594	1	0	-1.02%
3	3.73	NITRATE	3.039e+000	1.956e+004	1518	1	0	-0.44%
4	6.02	PHOSPHATE	5.755e+000	9.585e+003	519	1	0	-0.82%
5	7.47	SULFATE	6.145e+000	2.633e+004	1236	1	0	-0.67%



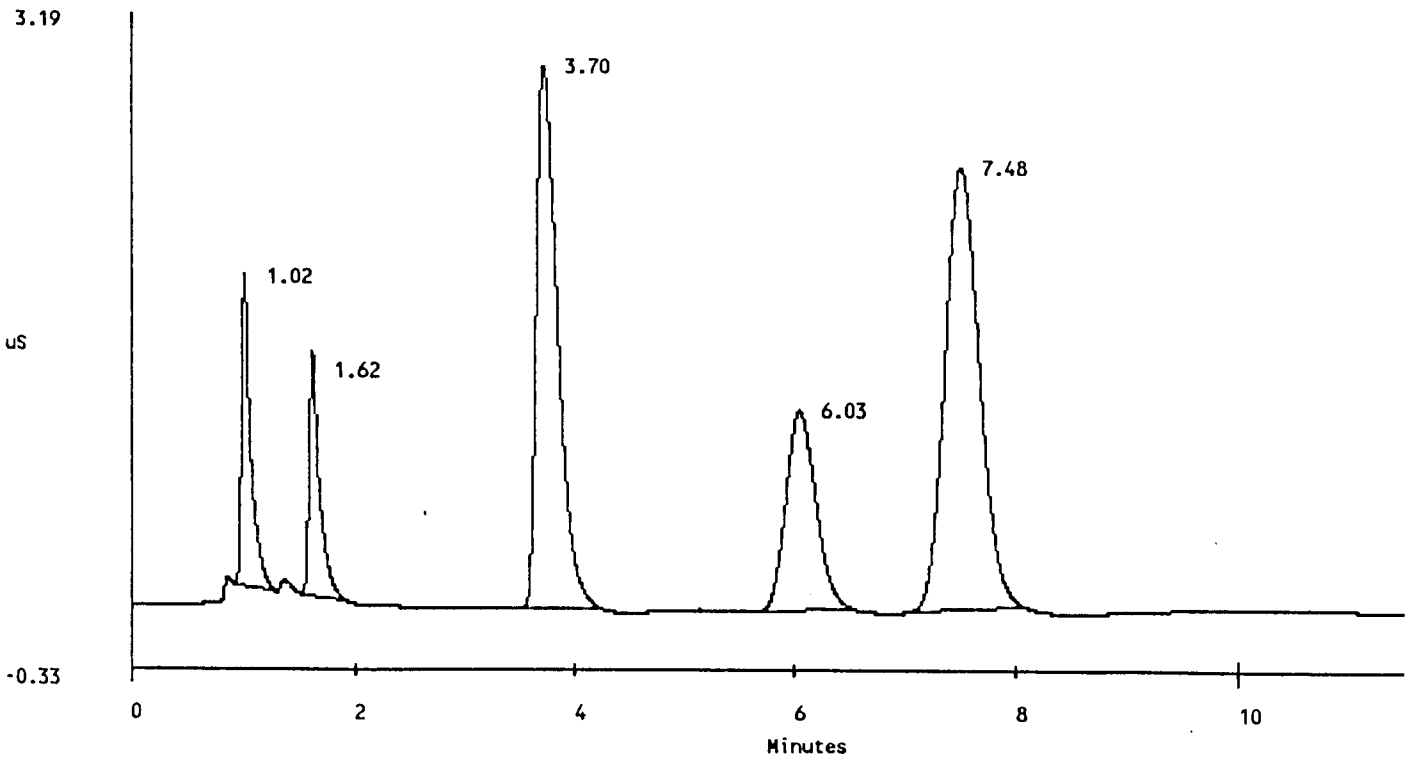
DATA REPROCESSED ON Mon Jul 02 14:37:59 1990

Sample Name: AUTOCAL3R Date: Tue Apr 03 10:41:41 1990
Data File : A:\90040300.D05
Method : C:\WINDOWS\AI400\METHOD\SST.MET
CIM Address: 1 System : 1 Cycle#: 5 Detector: CDM

********** EXTERNAL STANDARD REPORT **********

Stop time = 11.50 Minutes Number of Data Points = 3451
Area reject = 1000 One Data Point per 0.2 seconds
Amount Injected = 1 Dilution factor = 1

PEAK NUM	RET TIME	PEAK NAME	CONC. in ug/ml	AREA	HEIGHT	BL	REF PEAK	% DELTA RET TIME
1	1.02	FLUORIDE	5.941e-001	9.348e+003	1644	1	0	0.00%
2	1.62	CHLORIDE	7.523e-001	8.080e+003	1191	1	0	-1.02%
3	3.70	NITRATE	6.051e+000	3.911e+004	2906	1	0	-1.33%
4	6.03	PHOSPHATE	8.564e+000	1.976e+004	1057	1	0	-0.55%
5	7.48	SULFATE	8.817e+000	5.059e+004	2357	1	0	-0.44%



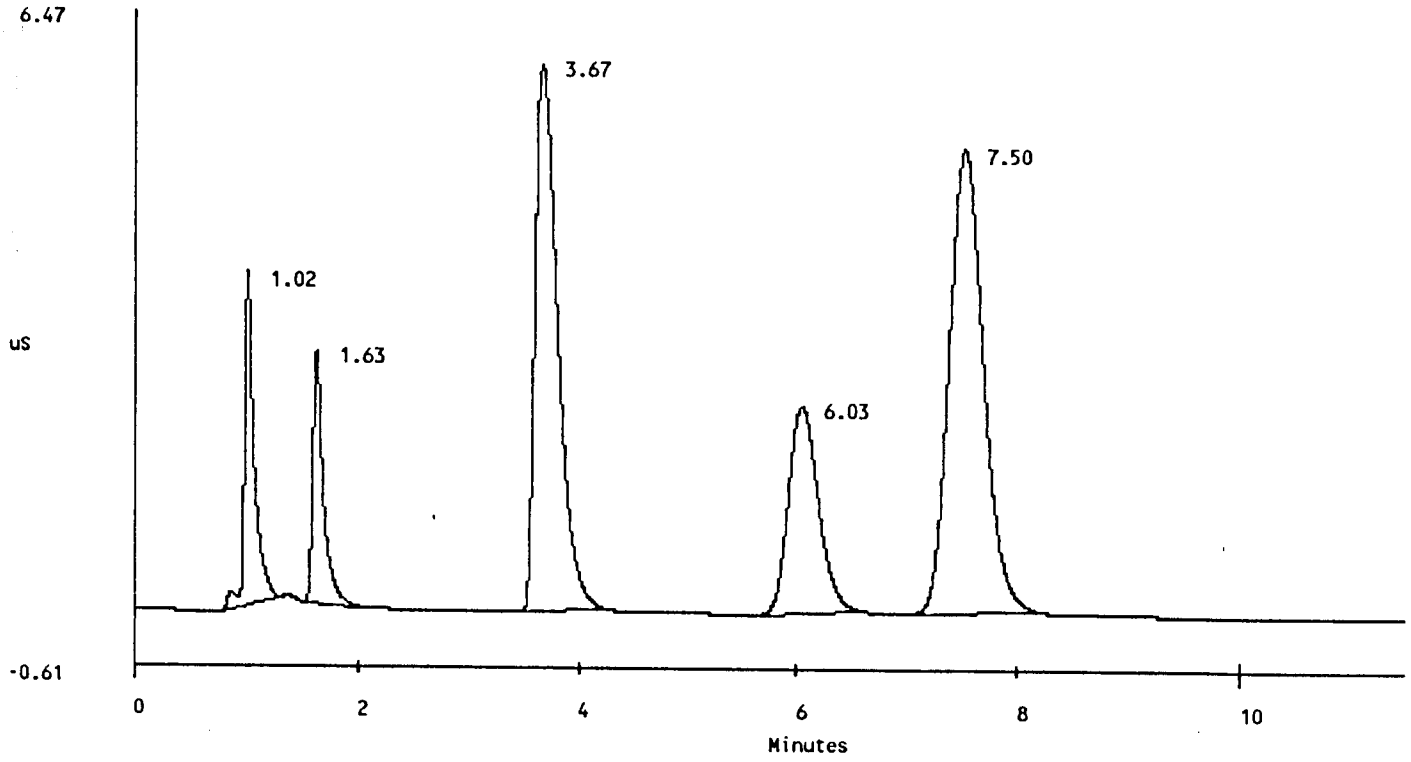
DATA REPROCESSED ON Mon Jul 02 14:38:33 1990

Sample Name: AUTOCAL4R	Date: Tue Apr 03 10:54:02 1990
Data File : A:\90040300.D06	
Method : C:\WINDOWS\AI400\METHOD\SST.MET	
CIM Address: 1 System : 1 Cycle#: 6	Detector: CDM

********** EXTERNAL STANDARD REPORT **********

Stop time = 11.50 Minutes Number of Data Points = 3450
Area reject = 1000 One Data Point per 0.2 seconds
Amount Injected = 1 Dilution factor = 1

PEAK NUM	RET TIME	PEAK NAME	CONC. in ug/ml	AREA	HEIGHT	BL	REF PEAK	% DELTA RET TIME
1	1.02	FLUORIDE	1.177e+000	2.200e+004	3547	1	0	0.00%
2	1.63	CHLORIDE	1.490e+000	1.722e+004	2702	1	0	0.00%
3	3.67	NITRATE	1.198e+001	8.379e+004	5858	1	0	-2.22%
4	6.03	PHOSPHATE	1.460e+001	4.206e+004	2212	1	0	-0.55%
5	7.50	SULFATE	1.496e+001	1.068e+005	4931	1	0	-0.22%



DATA REPROCESSED ON Mon Jul 02 14:39:07 1990

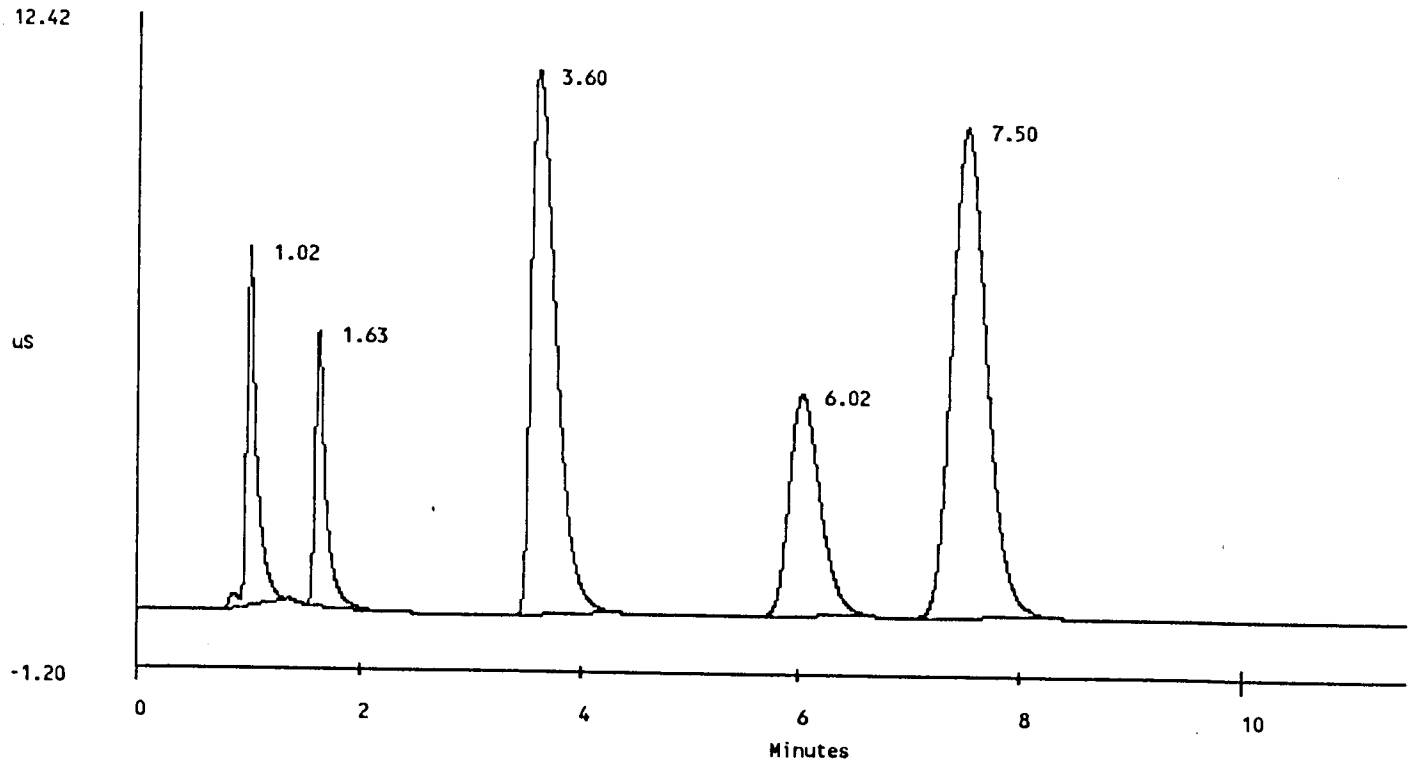
Sample Name: AUTOCAL5R	Date: Tue Apr 03 11:06:22 1990
Data File : A:\90040300.D07	
Method : C:\WINDOWS\AI400\METHOD\SST.MET	
CIM Address: 1 System : 1 Cycle#: 7	Detector: CDM

********** EXTERNAL STANDARD REPORT **********

Stop time = 11.50 Minutes
Area reject = 1000
Amount Injected = 1

Number of Data Points = 3450
One Data Point per 0.2 seconds
Dilution factor = 1

PEAK NUM	RET TIME	PEAK NAME	CONC. in ug/ml	AREA	HEIGHT	BL	REF PEAK	% DELTA RET TIME
1	1.02	FLUORIDE	3.050e+000	4.520e+004	7323	1	0	0.00%
2	1.63	CHLORIDE	3.751e+000	3.558e+004	5631	1	0	0.00%
3	3.60	NITRATE	2.869e+001	1.757e+005	11209	1	0	-4.00%
4	6.02	PHOSPHATE	2.675e+001	8.811e+004	4535	1	0	-0.82%
5	7.50	SULFATE	2.728e+001	2.192e+005	10100	1	0	-0.22%



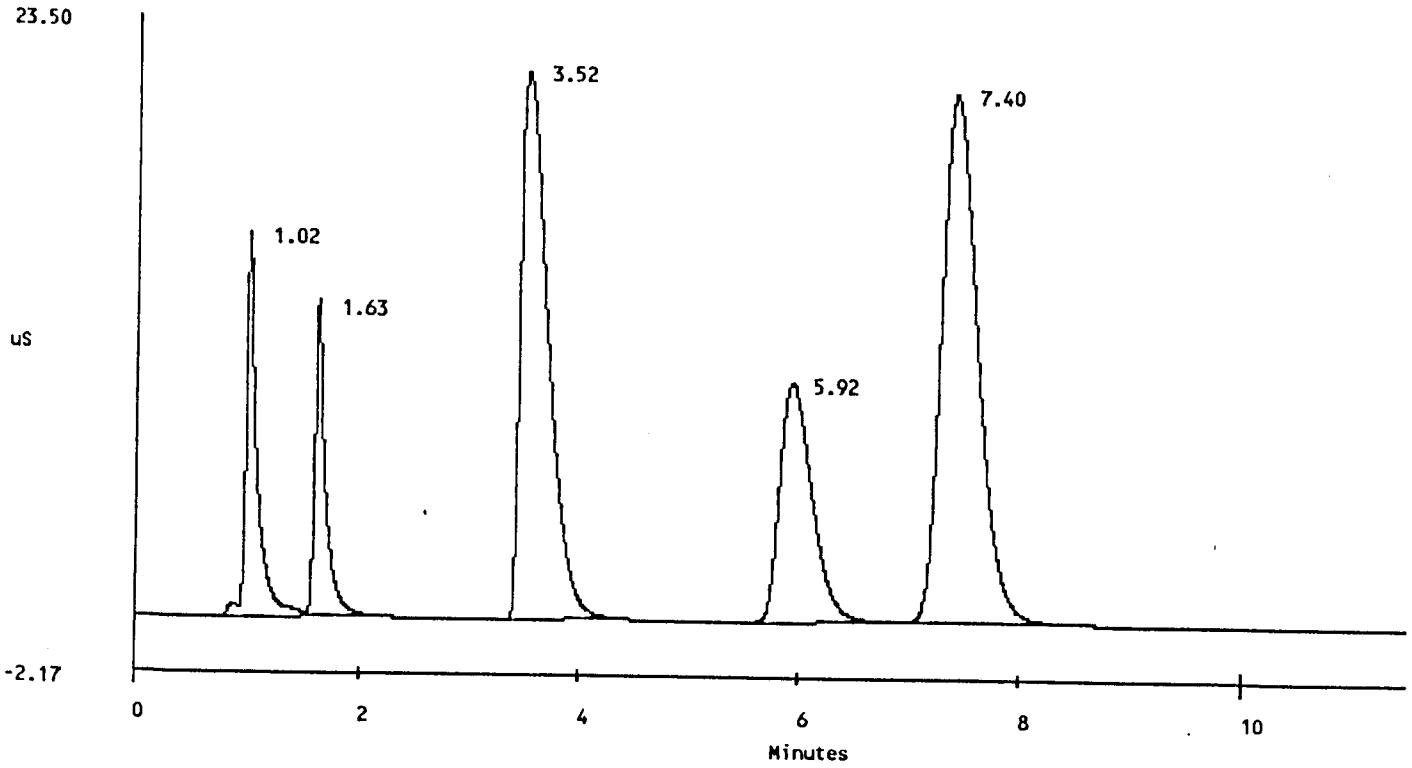
DATA REPROCESSED ON Mon Jul 02 14:39:42 1990

Sample Name: AUTOCAL6R Date: Tue Apr 03 11:18:42 1990
Data File : A:\90040300.D08
Method : C:\WINDOWS\AI400\METHOD\SST.MET
CIM Address: 1 System : 1 Cycle#: 8 Detector: CDM

********** EXTERNAL STANDARD REPORT **********

Stop time = 11.50 Minutes Number of Data Points = 3451
Area reject = 1000 One Data Point per 0.2 seconds
Amount Injected = 1 Dilution factor = 1

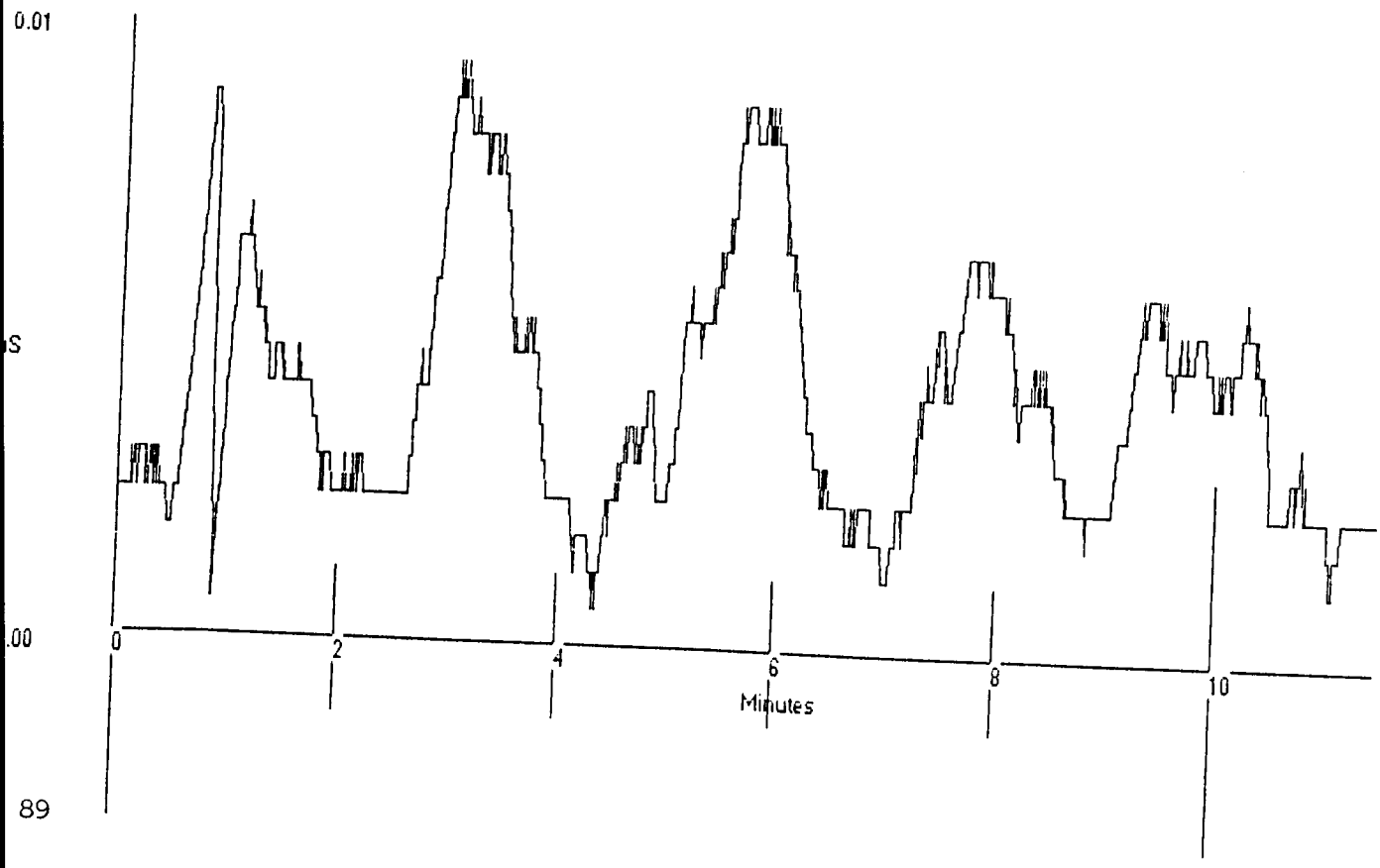
PEAK NUM	RET TIME	PEAK NAME	CONC. in ug/ml	AREA	HEIGHT	BL	REF PEAK	% DELTA RET TIME
1	1.02	FLUORIDE	5.778e+000	9.886e+004	14697	2	0	0.00%
2	1.63	CHLORIDE	7.060e+000	7.699e+004	11887	2	0	0.00%
3	3.52	NITRATE	5.544e+001	3.641e+005	21314	1	0	-6.22%
4	5.92	PHOSPHATE	5.042e+001	1.851e+005	9060	1	0	-2.47%
5	7.40	SULFATE	5.218e+001	4.591e+005	20537	1	0	-1.55%



DIONEX SCHEDULE - A:\90040500.SCH

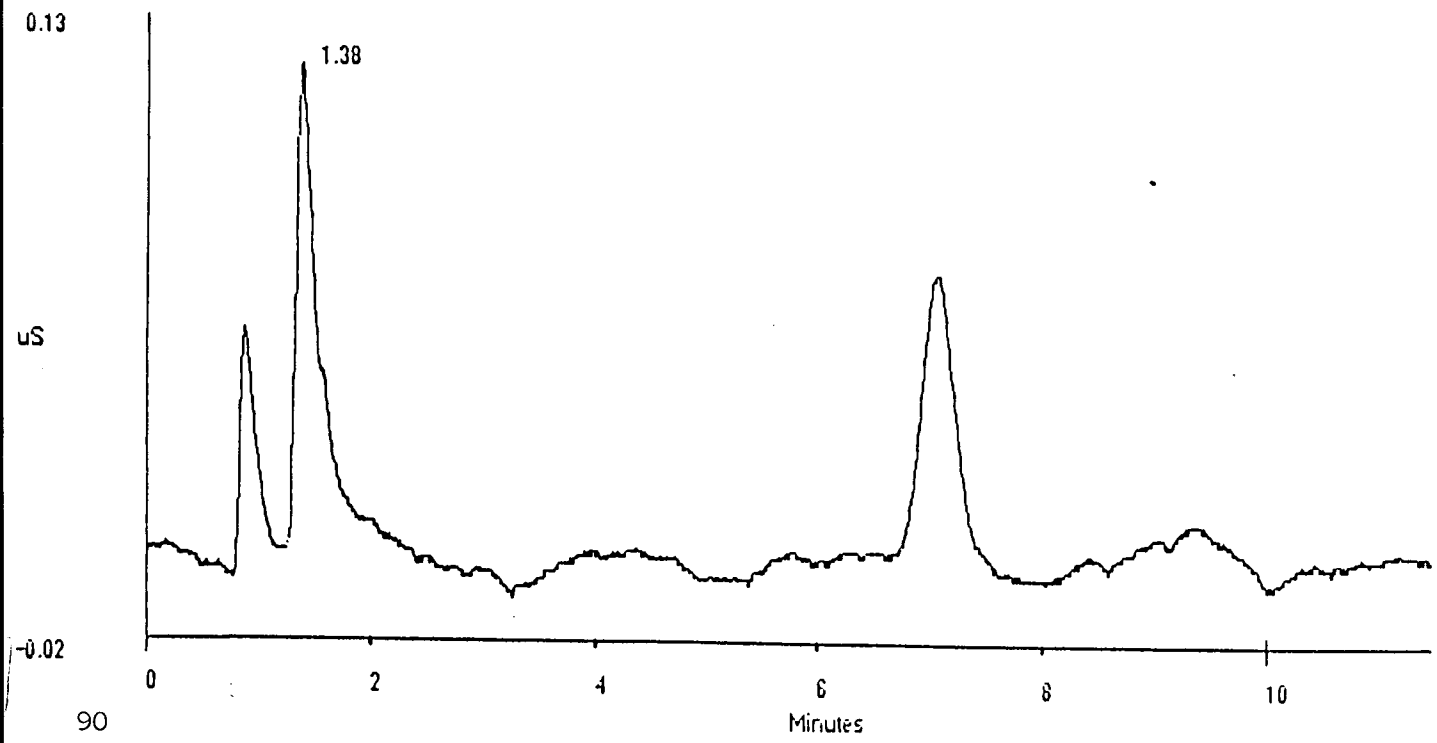
Inject	Sample Name	Method Name	Data File	Volume	Dilution	Int Std
1	SETUP	c:\windows\ai	c:\windows\ai	1	1	0
2	BLANK	c:\windows\ai	c:\windows\ai	1	1	0
3	LMCS/6C11-HO	c:\windows\ai	c:\windows\ai	1	101	0
4	438B	c:\windows\ai	c:\windows\ai	1	1	0
5	427	c:\windows\ai	c:\windows\ai	1	101	0
6	428D	c:\windows\ai	c:\windows\ai	1	101	0
7	429S	c:\windows\ai	c:\windows\ai	1	101	0
8	451	c:\windows\ai	c:\windows\ai	1	101	0
9	452D	c:\windows\ai	c:\windows\ai	1	101	0
10	475	c:\windows\ai	c:\windows\ai	1	101	0
11	476D	c:\windows\ai	c:\windows\ai	1	101	0
12	547	c:\windows\ai	c:\windows\ai	1	101	0
13	548D	c:\windows\ai	c:\windows\ai	1	101	0
14	571	c:\windows\ai	c:\windows\ai	1	101	0
15	572D	c:\windows\ai	c:\windows\ai	1	101	0
16	983	c:\windows\ai	c:\windows\ai	1	101	0
17	984D	c:\windows\ai	c:\windows\ai	1	51	0
18	64D	c:\windows\ai	c:\windows\ai	1	51	0
19	LMCS/6C11-HO	c:\windows\ai	c:\windows\ai	1	101	0
		c:\windows\ai	c:\windows\ai	1	101	0

```
==========================================================================
| Sample Name: SETUP                                                      |
| Data File   : c:\windows\ai400\data\900-5963.d01   Date: Thu Apr 05 11:44:48 1990|
| Method      : c:\windows\ai400\method\sst.met                           |
| CIM Address: 1        System : 1        Cycle#:   1       Detector: CDM |
==========================================================================
*********************** EXTERNAL STANDARD REPORT ***************************

Start Time =  0.00 minutes                 Stop time = 11.50 Minutes
Number of Data Points  =  3450              One Data Point per 0.2 seconds
Areareject = 1000
Amount Injected = 1          Dilution factor = 1

PEAK RET    PEAK                CONC. in                                REF   % DELTA
NUM  TIME   NAME                ug/ml          AREA      HEIGHT BL PEAK RET TIME
-------------------------------------------------------------------------------
```



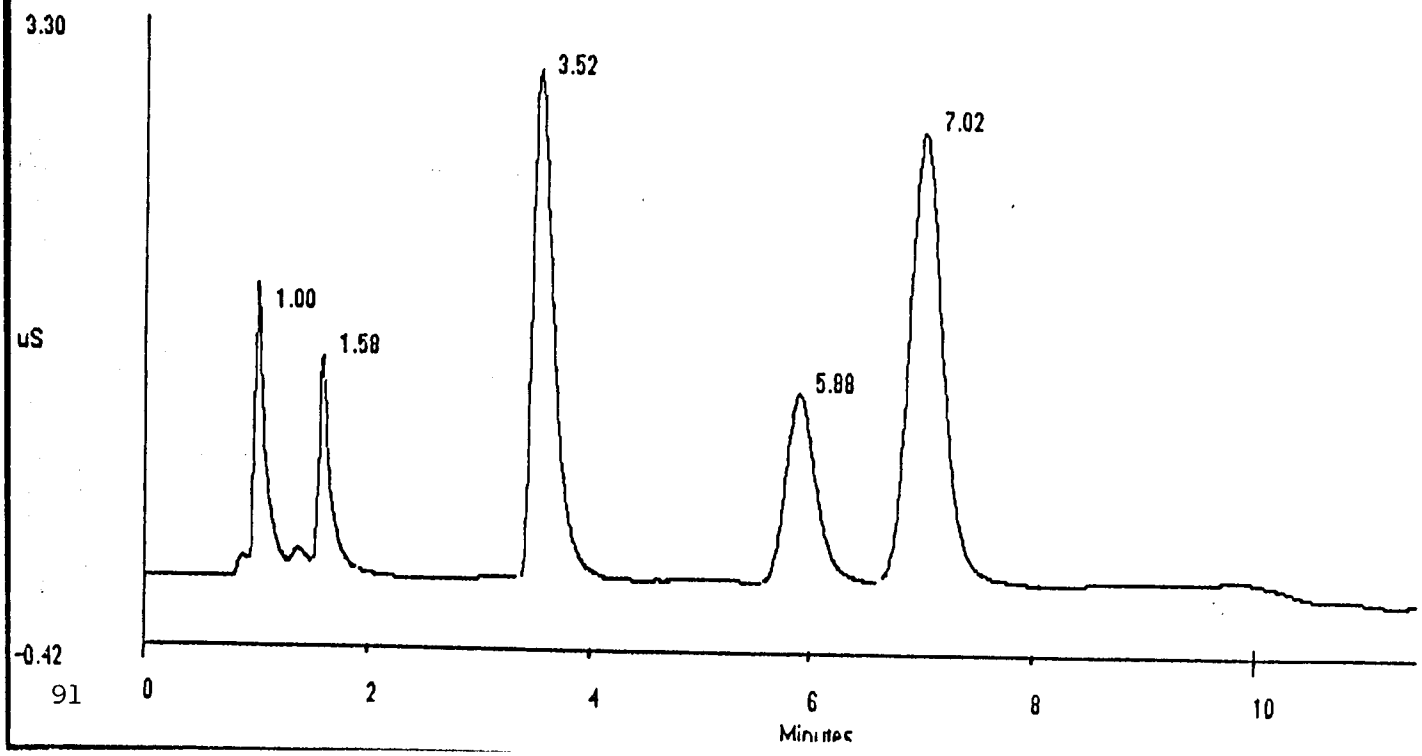
```
==========================================================================
: Sample Name: BLANK                          Date: Thu Apr 05 11:57:04 1990:
: Data File  : c:\windows\ai400\data\900-5963.d02                        :
: Method     : c:\windows\ai400\method\sst.met                           :
: CIM Address: 1        System : 1        Cycle#:   2      Detector: CDM  :
==========================================================================
*********************  EXTERNAL STANDARD REPORT  *************************

Start Time =  0.00 minutes              Stop time = 11.50 Minutes
Number of Data Points  =  3450           One Data Point per 0.2 seconds
Areareject = 1000
Amount Injected = 1        Dilution factor = 1
```

PEAK NUM	RET TIME	PEAK NAME	CONC. in ug/ml	AREA	HEIGHT	BL	REF PEAK	% DELTA RET TIME
1	1.38		0.000e+000	1.021e+003	106	1		



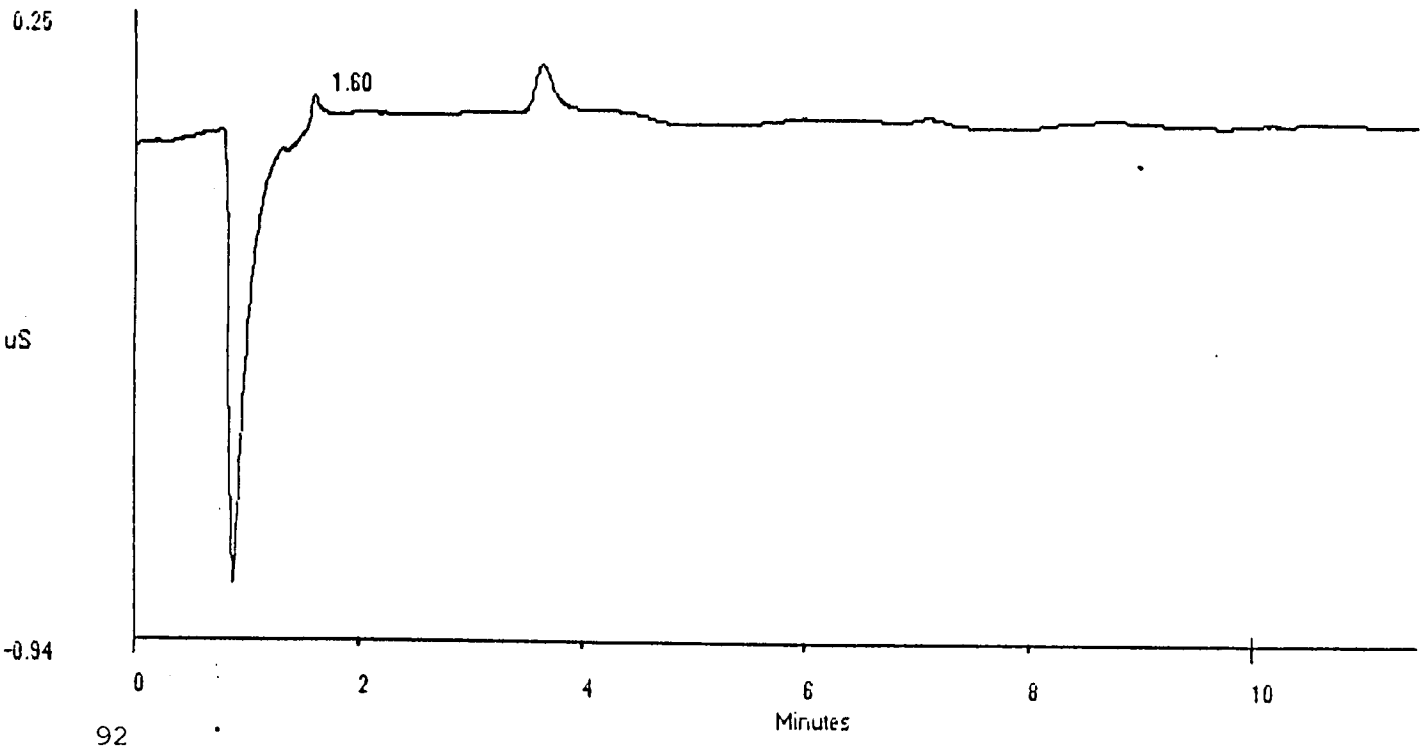
```
==========================================================================
| Sample Name: LMCS/6C11-HO                    Date: Thu Apr 05 12:09:18 1990|
| Data File   : c:\windows\ai400\data\900-5963.d03                        |
| Method      : c:\windows\ai400\method\sst.met                           |
| CIM Address: 1        System : 1        Cycle#:   3       Detector: CDM  |
==========================================================================
*********************** EXTERNAL STANDARD REPORT ***************************

Start Time =  0.00 minutes              Stop time = 11.50 Minutes
Number of Data Points  =  3450           One Data Point per 0.2 seconds
Areareject = 1000
Amount Injected = 1        Dilution factor = 101
```

PEAK NUM	RET TIME	PEAK NAME	CONC. in ug/ml	AREA	HEIGHT	BL	REF PEAK	% DELTA RET TIME
1	1.00	FLUORIDE	5.097e+001	9.542e+003	1452	1	0	-1.64%
2	1.58	CHLORIDE	7.181e+001	7.920e+003	1209	1	0	-3.06%
3	3.52	NITRATE	6.106e+002	3.939e+004	2949	1	0	0.00%
4	5.88	PHOSPHATE	6.038e+002	2.002e+004	1084	1	0	-0.56%
5	7.02	SULFATE	6.268e+002	5.312e+004	2626	1	0	-5.18%



```
==========================================================================
| Sample Name: 438B                          Date: Thu Apr 05 12:21:34 1990|
| Data File  : c:\windows\ai400\data\900-5963.d04                          |
| Method     : c:\windows\ai400\method\sst.met                             |
| CIM Address: 1       System : 1       Cycle#:   4      Detector: CDM     |
==========================================================================
*********************** EXTERNAL STANDARD REPORT ***************************

Start Time =  0.00 minutes              Stop time = 11.50 Minutes
Number of Data Points  =  3450           One Data Point per 0.2 seconds
Areareject = 1000
Amount Injected = 1        Dilution factor = 1
```

PEAK NUM	RET TIME	PEAK NAME	CONC. in ug/ml	AREA	HEIGHT	BL	REF PEAK	% DELTA RET TIME
1	1.60	CHLORIDE	2.017e-001	1.746e+004	266	1	0	-2.04%



DATA REPROCESSED ON Thu Aug 23 13:19:27 1990

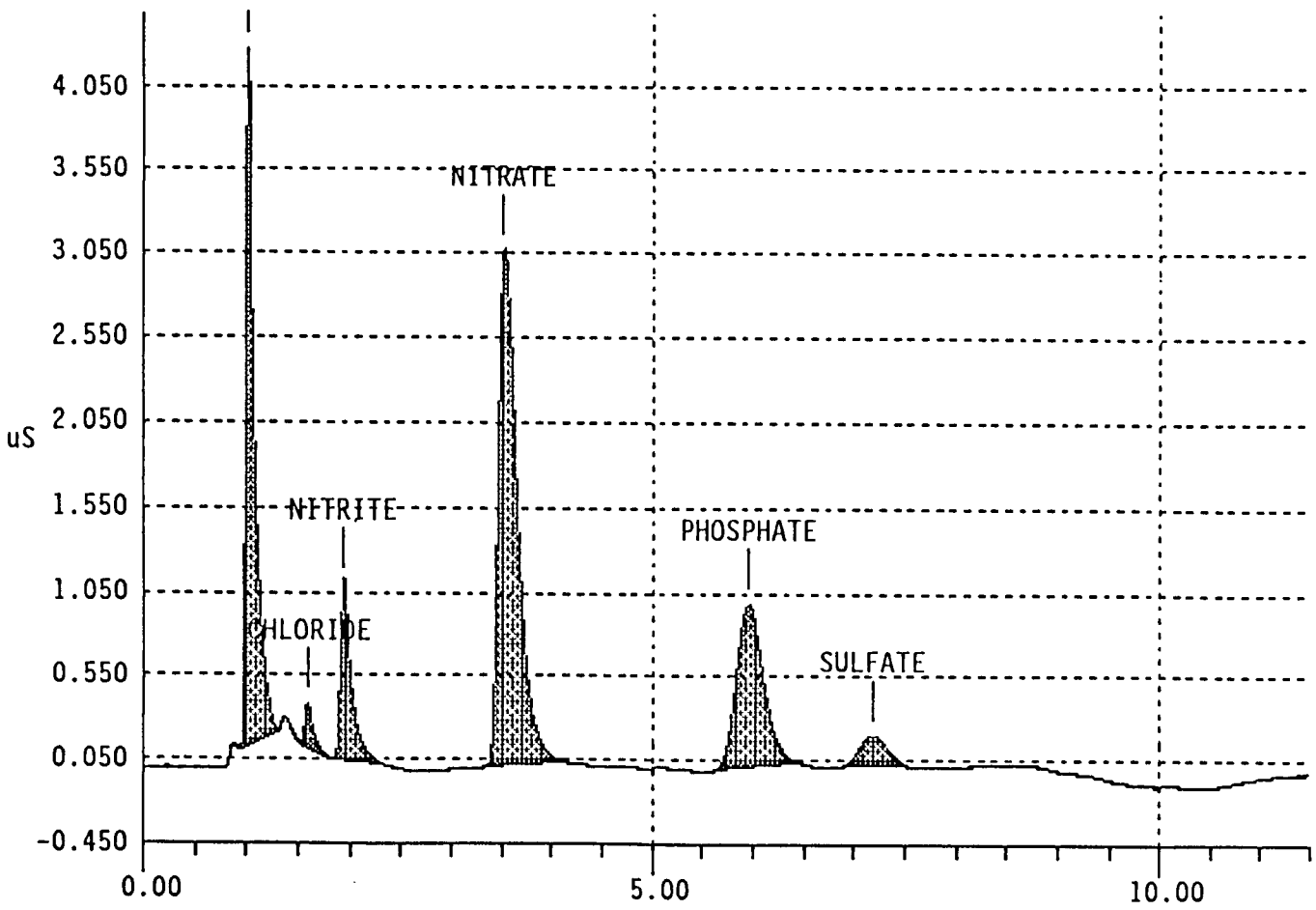
Sample Name: 451	Date: Thu Apr 05 14:10:34 1990
Data File : A:\90040500.D08	
Method : c:\windows\ai400\method\sst.met	
ACI Address: 1 System : 1 Inject#: 8	Detector: CDM

********** EXTERNAL STANDARD REPORT **********

Stop time = 11.50 Minutes Number of Data Points = 3450
Area reject = 1000 One Data Point per 0.2 seconds
Amount Injected = 1 Dilution factor = 101

PEAK NUM	RET TIME	PEAK NAME	CONC. in ug/ml	AREA	HEIGHT	BL	REF PEAK	% DELTA RET TIME
1	1.02	FLUORIDE	1.371e+002	2.520e+004	4159	1	0	0.00%
2	1.60	CHLORIDE	2.014e+001	1.454e+003	262	1	0	0.00%
3	1.93	NITRITE	1.290e+002	8.009e+003	1051	1	0	0.00%
4	3.52	NITRATE	6.331e+002	4.079e+004	3056	1	0	0.00%
5	5.95	PHOSPHATE	5.451e+002	1.815e+004	972	1	0	0.00%
6	7.18	SULFATE	5.232e+001	3.393e+003	181	1	0	0.00%

File: A:\90040500.D08 Sample: 451



DATA REPROCESSED ON Thu Aug 23 13:21:09 1990

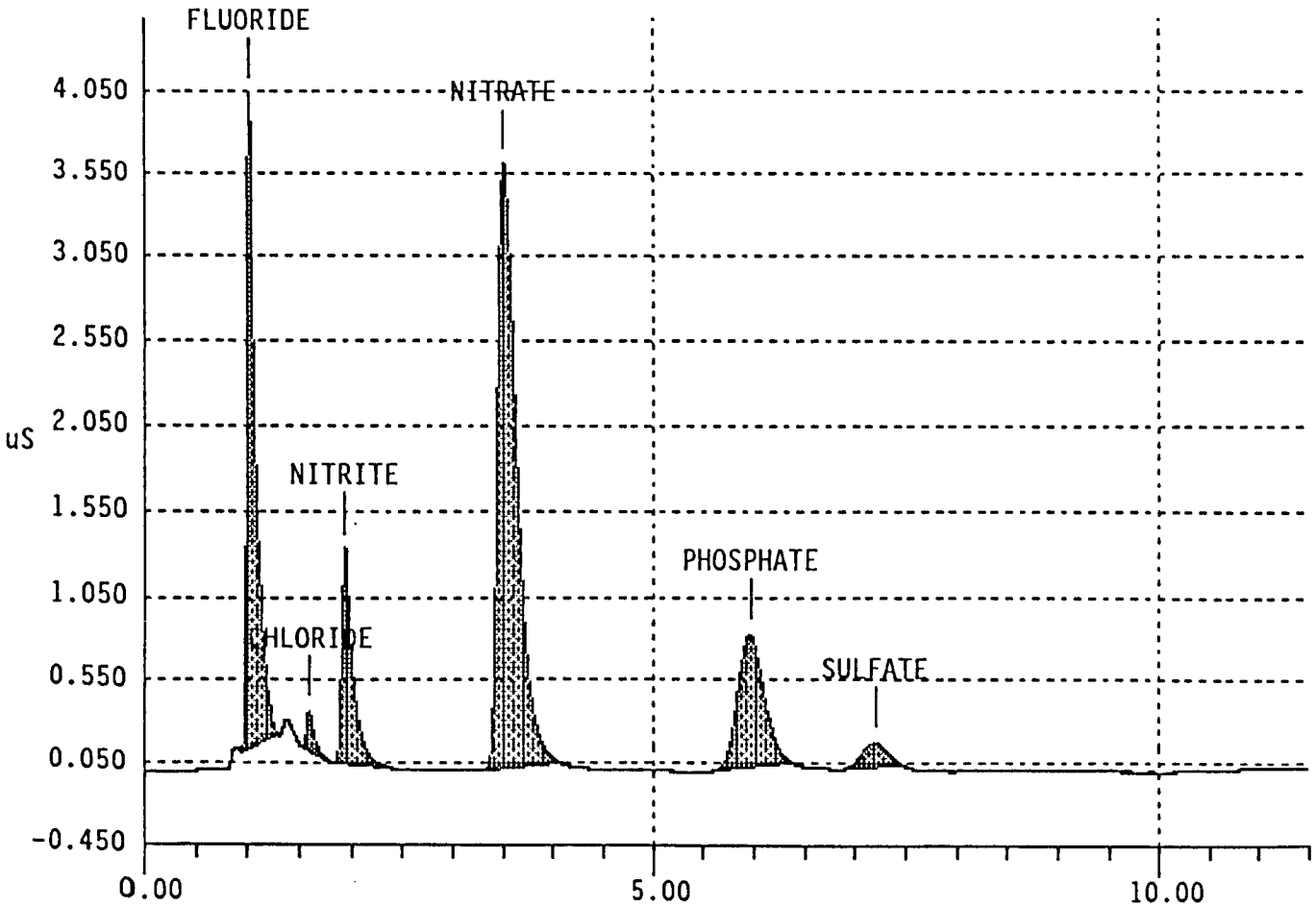
Sample Name: 452D	Date: Thu Apr 05 14:22:50 1990
Data File : A:\90040500.D09	
Method : c:\windows\ai400\method\sst.met	
ACI Address: 1 System : 1 Inject#: 9	Detector: CDM

********** EXTERNAL STANDARD REPORT **********

Stop time = 11.50 Minutes Number of Data Points = 3450
Area reject = 1000 One Data Point per 0.2 seconds
Amount Injected = 1 Dilution factor = 101

PEAK NUM	RET TIME	PEAK NAME	CONC. in ug/ml	AREA	HEIGHT	BL	REF PEAK	% DELTA RET TIME
1	1.02	FLUORIDE	1.291e+002	2.383e+004	3905	1	0	0.00%
2	1.60	CHLORIDE	1.894e+001	1.295e+003	241	1	0	0.00%
3	1.93	NITRITE	1.504e+002	9.631e+003	1279	1	0	0.00%
4	3.52	NITRATE	7.462e+002	4.820e+004	3594	1	0	0.00%
5	5.97	PHOSPHATE	4.547e+002	1.479e+004	800	1	0	0.00%
6	7.20	SULFATE	4.534e+001	2.707e+003	151	1	0	0.00%

File: A:\90040500.D09 Sample: 452D



DATA REPROCESSED ON Thu Aug 23 13:17:53 1990

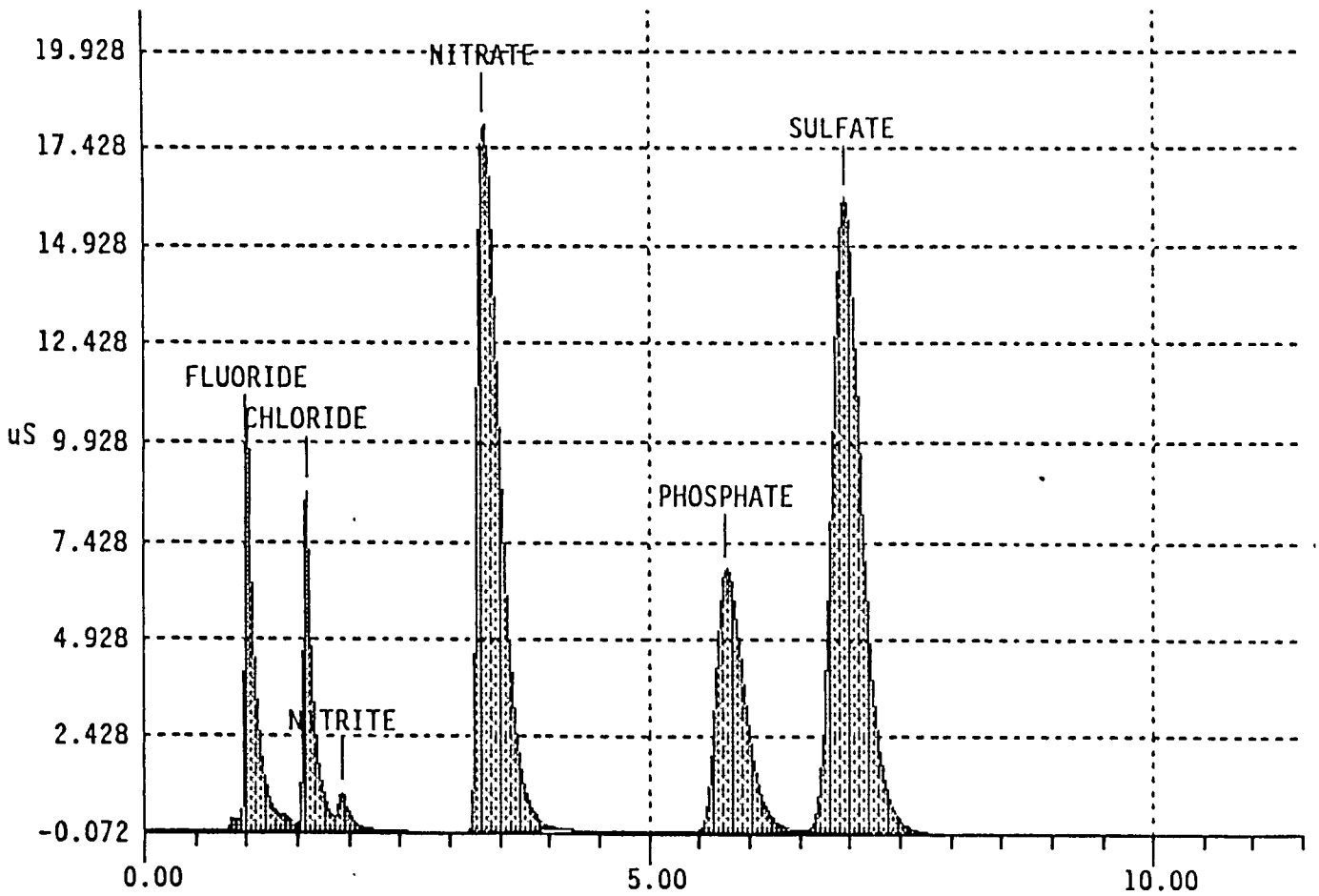
Sample Name: 429S	Date: Thu Apr 05 13:58:17 1990
Data File : A:\90040500.D07	
Method : c:\windows\ai400\method\sst.met	
ACI Address: 1 System : 1 Inject#: 7	Detector: CDM

********** EXTERNAL STANDARD REPORT **********

Stop time = 11.50 Minutes Number of Data Points = 3450
Area reject = 1000 One Data Point per 0.2 seconds
Amount Injected = 1 Dilution factor = 101

PEAK NUM	RET TIME	PEAK NAME	CONC. in ug/ml	AREA	HEIGHT	BL	REF PEAK	% DELTA RET TIME
1	1.00	FLUORIDE	3.052e+002	7.634e+004	9685	2	0	0.00%
2	1.58	CHLORIDE	4.348e+002	5.743e+004	8656	3	0	0.00%
3	1.93	NITRITE	1.089e+002	6.323e+003	836	4	0	0.00%
4	3.35	NITRATE	3.839e+003	2.908e+005	17987	1	0	0.00%
5	5.77	PHOSPHATE	3.452e+003	1.356e+005	6762	2	0	0.00%
6	6.93	SULFATE	3.527e+003	3.404e+005	16085	2	0	-6.31%

File: A:\90040500.D07 Sample: 429S



DATA REPROCESSED ON Thu Aug 23 13:37:04 1990

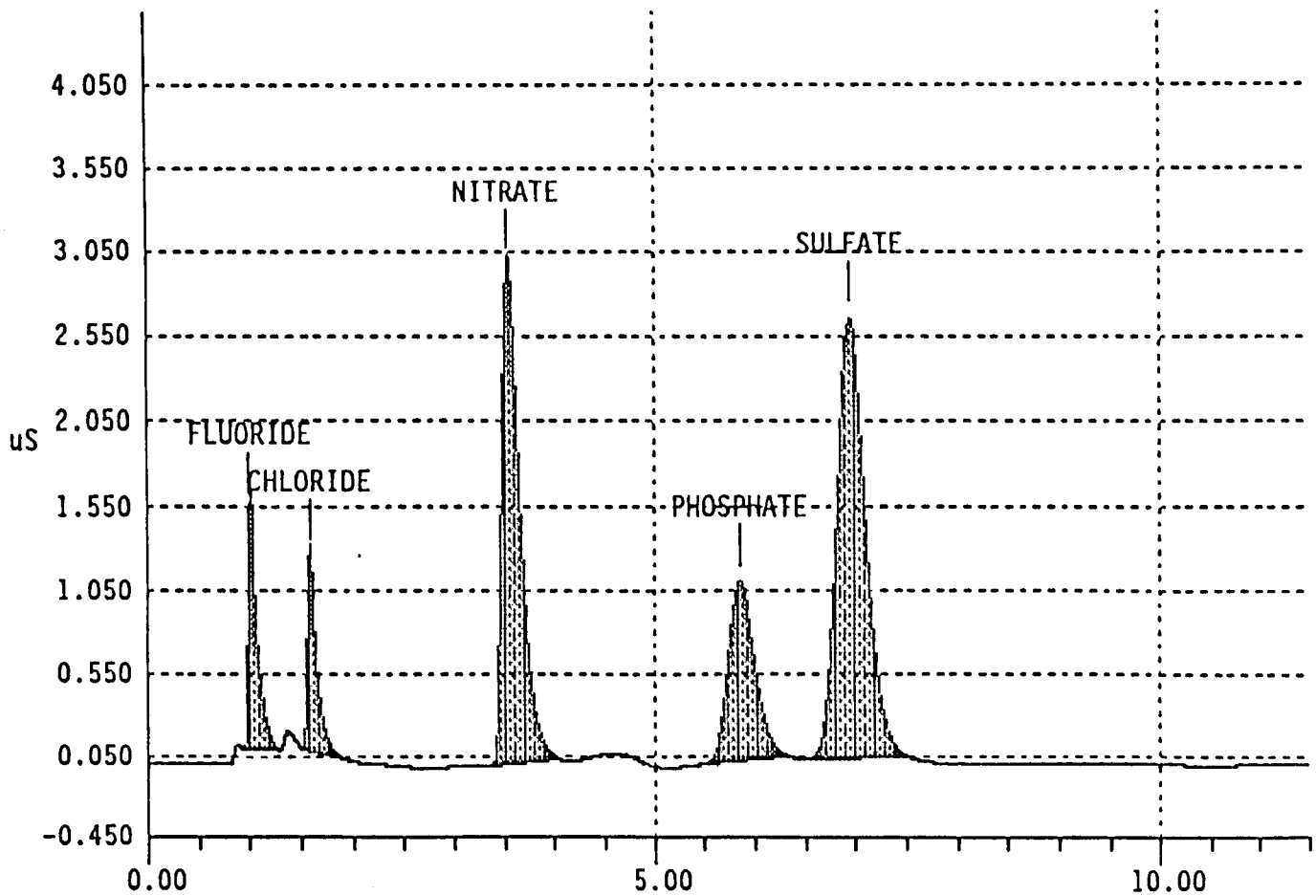
Sample Name: LMCS/6C11-HO F0574 Date: Thu Apr 05 16:25:34 1990
Data File : A:\90040500.D19
Method : c:\windows\ai400\method\sst.met
ACI Address: 1 System : 1 Inject#: 19 Detector: CDM

********** EXTERNAL STANDARD REPORT **********

Stop time = 11.50 Minutes Number of Data Points = 3450
Area reject = 1000 One Data Point per 0.2 seconds
Amount Injected = 1 Dilution factor = 101

PEAK NUM	RET TIME	PEAK NAME	CONC. in ug/ml	AREA	HEIGHT	BL	REF PEAK	% DELTA RET TIME
1	1.00	FLUORIDE	5.094e+001	9.493e+003	1451	1	0	0.00%
2	1.58	CHLORIDE	7.021e+001	7.816e+003	1180	1	0	0.00%
3	3.53	NITRATE	6.154e+002	3.890e+004	2971	1	0	0.00%
4	5.85	PHOSPHATE	6.079e+002	2.009e+004	1091	1	0	0.00%
5	6.95	SULFATE	6.252e+002	5.262e+004	2619	1	0	-6.08%

File: A:\90040500.D19 Sample: LMCS/6C11-HO



Analytical Batch

LAB SEGMENT SERIAL #:F0441

CUSTOMER ID:89-071

INSTRUMENT	Dionex 4000
PROCEDURE/REV	LA-533-105/A-3
TECHNOLOGIST	N. E. Wright
DATE	April 12, 1990
TEMPERATURE	22.5 C
STARTING TIME	1100
ENDING TIME	1420
CHEMIST	H. S. Rich

Ion Chromatograph analysis
Water Digestion
*Run for Flouride only

	DESCRIPTION	LAB ID
1	Initial LMCS Check Std.	F0426
2	Reagent Blank	F0438
3	Sample 89-070	F0427
4	Duplicate Sample 89-070	F0428
5	Spike 89-070	F0429
6	Sample 89-071	F0451
7	Duplicate Sample 89-071	F0452
8	Sample 89-072	F0475
9	Duplicate Sample 89-072	F0476
10	Sample 89-075	F0547
11	Duplicate Sample 89-075	F0548

	DESCRIPTION	LAB ID
12	Sample 89-076	F0571
13	Final LMCS Check Std.	F0574
14		
15		
16		
17		
18		
19		
20		
21		
22		

STANDARD TYPE	PRIMARY BOOK # & ALIQUOT VOL.	SECOND BOOK # & ALIQUOT VOL.	THIRD BK# & ALQT.VOL.	FINAL VOL. OF STD.
LMCS Check Std.	6C11HO/100 uL			10.1 mL
Spike	35C9-77/300 uL	F0427/50 uL		5.3 mL

SST-102 Rev. F 9/7/90 Interim

Single Shell Tank
Calibration Record

ANALYTE:	Ion Chromatograph		
PROCEDURE:	LA-533-105	REVISION:	A-3
INSTRUMENT:	DIONEX 4000	PROPERTY NUMBER:	WB24271
TECHNOLOGIST:	N.E. Wright	PAYROLL NUMBER:	6B107
DATE:	April 11, 1990		

CALIBRATION STANDARD ID: 35C9-79 issued April 10, 1990

ANALYTE CONCENTRATION: F 49 Cl 66 PO_4 609 NO_3 611 SO_4 596 (ppm)

TYPE OF CALIBRATION: Linear

COMMENTS:

SST-103 Rev. (Draft) 9/4/90 Interim

DIONEX METHOD PARAMETERS - SST.MET

Detector Parameters

Number of Detectors	1
Detector 1 Type	CDM

Report Options

Run Time (minutes)	11.50
Detector 1 real time plot scale	20.00
Print Report	Yes
Print Replot	Yes
AutoScale Replot to Highest Peak	Yes
Print Retention Times on Chromatogram	Yes
List Peaks Not Found in this run	No
Report Unknowns found in run	Yes
Record Raw Data	Yes
Raw Data File Name: A:\90040979.D08	
Record Result Data	No

Integration Parameters

Sampling Rate (seconds)	0.20
Peak Threshold (mV or uS/data pt interval)	0.400
Starting Peak Width (seconds)	10.0
Peak Area Reject	1000

Integration Timed Events

Time	Description

Calibration Parameters

External or Internal Calibration	External
Calibrate by Area or Height	Height
Replace Or Average Calibrations	Replace
Number Of Levels for Calibration	6
Calibration fit type	Quadratic
Response Factor for unknown peaks	0.0
Default Injection Volume	1.0
Default Dilution Factor	1.0
Area Reject for Reference Peaks	1000
Percent Retention Time Window for Reference Peaks	5.0

Component # 1 FLUORIDE Retention Time 1.00
Reference Peak C:\WINDOWS\AI400\METHOD\SST.MET Window Size
Least Squares Slope = 3.68480E-004
Least Squares Intercept = -1.99974E-004
Ka = -4.02362E-009

Level	Amount	Area	Height
1	9.78000E-002	1668	300
2	2.43800E-001	3642	607
3	4.85200E-001	9315	1320
4	9.60800E-001	18456	2776
5	1.88460E+000	35592	5385
6	3.62900E+000	83552	11233

Component # 2 CHLORIDE Retention Time 1.60
Reference Peak C:\WINDOWS\AI400\METHOD\SST.MET Window Size
Least Squares Slope = 6.15991E-004
Least Squares Intercept = -3.39552E-002
Ka = -1.21610E-008

Level	Amount	Area	Height
1	1.31700E-001	2313	358
2	3.28400E-001	3676	587
3	6.53500E-001	6685	1135
4	1.29410E+000	14160	2092
5	2.53800E+000	28199	4705
6	4.88900E+000	62634	9921

Component # 3 NITRITE Retention Time 1.95
Reference Peak C:\WINDOWS\AI400\METHOD\SST.MET Window Size
Least Squares Slope = 7.28693E-004
Least Squares Intercept = 2.72186E-001
Ka = 3.36454E-009

Level	Amount	Area	Height
1	1.18960E+000	9937	1360
2	2.99000E+000	25698	3515
3	5.95050E+000	53506	7323
4	1.17843E+001	114215	15244
5	2.39442E+001	218918	28443
6	4.45185E+001	440177	49476

Component # 4 NITRATE Retention Time 3.38
Reference Peak C:\WINDOWS\AI400\METHOD\SST.MET Window Size
Least Squares Slope = 2.06336E-003
Least Squares Intercept = -2.78230E-001
Ka = 2.72813E-010

Level	Amount	Area	Height
1	1.21960E+000	7900	677
2	3.03980E+000	19225	1565
3	6.04950E+000	40617	3098
4	1.19800E+001	84027	6111
5	2.35000E+001	171346	11368
6	4.52600E+001	368906	22029

Component # 5 PHOSPHATE Retention Time 5.80
Reference Peak C:\WINDOWS\AI400\METHOD\SST.MET Window Size
Least Squares Slope = 5.30474E-003
Least Squares Intercept = 1.89883E-001
Ka = -4.78291E-008

Level	Amount	Area	Height
1	1.21550E+000	3360	198
2	3.02990E+000	9889	536
3	6.02970E+000	20802	1103
4	1.19412E+001	43160	2270
5	2.34230E+001	88767	4565
6	4.51110E+001	186751	9238

Component # 6 SULFATE Retention Time 6.85
Reference Peak C:\WINDOWS\AI400\METHOD\SST.MET Window Size
Least Squares Slope = 2.26381E-003
Least Squares Intercept = 6.72726E-003
Ka = -1.34143E-008

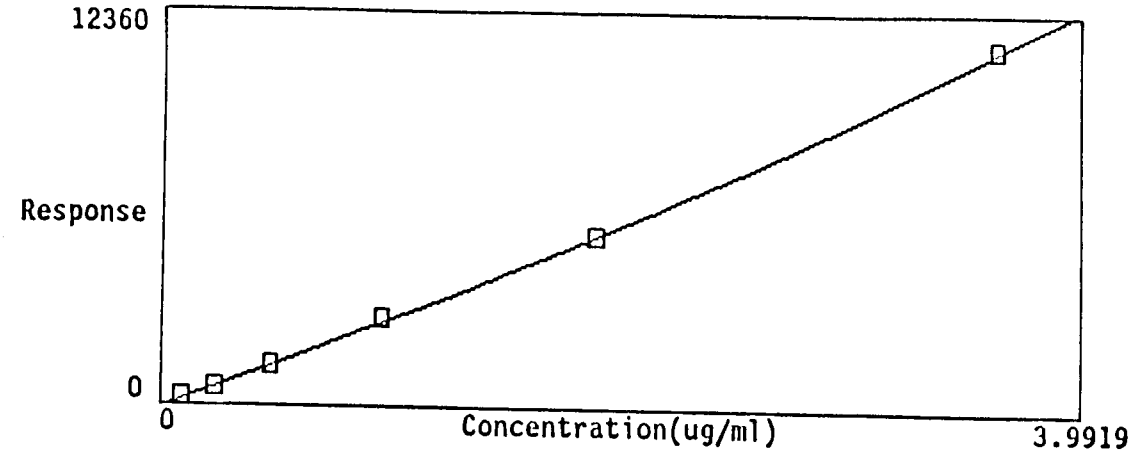
Level	Amount	Area	Height
1	1.18960E+000	10771	557
2	2.96520E+000	25693	1297
3	5.90100E+000	51993	2607
4	1.16860E+001	108657	5358
5	2.29231E+001	220178	10811
6	4.41480E+001	472662	22498

Component # 7 Oxalate Retention Time 9.77
Reference Peak FLUORIDE Window Size 10.00%
Least Squares Slope = 0.00000E+000
Least Squares Intercept = 0.00000E+000
Ka = 0.00000E+000

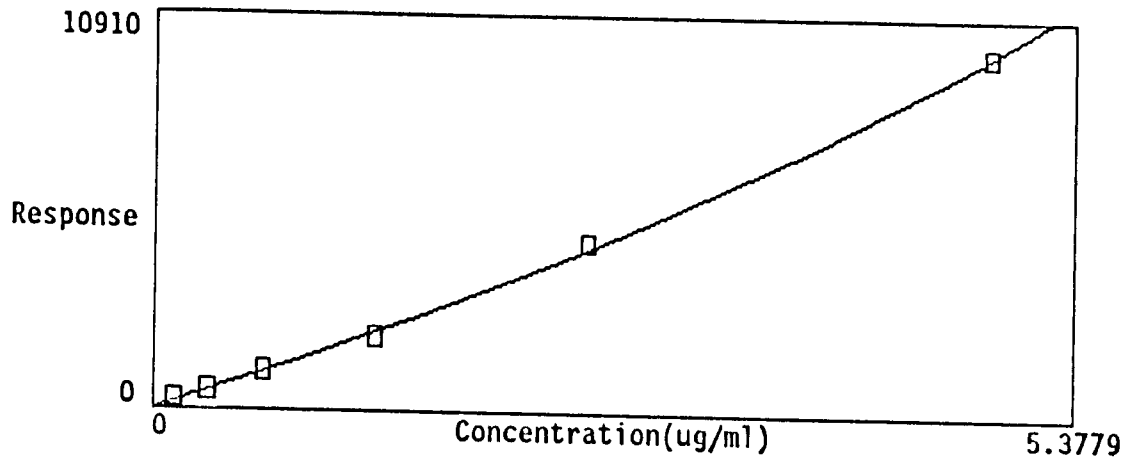
Level	Amount	Area	Height
1	0.00000E+000	0	0
2	0.00000E+000	0	0
3	0.00000E+000	0	0
4	0.00000E+000	0	0
5	0.00000E+000	0	0
6	0.00000E+000	98993	5848

IC Control File: C:\WINDOWS\AI400\METHOD\GROUT01.TE

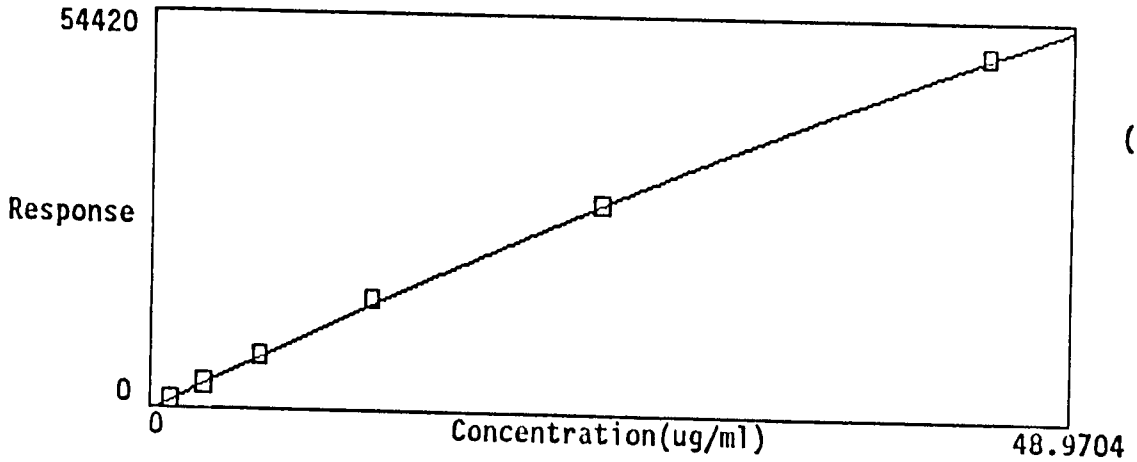
Step	Time	Description
Init		CDM AutoOffset Off
Init		CDM Recorder Mark OFF
Init		CDM Temp. Comp. = 1.7 / Deg C
Init		CDM Recorder Range = 1.000 uS
Init		CDM Cell ON
Init		CMA Heater = 25 Deg. C
Init		Valve A ON
Init		Valve B ON
Init		Inject Valve OFF
Init		CIM Relay 1 OFF
Init		CIM Relay 2 OFF
Init		CIM AC 1 OFF
Init		CIM AC 2 OFF
Init		GPM Start
Init		GPM Hold Gradient Clock
Init		GPM Reset ON
1	0.0	CDM AutoOffset ON
1	0.0	GPM Reset OFF
2	0.1	Inject Valve ON
2	0.1	GPM Run Gradient Clock
3	3.0	Inject Valve OFF
4	3.5	CIM Relay 1 ON
5	4.0	CIM Relay 1 OFF



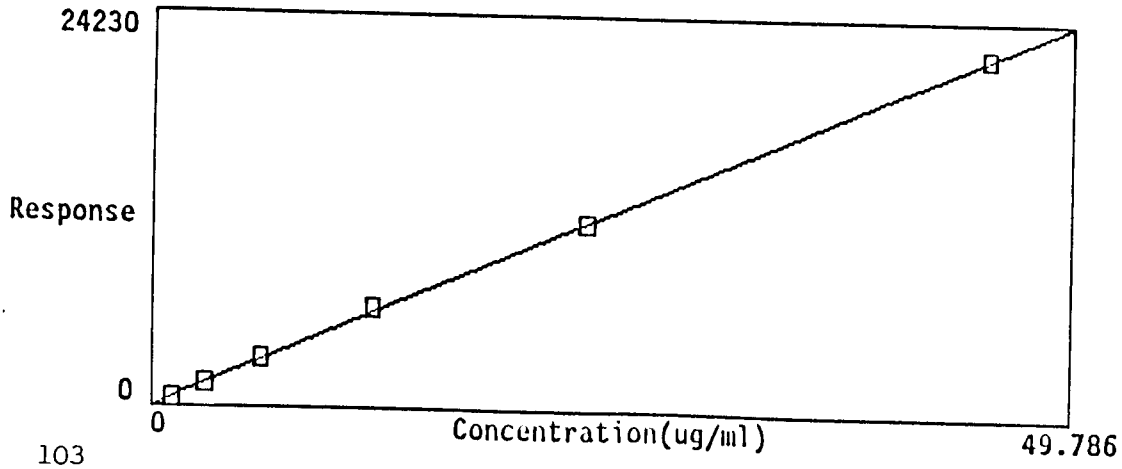
Component: FLUORIDE
Fit Type: Quadratic
Conc = (-4.023616e-009
(3.684797e-004 * Resp)+



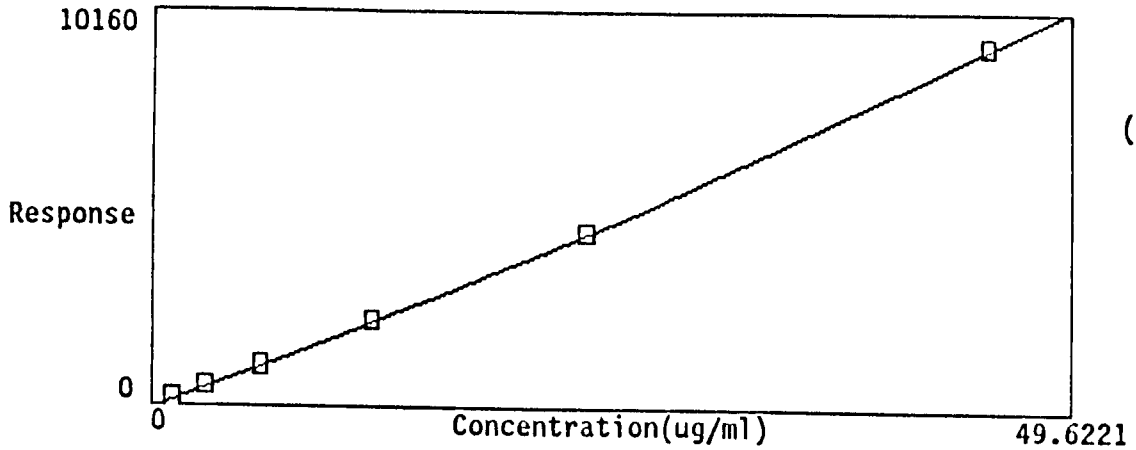
Component: CHLORIDE
Fit Type: Quadratic
Conc = (-1.216103e-008
(6.159914e-004 * Resp)+



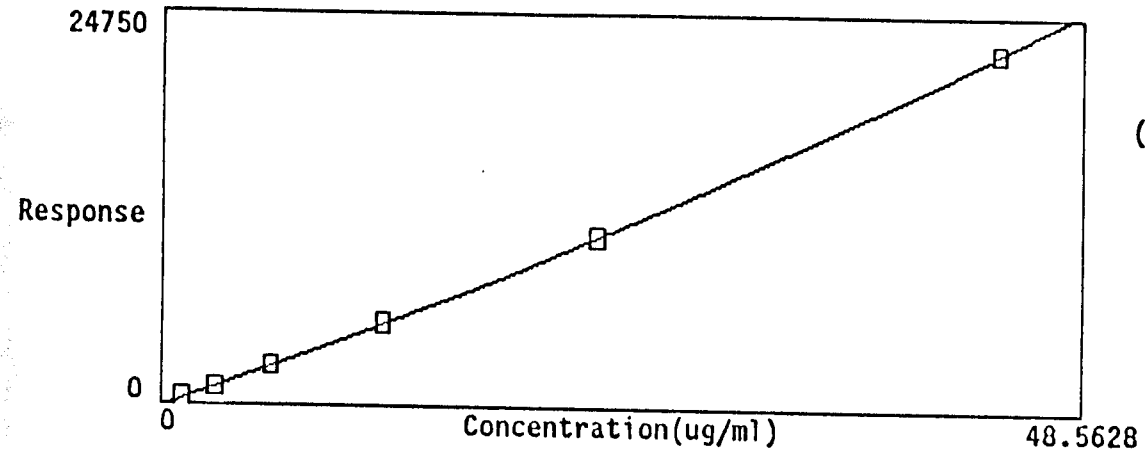
Component: NITRITE
Fit Type: Quadratic
Conc = (3.364537e-009 *
(7.286927e-004 * Resp)+



Component: NITRATE
Fit Type: Quadratic
Conc = (2.728131e-010 *
(2.063355e-003 * Resp)+



Component: PHOSPHATE
Fit Type: Quadratic
Conc = (-4.782909e-008
(5.304744e-003 * Resp)+



Component: SULFATE
Fit Type: Quadratic
Conc = (-1.341431e-008
(2.263806e-003 * Resp)+

```
*********************    AUTOMATIC CALIBRATION UPDATE    **********************
Method File:   C:\WINDOWS\AI400\METHOD\SST.MET
Result File:   CALDATA.R10
Sample Name:   AUTOCAL1R                                Calibration Level :  1
Interface #: 1  Cycle #: 3      Result File Date: Wed Apr 11 10:22:06 1990
Start time  = 0          Stop time = 11.50
Area reject = 1000       One DataPoint per 0.2 seconds
Amount Injected = 1      Dilution factor = 1
**********************  PEAKS NOT FOUND IN THIS RUN  *************************
```

Name	Adjusted Ret Time	Reference Peak
FLUORIDE	1.00	0
Oxalate	9.77	1

```
*********************    COMPONENTS FOUND IN THIS RUN    *************************
```

COMP NUM	COMPONENT NAME	OLD RET.TIME	MEASURED RET.TIME	NEW RET.TIME	OLD HEIGHT	MEASURED HEIGHT	NEW HEIGHT
2	CHLORIDE	1.60	1.60	1.60	3.580e+002	3.583e+002	3.583e+002
3	NITRITE	1.95	1.95	1.95	1.360e+003	1.360e+003	1.360e+003
4	NITRATE	3.38	3.67	3.67	4.680e+002	6.767e+002	6.767e+002
5	PHOSPHATE	5.80	6.00	6.00	1.800e+002	1.983e+002	1.983e+002
6	SULFATE	6.85	6.98	6.98	1.980e+002	5.565e+002	5.565e+002

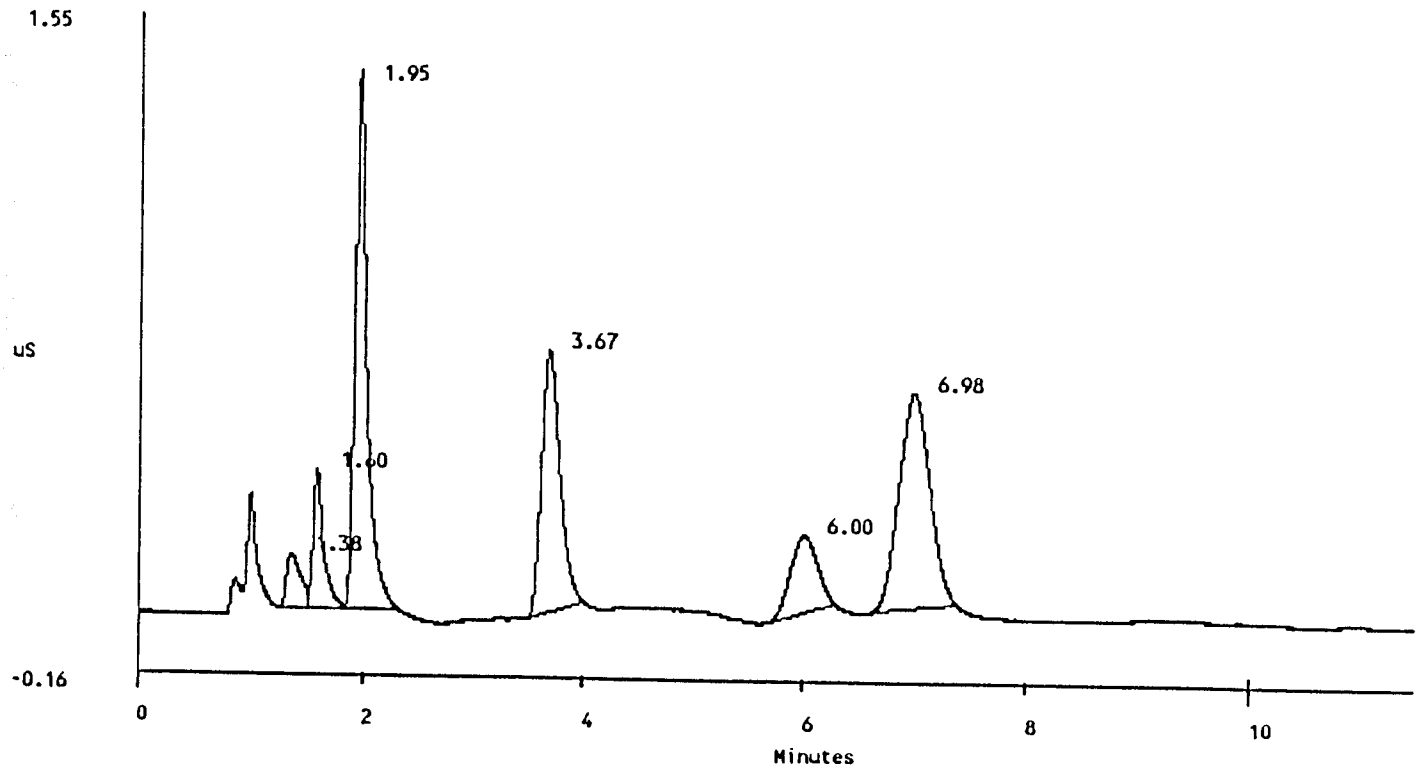
DATA REPROCESSED ON Mon Jul 16 10:15:06 1990

Sample Name: AUTOCAL1R Date: Wed Apr 11 10:22:06 1990
Data File : A:\90040979.D03
Method : C:\WINDOWS\AI400\METHOD\SST.MET
CIM Address: 1 System : 1 Cycle#: 3 Detector: CDM

********** EXTERNAL STANDARD REPORT **********

Stop time = 11.50 Minutes Number of Data Points = 3451
Area reject = 1000 One Data Point per 0.2 seconds
Amount Injected = 1 Dilution factor = 1

PEAK NUM	RET TIME	PEAK NAME	CONC. in ug/ml	AREA	HEIGHT	BL	REF PEAK	% DELTA RET TIME
1	1.38		0.000e+000	1.225e+003	140	2		
2	1.60	CHLORIDE	1.317e-001	2.313e+003	358	2	0	0.00%
3	1.95	NITRITE	1.190e+000	9.937e+003	1360	2	0	0.00%
4	3.67	NITRATE	1.220e+000	7.900e+003	677	1	0	0.00%
5	6.00	PHOSPHATE	1.216e+000	3.360e+003	198	1	0	0.00%
6	6.98	SULFATE	1.190e+000	1.077e+004	557	1	0	0.00%



********** AUTOMATIC CALIBRATION UPDATE **********

Method File: C:\WINDOWS\AI400\METHOD\SST.MET
Result File: CALDATA.R10
Sample Name: AUTOCAL2R
Calibration Level : 2
Interface #: 1 Cycle #: 4 Result File Date: Wed Apr 11 10:34:25 1990
Start time = 0 Stop time = 11.50
Area reject = 1000 One DataPoint per 0.2 seconds
Amount Injected = 1 Dilution factor = 1

********** PEAKS NOT FOUND IN THIS RUN **********

Name	Adjusted Ret Time	Reference Peak
Oxalate	9.77	1

********** COMPONENTS FOUND IN THIS RUN **********

COMP NUM	COMPONENT NAME	OLD RET.TIME	MEASURED RET.TIME	NEW RET.TIME	OLD HEIGHT	MEASURED HEIGHT	NEW HEIGHT
1	FLUORIDE	1.00	1.00	1.00	6.160e+002	6.067e+002	6.067e+002
2	CHLORIDE	1.60	1.60	1.60	4.890e+002	5.866e+002	5.866e+002
3	NITRITE	1.95	1.95	1.95	3.515e+003	3.515e+003	3.515e+003
4	NITRATE	3.67	3.63	3.63	1.234e+003	1.565e+003	1.565e+003
5	PHOSPHATE	6.00	5.98	5.98	4.370e+002	5.364e+002	5.364e+002
6	SULFATE	6.98	6.97	6.97	9.220e+002	1.297e+003	1.297e+003

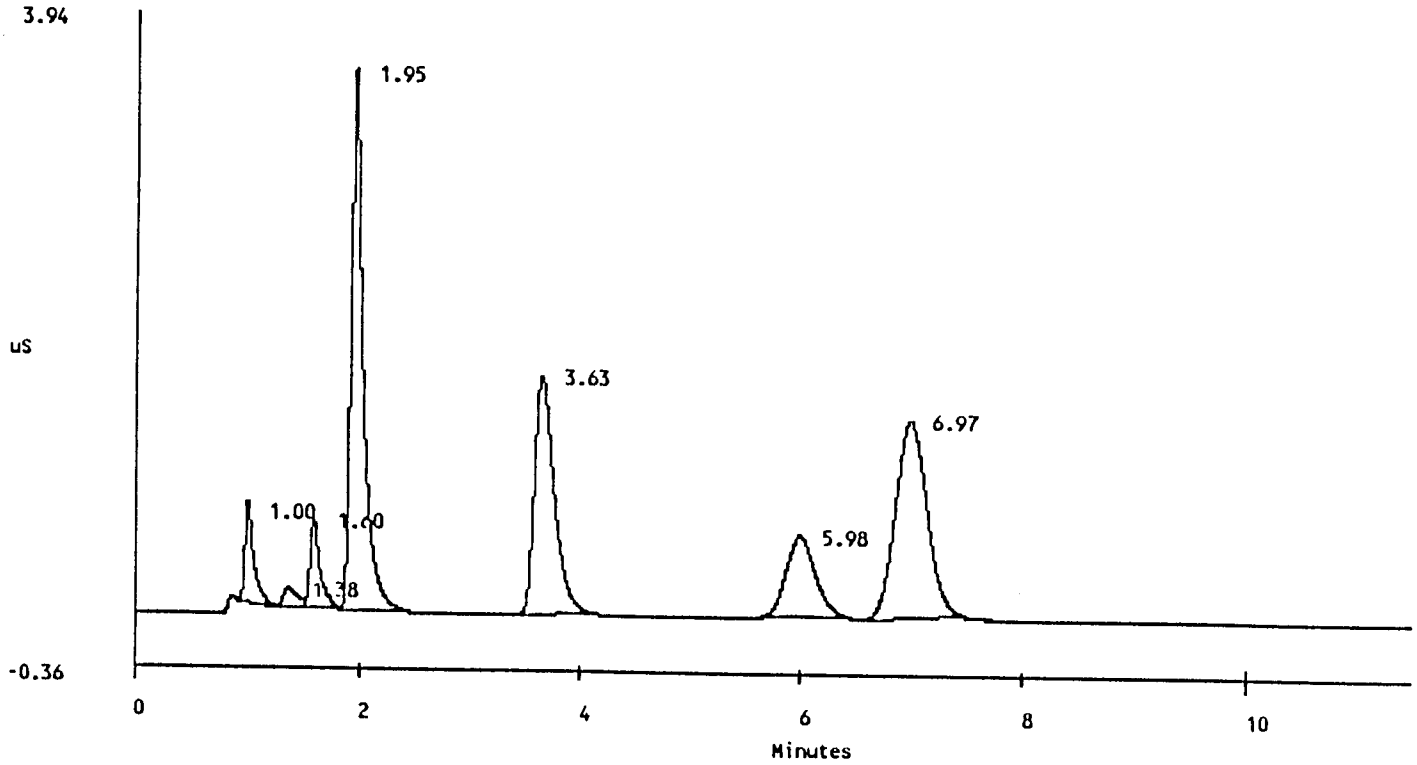
DATA REPROCESSED ON Mon Jul 16 10:16:39 1990

Sample Name: AUTOCAL2R Date: Wed Apr 11 10:34:25 1990
Data File : A:\90040979.D04
Method : C:\WINDOWS\AI400\METHOD\SST.MET
CIM Address: 1 System : 1 Cycle#: 4 Detector: CDM

********** EXTERNAL STANDARD REPORT **********

Stop time = 11.50 Minutes Number of Data Points = 3451
Area reject = 1000 One Data Point per 0.2 seconds
Amount Injected = 1 Dilution factor = 1

PEAK NUM	RET TIME	PEAK NAME	CONC. in ug/ml	AREA	HEIGHT	BL	REF PEAK	% DELTA RET TIME
1	1.00	FLUORIDE	2.438e-001	3.642e+003	607	1	0	0.00%
2	1.38		0.000e+000	1.159e+003	132	2		
3	1.60	CHLORIDE	3.284e-001	3.676e+003	587	2	0	0.00%
4	1.95	NITRITE	2.990e+000	2.570e+004	3515	2	0	0.00%
5	3.63	NITRATE	3.040e+000	1.923e+004	1565	1	0	0.00%
6	5.98	PHOSPHATE	3.030e+000	9.889e+003	536	1	0	0.00%
7	6.97	SULFATE	2.965e+000	2.569e+004	1297	1	0	0.00%



********** AUTOMATIC CALIBRATION UPDATE **********

Method File: C:\WINDOWS\AI400\METHOD\SST.MET
Result File: CALDATA.R10
Sample Name: AUTOCAL3R Calibration Level : 3
Interface #: 1 Cycle #: 5 Result File Date: Wed Apr 11 10:46:43 1990
Start time = 0 Stop time = 11.50
Area reject = 1000 One DataPoint per 0.2 seconds
Amount Injected = 1 Dilution factor = 1

********** PEAKS NOT FOUND IN THIS RUN **********

Name	Adjusted Ret Time	Reference Peak
Oxalate	9.77	1

********** COMPONENTS FOUND IN THIS RUN **********

COMP NUM	COMPONENT NAME	OLD RET.TIME	MEASURED RET.TIME	NEW RET.TIME	OLD HEIGHT	MEASURED HEIGHT	NEW HEIGHT
1	FLUORIDE	1.00	1.00	1.00	1.226e+003	1.320e+003	1.320e+003
2	CHLORIDE	1.60	1.60	1.60	1.017e+003	1.135e+003	1.135e+003
3	NITRITE	1.95	1.95	1.95	7.323e+003	7.323e+003	7.323e+003
4	NITRATE	3.63	3.58	3.58	2.460e+003	3.098e+003	3.098e+003
5	PHOSPHATE	5.98	5.97	5.97	9.480e+002	1.103e+003	1.103e+003
6	SULFATE	6.97	6.97	6.97	1.890e+003	2.607e+003	2.607e+003

DATA REPROCESSED ON Mon Jul 16 10:17:20 1990

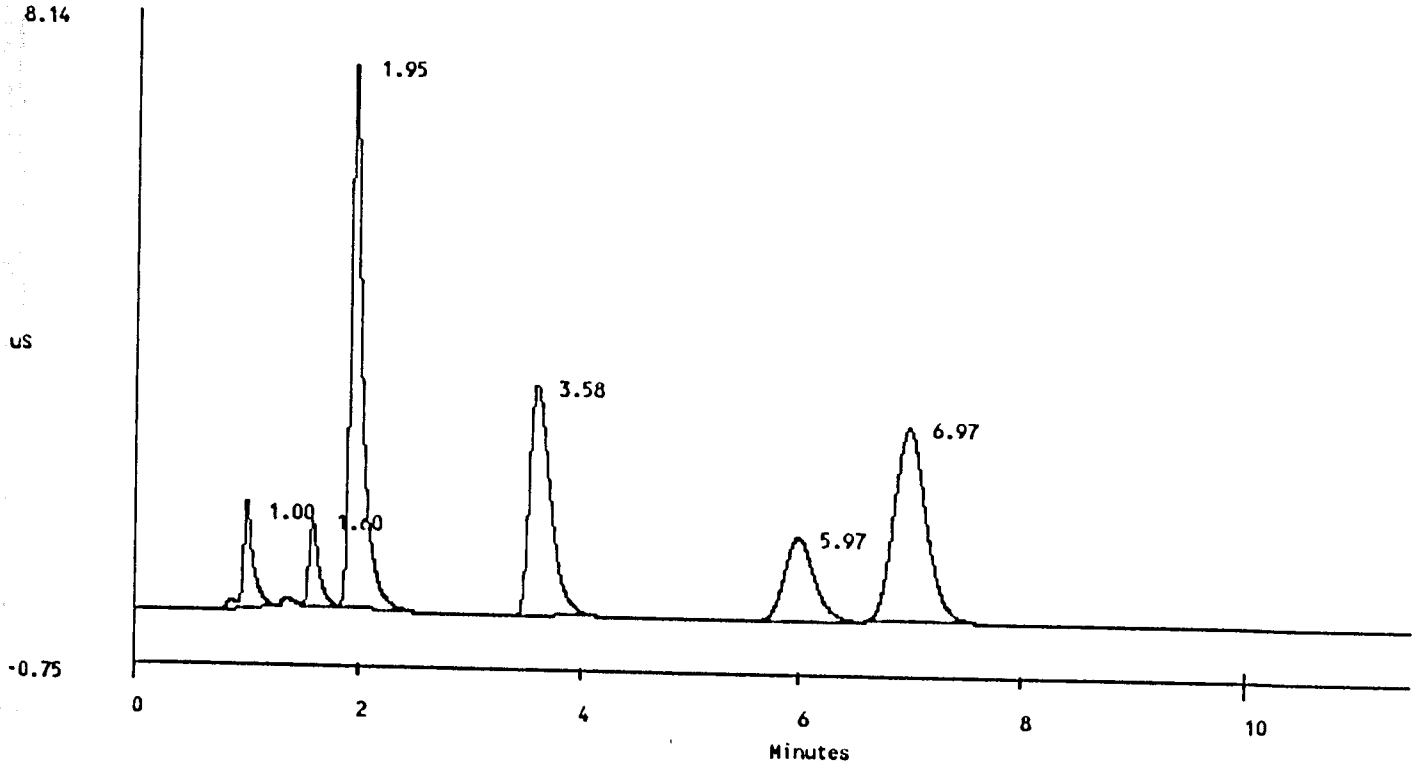
Sample Name: AUTOCAL3R
Date: Wed Apr 11 10:46:43 1990
Data File : A:\90040979.D05
Method : C:\WINDOWS\AI400\METHOD\SST.MET
CIM Address: 1 System : 1 Cycle#: 5 Detector: CDM

********** EXTERNAL STANDARD REPORT **********

Stop time = 11.50 Minutes
Area reject = 1000
Amount Injected = 1

Number of Data Points = 3450
One Data Point per 0.2 seconds
Dilution factor = 1

PEAK NUM	RET TIME	PEAK NAME	CONC. in ug/ml	AREA	HEIGHT	BL	REF PEAK	% DELTA RET TIME
1	1.00	FLUORIDE	4.852e-001	9.315e+003	1320	1	0	0.00%
2	1.60	CHLORIDE	6.535e-001	6.685e+003	1135	1	0	0.00%
3	1.95	NITRITE	5.951e+000	5.351e+004	7323	1	0	0.00%
4	3.58	NITRATE	6.050e+000	4.062e+004	3098	1	0	0.00%
5	5.97	PHOSPHATE	6.030e+000	2.080e+004	1103	2	0	0.00%
6	6.97	SULFATE	5.901e+000	5.199e+004	2607	2	0	0.00%



********** AUTOMATIC CALIBRATION UPDATE **********

Method File: C:\WINDOWS\AI400\METHOD\SST.MET
Result File: CALDATA.R10
Sample Name: AUTOCAL4R
Calibration Level : 4
Interface #: 1 Cycle #: 6 Result File Date: Wed Apr 11 10:59:03 1990
Start time = 0 Stop time = 11.50
Area reject = 1000 One DataPoint per 0.2 seconds
Amount Injected = 1 Dilution factor = 1

********** PEAKS NOT FOUND IN THIS RUN **********

Name	Adjusted Ret Time	Reference Peak
Oxalate	9.77	1

********** COMPONENTS FOUND IN THIS RUN **********

COMP NUM	COMPONENT NAME	OLD RET.TIME	MEASURED RET.TIME	NEW RET.TIME	OLD HEIGHT	MEASURED HEIGHT	NEW HEIGHT
1	FLUORIDE	1.00	1.00	1.00	2.625e+003	2.776e+003	2.776e+003
2	CHLORIDE	1.60	1.58	1.58	2.088e+003	2.092e+003	2.092e+003
3	NITRITE	1.95	1.95	1.95	1.524e+004	1.524e+004	1.524e+004
4	NITRATE	3.58	3.53	3.53	4.753e+003	6.111e+003	6.111e+003
5	PHOSPHATE	5.97	5.93	5.93	1.886e+003	2.270e+003	2.270e+003
6	SULFATE	6.97	6.93	6.93	4.005e+003	5.358e+003	5.358e+003

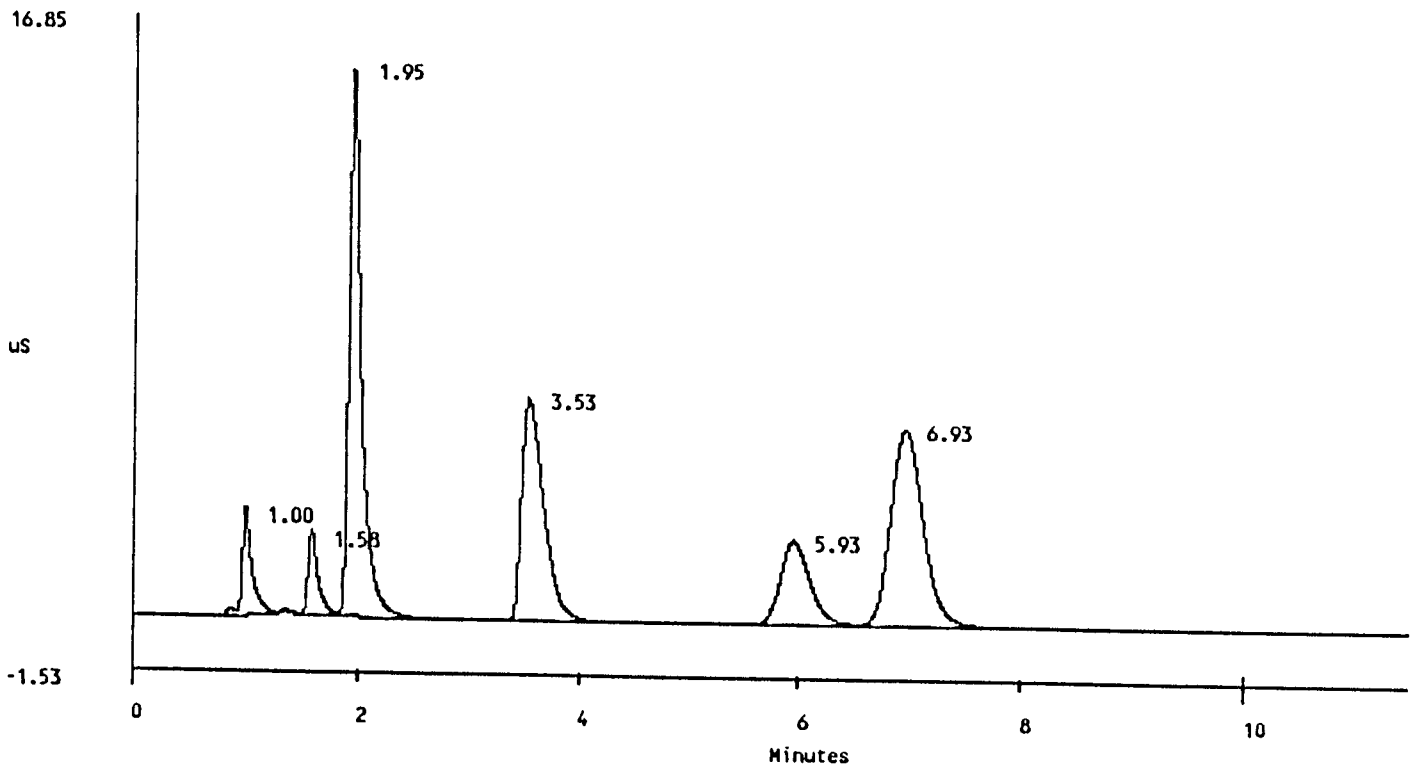
DATA REPROCESSED ON Mon Jul 16 10:17:59 1990

Sample Name: AUTOCAL4R Date: Wed Apr 11 10:59:03 1990
Data File : A:\90040979.D06
Method : C:\WINDOWS\AI400\METHOD\SST.MET
CIM Address: 1 System : 1 Cycle#: 6 Detector: CDM

********** EXTERNAL STANDARD REPORT **********

Stop time = 11.50 Minutes Number of Data Points = 3450
Area reject = 1000 One Data Point per 0.2 seconds
Amount Injected = 1 Dilution factor = 1

PEAK NUM	RET TIME	PEAK NAME	CONC. in ug/ml	AREA	HEIGHT	BL	REF PEAK	% DELTA RET TIME
1	1.00	FLUORIDE	9.608e-001	1.846e+004	2776	1	0	0.00%
2	1.58	CHLORIDE	1.294e+000	1.416e+004	2092	2	0	0.00%
3	1.95	NITRITE	1.178e+001	1.142e+005	15244	2	0	0.00%
4	3.53	NITRATE	1.198e+001	8.403e+004	6111	1	0	0.00%
5	5.93	PHOSPHATE	1.194e+001	4.316e+004	2270	2	0	0.00%
6	6.93	SULFATE	1.169e+000	1.087e+005	5358	2	0	0.00%



********** AUTOMATIC CALIBRATION UPDATE **********

Method File: C:\WINDOWS\AI400\METHOD\SST.MET
Result File: CALDATA.R10
Sample Name: AUTOCAL5R Calibration Level : 5
Interface #: 1 Cycle #: 7 Result File Date: Wed Apr 11 11:11:21 1990
Start time = 0 Stop time = 11.50
Area reject = 1000 One DataPoint per 0.2 seconds
Amount Injected = 1 Dilution factor = 1

********** PEAKS NOT FOUND IN THIS RUN **********

Name	Adjusted Ret Time	Reference Peak
Oxalate	9.77	1

********** COMPONENTS FOUND IN THIS RUN **********

COMP NUM	COMPONENT NAME	OLD RET.TIME	MEASURED RET.TIME	NEW RET.TIME	OLD HEIGHT	MEASURED HEIGHT	NEW HEIGHT
1	FLUORIDE	1.00	1.00	1.00	5.315e+003	5.385e+003	5.385e+003
2	CHLORIDE	1.58	1.60	1.60	4.066e+003	4.705e+003	4.705e+003
3	NITRITE	1.95	1.95	1.95	2.844e+004	2.844e+004	2.844e+004
4	NITRATE	3.53	3.47	3.47	9.250e+003	1.137e+004	1.137e+004
5	PHOSPHATE	5.93	5.88	5.88	3.876e+003	4.565e+003	4.565e+003
6	SULFATE	6.93	6.90	6.90	8.158e+003	1.081e+004	1.081e+004

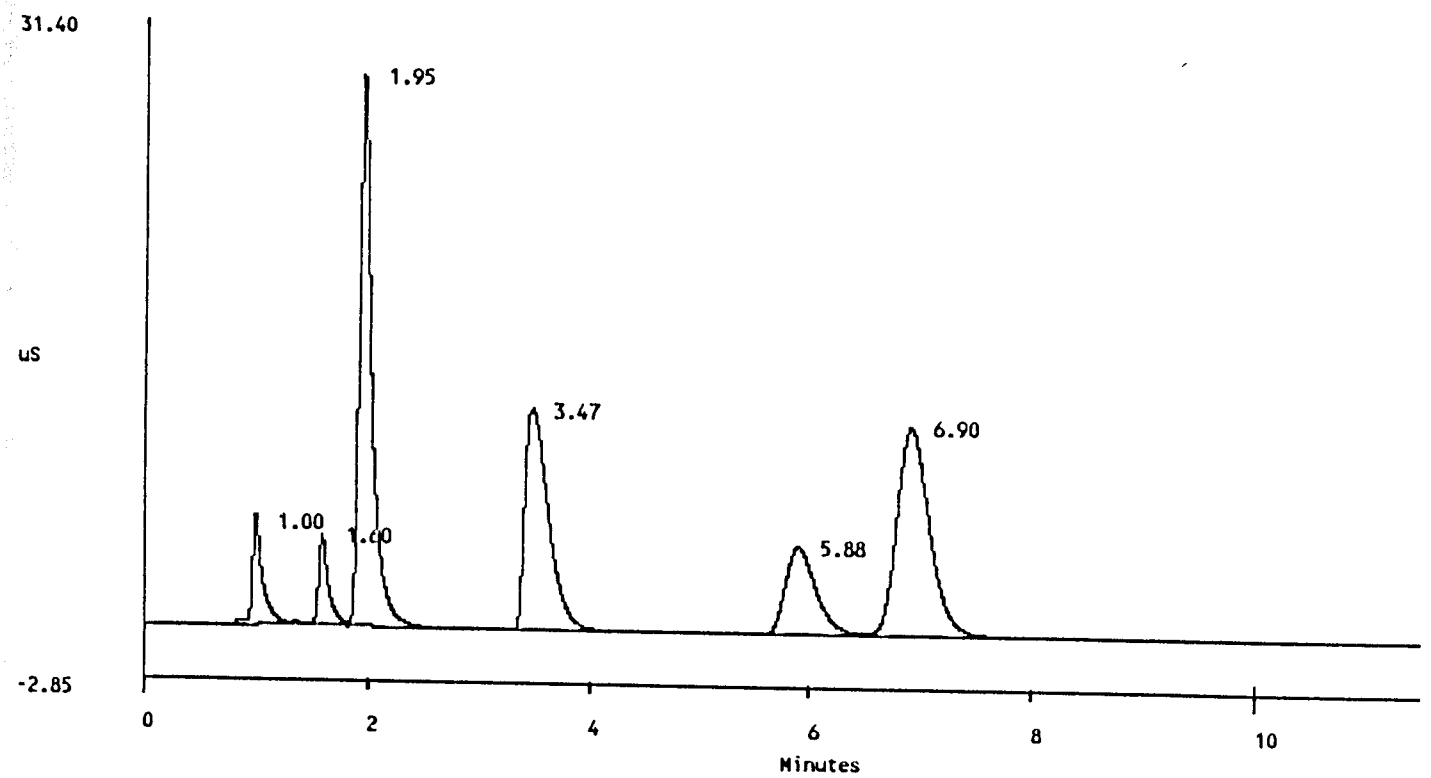
DATA REPROCESSED ON Mon Jul 16 10:18:38 1990

Sample Name: AUTOCAL5R Date: Wed Apr 11 11:11:21 1990
Data File : A:\90040979.D07
Method : C:\WINDOWS\AI400\METHOD\SST.MET
CIM Address: 1 System : 1 Cycle#: 7 Detector: CDM

********** EXTERNAL STANDARD REPORT **********

Stop time = 11.50 Minutes Number of Data Points = 3450
Area reject = 1000 One Data Point per 0.2 seconds
Amount Injected = 1 Dilution factor = 1

PEAK NUM	RET TIME	PEAK NAME	CONC. in ug/ml	AREA	HEIGHT	BL	REF PEAK	% DELTA RET TIME
1	1.00	FLUORIDE	1.885e+000	3.559e+004	5385	1	0	0.00%
2	1.60	CHLORIDE	2.538e+000	2.820e+004	4705	2	0	0.00%
3	1.95	NITRITE	2.394e+001	2.189e+005	28443	2	0	0.00%
4	3.47	NITRATE	2.350e+004	1.713e+005	11368	1	0	0.00%
5	5.88	PHOSPHATE	2.342e+001	8.877e+004	4565	2	0	0.00%
6	6.90	SULFATE	2.292e+001	2.202e+005	10811	2	0	0.00%



********** AUTOMATIC CALIBRATION UPDATE **********

Method File: C:\WINDOWS\AI400\METHOD\SST.MET
Result File: CALDATA.R10
Sample Name: AUTOCAL6R Calibration Level : 6
Interface #: 1 Cycle #: 8 Result File Date: Wed Apr 11 11:23:42 1990
Start time = 0 Stop time = 11.50
Area reject = 1000 One DataPoint per 0.2 seconds
Amount Injected = 1 Dilution factor = 1

********** PEAKS NOT FOUND IN THIS RUN **********

Name	Adjusted Ret Time	Reference Peak
Oxalate	9.77	1

********** COMPONENTS FOUND IN THIS RUN **********

COMP NUM	COMPONENT NAME	OLD RET.TIME	MEASURED RET.TIME	NEW RET.TIME	OLD HEIGHT	MEASURED HEIGHT	NEW HEIGHT
1	FLUORIDE	1.00	1.00	1.00	1.109e+004	1.123e+004	1.123e+004
2	CHLORIDE	1.60	1.60	1.60	9.183e+003	9.921e+003	9.921e+003
3	NITRITE	1.95	1.95	1.95	4.948e+004	4.948e+004	4.948e+004
4	NITRATE	3.47	3.38	3.38	1.747e+004	2.203e+004	2.203e+004
5	PHOSPHATE	5.88	5.80	5.80	8.003e+003	9.238e+003	9.238e+003
6	SULFATE	6.90	6.85	6.85	1.695e+004	2.250e+004	2.250e+004

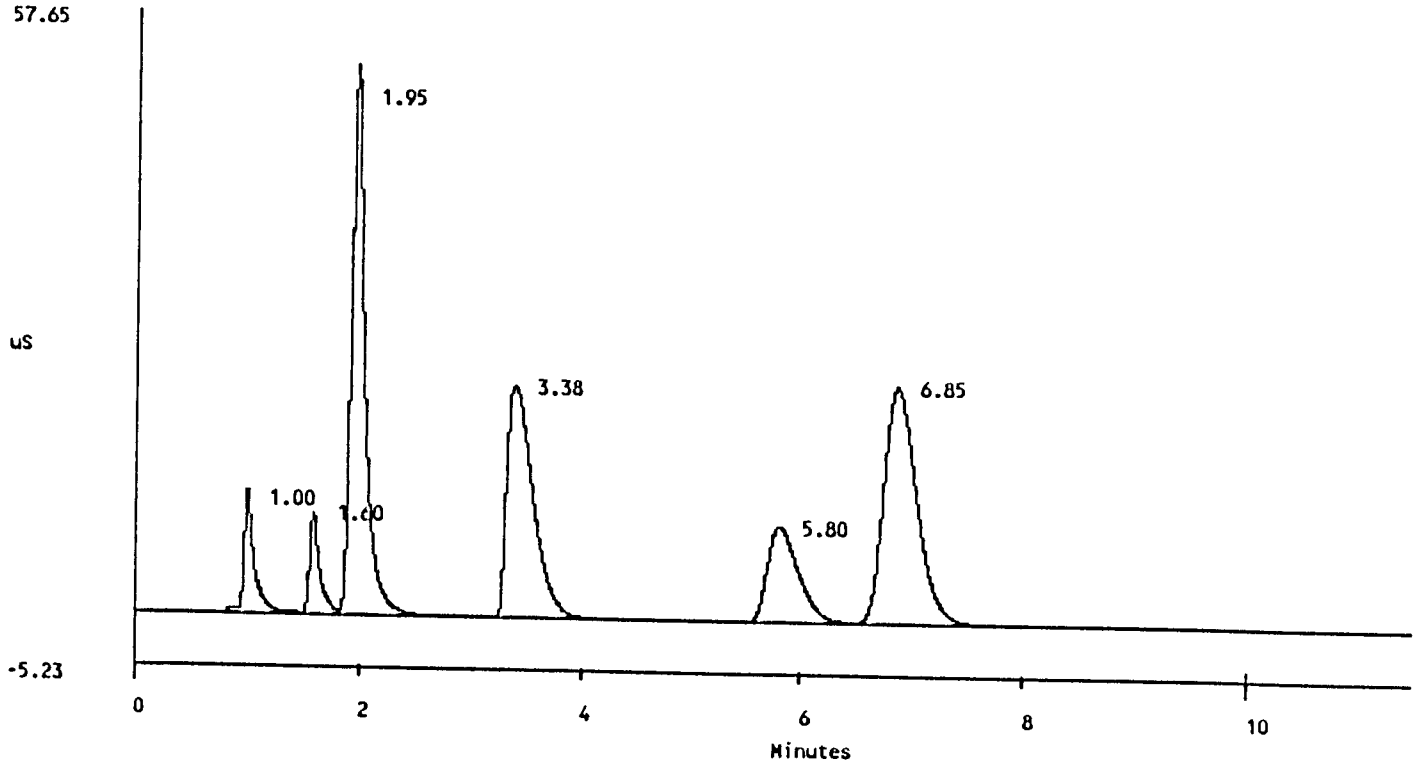
DATA REPROCESSED ON Mon Jul 16 10:19:17 1990

Sample Name: AUTOCAL6R Date: Wed Apr 11 11:23:42 1990
Data File : A:\90040979.D08
Method : C:\WINDOWS\AI400\METHOD\SST.MET
CIM Address: 1 System : 1 Cycle#: 8 Detector: CDM

********** EXTERNAL STANDARD REPORT **********

Stop time = 11.50 Minutes Number of Data Points = 3450
Area reject = 1000 One Data Point per 0.2 seconds
Amount Injected = 1 Dilution factor = 1

PEAK NUM	RET TIME	PEAK NAME	CONC. in ug/ml	AREA	HEIGHT	BL	REF PEAK	% DELTA RET TIME
1	1.00	FLUORIDE	3.629e+000	8.355e+004	11233	2	0	0.00%
2	1.60	CHLORIDE	4.889e+000	6.263e+004	9921	2	0	0.00%
3	1.95	NITRITE	4.452e+001	4.402e+005	49476	2	0	0.00%
4	3.38	NITRATE	4.526e+001	3.689e+005	22029	1	0	0.00%
5	5.80	PHOSPHATE	4.511e+001	1.868e+005	9238	2	0	0.00%
6	6.85	SULFATE	4.415e+001	4.727e+005	22498	2	0	0.00%

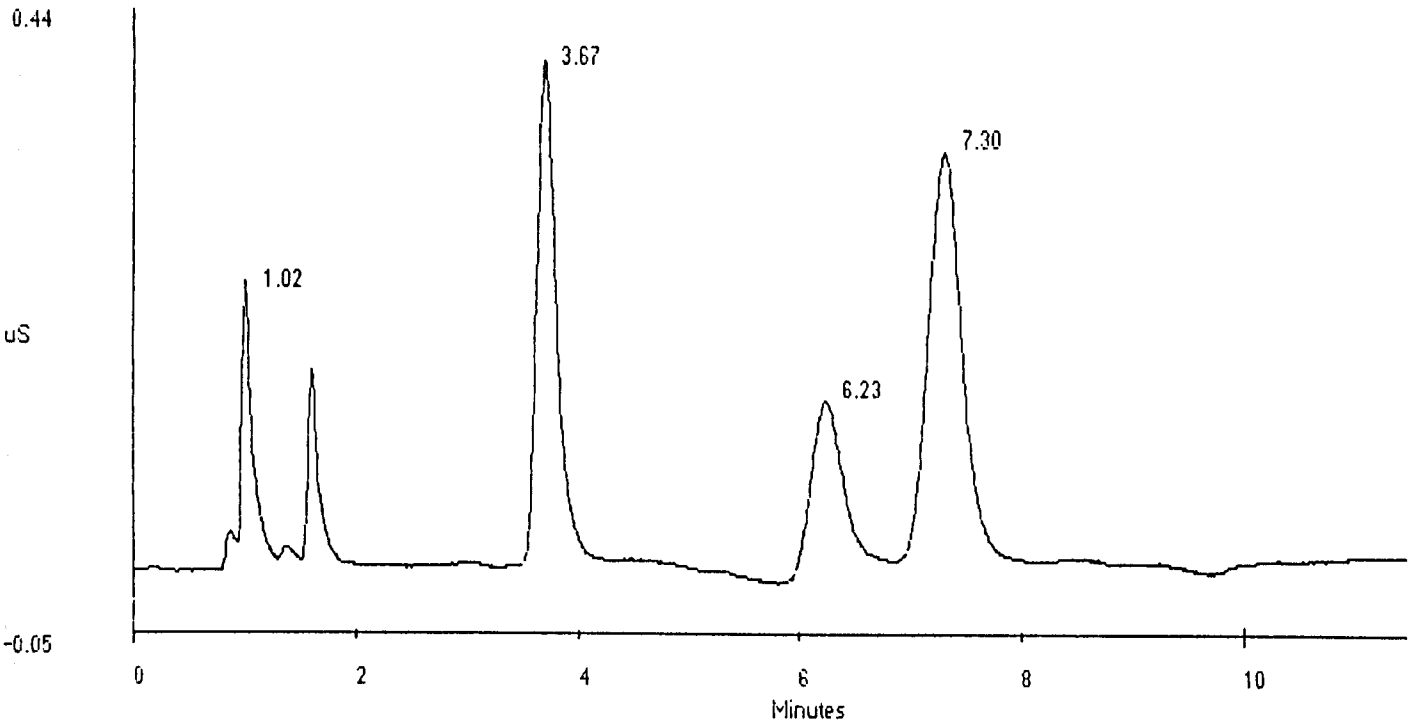


DIONEX SCHEDULE - A:\90041200.SCH

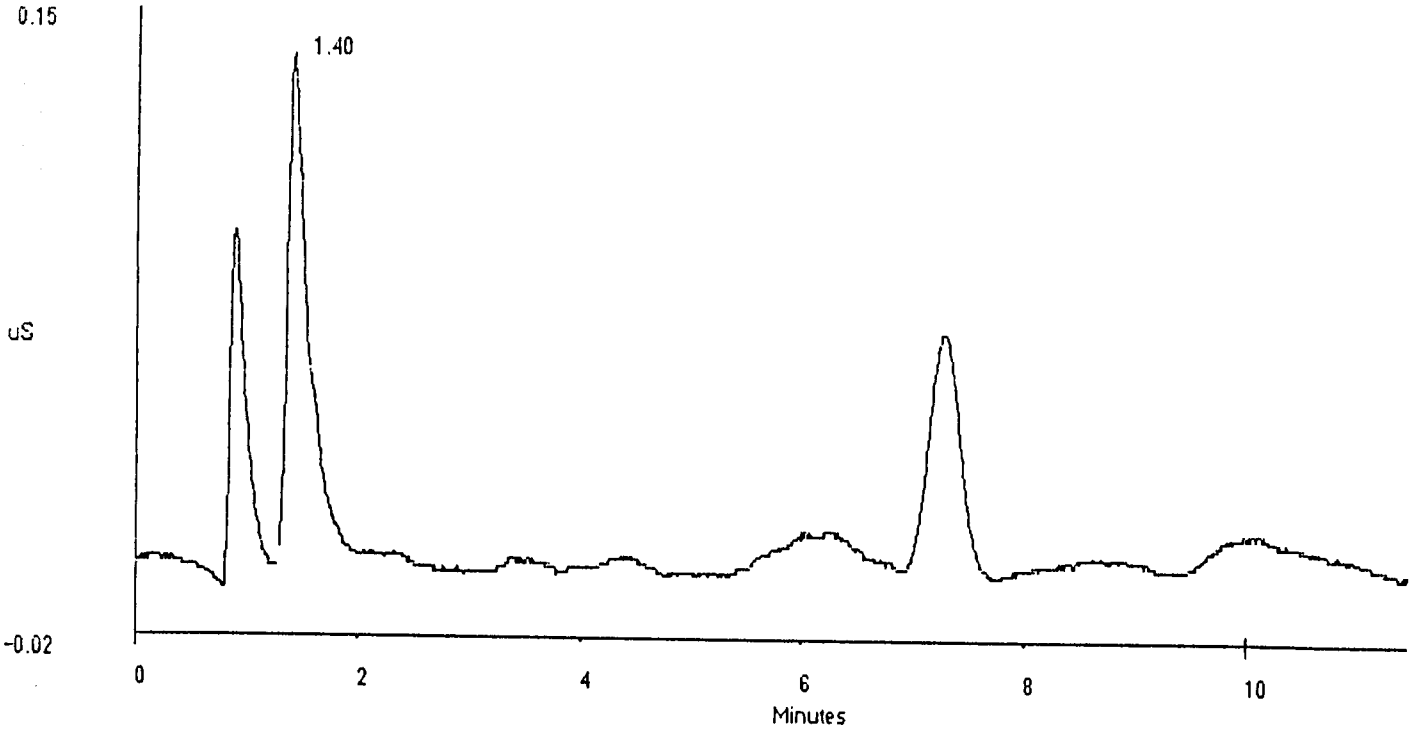
Inject	Sample Name	Method Name	Data File	Volume	Dilution	Int Std
1	SETUP	c:\windows\ai	c:\windows\ai	1	1	0
2	BLANK	c:\windows\ai	c:\windows\ai	1	1	0
3	LMCS/6C11-HO	c:\windows\ai	c:\windows\ai	1	101	0
4	438B	c:\windows\ai	c:\windows\ai	1	1	0
5	427	c:\windows\ai	c:\windows\ai	1	101	0
6	428D	c:\windows\ai	c:\windows\ai	1	101	0
7	429S	c:\windows\ai	c:\windows\ai	1	101	0
8	451	c:\windows\ai	c:\windows\ai	1	101	0
9	452D	c:\windows\ai	c:\windows\ai	1	101	0
10	475	c:\windows\ai	c:\windows\ai	1	101	0
11	476D	c:\windows\ai	c:\windows\ai	1	101	0
12	547	c:\windows\ai	c:\windows\ai	1	101	0
13	548D	c:\windows\ai	c:\windows\ai	1	101	0
14	571	c:\windows\ai	c:\windows\ai	1	101	0
15	572D	c:\windows\ai	c:\windows\ai	1	101	0
16	983	c:\windows\ai	c:\windows\ai	1	21	0
17	984D	c:\windows\ai	c:\windows\ai	1	21	0
18	LMCS/6C11-HO	c:\windows\ai	c:\windows\ai	1	101	0

```
==========================================================================
| Sample Name: SETUP                          Date: Thu Apr 12 11:09:04 1990|
| Data File   : c:\windows\ai400\data\90041200.d01                          |
| Method      : c:\windows\ai400\method\sst.met                             |
| CIM Address: 1        System : 1        Cycle#:   1       Detector: CDM   |
==========================================================================
*********************  EXTERNAL STANDARD REPORT  *************************

Start Time =  0.00 minutes              Stop time = 11.50 Minutes
Number of Data Points  =  3450           One Data Point per 0.2 seconds
Areareject = 1000
Amount Injected = 1        Dilution factor = 1
```

PEAK NUM	RET TIME	PEAK NAME	CONC. in ug/ml	AREA	HEIGHT	BL	REF PEAK	% DELTA RET TIME
1	1.02	FLUORIDE	7.169e-002	1.081e+003	196	1	0	1.67%
2	3.67		0.000e+000	4.412e+003	376	1		
3	6.23		0.000e+000	1.859e+003	115	1		
4	7.30	SULFATE	6.889e-001	5.861e+003	301	1	0	6.57%



```
==========================================================================
| Sample Name: BLANK                                Date: Thu Apr 12 11:21:20 1990|
| Data File   : c:\windows\ai400\data\90041200.d02                          |
| Method      : c:\windows\ai400\method\sst.met                             |
| CIM Address: 1        System : 1        Cycle#:    2       Detector: CDM  |
==========================================================================
*********************** EXTERNAL STANDARD REPORT ***************************

Start Time =  0.00 minutes                Stop time = 11.50 Minutes
Number of Data Points  =  3450             One Data Point per 0.2 seconds
Areareject = 1000
Amount Injected = 1        Dilution factor = 1

PEAK RET    PEAK                CONC. in                                REF   % DELTA
NUM  TIME   NAME                ug/ml          AREA      HEIGHT BL PEAK RET TIME
--------------------------------------------------------------------------------
```

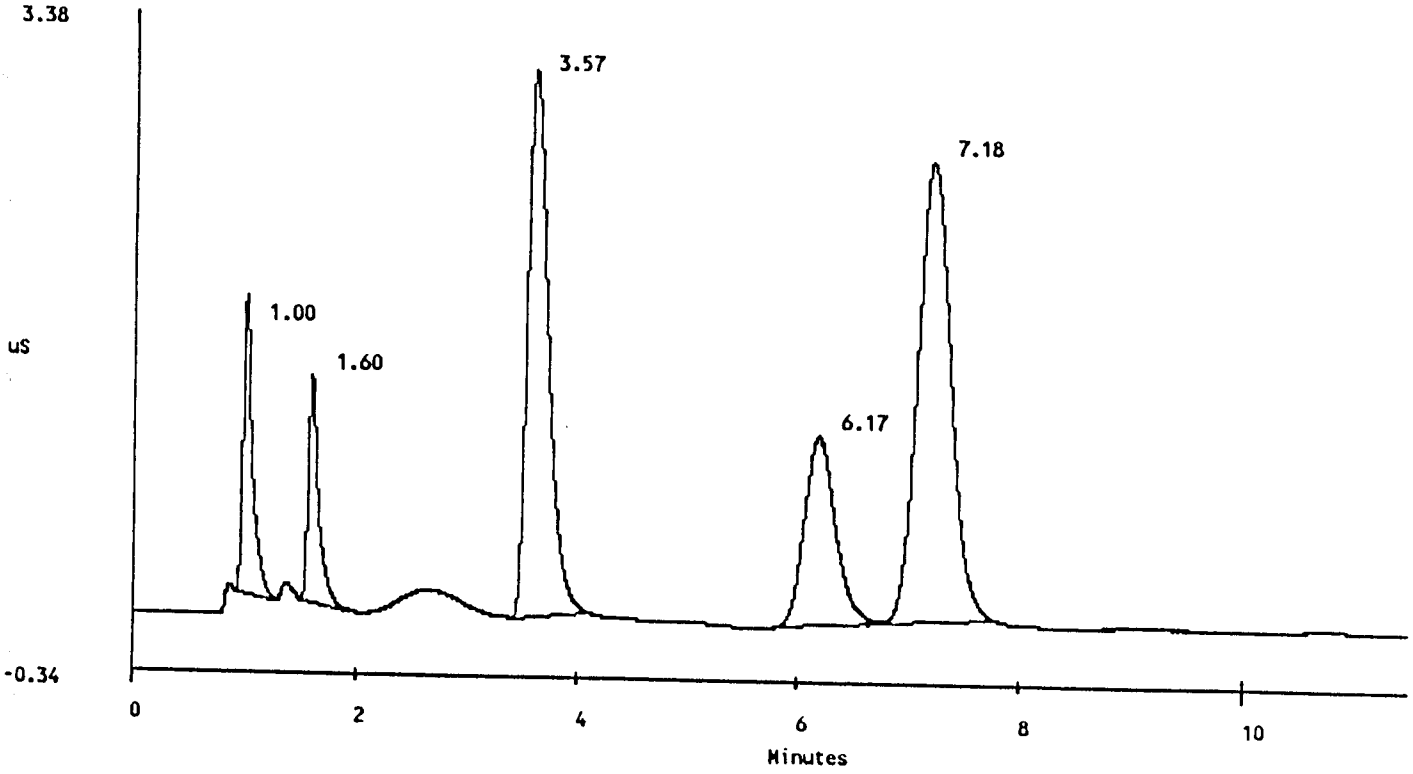


Sample Name: LMCS/6C11-HO F 0420 Date: Thu Apr 12 11:33:35 1990
Data File : 90041200.D03
Method : c:\windows\ai400\method\sst.met
CIM Address: 1 System : 1 Cycle#: 3 Detector: CDM

********** EXTERNAL STANDARD REPORT **********

Start Time = 0.00 minutes Stop time = 11.50 Minutes
Number of Data Points = 3451 One Data Point per 0.2 seconds
Areareject = 1000
Amount Injected = 1 Dilution factor = 101

PEAK NUM	RET TIME	PEAK NAME	CONC. in ug/ml	AREA	HEIGHT	BL	REF PEAK	% DELTA RET TIME
1	1.00	FLUORIDE	5.450e+001	9.780e+003	1489	1	0	0.00%
2	1.60	CHLORIDE	7.288e+001	7.890e+003	1258	1	0	0.00%
3	3.57	NITRATE	5.993e+002	3.943e+004	3009	1	0	5.42%
4	6.17	PHOSPHATE	5.816e+002	2.084e+004	1060	2	0	6.32%
5	7.18	SULFATE	5.781e+002	5.320e+004	2564	2	0	4.87%

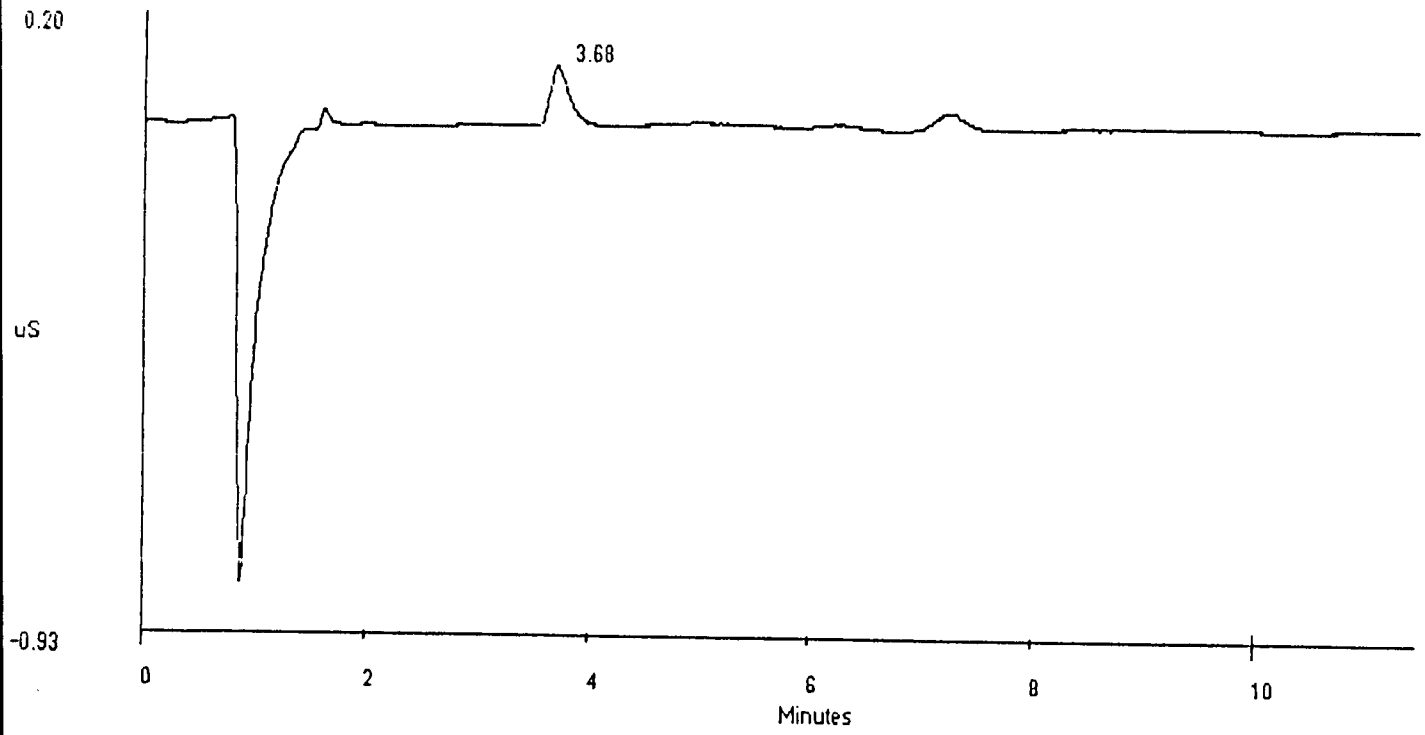


```
Sample Name: 438B                                   Date: Thu Apr 12 11:45:50 1990
Data File   : c:\windows\ai400\data\90041200.d04
Method      : c:\windows\ai400\method\sst.met
CIM Address: 1        System : 1        Cycle#:   4        Detector: CDM
```

********** EXTERNAL STANDARD REPORT **********

Start Time = 0.00 minutes Stop time = 11.50 Minutes
Number of Data Points = 3450 One Data Point per 0.2 seconds
Areareject = 1000
Amount Injected = 1 Dilution factor = 1

PEAK NUM	RET TIME	PEAK NAME	CONC. in ug/ml	AREA	HEIGHT	BL	REF PEAK	% DELTA RET TIME

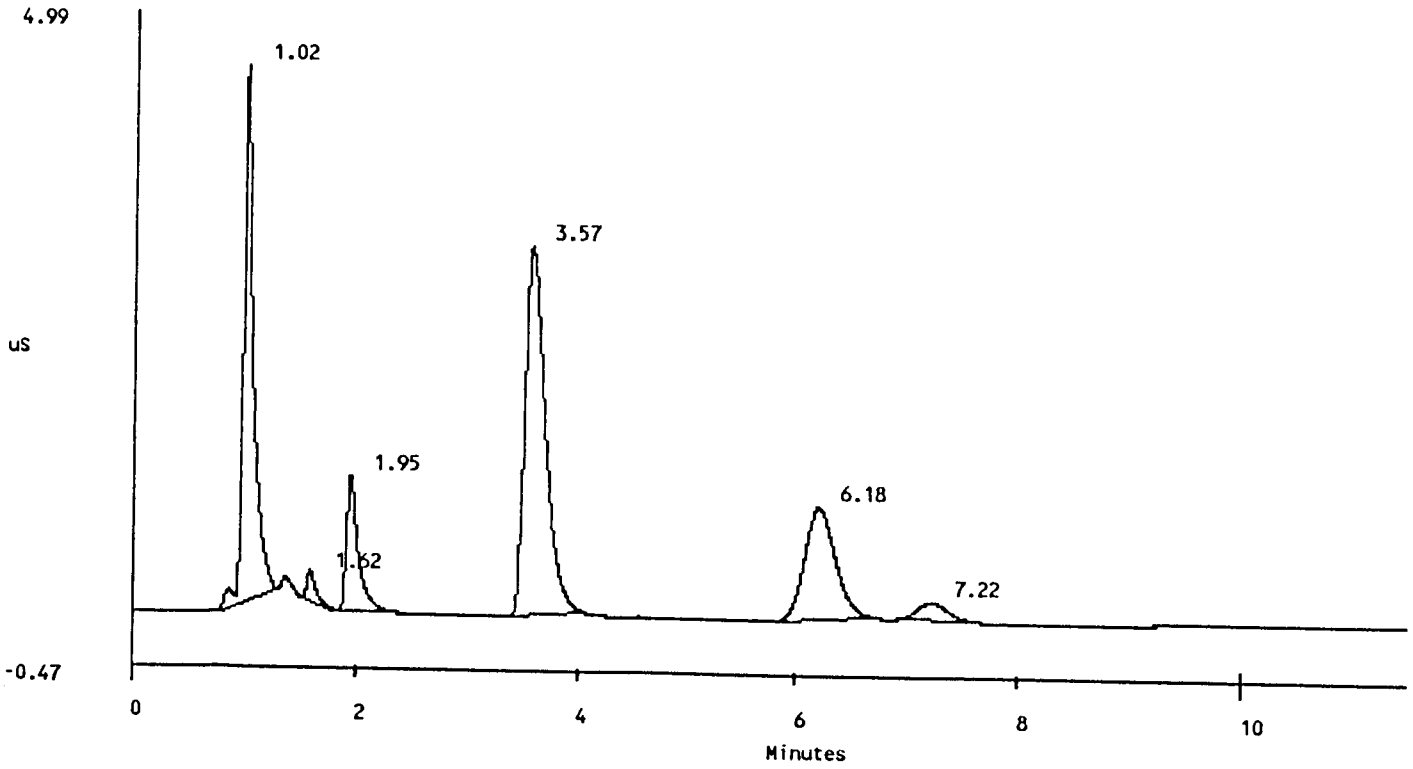


Sample Name: 451
Data File : 90041200.D08
Method : c:\windows\ai400\method\sst.met
CIM Address: 1 System : 1 Cycle#: 8 Detector: CDM
Date: Thu Apr 12 12:34:52 1990

********** EXTERNAL STANDARD REPORT **********

Start Time = 0.00 minutes
Stop time = 11.50 Minutes
Number of Data Points = 3450
One Data Point per 0.2 seconds
Arearject = 1000
Amount Injected = 1
Dilution factor = 101

PEAK NUM	RET TIME	PEAK NAME	CONC. in ug/ml	AREA	HEIGHT	BL	REF PEAK	% DELTA RET TIME
1	1.02	FLUORIDE	1.579e+002	2.741e+004	4460	1	0	1.67%
2	1.62	CHLORIDE	1.079e+001	1.355e+003	230	1	0	1.04%
3	1.95	NITRITE	1.100e+002	7.906e+003	1115	1	0	0.00%
4	3.57	NITRATE	6.103e+002	3.943e+004	3062	1	0	5.42%
5	6.18	PHOSPHATE	5.100e+002	1.773e+004	924	1	0	6.61%
6	7.22	SULFATE	3.194e+001	2.474e+003	136	1	0	5.35%

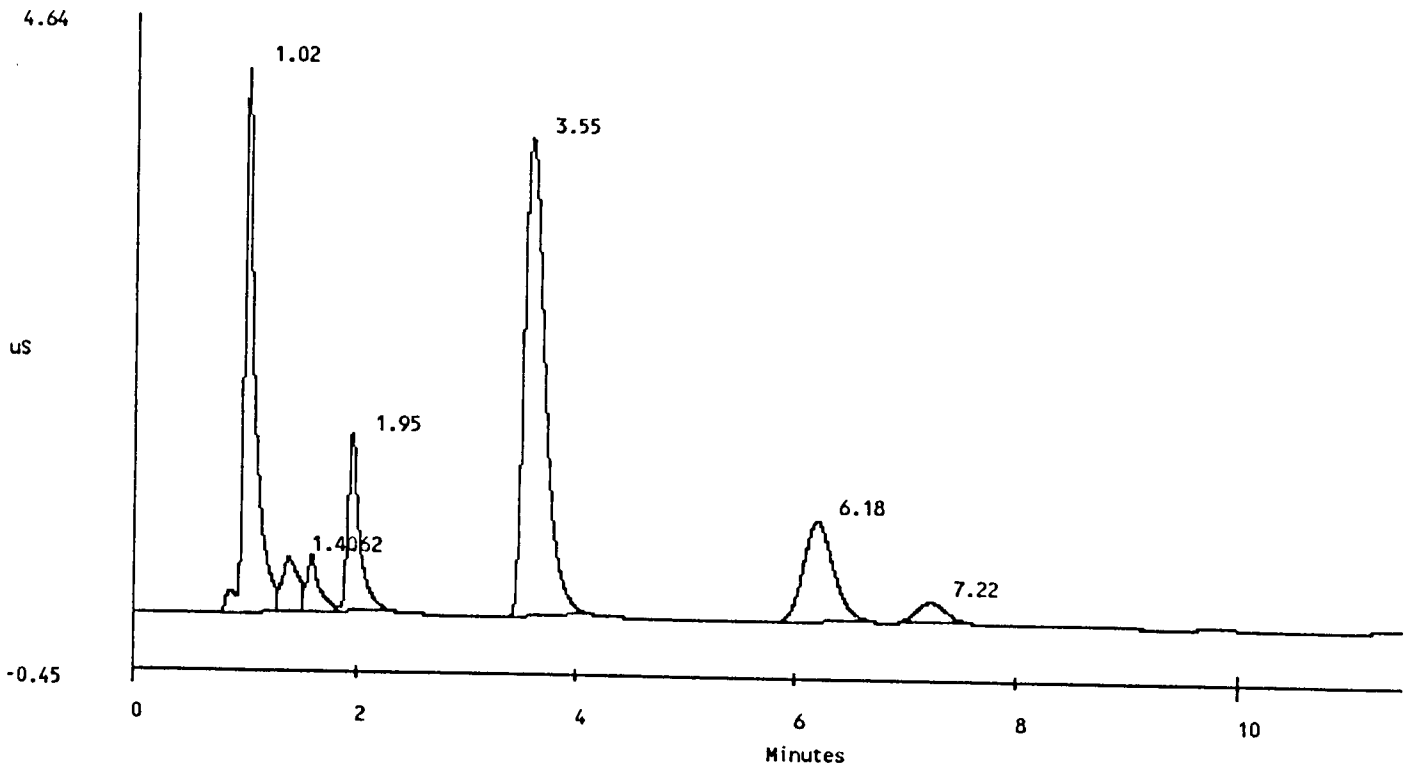


Sample Name: 452D
Data File : 90041200.D09
Method : c:\windows\ai400\method\sst.met
CIM Address: 1 System : 1 Cycle#: 9 Detector: CDM
Date: Thu Apr 12 12:47:08 1990

********** EXTERNAL STANDARD REPORT **********

Start Time = 0.00 minutes
Stop time = 11.50 Minutes
Number of Data Points = 3451
One Data Point per 0.2 seconds
Arearject = 1000
Amount Injected = 1
Dilution factor = 101

PEAK NUM	RET TIME	PEAK NAME	CONC. in ug/ml	AREA	HEIGHT	BL	REF PEAK	% DELTA RET TIME
1	1.02	FLUORIDE	1.499e+002	2.959e+004	4222	3	0	1.67%
2	1.40		0.000e+000	3.432e+003	374	4		
3	1.62	CHLORIDE	2.230e+001	3.190e+003	417	4	0	1.04%
4	1.95	NITRITE	1.279e+002	9.992e+003	1355	2	0	0.00%
5	3.55	NITRATE	7.415e+002	4.822e+004	3691	1	0	4.93%
6	6.18	PHOSPHATE	4.354e+002	1.492e+004	783	1	0	6.61%
7	7.22	SULFATE	3.624e+001	2.747e+003	155	1	0	5.35%

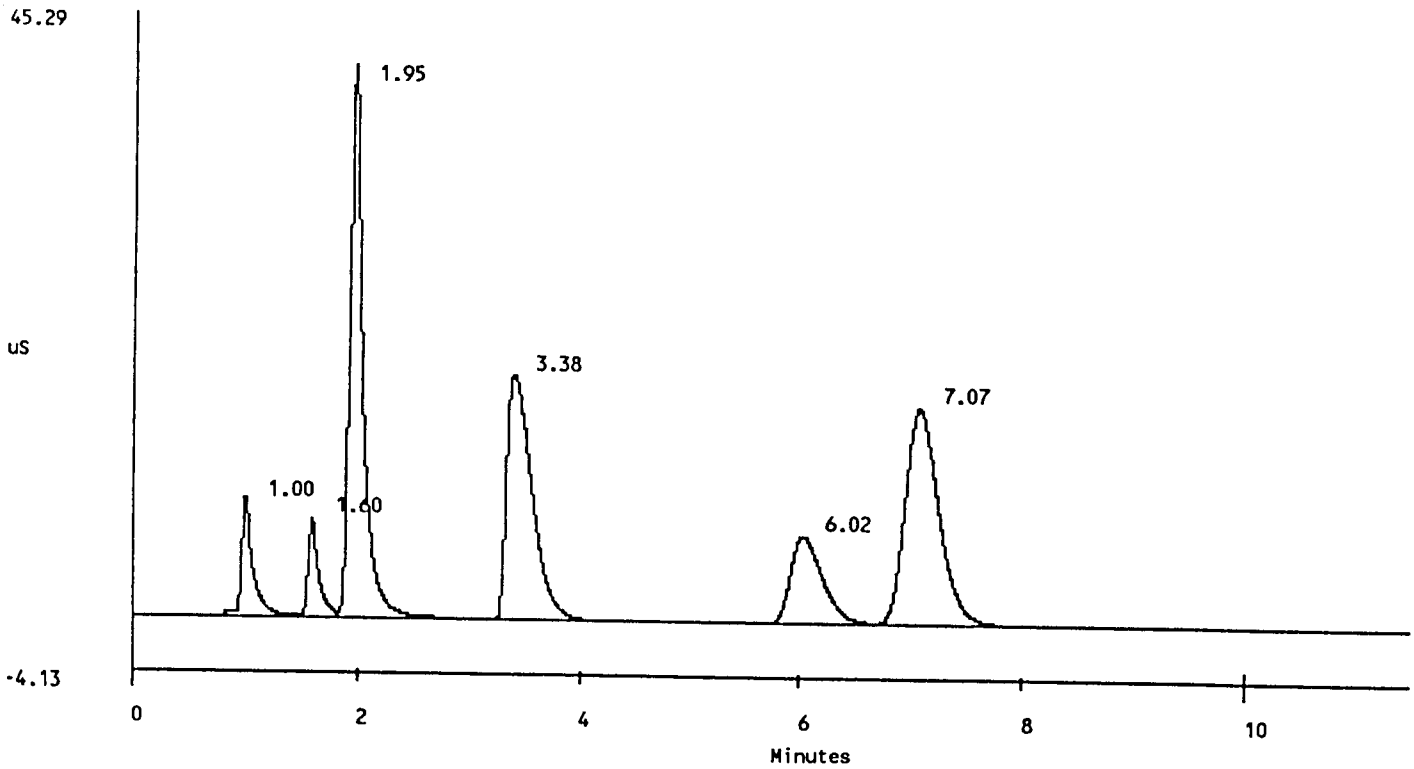


Sample Name: 429S
Date: Thu Apr 12 12:22:35 1990
Data File : 90041200.D07
Method : c:\windows\ai400\method\sst.met
CIM Address: 1 System : 1 Cycle#: 7 Detector: CDM

********** EXTERNAL STANDARD REPORT **********

Start Time = 0.00 minutes
Stop time = 11.50 Minutes
Number of Data Points = 3450
One Data Point per 0.2 seconds
Areareject = 1000
Amount Injected = 1
Dilution factor = 101

PEAK NUM	RET TIME	PEAK NAME	CONC. in ug/ml	AREA	HEIGHT	BL	REF PEAK	% DELTA RET TIME
1	1.00	FLUORIDE	2.921e+002	6.771e+004	8669	2	0	0.00%
2	1.60	CHLORIDE	3.943e+002	4.826e+004	7505	2	0	0.00%
3	1.95	NITRITE	3.480e+003	3.366e+005	39647	2	0	0.00%
4	3.38	NITRATE	3.747e+003	2.932e+005	18071	1	0	0.00%
5	6.02	PHOSPHATE	3.360e+003	1.356e+005	6632	2	0	3.74%
6	7.07	SULFATE	3.335e+003	3.435e+005	16122	2	0	3.16%



Analytical Batch

LAB SEGMENT SERIAL #:F0441

CUSTOMER ID:89-071

INSTRUMENT	WB39937
PROCEDURE/REV	LA-344-105/A-1
TECHNOLOGIST	E. Colvin
DATE	March 27, 1990
TEMPERATURE	NA
STARTING TIME	1230
ENDING TIME	1430
CHEMIST	R. E. Brandt

Total Organic Carbon from water digestion

	DESCRIPTION	LAB ID
1	Initial LMCS Check Std.	F0450
2	Reagent Blank	F0462
3	Sample 89-071	F0451
4	Duplicate Sample 89-071	F0452
5	Spike of Sample 89-071	F0453
6	Final LMCS Check Std	F0454
7		
8		
9		
10		
11		

	DESCRIPTION	LAB ID
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		

STANDARD TYPE	PRIMARY BOOK # & ALIQUOT VOL.	SECOND BOOK # & ALIQUOT VOL.	THIRD BK# & ALQT.VOL.	FINAL VOL. OF STD.
LMCS Check Std.	70C11C/200ul			2.20ml
Spike	8DC11/200ul	F0451/200ul		.50ml

SST-102 Rev. F 9/7/90 Interim

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: F-450 Date: 03-27-1990 Time: 11:14:29

Blank = .4281608 Sample Size = 200 Dilution Factor = 11
% Difference = 10 Min Readings = 7 Max Readings = 7

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	1.01	0.80	%-6650.00
2	2.01	35.00	97.71
3	3.01	45.70	23.41
4	4.01	50.40	9.33
5	5.01	52.90	4.73
6	6.01	54.40	2.76
7	7.01	55.20	1.45

(55.2 - 2.999974)(11)/(200) = 2.871002 g/L Carbon

(55.2 - 2.999974)(11)/(200)(12) = .2392502 Molar Carbon

Sample Run By: 80028_____

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: F-462 Date: 03-27-1990 Time: 10:58:37

Blank = N/A Sample Size = 200 Dilution Factor = 1
% Difference = 10 Min Readings = 7 Max Readings = 7

== Reading ====	Analysis Time ====	Coulometer ====	% Difference ==
1	1.01	0.00	0.00
2	2.01	1.00	100.00
3	3.01	1.40	28.57
4	4.01	1.80	22.22
5	5.01	2.20	18.18
6	6.01	2.60	15.38
7	7.01	3.00	13.33

BLANK VALUE = 3 / 7.006714 = .4281608 ug/minute X7 =

Sample Run By: 80028_____

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: F-451 Date: 03-27-1990 Time: 12:35:46

Blank = .4281608 Sample Size = 200 Dilution Factor = 1.1
% Difference = 10 Min Readings = 7 Max Readings = 7

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	1.01	0.00	0.00
2	2.01	1.80	100.00
3	3.01	2.60	30.77
4	4.01	3.00	13.33
5	5.01	3.50	14.29
6	6.01	3.90	10.26
7	7.01	4.30	9.30

(4.3 - 2.999974)(1.1)/(200) = 7.150144E-03 g/L Carbon

(4.3 - 2.999974)(1.1)/(200)(12) = 5.958454E-04 Molar Carbon

Sample Run By: 80028_____

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: F-452 Date: 03-27-1990 Time: 12:43:53

Blank = .4281608 Sample Size = 200 Dilution Factor = 1.1
% Difference = 10 Min Readings = 7 Max Readings = 7

Reading	Analysis Time	Coulometer	% Difference
1	1.01	0.00	0.00
2	2.01	1.60	100.00
3	3.01	2.30	30.43
4	4.01	2.90	20.69
5	5.01	3.40	14.71
6	6.01	3.80	10.53
7	7.01	4.30	11.63

(4.3 - 2.999608)(1.1)/(200) = 7.152157E-03 g/L Carbon

(4.3 - 2.999608)(1.1)/(200)(12) = 5.960131E-04 Molar Carbon

Sample Run By: 80028_____

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: F-453 Date: 03-27-1990 Time: 12:52:18

Blank = .4281608 Sample Size = 200 Dilution Factor = 1.1
% Difference = 10 Min Readings = 7 Max Readings = 7

== Reading ====	Analysis Time ====	Coulometer ====	% Difference ==
1	1.01	0.00	0.00
2	2.01	78.50	100.00
3	3.01	102.80	23.64
4	4.01	113.40	9.35
5	5.01	117.80	3.74
6	6.01	120.20	2.00
7	7.01	121.60	1.15

(121.6 - 2.999556)(1.1)/(200) = .6523024 g/L Carbon

(121.6 - 2.999556)(1.1)/(200)(12) = 5.435854E-02 Molar Carbon

Sample Run By: 80028_____

COULOMETER ANALYSIS REPORT
TICTOC Rev. 0

Sample: F-454 Date: 03-27-1990 Time: 13:01:17

Blank = .4281608 Sample Size = 200 Dilution Factor = 11
% Difference = 10 Min Readings = 7 Max Readings = 7

== Reading	==== Analysis Time	==== Coulometer	==== % Difference ==
1	1.01	0.00	0.00
2	2.01	36.50	100.00
3	3.01	47.60	23.32
4	4.01	52.20	8.81
5	5.01	54.50	4.22
6	6.01	55.80	2.33
7	7.01	56.50	1.24

(56.5 - 2.999608)(11)/(200) = 2.942522 g/L Carbon

(56.5 - 2.999608)(11)/(200)(12) = .2452102 Molar Carbon

Sample Run By: 80028_____

ACID DIGESTION TEST ANALYSIS

ICP Results Data Summary

Date Analyzed:	April 2, 1990	Acid Digested LMCS Standard	F0455
Procedure:	LA-505-151/A-0	Reagent Blank	F0463
Analyst:	J. A. White	Sample 89-071	F0456
Digestion	Acid Digestion	Duplicate of 89-071	F0457
Procedure:	LA-505-159/A-0	Spike of 89-071	F0458
		Acid Digested LMCS Standard	F0459

	Instrument Starting LMCS Standard %	Acid Digest. LMCS Standard %	Reagent BLANK ppm	Wet Weight Sample ug/g	Wet Weight Sample Duplicate ug/g	Spike Recovery %	LMCS ACID Digestion %	Closing LMCS Standard %
Aluminum	105.18%		0.00 LT	41643	49481	NOT CALC.	97.82%	100.45%
Antimony	100.57%		0.10 LT	-106 LT	204 LT			99.68%
Arsenic	103.92%		0.00 LT	-45 LT	-13 LT			100.90%
Barium	97.72%		0.00 LT	-8 LT	1 LT	NOT CALC.	91.60%	97.13%
Beryllium	100.25%		0.00	0 LT	1 LT			97.02%
Bismuth	107.11%	95.88%	0.11 LT	37353	41129	NOT CALC.		99.70%
Boron	100.86%	91.21%	0.13	802	15 LT	5.27%		98.96%
Cadmium	108.57%	96.78%	0.00 LT	-18 LT	-11 LT	NOT CALC.		101.77%
Calcium	102.01%	97.18%	0.13	483	447	96.33%		100.73%
Chromium	102.82%		0.01	917	924	63.04%	98.09%	100.41%
Copper	100.24%	93.82%	0.00 LT	-6 LT	17 LT	NOT CALC.		99.59%
Europium	102.32%		0.00 LT	-16 LT	-10 LT			102.33%
Iron	104.27%		0.06	21823	22935	NOT CALC.	99.86%	100.78%
Lanthanum	96.75%	88.45%	-0.01 LT	-66 LT	-25 LT	NOT CALC.		93.53%
Lead	107.15%	92.75%	-0.07 LT	226	403	69.76%		96.13%
Lithium	97.09%	95.20%	-0.01 LT	-44 LT	-34 LT	NOT CALC.	90.53%	97.72%
Magnesium	105.23%		0.02	287	570	111.38%		99.98%
Manganese	105.41%		0.00	927	973	88.30%	100.68%	102.24%
Mercury	104.68%		0.02	550	936			101.34%
Molybdenum	103.95%	96.48%	0.00 LT	-9 LT	7 LT	NOT CALC.		98.10%
Nickel	107.18%		0.01 LT	13 LT	38 LT	95.90%	101.42%	101.54%
Potassium	100.13%	85.56%	-0.22 LT	-1499 LT	-1105 LT	NOT CALC.		96.96%
Samarium	103.23%		-0.13 LT	-984 LT	-629 LT			98.76%
Selenium	100.53%		-0.04 LT	75 LT	284			93.03%
Silver	107.85%		0.01 LT	-68 LT	-44 LT	NOT CALC.		103.99%
Sodium	97.11%	90.33%	0.11	119306	106345	NOT CALC.		95.04%
Strontium	99.49%	93.37%	0.00 LT	234	232	88.72%		98.47%
Sulfur	106.85%		0.04	644	723			101.94%
Tantalum	97.64%		-0.02 LT	-145 LT	-69 LT	NOT CALC.	81.37%	91.95%
Thallium	104.11%		0.05 LT	-797 LT	-294 LT			101.47%
Thorium	105.99%		-0.04 LT	-607 LT	-346 LT			102.12%
Tin	104.51%		0.03	-14 LT	24 LT	NOT CALC.	98.76%	97.42%
Titanium	102.05%		0.06	-19 LT	-5 LT	NOT CALC.	94.54%	98.68%
Uranium	107.78%		-0.89 LT	-4018 LT	-1601 LT			100.25%
Vanadium	103.22%		0.00 LT	-28 LT	-11 LT			100.33%
Zinc	105.27%	93.87%	0.03	262	154	83.61%		100.51%
Zirconium	102.45%		-0.02 LT	-37 LT	23 LT	NOT CALC.	96.92%	99.66%

LT: Less Than
NC: Not Calibrated
NOT CALC: Not Calculated
Instrument Standards Outside Control Limits

Analytical Batch

LAB SEGMENT SERIAL #:F0441

CUSTOMER ID:89-071

INSTRUMENT	N/A
PROCEDURE/REV	LA-505-159/A-0
TECHNOLOGIST	J. Worrell
DATE	March 05, 1990
TEMPERATURE	20 C
STARTING TIME	0800
ENDING TIME	1515
CHEMIST	S. A. Jones

Acid Digestion

	DESCRIPTION	LAB ID
1	Reagent Blank	F0463
2	Sample 89-071	F0456
3	Duplicate Sample 89-071	F0457
4	Spike of sample 89-071	F0458
5		
6		
7		
8		
9		
10		
11		

	DESCRIPTION	LAB ID
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		

STANDARD TYPE	PRIMARY BOOK # & ALIQUOT VOL.	SECOND BOOK # & ALIQUOT VOL.	THIRD BK# & ALQT.VOL.	FINAL VOL. OF STD.
No LMCS Std.				
Spike	103C15-D/5ml	104C15-B/5ml		

SST-102 Rev. F 9/7/90 Interim

ICP Results Raw Data Summary

Date Analyzed:	April 2, 1990	Acid Digested LMCS Standard	F0455
Procedure:	LA-505-151/A-0	Reagent Blank	F0463
Analyst:	J. A. White	Sample 89-071	F0456
Digestion	Acid Digestion	Duplicate of 89-071	F0457
Procedure:	LA-505-159/A-0	Spike of 89-071	F0458
		Acid Digested LMCS Standard	F0459

	Instrument Starting LMCS Standard %	Acid Digest. LMCS Standard %	Reagent BLANK ppm	Wet Weight Sample ug/g	Wet Weight Sample Duplicate ug/g	Spike Recovery %	LMCS ACID Digestion %	Closing LMCS Standard %
Aluminum	105.18%		0.00 LT	41643	49481	NOT CALC.	97.82%	100.45%
Antimony	100.57%		0.10 LT	-106 LT	204 LT			99.68%
Arsenic	103.92%		0.00 LT	-45 LT	-13 LT			100.90%
Barium	97.72%		0.00 LT	-8 LT	1 LT	NOT CALC.	91.60%	97.13%
Beryllium	100.25%		0.00	0 LT	1 LT			97.02%
Bismuth	107.11%	95.88%	0.11 LT	37353	41129	NOT CALC.		99.70%
Boron	100.86%	91.21%	0.13	802	15 LT	5.27%		98.96%
Cadmium	108.57%	96.78%	0.00 LT	-18 LT	-11 LT	NOT CALC.		101.77%
Calcium	102.01%	97.18%	0.13	483	447	96.33%		100.73%
Cerium	92.53%		-0.14 LT	-722 LT	-338 LT	NOT CALC.	83.20%	86.13% #
Chromium	102.82%		0.01	917	924	63.04%	98.09%	100.41%
Cobalt	107.52%		-0.01 LT	-192 LT	-92 LT	NOT CALC.	83.50%	81.79% #
Copper	100.24%	93.82%	0.00 LT	-6 LT	17 LT	NOT CALC.		99.59%
Europium	102.32%		0.00 LT	-16 LT	-10 LT			102.33%
Iron	104.27%		0.06	21823	22935	NOT CALC.	99.86%	100.78%
Lanthanum	96.75%	88.45%	-0.01 LT	-66 LT	-25 LT	NOT CALC.		93.53%
Lead	107.15%	92.75%	-0.07 LT	226	403	69.76%		96.13%
Lithium	97.09%	95.20%	-0.01 LT	-44 LT	-34 LT	NOT CALC.	90.53%	97.72%
Magnesium	105.23%		0.02	287	570	111.38%		99.98%
Manganese	105.41%		0.00	927	973	88.30%	100.68%	102.24%
Mercury	104.68%		0.02	550	936			101.34%
Molybdenum	103.95%	96.48%	0.00 LT	-9 LT	7 LT	NOT CALC.		98.10%
Neodymium	0.00% #		-0.08 LT	-793 LT	-502 LT	NOT CALC.	104.11%	111.12% #
Nickel	107.18%		0.01 LT	13 LT	38 LT	95.90%	101.42%	101.54%
Phosphorous	122.43% #	110.54%	0.19	29899	18849	NOT CALC.		122.46% #
Potassium	100.13%	85.56%	-0.22 LT	-1499 LT	-1105 LT	NOT CALC.		96.96%
Samarium	103.23%		-0.13 LT	-984 LT	-629 LT			98.76%
Selenium	100.53%		-0.04 LT	75 LT	284			93.03%
Silicon	85.37% #	52.40%	0.19	1996	3021	63.51%		81.13% #
Silver	107.85%		0.01 LT	-68 LT	-44 LT	NOT CALC.		103.99%
Sodium	97.11%	90.33%	0.11	119306	106345	NOT CALC.		95.04%
Strontium	99.49%	93.37%	0.00 LT	234	232	88.72%		98.47%
Sulfur	106.85%		0.04	644	723			101.94%
Tantalum	97.64%		-0.02 LT	-145 LT	-69 LT	NOT CALC.	81.37%	91.95%
Thallium	104.11%		0.05 LT	-797 LT	-294 LT			101.47%
Thorium	105.99%		-0.04 LT	-607 LT	-346 LT			102.12%
Tin	104.51%		0.03	-14 LT	24 LT	NOT CALC.	98.76%	97.42%
Titanium	102.05%		0.06	-19 LT	-5 LT	NOT CALC.	94.54%	98.68%
Tungsten	88.27% #		-0.01 LT	-45 LT	23 LT			87.68% #
Uranium	107.78%		-0.89 LT	-4018 LT	-1601 LT			100.25%
Vanadium	103.22%		0.00 LT	-28 LT	-11 LT			100.33%
Zinc	105.27%	93.87%	0.03	262	154	83.61%		100.51%
Zirconium	102.45%		-0.02 LT	-37 LT	23 LT	NOT CALC.	96.92%	99.66%

LT: Less Than
NC: Not Calibrated
NOT CALC: Not Calculated
Instrument Standards Outside Control Limits

Analytical Batch

Lab Segment Serial #: F0441

Customer ID: 89-071

Instrument	WB39939
Procedure/Rev	LA-505-151/A-0
Technologist	J. A. White
Date	April 02, 1990
Temperature	N/A
Starting Time	0705
Ending Time	1250
Chemist	S. A. Jones

ICP Analysis

Acid Digestion

No inter-element corrections were performed on this data.

	Description	Lab ID
1	Initial LMCS Check Std	N/A
2	Digested Std	F0455
3	Reagent Blank	F0463
4	Sample 89-071	F0456
5	Duplicate Sample 89-071	F0457
6	Spike Sample 89-071	F0458
7	Digested Std	F0459
8	Final LMCS Check Std	N/A
9		
10		
11		

	Description	Lab ID
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		

Standard Type	Primary Book # & Aliquot Vol.	Second Book # & Aliquot Vol.	Third Book # & Aliquot Vol.	Final Vol. of Std.
LMCS Check Std	78C11D/3.0 mL	82B38B/3.0 mL	77C11D/3.0 mL	3.0 mL
Spike	103C15C/5.0 mL	104C15D/5.0 mL	F0458/.5239 g	50.0 mL
Digested Std	81C11A/5.0 mL	82C11A/5.0 mL		50.0 mL

SST-102 Rev. I 10/2/90 Interim

Date Analyzed:	April 2, 1990	Acid Digested LMCS Standard	F0455
Procedure:	LA-505-151/A-0	Reagent Blank	F0463
Analyst:	J. A. White	Sample 89-071	F0456
Digestion	Acid Digestion	Duplicate of 89-071	F0457
Procedure:	LA-505-159/A-0	Spike of 89-071	F0458
		Acid Digested LMCS Standard	F0459

Grams/mL

	SST-1	SST-2	SST-3	Starting LMCS Standard Instrument Standard ppm	Recovery %		LMCS Acid Digestion Standard ppm	Acid Digestion Standard Recovery %	Reagent Blank ppm	Digestion Weight Volume Sample Dilution Three ppm
Aluminum				52.59	105.18%				0.00 LT	
Antimony	10.06				100.57%				0.10 LT	
Arsenic				51.96	103.92%				0.00 LT	
Barium	9.77				97.72%				0.00 LT	
Beryllium				10.03	100.25%				0.00	
Bismuth		53.66			107.11%		9.59	95.88%	0.11 LT	
Boron	10.09				100.86%		9.12	91.21%	0.13	
Cadmium	10.86				108.57%		9.68	96.78%	0.00 LT	
Calcium	10.20				102.01%		9.72	97.18%	0.13	
Cerium	9.25				92.53%				-0.14 LT	
Chromium	10.28				102.82%				0.01	
Cobalt	10.75				107.52%				-0.01 LT	
Copper	10.02				100.24%		9.38	93.82%	0.00 LT	
Europium		10.23			102.32%				0.00 LT	
Iron	10.43				104.27%				0.06	
Lanthanum		48.47			96.75%		8.85	88.45%	-0.01 LT	
Lead		53.68			107.15%		9.28	92.75%	-0.07 LT	
Lithium	9.71				97.09%		9.52	95.20%	-0.01 LT	
Magnesium	10.52				105.23%				0.02	
Manganese	10.54				105.41%				0.00	
Mercury				26.17	104.68%				0.02	
Molybdenum				51.98	103.95%		9.63	96.48%	0.00 LT	
Neodymium					0.00%	#			-0.08 LT	
Nickel	10.72				107.18%				0.01 LT	
Phosphorous				61.21	122.43%	#	11.05	110.54%	0.19	
Potassium	25.03				100.13%		8.56	85.56%	-0.22 LT	
Samarium		10.32			103.23%				-0.13 LT	
Selenium				50.27	100.53%				-0.04 LT	
Silicon				42.68	85.37%	#	5.24	52.40%	0.19	
Silver		10.79			107.85%		2.80		0.01 LT	
Sodium	24.28				97.11%		9.03	90.33%	0.11	
Strontium	9.95				99.49%		9.34	93.37%	0.00 LT	
Sulfur				53.42	106.85%				0.04	
Tantalum				48.82	97.64%				-0.02 LT	
Thallium				52.06	104.11%				0.05 LT	
Thorium		53.10			105.99%				-0.04 LT	
Tin	52.26				104.51%				0.03	
Titanium				51.03	102.05%				0.06	
Tungsten				22.07	88.27%	#			-0.01 LT	
Uranium		54.00			107.78%				-0.89 LT	
Vanadium				10.32	103.22%				0.00 LT	
Zinc	10.53				105.27%		9.39	93.87%	0.03	
Zirconium				51.22	102.45%				-0.02 LT	
Dilution Factor	1.00	1.00	1.00				10.00		1.00	1.00

	0.5506 g 50.00 mL Sample Dilution Two ppm	0.01101 Sample Dilution One ppm	Digestion Weight Volume Sample Duplicate Dilution Three ppm	0.5256 g 50.00 mL Sample Duplicate Dilution Two ppm	0.01051 Sample Duplicate Dilution One ppm	Digestion Weight Volume Spike of Sample Dilution Three ppm	0.5239 g 50.00 mL Spike of Sample Dilution Two ppm	Spike of Sample Dilution One ppm	Spike Recovery %
Aluminum	458.57	440.03		520.14	520.01		392.82	424.74	NOT CALC.
Antimony	15.03	-1.17 LT		8.46	2.15 LT		-1.88	6.84	
Arsenic	0.48	-0.50 LT		-0.89	-0.13 LT		-4.88	-0.33 LT	
Barium	0.10	-0.09 LT		-0.24	0.01 LT		8.09	9.28	NOT CALC.
Beryllium	0.08	0.00 LT		0.04	0.01 LT		-0.11	-0.01 LT	
Bismuth	411.33	379.23		432.35	416.70		352.99	369.09	NOT CALC.
Boron	8.83	0.84		1.95	0.16 LT		8.30	8.93	5.27%
Cadmium	-0.24	-0.19 LT		-0.67	-0.12 LT		8.38	9.39	NOT CALC.
Calcium	5.32	3.67		4.70	3.80		14.69	13.81	96.33%
Cerium	0.19	-7.95 LT		-18.34	-3.55 LT		-69.49	-10.94 LT	NOT CALC.
Chromium	10.10	9.43		9.71	9.94		15.92	18.29	63.04%
Cobalt	0.00	-2.11 LT		-2.12	-0.97 LT		-6.77	5.63	NOT CALC.
Copper	0.51	-0.06 LT		-0.52	0.18 LT		6.66	9.39	NOT CALC.
Europium	-0.07	-0.18 LT		-0.36	-0.11 LT		-1.14	-0.20 LT	
Iron	240.32	223.54		241.09	231.44		214.67	212.22	NOT CALC.
Lanthanum	0.25	-0.72 LT		-1.53	-0.26 LT		4.32	8.12	NOT CALC.
Lead	7.19	2.49		-5.39	4.24		-7.79	9.35	69.76%
Lithium	-0.55	-0.48 LT		-1.30	-0.36 LT		7.04	9.37	NOT CALC.
Magnesium	3.16	2.38		5.99	2.51		14.15	12.46	111.38%
Manganese	10.21	9.49		10.23	9.87		18.55	18.64	88.30%
Mercury	6.06	2.67		9.84	0.90		1.53	0.36	
Molybdenum	0.42	-0.10 LT		-0.07	0.07 LT		7.58	9.08	NOT CALC.
Neodymium	0.80	-8.73 LT		-17.26	-5.27 LT		-51.60	-1.03 LT	NOT CALC.
Nickel	1.35	0.14 LT		0.77	0.40 LT		8.01	9.73	95.90%
Phosphorous	329.25	284.23		198.14	177.18		241.01	242.88	NOT CALC.
Potassium	-17.12	-16.51 LT		-43.32	-11.62 LT		-100.90	-11.57 LT	NOT CALC.
Samarium	-2.34	-10.84 LT		-20.57	-6.62 LT		-71.31	-14.03 LT	
Selenium	2.93	0.82 LT		-5.28	2.98		-21.52	3.26	
Silicon	31.56	21.98		31.76	26.73		15.66	27.26	63.51%
Silver	-0.25	-0.75 LT		-1.51	-0.46 LT		1.73	5.87	NOT CALC.
Sodium	1313.80	1290.30		1117.90	1104.10		1194.10	1207.70	NOT CALC.
Strontium	2.58	2.40		2.44	2.49		11.33	11.71	88.72%
Sulfur	6.19	7.09		5.23	7.60		-0.46	6.10	
Tantalum	0.40	-1.60 LT		-2.83	-0.72 LT		-9.95	1.51	NOT CALC.
Thallium	8.03	-8.78 LT		-7.90	-3.09 LT		-72.80	-10.12 LT	
Thorium	0.50	-6.68 LT		-10.98	-3.63 LT		-44.11	-8.27 LT	
Tin	0.94	-0.16 LT		-0.16	0.25 LT		5.94	8.85	NOT CALC.
Titanium	0.20	-0.21 LT		-0.46	-0.06 LT		6.97	8.78	NOT CALC.
Tungsten	1.72	-0.50 LT		-1.59	0.24 LT		-7.10	-0.77 LT	
Uranium	0.90	-44.25 LT		-107.60	-16.83 LT		-416.60	-61.20 LT	
Vanadium	0.08	-0.31 LT		-0.47	-0.11 LT		-2.97	-0.36 LT	
Zinc	2.89	1.48		1.69	1.62		11.11	10.85	83.61%
Zirconium	0.53	-0.41 LT		-1.49	0.24 LT		-5.10	2.94	NOT CALC.
Dilution Factor	101.00	21.00	1.00	101.00	21.00	1.00	101.00	21.00	

	Standard LMCS Acid Digestion ppm	Acid Digestion Standard Recovery %	SST-1	SST-2	Ending LMCS Standard SST-3	Standard Recovery %		Spike Standard LMCS ppm added	Spike Standard ID Book # 5.0 mL 103C15C + 5.0 mL 104C15D
Aluminum	9.78	97.82%			50.22	100.45%		10.00	
Antimony			9.97			99.68%			
Arsenic					50.45	100.90%			
Barium	9.16	91.60%	9.71			97.13%		10.00	
Beryllium					9.70	97.02%			
Bismuth				49.95		99.70%		10.00	
Boron			9.90			98.96%		10.00	
Cadmium			10.18			101.77%		10.00	
Calcium			10.07			100.73%		10.00	
Cerium	8.32	83.20%	8.61			86.13%	#	10.00	
Chromium	9.90	98.09%	10.04			100.41%		10.00	
Cobalt	8.35	83.50%	8.18			81.79%	#	10.00	
Copper			9.96			99.59%		10.00	
Europium				10.23		102.33%			
Iron	9.99	99.86%	10.08			100.78%		10.00	
Lanthanum				46.86		93.53%		10.00	
Lead				48.16		96.13%		10.00	
Lithium	9.05	90.53%	9.77			97.72%		10.00	
Magnesium			10.00			99.98%		10.00	
Manganese	10.07	100.68%	10.22			102.24%		10.00	
Mercury					25.34	101.34%			
Molybdenum					49.05	98.10%		10.00	
Neodymium	10.41	104.11%	11.11			111.12%	#	10.00	
Nickel	10.14	101.42%	10.15			101.54%		10.00	
Phosphorous					61.23	122.46%	#	10.00	
Potassium			24.24			96.96%		10.00	
Samarium				9.88		98.76%			
Selenium	3.85				46.52	93.03%			
Silicon					40.57	81.13%	#	10.00	
Silver				10.40		103.99%		10.00	
Sodium			23.76			95.04%		10.00	
Strontium			9.85			98.47%		10.00	
Sulfur					50.97	101.94%			
Tantalum	8.10	81.37%			45.98	91.95%		9.95	
Thallium					50.74	101.47%			
Thorium				51.16		102.12%			
Tin	9.88	98.76%	48.71			97.42%		10.00	
Titanium	9.46	94.54%			49.34	98.68%		10.00	
Tungsten					21.92	87.68%	#		
Uranium	5.51			50.22		100.25%			
Vanadium					10.03	100.33%			
Zinc			10.05			100.51%		10.00	
Zirconium	9.67	96.92%			49.83	99.66%		9.98	
Dilution Factor	10.00		1.00	1.00	1.00				

	SST-1	SST-2	LMCS Standards Values ppm SST-3	LMCS Standard IDs Book # 78C11D 82B38B 77C11D	ACID DIGESTION LMCS STANDARD VALUES ppm in Sample	ACID DIGEST. LMCS IDs Book # 81C11A 82C11A
Aluminum			50.00		100.00	
Antimony	10.00					
Arsenic			50.00			
Barium	10.00				100.00	
Beryllium			10.00			
Bismuth		50.10			100.00	
Boron	10.00				100.00	
Cadmium	10.00				100.00	
Calcium	10.00				100.00	
Cerium	10.00				100.00	
Chromium	10.00				100.90	
Cobalt	10.00				100.00	
Copper	10.00				100.00	
Europium		10.00				
Iron	10.00				100.00	
Lanthanum		50.10			100.00	
Lead		50.10			100.00	
Lithium	10.00				100.00	
Magnesium	10.00				100.00	
Manganese	10.00				100.00	
Mercury			25.00			
Molybdenum			50.00		99.80	
Neodymium	10.00				100.00	
Nickel	10.00				100.00	
Phosphorous			50.00		100.00	
Potassium	25.00				100.00	
Samarium		10.00				
Selenium			50.00			
Silicon			50.00		100.00	
Silver		10.00				
Sodium	25.00				100.00	
Strontium	10.00				100.00	
Sulfur			50.00			
Tantalum			50.00		99.50	
Thallium			50.00			
Thorium		50.10				
Tin	50.00				100.00	
Titanium			50.00		100.10	
Tungsten			25.00			
Uranium		50.10				
Vanadium			10.00			
Zinc	10.00				100.00	
Zirconium			50.00		99.80	
Dilution Factor					10.00	

ICP Calibration Report

Procedure:	LA-505-151	Revision: A-0	
Instrument:	WB39939		
Technologist:	J. A. White		
Date:	April 2, 1990	Time: 07:08	

Calibration Standards for ICP Program "SST"

Element	Standard	Element	Standard
Aluminum	SST-3	Antimony	SST-4
Arsenic	SST-4	Barium	SST-2
Beryllium	SST-2	Bismuth	SST-4
Boron	SST-3	Cadmium	SST-2
Calcium	SST-2	Cerium	SST-5
Chromium	SST-2	Cobalt	SST-2
Copper	SST-2	Europium	SST-5
Iron	SST-2	Lanthanum	SST-5
Lead	SST-4	Lithium	SST-1
Magnesium	SST-2	Manganese	SST-2
Mercury	SST-3	Molybdenum	SST-3
Neodymium	SST-5	Nickel	SST-2
Phosphorous	SST-3	Potassium	SST-1
Samarium	SST-5	Selenium	SST-4
Silicon	SST-3	Silver	SST-2
Sodium	SST-1	Strontium	SST-2
Sulfur	SST-3	Tantalum	SST-3
Thallium	SST-4	Thorium	SST-4
Tin	SST-4	Titanium	SST-3
Tungsten	SST-3	Uranium	SST-4
Vanadium	SST-2	Zinc	SST-2
Zirconium	SST-3		

ICP Standard Formulations

SST-0:
Calibration blank, 1 M ultrex HNO_3.

SST-1:
Stock solutions from AESAR/John Mathey Inc., Seabrook, NH 03874. Individual element solutions as follows:

Li	$LiCO_3$ 10,000 ppm in 5% HNO_3 Lot# 14394A
K	KNO_3 10,000 ppm in 5% HNO_3 Lot# 14379A
Na	$NaCO_3$ 10,000 ppm in 5% HNO_3 Lot# 14400A

200 mL of standard made by combining 25 mL HCl/HNO_3 mixed acid, 1 mL each single element standards, and water.

SST-2:
Stock solutions from VHG labs, Inc., 180 Zachary Rd. #5, Manchester, NH 03103. Mixed element standards as follows:

SM-10	Li, Na, K, Rb, Cs, Be, Mg, Ca, Sr, & Ba 100 ppm Lot# 0-119A
SM-20	V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Ag, & Cd 100 ppm Lot# 0-119B

50 mL of each mixed standard are added to a 250 mL volumetric flask and diluted to volume with 1 M HNO3.

SST-3:
Stock solutions from AESAR/John Mathey Inc., Seabrook, NH 03874. Individual element solutions as follows:

Al	Al 10,000 ppm in 10% HCl Lot# 9-053A
B	H_3BO_3 10,000 ppm in 1% NH_4OH Lot# 9-335A
Hg	Hg 10,000 ppm in 5% HNO_3 Lot# 8-656S
Mo	Mo 10,000 ppm in 5% HCl Lot# 9-159T
P	P 10,000 ppm in 5% HNO3 Lot# 9-160A
Si	Si 1000 ppm in KOH Lot# 086DM Spex Industries, Edison, NJ
S	$(NH_4)_2SO_4$ in H_2O Lot# 9-231M
Ta	TaCl5 10,000 ppm in 5% HCl/tr HF Lot# 9-335M
Ti	Ti 10,000 ppm in 5% HF Lot# 9-079EE
W	W 10,000 ppm in 5% HF/tr HNO_3 Lot# 8-685L
Zr	$ZrCl_2O$ 10,100 ppm in 5% HCl Lot# 9-078G

50 mL of each mixed standard are added to a 250 mL volumetric flask and diluted to volume with 1 M HNO33.

SST-4:
Stock solution from VHG labs, Inc., 180 Zachary Rd. #5, Manchester, NH 03103. Mixed element standard as follows:

SM-50 Ga, In, Tl, Ge, Sn, Pb, As, Sb, Bi, Se, Te, Th, & U 100 ppm Lot# 0-119D

Solution is used directly for calibration.

SST-5:
Stock solution from VHG labs, Inc., 180 Zachary Rd. #5, Manchester, NH 03103. Mixed element standard as follows:

SM-60 Sc, Y, La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, & Lu 100 ppm Lot# 7-165F

50 mL of SM-60 is added to a 250 mL volumetric flask and diluted to volume with 1 M HNO_3.

```
02-Apr-90        07:08:31

Condition     Value                Min      /  Max

VACUUM   =    29.36                7.000    /  50.00
SPTEMP   =    38.75                37.00    /  39.00
MAINS    =    236.9                220.0    /  247.0
-1000V   =    -1005                -1010    /  -990
CTEMP    =    23.75                19.00    /  35.00
+5V      =    5.169                4.750    /  5.250
+12V     =    12.14                11.70    /  12.30
-12V     =    -12.2                -12.3    /  -11.7
+24V     =    23.14                22.50    /  26.50
-100V    =    -100                 -101     /  -99.0
+5VSQ    =    5.150                4.750    /  5.250
+15VSQ   =    15.13                14.70    /  15.30
-15VSQ   =    -15.2                -15.3    /  -14.7

Position Calibration in Progress
         SLIT     PM       ALPHA    BETA     ALPHA    BETA     ALPHA    BETA
         POS'N             SLIT     SLIT     LAMBDA1  LAMBDA1  LAMBDA2  LAMBDA2
Previous data :
INSTR    0.00000 587.206 1.00105 -0.6533 1.00009 -0.0612 0.00000 0.00000
Current data  :
INSTR    0.00000 587.206 1.00105 -0.6533 1.00009 -0.0612 0.00000 0.00000
START THE PLASMA NOW, PLEASE.02-Apr-90        07:13:10

02-Apr-90        07:43:00

DYFORM-I- [Formatting in progress]
DYFORM-I- Formatting completed ok

?CCL-W-This command may interfere with other users
?DUP-I-No bad blocks detected DY0:

?CCL-W-This command may interfere with other users

?CCL-W-This command may interfere with other users

?CCL-W-This command may interfere with other users

?CCL-W-This command may interfere with other users

Directory of back-up floppy disc

SYS    .STM     Length    4        06-Feb-90
INSTR  .INT     Length    1        02-Apr-90
LINE   .LIB     Length   20        02-Oct-89
CONFIL.DAT      Length    8        07-Jul-86
ICPROG.PRG      Length    2        24-Jan-83
OEPROG.PRG      Length    2        24-Jan-83
IPROFI.PRG      Length    2        29-Sep-89
SODIUM.PRG      Length    2        14-Nov-89
MAGOX  .PRG     Length    2        20-Nov-89
ICPQ   .PRG     Length    9        12-Dec-89
NEODYM.PRG      Length    2        23-Jan-90
CHROME.PRG      Length    2        23-Jan-90
ALLSIM.PRG      Length   11        01-Feb-90
MERCUR.PRG      Length    2        07-Feb-90
SSTEPA.PRG      Length    9        07-Feb-90
TEST   .PRG     Length    2        28-Feb-90
BECDL  .PRG     Length    3        28-Mar-90
SST    .PRG     Length   12        31-Mar-90
BECDLB.STD      Length    1        28-Mar-90
BECDLH.STD      Length    1        28-Mar-90
```

```
SYS    .STM     Length    4        06-Feb-90
INSTR  .INT     Length    1        02-Apr-90
LINE   .LIB     Length   20        02-Oct-89
CONFI1.DAT      Length    8        07-Jul-86
ICPROG.PRG      Length    2        24-Jan-83
DEPROG.PRG      Length    2        24-Jan-83
IPROFI.PRG      Length    2        29-Sep-89
SODIUM.PRG      Length    2        14-Nov-89
MAGOX .PRG      Length    2        20-Nov-89
ICPQ  .PRG      Length    9        12-Dec-89
NEODYM.PRG      Length    2        23-Jan-90
CHROME.PRG      Length    2        23-Jan-90
ALLSIM.PRG      Length   11        01-Feb-90
MERCUR.PRG      Length    2        07-Feb-90
SSTEPA.PRG      Length    9        07-Feb-90
TEST  .PRG      Length    2        28-Feb-90
BECDL .PRG      Length    3        28-Mar-90
SST   .PRG      Length   12        31-Mar-90
BECDLB.STD      Length    1        28-Mar-90
BECDLH.STD      Length    1        28-Mar-90
ALLSIM.SEQ      Length    1        29-Sep-89
SST   .SEQ      Length    1        02-Oct-89
MAGOX .SEQ      Length    1        20-Nov-89
ICPQ  .SEQ      Length    1        28-Nov-89
MERCUR.SEQ      Length    1        07-Feb-90
MAGOX .PAK      Length    5        20-Nov-89
ICPQ  .PAK      Length   31        12-Dec-89
ALLSIM.PAK      Length   40        01-Feb-90
MERCUR.PAK      Length    2        07-Feb-90
SST   .PAK      Length   44        31-Mar-90
REPORT.REP      Length    2        19-Jul-83
CONFI2.DAT      Length    8        07-Jul-86
CONFI3.DAT      Length    8        07-Jul-86
CONFI4.DAT      Length    8        07-Jul-86
CONFI5.DAT      Length    8        07-Jul-86
CONFI6.DAT      Length    8        07-Jul-86
CONFI7.DAT      Length    8        07-Jul-86
CONFI8.DAT      Length    8        07-Jul-86
CONFI9.DAT      Length    9        07-Jul-86
VTSET .CMD      Length    1        15-Dec-85
AON   .CMD      Length    1        21-Oct-83
AUP   .CMD      Length    1        15-Dec-83
AOFF  .CMD      Length    1        21-Oct-83
CONVLB.CMD      Length    3        01-Jan-79
ICP   .CMD      Length    1        15-Jul-83
OES   .CMD      Length    1        15-Jul-83
START .CMD      Length    1        14-Oct-84
STATR .CMD      Length    1        03-Oct-89
PEARL .CMD      Length    1        04-Oct-89
TEMPER.CMD      Length    1        25-Jan-90
TEMPR2.CMD      Length    1        25-Jan-90
<Unused>        Length  658

Total free blocks =   658


Directory of back-up floppy disc

PARAM .INS      Length    1        20-Mar-90
<Unused>        Length   50
OPTION.INS      Length    1        20-Mar-90
CLEAR .TXT      Length    1        28-Sep-87
INSTAL.IND      Length   32        11-Jan-88
STARTS.COM      Length    1        07-Aug-87
STARTI.IND      Length    4        13-Aug-87
STARTU.COM      Length    1        [illegible]
```

```
Directory of back-up floppy disc

PARAM .INS      Length    1        20-Mar-90
<Unused>        Length   50
OPTION.INS      Length    1        20-Mar-90
CLEAR .TXT      Length    1        28-Sep-87
INSTAL.IND      Length   32        11-Jan-88
STARTS.COM      Length    1        07-Aug-87
STARTI.IND      Length    4        13-Aug-87
STARTW.COM      Length    1        13-Aug-87
STARTD.COM      Length    1        20-Aug-87
TSXVER.602      Length    1        28-Jul-87
RT11SJ.SYS      Length   80        24-Jun-87
CONFIG.DAT      Length    8        20-Mar-90
ASS   .COM      Length    1        25-May-88
ASSI  .COM      Length    1        14-Apr-86
DY0FRM.SAV      Length    2        28-Jan-85
DY1FRM.SAV      Length    2        28-Jan-85
FLCOPY.ENC      Length    1        07-Apr-87
FLCOPY.COM      Length    1        09-Dec-87
FLCOPY.IND      Length   10        22-Dec-88
SWAP  .SYS      Length   27        03-Sep-86
TT    .SYS      Length    2        12-May-87
LD    .SYS      Length    0        12-May-87
NL    .SYS      Length    2        12-May-87
NL    .TSX      Length    2        15-Jan-87
DY    .SYS      Length    4        12-May-87
DY    .TSX      Length    4        15-Jan-87
DL    .SYS      Length    4        12-May-87
DL    .TSX      Length    5        15-Jan-87
SYSDAT.DAT      Length    1        08-Jan-86
PIP   .SAV      Length   30        03-Sep-86
KED   .SAV      Length   58        03-Sep-86
INFO  .SAV      Length    2        03-Oct-85
SYSDAT.SAV      Length   26        10-Dec-82
IND   .SAV      Length   58        05-Jan-87
SIPP  .SAV      Length   21        03-Sep-86
DIR   .SAV      Length   19        03-Sep-86
RESORC.SAV      Length   25        03-Sep-86
DUP   .SAV      Length   49        05-Jan-87
TRANSF.SAV      Length   16        03-Sep-86
SETSIZ.SAV      Length    4        15-Jan-87
CCL   .SAV      Length   43        15-Jan-87
TSXUCL.SAV      Length    6        15-Jan-87
LOGON .SAV      Length    8        15-Jan-87
TSAUTH.SAV      Length   22        15-Jan-87
ACCESS.TSX      Length   13        01-May-87
LINE  .TSX      Length    1        21-Aug-87
DPS   .TXT      Length    1        21-Aug-87
RT11  .LOG      Length    1        22-Sep-87
DPS   .LOG      Length    1        22-Sep-87
SYSMON.SAV      Length   46        20-Mar-90
TSKMON.SAV      Length  137        20-Mar-90
<Unused>        Length  117

Total free blocks =   167


Directory of back-up floppy disc

TSX   .SAV      Length  242        20-Mar-90
TSXMOD.SAV      Length   78        20-Mar-90
DPS   .SAV      Length   79        20-Mar-90
DPSRT .STD      Length    4        20-Mar-90
DPSMAP.LST      Length   16        20-Mar-90
DPS   .DPS      Length   27        20-Mar-90
```

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Directory of back-up floppy disc

TSX    .SAV     Length  242        20-Mar-90
TSXMOD.SAV      Length   78        20-Mar-90
DPS    .SAV     Length   79        20-Mar-90
DPSRT  .STB     Length    4        20-Mar-90
DPSMAP.LST      Length   16        20-Mar-90
DPS    .DPS     Length   27        20-Mar-90
UTIL1  .DPS     Length   35        20-Mar-90
UTIL2  .DPS     Length   32        20-Mar-90
UTIL3  .DPS     Length   35        20-Mar-90
UTIL4  .DPS     Length   30        20-Mar-90
UTIL5  .DPS     Length   30        20-Mar-90
INIT   .SAV     Length   22        20-Mar-90
EDITOR.DPS      Length   34        20-Mar-90
TABLE  .DPS     Length   25        20-Mar-90
INSPEC.DPS      Length   21        20-Mar-90
PACK   .DPS     Length   18        20-Mar-90
ANUTIL.DPS      Length   38        20-Mar-90
A1FAST.DPS      Length   28        20-Mar-90
A2FAST.DPS      Length   34        20-Mar-90
A3FAST.DPS      Length   34        20-Mar-90
AN1    .DPS     Length   38        20-Mar-90
AN2DE  .DPS     Length   40        20-Mar-90
<Unused>        Length   22

Total free blocks =     22
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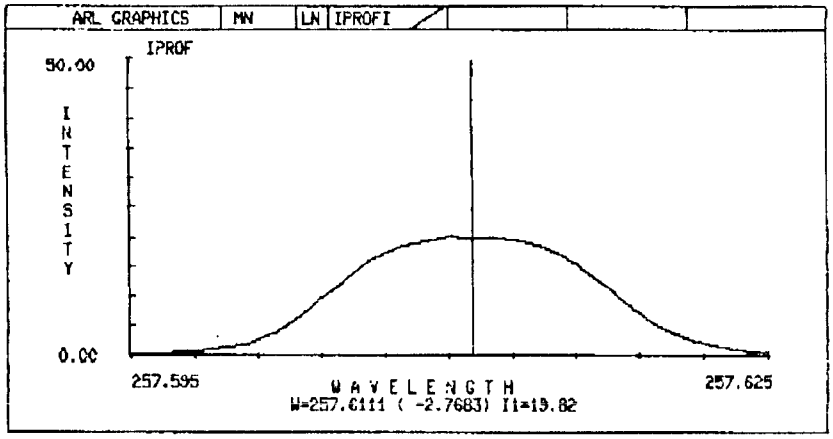
ARL GRAPHICS
MN
LN
IPROFI
IPROF
50.00
INTENSITY
0.00
257.595
WAVELENGTH
257.625
W=257.6111 (-2.7683) I1=19.82

April 2, 1990 ICP Calibration

Sample name : SST0
Programme : SST 02-Apr-90 09:58:59

NAME	MV INT	RSD
AL	1.44	1.81
SB	0.36	0.43
AS	0.85	1.29
BA	2.46	1.76
BE	0.59	1.36
BI	3.14	2.21
B	3.03	1.02
CD	1.93	1.39
CA	0.39	0.77
CE	3.42	1.85
CR	0.98	3.24
CO	0.21	0.56
CU	2.05	1.48
EU	2.65	1.78
FE	1.15	2.51
LA	0.30	0.84
PB	0.25	0.40
LI	2.69	2.92
MG	0.24	1.16
MN	0.56	0.63
HG	3.15	0.39
MO	1.43	1.86
ND	3.50	1.85
NI	2.67	1.94
P	0.57	2.63
K	2.27	1.36
SM	3.25	1.80
SE	1.40	2.18
SI	2.30	1.52
AG	9.58	1.96
NA	3.58	2.00
SR	2.58	1.40
S	0.62	1.79
TA	2.60	1.64
TL	2.70	3.41
TH	0.77	1.57
SN	1.03	0.93
TI	2.57	1.58
W	1.10	1.56
U	3.26	1.92
VI	3.95	2.02
ZN	2.32	1.66
ZR	3.43	1.20

Sample name : SST1
Programme : SST 02-Apr-90 10:01:11

NAME	MV INT	RSD
LI	705.46	0.08
K	16.73	0.10
NA	82.12	0.19

Sample name : SST2
Programme : SST 02-Apr-90 10:03:20

April 2, 1990 ICP Calibration

NAME	MV INT	RSD
BA	434.01	0.18
BE	604.75	0.14
CD	356.40	0.87
CA	631.21	0.22
CR	83.90	1.11
CO	1.80	2.37
CU	142.89	0.15
FE	173.23	0.35
MG	541.47	0.71
MN	356.30	0.41
NI	192.31	0.40
AG	598.62	0.37
SR	746.55	0.27
VI	245.40	0.60
ZN	700.14	0.52

Sample name : SST3
Programme : SST 02-Apr-90 10:06:19

NAME	MV INT	RSD
AL	27.17	1.13
B	953.28	1.10
HG	701.35	0.87
MO	343.82	0.92
P	43.94	2.23
SI	102.90	0.78
S	40.85	1.60
TA	132.47	0.80
TI	652.90	1.20
W	78.39	0.87
ZR	206.30	1.11

Sample name : SST4
Programme : SST 02-Apr-90 10:09:33

NAME	MV INT	RSD
SB	7.52	2.52
AS	149.09	2.09
BI	125.90	1.51
PB	5.87	2.34
SE	60.06	1.32
TL	55.56	1.27
TH	21.00	1.34
SN	251.13	2.37
U	14.49	1.12

Sample name : SST5
Programme : SST 02-Apr-90 10:12:30

NAME	MV INT	RSD
CE	17.33	1.07
EU	699.26	0.95
LA	8.25	0.91
ND	17.81	0.51

Programme name : SST Channel name : AE Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	1.3715	28.591	-0.280556E+01	0.194336E+01		

Programme name : SST Channel name : SBI Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.3388	7.8992	-0.497698E+01	0.139541E+02		

Programme name : SST Channel name : AS Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.8088	156.55	-0.574291E+00	0.674579E+00		

Programme name : SST Channel name : BA Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.3414	455.71	-0.114225E+00	0.463450E-01		

Programme name : SST Channel name : BEI Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.5602	634.99	-0.195201E-01	0.331036E-01		

Programme name : SST Channel name : BI Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.9827	132.19	-0.255763E+01	0.814617E+00		

Programme name : SST Channel name : AL Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	1.3715	28.531	-0.280556E+01	0.194336E+01		

Programme name : SST Channel name : SB1 Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.3388	7.8992	-0.497698E+01	0.139541E+02		

Programme name : SST Channel name : AS Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.8088	156.55	-0.574291E+00	0.674579E+00		

Programme name : SST Channel name : BA Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.3414	455.71	-0.114225E+00	0.463450E-01		

Programme name : SST Channel name : BE1 Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.5602	634.99	-0.195201E-01	0.331036E-01		

Programme name : SST Channel name : BI Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.9827	132.19	-0.255763E+01	0.814617E+00		

Programme name : SST Channel name : B Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.8772	1000.9	-0.159361E+00	0.526175E-01		

Programme name : SST Channel name : CD Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	1.8354	374.22	-0.109009E+00	0.564329E-01		

Programme name : SST Channel name : CA Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.3724	662.77	-0.124283E-01	0.317049E-01		

Programme name : SST Channel name : CE Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	3.2481	18.201	-0.491412E+01	0.143730E+01		

Programme name : SST Channel name : CK Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.9320	88.094	-0.236319E+00	0.241202E+00		

Programme name : SST Channel name : CO Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.1954	1.8858	-0.258646E+01	0.125760E+02		

Programme name : SST Channel name : CU Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	1.9443	150.04	-0.290622E+00	0.141998E+00		

Programme name : SST Channel name : EU Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.5150	734.23	-0.760056E-01	0.287103E-01		

Programme name : SST Channel name : FE Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	1.0941	181.89	-0.133852E+00	0.116224E+00		

Programme name : SST Channel name : LA Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.2856	8.6611	-0.756585E+00	0.251636E+01		

Programme name : SST Channel name : PB Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.2385	6.1614	-0.446858E+01	0.178031E+02		

Programme name : SST Channel name : LI Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.5517	740.73	-0.191099E+00	0.711465E-01		

Programme name : SST Channel name : P Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.8274	46.142	-0.101066E+01	0.116080E+01		

Programme name : SST Channel name : K Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.1600	17.564	-0.786536E+01	0.345933E+01		

Programme name : SST Channel name : SM Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	3.0862	17.609	-0.480501E+01	0.147907E+01		

Programme name : SST Channel name : SE Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	1.3271	63.059	-0.238156E+01	0.170477E+01		

Programme name : SST Channel name : SI Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.1872	108.05	-0.114429E+01	0.497013E+00		

Programme name : SST Channel name : AG Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	9.1007	628.55	-0.325264E+00	0.339536E-01		

Programme name : SST Channel name : NA Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	3.4099	96.230	-0.228098E+01	0.636613E+00		

Programme name : SST Channel name : SR Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.4526	783.88	-0.694027E-01	0.268029E-01		

Programme name : SST Channel name : S Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.5900	42.389	-0.771902E+00	0.124300E+01		

Programme name : SST Channel name : TA Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.4668	139.09	-0.999700E+00	0.384993E+00		

Programme name : SST Channel name : TL2 Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.5691	58.342	-0.511609E+01	0.189181E+01		

Programme name : SST Channel name : TH Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.7312	22.047	-0.380502E+01	0.494372E+01		

Programme name : SST Channel name : SN Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	0.9826	263.69	-0.413576E+00	0.399848E+00		

Programme name : SST Channel name : TI Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.4434	625.54	-0.197746E+00	0.768943E-01		

Programme name : SST Channel name : W Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	1.0437	82.307	-0.710752E+00	0.646923E+00		

Programme name : SST Channel name : U Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	3.0967	15.216	-0.290212E+02	0.890313E+01		

Programme name : SST Channel name : V1 Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.8066	257.67	-0.243711E+00	0.824936E-01		

Programme name : SST Channel name : ZN Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	2.2059	735.14	-0.665506E-01	0.286609E-01		

April 2, 1990 ICP Calibration

Programme name : SST Channel name : ZR Polynomial type : CC

Curve	Min Int	Max Int	Curve Coefficients C0	C1	C2	C3
CRV1	3.2585	216.61	-0.845389E+00	0.246469E+00		

April 2, 1990 ICP Analysis

Sample name : HNO3
Programme : SSI 02-Apr-90 10:24:52

NAME	MV INT	CONCEN	RSD
Al	1.26	(-0.363	-15.11
Sb	0.34	-0.209	-19.25
As	0.77	(-0.055	-24.19
Ba	2.12	(-0.016	-17.65
Be	0.56	(-0.001	-22.80
Bi	2.81	(-0.267	-21.25
B	4.43	0.074	17.71
Cd	1.70	(-0.013	-16.84
Ca	0.37	(-0.001	-23.01
Ce	2.94	(-0.688	-17.69
Cr	0.85	(-0.032	-17.58
Co	0.19	(-0.130	-22.88
Cu	1.80	(-0.034	-15.80
Eu	2.26	(-0.011	-17.05
Fe	1.04	(-0.014	-26.72
La	0.28	(-0.051	-22.18
Pb	0.24	(-0.243	-15.23
Li	2.32	(-0.026	-14.17
Mg	0.32	(-0.001	-18.41
Mn	0.57	(-0.005	-6.50
Hg	5.27	0.152	16.35
Mo	1.27	(-0.023	-17.02
Nd	3.06	(-0.613	-12.29
Ni	2.40	(-0.028	-21.39
P	0.80	(-0.085	-53.39
K	2.01	(-0.928	-17.01
Sm	2.80	(-0.664	-18.34
Se	1.23	(-0.292	-15.94
Si	2.04	(-0.128	-18.88
Ag	8.15	(-0.049	-10.07
Na	2.97	(-0.390	-12.63
Sr	2.31	(-0.007	-18.68
S	0.55	(-0.094	-17.32
Ta	2.26	(-0.129	-16.35
Tl	2.39	(-0.593	-26.18
Th	0.68	(-0.427	-20.40
Sn	0.94	(-0.038	-22.87
Ti	2.27	(-0.023	-18.34
W	0.98	(-0.077	-10.64
U	2.80	(-4.128	-18.00
V	2.65	(-0.025	-20.79
Zn	2.09	(-0.007	-17.31
Zr	3.11	(-0.079	-17.58

April 2, 1990 ICP Analysis

Sample name : 78C11F
Sample code 1 : SST1
Programme : SST 02-Apr-90 10:29:39

NAME	MV INT	CONCEN	RSD
Al	1.49	0.089	5.51
Sb	1.11	10.597	1.36
As	0.99	0.091	3.08
Ba	213.32	9.772	0.47
Be	0.62	0.001	19.31
Bi	3.31	0.135	23.94
B	194.71	10.086	0.18
Cd	194.35	10.857	0.27
Ca	322.13	10.201	0.42
Ce	9.86	9.253	0.87
Cr	43.61	10.202	0.17
Co	1.06	10.752	2.53
Cu	72.64	10.034	0.27
Eu	3.46	0.023	1.18
Fe	90.87	10.427	0.34
La	0.32	0.053	5.50
Pb	0.35	0.000	
Li	139.14	9.709	0.36
Mg	205.05	10.523	0.47
Mn	193.37	10.541	0.20
Hg	3.56	0.030	29.57
Mo	1.52	0.013	7.39
Nd	10.57	9.879	2.55
Ni	104.30	10.718	0.29
P	1.00	0.145	11.11
K	9.51	25.093	0.04
Sm	3.14	-0.163	-9.98
Se	3.77	4.052	0.63
Si	2.35	0.025	12.94
Ag	9.38	-0.007	-15.42
Na	41.72	24.278	0.51
Sr	372.65	9.949	0.52
S	0.84	0.273	2.25
Ta	2.60	0.001	317.58
Tl	2.90	0.363	26.83
Th	0.81	0.204	8.72
Sn	131.73	52.255	0.43
Ti	2.52	-0.004	-21.80
W	1.40	0.192	3.88
U	3.64	3.491	3.57
V	3.00	0.004	58.73
Zn	369.62	10.527	0.25
Zr	3.41	-0.006	-49.59

April 2, 1990 ICP Analysis

Sample name : 820380
Sample code 1 : SST2
Programme : SST 02-Apr-90 10:34:30

NAME	MV INT	CONCEN	RSD
Al	3.68	4.343	1.42
Sb	0.39	0.302	13.70
As	2.95	1.413	2.21
Ba	2.77	0.014	13.58
Be	0.62	0.001	16.20
Bi	69.02	53.663	0.66
B	6.18	0.166	8.55
Cd	2.02	0.005	35.42
Ca	1.07	0.022	0.88
Ce	3.76	0.492	16.07
Cr	1.39	0.098	4.54
Co	0.21	0.017	150.00
Cu	3.62	0.223	1.42
Eu	359.03	10.232	0.89
Fe	1.70	0.063	2.40
La	19.56	148.472	0.68
Pb	3.27	53.682	0.96
Li	2.62	-0.005	-73.69
Mg	0.61	0.010	1.62
Mn	0.84	0.010	7.92
Hg	3.89	0.053	8.96
Mo	1.56	0.019	15.04
Nd	4.10	0.837	2.99
Ni	2.94	0.029	12.36
P	1.28	0.478	3.80
K	2.19	-0.303	-36.72
Sm	10.23	10.323	0.52
Se	1.54	0.238	15.09
Si	3.51	0.592	2.60
Ag	327.21	10.785	0.47
Na	3.42	-0.103	-34.40
Sr	2.82	0.006	13.43
S	0.73	0.136	7.37
Ta	3.11	0.196	6.46
Tl	6.05	6.338	1.20
Th	11.51	53.099	0.66
Sn	1.26	0.089	12.85
Ti	3.19	0.047	6.78
W	1.13	0.022	54.66
U	9.32	53.998	0.56
V	6.02	0.253	0.90
Zn	2.71	0.011	9.19
Zr	3.89	0.114	7.77

April 2, 1990 ICP Analysis

Sample name : 77D11F
Sample code 1 : ST3
Programme : SST 02-Apr-90 10:38:51

NAME	MV INT	CONCEN	RSD
Al	28.50	>52.589	0.53
Sb	0.47	1.558	5.56
As	77.88	51.962	0.18
Ba	2.60	0.006	23.94
Be	303.42	10.025	0.86
Bi	4.08	0.760	10.39
B	5.49	0.129	18.54
Cd	2.06	0.007	12.67
Ca	1.03	0.020	0.31
Ce	3.12	(-0.427	-15.84
Cr	1.07	0.021	24.77
Co	0.21	0.021	91.65
Cu	2.26	0.031	11.09
Eu	2.44	(-0.006	-19.64
Fe	1.46	0.036	2.22
La	0.29	-0.026	-31.11
Pb	0.26	0.119	8.66
Li	2.44	(-0.017	-15.53
Mg	0.48	0.005	1.72
Mn	0.92	0.015	2.85
Hg	368.61	26.171	0.33
Mo	357.35	51.977	0.37
Nd	3.31	(-0.256	-20.72
Ni	7.14	0.472	1.89
P	53.60	>61.213	0.72
K	2.10	(-0.617	-16.54
Sm	3.01	(-0.357	-20.31
Se	30.88	50.367	0.69
Si	88.18	42.683	2.00
Ag	18.05	0.288	2.51
Na	3.47	-0.075	-43.85
Sr	2.54	-0.001	-67.59
S	43.60	>53.424	0.72
Ta	139.41	48.822	0.38
Tl	30.22	52.057	0.74
Th	0.89	0.618	8.85
Sn	1.57	0.213	3.47
Ti	666.26	51.027	0.31
W	35.21	22.060	0.23
U	4.97	15.233	4.15
V	138.02	10.322	0.73
Zn	3.57	0.036	3.56
Zr	211.26	51.224	0.38

April 2, 1990 ICP Analysis

Sample name : F455
Sample code 1 : ICP1B
Sample code 2 : DIGEST
Sample code 3 : DIRECT
Programme : SST 02-Apr-90 10:44:44

NAME	MV INT	CONCEN	RSD
Al	1.46	0.028	219.30
Sb	0.35	-0.028	-340.34
As	1.22	0.250	9.32
Ba	3.37	-0.005	-55.80
Be	0.59	-0.000	-309.72
Bi	14.91	9.588	3.40
B	176.38	9.121	1.65
Cd	173.46	9.678	3.08
Ca	306.91	9.718	1.37
Ce	3.19	(-0.328	-32.30
Cr	1.09	0.026	160.79
Co	0.20	-0.117	-6.19
Cu	68.12	9.382	1.40
Eu	2.39	(-0.007	-20.37
Fe	1.73	0.067	6.50
La	3.82	8.845	1.77
Pb	0.77	9.275	3.84
Li	2.42	(-0.019	-19.01
Mg	257.92	9.520	2.65
Mn	0.80	0.008	5.03
Hg	3.93	0.056	44.31
Mo	67.37	9.629	2.96
Ne	3.50	-0.003	-2133.2
Ni	2.66	-0.001	-970.96
P	10.39	11.054	6.91
K	4.75	8.556	3.33
Sm	2.90	(-0.519	-19.93
Se	1.33	(-0.121	-30.99
Si	12.95	5.240	1.50
Ag	91.94	2.797	2.38
Na	17.77	9.033	2.07
Sr	349.92	9.337	1.64
S	0.74	0.149	9.69
Ta	2.38	(-0.084	-22.77
Tl	2.53	(-0.339	-45.45
Th	0.72	(-0.257	-28.15
Sn	1.30	0.139	11.66
Ti	3.10	0.041	11.04
W	1.27	0.108	19.99
U	2.98	(-2.469	-25.66
V	2.84	-0.010	-44.41
Zn	329.85	9.337	2.65
Zr	3.19	(-0.060	-20.28

April 2, 1990 ICP Analysis

Sample name : F463
Sample code 1 : BLANK
Sample code 2 : DIRECT
Programme : SST 02-Apr-90 10:49:25

NAME	MV INT	CONCEN	RSD
Al	1.44	-0.004	-305.52
Sb	0.36	0.102	36.08
As	0.85	0.001	1222.08
Ba	2.43	-0.002	-25.64
Be	0.61	0.001	41.61
Bi	3.38	0.112	10.15
B	5.49	0.130	15.85
Cd	1.91	-0.001	-9.93
Ca	4.37	0.126	0.15
Ce	3.32	-0.138	-17.13
Cr	1.01	0.008	24.38
Co	0.20	-0.013	-57.74
Cu	2.04	-0.001	-148.47
Eu	2.57	-0.002	-21.38
Fe	1.68	0.061	2.89
La	0.30	-0.011	-48.04
Pb	0.25	-0.065	-41.66
Li	2.61	-0.006	-16.79
Mg	0.07	0.020	0.89
Mn	0.73	0.004	5.71
Hg	3.45	0.022	67.01
Mo	1.44	0.002	70.01
Nd	3.44	-0.075	-31.32
Ni	2.78	0.012	13.52
P	1.04	0.193	15.52
K	2.21	-0.219	-13.24
Sm	3.16	-0.127	-14.21
Se	1.37	-0.043	-20.26
Si	2.68	0.186	4.27
Ag	9.87	0.010	11.92
Na	3.75	0.107	10.02
Sr	2.58	0.000	407.23
S	0.65	0.036	27.56
Ta	2.54	-0.020	-36.71
Tl	2.73	0.047	179.08
Th	0.76	-0.043	-46.15
Sn	1.10	0.027	10.50
Ti	3.34	0.059	1.38
W	1.09	-0.006	-37.30
U	3.16	-0.887	-13.79
V	2.94	-0.001	-249.22
Zn	3.24	0.026	2.44
Zr	3.37	-0.015	-11.79

April 2, 1990 ICP Analysis

Sample name : F456
Sample code 1 : 100-10
Sample code 2 : 89071
Sample code 3 : SAMPLE
Programme : SST 02-Apr-90 10:54:12

NAME	MV INT	CONCEN	DILCOR	RSD
Al	3.78	4.540	458.57	1.55
Sb	0.37	0.149	15.033	21.65
As	0.86	0.005	0.477	95.12
Ba	2.49	0.001	0.103	149.40
Be	0.61	0.001	0.084	40.86
Bi	8.14	4.073	411.33	1.26
B	4.69	0.087	8.832	15.38
Cd	1.89	-0.002	-0.237	-22.68
Ca	2.05	0.053	5.317	0.33
Ce	3.42	0.002	0.193	3170.55
Cr	1.40	0.100	10.102	5.93
Co	0.21	0.000	0.000	4028700
Cu	2.08	0.005	0.512	64.57
Eu	2.62	-0.001	-0.071	-144.54
Fe	21.62	2.379	240.32	0.95
La	0.30	0.003	0.254	152.75
Pb	0.26	0.071	7.192	25.00
Li	2.61	-0.005	-0.549	-39.31
Mg	1.19	0.031	3.164	1.75
Mn	2.51	0.101	10.213	0.90
Hg	3.99	0.060	6.061	70.90
Mo	1.46	0.004	0.423	47.96
Nd	3.50	0.008	0.800	1160.97
Ni	2.79	0.013	1.349	9.93
P	3.58	3.260	329.25	3.35
K	2.32	-0.170	-17.13	-44.35
Sm	3.23	-0.023	-2.340	-268.99
Se	1.41	0.029	2.927	30.07
Si	2.93	0.312	31.558	9.33
Ag	9.51	-0.002	-0.251	-169.51
Na	24.02	13.007	1313.8	0.62
Sr	3.53	0.026	2.581	3.00
S	0.67	0.061	6.193	18.39
Ta	2.61	0.004	0.402	386.74
Tl	2.75	0.079	8.025	210.77
Th	0.77	0.005	0.499	950.37
Sn	1.06	0.009	0.942	13.78
Ti	2.60	0.002	0.197	97.04
W	1.13	0.017	1.721	67.51
U	3.26	0.009	0.899	4119.71
V	2.96	0.001	0.083	632.72
Zn	3.32	0.029	2.886	3.62
Zr	3.45	0.005	0.531	131.45

Dilution factor : 101.000

April 2, 1990 ICP Analysis

Sample name : F456
Sample code 1 : 500-10
Sample code 2 : 89071
Sample code 3 : SAMPLE
Programme : SSI 02-Apr-90 10:58:49

NAME	MV INT	CONCEN	DILCOR	RSD
Al	12.23	20.954	440.03	0.73
Sb	0.35	-0.056	-1.172	-38.19
As	0.82	-0.024	-0.496	-44.29
Ba	2.37	-0.004	-0.089	-23.68
Be	0.58	-0.000	-0.004	-28.64
Bi	25.31	18.059	379.23	0.90
B	3.79	0.040	0.840	26.01
Cd	1.77	(-0.009	(-0.194	-16.51
Ca	5.90	0.175	3.667	0.87
Ce	3.16	(-0.378	(-7.948	-10.68
Cr	2.84	0.449	9.425	1.50
Co	0.20	-0.101	-2.113	-14.43
Cu	2.03	-0.003	-0.064	-63.99
Eu	2.35	(-0.008	(-0.178	-8.76
Fe	92.74	10.645	223.54	0.96
La	0.29	-0.034	-0.722	-7.32
Pb	0.26	0.119	2.492	22.91
Li	2.36	(-0.023	(-0.481	-6.42
Mg	3.41	0.113	2.380	0.99
Mn	8.92	0.452	9.490	1.06
Hg	4.92	0.127	2.669	22.50
Mo	1.40	-0.005	-0.102	-31.75
Nd	3.20	(-0.416	(-8.734	-19.38
Ni	2.73	0.007	0.142	52.39
P	12.53	13.535	284.23	2.05
K	2.05	(-0.786	(-16.51	-6.36
Sm	2.90	(-0.516	(-10.84	-8.28
Se	1.42	0.039	0.823	30.44
Si	4.41	1.047	21.977	3.94
Ag	8.53	(-0.036	(-0.747	-10.04
Na	100.10	>61.441	>1290.3	0.87
Sr	6.83	0.114	2.396	0.93
S	0.85	0.338	7.091	2.39
Ta	2.40	(-0.076	(-1.601	-16.20
Tl	2.48	(-0.418	(-8.780	-18.23
Th	0.71	(-0.318	(-6.679	-10.58
Sn	1.02	-0.007	-0.157	-70.06
Ti	2.44	(-0.010	(-0.209	-15.08
W	1.06	-0.024	-0.498	-2.73
U	3.02	(-2.107	(-44.25	-11.36
V	2.77	(-0.015	(-0.311	-31.04
Zn	4.78	0.070	1.479	3.14
Zr	3.35	-0.019	-0.407	-23.86

Dilution factor : 21.0000

April 2, 1990 ICP Analysis

Sample name : F547
Sample code 1 : 500-10
Sample code 2 : 89071
Sample code 3 : SAMPLE
Programme : SST 02-Apr-90 11:03:35

NAME	MV INT	CONCEN	DILCOR	RSD
Al	1.25	(-0.375	(-7.876	-11.46
Sb	0.34	-0.177	-3.712	-20.89
As	0.77	(-0.056	(-1.181	-12.53
Ba	2.14	(-0.015	(-0.320	-11.11
Be	0.56	-0.001	-0.020	-24.22
Bi	3.84	(-0.241	(-5.052	-8.16
B	3.44	0.021	0.450	15.60
Cd	1.70	(-0.013	(-0.279	-4.66
Ca	0.37	(-0.001	(-0.013	-15.00
Ce	2.97	(-0.050	(-13.64	-11.84
Cr	0.86	(-0.030	(-0.638	-9.52
Co	0.20	-0.122	-2.553	-20.69
Cu	1.82	(-0.032	(-0.663	-9.22
Eu	2.28	(-0.010	(-0.219	-11.18
Fe	1.03	(-0.015	(-0.308	-21.08
La	0.28	(-0.046	(-0.969	-11.35
Pb	0.24	(-0.243	(-5.109	-8.45
Li	2.30	(-0.027	(-0.576	-10.02
Mg	0.32	(-0.001	(-0.020	-13.87
Mn	0.57	(-0.005	(-0.096	-6.32
Hg	5.25	0.151	3.162	30.78
Mo	1.32	(-0.017	(-0.360	-19.31
Nd	3.08	(-0.589	(-12.37	-8.12
Ni	2.49	(-0.019	(-0.391	-15.64
P	0.84	-0.039	-0.829	-38.46
K	1.99	(-0.994	(-20.87	-8.60
Sm	2.83	(-0.625	(-13.12	-11.49
Se	1.23	(-0.286	(-6.002	-13.08
Si	2.06	(-0.119	(-2.508	-12.92
Ag	6.43	(-0.039	(-0.819	-11.55
Na	2.98	(-0.383	(-8.039	-7.24
Sr	3.33	(-0.007	(-0.142	-11.95
S	0.55	(-0.094	(-1.975	-6.52
Ta	2.29	(-0.118	(-2.469	-12.54
Tl	2.40	(-0.585	(-12.28	-24.46
Th	0.69	(-0.402	(-8.444	-12.91
Sn	0.94	(-0.038	(-0.800	-5.55
Ti	2.30	(-0.021	(-0.435	-11.71
W	1.00	(-0.067	(-1.404	-12.48
U	2.82	(-3.885	(-81.58	-11.81
V	2.68	(-0.022	(-0.472	-22.86
Zn	2.10	(-0.006	(-0.136	-8.80
Zr	3.13	(-0.074	(-1.551	-10.01

Dilution factor : 21.0000

April 2, 1990 ICP Analysis

Sample name : F457
Sample code 1 : 100-10
Sample code 2 : 89071
Sample code 3 : SAMDUP
Programme : SST 02-Apr-90 11:09:02

NAME	MV INT	CONCEN	DILCOR	RSD
Al	4.09	5.150	520.14	0.78
Sb	0.36	0.084	8.456	41.94
As	0.84	-0.009	-0.886	-29.12
Ba	2.41	-0.002	-0.240	-14.09
Be	0.60	0.000	0.037	36.74
Bi	8.39	4.280	432.25	1.04
B	3.40	0.019	1.947	9.18
Cd	1.82	(-0.007	(-0.667	-4.52
Ca	1.86	0.047	4.703	0.65
Ce	3.29	-0.182	-18.34	-8.72
Cr	1.38	0.096	9.712	3.24
Co	0.20	-0.021	-2.117	-60.00
Cu	2.01	-0.005	-0.516	-14.25
Ho	2.52	-0.004	-0.357	-7.55
Fe	21.69	2.387	241.09	0.73
La	0.29	-0.015	-1.525	-25.46
Pb	0.25	-0.053	-5.394	-33.33
Li	2.51	(-0.013	(-1.296	-3.61
Mg	1.95	0.059	5.991	0.87
Mn	2.51	0.101	10.230	0.11
Hg	4.51	0.097	9.837	14.27
Mo	1.43	-0.001	-0.069	-89.22
Nd	3.38	-0.171	-17.26	-20.99
Ni	2.74	0.008	0.767	47.19
P	2.56	1.962	198.14	3.04
K	2.15	(-0.429	(-43.32	-2.03
Sm	3.11	-0.204	-20.57	-7.37
Sc	1.37	-0.052	-5.280	-22.90
Si	2.94	0.314	31.759	3.74
Ag	9.14	-0.015	-1.511	-4.77
Na	20.97	11.069	1117.9	0.69
Sr	3.48	0.024	2.437	1.24
S	0.66	0.052	5.231	15.43
Ta	2.52	-0.028	-2.826	-27.49
Tl	2.66	-0.078	-7.898	-69.24
Th	0.75	-0.109	-10.98	-11.44
Sn	1.03	-0.002	-0.162	-308.56
Ti	2.51	-0.005	-0.458	-20.55
W	1.07	-0.016	-1.590	-51.71
U	3.14	-1.065	-107.6	-10.93
V	2.90	-0.005	-0.472	-39.71
Zn	2.90	0.017	1.687	4.05
Zr	3.37	-0.015	-1.494	-13.23

Dilution factor : 101.000

April 2, 1990 ICP Analysis

Sample name : F457
Sample code 1 : 500-10
Sample code 2 : B9071
Sample code 3 : SAMDUP
Programme : SST 02-Apr-90 11:14:53

NAME	MV INT	CONCEN	DILCOR	RSD
Al	14.19	24.762	520.01	0.47
Sb	0.36	0.102	2.149	40.91
As	0.84	-0.006	-0.132	-300.00
Ba	2.48	0.000	0.010	514.54
Be	0.60	0.000	0.008	110.55
Bi	27.50	19.843	416.70	0.28
B	3.17	0.007	0.156	60.66
Cd	1.83	(-0.006	(-0.117	-44.62
Ca	6.10	0.181	3.798	0.77
Ce	3.30	-0.169	-3.552	-62.78
Cr	2.94	0.473	9.936	1.17
Co	0.20	-0.046	-0.968	-37.37
Cu	2.11	0.009	0.180	65.21
Eu	2.47	(-0.005	(-0.107	-35.64
Fe	95.98	11.021	231.44	0.28
La	0.30	-0.013	-0.264	-61.10
Pb	0.26	0.202	4.237	20.38
Li	2.44	(-0.017	(-0.361	-39.93
Mg	3.58	0.119	2.509	0.40
Mn	9.25	0.470	9.865	0.52
Hg	3.75	0.043	0.903	7.17
Mo	1.46	0.003	0.071	130.24
Nd	3.32	(-0.251	(-5.272	-57.79
Ni	2.85	0.019	0.402	30.70
P	8.14	8.437	177.18	0.74
K	2.11	(-0.553	(-11.62	-25.67
Sm	3.04	(-0.315	(-6.616	-37.74
Se	1.40	0.142	2.983	32.12
Si	4.86	1.273	26.733	1.31
Ag	8.94	(-0.022	(-0.458	-39.03
Na	86.17	)52.574	)1104.1	0.92
Sr	7.00	0.119	2.492	0.36
S	0.91	0.362	7.596	3.57
Ta	2.51	-0.034	-0.722	-69.55
Tl	2.63	-0.147	-3.086	-90.03
Th	0.73	-0.173	-3.634	-43.74
Sn	1.06	0.012	0.252	63.10
Ti	2.54	-0.003	-0.056	-159.78
W	1.12	0.011	0.240	105.04
U	3.17	-0.801	-16.83	-84.14
V	2.89	-0.005	-0.113	-117.26
Zn	5.02	0.077	1.624	1.85
Zr	3.48	0.012	0.242	118.27

Dilution factor : 21.0000

April 2, 1990 ICP Analysis

Sample name : E450
Sample code 1 : 100-10
Sample code 2 : 89071
Sample code 3 : SPIKE
Programme : SST 02-Apr-90 11:19:19

NAME	MV INT	CONCEN	DILCOR	RSD
Al	3.44	3.889	392.82	1.53
Sb	0.36	-0.019	-1.879	-43.30
As	0.78	(-0.048	(-4.883	-8.97
Ba	4.19	0.080	8.093	1.76
Be	0.56	(-0.001	(-0.109	-15.31
Bi	7.43	3.495	352.99	1.69
B	4.59	0.082	8.299	4.25
Cd	3.40	0.083	8.377	2.70
Ca	4.98	0.145	14.692	0.46
Ce	2.94	(-0.688	(-69.49	-6.68
Cr	1.63	0.158	15.916	1.90
Co	0.20	-0.067	-6.774	-21.65
Cu	2.51	0.066	6.664	4.03
Eu	2.25	(-0.011	(-1.142	-4.32
Fe	19.44	2.125	214.67	0.68
La	0.32	0.043	4.321	3.40
Pb	0.25	-0.077	-7.792	-13.32
Li	3.67	0.070	7.044	2.35
Mg	4.13	0.140	14.149	1.21
Mn	4.02	0.184	18.548	0.52
Hg	3.36	0.015	1.531	39.62
Mo	1.95	0.075	7.581	5.00
Nd	3.13	(-0.511	(-51.60	-12.99
Ni	3.42	0.079	8.010	2.80
P	2.93	2.386	241.01	3.61
K	1.99	(-0.999	(-100.9	-4.42
Sm	2.77	(-0.706	(-71.31	-6.19
Se	1.27	(-0.213	(-21.52	-13.36
Si	2.61	0.155	15.662	18.14
Ag	10.08	0.017	1.726	16.91
Na	22.15	11.823	1194.1	0.73
Sr	6.75	0.112	11.328	1.10
S	0.62	-0.005	-0.460	-340.99
Ta	2.34	(-0.099	(-9.954	-10.53
Tl	2.32	(-0.721	(-72.80	-10.38
Th	0.68	(-0.437	(-44.11	-6.82
Sn	1.18	0.059	5.937	8.88
Ti	3.47	0.069	6.968	3.52
W	0.99	(-0.070	(-7.100	-10.45
U	2.80	(-4.125	(-416.6	-6.17
V	2.60	(-0.029	(-2.972	-8.84
Zn	6.16	0.110	11.107	1.01
Zr	3.38	(-0.051	(-5.103	-13.89

Dilution factor : 101.000

April 2, 1990 ICP Analysis

Sample name : F458
Sample code 1 : 500 10
Sample code 2 : 89071
Sample code 3 : SPIKE
Programme : SST 02-Apr-90 11:23:28

NAME	MV INT	CONCEN	DILCOR	RSD
Al	11.85	20.326	424.74	0.94
Sb	0.38	0.326	6.836	26.76
As	0.83	-0.016	-0.331	-37.12
Ba	12.00	0.442	9.278	1.06
Be	0.57	-0.001	-0.013	-29.41
Bi	24.72	17.576	369.09	1.59
B	11.11	0.425	8.931	1.79
Cd	9.86	0.447	9.393	2.53
Ca	21.13	0.658	13.809	0.71
Ce	3.06	(-0.521	(-10.94	-15.66
Cr	4.59	0.871	18.294	1.86
Co	0.23	0.268	5.634	4.69
Cu	5.20	0.447	9.388	1.46
Eu	2.31	(-0.010	(-0.203	-13.65
Fe	98.10	10.106	212.22	1.55
La	0.45	0.387	8.120	1.99
Pb	0.28	0.445	9.347	12.00
Li	8.96	0.446	9.369	0.52
Mg	16.40	0.593	12.460	1.82
Mn	16.88	0.887	18.635	1.40
Hg	3.39	0.017	0.358	24.32
Mo	4.39	0.432	9.079	3.27
Nd	3.46	-0.049	-1.027	-80.27
Ni	7.06	0.463	9.725	2.97
P	10.83	11.566	242.88	6.37
K	2.11	(-0.551	(-11.57	-22.40
Sm	2.80	(-0.668	(-14.03	-12.56
Se	1.49	0.155	3.258	38.56
Si	4.91	1.298	27.262	10.03
Ag	17.82	0.280	5.879	2.85
Na	93.92	)57.508	)1207.7	0.74
Sr	23.32	0.557	11.705	1.07
S	0.85	0.290	6.099	9.86
Ta	2.78	0.072	1.506	19.35
Tl	2.45	(-0.482	(-10.12	-17.27
Th	0.69	(-0.394	(-8.271	-14.48
Sn	2.09	0.421	8.850	3.81
Ti	8.01	0.418	8.778	1.54
W	1.04	(-0.037	(-0.774	-36.81
U	2.93	(-2.914	(-61.20	-17.37
V	2.75	(-0.017	(-0.361	-22.32
Zn	20.34	0.516	10.846	1.99
Zr	4.00	0.140	2.942	7.32

Dilution factor : 21.0000

April 2, 1990 ICP Analysis

Sample name : F459
Sample code 1 : ICP28
Sample code 2 : DIGEST
Sample code 3 : DIRECT
Programme : SST 02-Apr-90 11:27:56

NAME	MV INT	CONCEN	RSD
Al	6.48	9.782	1.01
Sb	0.37	0.121	29.04
As	1.23	0.257	4.98
Ba	200.12	9.160	0.80
Be	0.68	0.002	8.19
Bi	3.31	0.140	6.31
B	2.75	0.038	4.97
Cd	2.01	0.005	9.35
Ca	13.60	0.419	0.93
Ce	9.21	8.320	0.93
Cr	42.01	9.897	1.68
Co	0.87	8.350	1.65
Cu	2.04	-0.001	-235.94
Dy	3.40	0.022	3.97
Fe	87.07	9.936	1.13
La	0.32	0.045	6.41
Pb	0.25	0.012	239.12
Li	129.93	9.059	0.92
Mg	2.97	0.097	1.69
Mn	184.72	10.068	1.33
Hg	3.60	0.033	9.92
Mo	1.62	0.027	6.53
Nd	10.95	10.411	2.34
Ni	98.84	10.142	1.29
P	1.06	0.221	10.57
K	2.10	(-0.603	-7.22
Sm	3.07	(-0.203	-12.70
Se	3.66	3.850	3.62
Si	3.37	0.531	0.89
Ag	10.83	0.042	6.26
Na	3.65	0.044	31.78
Sr	2.70	0.093	12.90
S	0.79	0.214	5.27
Ta	23.62	8.096	1.46
Tl	3.06	0.663	8.70
Th	0.81	0.224	15.44
Sn	25.72	9.876	1.26
Ti	125.66	9.463	1.10
W	1.13	0.018	47.56
U	3.88	5.508	6.51
V	3.02	0.006	56.81
Zn	4.99	0.076	2.48
Zr	42.68	9.673	1.26

April 2, 1990 ICP Analysis

Sample name : HNO3
Programme : SST 03-Apr-90 11:32:07

NAME	MV INT	CONCEN	RSD
Al	1.36	(-0.157	-19.48
Sb	0.36	0.102	27.27
As	0.94	-0.011	-137.83
Ba	2.37	-0.005	-43.29
Be	0.60	0.000	142.72
Bi	3.12	-0.014	-406.42
B	3.09	0.003	179.30
Cd	1.82	(-0.006	-23.30
Ca	0.38	-0.000	-19.92
Ce	3.30	-0.178	-43.86
Cr	0.93	(-0.012	-20.70
Co	0.20	-0.021	-103.92
Cu	1.99	-0.009	-54.92
Eu	2.55	-0.003	-46.36
Fe	1.16	0.001	249.65
La	0.30	-0.008	-50.92
Pb	0.25	-0.036	-86.60
Li	2.55	-0.010	-41.50
Mg	0.34	-0.000	-46.63
Mn	0.62	(-0.002	-18.92
Hg	3.25	0.007	29.44
Mo	1.42	-0.002	-183.29
Nd	3.41	-0.121	-61.91
Ni	2.71	0.005	111.05
P	0.90	0.038	56.77
K	2.15	(-0.399	-31.39
Sm	3.13	-0.172	-51.15
Se	1.34	-0.092	-22.45
Si	2.25	-0.027	-58.55
Ag	9.35	-0.008	-72.85
Na	3.28	(-0.190	-21.16
Sr	2.52	-0.002	-58.88
S	0.59	(-0.039	-36.29
Ta	2.51	-0.033	-53.87
Tl	2.63	-0.110	-91.63
Sb	0.75	-0.077	-66.64
Sn	1.03	-0.004	-366.78
Ti	2.50	-0.005	-54.00
W	1.08	-0.011	-135.85
U	3.14	-1.107	-47.75
V	2.86	-0.007	-64.92
Zn	2.24	-0.002	-36.61
Zr	3.35	-0.019	-58.39

April 2, 1990 ICP Analysis

Sample name : 78C11E
Sample code 1 : SST1
Programme : SST 02-Apr-90 11:35:58

NAME	MV INT	CONCEN	RSD
Al	1.39	-0.096	-36.79
Sb	1.07	9.968	2.03
As	0.95	0.066	5.03
Be	212.05	9.713	1.00
Be	0.69	0.000	57.28
Bi	3.09	-0.040	-93.64
B	191.09	9.896	0.90
Cd	182.29	10.177	2.50
Ca	318.10	10.073	1.03
Ce	9.41	8.613	2.66
Cr	42.61	10.041	1.12
Co	0.86	8.179	3.81
Cu	72.18	9.959	0.90
Eu	3.30	0.019	4.12
Fe	87.86	10.078	1.15
La	0.31	0.028	13.89
Pb	0.25	-0.053	-33.33
Li	140.04	9.772	0.69
Mg	270.85	9.998	1.78
Mn	187.58	10.224	1.28
Hg	3.24	0.007	60.61
Mo	1.45	0.003	118.91
Nd	11.45	11.112	1.19
Ni	98.95	10.154	1.49
P	0.92	0.056	24.39
K	9.28	24.340	1.22
Sm	2.90	(-0.521	-9.66
Se	3.69	3.912	1.12
Si	2.21	-0.047	-29.99
Ag	8.84	(-0.025	-14.32
Na	40.91	23.760	1.18
Sr	368.87	9.847	[illegible].18
S	0.80	0.219	3.55
Ta	2.43	(-0.062	-27.16
Tl	2.62	-0.157	-66.65
Th	0.76	-0.036	-139.29
Sn	122.86	48.711	2.13
Ti	2.38	(-0.015	-11.37
W	1.30	0.132	6.26
U	3.40	1.246	26.88
V	2.76	(-0.016	-29.09
Zn	353.01	10.051	1.47
Zr	3.24	(-0.046	-14.89

April 2, 1990 ICP Analysis

Sample name : 82838C
Sample code 1 : SST2
Programme : SST 02-Apr-90 11:40:27

NAME	MV INT	CONCEN	RSD
Al	3.36	3.718	1.03
Sb	0.37	0.223	9.55
As	2.59	1.172	2.05
Ba	2.46	-0.000	-811.59
Be	0.58	-0.000	-79.34
Bi	64.45	49.948	1.24
B	5.60	0.135	20.75
Cd	1.80	(-0.007	-25.07
Ca	1.92	0.020	0.97
Ce	3.35	-0.097	-27.56
Cr	1.26	0.068	3.53
Co	0.20	-0.126	-11.55
Cu	3.36	0.186	2.14
Eu	359.06	10.233	0.82
Fe	1.52	0.043	9.64
La	16.92	>46.857	0.96
Pb	2.96	48.163	1.57
Li	2.31	(-0.027	-2.68
Mg	0.57	0.008	2.47
Mn	0.77	0.006	8.98
Hg	3.53	0.027	7.02
Mo	1.43	-0.000	-525.11
Nd	3.74	0.345	20.75
Ni	2.73	0.007	72.15
P	1.15	0.321	9.23
K	1.95	(-1.135	-3.51
Sm	9.93	9.876	1.02
Se	1.39	-0.006	-217.03
Si	3.23	0.462	2.31
Ag	315.86	10.399	0.97
Na	3.02	(-0.356	-3.33
Sr	2.59	0.000	158.99
S	0.66	0.042	15.28
Ta	2.80	0.079	5.11
Tl	5.57	5.426	2.16
Th	11.12	51.161	1.01
Sn	1.15	0.047	4.95
Ti	2.85	0.021	5.52
W	1.03	(-0.046	-9.67
U	8.90	50.223	1.05
V	5.75	0.231	1.90
Zn	2.50	0.005	3.08
Zr	3.60	0.042	8.83

April 2, 1990 ICP Analysis

Sample name : 77C11F
Sample code 1 : SST3
Programme : SST 03-Apr-90 11:44:20

NAME	MV INT	CONCEN	RSD
Al	27.29	50.223	1.16
Sb	0.48	1.702	7.75
As	75.64	50.449	0.76
Ba	2.54	0.008	34.48
Be	293.66	9.702	0.91
Bi	4.16	0.831	4.95
B	5.01	0.104	7.05
Co	2.09	0.009	22.53
Cs	1.00	0.019	0.85
Ce	3.22	(-0.293	-45.36
Cr	1.09	0.027	20.87
Co	0.21	0.013	57.73
Cu	2.29	0.035	19.89
Ec	2.53	-0.003	-66.72
Fe	1.47	0.037	5.70
La	0.29	-0.018	-41.66
Pb	0.26	0.089	40.00
Li	2.48	(-0.015	-30.24
Mg	0.48	0.005	3.87
Mn	0.91	0.014	4.66
Hg	356.93	25.335	1.13
Mo	337.32	49.052	0.86
Nd	3.42	-0.106	-113.68
Ni	7.15	0.473	3.35
P	53.62	)61.228	1.10
K	2.10	(-0.598	-28.94
Sm	3.10	-0.227	-57.62
Se	28.60	45.515	0.75
Si	83.92	40.567	0.75
Ag	18.54	0.304	2.70
Na	3.47	-0.074	-77.66
Sr	2.59	0.000	459.95
S	41.63	50.972	1.75
Ta	122.02	45.976	0.73
Tl	29.52	50.737	0.57
Th	0.92	0.755	11.54
Sn	1.61	0.231	4.97
Ti	644.32	49.340	1.19
W	34.98	21.921	1.56
U	5.23	17.557	6.07
V	124.57	10.033	0.99
Zn	3.56	0.035	2.31
Zr	205.61	49.832	1.11

April 2, 1990 ICP Analysis

Sample name : HNO3
Programme : SST 02-Apr-90 13:48:30

NAME	MV INT	CONCEN	RSD
Al	1.30	(-0.279	-6.33
Sb	0.36	0.000	
As	0.00	(-0.038	-11.09
Ba	2.25	(-0.010	-10.19
Be	0.59	-0.000	-87.67
Bi	2.98	-0.125	-22.96
B	2.85	(-0.009	-17.33
Cd	1.73	(-0.012	-7.85
Ca	0.37	(-0.001	-11.10
Ce	3.13	(-0.415	-9.76
Cr	0.90	(-0.019	-3.31
Co	0.20	-0.034	-37.50
Cs	1.90	(-0.021	-13.51
Eu	2.42	(-0.007	-10.78
Fe	1.09	(-0.007	-22.55
La	0.29	-0.023	-23.13
Pb	0.25	-0.089	0.00
Li	2.40	(-0.020	-9.09
Mg	0.33	(-0.001	-8.81
Mn	0.62	(-0.002	-35.94
Hg	3.45	0.031	34.80
Mo	1.37	-0.009	-25.66
Nd	3.25	(-0.348	-12.56
Ni	2.63	-0.003	-147.68
P	0.88	0.016	98.80
K	2.07	(-0.722	-4.57
Sm	2.98	(-0.399	-10.37
Se	1.29	(-0.188	-10.00
Si	2.15	(-0.077	-10.64
Ag	8.74	(-0.029	-11.78
Na	3.12	(-0.298	-4.29
Sr	2.42	(-0.004	-11.37
S	0.56	(-0.077	-9.81
Ta	2.41	(-0.072	-9.64
Tl	2.55	(-0.300	-42.78
Th	0.73	(-0.218	-14.79
Sn	1.00	-0.015	-58.31
Ti	2.40	(-0.013	-14.00
W	1.05	-0.033	-15.84
U	2.97	(-2.537	-9.65
V	2.76	(-0.016	-22.76
Zn	2.16	(-0.005	-10.81
Zr	3.23	(-0.040	-11.21

APPENDIX A
ANALYTICAL ANALYSIS CARDS

Serial No.	Sample Point	Date	Time Issued	Priority
F 441.-5002	SEGMENT-B	11-30-89	8:24	24

Determination	Method/Standard	Result Units	Charge Code	Rerune
PRT-SIZE	LI-000-200	NONE	WB75L	0

Sample Size: ?

Customer ID: 89-071

Remarks, Calculations, Results:
PARTICLE SIZE DISTRIBUTION Bottle 285
Gross wt 22.87 Results: see attached (6)
Tare wt 21.67
Sample wt 22

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
RLW KJP JRS	2/14/91			
Hrs 1-27-90	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
			DMS

54-6600-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 441.-5003	SEGMENT-B	11-30-89	8:24	16

Determination	Method/Standard	Result Units	Charge Code	Rerune
HOMOGZT	LI-000-200	NONE	WB75L	0

Sample Size: ?

Customer ID: 89-071

Remarks, Calculations, Results:
Homogenization Complete
Jar # 261
WHC N 3134 pg 26

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
61300 68090				
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
4/14/90			

54-6600-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 441.-5000	SEGMENT-B	11-30-89	8:24	18

Determination	Method/Standard	Result Units	Charge Code	Rerune
APPR/OTR	LI-000-200	NONE	WB75L	0

Sample Size: ? WHC N 3133

Customer ID: 89-071

Remarks, Calculations, Results:
Penitrometer 160 mm
A. JAR ID# 261
B. JAR TARE WT. 221.2
C. JAR TOTAL WT. 373.6
D. C-B= 152.4
E. EST. VOL./LENGTH 12"
F. VISUAL REMARKS Very dark brown solids firm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
RLW KJP JRS	61300 65286			
Hrs 1-27-90	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	

54-6600-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 441.-5001	SEGMENT-B	11-30-89	8:24	18

Determination	Method/Standard	Result Units	Charge Code	Rerune
VOA SAMP	LI-000-200	NONE	WB75L	0

Sample Size: ?

Customer ID: 89-071

Remarks, Calculations, Results:
DUPLICATE SAMPLE Bottle # 286
Gross wt 32.26
Tare wt 21.20
Sample wt 11.06 gm WHC N3133

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
RLW KJP JRS	61300 65286			
Hrs 1-27-90	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	

54-6600-061 (R-10-83)

pH Analysis of Solid Sample

Serial No.	Sample Point	Date	Time Issued	Priority
F 461.-5315	SEGMENT-V	11-30-89	8:30	18

Determination	Method/Standard	Result Units	Charge Code	Reruns
pH	LA-212-103	NONE	WB75L	0

Sample Size: ? 1 ml

Customer ID: 089071

Remarks, Calculations, Results:
~~LMCS CHECK SAMPLE~~
pH FOUND 6.03
STD ID
SAMPLE TEMP 24.4
Reagent Blank

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C269				
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
3-5-90	1332	

3-8

84-6800-081 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 440.-5515	SEGMENT-A	11-30-89	8:24	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
pH	LA-212-103	% RECOVERY	WB75L	0

Sample Size: ? 1 ml

Customer ID: 089071

Remarks, Calculations, Results
LMCS CHECK SAMPLE
pH FOUND 10.06
STD ID 7251-13
SAMPLE TEMP 24.4

K4

100.6%

10.06 / 10.00

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C269				
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
3-5-90	1331	

3-8

84-6800-081 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 442.-5115	SEGMENT-C	11-30-89	8:25	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
pH	LA-212-103	NONE	WB75L	0

Sample Size: ? 3.200 g / 3.200 ml

Customer ID:

Remarks, Calculations, Results
pH 13.09
SAMPLE TEMP 24.5

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C269				
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
3-5-90	1334	

3-8

84-6800-081 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 441.-5015	SEGMENT-B	11-30-89	8:24	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
pH	LA-212-103	NONE	WB75L	0

Sample Size: ? 2.950 g / 2.950 ml

Customer ID: 89-071

Remarks, Calculations, Results:
pH 12.49
SAMPLE TEMP 24.5

#353 10.43g

WHC D3134

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C269				
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
3-5-90	1333	

3/8

84-6800-081 (R-10-83)

pH Analysis of Solid Sample

Serial No.	Sample Point	Date	Time Issued	Priority
F 444.-5515	SEGMENT-E	11-30-89	8:25	19

Determination	Method/Standard	Result Units	Charge Code	Rerun
pH	LA-212-103	% RECOVERY	WB75L	0

Sample Size	Customer ID
? 1 ml	089071

Remarks, Calculations, Results:

LMCS CHECK SAMPLE
pH FOUND 9.99
STD ID [illegible]
SAMPLE TEMP 24.5

9.99 / 10.00

99.9%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
LC269				
	Hrs	Hrs	Hrs	Hrs
Date 3-5-90	Time Completed 3-8 1330	Lab Unit Mgr		

54-6800-061 (R-10-83)

Percent Water Analysis

Serial No.	Sample Point	Date	Time Issued	Priority
F 416.-5510	SEGMENT-A	11-30-89	8: 5	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
% H20	LA-564-101	% RECOVERY	WB75L	0

Sample Size: ?

Customer ID: 89-070

Remarks, Calculations, Results:

LMCS CHECK SAMPLE
LMCS ID 11C11AA

① 22.8786 ② 57.76 G 22.8859 98.3%
58.16 21.4798 T 21.5004 57.96/58.98
22.0651 W1 22.0857
22.0632 W2 22.0811

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B598/RH				[signature]
Hrs	Hrs	Hrs	Hrs	Hrs

Date: 3-2-90 | Time Completed: | Lab Unit Mgr: [signature]

54-6800-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 564.-5510	SEGMENT-E	12- 1-89	11:34	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
% H20	LA-564-101	% RECOVERY	WB75L	0

Sample Size: ?

Customer ID: 089076

Remarks, Calculations, Results:

LMCS CHECK SAMPLE
LMCS ID 11C11AA

① 57.77 ② 57.18%/58.98 56.58
G 22.9823 22.9189 96.95%
T 21.59560 21.5377
W1 22.1812 22.1374
W2 22.1780 22.1310

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B598				[signature]
Hrs	Hrs	Hrs	Hrs	Hrs

Date: 3-2-90 | Time Completed: | Lab Unit Mgr: [signature]

54-6800-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 441.-5010	SEGMENT-B	11-30-89	8:24	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
% H20	LA-564-101	%	WB75L	0

Sample Size: ?

Customer ID: 89-071

Remarks, Calculations, Results:

#355 4.19g

G. 22.3233
T. 21.4150 39.06%
W1 21.9685
W2 21.9678 WHCN 3134

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B598/RH				[signature]
Hrs	Hrs	Hrs	Hrs	Hrs

Date: 3-2-90 | Time Completed: | Lab Unit Mgr: [signature]

54-6800-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 437.-5310	SEGMENT-V	11-30-89	8: 9	18

Determination	Method/Standard	Result Units	Charge Code	Reruns
% H20	LA-564-101	% g	WB75L	0

Sample Size: ?

Customer ID: 089070

Remarks, Calculations, Results:

REAGENT BLANK

① .0065 ② .0059
21.5642 G 21.6807 .0062g
21.5642 T. 21.6807
21.5578 W1 21.6748
21.5576 W2 21.6746

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B598/RH				[signature]
Hrs	Hrs	Hrs	Hrs	Hrs

Date: 3-2-90 | Time Completed: | Lab Unit Mgr: [signature]

54-6800-061 (R-10-83)

Percent Water Analysis

Serial No.	Sample Point	Date	Time Issued	Priority
F 442.-5110	SEGMENT-C	11-30-89	8:25	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
% H2O	LA-564-101	%	WB75L	0

Sample Size	Customer ID
?	

Remarks, Calculations, Results:

DUPLICATE SAMPLE

G. 22.5338
T. 21.5988
W1 22.1688
W2 22.1680

39.04%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6859 8/RH				
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
3-2-90		

54-6800-081 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 446.-6000	SEGMENT-G	11-30-89	8:25	18

Determination	Method/Standard	Result Units	Charge Code	Reruns
FUSION	LA-549-141	G/L	WB75L	0

Sample Size: ?

Customer ID: 89071

Remarks, Calculations, Results:
GRAMS SAMPLE .5638
VOLUME ON COMPLETION 200 mL
2.82^{-3} g/ml

WHCW 3134

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B598/RH				
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
3-10-90		

54-6800-081 (R-10-83)

Serial No	Sample Point	Date	Time Issued	Priority
F 447.-6100	SEGMENT-H	11-30-89	8:26	18

Determination	Method/Standard	Result Units	Charge Code	Reruns
FUSION	LA-549-141	G/L	WB75L	0

Sample Size: ?

Customer ID:

Remarks, Calculations, Results:
DUPLICATE ANALYSIS
GRAMS SAMPLE .5038
VOLUME ON COMPLETION 200 mL
2.52^{-3} g/ml

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B598/RH				
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
3-10-90		

54-6800-081 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 436.-6300	SEGMENT-U	11-30-89	8: 8	18

Determination	Method/Standard	Result Units	Charge Code	Reruns
FUSION	LA-549-141	G/L	WB75L	0

Sample Size: ? 200 mL

Customer ID: 089070

Remarks, Calculations, Results:
REAGENT BLANK

complete

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B598/RH				
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
3-10-90		

54-6800-081 (R-10-83)

Total Alpha Analysis on the Fusion Dissolution

Serial No.	Sample Point	Date	Time Issued	Priority
F 460.-6320	SEGMENT-U	11-30-89	8:30	18

Determination	Method/Standard	Result Units	Charge Code	Reruns
AT	LA-548-101	uCI/L	WB75L	0

Sample Size: ? 10 ml

Customer ID: G89071

Remarks, Calculations, Results:
REAGENT BLANK
H2O

< 1.83-4 uci/l

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C269				
Mary Fraley	Hrs	Hrs	Hrs	Hrs

Date: 3-23-90 | Time Completed | Lab Unit Mgr

54-6600-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 445.-6520	SEGMENT-F	11-30-89	8:25	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
AT	LA-548-101	% RECOVERY	WB75L	0

Sample Size: ? 10 ml

Customer ID: G89071

Remarks, Calculations, Results:
LMCS CHECK SAMPLE
LMCS ID 132B49

96.7%

9.34-3 / 9.65-3

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C269				
Mary Fraley	Hrs	Hrs	Hrs	Hrs

Date: 3-23-90 | Time Completed | Lab Unit Mgr

54-6600-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 447.-6120	SEGMENT-H	11-30-89	8:26	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
AT	LA-548-101	uCI/L	WB75L	0

Sample Size: ? 100-10-250

Customer ID: G89071

Remarks, Calculations, Results:
DUPLICATE SAMPLE

1.121 uci/l

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C269				
Mary Fraley	Hrs	Hrs	Hrs	Hrs

Date: 3-23-90 | Time Completed | Lab Unit Mgr

54-6600-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 446.-6020	SEGMENT-G	11-30-89	8:25	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
AT	LA-548-101	uCI/L	WB75L	0

Sample Size: ? 100-10-250

Customer ID: G89071

Remarks, Calculations, Results:

1.207 uci/l

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C269				
Mary Fraley	Hrs	Hrs	Hrs	Hrs

Date: 3-23-90 | Time Completed | Lab Unit Mgr

54-6600-061 (R-10-83)

14/2

30/10 — 1.0

18/10

FO446.-6020

Alpha Calculation by DM on 03-24-1990 at 06:06:30
Det #14 2 -inch mount Alpha eff. : .2111
Sample size : .25 mL Dilution : 101

Mount # 1

30 / 10 - 1.0 = 1.7241E+00 uCi/L alpha

Mount # 2

18 / 10 - 1.0 = 6.8965E-01 uCi/L alpha

14/2

26/10 — 1.0

20/10

FO447.-6120

Alpha Calculation by DM on 03-24-1990 at 06:07:11
Det #14 2 -inch mount Alpha eff. : .2111
Sample size : .25 mL Dilution : 101

Mount # 1

26 / 10 - 1.0 = 1.3793E+00 uCi/L alpha

Mount # 2

20 / 10 - 1.0 = 8.6207E-01 uCi/L alpha

14/2

471/10 - 1.0

424/10

FO445.-6520

Alpha Calculation by DM on 03-24-1990 at 06:04:38
Det #14 2 -inch mount Alpha eff. : .2111
Sample size : 10 mL Dilution : 1

Mount # 1

471 / 10 - 1.0 = 9.8369E-03 uCi/L alpha

Mount # 2

424 / 10 - 1.0 = 8.8340E-03 uCi/L alpha

14/2

12/10 — 1.0

7/10

FO460.-6320

Alpha Calculation by DM on 03-24-1990 at 06:05:23
Det #14 2 -inch mount Alpha eff. : .2111
Sample size : 10 mL Dilution : 1

Mount # 1

12 / 10 - 1.0 (2.0782E-04 uCi/L alpha

Mount # 2

7 / 10 - 1.0 (1.5722E-04 uCi/L alpha

Total Alpha Analysis on the Fusion Dissolution

Serial No.	Sample Point	Date	Time Issued	Priority
F 449.-6520	SEGMENT-J	11-30-89	8:26	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
AT	LA-548-101	% RECOVERY	WB75L	0

Sample Size: ? 10 ml

Customer ID: 689071

Remarks, Calculations, Results:

LMCS CHECK SAMPLE
LMCS ID 132B44

104.6%

1.01-2 / 9.6539-3

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C269				Sc
Mary Fraley	Hrs	Hrs	Hrs	Hrs

Date: 3-23-90 | Time Completed: | Lab Unit Mgr: [signature] Kathy Chomelike

54-6800-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 448.-6220	SEGMENT-1	11-30-89	8:26	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
AT	LA-508-101	% RECOVERY	WB75L	0

Sample Size: ? 100-10-250

Customer ID: 689071

Remarks, Calculations, Results:

SPIKE SAMPLE
SPIKE ID 132B44
SPIKE VOLUME 10 ml

105.0%

~~4.22 vial/l - 1.207 = 4.099/10,000~~

1.013-2

~~4.099~~-3 / 9.65-3

~~42.5%~~

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C269				Sc
Mary Fraley	Hrs	Hrs	Hrs	Hrs

Date: 3-23-90 | Time Completed: | Lab Unit Mgr: [signature] Kathy Chomelike

54-6800-061 (R-10-83)

14/2 F0449.-6520

470/10 — 1.0

498/10

Alpha Calculation by DM on 03-24-1990 at 07:08:01
Det #14 2 -inch mount Alpha eff. : .2111
Sample size : 10 mL Dilution : 1

Mount # 1

470 / 10 - 1.0 = 9.8156E-03 uCi/L alpha

Mount # 2

498 / 10 - 1.0 = 1.0413E-02 uCi/L alpha

14/2 F0448.-6220

514/10 — 1.0

484/10

Alpha Calculation by DM on 03-24-1990 at 06:07:51
Det #14 2 -inch mount Alpha eff. : .2111
Sample size : .25 mL Dilution : 101

Mount # 1

514 / 10 - 1.0 = 4.3448E+01 uCi/L alpha

Mount # 2

484 / 10 - 1.0 = 4.0862E+01 uCi/L alpha

Total Beta Analysis on the Fusion Dissolution

3-4

Serial No.	Sample Point	Date	Time Issued	Priority
F 460.-6325	SEGMENT-U	11-30-89	8:30	18

Determination	Method/Standard	Result Units	Charge Code	Reruns
TB	LA-548-101	uCI/L	WB75L	0

Sample Size: ? 10 ml

Customer ID: 689071

Remarks, Calculations, Results: REAGENT BLANK H_2O Count on 13, 14 or 15

< 9.94^{-4} uci/l

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C269				SL
Mary Franz	Hrs	Hrs	Hrs	Hrs

Date: 3-23-90 Time Completed: Lab Unit Mgr: Paul N. Pool Kathy Hondike

54-6800-081 (R-10-83)

1-2

Serial No.	Sample Point	Date	Time Issued	Priority
F 445.-6525	SEGMENT-F	11-30-89	8:25	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
TB	LA-508-101	% RECOVERY	WB75L	0

Sample Size: ? 10 ml

Customer ID: 689071

Remarks, Calculations, Results: LMCS CHECK SAMPLE LMCS ID 132B44 Count on 13, 14 or 15

1.32^{-1} / 1.3036^{-1} 101.390

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C269				SL
Mary Franz	Hrs	Hrs	Hrs	Hrs

Date: 3-23-90 Time Completed: Lab Unit Mgr: Paul N. Pool Kathy Hondike

54-6800-081 (R-10-83)

7-8

Serial No.	Sample Point	Date	Time Issued	Priority
F 447.-6125	SEGMENT-H	11-30-89	8:26	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
TB	LA-548-101	uCI/L	WB75L	0

Sample Size: ? 100-10-250

Customer ID: 689071

Remarks, Calculations, Results: DUPLICATE SAMPLE Count on 13, 14 or 15

2.442^{3} uci/l

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C269				SL
Mary Franz	Hrs	Hrs	Hrs	Hrs

Date: 3-23-90 Time Completed: Lab Unit Mgr: Paul N. Pool Kathy Hondike

54-6800-081 (R-10-83)

5-6

Serial No	Sample Point	Date	Time Issued	Priority
F 446.-6025	SEGMENT-G	11-30-89	8:25	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
TB	LA-508-101	uCI/L	WB75L	0

Sample Size: ? 100-10-250

Customer ID: 689071

Remarks, Calculations, Results: Count on 13, 14 or 15

2.404^{3} uci/l

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C269				SL
Mary Franz	Hrs	Hrs	Hrs	Hrs

Date: 3-23-90 Time Completed: Lab Unit Mgr: Paul N. Pool Kathy Hondike

54-6800-081 (R-10-83)

14/2

$\frac{276}{10} - 21$

$\frac{230}{10}$

F0460.-6325

Beta Calculation by DM on 03-24-1990 at 06:05:21
Det #14 2 -inch mount Beta eff. : .2734
Sample size : 10 mL Dilution : 1

Mount # 1

$\frac{276}{10} - 21.0 = 1.0874E-03$ uCi/L beta

Mount # 2

$\frac{230}{10} - 21.0 < 8.9976E-04$ uCi/L beta

14/2

$\frac{8517}{10} - 21$

$\frac{7966}{10}$

F0445.-6525

Beta Calculation by DM on 03-24-1990 at 06:04:36
Det #14 2 -inch mount Beta eff. : .2734
Sample size : 10 mL Dilution : 1

Mount # 1

$\frac{8517}{10} - 21.0 = 1.3687E-01$ uCi/L beta

Mount # 2

$\frac{7966}{10} - 21.0 = 1.2779E-01$ uCi/L beta

14/2

$\frac{36550}{10} - 21$

$\frac{37252}{10}$

F0447.-6125

Beta Calculation by DM on 03-24-1990 at 06:07:09
Det #14 2 -inch mount Beta eff. : .2734
Sample size : .25 mL Dilution : 101

Mount # 1

$\frac{36550}{10} - 21.0 = 2.4189E+03$ uCi/L beta

Mount # 2

$\frac{37252}{10} - 21.0 = 2.4656E+03$ uCi/L beta

14/2

$\frac{36915}{10} - 21$

$\frac{35745}{10}$

F0446.-6025

Beta Calculation by DM on 03-24-1990 at 06:06:28
Det #14 2 -inch mount Beta eff. : .2734
Sample size : .25 mL Dilution : 101

Mount # 1

$\frac{36915}{10} - 21.0 = 2.4432E+03$ uCi/L beta

Mount # 2

$\frac{35745}{10} - 21.0 = 2.3653E+03$ uCi/L beta

Total Beta Analysis on the Fusion Dissolution

9-10

Serial No.	Sample Point	Date	Time Issued	Priority
F 448.-6225	SEGMENT-I	11-30-89	8:26	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
TB	LA-548-101	% RECOVERY	WB75L	0

Sample Size	Customer ID
? 100-10-250 (F446)	689071

Remarks, Calculations, Results:
SPIKE SAMPLE
SPIKE ID 132B44
SPIKE VOLUME 10 ml

Count 13, 14 or 15 ~~14~~
99.1% ~~40.64%~~

~~2.926³ mm/l - 2.404³ = 522.0~~ / 10,000 ~~17~~
1.292⁻¹ / 1.3036⁻¹

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C269				[illegible]
[illegible]	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
3-23-90		[illegible]	Kathy [illegible]

84-6800-081 (R-19-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 449.-6525	SEGMENT-J	11-30-89	8:26	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
TB	LA-548-101	% RECOVERY	WB75L	0

Sample Size	Customer ID
? 10 ml	689071

Remarks, Calculations, Results:
LMCS CHECK SAMPLE
LMCS ID 132B44

Count on 13, 14 or 15
104.3%
1.36⁻¹ / 1.3036⁻¹

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6C269				[illegible]
[illegible]	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
3-23-90		[illegible]	Kathy [illegible]

84-6800-081 (R-19-83)

14/2

$\frac{43360}{10} - 21$

FO448.-6225

$\frac{44974}{10}$

Beta Calculation by DM on 03-24-1990 at 06:07:49
Det #14 2 -inch mount Beta eff. : .2734
Sample size : .25 mL Dilution : 101

Mount # 1

$\frac{43360}{10} - 21.0 = 2.8722E+03$ uCi/L beta

Mount # 2

$\frac{44974}{10} - 21.0 = 2.9796E+03$ uCi/L beta

14/2

$\frac{8397}{10} - 21$

FO449.-6525

$\frac{8481}{10}$

Beta Calculation by DM on 03-24-1990 at 07:07:59
Det #14 2 -inch mount Beta eff. : .2734
Sample size : 10 mL Dilution : 1

Mount # 1

$\frac{8397}{10} - 21.0 = 1.3485E-01$ uCi/L beta

Mount # 2

$\frac{8481}{10} - 21.0 = 1.3627E-01$ uCi/L beta

1071

Serial No.	Sample Point	Date	Time Issued	Priority
F 436.-6330	SEGMENT-U	11-30-89	8: 9	18

Determination	Method/Standard	Result Units	Charge Code	Reruns
GEA	LA-548-121	uCI/L	WB75L	0

Sample Size: ? 1ml

Customer ID: C89070

Remarks, Calculations, Results:
REAGENT BLANK

Co^{60} < 3.73^{-4} uci/l

Cs^{137} < 481^{-4} uci/l

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6 BS98/RH				gl
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
3-14-90		gp	Dm &

54-6800-061 (R-10-83)

1070

Serial No.	Sample Point	Date	Time Issued	Priority
F 421.-6530	SEGMENT-F	11-30-89	8: 5	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
GEA	LA-548-121	% RECOVERY	WB75L	0

Sample Size: ? 500λ Li .001 2

Customer ID: C89070

Remarks, Calculations, Results:
LMCS CHECK SAMPLE
LMCS ID 122634

Co^{60} 2.14' / 2.0933' 102.2%

Co^{137} 2.85' / 2.8979' 98.3%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6 BS98/RH				gl
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
3-14-90		gp	Dm &

54-6800-061 (R-10-83)

1076

Serial No.	Sample Point	Date	Time Issued	Priority
F 447.-6130	SEGMENT-H	11-30-89	8:26	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
GEA	LA-548-121	uCI/L	WB75L	0

Sample Size: ? 50λ

Customer ID: C89071

Remarks, Calculations, Results:
DUPLICATE SAMPLE

1.37^{2} uci/l Cs^{137}

< 5.44^{-1} uci/l Co^{60}

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6 BS98/RH				gl
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
3-14-90			

54-6800-061 (R-10-83)

1075

Serial No.	Sample Point	Date	Time Issued	Priority
F 446.-6030	SEGMENT-G	11-30-89	8:26	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
GEA	LA-548-121	uCI/L	WB75L	0

Sample Size: ? 50λ

Customer ID: C89071

Remarks, Calculations, Results:

Co^{60} < 6.79^{-1} uci/l

Cs^{137} 1.79^{2} uci/l

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6 BS98/RH				gl
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
3-14-90		gp	Dm &

54-6800-061 (R-10-83)

1087

Serial No.	Sample Point	Date	Time Issued	Priority
F 569.-6530	SEGMENT-J	12- 1-89	11:35	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
GEA	LA-548-121	% RECOVERY	WB75L	0

Sample Size	Customer ID
? 500 λ	089076

Remarks, Calculations, Results:

LMCS CHECK SAMPLE
LMCS ID 122844

Co^{60} 2.07'/2.0932' 98.9%

Cs^{137} 2.82'/2.8979' 97.3%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
GB598/RH				SNL
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
3-14-90		CP	DMS

84-6800-081 (R-10-83)

1084

Serial No.	Sample Point	Date	Time Issued	Priority
F 568.-6230	SEGMENT-I	12- 1-89	11:35	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
GEA	LA-548-121	% RECOVERY	WB75L	0

Sample Size	Customer ID
? 50 λ	089076

Remarks, Calculations, Results:

SPIKE SAMPLE F447
SPIKE ID 122844
SPIKE VOLUME 500

93.5%

2.04' - 6.85 = 13.55 x 2 = 2.71'/2.8979'

~~4.08² - 1.37² = 2.71²~~ KT

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
GB598/RH				SNL
Hrs	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
3-14-90		CP	DMS

84-6800-081 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 445.-6540	SEGMENT-F	11-30-89	RERUN	23

Determination	Method/Standard	Result Units	Charge Code	Reruns
U	LA-925-106	% RECOVERY	WB75L	1

Sample Size: ? .100 or 10 or .100 ml — Customer ID: 089071

Remarks, Calculations, Results: LMCS CHECK SAMPLE — Spike 54B38 5.62E-4 — 86.0%
LMCS ID 58B38

$$\frac{.130 \left(\frac{5.6}{5.7}\right)(.130)(5.62E-4)(.1)(1010)}{.410 - \left[\left(\frac{5.6}{5.7}\right)(.130)\right]} = 2.58E-2 / 2.99E-2$$

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B598			[signature]	
Hrs	Hrs	Hrs	Hrs	Hrs
Ronald D. Hale			[signature]	

Date	Time Completed	Lab Unit Mgr
7-11-90		[signature] [signature]

54-6800-081 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 460.-6340	SEGMENT-U	11-30-89	RERUN	18

Determination	Method/Standard	Result Units	Charge Code	Reruns
U	LA-925-106	G/L	WB75L	1

Sample Size: .05 ml — Customer ID: 089071

Remarks, Calculations, Results: REAGENT BLANK — Spike 54B38 5.62E-4

$$\frac{.02 \left(\frac{5.55}{5.65}\right)(.02)(5.62E-4)(.1)(20)}{.220 - \left[\left(\frac{5.55}{5.65}\right)(.02)\right]} = 1.1E-4 \text{ g/l}$$

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B598			[signature]	
Hrs	Hrs	Hrs	Hrs	Hrs
Ronald D. Hale				

Date	Time Completed	Lab Unit Mgr
7-11-90		[signature] [signature]

54-6800-081 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 449.-6540	SEGMENT-J	11-30-89	8:27	23

Determination	Method/Standard	Result Units	Charge Code	Reruns
U	LA-925-106	% RECOVERY	WB75L	1

Sample Size: ? 0.100 ml - 10 ml - 0.100 ml — Customer ID: 089071

Remarks, Calculations, Results: LMCS CHECK SAMPLE — Spike 54B38 5.62E-4 — RERUN — 87.3%
LMCS ID 58B38

$$\frac{.130 \left(\frac{5.6}{5.7}\right)(.130)(5.62E-4)(.1)(1010)}{.405 - \left[\left(\frac{5.6}{5.7}\right)(.130)\right]} = 2.61E-2 / 2.99E-2$$

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B598			[signature]	
Hrs	Hrs	Hrs	Hrs	Hrs
Ronald D. Hale			[signature]	

Date	Time Completed	Lab Unit Mgr
7-11-90		[signature] [signature]

54-6800-081 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 447.-6140	SEGMENT-H	11-30-89	8:26	23

Determination	Method/Standard	Result Units	Charge Code	Reruns
U	LA-925-106	G/L	WB75L	1

Sample Size: ? .100 ml - 10 ml - .250 ml — Customer ID: 089071

Remarks, Calculations, Results: DUPLICATE SAMPLE — Spike 54B38 5.62E-4 — RERUN

$$\frac{.050 \left(\frac{5.75}{5.85}\right)(.05)(5.62E-4)(.1)(404)}{.320 - \left[\left(\frac{5.75}{5.85}\right)(.05)\right]} = 4.12E-3 \text{ g/l}$$

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B598			[signature]	
Hrs	Hrs	Hrs	Hrs	Hrs
Ronald D. Hale				

Date	Time Completed	Lab Unit Mgr
7-11-90		[signature] [signature]

54-6800-081 (R-10-83)

Serial No	Sample Point	Date	Time Issued	Priority
F 448.-6240	SEGMENT-I	11-30-89	RERUN	23

Determination	Method/Standard	Result Units	Charge Code	Reruns
U	LA-925-106	% RECOVERY	WB75L	1

Sample Size: ? 100ul sample 100ul std > 10ml - ~~100ul~~ 250ul

Customer ID: 089071

Remarks, Calculations, Results:
SPIKE SAMPLE F 446 Spike 54B38 5.62E-4
SPIKE ID 58B38
SPIKE VOLUME ____

~~2.72E-2/2.99E-2 = 91.1%~~

.380 $\frac{(\frac{5.75}{5.85})(.380)(5.62E-4)(.1)(408)}{.630-[(\frac{5.75}{5.85})(.380)]}$ (3.33E-2) - (4.06E-3) =

.630

over

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B598			[signature]	
Hrs	Hrs	Hrs	Hrs	Hrs
[signature]				

Date	Time Completed	Lab Unit Mgr	
7-11-90		[signature]	[signature]

54-6800-081 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 446.-6040	SEGMENT-B	11-30-89	RERUN	23

Determination	Method/Standard	Result Units	Charge Code	Reruns
U	LA-925-106	G/L	WB75L	1

Sample Size: ? 0.100 ml - 10ml - 0.250 ml

Customer ID: 089071

Remarks, Calculations, Results: Spike 54B38 5.62E-4

.060 $\frac{(\frac{5.75}{5.85})(.06)(5.62E-4)(.1)(404)}{.280-[(\frac{5.75}{5.85})(.06)]}$ = 6.06E-3 g/l

.280

over

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B598			[signature]	
Hrs	Hrs	Hrs	Hrs	Hrs
[signature]				

Date	Time Completed	Lab Unit Mgr	
7-11-90		[signature]	[signature]

54-6800-081 (R-10-83)

F0448.-6240

$$\frac{.38\,(5.626\text{-}04)(.1)(408)}{\left(\frac{5.335}{5.75}\right)(.63)-.38} = 3.34\times10^{-2}\ g/L$$

$$\frac{3.34\times10^{-2} - 6.06\times10^{-3}}{2.99\times10^{-2}}\,(100) = 91.4\%$$

F0446.-6040

$$\frac{(.06)(5.626\text{-}4)(.1)(408)}{\left(\frac{5.335}{5.75}\right)(.24)-(.06)} = 6.06\times10^{-3}$$

Serial No.	Sample Point	Date	Time Issued	Priority
F 451.-7000	SEGMENT-L	11-30-89	8:27	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
H2O-DGST	LA-504-101	G/L	WB75L	0

Sample Size: ?

Customer ID: 89071

Remarks, Calculations, Results:

GRAMS SAMPLE .5013
VOLUME ON
COMPLETION 50 ml

1.003^{-2} g/ml

#362 3.419

F451
SEQUENCE # : 11
WT 1: 119.9630
WT 2: 120.4640
NET WEIGHT:
---> 0.5013 GRAMS
03/05/90 @ 13:59:30

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
80725/S.C	6C269			
Hrs	Mary Franz	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
3-6-90			DMS

94-6800-081 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 462.-7300	SEGMENT-W	11-30-89	8:30	18

Determination	Method/Standard	Result Units	Charge Code	Reruns
H2O-DGST	LA-504-101	G/L	WB75L	0

Sample Size: ?

Customer ID: 089071

Remarks, Calculations, Results:

REAGENT BLANK

complete

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
80725/S.C.	6C269			
Hrs	Mary Franz	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
3-6-90			DMS

94-6800-081 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 453.-7200	SEGMENT-N	11-30-89	8:28	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
H2O-DGST	LA-504-101	% RECOVERY	WB75L	0

Sample Size: ?

Customer ID: 089071

Remarks, Calculations, Results:

SPIKED ANALYSIS
GRAMS SAMPLE .5063
VOLUME ON
COMPLETION 50 ml
VOLUME SPIKE
SPIKE ID

1.013^{-2} g/ml

F453
SEQUENCE # : 13
WT 1: 120.0930
WT 2: 120.5970
NET WEIGHT:
---> 0.5063 GRAMS
03/05/90 @ 14:06:15

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
80725/S.C.	6C269			
Hrs	Mary Franz	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
3-6-90			DMS

94-6800-081 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 452.-7100	SEGMENT-M	11-30-89	8:28	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
H2O-DGST	LA-504-101	G/L	WB75L	0

Sample Size: ?

Customer ID:

Remarks, Calculations, Results:

DUPLICATE ANALYSIS
GRAMS SAMPLE 0.4870
VOLUME ON
COMPLETION 50 ml

9.74^{-3} g/ml

F452
SEQUENCE # : 12
WT 1: 119.8650
WT 2: 120.3780
NET WEIGHT:
---> 0.4870 GRAMS
03/05/90 @ 14:01:54

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
80725/S.C.	6C269			
Hrs	Mary Franz	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
3-6-90			DMS

94-6800-081 (R-10-83)

Ion Chromatograph Analysis on the Water Digestion - Chloride Analysis

Serial No.	Sample Point	Date	Time Issued	Priority
F 438.-7372	SEGMENT-W	11-30-89	8: 9	18

Determination	Method/Standard	Result Units	Charge Code	Reruns
CL	LA-533-105	PPM	WB75L	0

Sample Size: ? Direct

Customer ID: C89070

Remarks, Calculations, Results:
REAGENT BLANK

.202 ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107/NEW				[signature] 4/1/71
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
4/5/90		[signature]	[signature]

84-6800-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 426.-7572	SEGMENT-K	11-30-89	8: 7	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
CL	LA-533-105	% RECOVERY	WB75L	0

Sample Size: 100-10

Customer ID: C89070

Remarks, Calculations, Results:
LMCS CHECK SAMPLE
LMCS ID UC1/AO

KT

99.7%

~~61~~ KT 71.81/72.00

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107/NEW				[signature] 4/1/71
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
4/5/90		[signature]	[signature]

84-6800-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 452.-7172	SEGMENT-M	11-30-89	8:28	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
CL	LA-533-105	PPM	WB75L	0

Sample Size: ? 100-10

Customer ID: C89071

Remarks, Calculations, Results:
DUPLICATE SAMPLE

1.89 ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107/NEW				[signature]
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
4/5/90		[signature]	[signature]

84-6800-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 451.-7072	SEGMENT-L	11-30-89	8:27	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
CL	LA-533-105	PPM	WB75L	0

Sample Size: ? 100-10

Customer ID: C89071

Remarks, Calculations, Results:

2.01 ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107/NEW				[signature] 4/1/71
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
4/5/90		[signature]	[signature]

84-6800-061 (R-10-83)

Ion Chromatograph Analysis on the Water Digestion - Chloride Analysis

Serial No.	Sample Point	Date	Time Issued	Priority
F 574.-7572	SEGMENT-O	12- 1-89	11:36	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
CL	LA-533-105	% RECOVERY	WB75L	0

Sample Size	Customer ID
100-10	089076

Remarks, Calculations, Results:

LMCS CHECK SAMPLE
LMCS ID EC11HO

KJ

97.5%

70.21/72.0

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107/WEW				[signature]
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
4/5/90		[signature]	KJ

84-6800-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 429.-7272	SEGMENT-N	11-30-89	8: 8	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
CL	LA-533-105	% RECOVERY	WB75L	0

Sample Size	Customer ID
? 100-10	089[illegible]

Remarks, Calculations, Results:

SPIKE SAMPLE
SPIKE ID 35C9-77
SPIKE VOLUME .300/5ml

See Reverse Side

GP

~~1.07 [(4.348² - 17.0)/1.07] / 434.5 x100 = 103.9%~~

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107/WEW				[signature] 9/71
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
4/5/90		[signature]	KJ

84-6800-061 (R-10-83)

Ion Chromatograph Analysis on the Water Digestion - Chloride Analysis

Cl

$$\frac{(1.06)(435) - (17.6)\left(\frac{9.746}{10.39}\right)}{\frac{(.300)(76)}{5.3}(101)} \times 100 =$$

$$= 102.4\%$$

8-23-90

F 429.-7272

Serial No.	Sample Point	Date	Time Issued	Priority
F 438.-7373	SEGMENT-W	11-30-89	8: 9	18

Determination	Method/Standard	Result Units	Charge Code	Rerun
NO3	LA-533-105	PPM	WB75L	0

Sample Size: ? Direct

Customer ID: ~~089070~~

Remarks, Calculations, Results:
REAGENT BLANK

<1 ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
68107/NEW				
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date 4/5/90 | Time Completed | Lab Unit Mgr

54-6600-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 426.-7573	SEGMENT-K	11-30-89	8: 7	19

Determination	Method/Standard	Result Units	Charge Code	Rerun
NO3	LA-533-105	% RECOVERY	WB75L	0

Sample Size: 100-10

Customer ID: ~~089070~~

Remarks, Calculations, Results:
LMCS CHECK SAMPLE
LMCS ID 6CMO

101.9%

616.6/599

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
68107/NEW				
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date 4/5/90 | Time Completed | Lab Unit Mgr

54-6600-061 (R-10-83)

Serial No	Sample Point	Date	Time Issued	Priority
F 452.-7173	SEGMENT-M	11-30-89	8:28	19

Determination	Method/Standard	Result Units	Charge Code	Rerun
NO3	LA-533-105	PPM	WB75L	0

Sample Size: ? 100-10

Customer ID: 089071

Remarks, Calculations, Results:
DUPLICATE SAMPLE

7.46 ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
68107/NEW				
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date 4/5/90 | Time Completed | Lab Unit Mgr

54-6600-061 (R-10-83)

Serial No	Sample Point	Date	Time Issued	Priority
F 451.-7073	SEGMENT-L	11-30-89	8:27	19

Determination	Method/Standard	Result Units	Charge Code	Rerun
NO3	LA-533-105	PPM	WB75L	0

Sample Size: ? 100-10

Customer ID: 089071

Remarks, Calculations, Results:

6.33 ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
68107/NEW				
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date 4/5/90 | Time Completed | Lab Unit Mgr

54-6600-061 (R-10-83)

Ion Chromatograph Analysis on the Water Digestion - Nitrate Analysis

Serial No	Sample Point	Date	Time Issued	Priority
F 574.-7573	SEGMENT-O	12- 1-89	11:37	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
NO3	LA-533-105	% RECOVERY	WB75L	0

Sample Size	Customer ID
100-10	089076

Remarks, Calculations, Results:

LMCS CHECK SAMPLE
LMCS ID 6C1740

615.4/599 102.7%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107/new				[signature]
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
4/5/90		[signature]

54-6800-061 (R-10-83)

Serial No	Sample Point	Date	Time Issued	Priority
F 429.-7273	SEGMENT-N	11-30-89	8: 8	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
NO3	LA-533-105	% RECOVERY	WB75L	0

Sample Size	Customer ID
? 100-10	089070

Remarks, Calculations, Results:

SPIKE SAMPLE
SPIKE ID 35C9-72
SPIKE VOLUME 300/5ml

See Reverse Side →

~~1.07 [(3.84³ - 3.03²)/3493.1] 100 = 109.4%~~

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107/new				[signature]
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
4/5/90		[signature]

54-6800-061 (R-10-83)

Ion Chromatograph Analysis on the Water Digestion - Nitrate Analysis

NO_3

$$\frac{(1.06)(3840) - (303)\left(\frac{9.746}{10.59}\right)}{\frac{.300(611)}{5.3}(101)} \times 100 =$$

$$= 108.4\%$$

8-23-90

F 429.-7273

Ion Chromatograph Analysis on the Water Digestion - Phosphate Analysis

Serial No.	Sample Point	Date	Time Issued	Priority
F 438.-7374	SEGMENT-W	11-30-89	8: 9	18

Determination	Method/Standard	Result Units	Charge Code	Reruns
PO4	LA-533-105	PPM	WB75L	0

Sample Size: ? Direct

Customer ID: G89070

Remarks, Calculations, Results:
REAGENT BLANK

<1 ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
68107/NEW				
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date: 4/5/90 | Time Completed | Lab Unit Mgr

54-6800-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 426.-7574	SEGMENT-K	11-30-89	8: 7	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
PO4	LA-533-105	% RECOVERY	WB75L	0

Sample Size: 100-10

Customer ID: G89070

Remarks, Calculations, Results:
LMCS CHECK SAMPLE
LMCS ID 6CMA0

100.8% *

603.8/599

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
68107/NEW				
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date: 4/5/90 | Time Completed | Lab Unit Mgr

54-6800-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 452.-7174	SEGMENT-M	11-30-89	8:28	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
PO4	LA-533-105	PPM	WB75L	0

Sample Size: ? 100-10

Customer ID: G89071

Remarks, Calculations, Results:
DUPLICATE SAMPLE

4.552 ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
68107/NEW				
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date: 4/5/90 | Time Completed | Lab Unit Mgr

54-6800-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 451.-7074	SEGMENT-L	11-30-89	8:27	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
PO4	LA-533-105	PPM	WB75L	0

Sample Size: ? 100-10

Customer ID: G89071

Remarks, Calculations, Results:

5.452 ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
68107/NEW				
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date: 4/5/90 | Time Completed | Lab Unit Mgr

54-6800-061 (R-10-83)

Serial No	Sample Point	Date	Time Issued	Priority
F 574.-7574	SEGMENT-O	12- 1-89	11:37	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
P04	LA-533-105	% RECOVERY	WB75L	0

Sample Size: 100-10

Customer ID: 089076

Remarks, Calculations, Results:

LMCS CHECK SAMPLE
LMCS ID 6C1140

607.9/599 101.5%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107/NEW				
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
4/5/90		QP

84-6800-081 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 429.-7274	SEGMENT-N	11-30-89	8: 8	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
P04	LA-533-105	% RECOVERY	WB75L	0

Sample Size: ? 100-10

Customer ID: 089070

Remarks, Calculations, Results:

SPIKE SAMPLE
SPIKE ID 3579-77
SPIKE VOLUME 300/5 ml

See Reverse Side

QP

$\frac{1.07(3.452^3)}{3464.5} \times 100 = 101.6\%$

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107/NEW				
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
4/5/90		QP

84-6800-081 (R-10-83)

Ion Chromatograph Analysis on the Water Digestion - Phosphate Analysis

PO_4

$$\frac{\frac{(1.06)(3450) - 0}{.300(606)} \cdot (101)}{5.3} \times 100 = 105.6\%$$

8-23-90

F 429.-7274

Ion Chromatograph Analysis on the Water Digestion - Sulphate Analysis

Serial No.	Sample Point	Date	Time Issued	Priority
F 438.-7375	SEGMENT-W	11-30-89	8: 9	18

Determination	Method/Standard	Result Units	Charge Code	Reruns
SO4	LA-533-105	PPM	WB75L	0

Sample Size: ? Direct

Customer ID: C89070

Remarks, Calculations, Results:
REAGENT BLANK

<1ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107/REW				
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
4/5/90		

84-6800-081 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 426.-7575	SEGMENT-K	11-30-89	8: 7	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
SO4	LA-533-105	% RECOVERY	WB75L	0

Sample Size: 100-10

Customer ID: C89070

Remarks, Calculations, Results:
LMCS CHECK SAMPLE
LMCS ID 6C1140

100.8%

6268/622

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107/REW				
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
4/5/90		

84-6800-081 (R-10-83)

Serial No	Sample Point	Date	Time Issued	Priority
F 452.-7175	SEGMENT-M	11-30-89	8:28	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
SO4	LA-533-105	PPM	WB75L	0

Sample Size: ? 100-10

Customer ID: C89071

Remarks, Calculations, Results:
DUPLICATE SAMPLE

4.53 ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107/REW				
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
4/5/90		

84-6800-081 (R-10-83)

Serial No	Sample Point	Date	Time Issued	Priority
F 451.-7075	SEGMENT-L	11-30-89	8:27	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
SO4	LA-533-105	PPM	WB75L	0

Sample Size: ? 100-10

Customer ID: C89071

Remarks, Calculations, Results:

5.23 ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107/REW				
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
4/5/90		

84-6800-081 (R-10-83)

Ion Chromatograph Analysis on the Water Digestion - Sulphate Analysis

Serial No.	Sample Point	Date	Time Issued	Priority
F 574.-7575	SEGMENT-O	12- 1-89	11:37	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
SO4	LA-533-105	% RECOVERY	WB75L	0

Sample Size	Customer ID
100-10	089076

Remarks, Calculations, Results:
LMCS CHECK SAMPLE
LMCS ID 6C11AS

625.2/622 100.5%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107/NEW				
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
4/5/90		

54-6800-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 429.-7275	SEGMENT-N	11-30-89	8: 8	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
SO4	LA-533-105	% RECOVERY	WB75L	0

Sample Size	Customer ID
? 100-10	089070

Remarks, Calculations, Results:
SPIKE SAMPLE
SPIKE ID 35C9-77
SPIKE VOLUME 300/5ml

See Reverse Side

$$\frac{1.07(3.527^3 - 3.01^1)}{3355.9} \times 100 = 111.5\%$$

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107/NEW				94170
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
4/5/90		

54-6800-061 (R-10-83)

Ion Chromatograph Analysis on the Water Digestion - Sulphate Anlaysis

SO_4

$$\frac{(1.06)(3530) - (30.1)\left(\frac{9.746}{10.39}\right)}{\frac{.300(589)}{5.3}(101)} \times 100 =$$

$$= 110.3\%$$

08-23-90

F 429.-7275

Serial No.	Sample Point	Date	Time Issued	Priority
F 426.-7571	SEGMENT-K	11-30-89	8: 7	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
F	LA-533-105	% RECOVERY	WB75L	0

Sample Size: 100-10
Customer ID:

Remarks, Calculations, Results:
LMCS CHECK SAMPLE
LMCS ID 6C11-40

RERUN

54.5/60.0 90.8%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107/NEW				
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
4/12/90	4/16	

54-6800-081 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 438.-7371	SEGMENT-W	11-30-89	8: 9	18

Determination	Method/Standard	Result Units	Charge Code	Reruns
F	LA-533-105	PPM	WB75L	0

Sample Size: ? Direct
Customer ID:

Remarks, Calculations, Results:
REAGENT BLANK

RERUN

<.1 ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107/NEW				
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
4/12/90	4/14	

54-6800-081 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 452.-7171	SEGMENT-M	11-30-89	8:28	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
F	LA-533-105	PPM	WB75L	0

Sample Size: ? 100-10
Customer ID: 89-071

Remarks, Calculations, Results:
DUPLICATE SAMPLE

RERUN

1.50[2]
~~1.499[2]~~ ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107/NEW				
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
4/12/90	4/14	

54-6800-081 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 451.-7071	SEGMENT-L	11-30-89	8:27	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
F	LA-533-105	PPM	WB75L	0

Sample Size: ? 100-10
Customer ID: 89-071

Remarks, Calculations, Results:

RERUN

1.579[2] ppm

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107/NEW				
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
4/12/90	4/14	

54-6800-081 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 574.-7571	SEGMENT-O	12- 1-89	11:36	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
F	LA-533-105	% RECOVERY	WB75L	0

Sample Size	Customer ID
100-10	

Remarks, Calculations, Results:
LMCS CHECK SAMPLE
LMCS ID 6C11-AO

RERUN

55.1/60.0

91.8%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107/REW				
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
4/12/90	4/16	

54-8800-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 429.-7271	SEGMENT-N	11-30-89	8: 8	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
F	LA-533-105	% RECOVERY	WB75L	0

Sample Size	Customer ID
? 100-10	

Remarks, Calculations, Results:
SPIKE SAMPLE
SPIKE ID 3SC9-79
SPIKE VOLUME 500/5ml

See Reverse Side RERUN

$$\frac{1.9(2.921^2 - 1.72^1)}{286.13} \times 100 = 105.0\%$$

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
6B107/REW				
Hrs .5	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr
4/12/90	4/16	

54-8800-061 (R-10-83)

Ion Chromatograph Analysis on the Water Digestion - Fluoride Analysis

Ion Chromatograph Analysis of the Water Digestion - Fluoride Analysis

F429.

$$\frac{\frac{5.3\,mL}{5.0\,mL}(292)(305) - (17.2)\left(\frac{9.746\,g/L}{10.39\,g/L}\right)}{\frac{(.300\,mL)(60\,ppm)}{5.3\,mL}(101)} \times 100 =$$

= 86.6%

8-23-90

Total Organic Carbon Analysis on the Water Digestion

Serial No.	Sample Point	Date	Time Issued	Priority
F 462.-7326	SEGMENT-W	11-30-89	8:30	18

Determination	Method/Standard	Result Units	Charge Code	Reruns
TOC	LA-344-105	G/L	WB75L	0

Sample Size: ? 200uL

Customer ID: 089071

Remarks, Calculations, Results:
REAGENT BLANK

3µg

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
80028				R E Bennett
Hrs: Ed Cohn	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
3.27.90		AP	DMS

54-8800-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 450.-7526	SEGMENT-K	11-30-89	8:27	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
TOC	LA-344-105	% RECOVERY	WB75L	0

Sample Size: ? 200uL-2mL-200uL

Customer ID: 089071

Remarks, Calculations, Results:
LMCS CHECK SAMPLE
LMCS ID 70C11C

KB

2.871/300 95.7%

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
80028				R E Bennett
Hrs: Ed Cohn	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
3-27-90		AP	DMS

54-8800-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 452.-7126	SEGMENT-M	11-30-89	8:28	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
TOC	LA-344-105	G/L	WB75L	0

Sample Size: ? 1mL+100uL .5m H_2SO_4 -200uL

Customer ID: 089071

Remarks, Calculations, Results:
DUPLICATE SAMPLE

7.15^{-3} g/l

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
80028				R E Bennett
Hrs: Ed Cohn	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
3-27-90		AP	DMS

54-8800-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 451.-7026	SEGMENT-L	11-30-89	8:27	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
TOC	LA-344-105	G/L	WB75L	0

Sample Size: ? 1mL+100uL .5m H_2SO_4 -200uL

Customer ID: 089071

Remarks, Calculations, Results:

7.15^{-3} g/l

10.03

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
80028				R E Bennett
Hrs: Ed Cohn	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
3-27-90		AP	DMS

54-8800-061 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 454.-7526	SEGMENT-O	11-30-89	8:28	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
TOC	LA-344-105	% RECOVERY	WB75L	0

Sample Size: ? 200uL-2mL-200uL

Customer ID: C89071

Remarks, Calculations, Results:

LMCS CHECK SAMPLE
LMCS ID 70611C

98.1%

KY

2.942 / 3.00

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
80028				[illegible]
Hrs	Hrs	Hrs	Hrs	Hrs
[illegible]				

Date	Time Completed	Lab Unit Mgr	
3-27-90		[illegible]	KMS

S4-6800-081 (R-10-83)

Serial No	Sample Point	Date	Time Issued	Priority
F 453.-7226	SEGMENT-N	11-30-89	8:28	19

Determination	Method/Standard	Result Units	Charge Code	Reruns
TOC	LA-344-105	% RECOVERY	WB75L	0

Sample Size: ? 200uL+100uL .5m H_2SO_4-200uL

Customer ID: C89071

Remarks, Calculations, Results:

SPIKE SAMPLE
SPIKE ID 70611
SPIKE VOLUME 200uL

SEE Reverse Side (9P)

$\frac{(121.6-300)-(1.3)}{114.9} \times 100 = 97.8\%$

10.13

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
80028				[illegible]
Hrs	Hrs	Hrs	Hrs	Hrs
[illegible]				

Date	Time Completed	Lab Unit Mgr	
3-27-90		[illegible]	KMS

S4-6800-081 (R-10-83)

Total Organic Carbon Analysis on the Water Digestion

F0453.-7226

$$\frac{118.6 - \left(1.3\left[\frac{10.13}{10.03}\right]\right)}{\frac{300\,\mu g}{\cancel{.200\,ml}\ .5\,ml}(.200\,ml)} = 97.7\%$$

JR Pulvick

Acid Digestion

Serial No.	Sample Point	Date	Time Issued	Priority
F 456.-8000	SEGMENT-Q	11-30-89	8:29	23

Determination	Method/Standard	Result Units	Charge Code	Reruns
ACD-DGST	LA-505-159	G/L	WB75L	0

Sample Size: ?

Customer ID: 89071

Remarks, Calculations, Results:
GRAMS SAMPLE 0.5506
VOLUME ON
COMPLETION 50 ml

1.10^{-2} g/ml

WHC D 31541 #060 4.50g

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
61483				
Hrs 1.0	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
3-5-90			

54-6800-081 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 463.-8300	SEGMENT-X	11-30-89	8:31	18

Determination	Method/Standard	Result Units	Charge Code	Reruns
ACD-DGST	LA-505-159	G/L	WB75L	0

Sample Size: ?

Customer ID: 089071

Remarks, Calculations, Results:
REAGENT BLANK
VOLUME ON
COMPLETION 50 ml

complete

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
61483				
Hrs 1.0	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
3-5-90			

54-6800-081 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 458.-8200	SEGMENT-S	11-30-89	8:29	23

Determination	Method/Standard	Result Units	Charge Code	Reruns
ACD-DGST	LA-505-158	% RECOVERY	WB75L	0

Sample Size: ?

Customer ID: 089071

Remarks, Calculations, Results:
SPIKED ANALYSIS
GRAMS SAMPLE 0.5239
VOLUME ON
COMPLETION 50 ml
VOLUME SPIKE 5ml & 5ml
SPIKE ID 103C15-D & 104C15-B

1.05^{-2} g/ml

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
61483				
Hrs 1.0	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
3-5-90			

54-6800-081 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 457.-8100	SEGMENT-R	11-30-89	8:29	23

Determination	Method/Standard	Result Units	Charge Code	Reruns
ACD-DGST	LA-505-159	G/L	WB75L	0

Sample Size: ?

Customer ID: 089071

Remarks, Calculations, Results:
DUPLICATE ANALYSIS
GRAMS SAMPLE 0.5256
VOLUME ON
COMPLETION 50ml

1.05^{-2} g/ml

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
61483				
Hrs 1.0	Hrs	Hrs	Hrs	Hrs

Date	Time Completed	Lab Unit Mgr	
3-5-90			

54-6800-081 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 458.-8250	SEGMENT-S	11-30-89	8:29	23

Determination	Method/Standard	Result Units	Charge Code	Reruns
ICP	LA-505-151	PPM	WB75L	0

Sample Size: ? 100-10 500-10

Customer ID: 089071

Remarks, Calculations, Results:
SPIKE SAMPLE
SPIKE ID 103C15C & 104C15D
SPIKE VOLUME 5ml ea.

Completed

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
65283				
Hrs	Hrs	Hrs	Hrs	Hrs
J. White				
Date	Time Completed	Lab Unit Mgr		
4-2-90				

54-8800-081 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 457.-8150	SEGMENT-R	11-30-89	8:29	23

Determination	Method/Standard	Result Units	Charge Code	Reruns
ICP	LA-505-151	PPM	WB75L	0

Sample Size: ? 100-10 500-10

Customer ID: 089071

Remarks, Calculations, Results:
DUPLICATE SAMPLE

Completed

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
65283				
Hrs	Hrs	Hrs	Hrs	Hrs
J. White				
Date	Time Completed	Lab Unit Mgr		
4-2-90				

54-8800-081 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 463.-8350	SEGMENT-X	11-30-89	8:31	18

Determination	Method/Standard	Result Units	Charge Code	Reruns
ICP	LA-505-151	PPM	WB75L	0

Sample Size: ?

Customer ID: 089071

Remarks, Calculations, Results:
REAGENT BLANK

Completed

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
65283				
Hrs	Hrs	Hrs	Hrs	Hrs
J. White				
Date	Time Completed	Lab Unit Mgr		
4-2-90				

54-8800-081 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 459.-8550	SEGMENT-T	11-30-89	8:29	23

Determination	Method/Standard	Result Units	Charge Code	Reruns
ICP	LA-505-151	% RECOVERY	WB75L	0

Sample Size: ?

Customer ID: 089071

Remarks, Calculations, Results:
LMCS CHECK SAMPLE
LMCS ID
78C11F
82B38C
77C11F

Completed

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
65283				
Hrs	Hrs	Hrs	Hrs	Hrs
J. White				
Date	Time Completed	Lab Unit Mgr		
4-2-90				

54-8800-081 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 455.-8550	SEGMENT-P	11-30-89	8:29	23

Determination	Method/Standard	Result Units	Charge Code	Rerune
ICP	LA-505-151	% RECOVERY	WB75L	0

Sample Size: ?

Customer ID: 089071

Remarks, Calculations, Results:

LMCS CHECK SAMPLE
LMCS ID_____
78C11F
82B38C
77C11F

Completed

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
65283				
Hrs	Hrs	Hrs	Hrs	Hrs
J. White				
Date	Time Completed	Lab Unit Mgr		
4-2-90				

54-8600-081 (R-10-83)

Serial No.	Sample Point	Date	Time Issued	Priority
F 456.-8050	SEGMENT-Q	11-30-89	8:29	23

Determination	Method/Standard	Result Units	Charge Code	Rerune
ICP	LA-505-151	PPM	WB75L	0

Sample Size: ? 100-10 500-10

Customer ID: 089071

Remarks, Calculations, Results:

Completed

Analyst - 1	Analyst - 2	Analyst - 3	Analyst - 4	Analyst - 5
65283				
Hrs	Hrs	Hrs	Hrs	Hrs
J. White				
Date	Time Completed	Lab Unit Mgr		
4-2-90				

54-8600-081 (R-10-83)