EPA - 454/R-99-042c
August 1999

Integrated Iron and Steel Industry

Final Report
Volume III of III

Appendices

Contract No. 68-D7-0068
Work Assignment 2-13

LTV Steel Company
Indiana Harbor Works
East Chicago, Illinois

Prepared for:

Michael K. Ciolek
Emission Measurement Center
Emission, Monitoring, and Analysis Division
Office of Air Quality Planning and Standards
U.S. Environmental Protection Agency
Research Triangle Park, North Carolina 27711

August 1999

ERG
EASTERN RESEARCH GROUP, INC.

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Method 29
Analytical Data for Metals

TRIANGLE LABS

CASE NARRATIVE

Analysis of Samples for the Presence of Trace Metals

Method 29 April 1996 Rev.

Client:	Eastern Research Group
TLI Project Number:	42298
Date:	August 1, 1997

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Rev. 25-Sep-96

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Overview

Six train samples, two field blank train samples and a three reagent blanks were analyzed for arsenic (As), beryllium (Be), cadmium (Cd), cobalt (Co), chromium (Cr), manganese (Mn), nickel (Ni), lead (Pb), antimony (Sb), selenium (Se), and mercury (Hg). For all analyses, the samples and associated QC samples were prepared and analyzed following the guidelines of Method 29 April 1996 Rev. Results reported relate only to the items tested.

QC Remarks

The release of this set of data by Triangle Laboratories, Inc. was authorized by the Quality Control Chemist who has reviewed each sample data package individually following a series of inspections/reviews. When applicable, general deviations from acceptable QC requirements are identified below and comments are made on the effects of these deviations upon the validity and reliability of the results. Specific QC issues associated with this particular project are:

Sample Receipt:

The HNO3 rinses, back half impingers, and the Hg impingers for eleven train samples were received without coolant on July 01, 1997 under project # 42298 in good condition. The 0.1N HNO3 rinse samples (LTV-96 and LTV-87) were received without coolant on July 01, 1997 under project # 42298 in good condition and put on hold per the client's request The filters and acetone probe rinses for the associated ten train samples were received without coolant on July 14, 1997 under project # 42434 in good condition. All samples were combined and processed under project # 42298. The data for all the samples were reported under project # 42298.

Samples LTV-59, LTV-57, and LTV-87 were not listed on the client's chain-of-custody. The sample labels were used to identify these samples. Sample LTV-59 was also identified as Method 29, Inlet, RB2 on the sample bottle. Upon further discussion with the client, it was noted that the ID for this sample should be Method 29, Inlet, RB3. The corrected ID was used to identify this sample.

Sample Preparation:

Laboratory documentation of the sample preparation is included in the data package.

Instrumentation:

Arsenic (As), beryllium (Be), cadmium (Cd), cobalt (Co), chromium (Cr), manganese (Mn), nickel (Ni), lead (Pb), antimony (Sb), and selenium (Se) concentrations were determined by Inductively Coupled Plasma Emission Spectroscopy (ICP).

Mercury (Hg) concentrations were determined by Cold Vapor Atomic Absorption (CVAA).

The linear range for the instrument TJA 61E Trace Analyzer was based on four standards and a blank, which established a correlation coefficient value greater than or equal to 0.995. A calibration curve, based on a blank and one standard, is established for each analytical run, followed by a check high standard and an initial calibration verification (ICV). The check high standard does not deviate from the calibration curve by more than 5%. In addition, continuing calibration verifications (CCVs) are performed throughout the analytical run.

A Reporting Detection Limit (RDL) is used instead of an Instrument Detection Limit (IDL). The spectrometer and atomic absorption instruments can achieve low detection limits between 0.2-8 ppb levels for many analytes. Triangle Labs is using RDL values of 1-10 times the IDL as detection limits for reporting purposes.

Data Review:

All analytes found in the method blank (MB) are detected at a level equal to or less than the respective Reporting Detection Limits (RDLs).

A sampling date was not supplied by the client and the sampling to analysis holding times cannot be determined. All samples were analyzed within 16 days of sample receipt at Triangle Laboratories.

The laboratory control sample (42298 LCS1) for Hg demonstrated a percent recovery slightly outside the QC criteria, but should not cause a bias towards the sample concentrations. Please note that the associated laboratory control sample duplicate (42298 LCS1 D) demonstrate a percent recovery within QC criteria. All related calibration samples (i.e. ICV, ICB, CCV, CCB etc.) were within the method criteria, which indicates that the instrument was operating properly.

The serial dilution results for Cr for sample LTV-88 & 2 & LTV-02,101 FH demonstrated a RPD slightly outside the QC control criteria of 10.0 percent, which does not indicate the presence of a significant amount of interferents specific to this analyte in the native sample matrix.

The recoveries for the post-digestion spike (PDS) are not reported for Cd, Mn, Ni, and Pb for sample LTV-88 & 2 & LTV-02,101 FH. The spike concentrations added were insignificant in comparison to the levels of these analytes present in the native sample. The concentration for Pb for the post-digestion spike (PDS) was above the linear range of the instrument and therefore, was not reported on the reporting forms.

QC requirements:

The analytical duplicates for analytes analyzed by ICP cannot be considered valid qualifiers if the concentrations of the analytes in the original and/or duplicate sample are not at least ten times the respective RDLs. The RPDs for these analyses are indicated by or "<RDL" in the Analyte Summary Reports.

For analytical duplicates which are valid qualifiers, the quality control RPD is ± 20.0 percent. If RPDs are outside this range, interferences are suspected.

The serial dilution analyses for analytes analyzed by ICP cannot be considered valid qualifiers if the concentrations of the analytes in the serial dilution sample are less than ten times the respective RDLs. The serial dilution RPDs for these analyses are indicated by "<RDL" in the Analyte Summary Reports.

For serial dilution analyses which are valid qualifiers, the quality control RPD is ± 10.0 percent. If RPDs are outside this range, interferences are suspected.

The quality control range for percent recoveries of laboratory control spiked samples is 80-120.

The quality control range for percent recoveries of spiked samples is 75-125. If recoveries are outside this range, a matrix effect is suspected.

By our interpretation, the analytical data in this project are valid based on the guidelines of Method 29 April 1996 Rev. Any specific QC concerns or problems have been discussed in the QC REMARKS section with emphasis on their effect on the data. Should Eastern Research Group have any questions or comments regarding this data package, please feel free to contact Project Scientist, Amy J. Boehm, at (919) 544-5729 ext.268.

For Triangle Laboratories, Inc.,

Report Preparation

Linda F. Jones
Report Preparation Chemist

Quality Control

Jerry P. Roach
Report Preparation Chemist

The total number of pages in this data package is: 197.

TRIANGLE LABS

TRIANGLE LABORATORIES, INC.

LIST OF CERTIFICATIONS AND ACCREDITATIONS

ENVIRONMENTAL

American Association for Laboratory Accreditation. Expires July 31, 1997. Certificate Number 0226-01. Accreditation for technical competence in Environmental Testing.(Including Waste Water. Sol/Haz Waste, Pulp/Paper, and Air Matrices) Parameters are AOX/TOX, Volatiles, Pesticides, PCB's, BNA's, and Dioxin/Furan. Method 1613 for Drinking Water.

State of Alabama, Department of Environmental Management. Expires December 31, 1997. Laboratory I.D. # 40950. Dioxin in drinking water.

State of Alaska, Department of Environmental Conservation. Expires December 21, 1997. Certificate number OS-00397. Dioxin in drinking water.

State of Arizona, Department of Health Services. Expires May 26, 1997. Certificate #AZ0423. Drinking Water for Dioxin, Dioxin in WW and S/H Waste.

State of Arkansas, Department of Pollution Control and Ecology. Expires February 18, 1998. Pulp/paper, soil, water, and Hazardous Waste for Dioxin/Furan; AOX/TOX.

State of California, Department of Health Services. Expires August 31, 1997. Certificate #1922. Selected Metals in Waste Water; Volatiles, Semi-volatiles, and Dioxin/furan in WW and Sol/Haz Waste. Dioxin in drinking water.

State of Connecticut, Department of Health Services. Expires September 30, 1997. Registration # PH-0117. Dioxin in drinking water.

Delaware Health and Social Services. Expires December 31, 1997. Certificate #NC 140. Dioxin in drinking water.

Florida Department of Health and Rehabilitative Services. Expires June 30, 1997.Dioxin in DW. Drinking Water ID HRS# 87424. Metals, Extractable Organics (GC/MS), Pesticides/PCB's (GC) and Volatiles (GC/MS) in Environmental Samples. Environmental water ID HRS# E87411.

Revised 5/30/97 jm

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Hawaii Department of Health. Expires March 1, 1998. Dioxin in drinking water. "Accepted" status for regulatory purposes.

Idaho Department of Health and Welfare. Expires November 30, 1997. Dioxin in drinking water.

State of Kansas, Department of Health and Environment. Expires January 31, 1998. Environmental Analyses/Non potable Water and Solid and Hazardous Waste. Method 1613 for drinking water. ID #'s - Drinking water and/or pollution control - E-215. Solid or Hazardous Waste - E-1209.

Commonwealth of Kentucky, Department for Environmental Protection. Expires December 31, 1997. ID#90060. Dioxin in drinking water.

Maryland Department of Health and Mental Hygiene. Expires September 30, 1997. Certification #235. Drinking water by Method 1613A.

State of Michigan, Department of Public Health. Expires March 31, 1997. Drinking water by Method 1613.

Mississippi State Department of Health. No expiration date.. Dioxin in drinking water.

Montana Department of Health and Environmental Services. Expires December 31, 1997. Dioxin in drinking water.

State of New Jersey, Department of Environmental Protection and Energy. Extended by state. Temporary certificate until June 30, 1997 or sooner. ID #67851. BNAs and Volatiles. Dioxin in drinking water.

State of New Mexico, Environment Department. Expires July 31, 1997. Dioxin in drinking water.

New York State Department of Health. Expires June 30, 1997. ID #11026. Environmental Analyses of non-potable Water, Solid and Hazardous Waste. Method 1613 in DW.

State of North Carolina, Department of Environment Health and Natural Resources Expires December 31, 1997. Certificate # 37751. Dioxin in drinking water.

State of North Carolina, Department of Environment, Health, and Natural Resources, Division of Environmental Management. Expires December 31, 1997. Certificate # 485. Metals, pesticides & PCBs, semi-volatiles and volatiles; TCLP.

North Dakota State Department of Health and Consolidated Laboratories. Expires December 31, 1997. Certificate # R-076. Effective October 4, 1993. Dioxin in drinking water.

Revised May 20, 1997 jm

Printed May 20, 1997

Oklahoma Department of Environmental Quality. Expires October 31, 1997. Laboratory #9612. Dioxin by 1613A, 8290 and 8280.

State of South Carolina, Department of Health and Environmental Control. Expires April 1, 1997. Certificate number #99040001 (drinking water). Expires August 31, 1997. Certificate number #99040002 (other parameters). Dioxin/Furans, BNA, Volatiles, and PCBs/pesticides under Clean Water Act, 2,3,7,8-TCDD for Drinking Water, and Organic extractables for Solid and Hazardous Waste.

State of Tennessee. Department of Environment and Conservation. Expires February 5, 1999. ID #02992. Method 1613 Drinking water only.

U.S. Department of Agriculture Soil Permit. Expires September 30, 2002. Permit No. S-4958. Under the authority of the Federal Plant Pest Act, permission is granted to receive foreign soil samples for use in laboratory analysis.

U.S. Army Corps of Engineers. Expires November 30, 1997. Validated to perform methods 8280 & 8290 for Lockbourne Landfill Site Investigation, Defense Distribution Depot Projects, and assorted projects for the USACE North Pacific Division Laboratory.

U.S. EPA Region V. Expires November 14, 1999. Dioxin in drinking water.

U.S. EPA Region VIII, for the State of Wyoming. Expires November 13, 1997. Dioxin in drinking water.

State of Utah, Department of Health. Expires December 31, 1997. Certificate Number E-166. Certification for the following parameters: Semi-Volatiles and Volatiles under RCRA; Volatiles under Clean Water Act; Dioxin/furans by Method 8280; Drinking water for Dioxin by Method 1613; Metals including Mercury and Microwave Digestion.

Commonwealth of Virginia, Department of General Services, Division of Consolidated Laboratory Services. Expires June 30, 1997. ID # 00341. Dioxin in drinking water.

State of Washington, Department of Ecology. Expires September 11, 1997. Lab Accreditation Number C067. Scope of Accreditation applies to water analyses for Polychlorinated Dibenzo-p-dioxins and Polychlorinated Dibenzofurans, BNA Extr (Semivolatile) Organics and Purgeable (Volatile) Organics.

State of Washington, Department of Health. Expires April 30, 1998. Dioxin in drinking water. Lab I.D. 129

State of West Virginia, Department of Health. Expires December 31, 1997. Certificate No. 9923(C). Dioxin in drinking water.

Revised May 20, 1997 jm

Printed May 20, 1997

State of Wisconsin, Department of Natural Resources. Expires June 30, 1997. Laboratory ID Number 999869530. Certification for the following categories of Organics: Purgeable, Base/Neutral, Acid, PCBs, and Dioxin. Expires November 14, 1999. Laboratory ID 999869530. Dioxin in drinking water.

PHARMACEUTICAL

Drug Enforcement Agency (DEA). Expires November 30, 1997. Registration number RT01195835. Controlled substance registration for schedules 1,2,3,3N,4,5.

N.C. Department of Human Resources. Expires October 31, 1997. Registration number NC-PT 0000 0031. North Carolina controlled substances registration. Application submitted for renewal.

Food & Drug Administration (FDA) Registration. Expires July 1997. ID #'s 001500 1053481. Annual registration of drug establishment. Annual registration of drug establishment.

OTHER

Clinical Laboratory Improvement Amendments (CLIA) Registration. Expires May 30, 1999. ID # 34D0705123. Department of Health & Human Services, Health Care Financing Administration.

U.S. EPA Large Quantity Hazardous Waste Generator. No expiration date. EPA ID #NCD982156879. Permit indicates that the laboratory is a large generator of hazardous waste.

North Carolina Radioactive Materials License. Expires April 30 1998. License No. 032-0954-1. License authorizes the licensee to receive, acquire, own, possess, transfer, import and use such radioactive materials as designated.

North Carolina General License for Radiation Protection. No. expiration date. License No. 032-875-OG. The general license applies only to radioactive material contained in devices which have been manufactured and labeled in accordance with specific requirements.

Revised May 23, 1997 jm

Printed May 23, 1997

ABBREVIATIONS

BH = Back Half
CCB = Continuing Calibration Blank
CCV = Continuing Calibration Verification
CHECK HS = Check High Standard
D = DUP = Analytical Duplicate (Prepared Duplicate)
DA = Duplicate Analysis
FH = Front Half
FV = Final Digestate Volume
ICB = Initial Calibration Blank
ICV = Initial Calibration Verification
ICSAB = Interference Check Solution (Solution AB)
    I = Initial
    F = Final
    Solution AB contains common interferents in addition to the analyte of interest.
IDL = Instrument Detection Limit
L = Serial Dilution
LCS = Laboratory Control Spike Sample
MB = Method Blank
MPV = Mercury Preparation Volume
MS = Pre-digestion Spike
MSD = Pre-digestion Spike Duplicate
N/A = Not Applicable
N/Av = Not Available
N/V = Not Valid
PDS = Post-digestion Spike
%REC = Percent Recovery
RDL = Reporting Detection Limit
RPD = Relative Percent Difference
T = Analytical Triplicate (Prepared Triplicate; for Hg analysis by Method 7471 only)
TV = Total Sample Volume
< = Analyte concentration in the sample is less than the respective RDL

STANDARD CONCENTRATIONS
for the TJA 61E TRACE ANALYZER

Analyte	Units	High Std	ICV/CCV	ICSAB	RDL	Wavelength
Ag	ppb	1000	500	500	1	3280
As	ppb	1000	500	500	5	1890
Al	ppb	1000	500	500000	50	3082
B	ppb	1000	500	500	7	2496
Ba	ppb	1000	500	500	2	4934
Be	ppb	1000	500	500	1	3130
Ca	ppb	1000	500	500000	60	3179
Cd	ppb	1000	500	500	1	2265
Ce	ppb	1000	500	500	3	4186
Co	ppb	1000	500	500	1	2286
Cr	ppb	1000	500	500	2	2677
Cu	ppb	1000	500	500	2	3247
Fe	ppb	1000	500	200000	40	2714
K	ppb	10000	5000	19000	220	7664
Li	ppb	1000	500	500	1	6708
Mg	ppb	1000	500	500000	30	2790
Mn	ppb	1000	500	500	2	2576
Mo	ppb	1000	500	500	2	2020
Na	ppb	10000	5000	5000	300	3302
Ni	ppb	1000	500	500	3	2316
P	ppb	1000	500	500	30	2149
Pb	ppb	1000	500	500	2	2203
Sb	ppb	1000	500	500	4	2068
Se	ppb	1000	500	500	3	1960
Si	ppb	1000	500	500	13	1888
Sr	ppb	1000	500	500	1	4215
Ti	ppb	1000	500	500	8	3349
Tl	ppb	1000	500	500	5	1908
V	ppb	1000	500	500	2	2924
Zn	ppb	1000	500	500	12	2062

Note: Use this reference page to review the raw data from the TJA 61E Trace Analyzer.

This page includes the standard concentrations for the check high standard, initial calibration verification (ICV), continuing calibration verification (CCV), and the interference check solution (ICSAB). In addition the reporting detection limit (RDL) and wavelength are reported for each analyte.

Revision Date: 15-Jul-96

CALCULATIONS FOR AIR SAMPLES

RESULTS FOR TRACE METALS (except mercury):

$$\text{RESULT in } \mu g \text{ (Front Half)} = \frac{\mu g/L * FV\ (mL) * DF}{1000\ mL/L}$$

$$\text{RESULT in } \mu g \text{ (Back Half \& Impingers)} = \frac{\mu g/L * TV\ (mL) * FV\ (mL) * DF}{mL\ used * 1000\ mL/L}$$

FV = final volume in mL
TV = total volume in mL
DF = Dilution Factor

The RESULTS for combined Front Half & Back Half samples use the same calculation as the Back Half & impinger samples.

RESULTS FOR MERCURY (Hg):

RESULT in µg (Front Half) = µg/L * (mL FV/mL aliquot) * MPV * DF

RESULT in µg (Back Half & Impingers) = µg/L * (mL TV/mL aliquot) * MPV * DF

MPV = mercury preparation volume = 0.1 L

%REC (Percent Recovery) for MS/MSD Hg spikes:

$$\%REC = \frac{\text{spike sample results - original sample results}}{\text{true spike sample results}} * 100$$

NOTE: Original sample results less than the RDL are not used in calulations.

%REC (Percent Recovery) for PDS:

$$\%REC = \frac{\text{Spike sample } \mu g/L \text{ conc. - original sample } \mu g/L \text{ conc.}}{\text{spike conc. } (\mu g/L)} * 100$$

%REC (Percent Recovery) for LCS/LCSD:

$$\%REC = \frac{\text{Spike sample } \mu g/L \text{ conc.}}{\text{spike conc. } (\mu g/L)} * 100$$

RPDs:

$$RPD = \frac{|\text{Result 2 - Result 1}|}{(\text{Result 2 + Result 1})/2} * 100$$

Rev. 2-Oct-96

Client: **Eastern Research Group**
Project Number: **42298**

Sample Report

Client Sample ID:	LTV-88 & 2 & LTV-02.101 FH
TLI Sample ID:	174-97-11,1 & 173-60-1A,10 FH
Date Received:	July 01 & 14, 1997
Date Prepared:	July 18-25, 1997
Date Analyzed:	July 28, 1997
Matrix:	Air

Analyte	Conc. (ug/L)	mL Total Vol.	mL Used	mL Final Vol.	Dilution Factor	Total ug Result
As	46.257	N/A	N/A	100	1	4.63
Be	0.259	N/A	N/A	100	1	< 0.100
Cd	726.988	N/A	N/A	100	1	72.7
Co	-7.271	N/A	N/A	100	1	< 0.100
Cr	216.987	N/A	N/A	100	1	21.7
Mn	535.365	N/A	N/A	100	1	53.5
Ni	817.800	N/A	N/A	100	1	81.8
Pb	30775.289	N/A	N/A	100	5	15400
Sb	60.445	N/A	N/A	100	1	6.04
Se	169.688	N/A	N/A	100	1	17.0

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Client: **Eastern Research Group**
Project Number: **42298**

Sample Report

Client Sample ID:	LTV-88 & 2 & LTV-02,101 FH L
TLI Sample ID:	174-97-11,1 & 173-60-1A,10 FH L
Date Received:	July 01 & 14, 1997
Date Prepared:	July 18-25, 1997
Date Analyzed:	July 28, 1997
Matrix:	Air

Analyte	Conc. (ug/L)	mL Total Vol.	mL Used	mL Final Vol.	Dilution Factor	Total ug Result
As	7.927	N/A	N/A	100	5	3.96
Be	0.136	N/A	N/A	100	5	< 0.500
Cd	153.150	N/A	N/A	100	5	76.6
Co	-1.256	N/A	N/A	100	5	< 0.500
Cr	48.990	N/A	N/A	100	5	24.5
Mn	108.372	N/A	N/A	100	5	54.2
Ni	172.627	N/A	N/A	100	5	86.3
Pb	6354.457	N/A	N/A	100	25	15900
Sb	14.467	N/A	N/A	100	5	7.23
Se	37.387	N/A	N/A	100	5	18.7

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Client: Eastern Research Group
Project Number: 42298

Sample Report

Client Sample ID:	LTV-03 BH
TLI Sample ID:	173-60-1B BH
Date Received:	July 01 & 14, 1997
Date Prepared:	July 18-25, 1997
Date Analyzed:	July 28, 1997
Matrix:	Air

Analyte	Conc. (ug/L)	mL Total Vol.	mL Used	mL Final Vol.	Dilution Factor	Total ug Result
As	0.216	670	570	100	1	< 0.588
Be	0.205	670	570	100	1	< 0.118
Cd	5.910	670	570	100	1	0.695
Co	-0.565	670	570	100	1	< 0.118
Cr	25.395	670	570	100	1	2.98
Mn	101.394	670	570	100	1	11.9
Ni	38.396	670	570	100	1	4.51
Pb	71.842	670	570	100	1	8.44
Sb	2.266	670	570	100	1	< 0.470
Se	168.572	670	570	100	1	19.8

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Client: **Eastern Research Group**
Project Number: **42298**

Sample Report

Client Sample ID:	LTV-03 BH L
TLI Sample ID:	173-60-1B BH L
Date Received:	July 01 & 14, 1997
Date Prepared:	July 18-25, 1997
Date Analyzed:	July 28, 1997
Matrix:	Air

Analyte	Conc. (ug/L)	mL Total Vol.	mL Used	mL Final Vol.	Dilution Factor	Total ug Result
As	-1.318	670	570	100	5	< 2.94
Be	0.069	670	570	100	5	< 0.588
Cd	1.119	670	570	100	5	0.658
Co	0.182	670	570	100	5	< 0.588
Cr	5.556	670	570	100	5	3.27
Mn	19.982	670	570	100	5	11.7
Ni	7.849	670	570	100	5	4.61
Pb	18.600	670	570	100	5	10.9
Sb	0.522	670	570	100	5	< 2.35
Se	36.695	670	570	100	5	21.6

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Client: **Eastern Research Group**
Project Number: **42298**

Sample Report

Client Sample ID:	LTV-89 & 3 & LTV-08 FH
TLI Sample ID:	174-97-13,4 & 173-60-2A FH
Date Received:	July 01 & 14, 1997
Date Prepared:	July 18-25, 1997
Date Analyzed:	July 28, 1997
Matrix:	Air

Analyte	Conc. (ug/L)	mL Total Vol.	mL Used	mL Final Vol.	Dilution Factor	Total ug Result
As	43.272	N/A	N/A	100	1	4.33
Be	0.250	N/A	N/A	100	1	< 0.100
Cd	674.566	N/A	N/A	100	1	67.5
Co	0.855	N/A	N/A	100	1	< 0.100
Cr	171.701	N/A	N/A	100	1	17.2
Mn	561.112	N/A	N/A	100	1	56.1
Ni	1166.381	N/A	N/A	100	1	117
Pb	15047.530	N/A	N/A	100	10	15000
Sb	58.077	N/A	N/A	100	1	5.81
Se	186.641	N/A	N/A	100	1	18.7

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Client: **Eastern Research Group**
Project Number: **42298**

Sample Report

Client Sample ID:	LTV-89 & 3 & LTV-08 FH DA
TLI Sample ID:	174-97-13,4 & 173-60-2A FH DA
Date Received:	July 01 & 14, 1997
Date Prepared:	July 18-25, 1997
Date Analyzed:	July 28, 1997
Matrix:	Air

Analyte	Conc. (ug/L)	mL Total Vol.	mL Used	mL Final Vol.	Dilution Factor	Total ug Result
As	42.792	N/A	N/A	100	1	4.28
Be	0.204	N/A	N/A	100	1	< 0.100
Cd	669.962	N/A	N/A	100	1	67.0
Co	1.169	N/A	N/A	100	1	0.117
Cr	170.696	N/A	N/A	100	1	17.1
Mn	559.259	N/A	N/A	100	1	55.9
Ni	1160.938	N/A	N/A	100	1	116
Pb	14956.682	N/A	N/A	100	10	15000
Sb	63.087	N/A	N/A	100	1	6.31
Se	187.574	N/A	N/A	100	1	18.8

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Client: **Eastern Research Group**
Project Number: **42298**

Sample Report

Client Sample ID:	LTV-09 BH
TLI Sample ID:	173-60-2B BH
Date Received:	July 01 & 14, 1997
Date Prepared:	July 18-25, 1997
Date Analyzed:	July 28, 1997
Matrix:	Air

Analyte	Conc. (ug/L)	mL Total Vol.	mL Used	mL Final Vol.	Dilution Factor	Total ug Result
As	-2.804	660	560	100	1	< 0.589
Be	0.065	660	560	100	1	< 0.118
Cd	-0.318	660	560	100	1	< 0.118
Co	-1.593	660	560	100	1	< 0.118
Cr	12.890	660	560	100	1	1.52
Mn	205.645	660	560	100	1	24.2
Ni	4.377	660	560	100	1	0.516
Pb	9.816	660	560	100	1	1.16
Sb	2.228	660	560	100	1	< 0.471
Se	139.641	660	560	100	1	16.5

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Client: **Eastern Research Group**
Project Number: **42298**

Sample Report

Client Sample ID:	LTV-09 BH DA
TLI Sample ID:	173-60-2B BH DA
Date Received:	July 01 & 14, 1997
Date Prepared:	July 18-25, 1997
Date Analyzed:	July 28, 1997
Matrix:	Air

Analyte	Conc. (ug/L)	mL Total Vol.	mL Used	mL Final Vol.	Dilution Factor	Total ug Result
As	-4.576	660	560	100	1	< 0.589
Be	0.081	660	560	100	1	< 0.118
Cd	-0.343	660	560	100	1	< 0.118
Co	-1.807	660	560	100	1	< 0.118
Cr	12.366	660	560	100	1	1.46
Mn	206.673	660	560	100	1	24.4
Ni	4.301	660	560	100	1	0.507
Pb	9.255	660	560	100	1	1.09
Sb	1.696	660	560	100	1	< 0.471
Se	134.400	660	560	100	1	15.8

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Sample Report

Client Sample ID:	LTV-90 & 4 & LTV-14 FH
TLI Sample ID:	174-97-15,6 & 173-60-3A FH
Date Received:	July 01 & 14, 1997
Date Prepared:	July 18-25, 1997
Date Analyzed:	July 28, 1997
Matrix:	Air

Analyte	Conc. (ug/L)	mL Total Vol.	mL Used	mL Final Vol.	Dilution Factor	Total ug Result
As	38.957	N/A	N/A	100	1	3.90
Be	0.213	N/A	N/A	100	1	< 0.100
Cd	726.763	N/A	N/A	100	1	72.7
Co	-7.951	N/A	N/A	100	1	< 0.100
Cr	174.490	N/A	N/A	100	1	17.4
Mn	1147.143	N/A	N/A	100	1	115
Ni	664.175	N/A	N/A	100	1	66.4
Pb	16315.991	N/A	N/A	100	10	16300
Sb	63.037	N/A	N/A	100	1	6.30
Se	168.328	N/A	N/A	100	1	16.8

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Sample Report

Client Sample ID:	LTV-15 BH
TLI Sample ID:	173-60-3B BH
Date Received:	July 01 & 14, 1997
Date Prepared:	July 18-25, 1997
Date Analyzed:	July 28, 1997
Matrix:	Air

Analyte	Conc. (ug/L)	mL Total Vol.	mL Used	mL Final Vol.	Dilution Factor	Total ug Result
As	-3.089	690	590	100	1	< 0.585
Be	0.201	690	590	100	1	< 0.117
Cd	-0.030	690	590	100	1	< 0.117
Co	-0.935	690	590	100	1	< 0.117
Cr	16.983	690	590	100	1	1.99
Mn	2681.926	690	590	100	1	314
Ni	4.349	690	590	100	1	0.509
Pb	16.677	690	590	100	1	1.95
Sb	4.028	690	590	100	1	0.471
Se	161.227	690	590	100	1	18.9

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Sample Report

Client Sample ID:	LTV-39 & 8 & LTV-38 FH
TLI Sample ID:	174-97-18,8 & 173-60-4A FH
Date Received:	July 01 & 14, 1997
Date Prepared:	July 18-25, 1997
Date Analyzed:	July 28, 1997
Matrix:	Air

Analyte	Conc. (ug/L)	mL Total Vol.	mL Used	mL Final Vol.	Dilution Factor	Total ug Result
As	5.776	N/A	N/A	100	1	0.578
Be	0.056	N/A	N/A	100	1	< 0.100
Cd	-5.083	N/A	N/A	100	1	< 0.100
Co	-13.712	N/A	N/A	100	1	< 0.100
Cr	115.477	N/A	N/A	100	1	11.5
Mn	140.317	N/A	N/A	100	1	14.0
Ni	490.045	N/A	N/A	100	1	49.0
Pb	270.535	N/A	N/A	100	1	27.1
Sb	62.157	N/A	N/A	100	1	6.22
Se	58.509	N/A	N/A	100	1	5.85

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Client: Eastern Research Group
Project Number: 42298

Sample Report

Client Sample ID:	LTV-40,38 BH
TLI Sample ID:	173-60-4B,4A BH
Date Received:	July 01 & 14, 1997
Date Prepared:	July 18-25, 1997
Date Analyzed:	July 28, 1997
Matrix:	Air

Analyte	Conc. (ug/L)	mL. Total Vol.	mL. Used	mL. Final Vol.	Dilution Factor	Total ug Result
As	-3.540	300	300	100	1	< 0.500
Be	0.050	300	300	100	1	< 0.100
Cd	0.261	300	300	100	1	< 0.100
Co	-0.905	300	300	100	1	< 0.100
Cr	12.973	300	300	100	1	1.30
Mn	157.365	300	300	100	1	15.7
Ni	4.587	300	300	100	1	0.459
Pb	39.868	300	300	100	1	3.99
Sb	-1.279	300	300	100	1	< 0.400
Se	12.049	300	300	100	1	1.20

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Sample Report

Client Sample ID:	LTV-52 & 10 & LTV-51 FH
TLI Sample ID:	174-97-19,9 & 173-60-5A FH
Date Received:	July 01 & 14, 1997
Date Prepared:	July 18-25, 1997
Date Analyzed:	July 28, 1997
Matrix:	Air

Analyte	Conc. (ug/L)	mL Total Vol.	mL Used	mL Final Vol.	Dilution Factor	Total ug Result
As	3.659	N/A	N/A	100	1	< 0.500
Be	-0.009	N/A	N/A	100	1	< 0.100
Cd	-7.418	N/A	N/A	100	1	< 0.100
Co	-14.652	N/A	N/A	100	1	< 0.100
Cr	105.582	N/A	N/A	100	1	10.6
Mn	55.734	N/A	N/A	100	1	5.57
Ni	248.809	N/A	N/A	100	1	24.9
Pb	92.009	N/A	N/A	100	1	9.20
Sb	60.668	N/A	N/A	100	1	6.07
Se	52.007	N/A	N/A	100	1	5.20

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Sample Report

Client Sample ID:	LTV-53,51 BH
TLI Sample ID:	173-60-5B,5A BH
Date Received:	July 01 & 14, 1997
Date Prepared:	July 18-25, 1997
Date Analyzed:	July 28, 1997
Matrix:	Air

Analyte	Conc. (ug/L)	mL Total Vol.	mL Used	mL Final Vol.	Dilution Factor	Total ug Result
As	-4.576	300	300	100	1	< 0.500
Be	0.129	300	300	100	1	< 0.100
Cd	0.373	300	300	100	1	< 0.100
Co	-1.180	300	300	100	1	< 0.100
Cr	12.646	300	300	100	1	1.26
Mn	1240.667	300	300	100	1	124
Ni	3.475	300	300	100	1	0.347
Pb	129.916	300	300	100	1	13.0
Sb	-0.536	300	300	100	1	< 0.400
Se	10.086	300	300	100	1	1.01

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Sample Report

Client Sample ID:	LTV-58 FH
TLI Sample ID:	173-60-6A FH
Date Received:	July 01 & 14, 1997
Date Prepared:	July 18-25, 1997
Date Analyzed:	July 28, 1997
Matrix:	Air

Analyte	Conc. (ug/L)	mL Total Vol.	mL Used	mL Final Vol.	Dilution Factor	Total ug Result
As	-1.483	N/A	N/A	100	1	< 0.500
Be	0.006	N/A	N/A	100	1	< 0.100
Cd	-0.530	N/A	N/A	100	1	< 0.100
Co	-1.436	N/A	N/A	100	1	< 0.100
Cr	12.073	N/A	N/A	100	1	1.21
Mn	15.694	N/A	N/A	100	1	1.57
Ni	6.064	N/A	N/A	100	1	0.606
Pb	5.342	N/A	N/A	100	1	0.534
Sb	3.834	N/A	N/A	100	1	< 0.400
Se	3.383	N/A	N/A	100	1	0.338

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Sample Report

Client Sample ID:	LTV-58,60 BH
TLI Sample ID:	173-60-6A,6C BH
Date Received:	July 01 & 14, 1997
Date Prepared:	July 18-25, 1997
Date Analyzed:	July 28, 1997
Matrix:	Air

Analyte	Conc. (ug/L)	mL Total Vol.	mL Used	mL Final Vol.	Dilution Factor	Total ug Result
As	-3.656	150	150	100	1	< 0.500
Be	0.169	150	150	100	1	< 0.100
Cd	-0.289	150	150	100	1	< 0.100
Co	-0.594	150	150	100	1	< 0.100
Cr	8.229	150	150	100	1	0.823
Mn	11.139	150	150	100	1	1.11
Ni	2.188	150	150	100	1	< 0.300
Pb	4.697	150	150	100	1	0.470
Sb	2.279	150	150	100	1	< 0.400
Se	2.176	150	150	100	1	< 0.300

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Sample Report

Client Sample ID:	LTV-57 BH
TLI Sample ID:	173-60-7 BH
Date Received:	July 01 & 14, 1997
Date Prepared:	July 18-25, 1997
Date Analyzed:	July 28, 1997
Matrix:	Air

Analyte	Conc. (ug/L)	mL Total Vol.	mL Used	mL Final Vol.	Dilution Factor	Total ug Result
As	-6.245	200	200	100	1	< 0.500
Be	0.108	200	200	100	1	< 0.100
Cd	-0.304	200	200	100	1	< 0.100
Co	-0.912	200	200	100	1	< 0.100
Cr	9.524	200	200	100	1	0.952
Mn	35.882	200	200	100	1	3.59
Ni	4.083	200	200	100	1	0.408
Pb	6.893	200	200	100	1	0.689
Sb	-1.340	200	200	100	1	< 0.400
Se	-1.281	200	200	100	1	< 0.300

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Sample Report

Client Sample ID:	LTV-46 & 9 & LTV-45 FH
TLI Sample ID:	174-97-20,10 & 173-60-11A FH
Date Received:	July 01 & 14, 1997
Date Prepared:	July 18-25, 1997
Date Analyzed:	July 28, 1997
Matrix:	Air

Analyte	Conc. (ug/L)	mL Total Vol.	mL Used	mL Final Vol.	Dilution Factor	Total ug Result
As	5.039	N/A	N/A	100	1	0.504
Be	0.152	N/A	N/A	100	1	< 0.100
Cd	-9.533	N/A	N/A	100	1	< 0.100
Co	-18.187	N/A	N/A	100	1	< 0.100
Cr	112.023	N/A	N/A	100	1	11.2
Mn	38.534	N/A	N/A	100	1	3.85
Ni	233.999	N/A	N/A	100	1	23.4
Pb	18.771	N/A	N/A	100	1	1.88
Sb	66.545	N/A	N/A	100	1	6.65
Se	60.488	N/A	N/A	100	1	6.05

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Sample Report

Client Sample ID:	LTV-45,47 BH
TLI Sample ID:	173-60-11A,11B BH
Date Received:	July 01 & 14, 1997
Date Prepared:	July 18-25, 1997
Date Analyzed:	July 28, 1997
Matrix:	Air

Analyte	Conc. (ug/L)	mL Total Vol.	mL Used	mL Final Vol.	Dilution Factor	Total ug Result
As	-3.108	150	150	100	1	< 0.500
Be	0.097	150	150	100	1	< 0.100
Cd	-0.165	150	150	100	1	< 0.100
Co	-0.993	150	150	100	1	< 0.100
Cr	5.012	150	150	100	1	0.501
Mn	29.921	150	150	100	1	2.99
Ni	1.815	150	150	100	1	< 0.300
Pb	8.588	150	150	100	1	0.859
Sb	7.076	150	150	100	1	0.708
Se	-0.628	150	150	100	1	< 0.300

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Sample Report

Client Sample ID:	LTV-91,99 & 5,12 & LTV-20 FH
TLI Sample ID:	174-97-12,17,2,3 & 173-60-12A FH
Date Received:	July 01 & 14, 1997
Date Prepared:	July 18-25, 1997
Date Analyzed:	July 28, 1997
Matrix:	Air

Analyte	Conc. (ug/L)	mL Total Vol.	mL Used	mL Final Vol.	Dilution Factor	Total ug Result
As	141.540	N/A	N/A	100	1	14.2
Be	-1.343	N/A	N/A	100	1	< 0.100
Cd	861.003	N/A	N/A	100	1	86.1
Co	-0.511	N/A	N/A	100	1	< 0.100
Cr	841.898	N/A	N/A	100	1	84.2
Mn	13334.219	N/A	N/A	100	1	1330
Ni	1193.349	N/A	N/A	100	1	119
Pb	19317.717	N/A	N/A	100	10	19300
Sb	124.741	N/A	N/A	100	1	12.50
Se	347.275	N/A	N/A	100	1	34.7

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Sample Report

Client Sample ID:	LTV-21 BH
TLI Sample ID:	173-60-12B BH
Date Received:	July 01 & 14, 1997
Date Prepared:	July 18-25, 1997
Date Analyzed:	July 28, 1997
Matrix:	Air

Analyte	Conc. (ug/L)	mL Total Vol.	mL Used	mL Final Vol.	Dilution Factor	Total ug Result
As	-1.114	610	510	100	1	< 0.598
Be	0.017	610	510	100	1	< 0.120
Cd	7.374	610	510	100	1	0.882
Co	0.557	610	510	100	1	< 0.120
Cr	58.852	610	510	100	1	7.04
Mn	437.650	610	510	100	1	52.3
Ni	40.027	610	510	100	1	4.79
Pb	808.638	610	510	100	1	96.7
Sb	0.113	610	510	100	1	< 0.478
Se	126.506	610	510	100	1	15.1

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Sample Report

Client Sample ID:	LTV-92 & 6 & LTV-26 FH
TLI Sample ID:	174-97-14,5 & 173-60-13A FH
Date Received:	July 01 & 14, 1997
Date Prepared:	July 18-25, 1997
Date Analyzed:	July 28, 1997
Matrix:	Air

Analyte	Conc. (ug/L)	mL Total Vol.	mL Used	mL Final Vol.	Dilution Factor	Total ug Result
As	184.349	N/A	N/A	100	1	18.4
Be	-2.734	N/A	N/A	100	1	< 0.100
Cd	808.306	N/A	N/A	100	1	80.8
Co	13.844	N/A	N/A	100	1	1.38
Cr	1009.181	N/A	N/A	100	1	101
Mn	18018.865	N/A	N/A	100	1	1800
Ni	828.507	N/A	N/A	100	1	82.9
Pb	18498.926	N/A	N/A	100	10	18500
Sb	99.302	N/A	N/A	100	1	9.93
Se	405.634	N/A	N/A	100	1	40.6

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Sample Report

Client Sample ID:	LTV-27 BH
TLI Sample ID:	173-60-13B BH
Date Received:	July 01 & 14, 1997
Date Prepared:	July 18-25, 1997
Date Analyzed:	July 28, 1997
Matrix:	Air

Analyte	Conc. (ug/L)	mL Total Vol.	mL Used	mL Final Vol.	Dilution Factor	Total ug Result
As	-2.825	440	340	100	1	< 0.647
Be	0.055	440	340	100	1	< 0.129
Cd	-0.327	440	340	100	1	< 0.129
Co	-1.497	440	340	100	1	< 0.129
Cr	12.701	440	340	100	1	1.64
Mn	52.151	440	340	100	1	6.75
Ni	8.878	440	340	100	1	1.15
Pb	10.712	440	340	100	1	1.39
Sb	-2.560	440	340	100	1	< 0.518
Se	161.373	440	340	100	1	20.9

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Client: Eastern Research Group
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Sample Report

Client Sample ID:	LTV-93 & 7 & LTV-32 FH
TLI Sample ID:	174-97-16,7 & 173-60-14A FH
Date Received:	July 01 & 14, 1997
Date Prepared:	July 18-25, 1997
Date Analyzed:	July 28, 1997
Matrix:	Air

Analyte	Conc. (ug/L)	mL Total Vol.	mL Used	mL Final Vol.	Dilution Factor	Total ug Result
As	200.979	N/A	N/A	100	1	20.1
Be	-2.385	N/A	N/A	100	1	< 0.100
Cd	848.065	N/A	N/A	100	1	84.8
Co	18.657	N/A	N/A	100	1	1.87
Cr	998.006	N/A	N/A	100	1	99.8
Mn	18995.707	N/A	N/A	100	1	1900
Ni	869.776	N/A	N/A	100	1	87.0
Pb	19072.715	N/A	N/A	100	10	19100
Sb	90.560	N/A	N/A	100	1	9.06
Se	322.289	N/A	N/A	100	1	32.2

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Sample Report

Client Sample ID:	LTV-33 BH
TLI Sample ID:	173-60-14B BH
Date Received:	July 01 & 14, 1997
Date Prepared:	July 18-25, 1997
Date Analyzed:	July 28, 1997
Matrix:	Air

Analyte	Conc. (ug/L)	mL Total Vol.	mL Used	mL Final Vol.	Dilution Factor	Total ug Result
As	-4.527	440	340	100	1	< 0.647
Be	0.074	440	340	100	1	< 0.129
Cd	-0.411	440	340	100	1	< 0.129
Co	-1.021	440	340	100	1	< 0.129
Cr	15.393	440	340	100	1	1.99
Mn	97.228	440	340	100	1	12.6
Ni	3.670	440	340	100	1	0.475
Pb	10.371	440	340	100	1	1.34
Sb	-1.563	440	340	100	1	< 0.518
Se	158.385	440	340	100	1	20.5

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QA: Serial Dilution

Client Sample ID:	LTV-88 & 2 & LTV-02,101 FH	LTV-88 & 2 & LTV-02,101 FH L
TLI Sample ID:	174-97-11,1 & 173-60-1A,10 FH	174-97-11,1 & 173-60-1A,10 FH L
Date Prepared:	July 18-25, 1997	July 18-25, 1997
Date Analyzed:	July 28, 1997	July 28, 1997
Matrix:	Air	Air

	Native Sample		Serial Dilution		
Analyte	Total ug Result	ug/L Conc.	Total ug Result	ug/L Conc.	RPD
As	4.63	46.257	3.96	7.927	<RDL
Be	< 0.100	0.259	< 0.500	0.136	<RDL
Cd	72.7	726.988	76.6	153.150	5.22%
Co	< 0.100	-7.271	< 0.500	-1.256	<RDL
Cr	21.7	216.987	24.5	48.990	12.1%
Mn	53.5	535.365	54.2	108.372	1.30%
Ni	81.8	817.800	86.3	172.627	5.35%
Pb	15400	30775.289	15900	6354.457	3.19%
Sb	6.04	60.445	7.23	14.467	<RDL
Se	17.0	169.688	18.7	37.387	9.52%

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Client: **Eastern Research Group**
Project Number: 42298

QA: Serial Dilution

Client Sample ID:	LTV-03 BH	LTV-03 BH L
TLI Sample ID:	173-60-1B BH	173-60-1B BH L
Date Prepared:	July 18-25, 1997	July 18-25, 1997
Date Analyzed:	July 28, 1997	July 28, 1997
Matrix:	Air	Air

	Native Sample		Serial Dilution		
Analyte	Total ug Result	ug/L Conc.	Total ug Result	ug/L Conc.	RPD
As	< 0.588	0.216	< 2.94	-1.318	<RDL
Be	< 0.118	0.205	< 0.588	0.069	<RDL
Cd	0.695	5.910	0.658	1.119	<RDL
Co	< 0.118	-0.565	< 0.588	0.182	<RDL
Cr	2.98	25.395	3.27	5.556	<RDL
Mn	11.9	101.394	11.7	19.982	<RDL
Ni	4.51	38.396	4.61	7.849	<RDL
Pb	8.44	71.842	10.9	18.600	<RDL
Sb	< 0.470	2.266	< 2.35	0.522	<RDL
Se	19.8	168.572	21.6	36.695	8.70%

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Client: **Eastern Research Group**
Project Number: **42298**

QA: Duplicate

Client Sample ID:	LTV-89 & 3 & LTV-08 FH	LTV-89 & 3 & LTV-08 FH DA
TLI Sample ID:	174-97-13,4 & 173-60-2A FH	174-97-13,4 & 173-60-2A FH DA
Date Prepared:	July 18-25, 1997	July 18-25, 1997
Date Analyzed:	July 28, 1997	July 28, 1997
Matrix:	Air	Air

	Sample		Duplicate		
Analyte	Total ug Result	ug/L Conc.	Total ug Result	ug/L Conc.	RPD
As	4.33	43.272	4.28	42.792	<RDL
Be	< 0.100	0.250	< 0.100	0.204	<RDL
Cd	67.5	674.566	67.0	669.962	0.743%
Co	< 0.100	0.855	0.117	1.169	<RDL
Cr	17.2	171.701	17.1	170.696	0.583%
Mn	56.1	561.112	55.9	559.259	0.357%
Ni	117	1166.381	116	1160.938	0.858%
Pb	15000	15047.530	15000	14956.682	0.000%
Sb	5.81	58.077	6.31	63.087	8.25%
Se	18.7	186.641	18.8	187.574	0.533%

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Client: **Eastern Research Group**
Project Number: **42298**

QA: Duplicate

Client Sample ID:	LTV-09 BH	LTV-09 BH DA
TLI Sample ID:	173-60-2B BH	173-60-2B BH DA
Date Prepared:	July 18-25, 1997	July 18-25, 1997
Date Analyzed:	July 28, 1997	July 28, 1997
Matrix:	Air	Air

	Sample		Duplicate		
Analyte	Total ug Result	ug/L Conc.	Total ug Result	ug/L Conc.	RPD
As	< 0.589	-2.804	< 0.589	-4.576	<RDL
Be	< 0.118	0.065	< 0.118	0.081	<RDL
Cd	< 0.118	-0.318	< 0.118	-0.343	<RDL
Co	< 0.118	-1.593	< 0.118	-1.807	<RDL
Cr	1.52	12.890	1.46	12.366	<RDL
Mn	24.2	205.645	24.4	206.673	0.823%
Ni	0.516	4.377	0.507	4.301	<RDL
Pb	1.16	9.816	1.09	9.255	<RDL
Sb	< 0.471	2.228	< 0.471	1.696	<RDL
Se	16.5	139.641	15.8	134.400	4.33%

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Client: Eastern Research Group
Project Number: 42298

QA: Matrix Spikes (Post-Digestion)

Client Sample ID:	LTV-88 & 2 & LTV-02,101 FH PDS	
TLI Sample ID:	174-97-11,1 & 173-60-1A,10 FH PDS	
Date Prepared:	July 18-25, 1997	
Date Analyzed:	July 28, 1997	
Matrix:	Air	

	Post-Digestion Spike			Post-Digestion Spike Duplicate			RPD
Analyte	Recovered Amount (ug/L)	Spike Amount (ug/L)	% Recovery	Recovered Amount (ug/L)	Spike Amount (ug/L)	% Recovery	
As	85.38	50	78%				---
Be	46.21	50	92%				---
Cd	759.18	50	Spike Low				---
Co	40.63	50	81%				---
Cr	263.38	50	93%				---
Mn	574.10	50	Spike Low				---
Ni	849.99	50	Spike Low				---
Pb	N/A	N/A	Spike Low				---
Sb	114.04	50	107%				---
Se	210.22	50	81%				---

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Client: Eastern Research Group
Project Number: 42298

QA: Matrix Spikes (Post-Digestion)

Client Sample ID:	LTV-03 BH PDS	
TLI Sample ID:	173-60-1B BH PDS	
Date Prepared:	July 18-25, 1997	
Date Analyzed:	July 28, 1997	
Matrix:	Air	

	Post-Digestion Spike			Post-Digestion Spike Duplicate			
Analyte	Recovered Amount (ug/L)	Spike Amount (ug/L)	% Recovery	Recovered Amount (ug/L)	Spike Amount (ug/L)	% Recovery	RPD
As	44.31	50	89%				—
Be	46.56	50	93%				—
Cd	53.00	50	94%				—
Co	47.22	50	94%				—
Cr	75.38	50	100%				—
Mn	148.53	50	94%				—
Ni	86.68	50	97%				—
Pb	115.93	50	88%				—
Sb	49.78	50	100%				—
Se	210.78	50	84%				—

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Client: **Eastern Research Group**
Project Number: **42298**

QA: Method Blank

TLI Sample ID:	42298 MB
Date Prepared:	July 18-25, 1997
Date Analyzed:	July 28, 1997
Matrix:	N/A

	Method Blank		
Analyte	Recovered Amount (ug/L)	Detection Limit (ug/L)	Pass or Fail
As	-5.10	5	Pass
Be	0.29	1	Pass
Cd	-0.25	1	Pass
Co	-0.48	1	Pass
Cr	-0.40	2	Pass
Mn	0.28	2	Pass
Ni	-1.28	3	Pass
Pb	1.18	2	Pass
Sb	0.54	4	Pass
Se	1.21	3	Pass
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Client: Eastern Research Group
Project Number: 42298

QA: Lab Control Spikes

TLI Sample ID:	42298 LCS	
Date Prepared:	July 18-25, 1997	
Date Analyzed:	July 28, 1997	
Matrix:	N/A	

	Lab Control Spike			Lab Control Spike Duplicate			
Analyte	Recovered Amount (ug/L)	Spike Amount (ug/L)	% Recovery	Recovered Amount (ug/L)	Spike Amount (ug/L)	% Recovery	RPD
As	41.89	50	84%				---
Be	44.31	50	89%				---
Cd	45.10	50	90%				---
Co	46.55	50	93%				---
Cr	46.66	50	93%				---
Mn	45.99	50	92%				---
Ni	45.33	50	91%				---
Pb	52.49	50	105%				---
Sb	52.65	50	105%				---
Se	44.65	50	89%				---

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Client: Eastern Research Group
Project Number: 42298

Sample Report

Date Received:	July 01 & 14, 1997
Date Prepared:	July 18-29, 1997
Date Analyzed:	July 21 & 29-31, 1997
DATA FILE:	AB780, AB785 & AB787
Matrix:	Air

ANALYTE: Hg	
ug/L RDL: 0.2	
Analysis Method:	29
Instrument: P E Zeeman 5100	
Spike Conc. (ug/L)	5

CVAA ANALYTE SUMMARY REPORT

Client Sample ID	TLI SAMPID	ug/L CONC	ml TV	ml FV	ml Aliquot	DIL FACTOR	Total ug RESULT	Avg. RESULT	RPD	%REC
LTV-88 & 2 & LTV-02 FH	174-97-11,1 & 173-60-1A,10	0.039	N/A	100	5	1	< 0.400	–	–	–
LTV-88 & 2 & LTV-02 FH D	174-97-11,1 & 173-60-1A,10 D	0.037	N/A	100	5	1	< 0.400	< 0.400	–	–
LTV-03 BH	173-60-1B	0.055	670	N/A	5	1	< 2.68	–	–	–
LTV-03 BH D	173-60-1B D	0.047	670	N/A	5	1	< 2.68	< 2.68	–	–
LTV-04 HNO3	173-60-1C	0.000	25	N/A	5	1	< 0.100	–	–	–
LTV-04 HNO3 D	173-60-1C D	-0.002	25	N/A	5	1	< 0.100	< 0.100	–	–
LTV-05 KMnO4	173-60-1D	0.289	230	N/A	5	1	1.33	–	–	–
LTV-05 KMnO4 D	173-60-1D D	0.308	230	N/A	5	1	1.42	1.37	–	–
LTV-06 HCl	173-60-1E	0.020	90	N/A	5	1	< 0.360	–	–	–
LTV-06 HCl D	173-60-1E D	0.027	90	N/A	5	1	< 0.360	< 0.360	–	–
LTV-89 & 3 & LTV-08 FH	174-97-13,4 & 173-60-2A	0.073	N/A	100	5	1	< 0.400	–	–	–
LTV-89 & 3 & LTV-08 FH D	174-97-13,4 & 173-60-2A D	0.057	N/A	100	5	1	< 0.400	< 0.400	–	–
LTV-09 BH	173-60-2B	0.070	660	N/A	5	1	< 2.64	–	–	–
LTV-09 BH D	173-60-2B D	0.081	660	N/A	5	1	< 2.64	< 2.64	–	–
LTV-10 HNO3	173-60-2C	-0.015	60	N/A	5	1	< 0.240	–	–	–
LTV-10 HNO3 D	173-60-2C D	-0.007	60	N/A	5	1	< 0.240	< 0.240	–	–
LTV-11 KMnO4	173-60-2D	0.360	250	N/A	5	1	1.80	–	–	–
LTV-11 KMnO4 D	173-60-2D D	0.362	250	N/A	5	1	1.81	1.81	–	–
LTV-12 HCl	173-60-2E	0.042	65	N/A	5	1	< 0.260	–	–	–
LTV-12 HCl D	173-60-2E D	0.020	65	N/A	5	1	< 0.260	< 0.260	–	–
LTV-90 & 4 & LTV-14 FH	174-97-15,6 & 173-60-3A	0.073	N/A	100	5	1	< 0.400	–	–	–
LTV-90 & 4 & LTV-14 FH D	174-97-15,6 & 173-60-3A D	0.047	N/A	100	5	1	< 0.400	< 0.400	–	–
LTV-15 BH	173-60-3B	0.091	690	N/A	5	1	< 2.76	–	–	–
LTV-15 BH D	173-60-3B D	0.063	690	N/A	5	1	< 2.76	< 2.76	–	–
LTV-16 HNO3	173-60-3C	-0.015	45	N/A	5	1	< 0.180	–	–	–
LTV-16 HNO3 D	173-60-3C D	-0.012	45	N/A	5	1	< 0.180	< 0.180	–	–
LTV-17 KMnO4	173-60-3D	0.595	250	N/A	5	1	2.98	–	–	–
LTV-17 KMnO4 D	173-60-3D D	0.582	250	N/A	5	1	2.91	2.94	–	–
LTV-18 HCl	173-60-3E	0.012	90	N/A	5	1	< 0.360	–	–	–
LTV-18 HCl D	173-60-3E D	0.007	90	N/A	5	1	< 0.360	< 0.360	–	–

Client: Eastern Research Group
Project Number: 42298

Sample Report

Date Received:	July 01 & 14, 1997
Date Prepared:	July 18-29, 1997
Date Analyzed:	July 21 & 29-31, 1997
DATA FILE:	AB780, AB785 & AB787
Matrix:	Air

ANALYTE:	Hg
ug/L RDL:	0.2
Analysis Method:	29
Instrument:	P E Zeeman 5100
Spike Conc. (ug/L)	5

CVAA ANALYTE SUMMARY REPORT

Client Sample ID	TLI SAMPID	ug/L CONC	ml TV	ml FV	ml Aliquot	Dil. FACTOR	Total ug RESULT	Avg. RESULT	RPD	%REC
LTV-39 & 8 & LTV-38 FH	174-97-18,8 & 173-60-4A	0.039	N/A	100	5	1	< 0.400	--	--	--
LTV-39 & 8 & LTV-38 FH D	174-97-18,8 & 173-60-4A D	0.023	N/A	100	5	1	< 0.400	< 0.400	--	--
LTV-38,40 BH	173-60-4AB	0.003	300	N/A	5	1	< 1.20	--	--	--
LTV-38,40 BH D	173-60-4AB D	0.000	300	N/A	5	1	< 1.20	< 1.20	--	--
LTV-41 HNO3	173-60-4C	0.003	33	N/A	5	1	< 0.132	--	--	--
LTV-41 HNO3 D	173-60-4C D	0.008	33	N/A	5	1	< 0.132	< 0.132	--	--
LTV-42 KMnO4	173-60-4D	0.065	260	N/A	5	1	< 1.04	--	--	--
LTV-42 KMnO4 D	173-60-4D D	0.091	260	N/A	5	1	< 1.04	< 1.04	--	--
LTV-42,43 HCl	173-60-4DE	0.013	65	N/A	5	1	< 0.260	--	--	--
LTV-42,43 HCl D	173-60-4DE D	0.010	65	N/A	5	1	< 0.260	< 0.260	--	--
LTV-52 & 10 & LTV-51 FH	174-97-19,9 & 173-60-5A	0.023	N/A	100	5	1	< 0.400	--	--	--
LTV-52 & 10 & LTV-51 FH D	174-97-19,9 & 173-60-5A D	0.013	N/A	100	5	1	< 0.400	< 0.400	--	--
LTV-51,53 BH	173-60-5AB	0.039	300	N/A	5	1	< 1.20	--	--	--
LTV-51,53 BH D	173-60-5AB D	0.029	300	N/A	5	1	< 1.20	< 1.20	--	--
LTV-54 HNO3	173-60-5C	0.021	65	N/A	5	1	< 0.260	--	--	--
LTV-54 HNO3 D	173-60-5C D	0.021	65	N/A	5	1	< 0.260	< 0.260	--	--
LTV-55 KMnO4	173-60-5D	0.029	275	N/A	5	1	< 1.10	--	--	--
LTV-55 KMnO4 D	173-60-5D D	0.023	275	N/A	5	1	< 1.10	< 1.10	--	--
LTV-55,56 HCl	173-60-5DE	0.037	75	N/A	5	1	< 0.300	--	--	--
LTV-55,56 HCl D	173-60-5DE D	0.029	75	N/A	5	1	< 0.300	< 0.300	--	--
LTV-58 FH	173-60-6A	0.025	N/A	100	5	1	< 0.400	--	--	--
LTV-58 FH D	173-60-6A D	0.013	N/A	100	5	1	< 0.400	< 0.400	--	--
LTV-58,60 BH	173-60-6AC	0.039	150	N/A	5	1	< 0.600	--	--	--
LTV-58,60 BH D	173-60-6AC D	0.026	150	N/A	5	1	< 0.600	< 0.600	--	--
LTV-58 HNO3	173-60-6A Hg	0.023	100	N/A	5	1	< 0.400	--	--	--
LTV-58 HNO3 D	173-60-6A Hg D	0.029	100	N/A	5	1	< 0.400	< 0.400	--	--
LTV-61 KMnO4	173-60-6D	0.154	95	N/A	5	1	< 0.380	--	--	--
LTV-61 KMnO4 D	173-60-6D D	0.081	95	N/A	5	1	< 0.380	< 0.380	--	--
LTV-61,62 HCl	173-60-6DE	0.018	220	N/A	5	1	< 0.880	--	--	--
LTV-61,62 HCl D	173-60-6DE D	0.021	220	N/A	5	1	< 0.880	< 0.880	--	--

Client: Eastern Research Group
Project Number: 42298

Sample Report

Date Received:	July 01 & 14, 1997
Date Prepared:	July 18-29, 1997
Date Analyzed:	July 21 & 29-31, 1997
DATA FILE:	AB780, AB785 & AB787
Matrix:	Air

ANALYTE: Hg	
ug/L RDL: 0.2	
Analysis Method:	29
Instrument: P E Zeeman 5100	
Spike Conc. (ug/L)	5

CVAA ANALYTE SUMMARY REPORT

Client Sample ID	TLI SAMPID	ug/L CONC	ml TV	ml FV	ml Aliquot	DIL FACTOR	Total ug RESULT	Avg RESULT	RPD	%REC
LTV-57 BH	173-60-7	0.047	200	N/A	5	1	< 0.800	–	–	–
LTV-57 BH D	173-60-7 D	0.060	200	N/A	5	1	< 0.800	< 0.800	–	–
LTV-59 KMnO4	173-60-6B	0.021	220	N/A	5	1	< 0.880	–	–	–
LTV-59 KMnO4 D	173-60-6B D	0.021	220	N/A	5	1	< 0.880	< 0.880	–	–
LTV-46 & 9 & LTV-45 FH	174-97-20,10 & 173-60-11A	0.023	N/A	100	5	1	< 0.400	–	–	–
LTV-46 & 9 & LTV-45 FH D	174-97-20,10 & 173-60-11A D	0.026	N/A	100	5	1	< 0.400	< 0.400	–	–
LTV-45,47 BH	173-60-11AB	0.029	150	N/A	5	1	< 0.600	–	–	–
LTV-45,47 BH D	173-60-11AB D	0.018	150	N/A	5	1	< 0.600	< 0.600	–	–
LTV-45 HNO3	173-60-11A	0.013	20	N/A	5	1	< 0.080	–	–	–
LTV-45 HNO3 D	173-60-11A D	0.013	20	N/A	5	1	< 0.080	< 0.080	–	–
LTV-48 KMnO4	173-60-11D	0.047	90	N/A	5	1	< 0.360	–	–	–
LTV-48 KMnO4 D	173-60-11D D	0.078	90	N/A	5	1	< 0.360	< 0.360	–	–
LTV-48,49 HCl	173-60-11DE	0.037	90	N/A	5	1	< 0.360	–	–	–
LTV-48,49 HCl D	173-60-11DE D	0.016	90	N/A	5	1	< 0.360	< 0.360	–	–
LTV-91,99 & 5,12 & LTV-20 FH	174-97-12,17,2,3 & 173-60-12A	0.146	N/A	100	5	1	< 0.400	–	–	–
LTV-91,99 & 5,12 & LTV-20 FH D	174-97-12,17,2,3 & 173-60-12A D	0.149	N/A	100	5	1	< 0.400	< 0.400	–	–
LTV-21 BH	173-60-12B	0.056	610	N/A	5	1	< 2.44	–	–	–
LTV-21 BH D	173-60-12B D	0.069	610	N/A	5	1	< 2.44	< 2.44	–	–
LTV-22 HNO3	173-60-12C	0.311	90	N/A	5	1	0.560	–	–	–
LTV-22 HNO3 D	173-60-12C D	0.301	90	N/A	5	1	0.542	0.551	–	–
LTV-23 KMnO4	173-60-12D	0.039	210	N/A	5	1	< 0.840	–	–	–
LTV-23 KMnO4 D	173-60-12D D	0.042	210	N/A	5	1	< 0.840	< 0.840	–	–
LTV-24 HCl	173-60-12E	-0.005	70	N/A	5	1	< 0.280	–	–	–
LTV-24 HCl D	173-60-12E D	-0.002	70	N/A	5	1	< 0.280	< 0.280	–	–

Client: Eastern Research Group
Project Number: 42298

Sample Report

Date Received:	July 01 & 14, 1997
Date Prepared:	July 18-29, 1997
Date Analyzed:	July 21 & 29-31, 1997
DATA FILE:	AB780, AB785 & AB787
Matrix:	Air

ANALYTE: Hg	
ug/L RDL: 0.2	
Analysis Method:	29
Instrument: P E Zeeman 5100	
Spike Conc. (ug/L)	5

CVAA ANALYTE SUMMARY REPORT

Client Sample ID	TLI SAMPID	ug/L CONC	ml TV	ml FV	ml Aliquot	DIL FACTOR	Total ug RESULT	Avg. RESULT	RPD	%REC
LTV-92 & 6 & LTV-26 FH	174-97-14,5 & 173-60-13A	0.227	N/A	100	5	1	0.454	–	–	–
LTV-92 & 6 & LTV-26 FH D	174-97-14,5 & 173-60-13A D	0.242	N/A	100	5	1	0.484	0.469	–	–
LTV-27 BH	173-60-13B	0.127	440	N/A	5	1	< 1.76	–	–	–
LTV-27 BH D	173-60-13B D	0.137	440	N/A	5	1	< 1.76	< 1.76	–	–
LTV-28 HNO3	173-60-13C	-0.015	60	N/A	5	1	< 0.240	–	–	–
LTV-28 HNO3 D	173-60-13C D	-0.022	60	N/A	5	1	< 0.240	< 0.240	–	–
LTV-29 KMnO4	173-60-13D	0.007	255	N/A	5	1	< 1.02	–	–	–
LTV-29 KMnO4 D	173-60-13D D	0.007	255	N/A	5	1	< 1.02	< 1.02	–	–
LTV-30 HCl	173-60-13E	0.002	65	N/A	5	1	< 0.260	–	–	–
LTV-30 HCl D	173-60-13E D	-0.002	65	N/A	5	1	< 0.260	< 0.260	–	–
LTV-93 & 7 & LTV-32 FH	174-97-16,7 & 173-60-14A	0.276	N/A	100	5	1	0.552	–	–	–
LTV-93 & 7 & LTV-32 FH D	174-97-16,7 & 173-60-14A D	0.271	N/A	100	5	1	0.542	0.547	–	–
LTV-33 BH	173-60-14B	0.125	440	N/A	5	1	< 1.76	–	–	–
LTV-33 BH D	173-60-14B D	0.130	440	N/A	5	1	< 1.76	< 1.76	–	–
LTV-34 HNO3	173-60-14C	0.015	50	N/A	5	1	< 0.200	–	–	–
LTV-34 HNO3 D	173-60-14C D	0.000	50	N/A	5	1	< 0.200	< 0.200	–	–
LTV-35 KMnO4	173-60-14D	0.054	260	N/A	5	1	< 1.04	–	–	–
LTV-35 KMnO4 D	173-60-14D D	0.054	260	N/A	5	1	< 1.04	< 1.04	–	–
LTV-36 HCl	173-60-14E	0.002	95	N/A	5	1	< 0.380	–	–	–
LTV-36 HCl D	173-60-14E D	0.005	95	N/A	5	1	< 0.380	< 0.380	–	–
LTV-03 BH MS	173-60-1B MS	5.183	670	N/A	5	1	69.5	–	–	104%
LTV-03 BH MSD	173-60-1B MSD	5.272	670	N/A	5	1	70.6	70.0	1.70%	105%
LTV-09 BH MS	173-60-2B MS	5.186	660	N/A	5	1	68.5	–	–	104%
LTV-09 BH MSD	173-60-2B MSD	4.982	660	N/A	5	1	65.8	67.1	4.01%	100%
LTV-15 BH MS	173-60-3B MS	5.113	690	N/A	5	1	70.6	–	–	102%
LTV-15 BH MSD	173-60-3B MSD	5.454	690	N/A	5	1	75.3	72.9	6.45%	109%
LTV-90 & 4 & LTV-14 FH MS	174-97-15,6 & 173-60-3A MS	4.735	N/A	100	5	1	9.47	–	–	95%
LTV-90 & 4 & LTV-14 FH MSD	174-97-15,6 & 173-60-3A MSD	4.988	N/A	100	5	1	9.98	9.72	5.20%	100%
LTV-61,62 HCl MS	173-60-6DE MS	5.316	220	N/A	5	1	23.4	–	–	106%
LTV-61,62 HCl MSD	173-60-6DE MSD	5.264	220	N/A	5	1	23.2	23.3	0.983%	105%

ient: Eastern Research Group

oject Number: 42298

ample Report

e Received:	July 01 & 14, 1997
e Prepared:	July 18-29, 1997
e Analyzed:	July 21 & 29-31, 1997
TA FILE:	AB780, AB785 & AB787
trix:	Air

ANALYTE: Hg	
ug/L RDL: 0.2	
Analysis Method:	29
Instrument: P E Zeeman 5100	
Spike Conc. (ug/L)	5

CVAA ANALYTE SUMMARY REPORT

ent Sample ID	TLI SAMPID	ug/L CONC	ml TV	ml FV	ml Aliquot	DIL FACTOR	Total ug RESULT	Avg RESULT	RPD	%REC
V-21 BH MS	173-60-12B MS	4.069	610	N/A	5	1	49.6	–	–	81%
V-21 BH MSD	173-60-12B MSD	3.787	610	N/A	5	1	46.2	47.9	7.18%	76%
V-27 BH MS	173-60-13B MS	4.808	440	N/A	5	1	42.3	–	–	96%
V-27 BH MSD	173-60-13B MSD	5.116	440	N/A	5	1	45.0	43.7	6.21%	102%
V-33 BH MS	173-60-14B MS	5.077	440	N/A	5	1	44.7	–	–	102%
V-33 BH MSD	173-60-14B MSD	5.170	440	N/A	5	1	45.5	45.1	1.82%	103%
V-03 BH MS	True Spike MS	5	670	N/A	5	1	67.0	–	–	–
V-03 BH MSD	True Spike MSD	5	670	N/A	5	1	67.0	67.0	–	–
V-09 BH MS	True Spike MS	5	660	N/A	5	1	66.0	–	–	–
V-09 BH MSD	True Spike MSD	5	660	N/A	5	1	66.0	66.0	–	–
V-15 BH MS	True Spike MS	5	690	N/A	5	1	69.0	–	–	–
V-15 BH MSD	True Spike MSD	5	690	N/A	5	1	69.0	69.0	–	–
V-90 & 4 & LTV-14 FH MS	True Spike MS	5	N/A	100	5	1	10.0	–	–	–
V-90 & 4 & LTV-14 FH MSD	True Spike MSD	5	N/A	100	5	1	10.0	10.0	–	–
V-61,62 HCl MS	True Spike MS	5	220	N/A	5	1	22.0	–	–	–
V-61,62 HCl MSD	True Spike MSD	5	220	N/A	5	1	22.0	22.0	–	–
V-21 BH MS	True Spike MS	5	610	N/A	5	1	61.0	–	–	–
V-21 BH MSD	True Spike MSD	5	610	N/A	5	1	61.0	61.0	–	–
V-27 BH MS	True Spike MS	5	440	N/A	5	1	44.0	–	–	–
V-27 BH MSD	True Spike MSD	5	440	N/A	5	1	44.0	44.0	–	–
V-33 BH MS	True Spike MS	5	440	N/A	5	1	44.0	–	–	–
V-33 BH MSD	True Spike MSD	5	440	N/A	5	1	44.0	44.0	–	–
hod Blank	42298 MB1	0.024	–	–	–	–	–	–	–	–
hod Blank D	42298 MB1 D	0.012	–	–	–	–	–	–	–	–
;	42298 LCS1	6.258	–	–	–	–	–	–	–	125%
;D	42298 LCS1 D	5.882	–	–	–	–	–	–	–	118%

Sample Report

Date Received:	July 01 & 14, 1997
Date Prepared:	July 18-29, 1997
Date Analyzed:	July 21 & 29-31, 1997
DATA FILE:	AB780, AB785 & AB787
Matrix:	Air

ANALYTE: Hg	
ug/L RDL: 0.2	
Analysis Method:	29
Instrument: P E Zeeman 5100	
Spike Conc. (ug/L)	5

CVAA ANALYTE SUMMARY REPORT

Client Sample ID	TLI SAMPID	ug/L CONC	ml TV	ml FV	ml Aliquot	DIL FACTOR	Total ug RESULT	Avg. RESULT	RPD	%REC
Method Blank	42298 MB2	0.029	--	--	--	--	--	--	--	--
Method Blank D	42298 MB2 D	0.018	--	--	--	--	--	--	--	--
LCS	42298 LCS2	4.928	--	--	--	--	--	--	--	99%
LCSD	42298 LCS2 D	4.784	--	--	--	--	--	--	--	96%
Method Blank	42298 MB3	0.016	--	--	--	--	--	--	--	--
Method Blank D	42298 MB3 D	0.008	--	--	--	--	--	--	--	--
LCS	42298 LCS3	5.246	--	--	--	--	--	--	--	105%
LCSD	42298 LCS3 D	4.949	--	--	--	--	--	--	--	99%
Method Blank	42298 MB4	0.003	--	--	--	--	--	--	--	--
Method Blank D	42298 MB4 D	-0.003	--	--	--	--	--	--	--	--
LCS	42298 LCS4	4.592	--	--	--	--	--	--	--	92%
LCSD	42298 LCS4 D	4.980	--	--	--	--	--	--	--	100%

Triangle Laboratories, Inc.
801 Capitola Drive * Durham, North Carolina 27713
Tele: (919) 544-5729 * Fax: (919) 544-5491

Printed: 01-Aug-97 at 12:51 PM

LTV STEEL COMPANY
CHAIN OF CUSTODY

RELINQUISHED BY = Ingrid L. Swift DATE = July 1, 1997 RECEIVED BY: J McBrian DATE: July 1, 1997
RELINQUISHED BY = J McBrian DATE = July 14, 1997 RECEIVED BY: DATE:

SAMPLE ID	FIELD ID						SAMPLE TYPE	PRESERVATIVE		Filter # COMMENTS	ANALYSIS
LTV-88	LTV-	062497-	M29-	OUTLET-	F-	1	METHOD 29, OUTLET, RUN 1	✓	Filter	#002	Metals
LTV-91	LTV-	062497-	M29-	INLET-	F-	1	METHOD 29, INLET, RUN 1	✓	Filter (1 of 2)	#007	Metals
LTV-89	LTV-	062697-	M29-	OUTLET-	F-	2	METHOD 29, OUTLET, RUN 2	✓	Filter	#009	Metals
LTV-92	LTV-	062697-	M29-	INLET-	F-	2	METHOD 29, INLET, RUN 2	✓	Filter	#023	Metals
LTV-90	LTV-	062797-	M29-	OUTLET-	F-	3	METHOD 29, OUTLET, RUN 3	✓	Filter	#018	Metals
LTV-93	LTV-	062797-	M29-	INLET-	F-	3	METHOD 29, INLET, RUN 3	✓	Filter	#008	Metals
LTV-99	LTV-	062597-	M29-	INLET-	F-	1A	METHOD 29, INLET, RUN 1	✓	Filter (2 of 2)	#024	Metals
LTV-39	LTV-	062697-	M29-	OUTLET-	F-	FB1	METHOD 29, OUTLET, FB1	✓	FILTER	#011	Metals
LTV-52	LTV-	062697-	M29-	INLET-	F-	FB2	METHOD 29, INLET, FB2	✓	FILTER	#010	Metals
LTV-46	LTV-	062497-	M29-	OUTLET-	F-	RB1	METHOD 29, OUTLET, RB1	✓	FILTER	#024	Metals

Received by:
[illegible] 7/14/97 1540

51

COPY 7/14/97

LTV STEEL COMPANY
CHAIN OF CUSTODY

RELINQUISHED BY = Julie L. Swift DATE = July 1, 1997 RECEIVED BY: J McBrison DATE: July 1, 1997
RELINQUISHED BY = J McBrison DATE = July 14, 1997 RECEIVED BY: J DATE: J

SAMPLE ID	FIELD ID						SAMPLE TYPE	PRESERVATIVE	Beaker # COMMENTS	ANALYSIS
LTV-01	LTV-	062497-	M29-	OUTLET-	APR-	1	METHOD 29, OUTLET, RUN 1	ACETONE PROBE RINSE	2	Metals
LTV-19	LTV-	062497-	M29-	INLET-	APR-	1	METHOD 29, INLET, RUN 1	ACETONE PROBE RINSE	5 (1 of 2)	Metals
LTV-100	LTV-	062597-	M29-	INLET-	APR-	1A	METHOD 29, INLET, RUN 1	ACETONE PROBE RINSE	12 (2 of 2)	Metals
LTV-07	LTV-	062697-	M29-	OUTLET-	APR-	2	METHOD 29, OUTLET, RUN 2	ACETONE PROBE RINSE	3	Metals
LTV-25	LTV-	062697-	M29-	INLET-	APR-	2	METHOD 29, INLET, RUN 2	ACETONE PROBE RINSE	6	Metals
LTV-13	LTV-	062797-	M29-	OUTLET-	APR-	3	METHOD 29, OUTLET, RUN 3	ACETONE PROBE RINSE	4	Metals
LTV-31	LTV-	062797-	M29-	INLET-	APR-	3	METHOD 29, INLET, RUN 3	ACETONE PROBE RINSE	7	Metals
LTV-37	LTV-	062697-	M29-	OUTLET-	APR-	FB1	METHOD 29, OUTLET, FB1	ACETONE PROBE RINSE	8	Metals
LTV-50	LTV-	062697-	M29-	INLET-	APR-	FB2	METHOD 29, INLET, FB2	ACETONE PROBE RINSE	10	Metals
LTV-44	LTV-	062497-	M29-	OUTLET-	APR-	RB1	METHOD 29, OUTLET, RB1	ACETONE	9	Metals
LTV-83	LTV-	062497-	M23-	OUTLET-	PR-	RB1	METHOD 23, OUTLET, RB 1	Acetone Probe Rinse		Dioxins/PAH

LTV-83 was not delivered — for Dioxin Delivered Separately

Received by
[signature] 7/14/97 1540

52

LTV STEEL COMPANY
CHAIN OF CUSTODY

RELINQUISHED BY = Julie C. Swift DATE = July 1, 1997 RECEIVED BY: B [illegible] DATE: 7/1/97
RELINQUISHED BY = DATE = RECEIVED BY: DATE:

SAMPLE ID	FIELD ID						SAMPLE TYPE	PRESERVATIVE	COMMENTS	ANALYSIS
LTV-02	LTV-	062497-	M29-	OUTLET-	HN-	1	METHOD 29, OUTLET, RUN 1	NITRIC ACID PROBE RINSE		Metals
LTV-20	LTV-	062497-	M29-	INLET-	HN-	1	METHOD 29, INLET, RUN 1	NITRIC ACID PROBE RINSE	2 of 2	Metals
LTV-101	LTV-	062597-	M29-	INLET-	HN-	1A	METHOD 29, OUTLET, RUN 1	Nitric Acid Probe Rinse	1 of 2	Metals
LTV-08	LTV-	062697-	M29-	OUTLET-	HN-	2	METHOD 29, OUTLET, RUN 2	NITRIC ACID PROBE RINSE		Metals
LTV-26	LTV-	062697-	M29-	INLET-	HN-	2	METHOD 29, INLET, RUN 2	NITRIC ACID PROBE RINSE		Metals
LTV-14	LTV-	062797-	M29-	OUTLET-	HN-	3	METHOD 29, OUTLET, RUN 3	NITRIC ACID PROBE RINSE		Metals
LTV-32	LTV-	062797-	M29-	INLET-	HN-	3	METHOD 29, INLET, RUN 3	NITRIC ACID PROBE RINSE		Metals
LTV-38	LTV-	062697-	M29-	OUTLET-	HN-	FB1	METHOD 29, OUTLET, FB1	NITRIC ACID PROBE RINSE		Metals
LTV-51	LTV-	062697-	M29-	INLET-	HN-	FB2	METHOD 29, INLET, FB2	NITRIC ACID PROBE RINSE		Metals
LTV-96	LTV-	062597-	M29-	OUTLET-	HNO-	PB	METHOD 29, OUTLET, PROOF BLANK	0.1N HNO3 Rinse	Hold	~~Metals~~
LTV-97	LTV-	062597-	M29-	INLET-	HNO-	PB	METHOD 29, INTLET, PROOF BLANK	0.1N HNO3 Rinse	Hold	~~Metals~~
LTV-45	LTV-	062497-	M29-	OUTLET-	HNO-	RB1	METHOD 29, OUTLET, RB1	0.1N HNO3		Metals
LTV-58	LTV-	062697-	M29-	INLET-	HNO-	RB2	METHOD 29, INLET, RB2	0.1N HNO3		Metals

JCSwift
7/1/97

53

LTV STEEL COMPANY
CHAIN OF CUSTODY

RELINQUISHED BY = Julie L. Swift DATE = July 1, 1997 RECEIVED BY: [illegible] DATE: 7/1/97
RELINQUISHED BY = DATE = RECEIVED BY: DATE:

SAMPLE ID	FIELD ID						SAMPLE TYPE	PRESERVATIVE	COMMENTS	ANALYSIS
LTV-05	LTV-	062497-	M29-	OUTLET-	KMnO-	1	METHOD 29, OUTLET, RUN 1	KMnO4 IMPINGERS		Metals
LTV-23	LTV-	062497-	M29-	INLET-	KMnO-	1	METHOD 29, INLET, RUN 1	KMnO4 IMPINGERS		Metals
LTV-11	LTV-	062697-	M29-	OUTLET-	KMnO-	2	METHOD 29, OUTLET, RUN 2	KMnO4 IMPINGERS		Metals
LTV-29	LTV-	062697-	M29-	INLET-	KMnO-	2	METHOD 29, INLET, RUN 2	KMnO4 IMPINGERS		Metals
LTV-17	LTV-	062797-	M29-	OUTLET-	KMnO-	3	METHOD 29, OUTLET, RUN 3	KMnO4 IMPINGERS		Metals
LTV-35	LTV-	062797-	M29-	INLET-	KMnO-	3	METHOD 29, INLET, RUN 3	KMnO4 IMPINGERS		Metals
LTV-42	LTV-	062697-	M29-	OUTLET-	KMnO-	FB1	METHOD 29, OUTLET, FB1	KMnO4 IMPINGERS		Metals
LTV-55	LTV-	062697-	M29-	INLET-	KMnO-	FB2	METHOD 29, INLET, FB2	KMnO4 IMPINGERS		Metals
LTV-48	LTV-	062497-	M29-	OUTLET-	KMnO-	RB1	METHOD 29, OUTLET, RB1	KMnO4		Metals
LTV-61	LTV-	062597-	M29-	INLET-	KMnO-	RB2	METHOD 29, INLET, RB2	KMnO4		Metals

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LTV STEEL COMPANY
CHAIN OF CUSTODY

RELINQUISHED BY = [illegible] DATE = July 1, 1997 RECEIVED BY: [illegible] DATE: 7/1/97 1300
RELINQUISHED BY = DATE = RECEIVED BY: DATE:

SAMPLE ID	FIELD ID						SAMPLE TYPE	PRESERVATIVE	COMMENTS	ANALYSIS
LTV-03	LTV-	062497-	M29-	OUTLET-	BH-	1	METHOD 29, OUTLET, RUN 1	HNO3/H2O2 BACK HALF		Metals
LTV-21	LTV-	062497-	M29-	INLET-	BH-	1	METHOD 29, INLET, RUN 1	HNO3/H2O2 BACK HALF		Metals
LTV-09	LTV-	062697-	M29-	OUTLET-	BH-	2	METHOD 29, OUTLET, RUN 2	HNO3/H2O2 BACK HALF		Metals
LTV-27	LTV-	062697-	M29-	INLET-	BH-	2	METHOD 29, INLET, RUN 2	HNO3/H2O2 BACK HALF		Metals
LTV-15	LTV-	062797-	M29-	OUTLET-	BH-	3	METHOD 29, OUTLET, RUN 3	HNO3/H2O2 BACK HALF		Metals
LTV-33	LTV-	062797-	M29-	INLET-	BH-	3	METHOD 29, INLET, RUN 3	HNO3/H2O2 BACK HALF		Metals
LTV-40	LTV-	062697-	M29-	OUTLET-	BH-	FB1	METHOD 29, OUTLET, FB1	HNO3/H2O2 BACK HALF		Metals
LTV-53	LTV-	062697-	M29-	INLET-	BH-	FB2	METHOD 29, INLET, FB2	HNO3/H2O2 BACK HALF		Metals
LTV-47	LTV-	062497-	M29-	OUTLET-	BH-	RB1	METHOD 29, OUTLET, RB1	HNO3/H2O2		Metals
LTV-60	LTV-	062597-	M29-	INLET-	BH-	RB2	METHOD 29, INLET, RB2	HNO3/H2O2		Metals
LTV-04	LTV-	062497-	M29-	OUTLET-	BHM-	1	METHOD 29, OUTLET, RUN 1	0.1N HNO3 RINSE - Hg		Metals
LTV-22	LTV-	062497-	M29-	INLET-	BHM-	1	METHOD 29, INLET, RUN 1	0.1N HNO3 RINSE - Hg		Metals
LTV-10	LTV-	062697-	M29-	OUTLET-	BHM-	2	METHOD 29, OUTLET, RUN 2	0.1N HNO3 RINSE - Hg		Metals
LTV-28	LTV-	062697-	M29-	INLET-	BHM-	2	METHOD 29, INLET, RUN 2	0.1N HNO3 RINSE - Hg		Metals
LTV-16	LTV-	062797-	M29-	OUTLET-	BHM-	3	METHOD 29, OUTLET, RUN 3	0.1N HNO3 RINSE - Hg		Metals
LTV-34	LTV-	062797-	M29-	INLET-	BHM-	3	METHOD 29, INLET, RUN 3	0.1N HNO3 RINSE - Hg		Metals
LTV-41	LTV-	062697-	M29-	OUTLET-	BHM-	FB1	METHOD 29, OUTLET, FB1	0.1N HNO3 RINSE - Hg		Metals
LTV-54	LTV-	062697-	M29-	INLET-	BHM-	FB2	METHOD 29, INLET, FB2	0.1N HNO3 RINSE - Hg		Metals

LTV 54 HNO3 / H2O2

LTV-41

55

LTV STEEL COMPANY
CHAIN OF CUSTODY

RELINQUISHED BY = Julie C. Swift DATE = July 1, 1997 RECEIVED BY: [illegible] DATE: [illegible]
RELINQUISHED BY = DATE = RECEIVED BY: DATE:

SAMPLE ID	FIELD ID						SAMPLE TYPE	PRESERVATIVE	COMMENTS	ANALYSIS
LTV-06	LTV-	062497-	M29-	OUTLET-	HCl-	1	METHOD 29, OUTLET, RUN 1	8N HCl RINSE - Hg		Metals
LTV-24	LTV-	062497-	M29-	INLET-	HCl-	1	METHOD 29, INLET, RUN 1	8N HCl RINSE - Hg		Metals
LTV-12	LTV-	062697-	M29-	OUTLET-	HCl-	2	METHOD 29, OUTLET, RUN 2	8N HCl RINSE - Hg		Metals
LTV-30	LTV-	062697-	M29-	INLET-	HCl-	2	METHOD 29, INLET, RUN 2	8N HCl RINSE - Hg		Metals
LTV-18	LTV-	062797-	M29-	OUTLET-	HCl-	3	METHOD 29, OUTLET, RUN 3	8N HCl RINSE - Hg		Metals
LTV-36	LTV-	062797-	M29-	INLET-	HCl-	3	METHOD 29, INLET, RUN 3	8N HCl RINSE - Hg		Metals
LTV-43	LTV-	062697-	M29-	OUTLET-	HCl-	FB1	METHOD 29, OUTLET, FB1	8N HCl RINSE - Hg		Metals
LTV-56	LTV-	062697-	M29-	INLET-	HCl-	FB2	METHOD 29, INLET, FB2	8N HCl RINSE - Hg		Metals
LTV-49	LTV-	062497-	M29-	OUTLET-	HCl-	RB1	METHOD 29, OUTLET, RB1	8N HCl		Metals
LTV-62	LTV-	062797-	M29-	INLET-	HCl-	RB2	METHOD 29, INLET, RB2	8N HCl		Metals

TRIANGLE LABORATORIES, INC. -- LOG IN RECORD/CHAIN OF CUSTODY

Custody Seal : Absent	Sample Seals: Absent	TLI Project Number 42298	Book
Chain of Custody : Present	Container...: Intact	Client: ERG02 - Eastern Research Group	173
Sample Tags : Absent			
Sample Tag Numbers: Not Listed on Chain of Custody			
SMO Forms : N/A		Date Received 07/01/97 By	Page
Box NO COOLANT		Carrier and Number JIM GAUGHEY	60

TLI Number.. ....Client Sample ID..... .....Matrix mR/H:CPM. .....Client COC ID.....* Location.....	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	DISPOSED Date/Init
173-60-1A LTV-02 NITRIC ACID LTV-02 METALS LAB									
173-60-1B LTV-03 HN03/H202 LTV-03 METALS LAB									
173-60-1C LTV-04 0.1N HN03 LTV-04 METALS LAB Hg									
173-60-1D LTV-05 KMN04 LTV-05 METALS LAB Hg									
173-60-1E LTV-06 8N HCl LTV-06 METALS LAB									
173-60-2A LTV-08 NITRIC ACID LTV-08 METALS LAB									
173-60-2B LTV-09 HN03/H202 LTV-09 METALS LAB									
173-60-2C LTV-10 0.1N HN03 LTV-10 METALS LAB Hg									
173-60-2D LTV-11 KMN04 LTV-11 METALS LAB									
173-60-2E LTV-12 8N HCl LTV-12 METALS LAB									
173-60-3A LTV-14 NITRIC ACID LTV-14 METALS LAB									
173-60-3B LTV-15 H_2O_2 ~~1N~~/HN03 LTV-15 METALS LAB									
173-60-3C LTV-16 0.1N HN03 LTV-16 METALS LAB Hg									
173-60-3D LTV-17 KMN04 LTV-17 METALS LAB									

Receiving Remarks:

Archive Remarks:

TRIANGLE LABORATORIES, INC. -- LOG IN RECORD/CHAIN OF CUSTODY

Custody Seal : Absent
Chain of Custody : Present
Sample Tags : Absent
Sample Tag Numbers: Not Listed on Chain of Custody
SMO Forms : N/A

Sample Seals: Absent
Container...: Intact

TLI Project Number 42298
Client: ERG02 - Eastern Research Group

Date Received 07/01/97 By [illegible]

Carrier and Number JIM GAUGHEY

Book 173

Page 60

Box NO COOLANT

TLI Number.. mR/H:CPM.	Client Sample ID..... Client COC ID.....*	Matrix Location.....	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	DISPOSED Date/Init
173-60-3E	LTV-18 LTV-18	8N HCl METALS LAB									
173-60-4A	LTV-38 LTV-38	NITRIC ACID METALS LAB									
173-60-4B	LTV-40 LTV-40	HN03/H202 METALS LAB									
173-60-4C	LTV-41 LTV-41	0.1N HN03 METALS LAB Hg									
173-60-4D	LTV-42 LTV-42	KMN04 METALS LAB									
173-60-4E	LTV-43 LTV-43	8NHCl METALS LAB									
173-60-5A	LTV-51 LTV-51	NITRIC ACID METALS LAB									
173-60-5B	LTV-53 LTV-53	HN03/H202 METALS LAB									
173-60-5C	LTV-54 LTV-54	0.1N HN03 METALS LAB Hg									
173-60-5D	LTV-55 LTV-55	KMN04 METALS LAB									
173-60-5E	LTV-56 LTV-56	8N HCl METALS LAB									
173-60-6A	LTV-58 LTV-58	NITRIC ACID METALS LAB									
173-60-6B	LTV-59 LTV-59	SRB 7/29/97 KMNO4 ~~HN03/H202~~ METALS LAB									
173-60-6C	LTV-60 LTV-60	SRB 7/29/97 HNO3/H2O2 ~~0.1N HN03~~ METALS LAB									

Receiving Remarks:

Archive Remarks:

TRIANGLE LABORATORIES, INC. -- LOG IN RECORD/CHAIN OF CUSTODY

Custody Seal : Absent	Sample Seals: Absent	TLI Project Number 42298	Book
Chain of Custody : Present	Container...: Intact	Client: ERG02 - Eastern Research Group	173
Sample Tags : Absent			
Sample Tag Numbers: Not Listed on Chain of Custody			
SMO Forms : N/A		Date Received 07/01/97 By	Page
Box NO COOLANT		Carrier and Number JIM GAUGHEY	60

TLI Number.. mR/H:CPM.	....Client Sample ID..... .....Client COC ID.....*	.....Matrix Location.....	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	DISPOSED Date/Init
173-60-6D	LTV-61 LTV-61	KMN04 METALS LAB									
173-60-6E	LTV-62 LTV-62	8N HCl METALS LAB									
173-60-7	LTV-57 LTV-57	H202/HN03 METALS LAB									
173-60-8	LTV-96 LTV-96	0.1N HN03 METALS LAB									
173-60-9	LTV-97 LTV-97	0.1N HN03 METALS LAB									
173-60-10	LTV-101 LTV-101	0.1N HN03PR METALS LAB									
173-60-11A	LTV-45 LTV-45	0.1N HN03PR METALS LAB									
173-60-11B	LTV-47 LTV-47	HN03/H202 METALS LAB									
173-60-11C	LTV-87 LTV-87	SRB 7/29/97 HNO3 IMP METALS LAB									
173-60-11D	LTV-48 LTV-48	KMN04 METALS LAB									
173-60-11E	LTV-49 LTV-49	8N HCl METALS LAB									
173-60-12A	LTV-20 LTV-20	NITRIC ACID METALS LAB									
173-60-12B	LTV-21 LTV-21	HN03/H202 METALS LAB									
173-60-12C	LTV-22 LTV-22	0.1N HN03 METALS LAB Hg									

Receiving Remarks:

Archive Remarks:

TRIANGLE LABORATORIES, INC. -- LOG IN RECORD/CHAIN OF CUSTODY

Custody Seal : Absent
Chain of Custody : Present
Sample Tags : Absent
Sample Tag Numbers: Not Listed on Chain of Custody
SMO Forms : N/A

Sample Seals: Absent
Container...: Intact

TLI Project Number 42298
Client: ERG02 - Eastern Research Group

Date Received 07/01/97 By

Box NO COOLANT

Carrier and Number JIM GAUGHEY

Book 173

Page 60

TLI Number.. mR/H:CPM.	Client Sample ID..... Client COC ID.....*	Matrix Location.....	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	DISPOSED Date/Init
173-60-12D	LTV-23	KMN04									
	LTV-23	METALS LAB									
173-60-12E	LTV-24	8N HCl									
	LTV-24	METALS LAB									
173-60-13A	LTV-26	NITRIC ACID									
	LTV-26	METALS LAB									
173-60-13B	LTV-27	HN03/H202									
	LTV-27	METALS LAB									
173-60-13C	LTV-28	0.1N HN03									
	LTV-28	METALS LAB Hg									
173-60-13D	LTV-29	KMN04									
	LTV-29	METALS LAB									
173-60-13E	LTV-30	8N HCl									
	LTV-30	METALS LAB									
173-60-14A	LTV-32	NITRIC ACID									
	LTV-32	METALS LAB									
173-60-14B	LTV-33	HN03/H202									
	LTV-33	METALS LAB									
173-60-14C	LTV-34	0.1N HN03									
	LTV-34	METALS LAB Hg									
173-60-14D	LTV-35	KMN04									
	LTV-35	METALS LAB									
173-60-14E	LTV-36	8N HCl									
	LTV-36	METALS LAB									

Receiving Remarks:

Archive Remarks:

TRIANGLE LABORATORIES, INC. -- LOG IN RECORD/CHAIN OF CUSTODY

Custody Seal : Absent
Chain of Custody : Present
Sample Tags : Absent
Sample Tag Numbers: Not Listed on Chain of Custody
SMO Forms : N/A

Sample Seals: Absent
Container. .: Intact

TLI Project Number 42434
Client. ERG02 - Eastern Research Group

Date Received 07/14/97 By

Carrier and Number JIM M.

Book 174

Page 97

Box NO COOLANT

TLI Number.. ....Client Sample ID..... ..... Matrix mR/H:CPM. .....Client COC ID.....* Location.....	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	DISPOSED Date/Init
174-97-1 2 ACETONE PROBE RINSE BEAKER #2 * METALS LAB									
174-97-2 5 ACETONE PROBE RINSE BEAKER #5 * METALS LAB									
174-97-3 12 ACETONE PROBE RINSE BEAKER #12 * METALS LAB									
174-97-4 3 ACETONE PROBE RINSE BEAKER #3 * METALS LAB									
174-97-5 6 ACETONE PROBE RINSE BEAKER #6 * METALS LAB									
174-97-6 4 ACETONE PROBE RINSE BEAKER #4 * METALS LAB									
174-97-7 7 ACETONE PROBE RINSE BEAKER #7 * METALS LAB									
174-97-8 8 ACETONE PROBE RINSE BEAKER #8 * METALS LAB									
174-97-9 10 ACETONE PROBE RINSE BEAKER #10 * METALS LAB									
174-97-10 9 ACETONE PROBE RINSE BEAKER #9 * METALS LAB									
174-97-11 LTV-88 FILTER LTV-88 METALS LAB									
174-97-12 LTV-91 FILTER LTV-91 METALS LAB									
174-97-13 LTV-89 FILTER LTV-89 METALS LAB									
174-97-14 LTV-92 FILTER LTV-92 METALS LAB									

Receiving Remarks:

Archive Remarks:

TRIANGLE LABORATORIES, INC. - LOG IN RECORD/CHAIN OF CUSTODY

Custody Seal : Absent	Sample Seals: Absent	TLI Project Number 42434	Book
Chain of Custody : Present	Container...: Intact	Client: ERG02 - Eastern Research Group	174
Sample Tags : Absent			
Sample Tag Numbers: Not Listed on Chain of Custody		Date Received 07/14/97 By	Page
SMO Forms : N/A			
Box NO COOLANT		Carrier and Number JIM M.	97

TLI Number.. mR/H:CPM.	Client Sample ID..... Client COC ID.....*	Matrix Location....	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	To LAB Date/Init	To STORAGE Date/Init	DISPOSED Date/Init
174-97-15	LTV-90	FILTER									
	LTV-90	METALS LAB									
174-97-16	LTV-93	FILTER									
	LTV-93	METALS LAB									
174-97-17	LTV-99	FILTER									
	LTV-99	METALS LAB									
174-97-18	LTV-39	FILTER									
	LTV-39	METALS LAB									
174-97-19	LTV-52	FILTER									
	LTV-52	METALS LAB									
174-97-20	LTV-46	FILTER									
	LTV-46	METALS LAB									

Receiving Remarks:

Archive Remarks:

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Project # 70998

Client: Eastern Research Group

Date/Int.: 7/16/97 SRB

Client Run# Method 29, Outlet, Run 1

Triangle Laboratories of RTP

(919) 544-5729

Analytes	ICP	GFAA	FLAA	CVAA
	As, Be, Cd, Co, Cr, Mn, Ni, Pb, Sb, Se	—	—	Hg

CONT # 1

Filter Type: G or Q

label 174-97-11

Dessicate to dryness and redissolve in 10ml con HNO3 — Int SRB — Date 7/25/97

Microwave dig with conc. HF and conc. HNO3 — Int SRB — Date 7/25/97

CONT # 2

Acetone Rinse

label 174-97-1

Volume Dry

Reduce volume to 20 ml on hotplate — Int SF — Date 7/18/97

Microwave dig with conc. HF and conc. HNO3 — Int SRB — Date 7/25/97

label 173-60-1A,10 174-97-1

Combine digestates

Front Half Digestate

Add 500 uL Sc

Dilute to 100 mls — Int SRB — Date 7/25/97

label 174-97-1,11 173-60-1A,10

Volume 100 mL

For Metal

label 174-97-1,11 173-60-1A,10 — Int SRB

Volume 100 — Date 7/25/97

(One post digest spike on FH for GFAA))

FH & BH Post dig. spk.

@ _____ ppb (instrument spiked)

Aliquot A: 5 mL

(No spike required)

Aliquot B: 5 mL

MR 7/29/97

For Hg

label 174-97-1/11 — Int MR

Volume 100 ml — Date 7/29/97

CONT # 3

HNO3 Rinse

label 173-60-1A,10

Volume 160

Reduce Volume to 20 mL on Hotplate — Int. SF — Date 7-18-97

Hotplate dig with HNO3 and H202 — Int. SRB — Date 7/25/97

~~Add 500 uL Sc — Int. — Date~~

Dilute to 100 mls — Int. SRB — Date 7/25/97

label 173-60-1B — Int SRB

Volume 100 — Date 7/25/97

(One post digestion spk on BH for GFAA)

CONT # 4

Back Half Impinger

label 173-60-1B

Volume 670

For Metals

label _____

Volume 570

For Hg

label 100

Volume ↓

Sample

label 173-60-1C — Int MR

Volume 100 ml — Date 7/29/97

Aliquot A: 5 ml

Aliquot B: 5 ml

Spike

(1 BH Hg Spike required)

label 173-60-1B — Int MR

Volume 100 ml — Date 7/29/97

Aliquot A: 5 ml

Aliquot B: 5 ml

spk 5 ml of 100 ppb — Int MR

final spk conc. added 5 ppb — Date 7/29/97

Hg Impingers

CONT # 5A — HNO3

label 173-60-1C

Volume 25 ml

Aliquot A 5 ml

Aliquot B 5 ml

Int MR

Date 7/29/97

CONT # 5B — KMNO4

label 173-60-1D

Volume 230 ml

Aliquot A 5 ml

Aliquot B 5 ml

Int MR

Date 7/29/97

CONT # 5C — HCl

label 173-60-1E

Volume 90 ml

Aliquot A 5 ml

Aliquot B 5 ml

Int MR

Date 7/29/97

(Duplicate Analysis of Each)

FH & BH Serial dilution performed

_____ ml to _____ ml FV + _____ uL Sc

Initials: _____

Date: _____

M 2 PC #91 B \2\lnmtlo c\k\ckb\12 93

Project # 4 a2478

Client: _____

Date/Int.: _____

Client Run# Method 29, Outlet, Run2

Triangle Laboratories of RTP

(919) 544-5729

Analytes

ICP	GFAA	FLAA	CVAA

CONT # 1

Filter Type: G or Q

label 174-97-13

Volume Dry

CONT # 2

Acetone Rinse

label 174-97-4

Volume 210

CONT # 3

HNO3 Rinse

label 173-60-2A

Volume 660

CONT # 4

Back Half Impinger

label 173-60-2B

Volume 660

Hg Impingers

CONT # 5A — HNO3

label 173-60-2C
Volume 60 ml
Aliquot A 5ml
Aliquot B 5ml
Int MR
Date 7/29/97

CONT # 5B — KMNO4

label 173-60-2D
Volume 250 ml
Aliquot A 5
Aliquot B 5
Int MR
Date 7/29/97

CONT # 5C — HCl

label 173-60-2E
Volume 65 ml
Aliquot A 5ml
Aliquot B 5ml
Int MR
Date 7/29/97

(Duplicate Analysis of Each)

Dessicate to dryness and redissolve in 10ml con HNO3 — Int SRB — Date 7/25/97

Reduce volume to 20 ml on hotplate — Int SF — Date 7-18-97

Microwave dig with conc. HF and conc. HNO3 — Int SRB — Date 7/25/97

Microwave dig with conc. HF and conc. HNO3 — Int SRB — Date 7/25/97

label 174-97-4
173-60-2A

Combine digestates

Front Half Digestate

Add 500 uL Sc X

Dilute to 100 mls — Int SRB — Date 7/25/97

label 174-97-4,13 173-60-2A

Volume 100 ML

For Metal

label 174-97-4,13 173-60-2A Int SRB

Volume 100 Date 7/25/97

(One post digest spike on FH for GFAA))

For Hg

label 174-97-4/13 Int MR

Volume 100 ml Date 7/29/97

FH & BH Post dig. spk.

@ 5 ppb (instrument spiked)

Aliquot A: 5 mL

(No spike required)

Aliquot B: 5 mL

7/29/97 MR

For Metals

label _____

Volume 960

For Hg

label _____

Volume 100

Reduce Volume to 20 mL on Hotplate — Int. SF — Date 7-18-97

Hotplate dig with HNO3 and H202 — Int. SRB — Date 7/25/97

Add 500 uL Sc X — Int. _____ — Date _____

Dilute to 100 mls — Int. SRB — Date 7/25/97

label 173-60-2B Int SRB

Volume 100 Date 7/25/97

(One post digestion spk on BH for GFAA)

Sample

label 173-60-2B Int MR

Volume 100ml Date 7/29/97

Aliquot A: 5ml

Aliquot B: 5ml

Spike

(1 BH Hg Spike required)

label 173-60-2B Int MR

Volume 100ml Date 7/29/97

Aliquot A: 5ml

Aliquot B: 5ml

spk 5 ml of 100 ppb

final spk conc. added 5 ppb

Int MR

Date 7/29/97

FH & BH Serial dilution performed

_____ ml to _____ ml FV + _____ uL Sc

Initials: _____

Date:

M 2 PC #91 B \2\logins.cdt\cdb\12 21

Project # 199 10

Client:

Date/Int.:

Client Run# Method 29, Outlet, Run 3

Triangle Laboratories of RTP

(919) 544-5729

ICP	GFAA	FLAA	CVAA

CONT # 1

Filter Type: G or Q

label 174-97-15

Dessicate to dryness and redissolve in 10ml con HNO3 — Int SRB — Date 7/25/97

Microwave dig with conc. HF and conc. HNO3 — Int SRB — Date 7/25/97

CONT # 2

Acetone Rinse

label 174-97-6

Volume Dry

Reduce volume to 20 ml on hotplate — Int SF — Date 7-18-97

Microwave dig with conc. HF and conc. HNO3 — Int SRB — Date 7/25/97

label 174-97-6 173-60-3A

CONT # 3

HNO3 Rinse

label 173-60-3A

Volume 130

CONT # 4

Back Half Impinger

label 173-60-3B

Volume 690

For Metals: label ____ Volume 590

For Hg: label ____ Volume 100

Reduce Volume to 20 mL on Hotplate — Int. SF — Date 7-18-97

Hotplate dig with HNO3 and H202 — Int. SRB — Date 7/25/97

Add 500 uL Sc — Int. ____ — Date ____

Dilute to 100 mls — Int. SRB — Date 7/25/97

label 173-60-3B — Int SRB — Volume 100 — Date 7/25/97

(One post digestion spk on BH for GFAA)

Combine digestates

Front Half Digestate

Add ~~500~~ uL Sc

Dilute to 100 mls — Int SRB — Date 7/25/97

label 174-97-6, 15 173-60-3A

Volume 100 ML

For Metals: label 174-97-6, 15 173-60-3A — Int SRB — Volume 100 — Date 7/25/97

For Hg: label 174-97-6/15 — Int MR — Volume 100 ml — Date 7/29/97

(One post digest spike on FH for GFAA))

FH & BH Post dig. spk. @ 50 ppb (instrument spiked)

Aliquot A: 5 mL (No spike required)

Aliquot B: 5 mL

Hg Impingers

CONT # 5A HNO3	CONT # 5B KMNO4	CONT # 5C HCl
label 173-60-3C	label 173-60-3D	label 173-60-3E
Volume 45 ml	Volume 250 ml	Volume 90 ml
Aliquot A 5 ml	Aliquot A 5 ml	Aliquot A 5 ml
Aliquot B 5 ml	Aliquot B 5 ml	Aliquot B 5 ml
Int MR	Int MR	Int MR
Date 7/29/97	Date 7/29/97	Date 7/29/97

(Duplicate Analysis of Each)

Sample: label 173-60-3B — Int MR — Volume 100 ml — Date 7/29/97 — Aliquot A: 5 ml — Aliquot B: 5 ml

Spike (1 BH Hg Spike required): label 173-60-3B — Int MR — Volume 100 ml — Date 7/29/97 — Aliquot A: 5 ml — Aliquot B: 5 ml

spk 5 ml of 100 ppb — Int MR

final spk conc. added 5 ppb ppb — Date 7/29/97

FH & BH Serial dilution performed

____ ml to ____ ml FV + ____ uL Sc

Initials: ____

Date: ____

M 2 PC#91 B \2lmnlra.cdl\akh\12 93

Project # 42298

Client: _____

Date/Int.: _____

Client Run# Method 29 Outlet, FB1

Triangle Laboratories of RTP

(919) 544-5729

Analytes			
ICP	GFAA	FLAA	CVAA

CONT # 1

Filter Type: G or Q

label 174-97-18

CONT # 2

Acetone Rinse

label 174-97-8

Volume Dry

Dessicate to dryness and redissolve in 10ml con HNO3 — Int SRB — Date 7/25/97

Microwave dig with conc. HF and conc. HNO3 — Int SRB — Date 7/25/97

CONT # 3

use 40mls

HNO3 Rinse

label 173-60-4A

Volume 140

Reduce volume to 20 ml on hotplate — Int SF — Date 7-18-97

Microwave dig with conc. HF and conc. HNO3 — Int SRB — Date 7/25/97

label 174-97-8 173-60-4A

Combine digestates

Front Half Digestate

Add 500 uL Sc

Dilute to 100 mls — Int SRB — Date 7/25/97

label 174-97-8,18 173-60-4A

Volume 100 ML

For Metal

label 174-97-8,18 173-60-4A Int SRB

Volume 100 Date 7/25/97

(one post digest spike on FH for GFAA))

FH & BH Post dig. spk.

@ 98 ppb (instrument spiked)

Aliquot A: 5 mL

(No spike required)

Aliquot B: 5 mL

For Hg

label 174-97-8/18 Int MR

Volume 100 ml Date 7/29/97

CONT # 4

use 4B = 200, 4A = 100

Back Half Impinger

label 173-60-4B

Volume 350 = TV

For Metals

label _____

Volume 300

For Hg

label _____

Volume _____

Reduce Volume to 20 mL on Hotplate — Int. SF — Date 7-18-97

Hotplate dig with HNO3 and H202 — Int. SRB — Date 7/25/97

Add 500 uL Sc — Int. _____ — Date _____

Dilute to 100 mls — Int. SRB — Date 7/25/97

label 173-60-4B,4A Int SRB

Volume 100 Date 7/25/97

(One post digestion spk on BH for GFAA)

Hg Impingers

CONT # 5A — HNO3

label 173-60-4C

Volume 33 ml

Aliquot A 5

Aliquot B 5

Int MR

Date 7/29/97

CONT # 5B — KMNO4

label 173-60-4D

Volume 260 ml

Aliquot A 5

Aliquot B 5

Int MR

Date 7/29/97

CONT # 5C — HCl

label 173-60-4E

Volume 65 ml

Aliquot A 5

Aliquot B 5

Int MR

Date 7/29/97

(Duplicate Analysis of Each)

Sample

label 173-60-4B Int MR

Volume 100 ml Date 7/29/97

Aliquot A: 5 ml

Aliquot B: 5 ml

Spike

(1 BH Hg Spike required)

label _____ Int _____

Volume _____ Date _____

Aliquot A: _____

Aliquot B: _____

spk _____ ml of _____ ppb — Int _____

final spk conc. added _____ ppb — Date _____

FH & BH Serial dilution performed

_____ ml to _____ ml FV + _____ uL Sc

Initials: _____

Date: _____

Project # [illegible]

Client: _____

Date/Int.: _____

Client Run# Method 29, Inlet, FB1

Triangle Laboratories of RTP
(919) 544-5729

ICP	GFAA	FLAA	CVAA

CONT # 1 — Filter Type: G or Q
label 174-97-19

CONT # 2 — Acetone Rinse
label 174-97-9
Volume Dry

CONT # 3 — HNO3 Rinse (use 5A=95)
label 173-60-5A
Volume 195

CONT # 4 — Back Half Impinger (use 5B=200, 5A=100)
label 173-60-5B
Volume 380=TV

Hg Impingers

CONT # 5A — HNO3
label 173-60-5C
Volume 65 ml
Aliquot A 5
Aliquot B 5
Int MK
Date 7/29/97

CONT # 5B — KMNO4
label 173-60-5D
Volume 275 ml
Aliquot A 5ml
Aliquot B 5ml
Int MK
Date 7/29/97

CONT # 5C — HCl
label 173-60-5E
Volume 75 ml
Aliquot A 5ml
Aliquot B 5ml
Int MK
Date 7/29/97

Dessicate to dryness and redissolve in 10ml con HNO3 — Int SRB, Date 7/25/97

Reduce volume to 20 ml on hotplate — Int SF, Date 7-18-97

Microwave dig with conc. HF and conc. HNO3 — Int SRB, Date 7/25/97
label 174-97-9
173-60-5A

Microwave dig with conc. HF and conc. HNO3 — Int SRB, Date 7/25/97

Combine digestates

Front Half Digestate

Add 500 uL Sc X

Dilute to 100 mls — Int SRB, Date 7/25/97
label 174-97-9,19 173-60-5A
Volume 100 ML

For Metal
label 174-97-9,19 173-60-5A
Int SRB
Volume 100 Date 7/25/97

For Hg
label 174-97-9/19
Int MC
Volume 100 ml Date 7/29/97

(one post digest spike on FH for GFAA))

FH & BH Post dig. spk.
@ 5 ppb (instrument spiked)

Aliquot A: 5 mL MC 7/29/97
(No spike required)
Aliquot B: 5 mL

For Metals
label _____
Volume 300

For Hg
label _____
Volume _____

Reduce Volume to 20 mL on Hotplate — Int. SF, Date 7-18-97

Hotplate dig with HNO3 and H202 — Int. SRB, Date 7/25/97

Add 500 uL Sc X — Int. _____, Date _____

Dilute to 100 mls — Int. SRB, Date 7/25/97

label 173-60-5B,5A
Int SRB
Volume 100 Date 7/25/97

(One post digestion spk on BH for GFAA)

(Duplicate Analysis of Each)

Sample
label 173-60-5B Int MK
Volume 100 Date 7/29/97
Aliquot A: 5ml
Aliquot B: 5ml

Spike
(1 BH Hg Spike required)
label _____ Int _____
Volume _____ Date _____
Aliquot A: _____
Aliquot B: _____
spk _____ ml of _____ ppb Int _____
final spk conc. added _____ ppb Date _____

FH & BH Serial dilution performed
_____ ml to _____ ml FV + _____ uL Sc
Initials: _____
Date:

M 2 PC#91 B \2llmmlm.cdt\cdtb\12 93

Project # 42298

Client: _____

Date/Int.: _____

Client Run# Method 29, Inlet, RB2

Triangle Laboratories of RTP

(919) 544-5729

Analytes			
ICP	GFAA	FLAA	CVAA

CONT # 1 — Filter Type: G or Q

label _____

Dessicate to dryness and redissolve in 10ml con HNO3 — Int _____ Date _____

Microwave dig with conc. HF and conc. HNO3 — Int _____ Date _____

CONT # 2 — Acetone Rinse

label _____

Volume _____

Reduce volume to 20 ml on hotplate — Int SF Date 7-18-97

Microwave dig with conc. HF and conc. HNO3 — Int SRB Date 7/25/97

label 173-60-6A

Combine digestates

Front Half Digestate

Add 500 uL Sc

Dilute to 100 mls — Int SRB Date 7/25/97

label 173-60-6A

Volume 100 ML

For Metal: label 173-60-6A Int SRB Volume 100 Date 7/25/97

For Hg: label 173-60-6A Int ME Volume 100 ml Date 7/29/97

(one post digest spike on FH for GFAA))

FH & BH Post dig. spk. @ 89 ppb (instrument spiked)

Aliquot A: 5 mL 7/29/97 ME (No spike required)

Aliquot B: 5 mL

CONT # 3 — HNO3 Rinse (use 6A = 75)

label 173-60-6A

Volume 225

CONT # 4 — Back Half Impinger (use 6C = 100, 6A = 50)

label 173-60-6C

Volume 115 = TV

For Metals: label _____ Volume 150

For Hg: label _____ Volume _____

Reduce Volume to 20 mL on Hotplate — Int. SF Date 7-18-97

Hotplate dig with HNO3 and H202 — Int. SRB Date 7/25/97

Add 500 uL Sc — Int. _____ Date _____

Dilute to 100 mls — Int. SRB Date 7/25/97

label 173-60-6A, 6C Int SRB Volume 100 Date 7/25/97

(One post digestion spk on BH for GFAA)

Hg Impingers

CONT # 5A — HNO3

label 173-60-6A Volume 100 ml Aliquot A 5 ml Aliquot B 5 ml Int ME Date 7/29/97

CONT # 5B — KMNO4

label 173-60-6D Volume 95 ml Aliquot A 5 ml Aliquot B 5 ml Int ME Date 7/29/97

CONT # 5C — HCl — KMNO4 7-30 D

label 173-60-6E Volume 200 ml Aliquot A 5 ml Aliquot B 5 ml Int ME Date 7/29/97

(Duplicate Analysis of Each)

Sample: label 173-60-6C Int ME Volume 100 ml Date 7/29/97 Aliquot A: 5 ml Aliquot B: 5 ml

Spike (1 BH Hg Spike required): label _____ Int _____ Volume _____ Date _____ Aliquot A: _____ Aliquot B: _____

spk _____ ml of _____ ppb Int _____

final spk conc. added _____ ppb Date _____

FH & BH Serial dilution performed

_____ ml to _____ ml FV + _____ uL Sc

Initials: _____

Date: _____

M 2 PC#91 B \2\lmmtra.cdr\ok\\12 93

Project # 1010\10

Client:

Date/Int.:

Client Run# Method 29, Inlet, RB3

Triangle Laboratories of RTP

(919) 544-5729

ICP	GFAA	FLAA	CVAA

CONT # 1

Filter Type: G or Q

label

Microwave dig with conc. HF and conc. HNO3 — Int ____ Date ____

CONT # 2

Acetone Rinse

label

Volume

Dessicate to dryness and redissolve in 10ml con HNO3 — Int ____ Date ____

Microwave dig with conc. HF and conc. HNO3 — Int ____ Date ____

label

Combine digestates

Front Half Digestate

Add 500 uL Sc

Dilute to 100 mls — Int ____ Date ____

label

Volume ____ ML

For Metal: label ____ Int ____ Volume ____ Date ____

For Hg: label ____ Int ____ Volume ____ml Date ____

(One post digest spike on FH for GFAA))

FH & BH Post dig. spk.

@ ____ppb (Instrument spiked)

Aliquot A: ____mL

(No spike required)

Aliquot B: ____ mL

CONT # 3

HNO3 Rinse

label

Volume

Reduce volume to 20 ml on hotplate — Int ____ Date ____

Microwave dig with conc. HF and conc. HNO3 — Int ____ Date ____

label

CONT # 4

Back Half Impinger

use 200ml

label 173-60-7

Volume 235=TV

For Metals: label ____ Volume 800

For Hg: label ____ Volume ____

Reduce Volume to 20 mL on Hotplate — Int. SF Date 7-18-97

Hotplate dig with HNO3 and H202 — Int. SRB Date 7/25/97

Add 500 uL Sc X — Int. ____ Date ____

Dilute to 100 mls — Int. SRB Date 7/25/97

label 173-60-7 Int SRB

Volume 100 Date 7/25/97

(One post digestion spk on BH for GFAA)

Hg Impingers

CONT # 5A — HNO3

label

Volume ____ml

Aliquot A ____

Aliquot B ____

Int ____

Date ____

CONT # 5B — KMNO4

label 173-60-6B

Volume 200 ml

Aliquot A 5ml

Aliquot B 5ml

Int MK

Date 7/29/97

CONT # 5C — HCl

label

Volume ____ml

Aliquot A ____

Aliquot B ____

Int ____

Date ____

(Duplicate Analysis of Each)

Sample: label ____ Int ____ Volume ____ Date ____ Aliquot A: ____ Aliquot B: ____

Spike (1 BH Hg Spike required): label ____ Int ____ Volume ____ Date ____ Aliquot A: ____ Aliquot B: ____

spk ____ml of ____ppb — Int ____

final spk conc. added ____ppb — Date ____

FH & BH Serial dilution performed

____ ml to ____ml FV + ____uL Sc

Initials: ____

Date: ____

M 2 PC#91 B \2ltmmtra cdr\akh\12 93

69

Project # 42248

Client:

Date/Int.:

Client Run# Method 29, Outlet, RB1

Triangle Laboratories of RTP

(919) 544-5729

Analytes			
ICP	GFAA	FLAA	CVAA

CONT # 1 — Filter Type: G or Q

label 174-97-20

Volume Dry

Dessicate to dryness and redissolve in 10ml con HNO3 — Int SRB — Date 7/25/97

Microwave dig with conc. HF and conc. HNO3 — Int SRB — Date 7/25/97

CONT # 2 — Acetone Rinse

label 174-97-10

Volume 115

Reduce volume to 20 ml on hotplate — Int SF — Date 7-18-97

Microwave dig with conc. HF and conc. HNO3 — Int SRB — Date 7/25/97

label 174-97-10 173-60-11A

Combine digestates

Front Half Digestate

Add 500 uL Sc

Dilute to 100 mls — Int SRB — Date 7/25/97

label 174-97-10,20 173-60-11A

Volume 100 ML

For Metal: label 174-97-10,20 173-60-11A — Int SRB — Volume 100 — Date 7/25/97

For Hg: label 174-97-10/20 — Int MR — Volume 100 ml — Date 7/29/97

(One post digest spike on FH for GFAA))

FH & BH Post dig. spk. @ 10 ppb (instrument spiked)

Aliquot A: 5 mL (No spike required) 7/29/97 MR

Aliquot B: 5 mL

CONT # 3 — HNO3 Rinse

label 173-60-11A

Volume 115

Reduce Volume to 20 mL on Hotplate — Int. SF — Date 7-18-97

Hotplate dig with HNO3 and H202 — Int. SRB — Date 7/25/97

Add 500 uL Sc — Int. — Date

Dilute to 100 mls — Int. SRB — Date 7/25/97

label 173-60-11A,11B — Int SRB — Volume 100 — Date 7/25/97

(One post digestion spk on BH for GFAA)

CONT # 4 — Back Half Impinger

USE 11A=45 ~~11A=65~~ EB 7/16/97

USE 11B = 100 11A = 50

label 173-60-~~7~~ 11B EE SRB 7/16/97

Volume 100=TV

For Metals: label — Volume 150

For Hg: label — Volume

Sample: label 173-60-11B — Int MR — Volume 100-L — Date 7/29/97 — Aliquot A: 5 ml — Aliquot B: 5 ml

Spike (1 BH Hg Spike required): label — Int — Volume — Date — Aliquot A: — Aliquot B: — spk ml of ppb — final spk conc. added ppb — Int — Date

FH & BH Serial dilution performed

ml to ml FV + ul. Sc

Initials:

Date:

Hg Impingers

CONT # 5A — HNO3

label 173-60-11A

Volume 20 ml

Aliquot A 5 ml

Aliquot B 5 ml

Int MR

Date 7/29/97

CONT # 5B — KMNO4

label 173-60-11D

Volume 90 ml

Aliquot A 5 ml

Aliquot B 5 ml

Int MR

Date 7/29/97

CONT # 5C — HCl

label 173-60-11E

Volume 90 ml

Aliquot A 5 ml

Aliquot B 5 ml

Int MR

Date 7/29/97

(Duplicate Analysis of Each)

Project # [illegible]

Client: _____

Date/Int.: _____

Client Run# Method 29, Inlet, Run 1

Triangle Laboratories of RTP

(919) 544-5729

ICP	GFAA	FLAA	CVAA

CONT # 1

Filter Type: G or Q

label 174-97-12,17

Volume Dry

CONT # 2

Acetone Rinse

label 174-97-2,3

Volume 170

CONT # 3

HNO3 Rinse

label 173-60-12A

Volume 610

CONT # 4

Back Half Impinger

label 173-60-12B

Volume 610

Hg Impingers

CONT # 5A — HNO3

label 173-60-12C
Volume 90 ml
Aliquot A 5ml
Aliquot B 5ml
Int MK
Date 7/29/97

CONT # 5B — KMNO4

label 173-60-12D
Volume 210 ml
Aliquot A 5ml
Aliquot B 5ml
Int MK
Date 7/29/97

CONT # 5C — HCl

label 173-60-12E
Volume 70 ml
Aliquot A 5ml
Aliquot B 5ml
Int MK
Date 7/29/97

(Duplicate Analysis of Each)

Dessicate to dryness and redissolve in 10ml con HNO3 — Int SRB, Date 7/25/97

Reduce volume to 20 ml on hotplate — Int SF, Date 7-18-97

Microwave dig with conc. HF and conc. HNO3 — Int SRB, Date 7/25/97

Microwave dig with conc. HF and conc. HNO3 — Int SRB, Date 7/25/97

label 174-97-2,3 173-60-12A

Combine digestates

Front Half Digestate

Add 500 uL Sc X

Dilute to 100 mls — Int SRB, Date 7/25/97

label 174-97-12,17,2,3 173-60-12A

Volume 100 ML

For Metal

label 174-97-2,3,12,17 173-60-12A Int SRB

Volume 100 Date 7/25/97

For Hg

label 174-97-2,3,12,17 173-60-12A Int MK

Volume 100 ml Date 7/29/97

(One post digest spike on FH for GFAA))

FH & BH Post dig. spk.

@ 1 ppb (instrument spiked)

Aliquot A: 5 mL

(No spike required)

Aliquot B: 5 mL

7/29/97 MK

For Metals

label _____

Volume 510

For Hg

label _____

Volume 100

Reduce Volume to 20 mL on Hotplate — Int. SF, Date 7-18-97

Hotplate dig with HNO3 and H202 — Int. SRB, Date 7/25/97

Add 500 uL Sc X — Int. _____, Date _____

Dilute to 100 mls — Int. SRB, Date 7/25/97

label 173-60-12B Int SRB

Volume 100 Date 7/25/97

(One post digestion spk on BH for GFAA)

Sample

label 173-60-12B Int MK

Volume 100ml Date 7/18/97

Aliquot A: 5ml

Aliquot B: 5ml

Spike (1 BH Hg Spike required)

label 173-60-12B Int MK

Volume 100ml Date 7/18/97

Aliquot A: 5 ml

Aliquot B: 5ml

spk 5 ml of 100 ppb — Int MK

final spk conc. added 5 ppb — Date 7/18/97

FH & BH Serial dilution performed

_____ ml to _____ ml FV + _____ ul. Sc

Initials: _____

Date:

M 2 PC #21 B \2llmmlq.cdt\cdt\12 93

Project # 42298

Client:

Date/Int.:

Client Run# Method 29, Inlet, Run 2

Triangle Laboratories of RTP

(919) 544-5729

Analytes			
ICP	GFAA	FLAA	CVAA

CONT # 1 — Filter Type: G or Q

label 174-97-14

CONT # 2 — Acetone Rinse

label 174-97-5

Volume Dry

CONT # 3 — HNO3 Rinse

label 173-60-13A

Volume 85

CONT # 4 — Back Half Impinger

label 173-60-13B

Volume 440

Dessicate to dryness and redissolve in 10ml con HNO3 — Int SRB — Date 7/25/97

Reduce volume to 20 ml on hotplate — Int SF — Date 7-18-97

Microwave dig with conc. HF and conc. HNO3 — Int SRB — Date 7/25/97

Microwave dig with conc. HF and conc. HNO3 — Int SRB — Date 7/25/97

label 173-60-13A 174-97-5

Combine digestates

Front Half Digestate

Add 500 uL Sc X

Dilute to 100 mls — Int SRB — Date 7/25/97

label 174-97-5,14 173-60-13A

Volume 100 ML

For Metal

label 174-97-5,14 173-60-13A

Int SRB

Volume 100 Date 7/25/97

(One post digest spike on FH for GFAA))

For Hg

label 174-97-5/14 173-60-13A

Int MR

Volume 100 ml Date 7/29/97

FH & BH Post dig. spk.

@ 22 ppb (Instrument spiked)

Aliquot A: 5 mL

(No spike required)

Aliquot B: 5 mL

7/29/97 MR

For Metals

label

Volume 340

For Hg

label

Volume 100

Reduce Volume to 20 mL on Hotplate — Int. SF — Date 7-18-97

Hotplate dig with HNO3 and H202 — Int. SRB — Date 7/25/97

Add 500 uL Sc X — Int. — Date

Dilute to 100 mls — Int. SRB — Date 7/25/97

label 173-60-13B Int SRB

Volume 100 Date 7/25/97

(One post digestion spk on BH for GFAA)

Hg Impingers

CONT # 5A — HNO3

label 173-60-13C

Volume 60 ml

Aliquot A 5ml

Aliquot B 5ml

Int MR

Date 7/29/97

CONT # 5B — KMNO4

label 173-60-13D

Volume 255 ml

Aliquot A 5ml

Aliquot B 5ml

Int MR

Date 7/29/97

CONT # 5C — HCl

label 173-60-13E

Volume 65 ml

Aliquot A 5ml

Aliquot B 5ml

Int MR

Date 7/29/97

(Duplicate Analysis of Each)

Sample

label 173-60-13B Int MR

Volume 100ml Date 7/18/97

Aliquot A: 5ml

Aliquot B: 5ml

Spike (1 BH Hg Spike required)

label 173-60-13B Int MR

Volume 100ml Date 7/18/97

Aliquot A: 5ml

Aliquot B: 5ml

spk 5 ml of 180 ppb — Int MR

final spk conc. added 5 ppb — Date 7/18/97

FH & BH Serial dilution performed

____ ml to ____ ml FV + ____ uL Sc

Initials: _____

Project # 1010 10

Client:

Date/Int.:

Client Run# Method 29, Inlet, Run 3

Triangle Laboratories of RTP

(919) 544-5729

ICP	GFAA	FLAA	CVAA

CONT # 1

Filter Type: G or Q

label 174-97-16

Dessicate to dryness and redissolve in 10ml con HNO3 — Int SRB — Date 7/25/97

Microwave dig with conc. HF and conc. HNO3 — Int SRB — Date 7/25/97

CONT # 2

Acetone Rinse

label 174-97-7

Volume Dry

Reduce volume to 20 ml on hotplate — Int SF — Date 7-18-97

Microwave dig with conc. HF and conc. HNO3 — Int SRB — Date 7/25/97

label 174-97-7 173-60-14A

CONT # 3

HNO3 Rinse

label 173-60-14A

Volume 150

Combine digestates

Front Half Digestate

Add 500 uL Sc

Dilute to 100 mls — Int SRB — Date 7/25/97

label 174-97-7,16 173-60-14A

Volume 100 ML

For Metal

label 174-97-7,16 173-60-14A

Int SRB

Volume 100 Date 7/25/97

For Hg

label 174-97-7,16 173-60-14A

Volume 100 ml

Int MR

Date 7/24/97

(One post digest spike on FH for GFAA))

FH & BH Post dig. spk.

@ 3 ppb (instrument spiked)

Aliquot A: 5 mL 7/24/97 MR

(No spike required)

Aliquot B: 5 mL

CONT # 4

Back Half Impinger

label 173-60-14B

Volume 440

For Metals

label

Volume 340

For Hg

label

Volume 100

Reduce Volume to 20 mL on Hotplate — Int. SF — Date 7-18-97

Hotplate dig with HNO3 and H202 — Int. SRB — Date 7/25/97

Add 500 uL Sc — Int. — Date

Dilute to 100 mls — Int. SRB — Date 7/25/97

label 173-60-14B Int SRB

Volume 100 Date 7/25/97

(One post digestion spk on BH for GFAA)

Hg Impingers

CONT # 5A — HNO3

label 173-60-14C

Volume 50 ml

Aliquot A 5ml

Aliquot B 5ml

Int MR

Date 7/29/97

CONT # 5B — KMNO4

label 173-60-14D

Volume 260 ml

Aliquot A 5ml

Aliquot B 5ml

Int MR

Date 7/29/97

CONT # 5C — HCl

label 173-60-14E

Volume 95 ml

Aliquot A 5

Aliquot B 5

Int 7/29/97

Date

(Duplicate Analysis of Each)

Sample

label 173-60-14B Int MR

Volume 100ml Date 7/18/97

Aliquot A: 5ml

Aliquot B: 5ml

Spike

(1 BH Hg Spike required)

label 173-60-14B Int MR

Volume 100ml Date 7/18/97

Aliquot A: 5ml

Aliquot B: 5ml

spk 5 ml of 100 ppb — Int MR

final spk conc. added 5ppb ppb — Date 7/18/97

FH & BH Serial dilution performed

____ ml to ____ ml FV + ____ uL Sc

Initials: _____

Date: _____

M 2 PC#91 B \2\lnmtlrg.cdr\ophi\12 93

INORGANICS SPIKE LOG

DATE	PROJECT # SAMPLE IDs	ANALYTE	ORIGINAL STANDARD #	ORIGINAL STANDARD CONC. (PPM)	SPIKE SAMPLE (µL) / FINAL VOLUME (mL)	SPIKE SAMPLE (PPB)	INITIALS	WITNESS
7-22-97	42508- LCS	*	3-001-8	*	1000/100	*	SRB	SF
	175-72-2 MS						↓	↓
	175-72-2 MSD							
7-22-97	42437- LCS	*	3-001-8	*	250/50	*	SRB	SF
	175-1-2 MS						↓	↓
	175-1-2 MSD							
7-24-97	42544A-LCS	*	3-001-8	*	250/50	*	LDJ	SRB
	176-9 1MS						↓	↓
	176-9-1MSD							
7-24-97	42553 -LCS	*	3-001-8	*	250/50	*	LDJ	SRB
	176-18-2MS						↓	↓
	176-18-2MSD							
7-24-97	42518 - LCS	*	3-001-8	*	1000/100	*	SRB	LDJ
	175-82-2 MS						↓	↓
	175-82-2 MSD							
7-25-97	42298-LCS	*	3-001-8	*	1000/100	*	SRB	SF

TLI # 42298

* SEE SPIKE LOG

Spiking Standard Preparation					SPIKING from Spiking Standard		
Element	Standard ID	Orig. Std. (ppm)	Spike(uL) Fvol(100mL)	conc (ppm)	Spike(uL) FVol(100ml)	conc (ppb)	combined total
Ag	2-115-4	100	5000	5	1000	50	
As	2-115-3	100	5000	5	1000	50	
Al	2-115-4	100	5000	5	1000	50	
Al	2-105-7	10000	950	95	1000	950	1000
B	2-115-4	100	5000	5	1000	50	
Ba	2-115-4	100	5000	5	1000	50	
Be	2-115-3	100	5000	5	1000	50	
Ca	2-115-3	100	5000	5	1000	50	
Ca	2-105-8	10000	950	95	1000	950	1000
Cd	2-115-3	100	5000	5	1000	50	
Co	2-115-3	100	5000	5	1000	50	
Cr	2-115-3	100	5000	5	1000	50	
Cu	2-115-3	100	5000	5	1000	50	
Fe	2-115-3	100	5000	5	1000	50	
Fe	2-105-9	10000	950	95	1000	950	1000
K	2-115-4	1000	5000	50	1000	500	
K	2-108-7	10000	1500	150	1000	1500	2000
Mg	2-115-3	100	5000	5	1000	50	
Mg	2-106-1	10000	950	95	1000	950	1000
Mn	2-115-3	100	5000	5	1000	50	
Mo	2-115-3	100	5000	5	1000	50	
Na	2-115-4	100	5000	5	1000	50	
Na	2-108-6	10000	1950	195	1000	1950	2000
Ni	2-115-3	100	5000	5	1000	50	
Pb	2-115-3	100	5000	5	1000	50	
Sb	2-115-3	100	5000	5	1000	50	
Se	2-115-3	100	5000	5	1000	50	
Ti	2-115-3	100	5000	5	1000	50	
Tl	2-115-3	100	5000	5	1000	50	
V	2-115-3	100	5000	5	1000	50	
Zn	2-115-3	100	5000	5	1000	50	
Zn	2-106-5	1000	1500	15	1000	150	200

1000uL of the Spiking Standard gives the listed conc. of the above elements.

**Spike seperately

Element	Orig Std (ppm)	Spike(uL) Fvol(100	conc (ppb)
Au	1000	140	1400
Ce	1000	30	300
Li	1000	70	700
P	1000	100	1000
Pd	1000	160	1600
Pt	1000	300	3000
S	1000	350	3500
Si	10000	350	35000
Sn	1000	20	200
Sr	1000	5	50

Spiking Standard 3-001-8
EXP: 8/31/97

Spiked by:
Predigestion- SRB 7/25/97

Postdigestion-

TRIANGLE LABORATORIES, INC.
Transfer Chain-of-Custody Form
Project 42298

Transfer From: IWLM To: IA I

	Initials..	Date.....	Time...
Released by:	SRB	7/25/97	15:30pm
Accepted by:	[illegible]	7/28/97	0:35

MILES.ID.....		TLI_No.....	Cust.Id.....
42298-	-000	TLI Blank	TLI Method Blank
42298-	-001	173-60-1A	LTV-02
42298-	-002	173-60-1B	LTV-03
42298-	-003	173-60-1C	LTV-04
42298-	-004	173-60-1D	LTV-05
42298-	-005	173-60-1E	LTV-06
42298-	-006	174-97-1	2 (=LTV01)
42298-	-007	173-60-10	LTV-101
42298-	-008	174-97-11	LTV-88
42298-	-009	173-60-2A	LTV-08
42298-	-010	173-60-2B	LTV-09
42298-	-011	173-60-2C	LTV-10
42298-	-012	173-60-2D	LTV-11
42298-	-013	173-60-2E	LTV-12
42298-	-014	174-97-4	3 (=LTV07)
42298-	-015	174-97-13	LTV-89
42298-	-016	173-60-3A	LTV-14
42298-	-017	173-60-3B	LTV-15
42298-	-018	173-60-3C	LTV-16
42298-	-019	173-60-3D	LTV-17
42298-	-020	173-60-3E	LTV-18
42298-	-021	174-97-6	4 (=LTV13)
42298-	-022	174-97-15	LTV-90
42298-	-023	173-60-4A	LTV-38
42298-	-024	173-60-4B	LTV-40
42298-	-025	173-60-4C	LTV-41
42298-	-026	173-60-4D	LTV-42
42298-	-027	173-60-4E	LTV-43
42298-	-028	174-97-8	8 (=LTV37)
42298-	-029	174-97-18	LTV-39

XfrCOC (Rev 11/01/94)

Additional comments or instructions:

TRIANGLE LABORATORIES, INC.
Transfer Chain-of-Custody Form
Project 42298

Transfer From: IWLM To: IA I

	Initials..	Date.....	Time...
Released by:	SRB	7/25/97	15:30 PM
Accepted by:	MCH	7/28/97	0:35

MILES.ID.....		TLI_No.....	Cust.Id.....
42298-	-030	173-60-5A	LTV-51
42298-	-031	173-60-5B	LTV-53
42298-	-032	173-60-5C	LTV-54
42298-	-033	173-60-5D	LTV-55
42298-	-034	173-60-5E	LTV-56
42298-	-035	174-97-9	10 (=LTV50)
42298-	-036	174-97-19	LTV-52
42298-	-037	173-60-12A	LTV-20
42298-	-038	173-60-12B	LTV-21
42298-	-039	173-60-12C	LTV-22
42298-	-040	173-60-12D	LTV-23
42298-	-041	173-60-12E	LTV-24
42298-	-042	174-97-2	5 (=LTV19)
42298-	-043	174-97-12	LTV-91
42298-	-044	173-60-13A	LTV-26
42298-	-045	173-60-13B	LTV-27
42298-	-046	173-60-13C	LTV-28
42298-	-047	173-60-13D	LTV-29
42298-	-048	173-60-13E	LTV-30
42298-	-049	174-97-5	6 (=LTV25)
42298-	-050	174-97-14	LTV-92
42298-	-051	173-60-14A	LTV-32
42298-	-052	173-60-14B	LTV-33
42298-	-053	173-60-14C	LTV-34
42298-	-054	173-60-14D	LTV-35
42298-	-055	173-60-14E	LTV-36
42298-	-056	174-97-7	7 (=LTV33)
42298-	-057	174-97-16	LTV-93
42298-	-058	173-60-6A	LTV-58
42298-	-059	173-60-6B	LTV-59

XfrCOC (Rev 11/01/94)

Additional comments or instructions:

TRIANGLE LABORATORIES, INC.
Transfer Chain-of-Custody Form
Project 42298

Transfer From: IWLM To: IA I

	Initials..	Date.....	Time...
Released by:	SRB	7/25/97	15:30pm
Accepted by:	MKH	7/28/97	0:35

MILES.ID.....		TLI_No.....	Cust.Id.....
42298-	-060	173-60-6C	LTV-60
42298-	-061	173-60-6D	LTV-61
42298-	-062	173-60-6E	LTV-62
42298-	-063	173-60-7	LTV-57
42298-	-064	173-60-11A	LTV-45
42298-	-065	173-60-11B	LTV-47
42298-	-067	173-60-11D	LTV-48
42298-	-068	173-60-11E	LTV-49
42298-	-069	174-97-10	9 (=LTV44)
42298-	-070	174-97-20	LTV-46
42298-	-071	LCS	Lab Control Spike

XfrCOC (Rev 11/01/94)

Additional comments or instructions:

Date	Project # Sample ID	Analyte	Std ID	Std conc (ppm)	Spike vol / Sample vol ml/ml	Spike conc (ppb)	Initials	Witness
1/17/97	42412B (rep)	+	2-119-7	+	100/10	+	MKH	MKH
	174-75-2 PDS	↓	↓	↓	↓	↓	↓	↓
1/18/97	42448B	+	2-119-7	+	100/10	+	MKH	MKH
	175-12-2MPDS	↓	↓	↓	↓	↓	↓	↓
1/18/97	42448D	+	2-119-7	+	100/10	+	MKH	MKH
	175-12-18APDS	↓	↓	↓	↓	↓	↓	↓
1/18/97	42492	+	2-119-7	+	100/10	+	MKH	MKH
	175-52-2 PDS	↓	↓	↓	↓	↓	↓	↓
1/21/97	42521B	+	2-119-7	+	100/10	+	MKH	MKH
	175-85-2BPDS	↓	↓	↓	↓	↓	↓	↓
1/21/97	42317	+	2-119-7	+	100/10	+	MKH	MKH
	173-79-5PABCPDS	↓	↓	↓	↓	↓	↓	↓
	173-79-50 PDS	↓	↓	↓	↓	↓	↓	↓
22/97	42381	+	2-119-7	+	100/10	+	MKH	MKH
	174-44-4 PDS	↓	↓	↓	↓	↓	↓	↓
22/97	42379B	+	2-119-7	+	100/10	+	MKH	MKH
	174-42-1PDS	↓	↓	↓	↓	↓	↓	↓
1/24/97	42476A	+	3-001-9	+	100/10	+	MKH	MKH
	175-40-14MSCOPDS	↓	↓	↓	↓	↓	↓	↓
24/97	42524 EESRB ~~2ABCD PDS~~ 7/24/97	+	3-001-9	+	100/10	+	SRB	
	175-88-2ABCD PDS	↓	↓	↓	↓	↓	↓	
1/25/97	42524	+	3-001-9	+	100/10	+	MKH	MKH
	175-88-2ABCDPDS	↓	↓	↓	↓	↓	↓	↓
1/28/97	42298	+	3-001-9	+	100/10	+	MKH	MKH
	173-6-1A PDS	↓	↓	↓	↓	↓	↓	↓
	173-6-1B PDS	↓	↓	↓	↓	↓	↓	↓

* SEE SPIKE LOG

Spiking Standard Preparation					SPIKING from Spiking Standard		
Element	Standard ID	Orig. Std. (ppm)	Spike(uL) Fvol(100mL)	conc (ppm)	Spike(uL) FVol(100ml)	conc (ppb)	combined total
Ag	2-115-4	100	5000	5	1000	50	
As	2-115-3	100	5000	5	1000	50	
Al	2-115-4	100	5000	5	1000	50	
Al	2-105-7	10000	950	95	1000	950	1000
B	2-115-4	100	5000	5	1000	50	
Ba	2-115-4	100	5000	5	1000	50	
Be	2-115-3	100	5000	5	1000	50	
Ca	2-115-3	100	5000	5	1000	50	
Ca	2-105-8	10000	950	95	1000	950	1000
Cd	2-115-3	100	5000	5	1000	50	
Co	2-115-3	100	5000	5	1000	50	
Cr	2-115-3	100	5000	5	1000	50	
Cu	2-115-3	100	5000	5	1000	50	
Fe	2-115-3	100	5000	5	1000	50	
Fe	2-105-9	10000	950	95	1000	950	1000
K	2-115-4	1000	5000	50	1000	500	
K	2-108-7	10000	1500	150	1000	1500	2000
Mg	2-115-3	100	5000	5	1000	50	
Mg	2-106-1	10000	950	95	1000	950	1000
Mn	2-115-3	100	5000	5	1000	50	
Mo	2-115-3	100	5000	5	1000	50	
Na	2-115-4	100	5000	5	1000	50	
Na	2-108-6	10000	1950	195	1000	1950	2000
Ni	2-115-3	100	5000	5	1000	50	
Pb	2-115-3	100	5000	5	1000	50	
Sb	2-115-3	100	5000	5	1000	50	
Se	2-115-3	100	5000	5	1000	50	
Ti	2-115-3	100	5000	5	1000	50	
Tl	2-115-3	100	5000	5	1000	50	
V	2-115-3	100	5000	5	1000	50	
Zn	2-115-3	100	5000	5	1000	50	
Zn	2-106-5	1000	1500	15	1000	150	200

1000uL of the Spiking Standard gives the listed conc. of the above elements.

**Spike seperately

Element	Orig Std (ppm)	Spike(uL) Fvol(100	conc (ppb)
Au	1000	140	1400
Ce	1000	30	300
Li	1000	70	700
P	1000	100	1000
Pd	1000	160	1600
Pt	1000	300	3000
S	1000	350	3500
Si	10000	350	35000
Sn	1000	20	200
Sr	1000	5	50

Spiking Standard 3-001-9
EXP: 8/31/97

Spiked by:
Predigestion-

Postdigestion- 7/28/97 [illegible]

See Individual Runs for Complete ID
8-4-97

Analysis Report Summary Mon 07-28-97 07:04:58 AM page 1

#	Sample Name	File	Method	Date	Time	OpID	Type	Mode
1	STD1-BLANK	72797	TRIANGL2	07/28/97	01:24		X	IR
2	STD3	72797	TRIANGL2	07/28/97	01:29		X	IR
3	STD3	72797	TRIANGL2	07/28/97	01:34	DKH	Q	CONC
4	CHECK LO	72797	TRIANGL2	07/28/97	01:39	DKH	Q	CONC
5	ICV/CCV	72797	TRIANGL2	07/28/97	01:44	DKH	Q	CONC
6	~~ICB/CCB~~	~~72797~~	~~TRIANGL2~~	~~07/28/97~~	~~01:49~~	~~DKH~~	~~Q~~	~~CONC~~
7	ICB/CCB	72797	TRIANGL2	07/28/97	01:55	DKH	Q	CONC
8	ICSAB	72797	TRIANGL2	07/28/97	02:00	DKH	Q	CONC
9	~~42298 MB~~	~~72797~~	~~TRIANGL2~~	~~07/28/97~~	~~02:09~~	~~DKH~~	~~S~~	~~CONC~~
10	42298 LCS	72797	TRIANGL2	07/28/97	02:13	DKH	S	CONC
11	173-60-1A,10	72797	TRIANGL2	07/28/97	02:18	DKH	S	CONC
12	173-60-1A.10 PDS	72797	TRIANGL2	07/28/97	02:23	DKH	S	CONC
13	173-60-1A,10 L	72797	TRIANGL2	07/28/97	02:27	DKH	S	CONC
14	173-60-2A	72797	TRIANGL2	07/28/97	02:32	DKH	S	CONC
15	173-60-2A DA	72797	TRIANGL2	07/28/97	02:37	DKH	S	CONC
16	173-60-3A	72797	TRIANGL2	07/28/97	02:42	DKH	S	CONC
17	173-60-4A	72797	TRIANGL2	07/28/97	02:46	DKH	S	CONC
18	173-60-5A	72797	TRIANGL2	07/28/97	02:51	DKH	S	CONC
19	~~ICV/CCV~~	~~72797~~	~~TRIANGL2~~	~~07/28/97~~	~~02:56~~	~~DKH~~	~~Q~~	~~CONC~~
20	ICV/CCV	72797	TRIANGL2	07/28/97	03:01	DKH	Q	CONC
21	ICB/CCB	72797	TRIANGL2	07/28/97	03:07	DKH	Q	CONC
22	173-60-6A	72797	TRIANGL2	07/28/97	03:13	DKH	S	CONC
23	173-60-11A	72797	TRIANGL2	07/28/97	03:17	DKH	S	CONC
24	173-60-12A	72797	TRIANGL2	07/28/97	03:22	DKH	S	CONC
25	173-60-13A	72797	TRIANGL2	07/28/97	03:27	DKH	S	CONC
26	173-60-14A	72797	TRIANGL2	07/28/97	03:31	DKH	S	CONC
27	~~173-60-1B~~	~~72797~~	~~TRIANGL2~~	~~07/28/97~~	~~03:36~~	~~DKH~~	~~S~~	~~CONC~~
28	173-60-1B PDS	72797	TRIANGL2	07/28/97	03:41	DKH	S	CONC
29	173-60-1B L	72797	TRIANGL2	07/28/97	03:46	DKH	S	CONC
30	173-60-2B	72797	TRIANGL2	07/28/97	03:50	DKH	S	CONC
31	173-60-2B DA	72797	TRIANGL2	07/28/97	03:55	DKH	S	CONC
32	ICV/CCV	72797	TRIANGL2	07/28/97	04:00	DKH	Q	CONC
33	~~ICB/CCB~~	~~72797~~	~~TRIANGL2~~	~~07/28/97~~	~~04:05~~	~~DKH~~	~~Q~~	~~CONC~~
34	~~ICB/CCB~~	~~72797~~	~~TRIANGL2~~	~~07/28/97~~	~~04:16~~	~~DKH~~	~~Q~~	~~CONC~~
35	ICB/CCB	72797	TRIANGL2	07/28/97	04:21	DKH	Q	CONC
36	173-60-3B	72797	TRIANGL2	07/28/97	04:27	DKH	S	CONC
37	173-60-4B.4A	72797	TRIANGL2	07/28/97	04:32	DKH	S	CONC
38	173-60-5B.5A	72797	TRIANGL2	07/28/97	04:36	DKH	S	CONC
39	173-60-6A.6C	72797	TRIANGL2	07/28/97	04:41	DKH	S	CONC
40	173-60-7	72797	TRIANGL2	07/28/97	04:46	DKH	S	CONC
41	173-60-11A.11B	72797	TRIANGL2	07/28/97	04:51	DKH	S	CONC
42	173-60-12B	72797	TRIANGL2	07/28/97	04:55	DKH	S	CONC
43	173-60-13B	72797	TRIANGL2	07/28/97	05:00	DKH	S	CONC
44	173-60-14B	72797	TRIANGL2	07/28/97	05:05	DKH	S	CONC
45	42298 MB	72797	TRIANGL2	07/28/97	05:19	DKH	S	CONC
46	ICV/CCV	72797	TRIANGL2	07/28/97	05:25	DKH	Q	CONC
47	ICB/CCB	72797	TRIANGL2	07/28/97	05:30	DKH	Q	CONC
48	173-60-1A,10 X5 L	72797	TRIANGL2	07/28/97	05:40	DKH	S	CONC
49	173-60-2A X10	72797	TRIANGL2	07/28/97	05:45	DKH	S	CONC
50	173-60-2A X10 DA	72797	TRIANGL2	07/28/97	05:52	DKH	S	CONC
51	173-60-3A X10	72797	TRIANGL2	07/28/97	05:57	DKH	S	CONC
52	173-60-12A X10	72797	TRIANGL2	07/28/97	06:02	DKH	S	CONC
53	173-60-13A X10	72797	TRIANGL2	07/28/97	06:08	DKH	S	CONC

DKH 7/28/97

Reanalyzed.

→

→ Use this sample as x 5 dilution for Pb. MKH 7/28/97

MKH 7/28/97

Reanalyzed.

MKH 7/28/97

dilutions for Pb only!
use 1A,10 x5 L as serial dilution for Pb.

#	Sample Name	File	Method	Date	Time	OpID	Type	Mode
54	173-60-14A X10	72797	TRIANGL2	07/28/97	06:13	DKH	S	CONC
55	173-60-1B	72797	TRIANGL2	07/28/97	06:19	DKH	S	CONC
56	ICV/CCV	72797	TRIANGL2	07/28/97	06:24	DKH	Q	CONC
~~57~~	~~ICB/CCB~~	~~72797~~	~~TRIANGL2~~	~~07/28/97~~	~~06:28~~	~~DKH~~	~~Q~~	~~CONC~~
~~58~~	~~ICB/CCB~~	~~72797~~	~~TRIANGL2~~	~~07/28/97~~	~~06:34~~	~~DKH~~	~~Q~~	~~CONC~~
59	ICB/CCB	72797	TRIANGL2	07/28/97	06:40	DKH	Q	CONC
60	ICSAB	72797	TRIANGL2	07/28/97	06:45	DKH	Q	CONC

DKH 7/28/97

TRIANGLE LABORATORIES, INC.

Sample Preparation Tracking & Management Form

roject: 42298

Client: Eastern Research Group (ERG02)

Sample Information

ethod: 7470

olvent/Acids(): HNO_3/H_2SO_4

Extraction Date: __/__/__

Lot: 117020/316080

Hg

ple crd	TLI SAMPLE ID / CLIENT SAMPLE ID	Sample Wgt g / Vol ml	Final Volume ml	Date digested __/__/__	__/__/__	__/__/__	__/__/__	__/__/__	__/__/__
	TLI Blank MBD TLI Method Blank	N/A	100						
	~~173-60-1A~~ 7/29/97 ~~ne~~ LTV-02								
	173-60-1B 173-60-1B D LTV-03	5/5		7/29/97					
	173-60-1C 173-60-1C LTV-04	5/5		7/21/97					
	173-60-1D 173-60-1D D LTV-05	5/5		7/21/97					
	173-60-1E 173-60-1E D LTV-06	5/5		7/21/97					
	~~174-97-1~~ 7/24/97 ~~ne~~ 2 (=LTV01)								
	~~173-60-1O~~ 7/29/97 ~~ne~~ LTV-101								
	174-97-~~11~~ 1/11 7/29/97 174-97-1/11 D LTV-88	5/5		7/29/97					
	~~173-60-2A~~ 7/29/97 ~~ne~~ LTV-08								
	173-60-2B 173-60-2B D LTV-09	5/5		7/29/97					
	173-60-2C 173-60-2C D LTV-10	5/5		7/21/97					
	173-60-2D 173-60-2D D LTV-11	5/5		7/21/97					

mments: See HGSL-1 p. 58, 59 & 60

REV 07/26/93 (PSTMF 7)

TRIANGLE LABORATORIES, INC.

Sample Preparation Tracking & Management Form

Project: 42298

Client: Eastern Research Group (ERG02)

Sample Information

Method: 7470

Solvent/Acids(): HNO_3 / H_2SO_4

Extraction Date: __/__/__

Lot: 117020 / 316080

Hg

Sample # crd	TLI SAMPLE ID / CLIENT SAMPLE ID	Sample Wgt g / Vol ml	Final Volume ml	Date digested					
013	173-60-2E 173-60-2E LTV-12	5/5	100	7/21/97					
014	174-97-4/13 174-97-4/13 D 3 (=LTV07)	5/5		7/29/97					
015	~~174-97-13~~ 7/29/97 ke LTV-89								
016	~~173-60-3A~~ 7/29/97 ke LTV-14								
017	173-60-3B 173-60-3B D LTV-15	5/5		7/29/97					
018	173-60-3C 173-60-3C D LTV-16	5/5		7/21/97					
019	173-60-3D 173-60-3D LTV-17	5/5		7/21/97					
020	173-60-3E 173-60-3E LTV-18	5/5		7/21/97					
021	174-97-6/15 174-97-6/15 D 4 (=LTV13)	5/5		7/29/97					
022	~~174-97-15~~ 7/29/97 ke LTV-90								
023	173-60-4A B 173-60-4A B D LTV-38	5/5		7/29/97					
024	~~173-60-4B~~ 7/29/97 ke LTV-40								
025	173-60-4C 173-60-4C D LTV-41	5/5		7/29/97					

Comments: See p. 1

REV 07/26/93 (PSTMF 7)

TRIANGLE LABORATORIES, INC.

Sample Preparation Tracking & Management Form

oject: 42298 Client: Eastern Research Group (ERG02)

Sample Information

thod: 7470 Extraction Date: __/__/__

lvent/Acids(): HNO_3 / H_2SO_4 Lot: 117020 / 316080

Hg

ple crd	TLI SAMPLE ID / CLIENT SAMPLE ID	Sample Wgt g / Vol ml	Final Volume ml	Date digested					
	173-60-4D 173-60-4D D LTV-42	5/5	100	7/29/97					
	173-60-4~~E~~ DE 173-60-4DE D LTV-43	5/5		7/29/97					
	174-97-8/18 174-97-8/18 D 8 (=LTV37)	5/5		7/29/97					
	~~174-97-18~~ 7/29/97 LTV-39								
	173-60-5A B 173-60-5AB D LTV-51	5/5		7/29/97					
	~~173-60-5B~~ 7/29/97 LTV-53								
	173-60-5C 173-60-5C D LTV-54	5/5		7/29/97					
	173-60-5D 173-60-5D D LTV-55	5/5		7/29/97					
	173-60-5~~E~~ DE 173-60-5DE D LTV-56	5/5							
	174-97-9/19 174-97-9/19 D 10 (=LTV50)	5/5		7/29/97					
	~~174-97-19~~ 7/29/97 LTV-52								
	~~173-60-12A~~ 7/29/97 LTV-20								
	173-60-12B 173-60-12B D LTV-21	5/5		7/21/97					

ments: See p. 1

REV 07/26/93 (PSTMF 7)

TRIANGLE LABORATORIES, INC.

Sample Preparation Tracking & Management Form

Project: 42298 Client: Eastern Research Group (ERG02)

Sample Information

Method: 7470 Extraction Date: __/__/__

Solvent/Acids(): HNO_3 / H_2SO_4 Lot: 117020 / 316050

Hg

Sample # crd	TLI SAMPLE ID / CLIENT SAMPLE ID		Sample Wgt g / Vol ml	Final Volume ml	Date digested					
039	173-60-12C 173-60-12C D	LTV-22	5/5	100	7/21/97					
040	173-60-12D 173-60-12D D	LTV-23	5/5		7/21/97					
041	173-60-12E 173-60-12E	LTV-24	5/5		7/21/97					
042	174-97-2/3 174-97-2/3 D	5 (=LTV19)	5/5		7/29/97					
043	~~174-97-12~~ 7/29/97 	LTV-91								
044	~~173-60-13A~~ 7/24/97 	LTV-26								
045	173-60-13B 173-60-13B	LTV-27	5/5		7/21/97					
046	173-60-13C 173-60-13C D	LTV-28	5/5		7/21/97					
047	173-60-13D 173-60-13D D	LTV-29	5/5		7/21/97					
048	173-60-13E 173-60-13E D	LTV-30	5/5		7/21/97					
049	174-97-5/14 174-97-5/14 D	6 (=LTV25)	5/5		7/29/97					
050	~~174-97-14~~ 7/24/97 	LTV-92								
051	~~173-60-14A~~ 7/24/97 	LTV-32								

Comments: See P. 1

REV 07/26/93 (PSTMF 7)

TRIANGLE LABORATORIES, INC.

Sample Preparation Tracking & Management Form

Project: 42298 Client: Eastern Research Group (ERG02)

Sample Information

Method: 7470 Extraction Date: __/__/__ Hg

Solvent/Acids(): HNO_3/H_2SO_4 Lot: 117020/316080

Sample Record	TLI SAMPLE ID / CLIENT SAMPLE ID		Sample Wgt g / Vol ml	Final Volume ml	Date digested					
52	173-60-14B 173-60-14B D	LTV-33	5/5	100	7/21/97					
53	173-60-14C 173-60-14C D	LTV-34	5/5		7/21/97					
54	173-60-14D 173-60-14D D	LTV-35	5/5		7/21/97					
55	173-60-14E 173-60-14E	LTV-36	5/5		7/21/97					
56	174-97-7/16 174-97-7/16 D	7 (=LTV33)	5/5		7/29/97					
57	~~174-97-16~~ 7/29/97 RC	LTV-93								
58	173-60-6A Hg 173-60-6A D Hg	LTV-58	5/5							
59	173-60-6B 173-60-6B D	LTV-59	5/5		7/29/97					
60	173-60-6~~B~~ A C 7/29/97 RC 173-60-6A C D	LTV-60	5/5		7/29/97					
61	173-60-6D 173-60-6D D	LTV-61	5/5		7/29/97					
62	173-60-6~~E~~ D E 7/29/97 RC 173-60-6D E D	LTV-62	5/5		7/29/97					
63	173-60-7 173-60-7 D	LTV-57	5/5		7/29/97					
64	173-60-11A B 173-60-11A B D	LTV-45	5/5		7/29/97					

Comments: See p. 1

REV 07/26/93 (PSTMF 7)

TRIANGLE LABORATORIES, INC.

Sample Preparation Tracking & Management Form

Project: 42298

Client: Eastern Research Group (ERG02)

Sample Information

Method: 7470

Extraction Date: __/__/__

Solvent/Acids(): HNO_3 / H_2SO_4

Lot: 117020 / 3.6080

Hg

Sample # crd	TLI SAMPLE ID / CLIENT SAMPLE ID	Sample Wgt g / Vol ml	Final Volume ml	Dated disposed __/__/__	__/__/__	__/__/__	__/__/__	__/__/__	__/__/__
065	173-60-11 ~~A B~~ 7/29/97 ~~173-60-11 A B D~~ LTV-47		100	7/29/97					
067	173-60-11D 173-60-11D D LTV-48	5/5		7/29/97					
068	173-60-11 DE 173-60-11 DE D LTV-49	5/5		7/29/97					
069	174-97-10/20 174-97-10/20 D 9 (=LTV44)	5/5		7/29/97					
070	~~174-97-20~~ 7/29/97 LTV-46								
071	LCS LCS D Lab Control Spike	N/A							
	173-60-11 A 173-60-11 A D	5/5		7/29/97					
	~~173-60~~ - 7/29/97								
	173-60-12B MS 173-60-12B MSD	5/5		7/21/97					
	173-60-13B MS 173-60-13B MSD	5/5		7/18/97					
	173-60-14B MS 173-60-14B MSD	5/5		7/18/97					
	173-60-1B MS 173-60-1B MSD	5/5		7/29/97					
	173-60-2B MS 173-60-2B MSD	5/5		7/29/97					

Comments: See p. 1

REV 07/26/93 (PSTMF 7)

TRIANGLE LABORATORIES, INC.

Sample Preparation Tracking & Management Form

roject: 42298

Client: Eastern Research Group (ERG02)

Sample Information

ethod: 7470

Extraction Date: __/__/__

olvent/Acids(): HNO_3 / H_2SO_4

Lot: 117020 / 316080

Hg

mple crd	TLI SAMPLE ID / CLIENT SAMPLE ID	Sample Wgt g / Vol ml	Final Volume ml	Date digested __/__/__	__/__/__	__/__/__	__/__/__	__/__/__	__/__/__
0	TLI Blank / TLI Method Blank								
	173-60-3B MS / 173-60-3B MSD	5 / 5		7/29/97					
	174-97-6/15 MS / 174-97-6/15 MSD	5 / 5		7/29/97					
	173-60-6DE MS / 173-60-6DE MSD	5 / 5		7/29/97					

omments: See p. 1

REV 07/26/93 (PSTMF 7)

TRIANGLE LABORATORIES, INC.

Sample Preparation Tracking & Management Form

Project: 42298 Client: Eastern Research Group (ERG02)

Sample Information

Method: 7470 Extraction Date: __/__/__

Solvent/Acids(): HNO_3 / H_2SO_4 Lot: 117020 / 316080

Hg

Sample #	crd	TLI SAMPLE ID / CLIENT SAMPLE ID	7/30/97 Sample Wgt g / Vol ml	7/30/97 Final Volume ml	__/__/__	__/__/__	__/__/__	__/__/__	__/__/__	__/__/__
058		173-60-6A / 173-60-6A D LTV-58	5/5	100						
		LCS 4 D 7/31/97 EE / LCS 4	N/A							
		173-60-6A MS / 173-60-6A MSD	5/5							
		MB4 / MB4 D	N/A							

Comments: HGSL-1 P. 60

REV 07/26/93 (PSTMF 7)

MERCURY SPIKE LOG

DATE	PROJECT # SAMPLE IDs	ORIGINAL SPIKE CONC. (Hg)	STANDARD # WORKING STANDARD PREPARED FROM	SPIKE AMOUNT (mL)	SPIKE SAMPLE (PPB)	INITIALS	WITNESS
7/15/97	42317 LCS2 LCS2D	0.1ppm	3-004-4	5ml	5ppb	MR	SRB
	173-79-6D MS 173-79-6D MSD						
	173-79-7D MS 173-79-7D MSD						
	173-79-8D MS 173-79-8D MSD						
7/17/97							
7/17/97	42429A LCS1 LCS1D	0.1ppm	3-004-4	5ml	5ppb	MR	SRB
	174-92-1C MS 174-92-1C MSD						
	174-92-2C MS 174-92-2C MSD						
	42429B LCS1 LCS1D						
	174-92-4C MS 174-92-4C MSD						
	174-92-5C MS 174-92-5C MSD						
7/18/97	42298 LCS1 LCS1D	0.1ppm	3-005-8	5ml	5ppb	MR	SRB
	173-60-12B MS 173-60-12B MSD						
	173-60-13B MS 173-60-13B MSD						
	173-60-14B MS 173-60-14B MSD						
7/21/97	42298 LCS1 LCS1D	0.1ppm	3-005-8	5ml	5ppb	MR	SRB
	173-60-12B MS 173-60-12B MSD						

MERCURY SPIKE LOG

DATE	PROJECT # SAMPLE IDs	ORIGINAL SPIKE CONC. (Hg)	STANDARD # WORKING STANDARD PREPARED FROM	SPIKE AMOUNT (mL)	SPIKE SAMPLE (PPB)	INITIALS	WITNESS
7-23-97	42508 LCS LCS D	0.1 ppm	3-004-4	5 ml	5 ppb	MR	SRB
	175-72-2 MS 175-72-2 MSD	↓	↓	↓	↓	↓	↓
7-24-97	42476A LCS LCS D	0.1 ppm	3-005-8	5 ml	5 ppb	MR	SRB
	175-40-14CD MS 175-40-14CD MSD	↓	↓	↓	↓	↓	↓
	175-40-15CD MS 175-40-15CD MSD						
7-25-97	42524 LCS LCS D	0.1 ppm	3-005-8	5 ml	5 ppb	MR	SRB
	175-88-2DE MS 175-88-2DE MSD	↓	↓	↓	↓	↓	↓
	175-88-2ABC MS 175-88-2ABC MSD						
7/29/97	42298 LCS2 LCS2 D	0.1 ppm	3-007-6	5 ml	5 ppb	MR	SRB
	173-60-1B MS 173-60-1B MSD	↓	↓	↓	↓	↓	↓
	173-60-2B MS 173-60-2B MSD						
	173-60-3B MS 173-60-3B MSD						
	42298 LCS3 LCS3 D						
	174-97-6/15 MS 174-97-6/15 MSD						
	173-60-6DE MS						
	173-60-6DE MSD						

MERCURY SPIKE LOG

DATE	PROJECT # SAMPLE IDs	ORIGINAL SPIKE CONC. (Hg)	STANDARD # WORKING STANDARD PREPARED FROM	SPIKE AMOUNT (mL)	SPIKE SAMPLE (PPB)	INITIALS	WITNESS
7-30-97	42298 LCS (4 EE) LCS (4)	0.1 ppm	3-007-6	5 ml	5 ppb	MR	SRB
	173-60-6A MS 173-60-6A MSD	↓	↓	↓	↓	↓	↓

AutoSampler Report Table: HA412 Mon 07-28-97 00:53:33 AM Page 1

MKH 7/28/97

Table Name: HA412 Autosampler Type: TYPE TJA
Sample Positions: 163/192 QC Positions: 13/19 # Sets: 1
Rinse Station location is rack -1, pos. -1.

--- Racks ---

Rack #	Type	Usage	#Pos Left	Analyses/Pos
1	Aux. (L) Rack	STD/QC/BLANK	13	10
2	Sample (16mm)	Samples	19	1
3	Sample (16mm)	Samples	48	1
4	Sample (16mm)	Samples	48	1
5	Sample (16mm)	Samples	48	1

--- Sample Sets ---

Set#	Type	Prepare?	Description	Method	#Pos	Rack#	StartPos
1	Normal	No	42298	TRIANGL2	29	2	1

* Co, Cd show some negatives in FH Blanks, but PDS recovery is acceptable!
MKH 7/28/97

--- Preparation Info ---

Set#	Uptake	Uptake#2	Final	Dil.Factor

No Samples Prepared.

Rack #1

Pos	Row	Col	Sample Name	Set #	#Used	Type
1	1	1	STD3	-NA-	2	Standard 1-53-7P
2	1	2	STD1-BLANK	-NA-	1	Standard
3	1	3	ICSAB	-NA-	2	QC Standard 1-53-9P
4	1	4	CHECK LO	-NA-	1	QC Standard
5	1	5	ICV/CCV	-NA-	4	QC Standard 1-53-8P
6	1	6	ICB/CCB	-NA-	4	QC Standard

(7...19 Not Used)

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Rack #2

Pos	Row	Col	Sample Name	Set #	#Used	Type
1	1	1	42298 MB	1	-NA-	Sample
2	1	2	42298 LCS	1	-NA-	Sample
3	1	3	173-60-1A,10	1	-NA-	Sample
4	1	4	173-60-1A,10 PDS	1	-NA-	Sample
5	1	5	173-60-1A,10 L	1	-NA-	Sample
6	1	6	173-60-2A	1	-NA-	Sample
7	1	7	173-60-2A DA	1	-NA-	Sample
8	1	8	173-60-3A	1	-NA-	Sample
9	1	9	173-60-4A	1	-NA-	Sample
10	1	10	173-60-5A	1	-NA-	Sample
11	1	11	173-60-6A	1	-NA-	Sample
12	1	12	173-60-11A	1	-NA-	Sample
13	2	1	173-60-12A	1	-NA-	Sample
14	2	2	173-60-13A	1	-NA-	Sample
15	2	3	173-60-14A	1	-NA-	Sample

See individual Run For Complete ID
08-1-97

Rack #2

Pos	Row	Col	Sample Name	Set #	#Used	Type
16	2	4	173-60-1B	1	-NA-	Sample
17	2	5	173-60-1B PDS	1	-NA-	Sample
18	2	6	173-60-1B L	1	-NA-	Sample
19	2	7	173-60-2B	1	-NA-	Sample
20	2	8	173-60-2B DA	1	-NA-	Sample
21	2	9	173-60-3B	1	-NA-	Sample
22	2	10	173-60-4B,4A	1	-NA-	Sample
23	2	11	173-60-5B.5A	1	-NA-	Sample
24	2	12	173-60-6A,6C	1	-NA-	Sample
25	3	1	173-60-7	1	-NA-	Sample
26	3	2	173-60-11A,11B	1	-NA-	Sample
27	3	3	173-60-12B	1	-NA-	Sample
28	3	4	173-60-13B	1	-NA-	Sample
29	3	5	173-60-14B	1	-NA-	Sample

(30...48 Not Used)

See individual lines for complete ID

See 2-4-97

Rack #3

Pos	Row	Col	Sample Name	Set #	#Used	Type

(1...48 Not Used)

Rack #4

Pos	Row	Col	Sample Name	Set #	#Used	Type

(1...48 Not Used)

Rack #5

Pos	Row	Col	Sample Name	Set #	#Used	Type

(1...48 Not Used)

Method: TRIANGL2 Sample Name: STD1-BLANK Operator:
Run Time: 07/28/97 01:24 Filename: 72797
Mode: IR Type: X Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.:

Elems	Ag3280	Al3082	As1890	B_2496	Ba4934	Be3130
Units	count	count	count	count	count	count
Avge	-.00003	.00454	-.00026	.00429	.00056	.0004
SDev	.00077	.00002	.00007	.0002	.00002	0
%RSD	2024.96	.6375	26.3763	4.80011	4.69196	1.86591

Elems	Ca3179	Cd2265	Ce4186	Co2286	Cr2677	Cu3247
Units	count	count	count	count	count	count
Avge	.00036	-.00015	.00057	-.00012	.00001	.00249
SDev	.00001	.00018	.00017	.00008	.00007	.00005
%RSD	4.19756	117.472	31.2083	64.2845	683.498	2.34113

Elems	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020
Units	count	count	count	count	count	count
Avge	.00015	5.13044	.10713	.00019	.00004	.00003
SDev	.00002	.09175	.00216	.00007	.00001	.00003
%RSD	15.5264	1.78837	2.01928	39.4158	30.4957	124.322

Elems	Na3302	Ni2316	P_2149	2203-1	2203-2	Sb2068
Units	count	count	count	count	count	count
Avge	.00313	-.00156	-.00059	.00044	.00015	.00066
SDev	.00568	.00032	.00022	.00113	.00032	.00021
%RSD	181.451	20.5826	36.9268	253.261	210.464	32.4285

Elems	1960-1	1960-2	Sn1899	Sr4215	Ti3349	Tl1908
Units	count	count	count	count	count	count
Avge	-.00662	.00216	-.00052	.00031	.00033	-.00058
SDev	.00156	.00027	.00005	.00001	.00022	.00009
%RSD	23.5681	12.56	11.3615	6.19176	65.6627	17.0359

Elems	V_2924	Zn2062	Si2881
Units	count	count	count
Avge	-.00032	.00003	.03211
SDev	.00002	.00004	.00169
%RSD	8.1222	148.209	5.27207

Method: TRIANGL2 Sample Name: STD3 Operator:
Run Time: 07/28/97 01:29 Filename: 72797
Mode: IR Type: X Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.:

Elems	Ag3280	Al3082	As1890	B_2496	Ba4934	Be3130
Units	count	count	count	count	count	count
Avge	.45064	.02024	.05982	.18491	.30861	.31689
SDev	.00082	.00002	.00014	.00261	.0009	.00204
%RSD	.18382	.12777	.23797	1.41656	.29276	.64585

Elems	Ca3179	Cd2265	Ce4186	Co2286	Cr2677	Cu3247
Units	count	count	count	count	count	count
Avge	.02875	1.19708	.12656	.12483	.18327	.17785
SDev	.00036	.01182	.00065	.00102	.00169	.00205
%RSD	1.26763	.988	.5162	.82189	.92358	1.15473

Elems	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020
Units	count	count	count	count	count	count
Avge	.0053	14.4762	8.50111	.0242	.1535	.09396
SDev	.0001	.63224	.69665	.00026	.00134	.00035
%RSD	2.01091	4.36749	8.19492	1.08747	.87622	.37548

Elems	Na3302	Ni2316	P_2149	2203-1	2203-2	Sb2068
Units	count	count	count	count	count	count
Avge	.10819	.43297	.02516	.2153	.10905	.1275
SDev	.00533	.00181	.00013	.00474	.00196	.00058
%RSD	4.93029	.41886	.52872	2.20199	1.7984	.45507

Elems	1960-1	1960-2	Sn1899	Sr4215	Ti3349	Tl1908
Units	count	count	count	count	count	count
Avge	.29341	.1736	.14097	.95076	1.27135	.03678
SDev	.00291	.00262	.00105	.00113	.00464	.00025
%RSD	.99267	1.51199	.75039	.11977	.36511	.70084

Elems	V_2924	Zn2062	Si2881	Pb2203	Se1960
Units	count	count	count		
Avge	.04503	.12995	.06074		
SDev	.00018	.00203	.00255		
%RSD	.40876	1.5628	4.20073		

Method: TRIANGL2 Sample Name: STD3 Operator: DKH
Run Time: 07/28/97 01:34 Filename: 72797
Mode: CONC Type: Q Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	Ag3280	Al3082	As1890	B_2496	Ba4934	Be3130
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	996.2	988.8	993.0	1008.	998.3	992.6
SDev	4.129	6.355	11.83	16.91	12.07	1.314
%RSD	.4145	.6427	1.191	1.677	1.21	.1324

Elems	Ca3179	Cd2265	Ce4186	Co2286	Cr2677	Cu3247
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	990.0	993.9	999.1	992.6	992.4	1000.
SDev	11.07	5.352	4.599	4.232	6.348	15.95
%RSD	1.119	.5385	.4603	.4264	.6397	1.595

Elems	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020
Units	ppb	ppm	ppb	ppb	ppb	ppb
Avge	980.6	Q10.54	Q1057.	992.0	992.0	997.2
SDev	22.94	.7593	91.7	11.91	2.92	5.002
%RSD	2.34	7.206	8.678	1.201	.2943	.5016

Elems	Na3302	Ni2316	P_2149	2203-1	2203-2	Sb2068
Units	ppm	ppb	ppb	ppb	ppb	ppb
Avge	Q10.51	991.7	1000.	997.9	999.4	997.8
SDev	.7479	1.788	8.336	21.58	13.19	7.874
%RSD	7.119	.1803	.8334	2.163	1.32	.7891

Elems	1960-1	1960-2	Sn1899	Sr4215	Ti3349	Tl1908
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	1011.	998.4	993.9	989.2	993.0	998.9
SDev	9.427	24.24	2.048	7.46	2.956	2.214
%RSD	.9321	2.428	.206	.7542	.2977	.2216

Elems	V_2924	Zn2062	Si2881	Pb2203	Se1960
Units	ppb	ppb	ppb	ppb	ppb
Avge	995.1	991.1	Q9016.	998.9	1003.
SDev	2.342	12.63	917	11.43	16.72
%RSD	.2353	1.274	10.17	1.144	1.668

Method: TRIANGL2 Sample Name: ICV/CCV Operator: DKH
Run Time: 07/28/97 01:44 Filename: 72797
Mode: CONC Type: Q Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	Ag3280	Al3082	As1890	B_2496	Ba4934	Be3130
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	511.0	509.4	509.8	510.9	512.6	506.1
SDev	1.472	12.92	2.697	4.634	1.467	3.051
%RSD	.2881	2.537	.5291	.9069	.2862	.6029

Elems	Ca3179	Cd2265	Ce4186	Co2286	Cr2677	Cu3247
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	Q562.1	511.0	512.2	508.4	508.9	516.8
SDev	9.446	4.924	2.603	6.534	6.238	3.085
%RSD	1.681	.9636	.5083	1.285	1.226	.597

Elems	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020
Units	ppb	ppm	ppb	ppb	ppb	ppb
Avge	498.0	5.146	516.7	517.2	511.8	512.2
SDev	19.45	.208	33.37	13.39	4.78	3.159
%RSD	3.905	4.042	6.458	2.588	.9338	.6166

Elems	Na3302	Ni2316	P_2149	2203-1	2203-2	Sb2068
Units	ppm	ppb	ppb	ppb	ppb	ppb
Avge	5.245	512.2	514.1	503.8	511.0	508.5
SDev	.2608	3.275	4.682	13.03	4.787	7.067
%RSD	4.972	.6395	.9108	2.587	.9368	1.39

Elems	1960-1	1960-2	Pb2203	Se1960	Sn1899	Sr4215
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	505.1	516.8	508.6	512.9	511.7	507.5
SDev	4.359	3.283	7.532	3.154	2.338	.8567
%RSD	.863	.6352	1.481	.615	.457	.1688

Elems	Ti3349	Tl1908	V_2924	Zn2062	Si2881
Units	ppb	ppb	ppb	ppb	ppb
Avge	508.5	514.4	513.0	519.6	Q3939.
SDev	2.728	3.061	3.38	9.463	826.8
%RSD	.5365	.595	.6589	1.821	20.99

Method: TRIANGL2 Sample Name: ICB/CCB Operator: DKH
Run Time: 07/28/97 01:49 Filename: 72797
Mode: CONC Type: Q Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	Ag3280	Al3082	As1890	B_2496	Ba4934	Be3130
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	-.9106	14.03	.3087	-1.390	.0706	.1299
SDev	.9547	8.881	2.012	3.459	.0988	.1223
%RSD	104.8	63.29	651.7	248.7	125.8	94.15

Elems	Ca3179	Cd2265	Ce4186	Co2286	Cr2677	Cu3247
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	.0615	.1794	-1.465	.2454	.6206	.2338
SDev	.2994	.1463	5.991	.5257	.2885	.2139
%RSD	486.6	81.55	408.9	214.2	46.49	91.48

Elems	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020
Units	ppb	ppm	ppb	ppb	ppb	ppb
Avge	3.273	.1741	.5136	5.675	.1037	.6568
SDev	15.1	.1245	.1771	4.068	.0979	.2353
%RSD	461.4	71.52	34.49	71.68	94.47	35.83

Elems	Na3302	Ni2316	P_2149	2203-1	2203-2	Sb2068
Units	ppm	ppb	ppb	ppb	ppb	ppb
Avge	-.2348	.8751	3.019	.9934	1.766	2.281
SDev	.3364	.502	3.05	4.358	2.832	3.777
%RSD	143.3	57.37	101	438.7	160.4	165.6

Elems	1960-1	1960-2	Pb2203	Se1960	Sn1899	Sr4215
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	-.5685	1.122	1.508	.5588	.5419	.1013
SDev	5.787	1.299	.7693	2.782	.2892	.0927
%RSD	1018	115.8	51	497.8	53.36	91.43

Elems	Ti3349	Tl1908	V_2924	Zn2062	Si2881
Units	ppb	ppb	ppb	ppb	ppb
Avge	.1858	Q6.613	-.3962	.2900	Q-522.9
SDev	.0175	4.173	.5673	.3042	751.1
%RSD	9.407	63.1	143.2	104.9	143.6

DKH 7/28/97

Method: TRIANGL2 Sample Name: ICB/CCB Operator: DKH
Run Time: 07/28/97 01:55 Filename: 72797
Mode: CONC Type: Q Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	Ag3280	Al3082	As1890	B_2496	Ba4934	Be3130
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	.1290	2.429	-1.481	-9.412	-.0251	.0937
SDev	1.597	5.706	1.718	.8605	.1266	.0804
%RSD	1238	234.9	116	9.142	504.4	85.77

Elems	Ca3179	Cd2265	Ce4186	Co2286	Cr2677	Cu3247
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	-.0182	.0168	Q-4.590	.3581	-.1993	-.3445
SDev	1.471	.0584	1.753	.7797	1.089	.8991
%RSD	8084	347.4	38.18	217.8	546.5	261

Elems	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020
Units	ppb	ppm	ppb	ppb	ppb	ppb
Avge	-7.863	.0537	.1800	2.317	.0956	.1769
SDev	25.87	.0105	.1613	6.085	.1164	1.021
%RSD	329	19.56	89.59	262.6	121.8	576.9

Elems	Na3302	Ni2316	P_2149	2203-1	2203-2	Sb2068
Units	ppm	ppb	ppb	ppb	ppb	ppb
Avge	-.0317	.5994	2.532	2.720	-.5613	2.120
SDev	.3326	.709	5.703	6.633	5.443	2.381
%RSD	1048	118.3	225.2	243.8	969.7	112.3

Elems	1960-1	1960-2	Pb2203	Se1960	Sn1899	Sr4215
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	1.799	-1.812	.5315	-.6094	.1067	.0345
SDev	4.794	5.806	1.691	2.32	.9978	.057
%RSD	266.4	320.4	318.2	380.7	935.3	165.1

Elems	Ti3349	Tl1908	V_2924	Zn2062	Si2881
Units	ppb	ppb	ppb	ppb	ppb
Avge	.0098	4.941	-.0592	.0930	Q-1504.
SDev	.3345	1.464	.9745	.1462	72.44
%RSD	3413	29.64	1647	157.1	4.817

Method: TRIANGLE Sample Name: ICSA8 Operator: DKH
Run Time: 07/28/97 02:00 Filename: 72797
Mode: CONC Type: Q Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	Ag3280	Al3082	As1890	B_2496	Ba4934	Be3130
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	528.0	533600.	509.2	514.3	513.1	482.7
SDev	4.904	1666	3.397	8.52	6.393	.5072
%RSD	.9287	.3122	.6671	1.657	1.246	.1051

Elems	Ca3179	Cd2265	Ce4186	Co2286	Cr2677	Cu3247
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	456200.	461.3	493.1	463.0	476.8	525.6
SDev	5156	1.127	5.71	.1983	1.614	10.96
%RSD	1.13	.2442	1.158	.0428	.3384	2.085

Elems	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020
Units	ppb	ppm	ppb	ppb	ppb	ppb
Avge	171900.	Q28.71	646.4	533900.	455.6	492.9
SDev	407.7	1.966	50.12	809.5	.5328	2.028
%RSD	.2371	6.848	7.753	.1516	.1169	.4113

Elems	Na3302	Ni2316	P_2149	2203-1	2203-2	Sb2068
Units	ppm	ppb	ppb	ppb	ppb	ppb
Avge	Q6.180	447.0	504.4	514.1	460.3	498.7
SDev	.4896	.207	5.776	6.919	8.569	10.17
%RSD	7.922	.0463	1.145	1.346	1.862	2.04

Elems	1960-1	1960-2	Pb2203	Se1960	Sn1899	Sr4215
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	541.8	499.9	478.2	513.9	493.4	Q495.7
SDev	11.17	17.72	5.105	8.106	3.627	4.147
%RSD	2.062	3.544	1.067	1.577	.735	.8366

Elems	Ti3349	Tl1908	V_2924	Zn2062	Si2881
Units	ppb	ppb	ppb	ppb	ppb
Avge	496.2	511.9	494.7	430.3	Q8644.
SDev	1.773	6.741	1.515	3.871	762.8
%RSD	.3573	1.317	.3064	.8996	8.826

Method: TRIANGL2 Sample Name: 42298 M8 Operator: DKH
Run Time: 07/28/97 02:09 Filename: 72797
Mode: CONC Type: S Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	As1890	Be3130	Cd2265	Co2286	Cr2677	Mn2576
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	L-3.490	L.1490	L.0328	L.7508	L1.093	L.3854
SDev	1.917	.0393	.2535	1.199	1.276	.2273
%RSD	54.94	26.35	772.4	159.8	116.8	58.96

Elems	Ni2316	Pb2203	Sb2068	Se1960
Units	ppb	ppb	ppb	ppb
Avge	L-.5858	L-.0552	4.550	L.9840
SDev	1.548	.3754	3.046	2.211
%RSD	264.3	680	66.95	224.7

DKH 7/28/97

Method: TRIANGL2 Sample Name: 42298 LCS Operator: DKH
Run Time: 07/28/97 02:13 Filename: 72797
Mode: CONC Type: S Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	As1890	Be3130	Cd2265	Co2286	Cr2677	Mn2576
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	41.89	44.31	45.10	46.55	46.66	45.99
SDev	2.697	.2683	.5899	1.689	1.945	.5454
%RSD	6.438	.6055	1.308	3.629	4.167	1.186

Elems	Ni2316	Pb2203	Sb2068	Se1960
Units	ppb	ppb	ppb	ppb
Avge	45.33	52.49	52.65	44.65
SDev	.9438	1.074	4.992	1.401
%RSD	2.082	2.046	9.48	3.139

174-97-11,1 3-4-97CC

Method: TRIANGL2 Sample Name: 173-60-1A.10 Operator: DKH
Run Time: 07/28/97 02:18 Filename: 72797
Mode: CONC Type: S Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	As1890	Be3130	Cd2265	Co2286	Cr2677	Mn2576
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	46.26	L.2595	727.0	L-7.271	217.0	535.4
SDev	5.44	.0286	9.022	1.776	1.419	2.468
%RSD	11.76	11.04	1.241	24.42	.6541	.461

Elems	Ni2316	Pb2203	Sb2068	Se1960
Units	ppb	ppb	ppb	ppb
Avge	817.8	H145400.	60.44	169.7
SDev	4.866	1642	4.531	4.027
%RSD	.595	1.129	7.496	2.373

174-97-11,1 ~ 224-97

Method: TRIANGL2 Sample Name: 173-60-1A.10 PDS Operator: DKH
Run Time: 07/28/97 02:23 Filename: 72797
Mode: CONC Type: S Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	As1890	Be3130	Cd2265	Co2286	Cr2677	Mn2576
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	85.38	46.21	759.2	40.63	263.4	574.1
SDev	4.563	.5478	10.88	.3985	3.741	7.403
%RSD	5.344	1.186	1.433	.9808	1.42	1.289

Elems	Ni2316	Pb2203	Sb2068	Se1960
Units	ppb	ppb	ppb	ppb
Avge	850.0	H143100.	114.0	210.2
SDev	10.34	3084	3.494	3.711
%RSD	1.216	2.155	3.064	1.765

174-97-11,1 - 3-4-97 cc

Method: TRIANGL2 Sample Name: 173-60-1A.10 L Operator: DKH
Run Time: 07/28/97 02:27 Filename: 72797
Mode: CONC Type: S Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	As1890	Be3130	Cd2265	Co2286	Cr2677	Mn2576
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	7.927	L.1356	153.1	L-1.256	48.99	108.4
SDev	.7569	.0502	2.745	.658	1.509	2.068
%RSD	9.549	37.01	1.792	52.39	3.08	1.908

Elems	Ni2316	Pb2203	Sb2068	Se1960
Units	ppb	ppb	ppb	ppb
Avge	172.6	30780.	14.47	37.39
SDev	2.942	646.5	2.317	.3544
%RSD	1.704	2.101	16.02	.948

174-49-13,14

Method: TRIANGL2 Sample Name: 173-60-2A Operator: DKH
Run Time: 07/28/97 02:32 Filename: 72797
Mode: CONC Type: S Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	As1890	Be3130	Cd2265	Co2286	Cr2677	Mn2576
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	43.27	L.2496	674.6	L.8551	171.7	561.1
SDev	2.737	.0181	2.263	.7339	.5759	2.043
%RSD	6.325	7.233	.3354	85.83	.3354	.3642

Elems	Ni2316	Pb2203	Sb2068	Se1960
Units	ppb	ppb	ppb	ppb
Avge	1166.	H134200.	58.08	186.6
SDev	3.991	1603	2.722	1.213
%RSD	.3421	1.194	4.688	.6498

174-97-13/A

Method: TRIANGL2 Sample Name: 173-60-2A DA Operator: DKH
Run Time: 07/28/97 02:37 Filename: 72797
Mode: CONC Type: S Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	As1890	Be3130	Cd2265	Co2286	Cr2677	Mn2576
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	42.79	L.2035	670.0	1.169	170.7	559.3
SDev	3.041	.013	4.388	.269	.9995	2.887
%RSD	7.105	6.392	.6549	23.01	.5855	.5162

Elems	Ni2316	Pb2203	Sb2068	Se1960
Units	ppb	ppb	ppb	ppb
Avge	1161.	H133900.	63.09	187.6
SDev	3.387	1219	2.267	3.807
%RSD	.2917	.9106	3.593	2.03

174-97-15,6 ↓ 3-4-97 ec

Method: TRIANGL2 Sample Name: 173-60-3A Operator: DKH
Run Time: 07/28/97 02:42 Filename: 72797
Mode: CONC Type: S Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	As1890	Be3130	Cd2265	Co2286	Cr2677	Mn2576
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	38.96	L.2132	726.8	L-7.951	174.5	1147.
SDev	3.603	.0341	4.549	.3931	.3425	4.577
%RSD	9.25	16.01	.6259	4.944	.1963	.399

Elems	Ni2316	Pb2203	Sb2068	Se1960
Units	ppb	ppb	ppb	ppb
Avge	664.2	H145200.	63.04	168.3
SDev	1.525	1733	3.865	3.449
%RSD	.2297	1.194	6.131	2.049

174-97-128 L

Method: TRIANGL2 Sample Name: 173-60-4A Operator: DKH

Run Time: 07/28/97 02:46 Filename: 72797

Mode: CONC Type: S Corr. Factor: 1.00000

Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	As1890	Be3130	Cd2265	Co2286	Cr2677	Mn2576
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	5.776	L.0559	L-5.083	L-13.71	115.5	140.3
SDev	2.011	.035	.1337	.9953	1.695	1.579
%RSD	34.83	62.55	2.63	7.258	1.468	1.125

Elems	Ni2316	Pb2203	Sb2068	Se1960
Units	ppb	ppb	ppb	ppb
Avge	490.0	270.5	62.16	58.51
SDev	1.181	72.89	3.565	2.315
%RSD	.241	26.94	5.735	3.957

174-97-149 ✓ 8-8-97 EE

Method: TRIANGL2 Sample Name: 173-60-5A Operator: DKH
Run Time: 07/28/97 02:51 Filename: 72797
Mode: CONC Type: S Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	As1890	Be3130	Cd2265	Co2286	Cr2677	Mn2576
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	L3.659	L-.0089	L-7.418	L-14.65	105.6	55.73
SDev	1.007	.02	.4816	.609	.8667	.2182
%RSD	27.51	224.2	6.492	4.156	.8208	.3915

Elems	Ni2316	Pb2203	Sb2068	Se1960
Units	ppb	ppb	ppb	ppb
Avge	248.8	92.01	60.67	52.01
SDev	1.443	2.6	1.812	2.545
%RSD	.5799	2.826	2.986	4.894

Method: TRIANGL2 Sample Name: ICV/CCV Operator: DKH
Run Time: 07/28/97 02:56 Filename: 72797
Mode: CONC Type: Q Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	Ag3280	Al3082	As1890	B_2496	Ba4934	Be3130
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	Q333.4	Q254.3	Q341.4	398.4	Q338.7	Q329.1
SDev	289.1	404.3	294.9	343.7	292.9	285.4
%RSD	86.72	159	86.39	86.28	86.5	86.72

Elems	Ca3179	Cd2265	Ce4186	Co2286	Cr2677	Cu3247
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	Q362.6	Q333.0	334.7	Q329.7	Q332.6	Q336.7
SDev	308.5	288.1	296.8	285.5	287.4	300.7
%RSD	85.07	86.51	88.69	86.58	86.41	89.3

Elems	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020
Units	ppb	ppm	ppb	ppb	ppb	ppb
Avge	Q304.1	Q3.814	Q381.2	Q325.3	Q332.9	Q335.4
SDev	285.6	3.1	330.8	287.4	287.9	289.9
%RSD	93.91	81.28	86.78	88.35	86.47	86.42

Elems	Na3302	Ni2316	P_2149	2203-1	2203-2	Sb2068
Units	ppm	ppb	ppb	ppb	ppb	ppb
Avge	Q3.560	Q335.3	Q337.0	318.2	339.6	Q334.7
SDev	3.108	289.7	295.2	274.5	291.9	288.7
%RSD	87.31	86.39	87.58	86.26	85.94	86.26

Elems	1960-1	1960-2	Pb2203	Se1960	Sn1899	Sr4215
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	329.8	330.4	Q332.5	Q330.2	Q338.1	Q333.3
SDev	280.4	288.5	286.1	285.8	293	288.2
%RSD	85.03	87.33	86.04	86.56	86.65	86.48

Elems	Ti3349	Tl1908	V_2924	Zn2062	Si2881
Units	ppb	ppb	ppb	ppb	ppb
Avge	Q333.0	Q342.8	Q337.9	Q334.3	Q544700.
SDev	288.2	288.6	287.9	289.6	268000
%RSD	86.53	84.17	85.21	86.63	49.2

Cup Empty
MKA 7/28/97

Method: TRIANGL2 Sample Name: ICV/CCV Operator: DKH
Run Time: 07/28/97 03:01 Filename: 72797
Mode: CONC Type: Q Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	Ag3280	Al3082	As1890	B_2496	Ba4934	Be3130
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	512.8	534.0	514.8	601.5	514.9	505.5
SDev	1.48	10.61	8.001	4.835	7.528	2.051
%RSD	.2886	1.987	1.554	.8038	1.462	.4056

Elems	Ca3179	Cd2265	Ce4186	Co2286	Cr2677	Cu3247
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	Q560.2	515.0	520.9	509.4	514.2	520.9
SDev	10.45	4.981	1.755	4.831	6.418	10.09
%RSD	1.866	.9672	.337	.9483	1.248	1.937

Elems	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020
Units	ppb	ppm	ppb	ppb	ppb	ppb
Avge	526.1	5.167	520.2	526.8	512.3	513.3
SDev	33.32	.5142	71.41	14.79	3.15	2.984
%RSD	6.333	9.951	13.73	2.807	.6149	.5813

Elems	Na3302	Ni2316	P_2149	2203-1	2203-2	Sb2068
Units	ppm	ppb	ppb	ppb	ppb	ppb
Avge	5.222	517.6	527.0	506.5	529.7	516.2
SDev	.3299	4.002	3.238	24.68	13.32	3.935
%RSD	6.318	.7732	.6144	4.872	2.516	.7623

Elems	1960-1	1960-2	Pb2203	Se1960	Sn1899	Sr4215
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	515.6	519.7	522.0	518.3	501.7	507.2
SDev	12.83	1.841	16.88	4.814	1.396	5.095
%RSD	2.488	.3543	3.235	.9287	.2783	1.005

Elems	Ti3349	Tl1908	V_2924	Zn2062	Si2881
Units	ppb	ppb	ppb	ppb	ppb
Avge	511.2	515.6	516.4	519.3	Q568300.
SDev	1.227	5.6	1.428	11.8	95250
%RSD	.2401	1.086	.2765	2.273	16.76

Method: TRIANGL2 Sample Name: ICB/CCB Operator: DKH
Run Time: 07/28/97 03:07 Filename: 72797
Mode: CONC Type: Q Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	Ag3280	Al3082	As1890	B_2496	Ba4934	Be3130
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	-.5381	10.77	-2.631	49.35	.0412	.1042
SDev	2.423	7.647	1.125	10.24	.0826	.0123
%RSD	450.2	71.01	42.77	20.75	200.5	11.85

Elems	Ca3179	Cd2265	Ce4186	Co2286	Cr2677	Cu3247
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	-.5198	-.1183	-.3998	.7076	.8896	-.5535
SDev	.4252	.0856	2.102	.408	.5825	.4732
%RSD	81.81	72.42	525.6	57.66	65.48	85.49

Elems	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020
Units	ppb	ppm	ppb	ppb	ppb	ppb
Avge	-1.532	-.1537	-.3124	4.448	.0141	-.2172
SDev	5.476	.1549	.3573	3.893	.0681	.532
%RSD	357.4	100.8	114.4	87.53	482.4	244.9

Elems	Na3302	Ni2316	P_2149	2203-1	2203-2	Sb2068
Units	ppm	ppb	ppb	ppb	ppb	ppb
Avge	-.1967	.7096	2.838	-.2262	.3944	.9105
SDev	.7089	.824	2.979	9.288	6.581	.528
%RSD	360.4	116.1	104.9	4106	1669	57.98

Elems	1960-1	1960-2	Pb2203	Se1960	Sn1899	Sr4215
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	1.693	1.284	.1877	1.420	-.0099	-.0079
SDev	4.044	3.393	1.378	1.528	1.046	.0335
%RSD	238.8	264.2	733.8	107.5	10580	423.2

Elems	Ti3349	Tl1908	V_2924	Zn2062	Si2881
Units	ppb	ppb	ppb	ppb	ppb
Avge	.0763	Q6.402	.5162	-.0788	Q241100.
SDev	.0849	1.551	.8914	.2477	24940
%RSD	111.3	24.23	172.7	314.5	10.34

Method: TRIANGL2 Sample Name: 173-60-6A Operator: DKH
Run Time: 07/28/97 03:13 Filename: 72797
Mode: CONC Type: S Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	As1890	Be3130	Cd2265	Co2286	Cr2677	Mn2576
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	L-1.483	L.0058	L-.5303	L-1.436	12.07	15.69
SDev	3.423	.0279	.107	.2428	.3395	.0202
%RSD	230.8	481.1	20.18	16.9	2.812	.1289

Elems	Ni2316	Pb2203	Sb2068	Se1960
Units	ppb	ppb	ppb	ppb
Avge	6.064	5.342	L3.834	3.383
SDev	.6646	.1131	2.453	1.11
%RSD	10.96	2.118	63.98	32.82

17497-20,104 ~~8-4-97 cc~~

Method: TRIANGL2 Sample Name: 173-60-11A Operator: DKH
Run Time: 07/28/97 03:17 Filename: 72797
Mode: CONC Type: S Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	As1890	Be3130	Cd2265	Co2286	Cr2677	Mn2576
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	5.039	L.1523	L-9.533	L-18.19	112.0	38.53
SDev	2.56	.0362	.4478	1.609	1.679	.4482
%RSD	50.8	23.78	4.698	8.85	1.499	1.163

Elems	Ni2316	Pb2203	Sb2068	Se1960
Units	ppb	ppb	ppb	ppb
Avge	234.0	18.77	66.55	60.49
SDev	3.214	.6581	5.838	2.417
%RSD	1.373	3.506	8.773	3.995

174-97-12,17,2,3 + 8-4-97cc

Method: TRIANGL2 Sample Name: 173-60-12A Operator: DKH
Run Time: 07/28/97 03:22 Filename: 72797
Mode: CONC Type: S Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	As1890	Be3130	Cd2265	Co2286	Cr2677	Mn2576
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	141.5	L-1.343	861.0	L-.5110	841.9	13330.
SDev	2.25	.1158	9.226	2.907	8.592	122.1
%RSD	1.589	8.619	1.072	568.9	1.021	.9153

Elems	Ni2316	Pb2203	Sb2068	Se1960
Units	ppb	ppb	ppb	ppb
Avge	1193.	H158900.	124.7	347.3
SDev	10.11	1978	5.863	1.792
%RSD	.8473	1.245	4.7	.5161

174-97-14,5 + 8-4-97 EE

Method: TRIANGL2 Sample Name: 173-60-13A Operator: DKH
Run Time: 07/28/97 03:27 Filename: 72797
Mode: CONC Type: S Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	As1890	Be3130	Cd2265	Co2286	Cr2677	Mn2576
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	184.3	L-2.734	808.3	13.84	1009.	18020.
SDev	4.589	.0387	8.828	.927	10.18	192
%RSD	2.489	1.414	1.092	6.696	1.009	1.065

Elems	Ni2316	Pb2203	Sb2068	Se1960
Units	ppb	ppb	ppb	ppb
Avge	828.5	H156900.	99.30	405.6
SDev	7.001	2725	4.828	9.721
%RSD	.845	1.737	4.862	2.396

174-97-16,7 ✓ 8-4-97 CC

Method: TRIANGL2 Sample Name: 173-60-14A Operator: DKH
Run Time: 07/28/97 03:31 Filename: 72797
Mode: CONC Type: S Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	As1890	Be3130	Cd2265	Co2286	Cr2677	Mn2576
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	201.0	L-2.385	848.1	18.66	998.0	19000.
SDev	2.766	.1341	7.088	1.539	7.89	153.3
%RSD	1.376	5.621	.8358	8.249	.7906	.8069

Elems	Ni2316	Pb2203	Sb2068	Se1960
Units	ppb	ppb	ppb	ppb
Avge	869.8	H165700.	90.56	322.3
SDev	4.444	806	4.285	8.043
%RSD	.511	.4863	4.731	2.496

Method: TRIANGL2 Sample Name: 173-60-18 Operator: DKH
Run Time: 07/28/97 03:36 Filename: 72797
Mode: CONC Type: S Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	As1890	Be3130	Cd2265	Co2286	Cr2677	Mn2576
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	L-.4306	L.0977	5.678	L-1.235	27.20	100.1
SDev	2.127	.0685	.5235	1.268	1.37	1.334
%RSD	494	70.12	9.219	102.7	5.035	1.333

Elems	Ni2316	Pb2203	Sb2068	Se1960
Units	ppb	ppb	ppb	ppb
Avge	38.80	125.8	4.806	171.3
SDev	.2062	93.06	4.14	2.139
%RSD	.5314	73.98	86.14	1.248

Reanalyzed - Poor replication of injections
MKH 7/28/97

Method: TRIANGL2 Sample Name: 173-60-1B PDS Operator: DKH
Run Time: 07/28/97 03:41 Filename: 72797
Mode: CONC Type: S Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	As1890	Be3130	Cd2265	Co2286	Cr2677	Mn2576
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	44.31	46.56	53.00	47.22	75.38	148.5
SDev	2.669	.3235	.5918	.9871	1.614	3.817
%RSD	6.023	.6948	1.117	2.09	2.141	2.57

Elems	Ni2316	Pb2203	Sb2068	Se1960
Units	ppb	ppb	ppb	ppb
Avge	86.68	115.9	49.78	210.8
SDev	1.368	1.938	1.837	1.572
%RSD	1.578	1.672	3.689	.7459

Method: TRIANGL2 Sample Name: 173-60-1B L Operator: DKH
Run Time: 07/28/97 03:46 Filename: 72797
Mode: CONC Type: S Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	As1890	Be3130	Cd2265	Co2286	Cr2677	Mn2576
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	L-1.318	L.0692	1.119	L.1816	5.556	19.98
SDev	.5984	.0714	.0553	1.069	1.28	.0988
%RSD	45.42	103.2	4.943	588.5	23.04	.4945

Elems	Ni2316	Pb2203	Sb2068	Se1960
Units	ppb	ppb	ppb	ppb
Avge	7.849	18.60	L.5217	36.70
SDev	.6526	3.687	3.156	2.291
%RSD	8.315	19.82	604.9	6.242

Method: TRIANGL2 Sample Name: 173-60-28 Operator: DKH
Run Time: 07/28/97 03:50 Filename: 72797
Mode: CONC Type: S Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	As1890	Be3130	Cd2265	Co2286	Cr2677	Mn2576
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	L-2.804	L.0652	L-.3177	L-1.593	12.89	205.6
SDev	1.163	.1032	.3963	.7373	.8695	1.125
%RSD	41.48	158.3	124.7	46.29	6.746	.5472

Elems	Ni2316	Pb2203	Sb2068	Se1960
Units	ppb	ppb	ppb	ppb
Avge	4.377	9.816	L2.228	139.6
SDev	.9922	2.196	3.903	2.119
%RSD	22.67	22.38	175.2	1.518

Method: TRIANGL2 Sample Name: 173-60-28 DA Operator: DKH
Run Time: 07/28/97 03:55 Filename: 72797
Mode: CONC Type: S Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	As1890	Be3130	Cd2265	Co2286	Cr2677	Mn2576
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	L-4.576	L.0806	L-.3430	L-1.807	12.37	206.7
SDev	1.616	.0559	.2883	.8453	.2993	.4862
%RSD	35.32	69.4	84.05	46.79	2.421	.2352

Elems	Ni2316	Pb2203	Sb2068	Se1960
Units	ppb	ppb	ppb	ppb
Avge	4.301	9.255	L1.696	134.4
SDev	.4849	.7742	1.648	1.42
%RSD	11.27	8.364	97.15	1.056

Method: TRIANGL2 Sample Name: ICV/CCV Operator: DKH
Run Time: 07/28/97 04:00 Filename: 72797
Mode: CONC Type: Q Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	Ag3280	Al3082	As1890	B_2496	Ba4934	Be3130
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	511.3	510.9	510.1	537.5	511.6	501.5
SDev	1.24	12.34	6.632	5.434	5.664	1.902
%RSD	.2425	2.416	1.3	1.011	1.107	.3793

Elems	Ca3179	Cd2265	Ce4186	Co2286	Cr2677	Cu3247
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	544.5	510.0	513.0	502.3	505.9	518.6
SDev	7.765	3.215	4.246	4.075	5.99	6.79
%RSD	1.426	.6305	.8276	.8113	1.184	1.309

Elems	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020
Units	ppb	ppm	ppb	ppb	ppb	ppb
Avge	504.8	Q5.514	Q559.7	518.9	501.0	513.0
SDev	23.77	.2082	34.58	14.94	2.929	1.993
%RSD	4.709	3.776	6.178	2.878	.5847	.3886

Elems	Na3302	Ni2316	P_2149	2203-1	2203-2	Sb2068
Units	ppm	ppb	ppb	ppb	ppb	ppb
Avge	5.415	513.4	518.3	484.8	521.0	508.5
SDev	.2764	2.484	7.817	5.862	5.172	4.934
%RSD	5.104	.4839	1.508	1.209	.9926	.9702

Elems	1960-1	1960-2	Pb2203	Se1960	Sn1899	Sr4215
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	496.9	506.7	508.9	503.5	497.7	501.0
SDev	2.499	5.267	5.361	4.304	3.801	3.402
%RSD	.503	1.039	1.053	.855	.7638	.6791

Elems	Ti3349	Tl1908	V_2924	Zn2062	Si2881
Units	ppb	ppb	ppb	ppb	ppb
Avge	503.7	511.0	510.3	506.3	Q41400.
SDev	1.539	1.18	1.974	7.505	10370
%RSD	.3055	.2309	.3868	1.482	25.05

Method: TRIANGL2 Sample Name: IC8/CC8 Operator: DKH
Run Time: 07/28/97 04:05 Filename: 72797
Mode: CONC Type: Q Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	Ag3280	Al3082	As1890	B_2496	Ba4934	Be3130
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	-.7678	15.12	-.7294	13.33	.0123	.1833
SDev	.4105	4.446	2.101	4.697	.201	.0122
%RSD	53.46	29.39	288.1	35.23	1628	6.646

Elems	Ca3179	Cd2265	Ce4186	Co2286	Cr2677	Cu3247
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	-2.090	-.0871	Q-3.097	-.1727	-.0021	-1.017
SDev	2.02	.2122	8.23	1.139	1.066	1.178
%RSD	96.66	243.6	265.7	659.4	51370	115.9

Elems	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020
Units	ppb	ppm	ppb	ppb	ppb	ppb
Avge	-8.664	-.2953	-.6301	2.387	.0193	-.2152
SDev	23.33	.1751	.3967	13.58	.1395	.2407
%RSD	269.3	59.3	62.95	568.7	723.6	111.8

Elems	Na3302	Ni2316	P_2149	2203-1	2203-2	Sb2068
Units	ppm	ppb	ppb	ppb	ppb	ppb
Avge	-.2623	.6011	3.558	1.173	1.890	1.221
SDev	.1682	.7171	11.46	6.212	3.432	3.585
%RSD	64.12	119.3	322.2	529.7	181.6	293.6

Elems	1960-1	1960-2	Pb2203	Se1960	Sn1899	Sr4215
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	2.072	2.601	1.651	2.425	.3678	-.0208
SDev	7.616	4.644	1.343	.8376	1.436	.1058
%RSD	367.5	178.5	81.34	34.54	390.4	507.8

Elems	Ti3349	Tl1908	V_2924	Zn2062	Si2881
Units	ppb	ppb	ppb	ppb	ppb
Avge	.0418	Q6.439	.4591	.0903	Q18040.
SDev	.4309	3.381	1.383	.7609	2560
%RSD	1030	52.51	301.2	843.1	14.19

DKH 7/28/97

Method: TRIANGL2 Sample Name: ICB/CCB Operator: DKH
Run Time: 07/28/97 04:16 Filename: 72797
Mode: CONC Type: Q Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	Ag3280	Al3082	As1890	B_2496	Ba4934	Be3130
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	Q2.514	15.22	4.675	7.568	.2357	.1255
SDev	7.674	53.95	7.68	5.746	.4705	.3679
%RSD	305.3	354.5	164.3	75.92	199.6	293.2

Elems	Ca3179	Cd2265	Ce4186	Co2286	Cr2677	Cu3247
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	3.116	.4111	Q7.880	Q1.842	1.936	-.0054
SDev	4.429	.6871	16.59	1.974	1.591	3.73
%RSD	142.2	167.1	210.6	107.2	82.21	68690

Elems	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020
Units	ppb	ppm	ppb	ppb	ppb	ppb
Avge	29.82	.0714	.0927	19.09	.3555	1.320
SDev	46.3	.1553	.2435	23.88	.291	1.306
%RSD	155.3	217.6	262.8	125.1	81.84	98.92

Elems	Na3302	Ni2316	P_2149	2203-1	2203-2	Sb2068
Units	ppm	ppb	ppb	ppb	ppb	ppb
Avge	.9772	.6236	4.904	-12.43	10.76	Q12.64
SDev	2.661	3.091	20.69	9.825	7.888	7.456
%RSD	272.4	495.7	421.9	79.03	73.31	59.01

Elems	1960-1	1960-2	Pb2203	Se1960	Sn1899	Sr4215
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	-34.93	23.05	Q3.037	Q3.742	5.466	.1015
SDev	46.89	25.85	2.065	1.662	8.266	.1945
%RSD	134.3	112.2	68	44.41	151.2	191.7

Elems	Ti3349	Tl1908	V_2924	Zn2062	Si2881
Units	ppb	ppb	ppb	ppb	ppb
Avge	.5091	Q6.528	Q2.950	1.420	Q15030.
SDev	.9514	7.509	2.639	1.187	3848
%RSD	186.9	115	89.46	83.62	25.61

MKA 7/28/97

Method: TRIANGL2 Sample Name: IC8/CC8 Operator: DKH
Run Time: 07/28/97 04:21 Filename: 72797
Mode: CONC Type: Q Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	Ag3280	Al3082	As1890	B_2496	Ba4934	Be3130
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	-.9562	28.54	-1.108	4.208	.1543	.2442
SDev	1.836	14.01	1.828	4.281	.2196	.0568
%RSD	192	49.08	164.9	101.7	142.3	23.27

Elems	Ca3179	Cd2265	Ce4186	Co2286	Cr2677	Cu3247
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	-1.256	.1380	-1.734	.8572	.8790	.2667
SDev	1.926	.1123	2.992	.9639	1.549	1.711
%RSD	153.3	81.39	172.6	112.4	176.2	641.8

Elems	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020
Units	ppb	ppm	ppb	ppb	ppb	ppb
Avge	3.778	-.2321	-.5083	7.832	.1291	.4505
SDev	21.98	.2549	.5629	11.65	.1503	1.252
%RSD	581.8	109.8	110.7	148.7	116.4	277.8

Elems	Na3302	Ni2316	P_2149	2203-1	2203-2	Sb2068
Units	ppm	ppb	ppb	ppb	ppb	ppb
Avge	-.4738	.4907	1.692	-3.709	2.450	2.988
SDev	.6131	.6086	5.029	8.647	5.53	2.816
%RSD	129.4	124	297.3	233.1	225.7	94.23

Elems	1960-1	1960-2	Pb2203	Se1960	Sn1899	Sr4215
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	-4.676	4.869	.3991	1.691	-.4069	.0632
SDev	2.747	3.239	.8234	1.717	1.965	.0945
%RSD	58.74	66.51	206.3	101.6	482.9	149.5

Elems	Ti3349	Tl1908	V_2924	Zn2062	Si2881
Units	ppb	ppb	ppb	ppb	ppb
Avge	.2819	4.070	.7638	.3474	Q14970.
SDev	.3939	3.814	.965	.2959	3553
%RSD	139.7	93.71	126.3	85.18	23.73

Method: TRIANGL2 Sample Name: 173-60-38 Operator: DKH
Run Time: 07/28/97 04:27 Filename: 72797
Mode: CONC Type: S Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	As1890	Be3130	Cd2265	Co2286	Cr2677	Mn2576
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	L-3.089	L.2012	L-.0304	L-.9347	16.98	2682.
SDev	3.463	.0903	.1314	.811	1.174	40.94
%RSD	112.1	44.85	431.6	86.77	6.912	1.526

Elems	Ni2316	Pb2203	Sb2068	Se1960
Units	ppb	ppb	ppb	ppb
Avge	4.349	16.68	4.028	161.2
SDev	.7839	.4601	3.634	3.532
%RSD	18.02	2.759	90.24	2.191

Method: TRIANGL2 Sample Name: 173-60-48.4A Operator: DKH
Run Time: 07/28/97 04:32 Filename: 72797
Mode: CONC Type: S Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	As1890	Be3130	Cd2265	Co2286	Cr2677	Mn2576
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	L-3.540	L.0500	L.2610	L-.9045	12.97	157.4
SDev	2.223	.0117	.0647	.1876	.1127	.2775
%RSD	62.8	23.48	24.79	20.74	.8688	.1763

Elems	Ni2316	Pb2203	Sb2068	Se1960
Units	ppb	ppb	ppb	ppb
Avge	4.587	39.87	L-1.279	12.05
SDev	.4635	.5212	1.966	.2594
%RSD	10.11	1.307	153.7	2.153

Method: TRIANGL2 Sample Name: 173-60-58.5A Operator: DKH
Run Time: 07/28/97 04:36 Filename: 72797
Mode: CONC Type: S Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	As1890	Be3130	Cd2265	Co2286	Cr2677	Mn2576
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	L-4.576	L.1294	L.3735	L-1.180	12.65	1241.
SDev	1.686	.0363	.2092	.4749	.307	1.498
%RSD	36.85	28.09	56.02	40.26	2.428	.1207

Elems	Ni2316	Pb2203	Sb2068	Se1960
Units	ppb	ppb	ppb	ppb
Avge	3.475	129.9	L-.5355	10.09
SDev	.6575	1.092	2.413	1.963
%RSD	18.92	.8406	450.5	19.46

Method: TRIANGL2 Sample Name: 173-60-6A,6C Operator: DKH
Run Time: 07/28/97 04:41 Filename: 72797
Mode: CONC Type: S Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	As1890	Be3130	Cd2265	Co2286	Cr2677	Mn2576
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	L-3.656	L.1687	L-.2888	L-.5942	8.229	11.14
SDev	.6	.0229	.1213	.6661	.4422	.7328
%RSD	16.41	13.54	42.01	112.1	5.373	6.579

Elems	Ni2316	Pb2203	Sb2068	Se1960
Units	ppb	ppb	ppb	ppb
Avge	L2.188	4.697	L2.279	L2.176
SDev	1.049	1.429	1.8	1.36
%RSD	47.93	30.42	79.01	62.5

Method: TRIANGL2 Sample Name: 173-60-7 Operator: DKH
Run Time: 07/28/97 04:46 Filename: 72797
Mode: CONC Type: S Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	As1890	Be3130	Cd2265	Co2286	Cr2677	Mn2576
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	L-6.245	L.1081	L-.3040	L-.9122	9.524	35.88
SDev	1.05	.0482	.2221	.9438	1.321	.0577
%RSD	16.81	44.57	73.07	103.5	13.87	.1607

Elems	Ni2316	Pb2203	Sb2068	Se1960
Units	ppb	ppb	ppb	ppb
Avge	4.083	6.893	L-1.340	L-1.281
SDev	1.002	.3305	3.138	1.149
%RSD	24.54	4.795	234.2	89.72

Method: TRIANGL2 Sample Name: 173-60-11A,11B Operator: DKH
Run Time: 07/28/97 04:51 Filename: 72797
Mode: CONC Type: S Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	As1890	Be3130	Cd2265	Co2286	Cr2677	Mn2576
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	L-3.108	L.0965	L-.1653	L-.9931	5.012	29.92
SDev	.9647	.021	.0846	.1717	.316	.0632
%RSD	31.03	21.71	51.2	17.29	6.304	.2113

Elems	Ni2316	Pb2203	Sb2068	Se1960
Units	ppb	ppb	ppb	ppb
Avge	L1.815	8.588	7.076	L-.6281
SDev	.4165	.8216	.8807	1.755
%RSD	22.95	9.567	12.45	279.3

Method: TRIANGL2 Sample Name: 173-60-12B Operator: DKH
Run Time: 07/28/97 04:55 Filename: 72797
Mode: CONC Type: S Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	As1890	Be3130	Cd2265	Co2286	Cr2677	Mn2576
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	L-1.114	L.0168	7.374	L.5574	58.85	437.6
SDev	1.431	.0118	.2877	.2973	.3246	1.289
%RSD	128.4	70.28	3.902	53.33	.5515	.2945

Elems	Ni2316	Pb2203	Sb2068	Se1960
Units	ppb	ppb	ppb	ppb
Avge	40.03	808.6	L.1127	126.5
SDev	.9589	11.26	.7468	.7997
%RSD	2.396	1.393	662.8	.6321

Method: TRIANGL2 Sample Name: 173-60-138 Operator: DKH
Run Time: 07/28/97 05:00 Filename: 72797
Mode: CONC Type: S Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	As1890	Be3130	Cd2265	Co2286	Cr2677	Mn2576
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	L-2.825	L.0549	L-.3269	L-1.497	12.70	52.15
SDev	3.876	.1471	.2472	1.391	2.472	.596
%RSD	137.2	268.1	75.63	92.9	19.47	1.143

Elems	Ni2316	Pb2203	Sb2068	Se1960
Units	ppb	ppb	ppb	ppb
Avge	8.878	10.71	L-2.560	161.4
SDev	1.328	1.283	6.306	.5137
%RSD	14.96	11.98	246.3	.3183

Method: TRIANGL2 Sample Name: 173-60-148 Operator: DKH
Run Time: 07/28/97 05:05 Filename: 72797
Mode: CONC Type: S Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	As1890	Be3130	Cd2265	Co2286	Cr2677	Mn2576
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	L-4.527	L.0736	L-.4105	L-1.021	15.39	97.23
SDev	3.684	.0566	.1664	.5497	.6958	.6805
%RSD	81.37	76.93	40.53	53.86	4.52	.6999

Elems	Ni2316	Pb2203	Sb2068	Se1960
Units	ppb	ppb	ppb	ppb
Avge	3.670	10.37	L-1.563	158.4
SDev	.4769	1.7	1.971	7.704
%RSD	13	16.39	126.1	4.864

Method: TRIANGL2 Sample Name: 42298 MB Operator: DKH
Run Time: 07/28/97 05:19 Filename: 72797
Mode: CONC Type: S Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	As1890	Be3130	Cd2265	Co2286	Cr2677	Mn2576
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	L-5.101	L.2887	L-.2475	L-.4754	L-.3990	L.2779
SDev	1.436	.0433	.1109	.4058	.6348	.1004
%RSD	28.15	15.01	44.8	85.35	159.1	36.12

Elems	Ni2316	Pb2203	Sb2068	Se1960
Units	ppb	ppb	ppb	ppb
Avge	L-1.280	L1.182	L.5354	L1.213
SDev	.494	1.295	1.311	.5312
%RSD	38.59	109.5	244.9	43.78

Method: TRIANGL2 Sample Name: ICV/CCV Operator: DKH
Run Time: 07/28/97 05:25 Filename: 72797
Mode: CONC Type: Q Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	Ag3280	Al3082	As1890	B_2496	Ba4934	Be3130
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	513.0	528.6	507.7	504.8	513.2	500.9
SDev	1.092	7.614	4.162	9.5	7.886	3.931
%RSD	.2129	1.44	.8197	1.882	1.537	.7847

Elems	Ca3179	Cd2265	Ce4186	Co2286	Cr2677	Cu3247
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	Q551.0	510.9	511.8	501.4	506.5	517.4
SDev	13.13	7.129	4.211	6.715	8.25	10.58
%RSD	2.384	1.396	.8227	1.339	1.629	2.045

Elems	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020
Units	ppb	ppm	ppb	ppb	ppb	ppb
Avge	493.6	5.191	518.8	512.4	504.1	512.0
SDev	32.3	.5372	75.58	22.31	5.34	2.362
%RSD	6.544	10.35	14.57	4.354	1.059	.4613

Elems	Na3302	Ni2316	P_2149	2203-1	2203-2	Sb2068
Units	ppm	ppb	ppb	ppb	ppb	ppb
Avge	5.002	512.9	518.7	483.3	516.6	506.6
SDev	.7986	5.997	16.05	9.182	11.4	4.082
%RSD	15.97	1.169	3.094	1.9	2.206	.8058

Elems	1960-1	1960-2	Pb2203	Se1960	Sn1899	Sr4215
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	497.1	504.6	505.5	502.1	495.5	503.5
SDev	3.648	13.04	9.766	9.908	5.998	4.21
%RSD	.7339	2.584	1.932	1.973	1.21	.8361

Elems	Ti3349	Tl1908	V_2924	Zn2062	Si2881
Units	ppb	ppb	ppb	ppb	ppb
Avge	506.2	506.3	509.7	510.1	Q15540.
SDev	1.112	6.378	2.611	15.28	2786
%RSD	.2197	1.26	.5123	2.995	17.92

Method: TRIANGL2 Sample Name: ICB/CCB Operator: DKH
Run Time: 07/28/97 05:30 Filename: 72797
Mode: CONC Type: Q Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	Ag3280	Al3082	As1890	B_2496	Ba4934	Be3130
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	Q-1.436	31.64	-1.505	-8.695	.4108	.5262
SDev	2.334	6.803	1.243	1.966	.5468	.4599
%RSD	162.6	21.5	82.59	22.61	133.1	87.41

Elems	Ca3179	Cd2265	Ce4186	Co2286	Cr2677	Cu3247
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	-1.252	.3500	1.598	.9275	1.180	.3997
SDev	1.066	.5685	8.921	.9962	.6354	1.215
%RSD	85.17	162.4	558.4	107.4	53.84	304.1

Elems	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020
Units	ppb	ppm	ppb	ppb	ppb	ppb
Avge	4.477	-.0993	.0741	10.26	.3787	1.054
SDev	18.26	.2481	.3774	4.721	.4832	.8494
%RSD	407.9	249.7	509.2	46.02	127.6	80.58

Elems	Na3302	Ni2316	P_2149	2203-1	2203-2	Sb2068
Units	ppm	ppb	ppb	ppb	ppb	ppb
Avge	-.5711	1.305	-2.770	-6.219	5.161	1.589
SDev	.6733	1.03	3.507	4.532	2.644	2.535
%RSD	117.9	78.9	126.6	72.88	51.24	159.5

Elems	1960-1	1960-2	Pb2203	Se1960	Sn1899	Sr4215
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	-6.157	4.973	1.371	1.267	.6203	.3199
SDev	4.87	1.842	.4604	2.102	.7407	.4821
%RSD	79.09	37.03	33.58	166	119.4	150.7

Elems	Ti3349	Tl1908	V_2924	Zn2062	Si2881
Units	ppb	ppb	ppb	ppb	ppb
Avge	.4658	Q5.598	1.265	.6891	Q7602.
SDev	.6758	3.092	.9011	.6922	2229
%RSD	145.1	55.24	71.23	100.4	29.32

174-97-11/1 L 8-4-97 cc

Method: TRIANGL2 Sample Name: 173-60-1A,10 X5 L Operator: DKH
Run Time: 07/28/97 05:40 Filename: 72797
Mode: CONC Type: S Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	As1890	Be3130	Cd2265	Co2286	Cr2677	Mn2576
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	L.2084	L.3095	31.34	L.5172	10.43	21.71
SDev	1.945	.1015	.3945	1.233	1.187	.3006
%RSD	933.5	32.78	1.259	238.4	11.39	1.385

Elems	Ni2316	Pb2203	Sb2068	Se1960
Units	ppb	ppb	ppb	ppb
Avge	36.11	6354.	L2.452	10.04
SDev	2.128	30.81	2.178	.2737
%RSD	5.894	.4849	88.83	2.725

194-97-13,4 → 3-4-97 EE

Method: TRIANGL2 Sample Name: 173-60-2A X10 Operator: DKH
Run Time: 07/28/97 05:45 Filename: 72797
Mode: CONC Type: S Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	As1890	Be3130	Cd2265	Co2286	Cr2677	Mn2576
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	L3.268	L.2660	74.32	L.9368	20.62	58.13
SDev	2.861	.0619	.4083	.2731	.5663	.6696
%RSD	87.54	23.28	.5494	29.15	2.746	1.152

Elems	Ni2316	Pb2203	Sb2068	Se1960
Units	ppb	ppb	ppb	ppb
Avge	128.5	15050.	8.192	23.53
SDev	.5027	633.1	2.037	2.691
%RSD	.3912	4.207	24.87	11.44

174-97-13,4 [illegible] [illegible] 8-4-97 cc

Method: TRIANGL2 Sample Name: 173-60-2A X10 DA Operator: DKH
Run Time: 07/28/97 05:52 Filename: 72797
Mode: CONC Type: S Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	As1890	Be3130	Cd2265	Co2286	Cr2677	Mn2576
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	L2.757	L.2849	74.74	L.6759	20.46	58.50
SDev	3.34	.0726	.418	.3714	.442	.5836
%RSD	121.1	25.49	.5592	54.94	2.16	.9975

Elems	Ni2316	Pb2203	Sb2068	Se1960
Units	ppb	ppb	ppb	ppb
Avge	128.5	14960.	6.059	20.61
SDev	1.471	353.6	.2953	1.277
%RSD	1.145	2.364	4.874	6.196

174-97-15,6 8-4-97 EE

Method: TRIANGL2 Sample Name: 173-60-3A X10 Operator: DKH
Run Time: 07/28/97 05:57 Filename: 72797
Mode: CONC Type: S Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	As1890	Be3130	Cd2265	Co2286	Cr2677	Mn2576
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	L3.857	L.2393	81.39	L-.1085	20.95	121.2
SDev	2.018	.0304	1.174	.3899	.3946	1.731
%RSD	52.33	12.71	1.443	359.2	1.883	1.428

Elems	Ni2316	Pb2203	Sb2068	Se1960
Units	ppb	ppb	ppb	ppb
Avge	74.28	16320.	10.79	21.35
SDev	.5238	221.4	1.145	.8843
%RSD	.7051	1.357	10.62	4.142

174-97-12,M,2,3 L 8-1-97 CC

Method: TRIANGL2 Sample Name: 173-60-12A X10 Operator: DKH
Run Time: 07/28/97 06:02 Filename: 72797
Mode: CONC Type: S Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	As1890	Be3130	Cd2265	Co2286	Cr2677	Mn2576
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	17.08	L.1591	100.7	1.228	101.0	1531.
SDev	1.336	.017	.6757	1.14	.6979	13.42
%RSD	7.82	10.71	.6709	92.84	.6908	.8767

Elems	Ni2316	Pb2203	Sb2068	Se1960
Units	ppb	ppb	ppb	ppb
Avge	143.8	19320.	14.13	44.08
SDev	1.297	384.5	.7837	.1058
%RSD	.9014	1.99	5.546	.24

174-99714,5 ▲ 3-4-97cc

Method: TRIANGL2 Sample Name: 173-60-13A X10 Operator: DKH
Run Time: 07/28/97 06:08 Filename: 72797
Mode: CONC Type: S Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	As1890	Be3130	Cd2265	Co2286	Cr2677	Mn2576
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	21.54	L.0000	92.90	2.527	115.3	2091.
SDev	1.916	.0296	2.617	1.193	4.671	60.61
%RSD	8.892	322400	2.817	47.2	4.051	2.898

Elems	Ni2316	Pb2203	Sb2068	Se1960
Units	ppb	ppb	ppb	ppb
Avge	96.96	18500.	11.04	53.77
SDev	3.42	570.9	4.146	2.483
%RSD	3.527	3.086	37.54	4.617

174-97-16,7 ← 8-4-97 cc

Method: TRIANGL2 Sample Name: 173-60-14A X10 Operator: DKH
Run Time: 07/28/97 06:13 Filename: 72797
Mode: CONC Type: S Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	As1890	Be3130	Cd2265	Co2286	Cr2677	Mn2576
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	23.32	L.0352	95.94	2.715	111.9	2187.
SDev	1.518	.0168	.3955	.2986	.8365	10.29
%RSD	6.51	47.79	.4122	11	.7474	.4707

Elems	Ni2316	Pb2203	Sb2068	Se1960
Units	ppb	ppb	ppb	ppb
Avge	101.4	19070.	11.21	41.52
SDev	.5262	141.8	2.172	2.516
%RSD	.5191	.7434	19.37	6.059

Method: TRIANGL2 Sample Name: 173-60-1B Operator: DKH
Run Time: 07/28/97 06:19 Filename: 72797
Mode: CONC Type: S Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	As1890	Be3130	Cd2265	Co2286	Cr2677	Mn2576
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	L.2164	L.2049	5.910	L-.5654	25.39	101.4
SDev	4.408	.1438	.3796	1.437	2.004	1.664
%RSD	2037	70.19	6.423	254.2	7.892	1.641

Elems	Ni2316	Pb2203	Sb2068	Se1960
Units	ppb	ppb	ppb	ppb
Avge	38.40	71.84	L2.266	168.6
SDev	1.566	2.552	4.159	.3696
%RSD	4.078	3.552	183.6	.2192

Method: TRIANGL2 Sample Name: ICV/CCV Operator: DKH
Run Time: 07/28/97 06:24 Filename: 72797
Mode: CONC Type: G Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	Ag3280	Al3082	As1890	B_2496	Ba4934	Be3130
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	512.3	520.4	510.6	504.0	511.2	502.6
SDev	.5843	2.908	5.642	8.26	4.137	.4987
%RSD	.1141	.5587	1.105	1.639	.8092	.0992

Elems	Ca3179	Cd2265	Ce4186	Co2286	Cr2677	Cu3247
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	Q565.8	513.3	515.3	504.5	509.3	516.1
SDev	24.58	3.213	5.61	1.814	4.187	6.64
%RSD	4.344	.626	1.089	.3596	.8221	1.286

Elems	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020
Units	ppb	ppm	ppb	ppb	ppb	ppb
Avge	511.8	5.250	524.0	516.9	505.4	512.2
SDev	15.6	.2023	34.18	6.608	2.206	2.568
%RSD	3.048	3.854	6.524	1.278	.4366	.5013

Elems	Na3302	Ni2316	P_2149	2203-1	2203-2	Sb2068
Units	ppm	ppb	ppb	ppb	ppb	ppb
Avge	5.192	517.2	511.1	489.6	521.9	508.4
SDev	.0699	1.306	10.9	6.076	11.9	.871
%RSD	1.346	.2526	2.133	1.241	2.28	.1713

Elems	1960-1	1960-2	Pb2203	Se1960	Sn1899	Sr4215
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	503.6	505.6	511.1	504.9	499.1	501.7
SDev	2.25	5.419	9.509	2.885	1.637	2.385
%RSD	.4469	1.072	1.86	.5713	.3279	.4753

Elems	Ti3349	Tl1908	V_2924	Zn2062	Si2881
Units	ppb	ppb	ppb	ppb	ppb
Avge	505.6	511.2	510.8	513.5	Q40160.
SDev	.8019	7.502	.7917	7.512	17870
%RSD	.1586	1.468	.155	1.463	44.5

Method: TRIANGL2 Sample Name: ICB/CCB Operator: DKH
Run Time: 07/28/97 06:28 Filename: 72797
Mode: CONC Type: Q Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	Ag3280	Al3082	As1890	B_2496	Ba4934	Be3130
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	.0670	28.80	-.3197	-10.93	.3013	.3420
SDev	.7264	8.478	1.781	2.641	.303	.1308
%RSD	1084	29.43	557.2	24.17	100.6	38.24

Elems	Ca3179	Cd2265	Ce4186	Co2286	Cr2677	Cu3247
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	.0537	.1803	Q4.150	Q1.206	1.313	.1535
SDev	1.33	.2614	9.035	.9553	1.282	1.113
%RSD	2477	144.9	217.7	79.24	97.69	725.2

Elems	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020
Units	ppb	ppm	ppb	ppb	ppb	ppb
Avge	11.12	-.0861	-.0900	12.26	.2439	.4077
SDev	19.58	.2262	.5376	8.817	.2596	.9454
%RSD	176.1	262.8	597.2	71.93	106.4	231.9

Elems	Na3302	Ni2316	P_2149	2203-1	2203-2	Sb2068
Units	ppm	ppb	ppb	ppb	ppb	ppb
Avge	-.0846	.7426	5.818	-.3311	.9850	2.403
SDev	.2327	.9032	7.387	5.167	3.927	4.677
%RSD	275.1	121.6	127	1561	398.7	194.6

Elems	1960-1	1960-2	Pb2203	Se1960	Sn1899	Sr4215
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	-2.347	.1206	.5467	-.7013	.3627	.1583
SDev	2.949	1.891	1.071	.8882	2.518	.2111
%RSD	125.6	1568	195.9	126.7	694.2	133.3

Elems	Ti3349	Tl1908	V_2924	Zn2062	Si2881
Units	ppb	ppb	ppb	ppb	ppb
Avge	.5029	Q7.151	1.621	.7731	Q3765.
SDev	.5606	2.506	1.07	.2672	2483
%RSD	111.5	35.04	66.01	34.57	65.95

DKH 7/28/97

Method: TRIANGL2 Sample Name: ICB/CCB Operator: DKH
Run Time: 07/28/97 06:34 Filename: 72797
Mode: CONC Type: Q Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	Ag3280	Al3082	As1890	B_2496	Ba4934	Be3130
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	-.9693	31.27	-.9664	-14.84	.1760	.2541
SDev	1.318	19.74	1.51	2.471	.3342	.1034
%RSD	136	63.12	156.2	16.65	189.8	40.67

Elems	Ca3179	Cd2265	Ce4186	Co2286	Cr2677	Cu3247
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	-.2651	.2421	-1.798	Q1.134	1.449	.0374
SDev	2.73	.7051	6.204	1.674	1.542	2.084
%RSD	1030	291.2	345.1	147.6	106.4	5575

Elems	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020
Units	ppb	ppm	ppb	ppb	ppb	ppb
Avge	12.83	-.0149	-.0238	11.93	.2128	1.342
SDev	42.67	.2163	.515	18.72	.2175	.8028
%RSD	332.6	1451	2161	157	102.2	52.05

Elems	Na3302	Ni2316	P_2149	2203-1	2203-2	Sb2068
Units	ppm	ppb	ppb	ppb	ppb	ppb
Avge	-.1946	.9009	6.364	.4481	1.094	3.488
SDev	.4716	1.056	21.95	6.881	5.683	5.24
%RSD	242.4	117.2	345	1536	519.6	150.2

Elems	1960-1	1960-2	Pb2203	Se1960	Sn1899	Sr4215
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	-2.780	1.640	.8788	.1679	.2128	.0814
SDev	7.154	5.328	1.746	1.572	.1792	.1577
%RSD	257.3	325	198.7	936.6	84.18	193.8

Elems	Ti3349	Tl1908	V_2924	Zn2062	Si2881
Units	ppb	ppb	ppb	ppb	ppb
Avge	.4264	Q8.306	1.280	.4368	Q1239.
SDev	.7331	1.982	1.487	.8521	1591
%RSD	171.9	23.87	116.2	195.1	128.4

MCA 7/28/97

Method: TRIANGL2 Sample Name: ICB/CCB Operator: DKH
Run Time: 07/28/97 06:40 Filename: 72797
Mode: CONC Type: Q Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	Ag3280	Al3082	As1890	B_2496	Ba4934	Be3130
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	Q-1.887	23.19	1.014	-17.30	-.1277	.1862
SDev	1.79	31.79	1.258	3.047	.3701	.1414
%RSD	94.89	137.1	124.1	17.62	289.7	75.95

Elems	Ca3179	Cd2265	Ce4186	Co2286	Cr2677	Cu3247
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	-2.680	-.0615	.7859	-.2361	-.1315	-1.308
SDev	2.842	.3282	6.681	1.586	2.053	2.631
%RSD	106	534	850.2	671.8	1561	201.1

Elems	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020
Units	ppb	ppm	ppb	ppb	ppb	ppb
Avge	-12.68	.0543	.1588	-.2122	-.0438	.2634
SDev	36.64	.2409	.5936	21.98	.3008	1.151
%RSD	289	443.3	373.7	10360	686.2	437

Elems	Na3302	Ni2316	P_2149	2203-1	2203-2	Sb2068
Units	ppm	ppb	ppb	ppb	ppb	ppb
Avge	-.6113	.0453	-13.16	-5.772	4.514	-1.197
SDev	.6117	1.277	13.1	7.047	6.51	5.394
%RSD	100.1	2822	99.54	122.1	144.2	450.6

Elems	1960-1	1960-2	Pb2203	Se1960	Sn1899	Sr4215
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	-4.135	.6885	1.088	-.9177	-1.388	-.0365
SDev	9.514	4.67	2.06	.592	1.436	.1619
%RSD	230.1	678.3	189.3	64.51	103.4	443.3

Elems	Ti3349	Tl1908	V_2924	Zn2062	Si2881
Units	ppb	ppb	ppb	ppb	ppb
Avge	-.2068	Q5.212	-.0728	-.1360	Q311.5
SDev	.7967	2.933	1.418	.9578	1769
%RSD	385.3	56.27	1947	704.3	567.9

Method: TRIANGL2 Sample Name: ICSA8 Operator: DKH
Run Time: 07/28/97 06:45 Filename: 72797
Mode: CONC Type: Q Corr. Factor: 1.00000
Lab ID.: Cust. Smpl. ID.: Cust. ID.: 42298

Elems	Ag3280	Al3082	As1890	B_2496	Ba4934	Be3130
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	530.8	531800.	504.4	505.1	509.9	484.8
SDev	4.214	1344	5.435	10.25	4.925	1.772
%RSD	.7939	.2528	1.078	2.029	.9657	.3655

Elems	Ca3179	Cd2265	Ce4186	Co2286	Cr2677	Cu3247
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	459300.	468.2	493.6	465.5	483.3	521.6
SDev	3283	.3802	5.232	.9373	.6849	9.851
%RSD	.7147	.0812	1.06	.2014	.1417	1.889

Elems	Fe2714	K_7664	Li6707	Mg2790	Mn2576	Mo2020
Units	ppb	ppm	ppb	ppb	ppb	ppb
Avge	173000.	Q25.59	575.1	536600.	454.7	493.8
SDev	256	1.605	43.38	2421	.8408	3.326
%RSD	.148	6.271	7.543	.4512	.1849	.6734

Elems	Na3302	Ni2316	P_2149	2203-1	2203-2	Sb2068
Units	ppm	ppb	ppb	ppb	ppb	ppb
Avge	5.482	454.0	459.5	504.8	472.3	495.2
SDev	.3159	.2676	19.61	13.17	17.3	10.54
%RSD	5.763	.0589	4.267	2.609	3.663	2.129

Elems	1960-1	1960-2	Pb2203	Se1960	Sn1899	Sr4215
Units	ppb	ppb	ppb	ppb	ppb	ppb
Avge	515.9	510.0	483.1	512.0	479.7	Q490.7
SDev	38.44	26.58	9.009	5.816	3.872	3.514
%RSD	7.452	5.211	1.865	1.136	.8072	.716

Elems	Ti3349	Tl1908	V_2924	Zn2062	Si2881
Units	ppb	ppb	ppb	ppb	ppb
Avge	496.1	508.3	495.6	433.7	Q10840.
SDev	2.224	10.13	2.506	1.309	943.6
%RSD	.4483	1.993	.5056	.3018	8.709

/Weight File: AB780.IDW Analyst: RICHARDS
mple Volume: 100 mL Nominal Weight: 1.0 g

Hg

Loc.	Sample ID	Weight	Dilution
0	STD BLK		
1	STD1=0.2ug/L		
2	STD2=0.5ug/L		
3	STD3=1.0ug/L		
4	STD4=2.0ug/L		
5	STD5=5.0ug/L		
6	STD6=10.0ug/L		
7	ICV=4.0ug/L		
8	ICB		
9	CHECK LO		
10	42298 MB1		
11	42298 MB1 D		
12	42298 LCS1		
13	42298 LCS1 D		
14	173-60-12B		
15	173-60-12B D		
16	173-60-12B MS		
17	173-60-12B MSD		
18	173-60-12C		
19	173-60-12C D		
20	CCV1=6.0ug/L		
21	CCB1		
22	173-60-12D		
23	173-60-12D D		
24	173-60-12E		
25	173-60-12E D		
26	173-60-13C		
27	173-60-13C D		
28	173-60-13D		
29	173-60-13D D		
30	173-60-13E		
31	173-60-13E D		
32	CCV2=6.0ug/L		
33	CCB2		
34	173-60-13B		
35	173-60-13B D		
36	173-60-13B MS		
37	173-60-13B MSD		
38	173-60-14C		
39	173-60-14C D		
40	173-60-14D		
41	173-60-14D D		
42	173-60-14E		
43	173-60-14E D		
44	CCV3=6.0ug/L		
45	CCB3		
46	173-60-1C		
47	173-60-1C D		
48	173-60-1D		
49	173-60-1D D		
50	173-60-1E		
51	173-60-1E D		
52	173-60-2C		
53	173-60-2C D		

3-006-3 MR 7/21/97

3-006-4 MR 7/21/97

3-006-4 MR 7/21/97

3-006-4 MR 7/21/97

3-006-4 MR 7/23/97

Loc.	Sample ID	Weight	Dilution
54	173-60-2D		
55	173-60-2D D		
56	CCV4=6.0ug/L	3-006-4 mr	7/21/97
57	CCB4		
58	173-60-14B		
59	173-60-14B D		
60	173-60-14B MS		
61	173-60-14B MSD		
62	173-60-2E		
63	173-60-2E D		
64	173-60-3C		
65	173-60-3C D		
66	173-60-3D		
67	173-60-3D D		
68	CCV5=6.0ug/L	3-006-4 mr	7/21/97
69	CCB5		
70	173-60-3E		
71	173-60-3E D		
72	CCV6=6.0ug/L	3-006-4 mr	7/21/97
73	CCB6		

Hg

ement File: HG_.MEL
ement: Hg2 Analyst: RICHARDS
int Data: Main+Suppl. Peak Storage: None
int: Calib. Curve
marks:
TANDARDS= 3-006-3
C= 3-006-4

STRUMENT: 5100 Technique: MHS Version: 7.01
velength: 253.7 Peak Slit: 0.7 Low
gnal Type: AA Signal Measurement: Peak Height (5)
ad Time: 30.0 Read Delay: 1.0 BOC Time: 2
mple Replicates: 1
andard Replicates: 1

AME:
ame Type: Air Flame Sensor: On
idant Flow: 10.0 L/min Fuel Flow: 2.0 L/min

_IBRATION:

olutions	ID	Conc
lib. Blank	STD BLK	
andard 1	STD 1	0.200
andard 2	STD 2	0.500
andard 3	STD 3	1.000
andard 4	STD 4	2.000
andard 5	STD 5	5.000
andard 6	STD 6	10.000

alibration Units: ug/L Sample Units: ug/L
alibration Type: Linear

:
trix Check Calculations:
Difference for Dupls: No Locations:
Recovery for Spike: No Locations: Conc:

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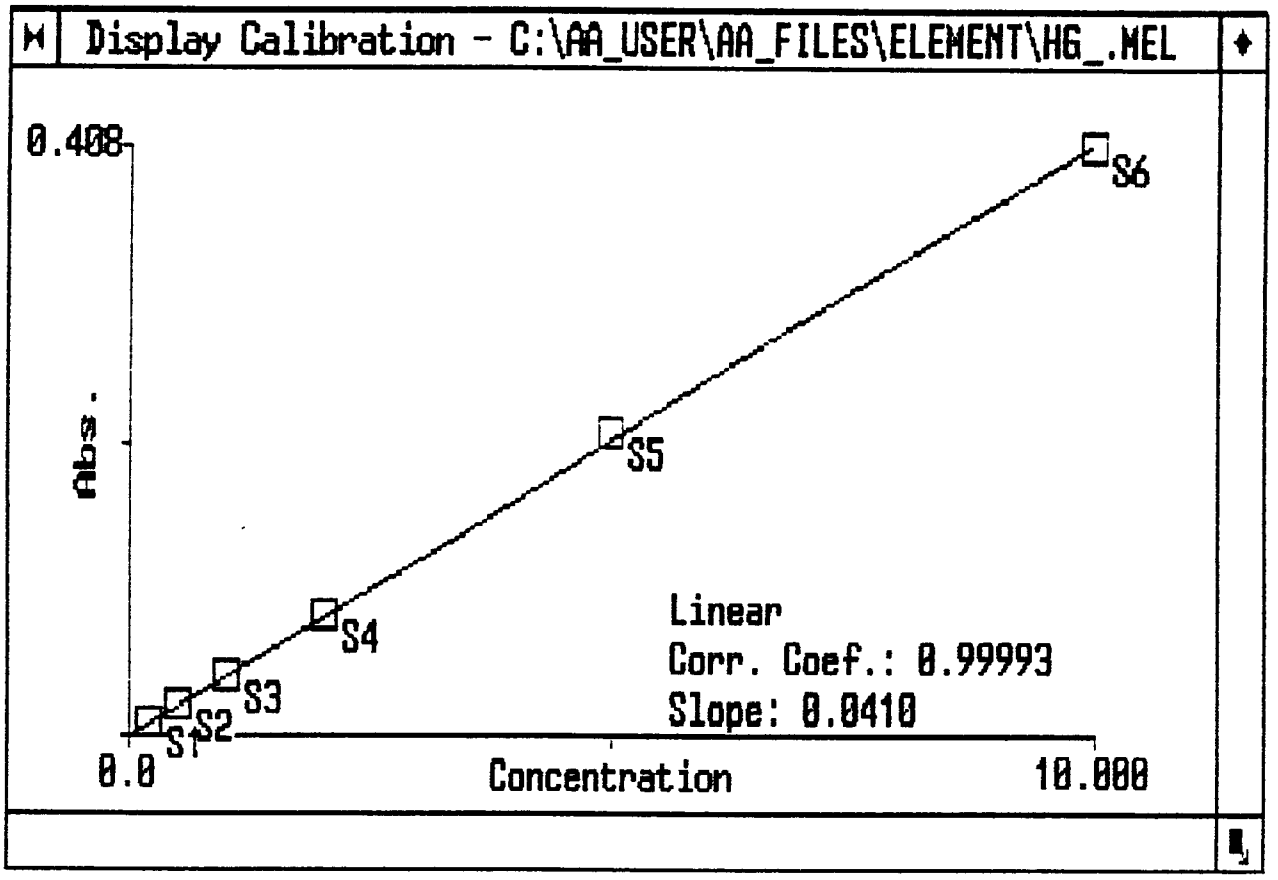
Element File: HG_.MEL	Element: Hg2	Wavelength: 253.7
Date: 07/21/97	Time: 13:00	Slit: 0.7 L
Data File: AB780.DAT	ID/Wt File: AB780.IDW	Lamp Current: 0
Technique: MHS	Calib. Type: Linear	Energy: 73

Remark 1: STANDARDS= 3-006-3
Remark 2: QC= 3-006-4



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ement File: HG_.MEL Element: Hg2 Wavelength: 253.7
te: 07/21/97 Time: 13:02 Slit: 0.7 L
ta File: AB780.DAT ID/Wt File: AB780.IDW Lamp Current: 0
chnique: MHS Calib. Type: Linear Energy: 73
mark 1: STANDARDS= 3-006-3
mark 2: QC= 3-006-4

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Replicate 1 Time: 13:10
Peak Area (A-s): 5.097 Peak Height (A): 0.241
Blank Corrected Pk Height (A): 0.241
Concentration (ug/L): 5.882

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ncentration (ug/L): 5.356

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Hg2 ID: 173-60-13D Seq. No.: 00050 A/S Pos.: -- Date: 07/21/97

Replicate 1 Time: 13:35
Peak Area (A-s): 0.008 Peak Height (A): 0.000
Blank Corrected Pk Height (A): 0.000
Concentration (ug/L): 0.007

Hg2 ID: 173-60-13D D Seq. No.: 00051 A/S Pos.: -- Date: 07/21/97

Replicate 1 Time: 13:36
Peak Area (A-s): 0.008 Peak Height (A): 0.000
Blank Corrected Pk Height (A): 0.000
Concentration (ug/L): 0.007

Hg2 ID: 173-60-13E Seq. No.: 00052 A/S Pos.: -- Date: 07/21/97

Replicate 1 Time: 13:37
Peak Area (A-s): -0.007 Peak Height (A): 0.000
Blank Corrected Pk Height (A): 0.000
Concentration (ug/L): 0.002

Hg2 ID: 173-60-13E D Seq. No.: 00053 A/S Pos.: -- Date: 07/21/97

Replicate 1 Time: 13:38
Peak Area (A-s): -0.008 Peak Height (A): -0.000
Blank Corrected Pk Height (A): -0.000
Concentration (ug/L): -0.002

Hg2 ID: CCV2=6.0ug/L Seq. No.: 00054 A/S Pos.: -- Date: 07/21/97

Replicate 1 Time: 13:40
Peak Area (A-s): 4.845 Peak Height (A): 0.214
Blank Corrected Pk Height (A): 0.214
Concentration (ug/L): 5.219

Hg2 ID: CCB2 Seq. No.: 00055 A/S Pos.: -- Date: 07/21/97

Replicate 1 Time: 13:41
Peak Area (A-s): 0.003 Peak Height (A): 0.000
Blank Corrected Pk Height (A): 0.000
Concentration (ug/L): 0.000

Hg2 ID: 173-60-13B Seq. No.: 00056 A/S Pos.: -- Date: 07/21/97

Replicate 1 Time: 13:43
Peak Area (A-s): 0.127 Peak Height (A): 0.005
Blank Corrected Pk Height (A): 0.005
Concentration (ug/L): 0.127

Hg2 ID: 173-60-13B D Seq. No.: 00057 A/S Pos.: -- Date: 07/21/97

plicate 1 Time: 13:44
ak Area (A-s): 0.126 Peak Height (A): 0.006
ank Corrected Pk Height (A): 0.006
ncentration (ug/L): 0.137

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Concentration (ug/L): 0.002

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Replicate 1 Time: 14:10
Peak Area (A-s): -0.015 Peak Height (A): -0.001
Blank Corrected Pk Height (A): -0.001
Concentration (ug/L): -0.017

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ncentration (ug/L): -0.015

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/Weight File: AB785.IDW Analyst: RICHARDS
mple Volume: 100 mL Nominal Weight: 1.0 g

Hg
7/29/97 MR

Loc.	Sample ID	Weight	Dilution
0	STD BLK		
1	STD1=0.2ug/L		
2	STD2=0.5ug/L		
3	STD3=1.0ug/L	3-008-1 MR 7/29/97	
4	STD4=2.0ug/L		
5	STD5=5.0ug/L		
6	STD6=10.0ug/L		
7	ICV=4.0ug/L	3-008-2 MR 7/29/97	
8	ICB		
9	CHECK LO		
10	42298 MB2		
11	42298 MB2 D		
12	42298 LCS2		
13	42298 LCS2 D		
14	173-60-1B		
15	173-60-1B D		
16	173-60-1B MS		
17	173-60-1B MSD		
18	174-97-8/18		
19	174-97-8/18 D		
20	CCV1=6.0ug/L	3-008-2 MR 7/29/97	
21	CCB1		
22	173-60-4AB		
23	173-60-4AB D		
24	173-60-4C		
25	173-60-4C D		
26	173-60-4D		
27	173-60-4D D		
28	174-97-9/19		
29	174-97-9/19 D		
30	173-60-2B		
31	173-60-2B D		
32	CCV2=6.0ug/L	3-008-2 MR 7/29/97	
33	CCB2		
34	173-60-2B MS		
35	173-60-2B MS D		
36	173-60-5B AB		
37	173-60-5B AB D 7-30-97 EC		
38	173-60-5C		
39	173-60-5C D		
40	173-60-5D		
41	173-60-5D D		
42	174-97-10/20		
43	174-97-10/20 D		
44	CCV3=6.0ug/L	3-008-2 MR 7/29/97	
45	CCB3		
46	173-60-11AB		
47	173-60-11AB D		
48	173-60-11A 7-30-97 EC		
49	173-60-11A D		
50	173-60-11D		
51	173-60-11D D		
52	173-60-3B		
53	173-60-3B D		

See individual Run For Complete ID 8-4-97

See individual runs for complete [illegible] 8-4-97 [illegible]

Loc.	Sample ID	Weight	Dilution
54	173-60-3B MS		
55	173-60-3B MS D		
56	CCV4=6.0ug/L	3-008-2 MR 7/29/97	
57	CCB4		
58	173-60-6A Hg sample [illegible] 7-30-97		
59	173-60-6A D Hg		
60	173-60-6AC		
61	173-60-6AC D		
62	173-60-6D		
63	173-60-6D D		
64	173-60-7		
65	173-60-7 D		
66	174-97-4/13		
67	174-97-4/13 D	3-008-2 MR 7/29/97	
68	CCV5=6.0ug/L		
69	CCB5		
70	42298 MB3		
71	42298 MB3 D		
72	42298 LCS3		
73	42298 LCS3 D		
74	174-97-6/15		
75	174-97-6/15 D		
76	~~174-97-6/15 MS~~ [illegible] 8-4-97 [illegible]		
77	174-97-6/15 MS		
78	174-97-6/15 MSD		
79	174-97-1/11		
80	174-97-1/11 D		
81	CCV1=6.0ug/L	3-008-2 MR 7/29/97	
82	CCB1		
83	174-97-2/3		
84	174-97-2/3 D		
85	174-97-5/14		
86	174-97-5/14 D		
87	174-97-7/16		
88	174-97-7/16 D		
89	173-60-4DE		
90	173-60-4DE D		
91	173-60-5DE		
92	173-60-5DE D		
93	CCV2=6.0ug/L	3-008-2 MR 7/29/97	
94	CCB2		
95	173-60-6DE		
96	173-60-6DE D		
97	173-60-6DE MS		
98	173-60-6DE MSD		
99	173-60-11DE		
100	173-60-11DE D		
101	173-60-6B		
102	173-60-6B D		
103	CCV3-6.0ug/L	3-008-2 MR 7/29/97	
104	CCB3		

ment File: HG_.MEL
ment: Hg2 Analyst: RICHARDS
nt Data: Main+Suppl. Peak Storage: None
.nt: Calib. Curve
arks:
ANDARDS= 3-008-1
:= 3-008-2

Hg
7/24/97
mc.

STRUMENT: 5100 Technique: MHS Version: 7.01
velength: 253.7 Peak Slit: 0.7 Low
inal Type: AA Signal Measurement: Peak Height (5)
ad Time: 30.0 Read Delay: 1.0 BOC Time: 2
ple Replicates: 1
andard Replicates: 1

AME:
ame Type: Air Flame Sensor: On
.dant Flow: 10.0 L/min Fuel Flow: 2.0 L/min

.IBRATION:

olutions	ID	Conc
.ib. Blank	STD BLK	----------
andard 1	STD 1	0.200
andard 2	STD 2	0.500
andard 3	STD 3	1.000
andard 4	STD 4	2.000
andard 5	STD 5	5.000
andard 6	STD 6	10.000

alibration Units: ug/L Sample Units: ug/L
alibration Type: Linear

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trix Check Calculations:
Difference for Dupls: No Locations:
Recovery for Spike: No Locations: Conc:

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-----------------------------------------------------------------------------
Element File: HG_.MEL          Element: Hg2                  Wavelength: 253.7
Date: 07/29/97                 Time: 12:22                   Slit: 0.7 L
Data File: AB785.DAT           ID/Wt File: AB785.IDW         Lamp Current: 0
Technique: MHS                 Calib. Type: Linear           Energy: 73
Remark 1: STANDARDS= 3-008-1
Remark 2: QC= 3-008-2
-----------------------------------------------------------------------------
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Hg2   ID: STD BLK              Seq. No.: 00003    A/S Pos.: --    Date: 07/29/97

Replicate  1                               Time: 12:24
Peak Area (A-s): -0.003                    Peak Height (A): 0.000
Blank Corrected Pk Height (A): 0.000
Concentration (ug/L   ): 0.003

Auto-zero performed.
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Hg2   ID: STD1=0.2ug/L         Seq. No.: 00004    A/S Pos.: --    Date: 07/29/97

Replicate  1                               Time: 12:25
Peak Area (A-s): 0.182                     Peak Height (A): 0.008
Blank Corrected Pk Height (A): 0.008
Concentration (ug/L   ): 0.219

Standard number 1 applied.  [0.200]
Correlation coefficient: 1.00000           Slope: 0.0401
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Hg2   ID: STD2=0.5ug/L         Seq. No.: 00005    A/S Pos.: --    Date: 07/29/97

Sample abs. is greater than that of the largest standard.
Replicate  1                               Time: 12:26
Peak Area (A-s): 0.447                     Peak Height (A): 0.018
Blank Corrected Pk Height (A): 0.018
Concentration (ug/L   ): 0.460

Standard number 2 applied.  [0.500]
Correlation coefficient: 0.99717           Slope: 0.0374
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Hg2   ID: STD3=1.0ug/L         Seq. No.: 00006    A/S Pos.: --    Date: 07/29/97

Sample abs. is greater than that of the largest standard.
Replicate  1                               Time: 12:27
Peak Area (A-s): 0.885                     Peak Height (A): 0.037
Blank Corrected Pk Height (A): 0.037
Concentration (ug/L   ): 0.979

Standard number 3 applied.  [1.000]
Correlation coefficient: 0.99946           Slope: 0.0368
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Hg2   ID: STD4=2.0ug/L         Seq. No.: 00007    A/S Pos.: --    Date: 07/29/97

Sample abs. is greater than that of the largest standard.
Replicate  1                               Time: 12:29
Peak Area (A-s): 1.848                     Peak Height (A): 0.079
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nk Corrected Pk Height (A): 0.079
centration (ug/L): 2.157

ndard number 4 applied. [2.000]
relation coefficient: 0.99848 Slope: 0.0390

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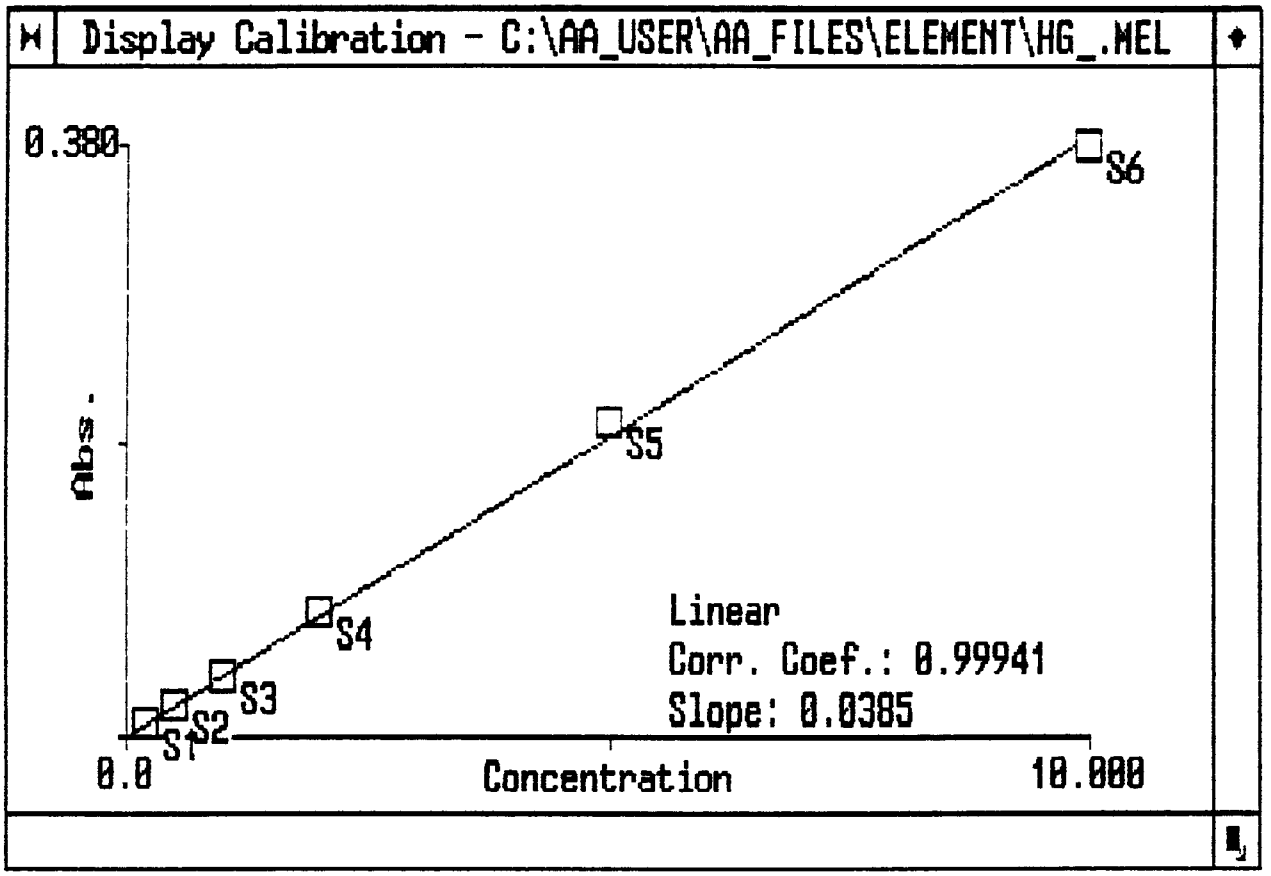
Element File: HG_.MEL	Element: Hg2	Wavelength: 253.7
Date: 07/29/97	Time: 12:32	Slit: 0.7 L
Data File: A8785.DAT	ID/Wt File: A8785.IDW	Lamp Current: 0
Technique: MHS	Calib. Type: Linear	Energy: 73

Remark 1: STANDARDS= 3-008-1
Remark 2: QC= 3-008-2



ement File: HG_.MEL Element: Hg2 Wavelength: 253.7
te: 07/29/97 Time: 12:33 Slit: 0.7 L
ta File: AB785.DAT ID/Wt File: AB785.IDW Lamp Current: 0
chnique: MHS Calib. Type: Linear Energy: 73
mark 1: STANDARDS= 3-008-1
mark 2: QC= 3-008-2

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2 ID: ICV=4.0ug/L Seq. No.: 00010 A/S Pos.: -- Date: 07/29/97

plicate 1 Time: 12:35
ak Area (A-s): 3.632 Peak Height (A): 0.161
ank Corrected Pk Height (A): 0.161
ncentration (ug/L): 4.172

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2 ID: ICB Seq. No.: 00011 A/S Pos.: -- Date: 07/29/97

plicate 1 Time: 12:36
ak Area (A-s): 0.018 Peak Height (A): 0.000
ank Corrected Pk Height (A): 0.000
ncentration (ug/L): 0.005

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2 ID: CHECK LO Seq. No.: 00012 A/S Pos.: -- Date: 07/29/97

plicate 1 Time: 12:38
ak Area (A-s): 0.191 Peak Height (A): 0.008
ank Corrected Pk Height (A): 0.008
ncentration (ug/L): 0.211

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2 ID: 42298 MB2 Seq. No.: 00013 A/S Pos.: -- Date: 07/29/97

plicate 1 Time: 12:40
ak Area (A-s): 0.030 Peak Height (A): 0.001
ank Corrected Pk Height (A): 0.001
ncentration (ug/L): 0.029

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2 ID: 42298 MB2 D Seq. No.: 00014 A/S Pos.: -- Date: 07/29/97

plicate 1 Time: 12:41
ak Area (A-s): 0.019 Peak Height (A): 0.001
ank Corrected Pk Height (A): 0.001
ncentration (ug/L): 0.018

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2 ID: 42298 LCS2 Seq. No.: 00015 A/S Pos.: -- Date: 07/29/97

plicate 1 Time: 12:42
ak Area (A-s): 4.423 Peak Height (A): 0.190
ank Corrected Pk Height (A): 0.190
ncentration (ug/L): 4.928

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2 ID: 42298 LCS2 D Seq. No.: 00016 A/S Pos.: -- Date: 07/29/97

Replicate 1 Time: 12:44
Peak Area (A-s): 4.347 Peak Height (A): 0.184
Blank Corrected Pk Height (A): 0.184
Concentration (ug/L): 4.784

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oncentration (ug/L): 0.041

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19,9 + 173-60-5A 8-4-97cc

Hg2 ID: 174 97-~~9/10~~ Seq. No.: 00031 A/S Pos.: -- Date: 07/29/97

Replicate 1 Time: 13:27
Peak Area (A-s): 0.020 Peak Height (A): 0.001
Blank Corrected Pk Height (A): 0.001
Concentration (ug/L): 0.023

19,9 + 173-60-5A D 8-4-97cc

Hg2 ID: 174-97-~~9/19 D~~ Seq. No.: 00032 A/S Pos.: -- Date: 07/29/97

Replicate 1 Time: 13:28
Peak Area (A-s): 0.015 Peak Height (A): 0.001
Blank Corrected Pk Height (A): 0.001
Concentration (ug/L): 0.013

Hg2 ID: 173-60-2B Seq. No.: 00033 A/S Pos.: -- Date: 07/29/97

Replicate 1 Time: 13:29
Peak Area (A-s): 0.070 Peak Height (A): 0.003
Blank Corrected Pk Height (A): 0.003
Concentration (ug/L): 0.070

Hg2 ID: 173-60-2B D Seq. No.: 00034 A/S Pos.: -- Date: 07/29/97

Replicate 1 Time: 13:30
Peak Area (A-s): 0.078 Peak Height (A): 0.003
Blank Corrected Pk Height (A): 0.003
Concentration (ug/L): 0.081

Hg2 ID: CCV2=6.0ug/L Seq. No.: 00035 A/S Pos.: -- Date: 07/29/97

Replicate 1 Time: 13:31
Peak Area (A-s): 5.228 Peak Height (A): 0.226
Blank Corrected Pk Height (A): 0.226
Concentration (ug/L): 5.866

Hg2 ID: CCB2 Seq. No.: 00036 A/S Pos.: -- Date: 07/29/97

Replicate 1 Time: 13:32
Peak Area (A-s): 0.027 Peak Height (A): 0.001
Blank Corrected Pk Height (A): 0.001
Concentration (ug/L): 0.013

Hg2 ID: 173-60-2B MS Seq. No.: 00037 A/S Pos.: -- Date: 07/29/97

Replicate 1 Time: 13:34
Peak Area (A-s): 4.478 Peak Height (A): 0.200
Blank Corrected Pk Height (A): 0.200
Concentration (ug/L): 5.186

Hg2 ID: 173-60-2B MS D Seq. No.: 00038 A/S Pos.: -- Date: 07/29/97

licate 1 Time: 13:35
k Area (A-s): 4.487 Peak Height (A): 0.192
nk Corrected Pk Height (A): 0.192
centration (ug/L): 4.982

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oncentration (ug/L): 0.023

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Replicate 1 Time: 14:01
Peak Area (A-s): 0.036 Peak Height (A): 0.001
Blank Corrected Pk Height (A): 0.001
Concentration (ug/L): 0.031

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ncentration (ug/L): 0.047

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plicate 1 Time: 14:32
ak Area (A-s): 0.040 Peak Height (A): 0.001
ank Corrected Pk Height (A): 0.001
ncentration (ug/L): 0.037

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Concentration (ug/L): 0.276

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Replicate 1 Time: 15:00
Peak Area (A-s): 0.030 Peak Height (A): 0.001
Blank Corrected Pk Height (A): 0.001
Concentration (ug/L): 0.021

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/Weight File: AB787.IDW.
mple Volume: 100 mL

Analyst: RICHARDS
Nominal Weight: 1.0 g

+lg
7/31/97 mr.

Loc.	Sample ID	Weight	Dilution
0	STD BLK		
1	STD1=0.2ug/L		
2	STD2=0.5ug/L		
3	STD3=1.0ug/L		
4	STD4=2.0ug/L		
5	STD5=5.0ug/L		
6	STD6=10.0ug/L		
7	ICV=4.0ug/L		
8	ICB		
9	CHECK LO		
10	42298 MB4		
11	42298 MB4 D		
12	42298 LCS		
13	42298 LCS D		
14	173-60-6A		
15	173-60-6A D		
16	173-60-6A MS		
17	173-60-6A MS D		
18	CCV1=6.0ug/L		
19	CCB1		
20	42486 MB2		
21	42486 MB2 D		
22	42486 LCS2		
23	42486 LCS2 D		
24	175-50-1/5		
25	175-50-1/5 D		
26	175-50-1/5 MS		
27	175-50-1/5 MSD		
28	175-50-2/6		
29	175-50-2/6 D		
30	CCV1=6.0ug/L		
31	CCB1		
32	175-50-3/7		
33	175-50-3/7 D		
34	175-50-4/8		
35	175-50-4/8 D		
36	175-50-12/4		
37	175-50-12/4 D		
38	CCV2=6.0ug/L		
39	CCB2		

3-008-5 mr 7/31/97

3-008-6 mr 7/31/97

3-008-6 mr 7/31/97

3-008-6 mr 7/31/97

3-008-6 mr 7/31/97

Element File: HG_.MEL
Element: Hg2
Print Data: Main+Suppl.
Print: Calib. Curve
Remarks:
STANDARDS= 3-008-5
QC= 3-008-6

Analyst: RICHARDS
Peak Storage: None

Hg

INSTRUMENT: 5100
Wavelength: 253.7 Peak
Signal Type: AA
Read Time: 30.0
Sample Replicates: 1
Standard Replicates: 1

Technique: MHS
Slit: 0.7 Low
Signal Measurement: Peak Height (5)
Read Delay: 1.0

Version: 7.01
BCC Time: 2

FLAME:
Flame Type: Air
Oxidant Flow: 10.0 L/min

Flame Sensor: On
Fuel Flow: 2.0 L/min

CALIBRATION:

Solutions	ID	Conc
Calib. Blank	STD BLK	----------
Standard 1	STD 1	0.200
Standard 2	STD 2	0.500
Standard 3	STD 3	1.000
Standard 4	STD 4	2.000
Standard 5	STD 5	5.000
Standard 6	STD 6	10.000

Calibration Units: ug/L
Calibration Type: Linear

Sample Units: ug/L

QC:
Matrix Check Calculations:
% Difference for Dupls: No Locations:
% Recovery for Spike: No Locations: Conc:

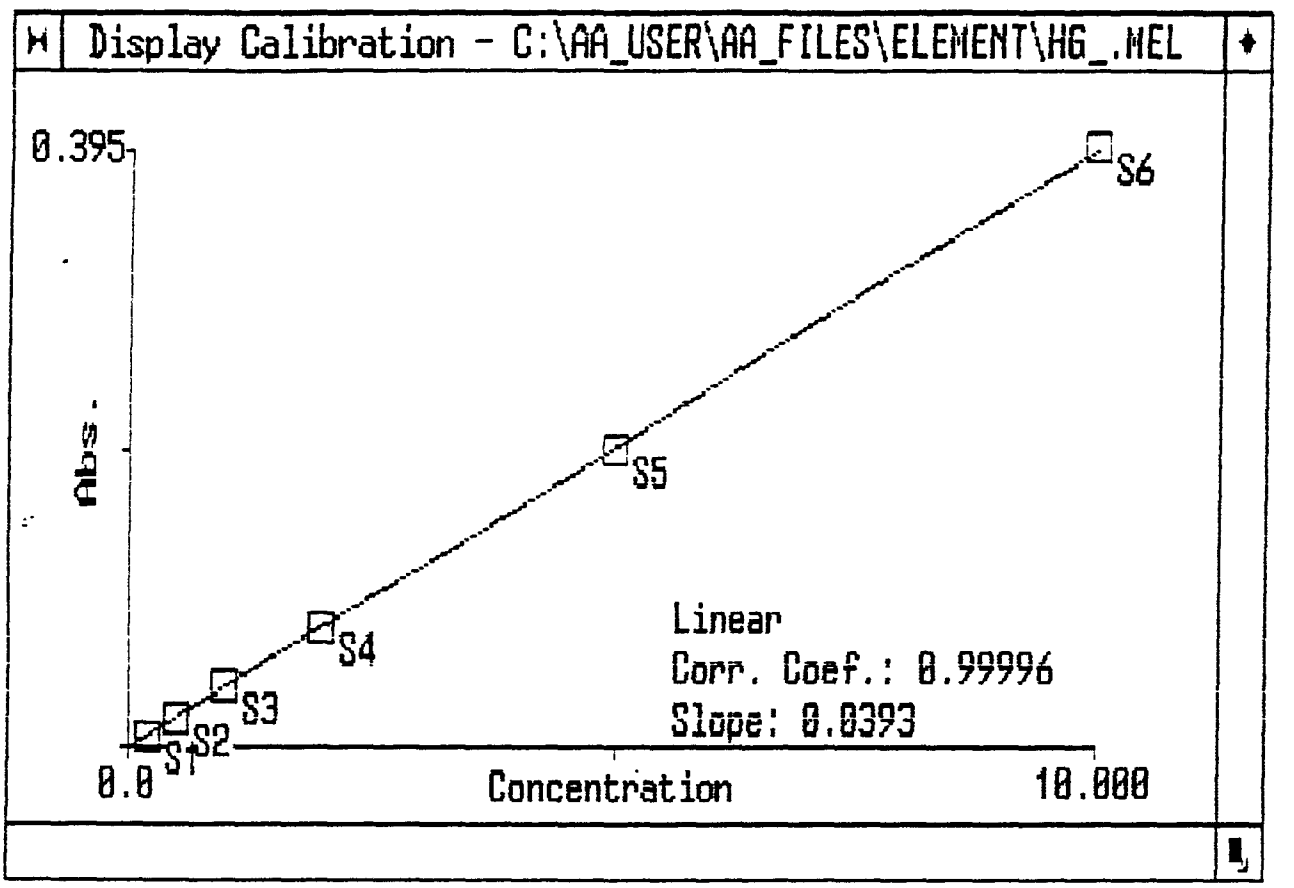
```
---------------------------------------------------------------------------
ment File: HG_.MEL          Element: Hg2                  Wavelength: 253.7
.e: 07/31/97                Time: 08:59                   Slit: 0.7 L
a File: A8787.DAT           ID/Wt File: A8787.IDW         Lamp Current: 0
hnique: MHS                 Calib. Type: Linear           Energy: 73
ark 1: STANDARDS= 3-008-5
ark 2: QC= 3-008-6
---------------------------------------------------------------------------
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
   ID: STD BLK              Seq. No.: 00003    A/S Pos.: --    Date: 07/31/97

licate  1                              Time: 09:00
k Area (A-s): 0.000                    Peak Height (A): 0.001
nk Corrected Pk Height (A): 0.001
centration (ug/L  ): 0.016

o-zero performed.
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
   ID: STD1=0.2ug/L         Seq. No.: 00004    A/S Pos.: --    Date: 07/31/97

ple abs. is greater than that of the largest standard.
licate  1                              Time: 09:01
k Area (A-s): 0.181                    Peak Height (A): 0.007
nk Corrected Pk Height (A): 0.007
centration (ug/L  ): 0.223

ndard number 1 applied.  [0.200]
relation coefficient: 1.00000          Slope: 0.0346
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
   ID: STD2=0.5ug/L         Seq. No.: 00005    A/S Pos.: --    Date: 07/31/97

ple abs. is greater than that of the largest standard.
licate  1                              Time: 09:03
k Area (A-s): 0.452                    Peak Height (A): 0.018
nk Corrected Pk Height (A): 0.018
centration (ug/L  ): 0.528

ndard number 2 applied.  [0.500]
relation coefficient: 0.99894          Slope: 0.0363
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
   ID: STD3=1.0ug/L         Seq. No.: 00006    A/S Pos.: --    Date: 07/31/97

ple abs. is greater than that of the largest standard.
licate  1                              Time: 09:04
k Area (A-s): 0.911                    Peak Height (A): 0.038
nk Corrected Pk Height (A): 0.038
centration (ug/L  ): 1.046

ndard number 3 applied.  [1.000]
relation coefficient: 0.99919          Slope: 0.0376
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
   ID: STD4=2.0ug/L         Seq. No.: 00007    A/S Pos.: --    Date: 07/31/97

ple abs. is greater than that of the largest standard.
licate  1                              Time: 09:05
```

Peak Area (A-s): 1.837 Peak Height (A): 0.078
Blank Corrected Pk Height (A): 0.078
Concentration (ug/L): 2.070

Standard number 4 applied. [2.000]
Correlation coefficient: 0.99956 Slope: 0.0386

~~~
~~~

ement File: HG_.MEL	Element: Hg2	Wavelength: 253.7
e: 07/31/97	Time: 09:08	Slit: 0.7 L
a File: AB787.DAT	ID/Wt File: AB787.IDW	Lamp Current: 0
hnique: MHS	Calib. Type: Linear	Energy: 73
ark 1: STANDARDS= 3-008-5		
ark 2: QC= 3-008-6		



:ement File: HG_.MEL Element: Hg2 Wavelength: 253.7
ate: 07/31/97 Time: 09:10 Slit: 0.7 L
ata File: A8787.DAT ID/Wt File: A8787.IDW Lamp Current: 0
echnique: MHS Calib. Type: Linear Energy: 73
emark 1: STANDARDS= 3-008-5
emark 2: QC= 3-008-6

:2 ID: ICV=4.0ug/L Seq. No.: 00010 A/S Pos.: -- Date: 07/31/97

eplicate 1 Time: 09:11
eak Area (A-s): 3.614 Peak Height (A): 0.152
ank Corrected Pk Height (A): 0.152
oncentration (ug/L): 3.866

:2 ID: ICB Seq. No.: 00011 A/S Pos.: -- Date: 07/31/97

plicate 1 Time: 09:12
ak Area (A-s): 0.025 Peak Height (A): 0.001
ank Corrected Pk Height (A): 0.001
ncentration (ug/L): 0.023

---

2 ID: CHECK LO Seq. No.: 00012 A/S Pos.: -- Date: 07/31/97

plicate 1 Time: 09:13
ak Area (A-s): 0.195 Peak Height (A): 0.007
ank Corrected Pk Height (A): 0.007
ncentration (ug/L): 0.189

---

2 ID: 42298 MB4 Seq. No.: 00013 A/S Pos.: -- Date: 07/31/97

plicate 1 Time: 09:15
ak Area (A-s): 0.019 Peak Height (A): 0.000
ank Corrected Pk Height (A): 0.000
ncentration (ug/L): 0.003

---

2 ID: 42298 MB4 D Seq. No.: 00014 A/S Pos.: -- Date: 07/31/97

plicate 1 Time: 09:15
ak Area (A-s): 0.016 Peak Height (A): -0.000
ank Corrected Pk Height (A): -0.000
ncentration (ug/L): -0.003

---

2 ID: 42298 LCS Seq. No.: 00015 A/S Pos.: -- Date: 07/31/97

plicate 1 Time: 09:17
ak Area (A-s): 4.322 Peak Height (A): 0.181
ank Corrected Pk Height (A): 0.181
ncentration (ug/L): 4.592

---

2 ID: 42298 LCS D Seq. No.: 00016 A/S Pos.: -- Date: 07/31/97

licate 1 Time: 09:18
k Area (A-s): 4.553 Peak Height (A): 0.196
nk Corrected Pk Height (A): 0.196
centration (ug/L): 4.980

ID: 173-60-6A Seq. No.: 00017 A/S Pos.: -- Date: 07/31/97

licate 1 Time: 09:19
k Area (A-s): 0.041 Peak Height (A): 0.001
nk Corrected Pk Height (A): 0.001
centration (ug/L): 0.025

ID: 173-60-6A D Seq. No.: 00018 A/S Pos.: -- Date: 07/31/97

licate 1 Time: 09:20
k Area (A-s): 0.024 Peak Height (A): 0.001
nk Corrected Pk Height (A): 0.001
centration (ug/L): 0.013

ID: 173-60-6A MS Seq. No.: 00019 A/S Pos.: -- Date: 07/31/97

licate 1 Time: 09:21
k Area (A-s): 4.473 Peak Height (A): 0.188
nk Corrected Pk Height (A): 0.188
centration (ug/L): 4.779

ID: 173-60-6A MS D Seq. No.: 00020 A/S Pos.: -- Date: 07/31/97

licate 1 Time: 09:22
k Area (A-s): 4.642 Peak Height (A): 0.202
nk Corrected Pk Height (A): 0.202
centration (ug/L): 5.138

ID: CCV1=6.0ug/L Seq. No.: 00021 A/S Pos.: -- Date: 07/31/97

licate 1 Time: 09:23
Area (A-s): 5.321 Peak Height (A): 0.226
nk Corrected Pk Height (A): 0.226
centration (ug/L): 5.755

ID: CCB1 Seq. No.: 00022 A/S Pos.: -- Date: 07/31/97

licate 1 Time: 09:24
Area (A-s): 0.045 Peak Height (A): 0.002
nk Corrected Pk Height (A): 0.002
entration (ug/L): 0.041

ID: 42486 MB2 Seq. No.: 00023 A/S Pos.: -- Date: 07/31/97

licate 1 Time: 12:52
Area (A-s): 0.022 Peak Height (A): 0.001
k Corrected Pk Height (A): 0.001

Appendix D

Gravimetric Analysis Data

LTV Filter Tare Weights Filter Wts

Filter Number	Tare Wt 11:00 6/18/97	Tare Wt 10:00 6/19/97	0.0005 or less Difference	
001	0.57904	0.57899	0.00005	✓
002	0.59716	0.59717	0.00001	✓
003	0.63791	0.63796	0.00005	✓
004	0.58210	0.58206	0.00004	✓
005	0.57539	0.57544	0.00005	✓
006	0.59353	0.59350	0.00003	✓
007	0.60423	0.60422	0.00001	✓
008	0.62437	0.62434	0.00003	✓
009	0.56388	0.56388	0.00000	✓
010	0.55521	0.55521	0.00000	✓
011	0.59768	~~0.59771.3~~	0.00005 0.59773	✓
012	0.60555	0.60554	0.00001	✓
013	0.64156	0.64151	0.00005	✓
014	0.58095	0.58098	0.00003	✓
015	0.58338	0.58339	0.00001	✓
016	0.57394	0.57390	0.00004	✓
017	0.58386	0.58387	0.00001	✓
018	0.58632	0.58636	0.00004	✓
019	0.58810	0.58808	0.00002	✓
020	0.58261	0.58257	0.00004	✓
021	0.57220	0.57225	0.00005	✓
022	0.58083	0.58088	0.00005	✓
023	0.71264	0.71263	0.00003	✓
024	0.72971	0.72972	0.00001	✓
025				

Carol Hurlin 6-20-97

Project No._____
Book No._____ TITLE LTV beakers + filter weigh

om Page No.__

Filter	Weigh 1 7/5/97	Weigh 2 7/8
LTV-88	0.71763	0.71789
92	1.17013	1.17031
46	0.70660	0.70615
91	0.93117	0.93103
39	~~0.160~~ 0.59815	0.59813
52	0.55513	0.55501
90	0.71450	0.71431
93	1.10576	1.10564
~~99~~		
89	0.69403	0.69406
99	0.86355	0.86353

filter find wt.

Sample ID	Beaker #	Weigh 1 7/13/97	Weigh 2 7/14/97	Difference
LTV-01	2	178.8614	178.8619	-0.0005
LTV-07	3	171.5307	171.531	-0.0003
LTV-13	4	168.3872	168.3869	0.0003
LTV-19	5	152.5475	152.5471	0.0004
LTV-25	6	166.7439	166.7443	-0.0004
LTV-31	7	180.5858	180.5861	-0.0003
LTV-37	8	150.2989	150.2988	0.0001
LTV-44	9	167.4812	167.4815	-0.0003
LTV-50	10	159.2096	159.2097	-0.0001
LTV-83	11	148.3343	148.3345	-0.0002
LTV-100	12	183.4912	183.4914	-0.0002

beaker	weigh 1 7/10 8am	weigh 2 7/10 1pm	Difference
1	174.9331	174.9327	0.0004
2	178.8372	178.8369	0.0003
3	171.5022	171.5022	0
4	168.334	168.3342	-0.0002
5	152.2608	152.2605	0.0003
6	166.2397	166.2399	-0.0002
7	180.0437	180.0439	-0.0002
8	150.2905	150.2906	-0.0001
9	167.4813	167.4809	0.0004
10	159.2087	159.2089	-0.0002
11	148.3343	148.3341	0.0002
12	183.4436	183.4436	0

Beaker find wt.
LTV

See page 15 for LTV Filter Tare weights

Beaker Tare wt
LTV

To Page No.__

essed & Understood by me.	Date	Invented by	Date
		Recorded by Alexandra McBrian	8/7/97

Appendix E

Field Data

E.1 Method 23 and Method 29 Field Data Sheets
E.2 Meter Box Calibrations
E.3 Chain-of-Custody Sheets
E.4 Summary of Sampling Parameters

Appendix E.1

Method 23 and Method 29 Field Data Sheets

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MODIFIED METHOD 5 DATA SHEET

Run
Page 1 of 2

Plant	LTV	XAD Trap Number		Meter Box Number	[illegible]
Date	6-25-97	Filter Heater Setting (°F)	248-250	Meter delta H @	1.70
Operator	MKO	Probe Length & Type	6' glass	DGM Factor (Y)	[illegible]
Sampling Location	Stack	Probe Heater Setting (°F)	248-250	Nozzle Type & ID (in.)	[illegible]
Sample Type	Dioxin	Minimum Sample Volume (ft3)		Ambient Temperature (°F)	77°F
Run Number	1	Initial Leak Check	0.015 at 17"	Assumed Moisture (% H2O)	10
Static Pressure (±) (in. H2O)	+1.80	Final Leak Check	0.018 at 15"	K-Factor	1.40
Barometric Pressure (in. H2O)	29.15				

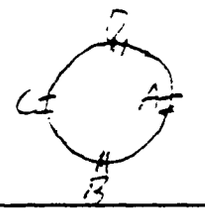
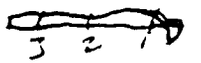


Diagram of Duct

Schematic of Traverse Point Layout



Read and record all data every 10 minutes

Traverse Point Number	Sampling Time (min)	Clock Time (24hr)	Gas Meter Reading ((Vm),ft3)	Velocity Head ((delta Ps), in.H2O)	Stack Ts (°F)	Orifice Pressure Differential (delta H, in.H2O) Desired	Actual	Probe Temp. (°F)	Filter Temp. (°F)	Adsorbent Trap Temp. (°F)	Dry Gas Meter Inlet (Tm in)	Dry Gas Meter Outlet (Tm out)	Impinger Exit Temp. (°F)	Pump Vacuum (in.Hg)
	0	0921	261.002							65				
C01	10	0941	269.0[illegible]	.72	117	1.36	1.36	256	245	[illegible]	84	83	55	7.0
1	20	0961	276.20	.72	116	1.36	1.36	244	242	60	88	84	62	4.5
1	30	1001	283.03	.73	117	1.28	1.28	245	251	60	89	84	65	5.0
2	40	1011	289.52	.63	116	1.19	1.19	242	248	64	88	84	66	5.0
3	50	1021	295.95	.61	116	.85	.85	247	250	66	88	84	68	5.0
3	60	1031	302.05	1.63	116	1.29	1.29	253	250	66	88	84	68	5.0
		Leak	Check	0.011	at 10"	✓								
	0	1210	307.20											
C01	10	1220	309.07	.62	117	1.17	1.17	262	256	56	92	92	61	5.0
1	20	1230	310.[illegible]	.62	117	1.17	1.17	260	254	62	93	91	61	5.0
2	30	1240	312.64	.65	117	1.23	1.23	254	256	62	93	92	62	6.0
2	40	1250	314.14	.65	117	1.23	1.23	255	258	65	95	93	63	6.0
3	50	1301	315.66	.60	117	1.14	1.14	249	251	63	95	92	63	6.0
3	60	1311	317.65	.60	117	1.14	1.14	251	255	68	100	92	68	6.0
		Leak	Check	0.016	at	15"								
	0													
C03	0	[illegible]	342.82											
1	10	[illegible]	344.75	.58	117	1.10	1.10	247	248	[illegible]	[illegible]	91	[illegible]	[illegible]
[illegible]	20	[illegible]	[illegible]	.57	117	1.08	1.08	250	260	[illegible]	91	90	[illegible]	[illegible]
[illegible]	30	[illegible]	[illegible]	.64	117	1.21	1.21	252	258	58	92	90	62	[illegible]
[illegible]	40	[illegible]	[illegible]	.60	117	1.14	1.14	252	248	60	90	90	62	6.0
[illegible]	[illegible]	[illegible]	[illegible]	.59	117	[illegible]	1.10	253	245	62	91	91	62	6.0
[illegible]	60	[illegible]	391.88	.58	117	1.10	1.10	240	248	61	91	90	63	6.0
		[illegible]	[illegible]	0.017	at	10"								

Comments:

Eastern Research Group, Inc.

MODIFIED METHOD 5 DATA SHEET

Run 1
Page 2 of 2

Plant	LTI	XAD Trap Number		Meter Box Number	
Date	[illegible]	Filter Heater Setting (°F)		Meter delta H @	
Operator	[illegible]	Probe Length & Type		DGM Factor (Y)	
Sampling Location	[illegible]	Probe Heater Setting (°F)		Nozzle Type & ID (in.)	
Sample Type	Dioxin	Minimum Sample Volume (ft3)		Ambient Temperature (°F)	
Run Number		Initial Leak Check		Assumed Moisture (% H2O)	
Static Pressure (±) (in. H2O)		Final Leak Check		K-Factor	1.90
Barometric Pressure (in. H2O)					

Diagram of Duct

Schematic of Traverse Point Layout

Read and record all data every 10 minutes

Traverse Point Number	Sampling Time (min)	Clock Time (24hr)	Gas Meter Reading ((Vm),ft3)	Velocity Head ((delta Ps), in.H2O)	Stack Ts (°F)	Orifice Pressure Differential (delta H, in.H2O) Desired	Actual	Probe Temp. (°F)	Filter Temp. (°F)	Adsorbent Trap Temp. (°F)	Dry Gas Meter Inlet (Tm in)	Dry Gas Meter Outlet (Tm out)	Impinger Exit Temp. (°F)	Pump Vacuum (in.Hg)
	0	1601	381.57											
15 1	10	1611	388.06	.64	119	1.21	1.21	268	262	54	98	97	61	6.0
	30	1621	394.83	.69	117	1.21	1.21	256	264	58	105	92	63	6.0
2	20	1631	401.52	.69	117	1.17	1.27	255	262	61	112	96	65	6.5
2	40	1641	408.53	.80	119	1.52	1.52	251	270	65	115	100	68	7.0
2	50	1651	416.15	.95	122	1.80	1.82	253	269	66	112	100	65	7.0
2	60	1761	425.00	.70	119	1.33	1.33	270	250	68	107	100	68	7.0
			Pitot check		0.0015 at	15 1								

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MOISTURE RECOVERY FORM FOR METHOD 4

Plant	LTV Steel
Date	6/24/97
Sampling Location	Outlet
Sample Type	Dioxin M23
Run Number	1
Impinger Box Number	Outlet 23
Recovery Person	J Swift
Recovery Rinses	3x MeCl2 ! 3x toluene
Sample Identification	LTV-
Filter Number	NA
XAD Number	~~DAIS~~ 03710 6-24-97

Impinger Number	Impinger Solution	Amount of Solution (g)	Impinger Tip Configuration	Impinger Weight		
				Final (g)	Initial (g)	Weight Gain (g)
1	MT	—	KO	789.5	459.4	330.1
2	HPLC H2O	~100g	GS	575.7	580.3	-4.6
3	HPLC H2O	~100g	GS	562.5	560.4	2.1
4	MT	—	GS	498.2	493.3	4.9
5	Silica Gel	~250g	GS	805.3	749.0	56.3
6						
7						
					Total Weight Gain (g)	388.8

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MODIFIED METHOD 5 DATA SHEET

Run ____
Page 1 of ____

Plant	[illegible]	XAD Trap Number	ELG-02	Meter Box Number	[illegible]
Date	[illegible]	Filter Heater Setting (°F)	250±25	Meter delta H @	1.700
Operator	MKD	Probe Length & Type	8'/1055	DGM Factor (Y)	.996
Sampling Location	[illegible]	Probe Heater Setting (°F)	250±25	Nozzle Type & ID (in.)	.411
Sample Type	[illegible]	Minimum Sample Volume (ft3)		Ambient Temperature (°F)	8[illegible]
Run Number	1	Initial Leak Check	0.009 at 17"	Assumed Moisture (% H2O)	1.30
Static Pressure (±) (in. H2O)	-13.0	Final Leak Check	0.011 at 9"	K-Factor	1.70
Barometric Pressure (in. H2O)	27.35				

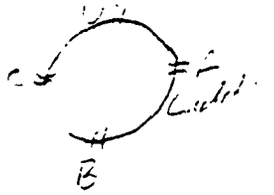
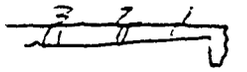


Diagram of Duct

Schematic of Traverse Point Layout



Read and record all data every 10 minutes

Traverse Point Number	Sampling Time (min)	Clock Time (24hr)	Gas Meter Reading ((Vm),ft3)	Velocity Head ((delta Ps), in.H2O)	Stack Ts (°F)	Orifice Pressure Differential (delta H, in.H2O) Desired	Actual	Probe Temp. (°F)	Filter Temp. (°F)	Adsorbent Trap Temp. (°F)	Dry Gas Meter Inlet (Tm in)	Dry Gas Meter Outlet (Tm out)	Impinger Exit Temp. (°F)	Pump Vacuum (in.Hg)
	0	0956	426.560											
B 1	10	1006	[illegible]	.70	117	1.22	1.23	225	225	54	79	75	65	2.5
1	20	1016	439.15	.70	117	1.20	1.22	240	248	55	86	78	61	2.5
2	30	1026	446.52	.75	117	1.42	1.42	245	237	56	88	80	60	3.0
2	40	1036	453.42	.72	117	1.42	1.42	250	247	58	84	80	66	3.0
3	50	1046	460.22	.68	117	1.19	1.24	260	251	59	81	84	65	3.0
3	60	1056	466.71	.65	117	1.22	1.25	260	250	65	82	85	68	3.0
		Leak	check	0.007	at 10"									
	0	1126	466.46											
A 1	10	1136	471.30	.65	117	1.19	1.19	245	240	62	81	82	68	3.0
1	20	1146	479.91	.65	116	1.19	1.19	245	249	63	83	81	66	3.0
2	30	1156	488.63	.65	116	1.19	1.19	250	250	62	83	82	63	3.0
2	40	1206	495.18	.68	118	1.19	1.19	240	242	66	84	82	68	3.0
3	50	1216	499.80	.65	118	1.14	1.18	245	240	68	82	83	66	3.0
3	60	1226	505.73	.60	118	1.14	1.14	247	241	68	81	83	67	3.0
		Leak check		0.008	at 7"									
	0	1206	506.10											
D 1	10	1316	512.48	.65	119	1.19	1.19	225	244	52	89	83	66	3.0
1	20	1326	519.23	.65	118	1.19	1.19	230	248	52	86	80	64	3.5
2	30	1336	526.06	.65	118	1.23	1.23	244	240	[illegible]	88	80	65	3.5
2	40	1346	532.22	.60	119	1.14	1.14	250	242	54	89	82	68	3.5
3	50	1356	538.62	.57	119	1.03	1.08	238	247	59	81	82	68	3.5
3	60	1406	544.51	.60	117	1.14	1.14	232	242	61	81	84	68	3.5
		Leak check		0.009	at 21"									

Comments:

Eastern Research Group, Inc.

MODIFIED METHOD 5 DATA SHEET

Run 2
Page 1 of 2

Plant		XAD Trap Number		Meter Box Number	C-77
Date		Filter Heater Setting (°F)		Meter delta H @	
Operator		Probe Length & Type		DGM Factor (Y)	
Sampling Location		Probe Heater Setting (°F)		Nozzle Type & ID (in.)	
Sample Type	Dioxin	Minimum Sample Volume (ft3)		Ambient Temperature (°F)	
Run Number	2	Initial Leak Check		Assumed Moisture (% H2O)	
Static Pressure (±) (in. H2O)		Final Leak Check		K-Factor	1.90
Barometric Pressure (in. H2O)					

Diagram of Duct

Schematic of Traverse Point Layout

Read and record all data every 10 minutes

Traverse Point Number	Sampling Time (min)	Clock Time (24hr)	Gas Meter Reading ((Vm),ft3)	Velocity Head ((delta Ps), in.H2O)	Stack Ts (°F)	Orifice Pressure Differential (delta H, in.H2O) Desired	Actual	Probe Temp. (°F)	Filter Temp. (°F)	Adsorbent Trap Temp. (°F)	Dry Gas Meter Inlet (Tm in)	Outlet (Tm out)	Impinger Exit Temp. (°F)	Pump Vacuum (in.Hg)
	0	1436	544.107											
C1	10	1446	547.07	.72	117	1.37	1.37	225	225	60	87	81	63	4.5
1	20	1456	550.62	.60	116	1.14	1.14	225	240	60	95	85	63	4.5
1	30	1506	554.50	.72	115	1.37	1.37	230	245	60	100	85	65	4.5
2	40	1516	557.00	.72	116	1.37	1.37	225	250	66	105	100	66	4.5
3	50	1526	559.73	.66	117	1.25	1.23	230	250	67	107	102	67	5.0
3	60	1531	585.13	.70	118	1.33	1.33	260	275	68	107	103	68	5.0
				.011 @ 4 min										

Comments:

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MOISTURE RECOVERY FORM FOR METHOD 4

Plant	LTV Steel
Date	6/20/97
Sampling Location	Outlet
Sample Type	Dioxin
Run Number	2
Impinger Box Number	Outlet Dioxin
Recovery Person	JSwift
Recovery Rinses	3x $MeCl_2$ & 3x toluene
Sample Identification	LTV-
Filter Number	NA
XAD Number	03710

Impinger Number	Impinger Solution	Amount of Solution (g)	Impinger Tip Configuration	Impinger Weight		
				Final (g)	Initial (g)	Weight Gain (g)
1	MT	—	KO	804.8	459.2	345.6
2	HPLC H_2O	~100g	GS	582.0	585.1	-3.1
3	HPLC H_2O	~100g	GS	585.3	585.4	-0.1
4	MT	—	GS	493.8	489.2	4.6
5	Silica Gel	~250g	GS	855.5	807.8	47.7
6						
7						
					Total Weight Gain (g)	394.7

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MODIFIED METHOD 5 DATA SHEET

Run 3
Page 1 of 3

Plant	BTU	XAD Trap Number	RG-5	Meter Box Number	2-29
Date	6-17-97	Filter Heater Setting (°F)	250-255	Meter delta H @	1.700
Operator	MKO	Probe Length & Type	8'/6'-S	DGM Factor (Y)	.995
Sampling Location	STACK	Probe Heater Setting (°F)	250-255	Nozzle Type & ID (in.)	S/Ot .247
Sample Type	Dobyns	Minimum Sample Volume (ft3)		Ambient Temperature (°F)	85
Run Number	3	Initial Leak Check	0.010 @ 7"	Assumed Moisture (% H2O)	10%
Static Pressure (±) (in. H2O)	-1.80	Final Leak Check	0.0 N @ 16"	K-Factor	1.90
Barometric Pressure (in. H2O)	29.40				

Diagram of Duct

Schematic of Traverse Point Layout

Read and record all data every 10 minutes

Traverse Point Number	Sampling Time (min)	Clock Time (24hr)	Gas Meter Reading ((Vm),ft3)	Velocity Head ((delta Ps), in.H2O)	Stack Ts (°F)	Orifice Pressure Differential (delta H, in.H2O) Desired	Actual	Probe Temp. (°F)	Filter Temp. (°F)	Adsorbent Trap Temp. (°F)	Dry Gas Meter Inlet (Tm in)	Outlet (Tm out)	Impinger Exit Temp. (°F)	Pump Vacuum (in.Hg)
	0	0841	585.56											
C1	10	0851	592.72	.75	115	1.42	1.42	250	244	47	97	97	66	2.5
1	20	0901	599.84	.75	114	1.47	1.47	250	248	49	102	92	65	2.5
2	30	0911	606.60	.77	115	1.52	1.36	250	250	50	102	94	67	3.0
2	40	0921	613.15	.75	115	1.42	1.42	250	250	56	105	94	67	3.0
3	50	0931	620.52	.63	116	1.19	1.19	252	252	57	106	96	67	3.0
3	60	0941	626.92	.72	117	1.36	1.36	250	254	57	107	97	68	3.0
			1028 check		0.003 @ 7"									
	0	1001	633.06											
P1	10	1011	639.59	.65	114	1.23	1.23	240	226	51	99	97	68	3.5
1	20	1021	646.00	.63	113	1.19	1.19	250	230	50	102	98	65	3.5
2	30	1031	652.47	.60	115	1.14	1.14	253	235	48	103	98	60	3.5
2	40	1041	658.60	.65	114	1.23	1.23	250	233	48	103	102	63	3.5
3	50	1051	664.50	.77	115	1.36	1.36	250	235	50	106	9[illegible]	67	4.0
3	60	1111	670.57	.78	115	1.48	1.48	250	230	51	104	96	67	4.0
			1106 check		0.003 @ 7"		1211							
	0	1126	677.645											
A1	10	1136	684.07	.63	116	1.23	1.23	250	252	45	95	97	67	4.0
1	20	1146	690.42	.63	117	1.23	1.23	250	250	48	102	99	63	4.5
2	30	1156	697.52	.62	117	1.17	1.17	250	248	50	102	97	63	5.0
2	40	1206	704.13	.62	115	1.17	1.17	225	250	55	103	96	68	5.0
3	50	1216	710.40	.55	116	1.04	1.04	250	252	56	103	95	68	5.0
3	60	1226	716.45	.60	115	1.14	1.14	250	250	58	104	96	67	5.0

Comments:

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MODIFIED METHOD 5 DATA SHEET

Run 3
Page 1 of 2

Plant	CPU	XAD Trap Number		Meter Box Number	
Date	6-22-91	Filter Heater Setting (°F)		Meter delta H @	
Operator	MKO	Probe Length & Type		DGM Factor (Y)	
Sampling Location	S1 FCU	Probe Heater Setting (°F)		Nozzle Type & ID (in.)	
Sample Type	Tedlar	Minimum Sample Volume (ft3)		Ambient Temperature (°F)	
Run Number	3	Initial Leak Check		Assumed Moisture (% H2O)	
Static Pressure (±) (in. H2O)	+.18	Final Leak Check		K-Factor	1.90
Barometric Pressure (in. H2O)	29.40				

Diagram of Duct

Schematic of Traverse Point Layout

Read and record all data every 10 minutes

Traverse Point Number	Sampling Time (min)	Clock Time (24hr)	Gas Meter Reading ((Vm),ft3)	Velocity Head ((delta Ps), in.H2O)	Stack Ts (°F)	Orifice Pressure Differential (delta H, in.H2O) Desired	Actual	Probe Temp. (°F)	Filter Temp. (°F)	Adsorbent Trap Temp. (°F)	Dry Gas Meter Inlet (Tm in)	Outlet (Tm out)	Impinger Exit Temp. (°F)	Pump Vacuum (in.Hg)
	0	1246	706.578											
1	10	1256	713.28	.75	115	1.42	1.42	231	257	46	93	91	62	5.0
1	20	1306	720.00	.68	115	1.29	1.29	241	257	46	99	90	62	5.0
2	30	1316	727.87	.80	115	1.52	1.52	245	254	48	102	92	67	5.0
2	40	1326	734.82	.80	116	1.52	1.52	248	254	50	103	93	67	5.0
3	50	1336	741.32	.72	116	1.36	1.36	250	255	51	109	90	68	5.0
3	60	1346	748.11	.86	116	1.16	1.16	252	258	52	105	95	67	5.0

Comments:

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MOISTURE RECOVERY FORM FOR METHOD 4

Plant	LTV Steel
Date	6/1/97
Sampling Location	Outlet
Sample Type	Dioxin
Run Number	3
Impinger Box Number	Outlet Dioxin
Recovery Person	JSmith
Recovery Rinses	3 MeCl2 & 3 x Toluene
Sample Identification	LTV-
Filter Number	DA
XAD Number	03410

Impinger Number	Impinger Solution	Amount of Solution (g)	Impinger Tip Configuration	Impinger Weight		
				Final (g)	Initial (g)	Weight Gain (g)
1	MT	—	KO	787.7	461.3 ~~476.2~~	326.4
2	HPLC H2O	~100g	GS	558.1	557.3	0.8
3	HPLC H2O	~100g	GS	598.9	605.0	-6.1
4	MT	—	GS	495.8	493.5	2.3
5	Silica Gel	~250g	GS	813.5	768.7	44.8
6						
7						
				Total Weight Gain (g)		368.2

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Methods

MODIFIED METHOD 5 DATA SHEET

Run
Page 1 of

Plant	CTU	XAD Trap Number		Meter Box Number	F-26
Date	6-25-97	Filter Heater Setting (°F)	250 ± 25	Meter delta H @	1.670
Operator	WKO	Probe Length & Type	8 ft glass	DGM Factor (Y)	0.994
Sampling Location	CTU/K	Probe Heater Setting (°F)	250 ± 25	Nozzle Type & ID (in.)	.217
Sample Type	Metals	Minimum Sample Volume (ft3)		Ambient Temperature (°F)	70
Run Number	1	Initial Leak Check	0.015 at 15"	Assumed Moisture (% H2O)	10.90
Static Pressure (±) (in. H2O)	-1.0	Final Leak Check	0.007 at 10	K-Factor	2.65
Barometric Pressure (in. H2O)	29.18				

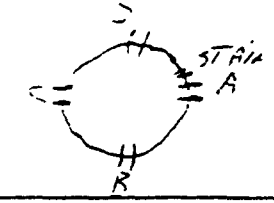
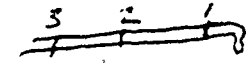


Diagram of Duct

Schematic of Traverse Point Layout



Read and record all data every 10 minutes

Traverse Point Number	Sampling Time (min)	Clock Time (24hr)	Gas Meter Reading ((Vm),ft3)	Velocity Head ((delta Ps), in.H2O)	Stack Ts (°F)	Orifice Pressure Differential (delta H, in.H2O) Desired	Actual	Probe Temp. (°F)	Filter Temp. (°F)	Adsorbent Trap Temp. (°F)	Dry Gas Meter Inlet (Tm in)	Dry Gas Meter Outlet (Tm out)	Impinger Exit Temp. (°F)	Pump Vacuum (in.Hg)
	0	0930	277.755							NA				
0.5	10	0940	280.70	.62	116	1.67	1.67	225	245		82	80	59	3.0
1.5	20	0950	283.46	.62	115	1.77	1.77	225	246		86	81	65	3.0
2	30	1000	286.86	.62	115	1.31	1.54	228	226		89	86	67	3.0
2.5	40	1010	289.32	.66	115	1.35	1.35	230	230		85	85	67	3.0
1	50	1020	292.07	.63	116	1.27	1.27	245	236		87	85	62	3.0
1	60	1030	294.28	.66	116	1.35	1.35	245	237		88	84	63	3.0
			120ft clock		04	on	start	120ft	1.2 ft					
			.014 at 10"											
	0	1210	316.81											
0.5	10	1220	319.63	.62	117	1.27	1.21	258	264		87	84	63	3.0
1.5	20	1230	322.96	.62	117	1.27	1.21	255	262		90	85	64	3.0
2	30	1240	325.75	.64	117	1.31	1.31	257	260		90	86	66	3.0
2.5	40	1250	328.77	.66	117	1.27	1.27	257	260		91	87	66	3.5
1	50	1300	331.31	.58	116	1.18	1.18	250	255		90	89	66	3.5
1	60	1310	334.041	.58	116	1.18	1.18	256	250		91	90	68	3.5
			120ft	clock		0.009	at	10"						
	0	1400	354.19											
0.5	10	1410	360.401	[illegible]	[illegible]	[illegible]	[illegible]	250	262		90	90	58	3.0
1.5	20	1420	363.05	.61	117	[illegible]	[illegible]	250	260		91	90	58	[illegible]
2	30	1430	365.86	.76	118	1.53	[illegible]	250	261		91	90	61	[illegible]
2.5	40	[illegible]	368.56	[illegible]	119	[illegible]	[illegible]	255	250		91	91	62	[illegible]
1	50	[illegible]	371.[illegible]	[illegible]	120	[illegible]	[illegible]	255	256		91	91	67	[illegible]
1	60	1450	374.120	[illegible]	117	1.66	[illegible]	250	250		92	90	61	[illegible]

Comments:

Leak Check 0.006 at 8"

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MOISTURE RECOVERY FORM FOR METHOD 4

Plant	LTV Steel
Date	6/27/97
Sampling Location	Outlet
Sample Type	Metals
Run Number	3
Impinger Box Number	Outlet
Recovery Person	JSwift
Recovery Rinses	3 x 0.1N HNO3
Sample Identification	LTV-
Filter Number	
XAD Number	UA

Impinger Number	Impinger Solution	Amount of Solution (g)	Impinger Tip Configuration	Impinger Weight Final (g)	Impinger Weight Initial (g)	Impinger Weight Weight Gain (g)
1	MT	—	GS	527.2	424.4	102.8
2	5% HNO3 10% H2O2	~100g	MGS	794.9	592.9	202.0
3	5% HNO3 10% H2O2	~100g	GS	614.7	583.3	31.4
4	MT	—	GS	499.7	491.2	8.5
5	4% KMnO4 10% H2SO4	~100g	MGS	559.0	568.2	-9.2
6	4% KMnO4 10% H2SO4	~100g	GS	610.7	606.2	4.5
7	Silica Gel	~250g	GS	857.1	827.5	29.6
					Total Weight Gain (g)	369.6

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MODIFIED METHOD 5 DATA SHEET

Metals

Run 3
Page 1 of 2

Plant	LTV	XAD Trap Number		Meter Box Number		
Date		Filter Heater Setting (°F)		Meter delta H @		
Operator		Probe Length & Type		DGM Factor (Y)		
Sampling Location	STK 1	Probe Heater Setting (°F)		Nozzle Type & ID (in.)		
Sample Type	Metals	Minimum Sample Volume (ft3)		Ambient Temperature (°F)		
Run Number	3	Initial Leak Check		Assumed Moisture (% H2O)		
Static Pressure (±) (in. H2O)		Final Leak Check		K-Factor	2.05	
Barometric Pressure (in. H2O)						

Diagram of Duct

Schematic of Traverse Point Layout

Read and record all data every 10 minutes

Traverse Point Number	Sampling Time (min)	Clock Time (24hr)	Gas Meter Reading ((Vm),ft3)	Velocity Head ((delta Ps), in.H2O)	Stack Ts (°F)	Orifice Pressure Differential (delta H, in.H2O) Desired	Actual	Probe Temp. (°F)	Filter Temp. (°F)	Adsorbent Trap Temp. (°F)	Dry Gas Meter Inlet (Tm in)	Outlet (Tm out)	Impinger Exit Temp. (°F)	Pump Vacuum (in.Hg)
	0	1245	716.87											
C3	10	1255	726.04	.61	117	1.41	1.41	225	240		98	98	67	3.0
3	20	1305	732.22	.65	116	1.23	1.23	245	238		101	99	61	3.0
2	30	1315	739.47	.68	117	1.34	1.34	255	250		106	106	64	3.0
2	40	1325	745.66	.68	117	1.39	1.39	250	240		105	100	67	3.0
1	50	1335	752.78	.75	117	1.53	1.53	250	248		107	101	67	3.0
1	60	1345	759.33	.75	117	1.53	1.53	250	250		108	102	68	3.0

Comments:

Eastern Research Group, Inc.

MODIFIED METHOD 5 DATA SHEET

Metals

Run 3
Page 1 of 2

Plant	[illegible]	XAD Trap Number	[illegible]	Meter Box Number	4-36
Date	[illegible]	Filter Heater Setting (°F)	[illegible]	Meter delta H @	1.578
Operator	[illegible]	Probe Length & Type	[illegible]	DGM Factor (Y)	.984
Sampling Location	[illegible]	Probe Heater Setting (°F)	[illegible]	Nozzle Type & ID (in.)	[illegible]
Sample Type	Metals	Minimum Sample Volume (ft3)		Ambient Temperature (°F)	83
Run Number	3	Initial Leak Check	0.007 at 10"	Assumed Moisture (% H2O)	10.70
Static Pressure (±) (in. H2O)	-1.50	Final Leak Check	0.004 at 8"	K-Factor	2.05
Barometric Pressure (in. H2O)	29.40				

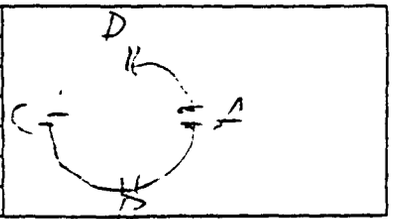

Diagram of Duct

Schematic of Traverse Point Layout

Read and record all data every 10 minutes

Traverse Point Number	Sampling Time (min)	Clock Time (24hr)	Gas Meter Reading ((Vm).ft3)	Velocity Head ((delta Ps), in.H2O)	Stack Ts (°F)	Orifice Pressure Differential (delta H, in.H2O) Desired	Actual	Probe Temp. (°F)	Filter Temp. (°F)	Adsorbent Trap Temp. (°F)	Dry Gas Meter Inlet (Tm in)	Dry Gas Meter Outlet (Tm out)	Impinger Exit Temp. (°F)	Pump Vacuum (in.Hg)
	0	0840	598.44											
D 2	10	0850	604.43	.64	115	1.51	1.31	250	250	DAA	90	89	67	1.0
2	20	0900	610.81	.64	116	1.51	1.51	255	250		93	91	58	1.0
2	30	0910	617.62	.70	115	1.45	1.45	250	251		94	91	61	1.0
2	40	0920	624.00	.70	115	1.42	1.42	257	246		96	92	63	1.0
1	50	0930	631.04	.71	118	1.51	1.51	258	250		103	98	66	1.0
1	60	0940	637.93	.74	118	1.51	1.51	260	251		104	99	68	1.0
			leak check	0.004 at	11									
	0	1000	638.01				1.27							
A 3	10	1010	644.69	.67	117	1.34	1.34	265	250		104	98	64	1.5
3	20	1020	651.25	.67	118	1.34	1.34	270	253		105	99	67	1.5
2	30	1030	657.85	.68	116	1.34	1.34	275	262		105	100	67	1.5
2	40	1040	664.37	.68	117	1.34	1.34	270	269		105	100	68	1.5
1	50	1050	671.02	.65	117	1.34	1.34	268	257		105	100	68	1.5
1	60	1100	677.60	.68	117	1.34	1.34	275	260		104	100	67	1.0
			leak check	0.006 at	9"									
B	0	1105	678.06											
B 3	10	1115	684.53	.65	116	1.33	1.33	270	255		98	97	66	1.5
3	20	1125	690.34	.68	116	1.39	1.39	263	256		104	100	68	2.0
2	30	1135	[illegible]	.75	115	1.60	1.60	264	256		105	101	68	2.0
2	40	1145	[illegible]	.75	116	1.64	1.64	266	255		105	100	67	2.0
1	50	1155	[illegible]	.75	117	1.47	1.47	265	260		106	101	65	2.5
1	60	1205	[illegible]	.75	118	1.60	1.60	265	262		105	101	68	2.5
			leak check	.75										

Comments:

Eastern Research Group, Inc.

MOISTURE RECOVERY FORM FOR METHOD 4

Plant	LTV Steel
Date	6/25/97
Sampling Location	Outlet
Sample Type	Metals
Run Number	2
Impinger Box Number	Outlet Metals
Recovery Person	J Swift
Recovery Rinses	3 x 0.1N HNO3
Sample Identification	LTV-
Filter Number	
XAD Number	NA

Impinger Number	Impinger Solution	Amount of Solution (g)	Impinger Tip Configuration	Impinger Weight		
				Final (g)	Initial (g)	Weight Gain (g)
1	MT	—	KO	569.3	437.0	132.3
2	5% HNO_3 10% H_2O_2	~100g	MGS	188.1	598.8	189.3
3	5% HNO_3 10% H_2O_2	~100g	GS	607.3 ~~693.9~~ 7/3 6 26 97	573.9	33.4
4	MT	—	GS	470.3	462.2	8.1
5	4% $KMnO_4$ 10% H_2SO_4	~100g	MGS	611.9	609.3	2.6
6	4% $KMnO_4$ 10% H_2O_2	~100g	GS	565.7	565.6	0.1
7	Silica Gel	~250g	GS	787.9	763.7	24.2
					Total Weight Gain (g)	390

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MODIFIED METHOD 5 DATA SHEET

Run 2
Page 1 of 2

Plant	LTI	XAD Trap Number		Meter Box Number	
Date	6-26-97	Filter Heater Setting (°F)		Meter delta H @	
Operator	MCS	Probe Length & Type		DGM Factor (Y)	
Sampling Location		Probe Heater Setting (°F)		Nozzle Type & ID (in.)	
Sample Type	Ni Fab	Minimum Sample Volume (ft3)		Ambient Temperature (°F)	
Run Number	2	Initial Leak Check		Assumed Moisture (% H2O)	
Static Pressure (±) (in. H2O)		Final Leak Check		K-Factor	2.05
Barometric Pressure (in. H2O)					

Diagram of Duct

Schematic of Traverse Point Layout

Read and record all data every 10 minutes

Traverse Point Number	Sampling Time (min)	Clock Time (24hr)	Gas Meter Reading ((Vm),ft3)	Velocity Head ((delta Ps), in.H2O)	Stack Ts (°F)	Orifice Pressure Differential (delta H, in.H2O) Desired	Actual	Probe Temp. (°F)	Filter Temp. (°F)	Adsorbent Trap Temp. (°F)	Dry Gas Meter Inlet (Tm in)	Outlet (Tm out)	Impinger Exit Temp. (°F)	Pump Vacuum (in.Hg)
	0	1435	568.75							N/A				
D 3	10	1445	569.5	.60	118	1.23	1.23	246	255		88	87	62	5.0
3	20	1455	571.29	.60	119	1.23	1.23	245	261		97	90	60	3.0
2	30	1505	573.08	.75	119	1.53	1.53	270	262		99	90	65	3.0
2	40	1515	585.07	.70	117	1.43	1.43	252	266		102	95	64	3.0
1	50	1525	591.46	.68	117	1.39	1.29	250	264		118	103	66	3.0
1	60	1535	598.345	.65	116	1.35	1.25	251	260		118	104	67	3.0
			6.00 ft	7"										

Comments:

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MODIFIED METHOD 5 DATA SHEET

Run [illegible]
Page 1 of [illegible]

Plant	[illegible]	XAD Trap Number	N/A	Meter Box Number	[illegible]
Date	[illegible]	Filter Heater Setting (°F)	[illegible]	Meter delta H @	[illegible]
Operator	[illegible]	Probe Length & Type	[illegible]	DGM Factor (Y)	[illegible]
Sampling Location	[illegible]	Probe Heater Setting (°F)	[illegible]	Nozzle Type & ID (in.)	[illegible]
Sample Type	[illegible]	Minimum Sample Volume (ft3)		Ambient Temperature (°F)	81
Run Number	[illegible]	Initial Leak Check	[illegible]	Assumed Moisture (% H2O)	[illegible]
Static Pressure (±) (in. H2O)	[illegible]	Final Leak Check	[illegible] at [illegible]	K-Factor	[illegible]
Barometric Pressure (in. H2O)	[illegible]				

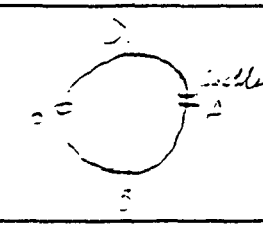

Diagram of Duct

Schematic of Traverse Point Layout

Read and record all data every 10 minutes

Traverse Point Number	Sampling Time (min)	Clock Time (24hr)	Gas Meter Reading ((Vm),ft3)	Velocity Head ((delta Ps), in.H2O)	Stack Ts (°F)	Orifice Pressure Differential (delta H, in.H2O) Desired	Actual	Probe Temp. (°F)	Filter Temp. (°F)	Adsorbent Trap Temp. (°F)	Dry Gas Meter Inlet (Tm in)	Dry Gas Meter Outlet (Tm out)	Impinger Exit Temp. (°F)	Pump Vacuum (in.Hg)
	0	0955	[illegible]							N/A				
3	10	1005	446.63	.65	117	1.33	1.33	245	231		82	81	60	1.0
3	20	1015	452.80	.65	117	1.33	1.32	246	253		86	82	59	1.0
2	30	1025	459.64	.80	117	1.64	1.64	246	245		88	84	62	1.0
2	40	1035	466.38	.80	117	1.64	1.64	240	247		84	84	62	1.0
1	50	1045	473.80	.75	117	1.53	1.55	258	244		92	86	66	1.0
1	60	1055	480.16	.65	116	1.33	1.34	252	250		95	88	65	1.0
		Leak check	0.010 at 9"											
	0	1135	480.77											
3	10	1135	486.75	.65	117	1.33	1.33	245	247		90	88	66	1.0
3	20	1145	492.65	.65	117	1.33	1.33	245	249		93	89	62	1.0
2	30	1155	500.00	.70	118	1.43	1.43	260	248		95	90	63	1.0
2	40	1205	507.33	.85	118	1.74	1.74	255	245		96	88	64	1.0
1	50	1215	514.40	.82	119	1.68	1.68	251	240		96	91	64	1.0
1	60	1225	520.49	.72	119	1.47	1.47	250	240		96	90	68	1.5
		Leak check	0.010 at 7"											
	0	1305	527.215											
3	10	1315	533.51	.60	117	1.23	1.23	235	225		89	89	64	1.5
3	20	1325	539.32	.60	117	1.23	1.22	242	216		93	88	62	1.5
2	30	1335	545.17	.65	119	1.32	1.22	245	230		91	87	62	1.5
2	40	1345	551.07	.65	119	1.32	1.32	245	231		95	89	63	1.5
1	50	1355	557.05	.62	119	1.27	1.27	250	225		92	87	63	1.5
1	60	1405	563.63	.64	119	1.31	1.31	252	225		91	88	63	1.5
		Leak check	0.010 at 7"											

Comments:

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Metals

MODIFIED METHOD 5 DATA SHEET

Page 2

Run 1
Page 1 of 2

Plant	STV	XAD Trap Number		Meter Box Number	
Date	6-25-07	Filter Heater Setting (°F)		Meter delta H @	
Operator	MKC	Probe Length & Type		DGM Factor (Y)	
Sampling Location	7 FCC	Probe Heater Setting (°F)		Nozzle Type & ID (in.)	
Sample Type	METALS	Minimum Sample Volume (ft3)		Ambient Temperature (°F)	
Run Number	1	Initial Leak Check		Assumed Moisture (% H2O)	
Static Pressure (±) (in. H2O)		Final Leak Check		K-Factor	2.05
Barometric Pressure (in. H2O)					

Diagram of Duct

Schematic of Traverse Point Layout

Read and record all data every 10 minutes

Traverse Point Number	Sampling Time (min)	Clock Time (24hr)	Gas Meter Reading ((Vm),ft3)	Velocity Head ((delta Ps), in.H2O)	Stack Ts (°F)	Orifice Pressure Differential (delta H, in.H2O) Desired	Actual	Probe Temp. (°F)	Filter Temp. (°F)	Adsorbent Trap Temp. (°F)	Dry Gas Meter Inlet (Tm in)	Outlet (Tm out)	Impinger Exit Temp. (°F)	Pump Vacuum (in.Hg)
	0	1600	399.115											
C 3	10	1610	402.42	.65	120	1.22	1.22	225	275		95	95	59	3.0
3	20	1620	405.58	.62	119	1.27	1.27	225	265		104	94	57	3.0
2	30	1630	408.22	.70	117	1.43	1.43	225	265		112	103	66	3.5
2	40	1640	410.14	.70	121	1.43	1.43	225	272		112	106	67	3.5
1	50	1650	411.11	.68	120	1.50	1.50	264	266		113	102	68	3.5
1	60	1700	414.089	1.10	120	2.25	2.25	265	266		117	107	68	3.5
			.040											

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MOISTURE RECOVERY FORM FOR METHOD 4

Plant	LTV Steel
Date	6/24/97
Sampling Location	Outlet
Sample Type	Metals
Run Number	1
Impinger Box Number	Outlet
Recovery Person	JSwift
Recovery Rinses	3 x 0.1N HNO3
Sample Identification	LTV-
Filter Number	002
XAD Number	NA

Impinger Number	Impinger Solution	Amount of Solution (g)	Impinger Tip Configuration	Impinger Weight		
				Final (g)	Initial (g)	Weight Gain (g)
1	MT	—	KO	592.3	421.4	170.9
2	5% HNO3 10% H2O2	~100g	MGS	754.0	591.7	162.3
3	5% HNO3 10% H2O2	~100g	GS	597.0	577.9	19.1
4	MT	—	GS	497.2	486.8	10.4
5	4% KMnO4 10% H2SO4	~100g	MGS	563.4	561.6	1.8
6	4% KMnO4 10% H2SO4	~100g	GS	603.2	600.0	3.2
7	Silica Gel	~250g	GS	831.4	794.7	36.7
			Total Weight Gain (g)			404.4

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MODIFIED METHOD 5 DATA SHEET

Run ____
Page 1 of ____

Plant	LTV - CHICAGO	XAD Trap Number	—	Meter Box Number	A-0
Date	6/25/97	Filter Heater Setting (°F)	250	Meter delta H @	1.791
Operator	MWH	Probe Length & Type	8' Pyrex	DGM Factor (Y)	.954
Sampling Location	INLET	Probe Heater Setting (°F)	250	Nozzle Type & ID (in.)	.103
Sample Type	M. METALS	Minimum Sample Volume (ft3)	N/A	Ambient Temperature (°F)	90°
Run Number	#1	Initial Leak Check	.019@15"	Assumed Moisture (% H2O)	6%
Static Pressure (±) (in. H2O)	- 5.6"	Final Leak Check	.0016.5"	K-Factor	0.086
Barometric Pressure (in. H2O)	29.36				

60" x 112"

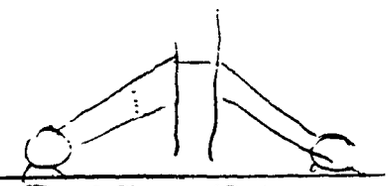

Diagram of Duct

$CO_2 = 2.5$, $O_2 = 19$ 1st Point
$CO_2 = 3.5$ $O_2 = 19$ 2nd Point
$CO_2 = 3.5$ $O_2 = 18.5$ 3rd Point

Schematic of Traverse Point Layout

Read and record all data every ____ minutes

Traverse Point Number	Sampling Time (min)	Clock Time (24hr)	Gas Meter Reading ((Vm),ft3)	Velocity Head ((delta Ps), in.H2O)	Stack Ts (°F)	Orifice Pressure Differential (delta H, in.H2O) Desired	Actual	Probe Temp. (°F)	Oven Filter Temp. (°F)	Adsorbent Trap Temp. (°F)	Dry Gas Meter Inlet (Tm in)	Dry Gas Meter Outlet (Tm out)	Impinger Exit Temp. (°F)	Pump Vacuum (in.Hg)
	0	09:30	288.127			±.02								
A-1	10	09:40	291.52	4.0	217	0.344	.34	245	247	N/A	83	83	71	1"
1	20	09:51	295.02	4.0	210	0.344	.34	240	246		90	84	54	1"
2	30	10:01	296.74	3.5	208	0.301	.30	236	244		90	84	55	1"
2	40	10:11	300.47	3.0	208	0.31	.31	240	246		90	82	57	1"
3	50	10:21	304.52	4.0	213	0.41	.41	240	244		90	83	58	1"
3	60	10:31	308.063	4.0	211	0.41	.41	247	250		90	83	60	1"
					FINAL	Leak	Check	.0016	1"					
	60	12:10	318.058											
B-1	70	12:20	321.416	3.2	217	.276	.28	240	245	N/A	90	89	87	1.0
1	80	12:30	324.57	3.2	220	.270	.28	273	290		98	90	57	1
2	90	12:40	327.125	2.5	221	.22	.22	267	277		98	91	58	1
2	100	12:50	329.432	2.0	[illegible]	.22	.22	269	276		98	91	61	1
3	110	13:00	333.01	3.2	222	.29	.28	255	266		98	91	62	1
3	120	13:10	336.15	3.0	215	.29	.29	237	259		98	91	60	1
	120	13:05	336.180											
C-1	130	14:15	338.70	2.2	224	.189	.19	240	254	N/A	94	91	79	1
1	140	14:25	341.23	2.2	221	.18	.19	240	254		97	92	63	1
2	150	14:35	343.47	1.7	216	.140	.15	241	253		96	91	65	1
2	160	14:45	345.032	1.8	224	.154	.15	241	252		95	91	67	1
3	170	14:55	348.33	2.0	241	.224	.22	249	257		94	89	66	1
3	180	15:05	351.035	2.0	245	.224	.22	250	258		95	87	65	1
	180	16:10	351.080											
D-1	190	16:10	352.575	2.1	232	.191	.18	229	247	N/A	95	91	89	1
1	200	16:20	356.01	2.1	227	.181	.18	250	248		98	92	66	1
2	210	16:30	357.966	1.4	225	.121	.12	257	249		99	92	67	1
2	220	16:40	359.916	1.4	225	.121	.12	259	250		99	92	71	1
3	230	16:50	362.795	2.0	232	.224	.22	255	251		102	95	66	1
3	240	17:00	365.445	2.0	232	.224	.22	256	252		102	95	66	1

Comments:

Port 3 $CO_2 = 2.5$, $O_2 = 20$ Port 4 $CO_2 = 3.0$, $O_2 = 21$

Eastern Research Group, Inc.

MOISTURE RECOVERY FORM FOR METHOD 4

Plant	LTV Steel
Date	6/23/97
Sampling Location	Inlet
Sample Type	Metals
Run Number	1
Impinger Box Number	Inlet
Recovery Person	J Swift
Recovery Rinses	3 x 0.1N HNO3
Sample Identification	LTV -
Filter Number	007
XAD Number	NA

Impinger Number	Impinger Solution	Amount of Solution (g)	Impinger Tip Configuration	Impinger Weight Final (g)	Impinger Weight Initial (g)	Impinger Weight Weight Gain (g)
1	(KO)MT	—	KO	523.1	422.5	100.6
2	5% HNO3 10% H2O2	~100g	MGS	613.6	606.7	6.9
3	5% HNO3 10% H2O2	~100g	GS	550.6	585.9	-35.3
4	MT	—	GS	528.4	484.0	44.4
5	4% KMnO4 10% H2SO4	~100g	MGS	610.9	623.7	-12.8
6	4% KMnO4 10% H2SO4	~100g	GS	538.0	571.9	-33.9
7	Silica Gel	~250g	GS	800.6	777.3	23.3
					Total Weight Gain (g)	93.2

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MODIFIED METHOD 5 DATA SHEET

Run 2
Page 1 of ____

Plant	LTV	XAD Trap Number	—	Meter Box Number	A-40
Date	6-26-97	Filter Heater Setting (°F)	250°F	Meter delta H @	1.791
Operator	MWH DW	Probe Length & Type	8' GLASS	DGM Factor (Y)	.994
Sampling Location	Inlet	Probe Heater Setting (°F)	250°F	Nozzle Type & ID (in.)	.103
Sample Type	metals	Minimum Sample Volume (ft3)	—	Ambient Temperature (°F)	75°
Run Number	2	Initial Leak Check	0.01 @ 10"	Assumed Moisture (% H2O)	6.9
Static Pressure (±) (in. H2O)	-5.6"	Final Leak Check		K-Factor	.086
Barometric Pressure (in. H2O) 997	29.45				

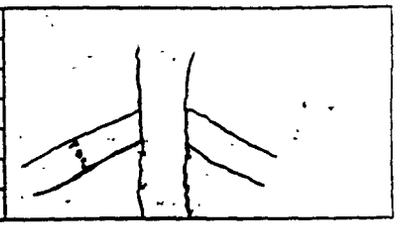


Diagram of Duct

(A) Port 1 - CO_2=3.0, O_2=19.5
(B) Port 1 - CO_2=3.0, O_2=19
Port 3 - CO_2=4.5, O_2=19 Port 3 B 18.5, 3.0

420
366.200

Schematic of Traverse Point Layout

Read and record all data every 10 minutes

Traverse Point Number	Sampling Time (min)	Clock Time (24hr)	Gas Meter Reading ((Vm),ft3)	Velocity Head ((delta Ps), in.H2O)	Stack Ts (°F)	Orifice Pressure Differential (delta H, in.H2O) Desired	Actual	Probe Temp. (°F)	Oven Filter Temp. (°F)	Adsorbent Trap Temp. (°F)	Dry Gas Meter Inlet (Tm in)	Dry Gas Meter Outlet (Tm out)	Impinger Exit Temp. (°F)	Pump Vacuum (in.Hg)
	0	0955	~~365.979~~		213									
A-1	10	10:05	368.835	3.7	~~214~~	.319	.319	251	263	N/A	88	82	73	1"
1	20	10:15	372.18	3.7	218	.319	.319	256	261		91	83	65	1"
2	30	10:25	376.35	3.1	214	.267	.27	250	258		90	83	63	1
2	40	10:35	379.30	3.1	216	.267	.27	252	257		91	83	62	1
3	50	10:45	382.56	3.5	216	.301	.30	250	258		92	84	63	1
3	60	10:55	385.91	3.5	214	.301	.30	253	258		92	85	63	1
	60	11:25	385.891			.01 @ 3"								
B-1	70	11:35	390.93	3.0	227	.258	.26	237	258	N/A	84	84	72	1
1	80	11:45	391.938	2.0	224	.258	.26	244	257		92	85	63	1
2	90	11:55	394.698	2.4	231	.206	.21	251	257		92	86	64	1
2	100	12:05	397.455	2.4	231	.206	.21	257	261		94	87	66	1
3	110	12:15	400.33	2.6	237	.224	.22	260	263		96	89	68	1
3	120	12:25	403.338	2.9	242	.250	.25	252	264		99	91	67	1.2
	120	12:05	403.418			.01 @ 3"								
C-1	130	12:15	406.125	2.3	233	.198	.20	261	263	N/A	98	94	84	1.2
1	140	12:25	408.81	2.3	229	.198	.20	253	256		99	93	68	1.2
2	150	12:35	411.34	2.0	227	.172	.17	246	251		99	93	67	1.2
2	160	12:45	413.88	2.0	226	.172	.17	242	251		99	92	69	1.2
3	170	12:55	416.70	2.7	228	.232	.23	241	251		100	92	69	1.2
3	180	14:05	419.571	2.7	230	.232	.23	240	249		99	93	69	1.2
	180	14:25	419.634			.01 @ 3"								
D-1	190	14:45	422.416	2.5	215	.215	.22	235	248	N/A	98	93	78	1.2
1	200	14:55	425.34	2.5	215	.215	.22	249	250		104	95	60	1.2
2	210	15:05	427.161	1.4	216	.121	.12	257	254		105	97	62	1.2
2	220	15:15	429.09	1.4	209	.121	.12	261	258		106	99	68	1.2
3	230	15:25	432.765	2.5	211	.215	.22	264	260		107	99	67	1.2
3	240	15:35	435.559	2.5	213	.215	.22	259	261		105	98	64	1.2
						.01 @ 5"								

Comments:

Port 4 CO_2=2.5, O_2=18

Eastern Research Group, Inc.

MOISTURE RECOVERY FORM FOR METHOD 4

Plant	LTV Steel
Date	6/25/97
Sampling Location	Inlet
Sample Type	Metals
Run Number	2
Impinger Box Number	Inlet
Recovery Person	JSwift
Recovery Rinses	3 x 0.1N HNO_3
Sample Identification	LTV
Filter Number	
XAD Number	NA

Impinger Number	Impinger Solution	Amount of Solution (g)	Impinger Tip Configuration	Impinger Weight		
				Final (g)	Initial (g)	Weight Gain (g)
1	MT	—	KO	497.4	454.3 ~~437.0~~	43.1
2	5% HNO_3 10% H_2O_2	~100g	MGS	634.2	592.4	41.8
3	5% HNO_3 10% H_2O_2	~100g	GS	568.5	564.8	3.7
4	MT	—	GS	427.9	427.3	0.6
5	4% $KMnO_4$ 10% H_2SO_4	~100g	MGS	579.8	580.5	-0.7
6	4% $KMnO_4$ 10% H_2SO_4	~100g	GS	576.0	576.2	-0.2
7	Silica Gel	~250g	GS	728.6	718.3	10.3
			Total Weight Gain (g)			98.6

Eastern Research Group, Inc.

MODIFIED METHOD 5 DATA SHEET

Plant	LTV	XAD Trap Number	—	Meter Box Number	A-4
Date	6-27-97	Filter Heater Setting (°F)	25°	Meter delta H @	.79
Operator	MWW/DLW	Probe Length & Type	5' GLASS	DGM Factor (Y)	.984
Sampling Location	Inlet	Probe Heater Setting (°F)	250	Nozzle Type & ID (in.)	0.103
Sample Type	METALS	Minimum Sample Volume (ft3)	—	Ambient Temperature (°F)	80°
Run Number	3	Initial Leak Check	.006 @ 10"	Assumed Moisture (% H2O)	6.8
Static Pressure (±) (in. H2O)	-5.6"	Final Leak Check	.001 @ 5"	K-Factor	0.0846
Barometric Pressure (in. H2O)	29.51				

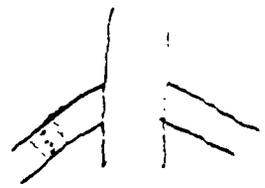


Diagram of Duct

Port 1 CO_2 = 2.5, O_2 = 16.5
Port 2 CO_2 = 3.5, O_2 = 20
(A) Port 3 CO_2 = 4.0 O_2 = 19.7 (B) CO_2 = 3.5 O_2 =

Schematic of Traverse Point Layout

Read and record all data every 10 minutes

Traverse Point Number	Sampling Time (min)	Clock Time (24hr)	Gas Meter Reading ((Vm),ft3)	Velocity Head ((delta Ps), in.H2O)	Stack Ts (°F)	Orifice Pressure Differential (delta H, in.H2O) Desired	Actual	Probe Temp. (°F)	Oven Filter Temp. (°F)	Adsorbent Trap Temp. (°F)	Dry Gas Meter Inlet (Tm in)	Outlet (Tm out)	Impinger Exit Temp. (°F)	Pump Vacuum (in.Hg)
	0	08:35	430.090											
A-1	10	08:45	439.21	4.0	195	.344	.344	253	266	N/A	89	82	54	1"
1	20	08:55	442.81	4.0	194	.344	.344	258	271		91	83	52	1"
2	30	09:05	445.790	3.5	192	.301	.30	249	257		92	83	55	1"
2	40	09:15	448.995	3.5	192	.301	.30	242	252		93	84	57	1"
3	50	09:25	452.49	4.2	200	.362	.360	247	254		94	85	56	1"
3	60	09:35	455.950	4.2	208	.362	.360	248	254		95	86	59	1"
	60	10:00	456.008		.01 @ 5"						~~[illegible]~~	~~[illegible]~~		
B-1	70	10:10	459.215	3.2	205	.276	.28	247	247	N/A	97	96	64	1"
1	80	10:20	462.225	3.2	198	.276	.28	254	252		96	96	53	1"
2	90	10:30	464.93	3.6	205	.224	.22	254	253		96	88	53	1"
2	100	10:40	467.585	3.6	207	.224	.22	254	255		96	89	57	1"
3	110	10:50	470.085	3.2	201	.276	.28	259	256		98	90	54	1"
3	120	11:00	473.723	3.2	193	.276	.28	262	260		100	92	60	1"
	120	11:21	473.018		.001 @ 3"									
C-1	130	11:31	476.140	2.4	192	.192	.19	243	258	N/A	97	93	64	1"
1	140	11:41	478.535	2.4	196	.192	.19	250	259		100	94	62	1"
2	150	11:51	480.773	1.4	199	.152	.15	257	262		101	95	65	1"
3	160	12:01	483.025	1.4	191	.152	.15	261	264		103	96	70	1"
3	170	12:11	485.775	2.8	198	.272	.27	261	265		104	98	69	1"
3	180	12:21	488.45	2.6	198	.272	.27	260	266		108	99	69	1"
	180	12:42	488.50		.001 @ 3"						~~107~~	~~102~~	~~[illegible]~~	~~1"~~
D-1	190	12:52	491.05	2.4	194	.192	.19	249	258	N/A	107	102	71	1"
1	200	13:02	493.545	2.4	209	.192	.19	250	258		112	103	72	1"
2	210	13:12	495.83	1.6	208	.128	.13	254	256		113	104	74	1"
2	220	13:22	498.01	1.6	202	.128	.13	259	260		113	105	78	1"
3	230	13:32	500.81	2.9	204	.232	.23	264	260		114	105	77	1"
3	240	13:42	503.503	2.9	205	.232	.23	260	259		115	105	73	1"

Comments:

Port 4 CO_2 = 3 O_2 = 17

Eastern Research Group, Inc.

MOISTURE RECOVERY FORM FOR METHOD 4

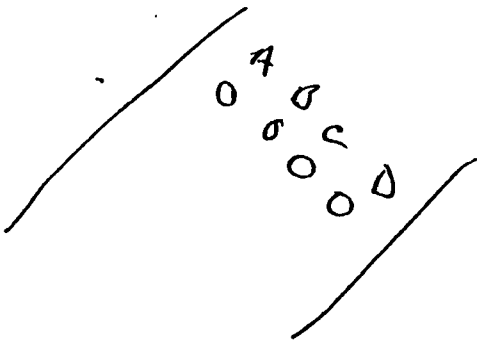
Plant	LTV Steel
Date	6/27/11
Sampling Location	Inlet
Sample Type	Metals
Run Number	3
Impinger Box Number	[illegible] Inlet
Recovery Person	JSc.ll
Recovery Rinses	3x 0.1N HNO_3
Sample Identification	LTV
Filter Number	
XAD Number	NA

Impinger Number	Impinger Solution	Amount of Solution (g)	Impinger Tip Configuration	Impinger Weight		
				Final (g)	Initial (g)	Weight Gain (g)
1	MT	—	KO	473.1	425.8	47.3
2	5% HNO_3 10% H_2O_2	~100g	MGS	647.4	610.9	36.5
3	5% HNO_3 10% H_2O_2	~100g	GS	594.2	592.1	2.1
4	MT	—	GS	487.7	487.5	0.2
5	4% $KMnO_4$ 10% H_2SO_4	~100g	MGS	621.7	620.9	0.8
6	4% $KMnO_4$ 10% H_2SO_4	~100g	GS	582.5	582.7	-0.2
7	Silica Gel	~250g	GS	780.6	770.7	9.9
				Total Weight Gain (g)		96.6

Eastern Research Group, Inc.

Preliminary Velocity Traverse Form and Cyclonic Flow Check

Plant	LTV EAST CHICAGO
Date	6/24/97
Location	INLET.
Stack ID (in)	60" x 128"
Barometric Pressure (in Hg)	996 MBAR 29.42
Ambient Temperature (°F)	100°
Static Pressure (in H2O)	5.6"
Operators	MWH JF McG.
Checked By	



Schematic of Traverse Point Layout
(Cross Section of Duct)

Traverse Point Number	Velocity Head ΔP, (in H2O)	Stack Temperature Ts, (°F)	Cyclonic Flow Angle (± °)	Traverse Point Number	Velocity Head ΔP, (in H2O)	Stack Temperature Ts, (°F)	Cyclonic Flow Angle (± °)
D-1	2.3	239	0°				
D-2	1.5	239	0°				
D-3	2.9	240	0°				
C-1	2.2	242	0°				
2	1.9	246	0°				
3	2.9	245	0°				
B-1	2.9	248	0°				
B-2	2.5	249	0°				
B-3	3.4	248	0°				
A-1	3.3	250	0°				
2	3.4	250	0°				
3	3.9	251	0°				
	1250 - 1330						

[1] Average of Absolute Values of All Ar[illegible] [illegible] Alignment Approach Sampling

Eastern Research Group, Inc.

K-FACTOR CALCULATION FORM

Plant	LTV EAST CHICAGO	Operator	MWH
Date	6/24/97	Used for runs	1, 2, 3
Location/Sampling Train			

C_p (S-type: 0.84; Std: 0.99)	0.84
P_b (barometric pressure at location) 992	~~29.42~~ 29.30
D_n (nozzle diameter, inches)	0.103
B_w (moisture in gas stream, fractional percent)	0.06
P_m (barometric pressure at meter, Hg) = (Average ΔH / 13.6) + P_b	~~29.64~~ 29.34
$\Delta H@$ (pressure differential of orifice in meterbox, H_2O)	~~1.84~~ 1.791
P_s (stack pressure, in. Hg) = P_b ± (stack static pressure (in. H_2O) / 13.6) -5.6 = -0.41" Hg.	~~29.85~~ 28.90
T_s (average stack temperature, °R) = ___ °F + 460 = ___ °R 250°	710
T_m (average meter temperature, °R) = $T_{ambient}$ + 20°F + 460 = ___ °R 100°	~~580~~ 570
M_d (molecular weight of stack gas, dry, lb/lb-mole) = (0.44 x %CO_2) + (0.32 x %O_2) + (0.28 x %N_2)	29.0
M_s (molecular weight of stack gas with water vapor, lb/lb-mole) = [M_d x (1 - B_w)] + [18 x B_w]	28.34
$K = (846.720)(D_n)^4(\Delta H@)(C_p)^2(1-B_w)^2(M_d/M_s)(P_s/P_m)(T_m/T_s)$	~~.092~~ .086

$\Delta H = K\Delta P$
Correlation Chart

1		2		3	
ΔH	ΔP	ΔH	ΔP	ΔH	ΔP
.184	2.0				
.276	3.0				
.368	4.0				

Comments: _____

ERG
Eastern Research Group, Inc.

Traverse Point Location Form

Plant	LTV - Chicago	Sample Ports Information	Number	I.D. (in)
Date	6/24/97			
Sampling Location	INLET			
Total Duct Depth (Distance A)	~~64"~~ 60"			
Inside Far Wall to Outside of Nipple/Port)	64"			
Nipple/Port Length (Distance B)	4"			
Inside Near Wall to Outside End of Nipple/Port)				
Stack Depth (Dist A – Dist B)	60"			
Stack Width (If rectangular)				
Nearest Upstream Disturbance				
Nearest Downstream Disturbance				
Location	MWI			

Schematic of Sampling Location
(Cross Section of Duct)

1	2	3	4	5	6
Traverse Point Number	Percent Fraction of Stack ID	Stack ID (in)	Product of Columns 2 & 3 (to nearest 1/8 inch)	Distance B (in)	Traverse Point Location from Outside of Nipple (sum of columns 4 & 5)
ABCD-1	16.67	60"	10"	4"	14"
2	0.50		30"	4"	34"
3	0.87		50"	4"	54"

Appendix E.2

Meter Box Calibrations

A-38

Initial 5 point Cal.

INSTRUMENTS
A METHOD 5
Meter Box Pre-Test Calibration
English Meter Box and English Calibration Meter Units

Filename: F:\DATAFILE\CALIBRAT\CAL_MENU.DSK\DGM_PREL.5P\A-38.WK1

Model Number: 511 Date: ->4/29/97
Serial Number: A-38 Barometric Pressure: -> 29.53 (in. Hg)
Calibration Meter Factor Yc: -> 1.0023 (number)

		DRY GAS METER READING				GAS Temperature		CALIBRATION METER READINGS			CALIBRATION METER Temperature	
dH (in H20)	Elasped Time (min)	Volume Initial (cu ft)	Volume Final (cu ft)	Volume Total (cu ft)		Inlet (deg F)	Outlet (deg F)	Volume Initial (cu ft)	Volume Final (cu ft)	Volume Total (cu ft)	Inlet (deg F)	Outlet (deg F)
5.00	10.00	212.123	224.631	12.508	Initial->	79.0	69.0	82.098	94.425	12.327	71.0	71.0
					Final--->	87.0	74.0					
3.00	12.50	224.631	236.780	12.149	Initial->	81.0	73.0	94.425	106.269	11.844	71.0	71.0
					Final--->	82.0	75.0					
2.00	10.00	236.780	244.791	8.011	Initial->	81.0	75.0	106.269	114.045	7.776	71.0	71.0
					Final--->	91.0	76.0					
1.00	22.00	244.791	257.487	12.696	Initial->	85.0	74.0	114.045	126.309	12.264	71.0	71.0
					Final--->	85.0	77.0					
0.50	14.00	257.487	263.361	5.874	Initial->	83.0	78.0	126.309	131.965	5.656	71.0	71.0
					Final--->	85.0	78.0					

	DRY GAS METER METER CALIBRATION FACTOR Y			DRY GAS METER ORIFICE CALIBRATION FACTOR dH@	
	Value (number)	Variation (number)		Value (in H20)	Variation (in H20)
	0.987	0.003		1.865	0.038
	0.982	-0.002		1.885	0.058
	0.986	0.002		1.861	0.033
	0.983	-0.001		1.811	-0.017
	0.982	-0.002		1.716	-0.112
Average	0.984		Average	1.828	

te: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +-0.02.

For Orifice Calibration Factor dH@, the orifice differential pressure in inches of H20 that equates to 0.75 cfm of air at 68 F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +-0.2.

ertify that the above Dry Gas Meter was calibrated in accordance with E.P.A. Method 5 , paragraph 7.1 ;CFR 40 Part 60, ng the Precision Wet Test Meter # 11AE6, which in turn was calibrated using the American Bell Prover # 3785, tificate # F107, which is traceable to the National Bureau of Standards (N.I.S.T.).

Signature _____ Date _____

English Meter Box and English Calibration Meter Units

Filename: F:\DATAFILE\CALIBRAT\CAL_MENU.DSK\DGM_PREL.5P\A-39.WK1

Model Number: 511 Date: ->4/30/97
Serial Number: A-39 Barometric Pressure: -> 29.65 (in. Hg)
Calibration Meter Factor Yc: -> 1.0023 (number)

dH (in H20)	Elasped Time (min)	DRY GAS METER READING Volume Initial (cu ft)	Volume Final (cu ft)	Volume Total (cu ft)		GAS Temperature Inlet (deg F)	Outlet (deg F)	CALIBRATION METER READINGS Volume Initial (cu ft)	Volume Final (cu ft)	Volume Total (cu ft)	CALIBRATION METER Temperature Inlet (deg F)	Outlet (deg F)
5.00	6.00	117.896	125.546	7.650	Initial->	96.0	77.0	159.982	167.562	7.580	75.0	75.0
					Final--->	98.0	79.0					
3.00	32.50	125.546	158.483	32.937	Initial->	93.0	79.0	167.562	199.789	32.227	75.0	75.0
					Final--->	102.0	83.0					
2.00	56.00	158.483	205.872	47.389	Initial->	97.0	83.0	199.789	245.655	45.866	75.0	75.0
					Final--->	102.0	86.0					
1.00	22.00	205.872	218.935	13.063	Initial->	98.0	86.0	245.655	258.225	12.570	75.0	75.0
					Final--->	98.0	85.0					
0.50	15.00	251.983	258.408	6.425	Initial->	87.0	83.0	290.051	296.269	6.218	75.0	75.0
					Final--->	94.0	83.0					

	DRY GAS METER METER CALIBRATION FACTOR Y Value (number)	Variation (number)		DRY GAS METER ORIFICE CALIBRATION FACTOR dH@ Value (in H20)	Variation (in H20)
	1.004	0.008		1.774	0.073
	0.999	0.003		1.718	0.017
	0.996	0.000		1.668	-0.033
	0.992	-0.004		1.711	0.010
	0.990	-0.006		1.632	-0.068
Average	0.996		Average	1.700	

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +-0.02.

For Orifice Calibration Factor dH@, the orifice differential pressure in inches of H20 that equates to 0.75 cfm of air at 68 F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +-0.2.

Filename: F:\DATAFILE\CALIBRAT\CAL_MENU.DSK\DGM_PREL.5P\A-40.WK1

Model Number: 511 Date: ->4/29/97
Serial Number: A-40 Barometric Pressure: -> 29.58 (in. Hg)
Calibration Meter Factor Yc: -> 1.0023 (number)

dH (in H20)	Elasped Time (min)	DRY GAS METER READING Volume Initial (cu ft)	Volume Final (cu ft)	Volume Total (cu ft)		GAS Temperature Inlet (deg F)	Outlet (deg F)	CALIBRATION METER READINGS Volume Initial (cu ft)	Volume Final (cu ft)	Volume Total (cu ft)	CALIBRATION METER Temperature Inlet (deg F)	Outlet (deg F)
5.00	5.00	179.628	185.954	6.326	Initial->	92.0	76.0	46.005	52.125	6.120	71.0	71.0
					Final--->	96.0	79.0					
3.00	14.00	209.020	223.316	14.296	Initial->	94.0	82.0	74.309	87.941	13.632	71.0	71.0
					Final--->	102.0	84.0					
2.00	14.00	223.316	234.850	11.534	Initial->	92.0	84.0	87.941	98.923	10.982	71.0	71.0
					Final--->	96.0	85.0					
1.00	10.00	234.850	240.728	5.878	Initial->	89.0	84.0	98.923	104.529	5.606	71.0	71.0
					Final--->	97.0	83.0					
0.50	77.50	240.728	272.716	31.988	Initial->	91.0	84.0	104.529	135.078	30.549	71.0	71.0
					Final--->	91.0	84.0					

	DRY GAS METER METER CALIBRATION FACTOR Y Value (number)	Variation (number)		DRY GAS METER ORIFICE CALIBRATION FACTOR dHa Value (in H20)	Variation (in H20)
	0.984	0.000		1.868	0.076
	0.984	-0.001		1.753	-0.038
	0.982	-0.002		1.795	0.004
	0.985	0.000		1.761	-0.030
	0.986	0.002		1.779	-0.012
Average	0.984		Average	1.791	

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +-0.02.

For Orifice Calibration Factor dHa, the orifice differential pressure in inches of H20 that equates to 0.75 cfm of air at 68 F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +-0.2.

I certify that the above Dry Gas Meter was calibrated in accordance with E.P.A. Method 5 , paragraph 7.1 ;CFR 40 Part 60, using the Precision Wet Test Meter # 11AE6, which in turn was calibrated using the American Bell Prover # 3785

A 35

APEX INSTRUMENTS
EPA METHOD 5
Meter Box Pre-Test Calibration
English Meter Box and English Calibration Meter Units

Filename: F:\DATAFILE\CALIBRAT\CAL_MENU.DSK\DGM_PREL.5P\A-35.WK1

Model Number: 511 Date: ->4/25/97
Serial Number: A-35 Barometric Pressure: -> 29.72 (in. Hg)
Calibration Meter Factor Yc: -> 1.0023 (number)

		DRY GAS METER READING				GAS Temperature		CALIBRATION METER READINGS			CALIBRATION METER Temperature	
dH (in H20)	Elasped Time (min)	Volume Initial (cu ft)	Volume Final (cu ft)	Volume Total (cu ft)		Inlet (deg F)	Outlet (deg F)	Volume Initial (cu ft)	Volume Final (cu ft)	Volume Total (cu ft)	Inlet (deg F)	Outlet (deg F)
5.00	25.00	642.638	672.722	30.084	Initial->	79.0	73.0	839.501	869.250	29.749	71.0	71.0
					Final--->	109.0	82.0					
3.00	8.50	672.722	680.737	8.015	Initial->	98.0	82.0	869.250	877.161	7.911	71.0	71.0
					Final--->	105.0	83.0					
2.00	12.00	680.737	690.098	9.361	Initial->	88.0	82.0	877.161	886.170	9.009	71.0	71.0
					Final--->	102.0	82.0					
1.00	13.00	690.098	697.456	7.358	Initial->	96.0	82.0	886.170	893.289	7.119	71.0	71.0
					Final--->	102.0	83.0					
0.50	34.50	697.456	711.090	13.634	Initial->	92.0	83.0	893.289	906.385	13.096	71.0	71.0
					Final--->	95.0	83.0					

	DRY GAS METER METER CALIBRATION FACTOR Y			DRY GAS METER ORIFICE CALIBRATION FACTOR dHa	
	Value (number)	Variation (number)		Value (in H20)	Variation (in H20)
	1.006	0.003		1.967	0.048
	1.021	0.018		1.911	-0.007
	0.991	-0.011		1.960	0.042
	1.003	0.000		1.840	-0.078
	0.993	-0.010		1.913	-0.005
Average	1.003		Average	1.918	

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +-0.02.

For Orifice Calibration Factor dHa, the orifice differential pressure in inches of H20 that equates to 0.75 cfm of a at 68 F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +-0.2.

I certify that the above Dry Gas Meter was calibrated in accordance with E.P.A. Method 5 , paragraph 7.1 ;CFR 40 Part 60, using the Precision Wet Test Meter # 11AE6, which in turn was calibrated using the American Bell Prover # 3785, certificate # F107, which is traceable to the National Bureau of Standards (N.I.S.T.).

Signature _____ Date 4-25-97

A 36

APEX INSTRUMENTS
EPA METHOD 5
Meter Box Pre-Test Calibration
English Meter Box and English Calibration Meter Units

Filename: F:\DATAFILE\CALIBRAT\CAL_MENU.DSK\DGM_PREL.5P\A-36.WK1

Model Number: 511 Date: ->4/25/97
Serial Number: A-36 Barometric Pressure: -> 29.85 (in. Hg)
Calibration Meter Factor Yc: -> 1.0023 (number)

dH (in H20)	Elasped Time (min)	DRY GAS METER READING Volume Initial (cu ft)	Volume Final (cu ft)	Volume Total (cu ft)		GAS Temperature Inlet (deg F)	Outlet (deg F)	CALIBRATION METER READINGS Volume Initial (cu ft)	Volume Final (cu ft)	Volume Total (cu ft)	CALIBRATION METER Temperature Inlet (deg F)	Outlet (deg F)
5.00	7.50	537.187	546.733	9.546	Initial->	102.0	73.0	919.384	928.649	9.265	71.0	71.0
					Final--->	99.0	76.0					
3.00	8.00	546.733	554.791	8.058	Initial->	97.0	77.0	928.649	936.419	7.770	71.0	71.0
					Final--->	99.0	78.0					
2.00	13.50	554.791	566.063	11.272	Initial->	97.0	79.0	936.419	947.225	10.806	71.0	71.0
					Final--->	104.0	81.0					
1.00	26.50	566.063	581.916	15.853	Initial->	97.0	81.0	947.225	962.350	15.125	71.0	70.0
					Final--->	93.0	82.0					
0.50	23.50	581.916	592.035	10.119	Initial->	85.0	82.0	962.350	972.000	9.650	70.0	70.0
					Final--->	98.0	82.0					

	DRY GAS METER METER CALIBRATION FACTOR Y Value (number)	Variation (number)		DRY GAS METER ORIFICE CALIBRATION FACTOR dHa Value (in H20)	Variation (in H20)
	0.991	0.002		1.827	0.102
	0.990	0.001		1.764	0.039
	0.991	0.002		1.723	-0.002
	0.986	-0.003		1.687	-0.038
	0.985	-0.004		1.625	-0.100
Average	0.988		Average	1.725	

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +-0.02.

For Orifice Calibration Factor dHa, the orifice differential pressure in inches of H20 that equates to 0.75 cfm of air at 68 F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +-0.2.

I certify that the above Dry Gas Meter was calibrated in accordance with E.P.A. Method 5 , paragraph 7.1 ;CFR 40 Part 60, using the Precision Wet Test Meter # 11AE6, which in turn was calibrated using the American Bell Prover # 3785, certificate # F107, which is traceable to the National Bureau of Standards (N.I.S.T.).

Signature [signature] Date 4-25-97

A37

[illegible] INSTRUMENTS
[illegible] METHOD 5
Meter Box Pre-Test Calibration
English Meter Box and English Calibration Meter Units

Filename: F:\DATAFILE\CALIBRAT\CAL_MENU.DSK\DGM_PREL.5P\A-37.WK1

Model Number: 511 Date: ->4/30/97
Serial Number: A-37 Barometric Pressure: -> 29.60 (in. Hg)
Calibration Meter Factor Yc: -> 1.0023 (number)

dH (in H20)	Elasped Time (min)	DRY GAS METER READING Volume Initial (cu ft)	Volume Final (cu ft)	Volume Total (cu ft)		GAS Temperature Inlet (deg F)	Outlet (deg F)	CALIBRATION METER READINGS Volume Initial (cu ft)	Volume Final (cu ft)	Volume Total (cu ft)	CALIBRATION METER Temperature Inlet (deg F)	Outlet (deg F)
5.00	5.50	284.526	291.511	6.985	Initial->	93.0	81.0	309.486	316.381	6.895	76.0	76.0
					Final--->	97.0	82.0					
3.00	7.00	396.245	403.206	6.961	Initial->	101.0	80.0	419.901	426.763	6.862	76.0	77.0
					Final--->	98.0	81.0					
2.00	20.50	403.206	419.962	16.756	Initial->	93.0	79.0	426.763	443.220	16.457	77.0	77.0
					Final--->	98.0	82.0					
1.00	66.50	419.962	458.867	38.905	Initial->	93.0	82.0	443.220	481.231	38.011	77.0	77.0
					Final--->	98.0	86.0					
0.50	47.50	458.867	479.371	20.504	Initial->	94.0	86.0	481.231	501.111	19.880	77.0	78.0
					Final--->	91.0	87.0					

	DRY GAS METER METER CALIBRATION FACTOR Y Value (number)	Variation (number)		DRY GAS METER ORIFICE CALIBRATION FACTOR dH@ Value (in H20)	Variation (in H20)
	1.000	0.000		1.799	0.064
	1.005	0.006		1.772	0.037
	1.000	0.000		1.765	0.030
	1.000	0.001		1.730	-0.005
	0.992	-0.007		1.609	-0.126
Average	0.999		Average	1.735	

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +-0.02.

For Orifice Calibration Factor dH@, the orifice differential pressure in inches of H20 that equates to 0.75 cfm of air at 68 F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +-0.2.

I certify that the above Dry Gas Meter was calibrated in accordance with E.P.A. Method 5 , paragraph 7.1 ;CFR 40 Part 60, using the Precision Wet Test Meter # 11AE6, which in turn was calibrated using the American Bell Prover # 3785, certificate # F107, which is traceable to the National Bureau of Standards (N.I.S.T.).

Signature _____ Date _____

NSTRUMENTS
~~ETHOD 5~~
er Box Post-Test Calibration
~~glish Meter Box and English Calibration~~ Meter Units

Filename: F:\DATAFILE\CALIBRAT\CAL_MENU.DSK\DGM_POST.3P\A-38P.WK1

Model Number: 511 Date: ->7/2/97
Serial Number: A-38 Barometric Pressure: -> 29.55 (in. Hg)
Calibration Meter Factor Yc: -> 1.0023 (number)

dH (in H20)	Elasped Time (min)	DRY GAS METER READING Volume Initial (cu ft)	Volume Final (cu ft)	Volume Total (cu ft)		GAS Temperature Inlet (deg F)	Outlet (deg F)	CALIBRATION METER READINGS Volume Initial (cu ft)	Volume Final (cu ft)	Volume Total (cu ft)	CALIBRATION METER Temperature Inlet (deg F)	Outlet (deg F)
0.83	12.00	814.652	821.068	6.416	Initial->	98.0	87.0	617.479	623.625	6.146	84.0	84.0
					Final--->	98.0	88.0					
0.83	9.50	821.068	826.157	5.089	Initial->	98.0	88.0	623.625	628.509	4.884	84.0	84.0
					Final--->	97.0	88.0					
0.83	72.50	826.157	865.235	39.078	Initial->	95.0	83.0	628.509	665.789	37.280	84.0	84.0
					Final--->	96.0	86.0					

	DRY GAS METER METER CALIBRATION FACTOR Y Value (number)	Variation (number)		DRY GAS METER ORIFICE CALIBRATION FACTOR dH@ Value (in H20)	Variation (in H20)
	0.974	0.002		1.826	0.007
	0.975	0.004		1.811	-0.009
	0.965	-0.006		1.822	0.002
Average	0.971		Average	1.820	

te: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +-0.02.

For Orifice Calibration Factor dH@, the orifice differential pressure in inches of H20 that equates to 0.75 cfm of air at 68 F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +-0.2.

ertify that the above Dry Gas Meter was calibrated in accordance with E.P.A. Method 5 , paragraph 7.1 ;CFR 40 Part 60, ng the Precision Wet Test Meter # 11AE6, which in turn was calibrated using the American Bell Prover # 3785, tificate # F107, which is traceable to the National Bureau of Standards (N.I.S.T.).

Signature _____ Date 7-2-97

APEX INSTRUMENTS
EPA METHOD 5
Meter Box Post-Test Calibration
English Meter Box and English Calibration Meter Units

Filename: F:\DATAFILE\CALIBRAT\CAL_MENU.DSK\DGM_POST.3P\A-39P.WK1

Model Number: 511 Date: ->7/2/97
Serial Number: A-39 Barometric Pressure: -> 29.55 (in. Hg)
Calibration Meter Factor Yc: -> 1.0023 (number)

dH (in H20)	Elasped Time (min)	DRY GAS METER READING Volume Initial (cu ft)	Volume Final (cu ft)	Volume Total (cu ft)		GAS Temperature Inlet (deg F)	Outlet (deg F)	CALIBRATION METER READINGS Volume Initial (cu ft)	Volume Final (cu ft)	Volume Total (cu ft)	CALIBRATION METER Temperature Inlet (deg F)	Outlet (deg F)
0.82	10.50	754.507	760.029	5.522	Initial->	82.0	75.0	533.834	539.225	5.391	85.0	85.0
					Final--->	89.0	78.0					
0.82	14.00	760.029	767.123	7.094	Initial->	86.0	78.0	539.225	546.108	6.883	85.0	85.0
					Final--->	94.0	81.0					
0.82	18.00	776.115	785.136	9.021	Initial->	85.0	83.0	554.795	563.509	8.714	85.0	85.0
					Final--->	98.0	83.0					

	DRY GAS METER METER CALIBRATION FACTOR Y Value (number)	Variation (number)		DRY GAS METER ORIFICE CALIBRATION FACTOR dH@ Value (in H20)	Variation (in H20)
	0.969	-0.001		1.839	-0.120
	0.970	0.000		1.994	0.035
	0.970	0.000		2.044	0.085
Average	0.970		Average	1.959	

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +-0.02.

For Orifice Calibration Factor dH@, the orifice differential pressure in inches of H20 that equates to 0.75 cfm of air at 68 F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +-0.2.

I certify that the above Dry Gas Meter was calibrated in accordance with E.P.A. Method 5 , paragraph 7.1 ;CFR 40 Part 60, using the Precision Wet Test Meter # 11AE6, which in turn was calibrated using the American Bell Prover # 3785, certificate # F107, which is traceable to the National Bureau of Standards (N.I.S.T.).

Signature _____ Date 7-2-97

JIM McGAUGHEY

APEX INSTRUMENTS
EPA METHOD 5
Meter Box Post-Test Calibration
English Meter Box and English Calibration Meter Units

Filename: F:\DATAFILE\CALIBRAT\CAL_MENU.DSK\DGM_POST.3P\A-40.WK1

Model Number: 511 Date: ->7/2/97
Serial Number: A-40P Barometric Pressure: -> 29.55 (in. Hg)
Calibration Meter Factor Yc: -> 1.0023 (number)

		DRY GAS METER READING				GAS Temperature		CALIBRATION METER READINGS			CALIBRATION METER Temperature	
dH (in H20)	Elapsed Time (min)	Volume Initial (cu ft)	Volume Final (cu ft)	Volume Total (cu ft)		Inlet (deg F)	Outlet (deg F)	Volume Initial (cu ft)	Volume Final (cu ft)	Volume Total (cu ft)	Inlet (deg F)	Outlet (deg F)
1.65	12.50	515.289	525.313	10.024	Initial->	99.0	82.0	677.241	686.912	9.671	84.0	84.0
					Final--->	100.0	84.0					
1.65	21.00	525.313	541.677	16.364	Initial->	90.0	84.0	686.912	702.661	15.749	84.0	84.0
					Final--->	104.0	86.0					
1.65	12.50	541.677	551.737	10.060	Initial->	95.0	86.0	702.661	712.322	9.661	84.0	84.0
					Final--->	101.0	87.0					

	DRY GAS METER METER CALIBRATION FACTOR Y		DRY GAS METER ORIFICE CALIBRATION FACTOR dH@	
	Value (number)	Variation (number)	Value (in H20)	Variation (in H20)
	0.976	0.002	1.871	0.004
	0.973	-0.001	1.867	0.000
	0.973	-0.001	1.863	-0.004
Average	0.974		Average 1.867	

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +-0.02.

For Orifice Calibration Factor dH@, the orifice differential pressure in inches of H20 that equates to 0.75 cfm of air at 68 F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +-0.2.

I certify that the above Dry Gas Meter was calibrated in accordance with E.P.A. Method 5 , paragraph 7.1 ;CFR 40 Part 60, using the Precision Wet Test Meter # 11AE6, which in turn was calibrated using the American Bell Prover # 3785, certificate # F107, which is traceable to the National Bureau of Standards (N.I.S.T.).

Signature [signature] Date 7-2-97

APEX INSTRUMENTS 623 SERIES METER CONSOLE CALIBRATION

Meter Console Information					
Console Model Number	623	Console Serial Number	707010	Manufacture Date	29-May-97
Gas Meter Model	Kimmon PK-III	Gas Meter Serial Number	707010	Encoder Model	HP HEDS-5701-A02
Totalizer Model	Durant 53300-403	Totalizer Scale Factor	3.52750	Temp Display Model	Watlow 935
Temp Controller Model	Watlow 935	High Flow Orifice Model	55	Low Flow Orifice Model	33

Calibration Conditions						
Wet Test Meter Idenification	11AE6	Calibration Technician	VHJ		Calibration Date	29-May-97
Wet Test Meter Calibration Factor	1.0003	Barometric Pressure	(P_b)	754.0	mm Hg	

Calibration Worksheet Information					
Version Number	2.0	Last Update	09-Jan-97	Filename	C:\DATAFILE\CALIBRAT\DGM_6005.PR5\707010.XLS

	Calibration Data							Results				
	Run Time	Orifice	Dry Gas Meter			Wet Test Meter		Standardized Volumes		Dry Gas Meter		
	Elapsed	Number	Gas Pressure	Gas Volume	Gas Temperature	Gas Volume	Gas Temperature	Dry Gas Meter	Wet Test Meter	Calibration Factor Value	Calibration Factor Variation	Corrected Flowrate
	(Θ)		(P_m)	(V_m)	(t_m)	(V_w)	(t_w)	($V_{m(std)}$)	($V_{w(std)}$)	(Y)	(ΔY)	(Q_m)
	min		mm H_2O	liters	°C	liters	°C	std liters	std liters			slm
Run 1 - Initial	5.50	55	20.0	0.000	29	0.000	25					
Final	5.50	55	20.0	7.093	29	7.040	25					
Total/Avg	5.50	55	20.0	7.093	29	7.040	25	6.845	6 874	1.004	0.001	1.25
Run 2 - Initial	0.00	55	25.0	0.000	29	0.000	25					
Final	14.00	55	25.0	18.999	29	18.800	25					
Total/Avg	14.00	55	25.0	18.999	29	18.800	25	18.345	18.357	1.001	-0.003	1.31
Run 3 - Initial	13.00	55	40.0	0.000	29	0.000	25					
Final	13.00	55	40.0	23.785	29	23.380	26					
Total/Avg	13.00	55	40.0	23.785	29	23.380	26	23 000	22.753	0.989	-0.014	1.75
Run 4 - Initial	6.00	33	80.0	0.000	27	0.000	26					
Final	6.00	33	80.0	6.666	28	6.650	26					
Total/Avg	6.00	33	80.0	6.666	28	6.650	26	6.492	6.472	0.997	-0.007	1.08
Run 5 - Initial	6.50	33	60.0	0.000	28	0.000	26					
Final	6.50	33	60 0	6.857	28	6.880	26					
Total/Avg	6.50	33	60.0	6.857	28	6.880	26	6.666	6.695	1.004	0.001	1.03
Run 6 - Initial	21.00	33	25.0	0.000	28	0.000	26					
Final	21.00	33	25.0	11.922	30	12.100	27					
Total/Avg	21.00	33	25 0	11.922	30	12.100	27	11.474	11.756	1.025	0.021	0.56

Average Meter Calibration Factor Y **1.003**

Note. For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +-0.02.

I certify that the above Dry Gas Meter was calibrated in accordance with USEPA Methods, CFR 40 Part 60, using the Precision Wet Test Meter # 11AE6, [illegible] in turn was calibrated using the American Bell Prover # 3785, certificate # F107, which is traceable to the National Bureau of Standards (N.I.S.T.).

APEX INSTRUMENTS 623 SERIES METER CONSOLE CALIBRATION

Meter Console Information					
Console Model Number	623	Console Serial Number	702004	Manufacture Date	30-Jan-97
Gas Meter Model	Kimmon PK-III	Gas Meter Serial Number	702004	Encoder Model	HP HEDS-5701-A02
Totalizer Model	Durant 53300-403	Totalizer Scale Factor	3.40000	Temp Display Model	Watlow 935
Temp Controller Model	Watlow 935	High Flow Orifice Model	55	Low Flow Orifice Model	33

Calibration Conditions						
Wet Test Meter Idenification	11AE6	Calibration Technician	VHJ		Calibration Date	01-Jul-97
Wet Test Meter Calibration Factor	1.0003	Barometric Pressure	(P_b)	758.0	mm Hg	

Calibration Worksheet Information					
Version Number	2 0	Last Update	09-Jan-97	Filename	C:\DATAFILE\CALIBRAT\DGM_6005.PR5\702004.XLS

	Calibration Data							Results				
	Run Time	Orifice	Dry Gas Meter			Wet Test Meter		Standardized Volumes		Dry Gas Meter		
	Elapsed	Number	Gas Pressure	Gas Volume	Gas Temperature	Gas Volume	Gas Temperature	Dry Gas Meter	Wet Test Meter	Calibration Factor Value	Calibration Factor Variation	Corrected Flowrate
	(Θ)		(P_m)	(V_m)	(t_m)	(V_w)	(t_w)	($V_{m(std)}$)	($V_{w(std)}$)	(Y)	(ΔY)	(Q_m)
	min		mm H_2O	liters	°C	liters	°C	std liters	std liters			slm
Run 1 - Initial	5 00	55	35.0	0.000	31	0 000	24					
Final	5 00	55	35.0	8.568	31	8.340	24					
Total/Avg	5.00	55	35.0	8.568	31	8.340	24	8.270	8.214	0.993	-0.004	1.64
Run 2 - Initial	6 00	55	25.0	0 000	31	0.000	24					
Final	6.00	55	25.0	8 840	31	8 560	24					
Total/Avg	6.00	55	25.0	8 840	31	8.560	24	8.524	8 431	0.989	-0.008	1 41
Run 3 - Initial	10.50	55	20.0	0.000	31	0.000	24					
Final	10.50	55	20.0	5.712	31	5 570	24					
Total/Avg	10.50	55	20.0	5.712	31	5.570	24	5.505	5 486	0.996	-0.001	0.52
Run 4 - Initial	7.50	33	80.0	0.000	31	0.000	24					
Final	7 50	33	80.0	7.928	31	7.800	24					
Total/Avg	7.50	33	80.0	7.928	31	7.800	24	7.686	7.682	1.000	0.002	1.02
60.00	9.50	33	60.0	0.000	30	0.000	24					
Final	9.50	33	60 0	8.228	30	8 130	24					
Total/Avg	9.50	33	60.0	8.228	30	8 130	24	7.987	8 007	1.003	0.005	0 84
Run 6 - Initial	10 00	33	30.0	0.000	30	0 000	24					
Final	10.00	33	30.0	5 477	30	5.400	24					
Total/Avg	10 00	33	30 0	5 477	30	5 400	24	5.301	5.319	1.003	0.006	0 53

Average Meter Calibration Factor Y **0.997**

Note For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +-0 02.

I certify that the above Dry Gas Meter was calibrated in accordance with USEPA Methods, CFR 40 Part 60, using the Precision Wet Test Meter # 11AE6, which in turn was calibrated using the American Bell Prover # 3785, certificate # F107, which is traceable to the National Bureau of Standards (N.I.S.T.).

Signature [illegible] Date 7-1-97

Printed on 7/1/97

Appendix E.3

Chain-of-Custody Sheets

LTV STEEL COMPANY
CHAIN OF CUSTODY

RELINQUISHED BY = Julie L. Swift DATE = July 1, 1997 RECEIVED BY: _____ DATE: _____
RELINQUISHED BY = _____ DATE = _____ RECEIVED BY: _____ DATE: _____

SAMPLE ID	FIELD ID	SAMPLE TYPE	PRESERVATIVE	COMMENTS	ANALYSIS
LTV-94	LTV- 062497- PROCESS- SINTER- TEST-	PROCESS, SINTER FEED, TEST DAY	Sinter Feed		Hold
LTV-103	LTV- 062597- PROCESS- SINTER- 1	PROCESS, SINTER FEED, RUN 1	Sinter Feed		Hold
LTV-95	LTV- 062597- PROCESS- BLOW OUT- 1	PROCESS, SCRUBBER BLOW OUT, RUN 1	Scrubber Blow Out		Hold
LTV-102	LTV- 062697- PROCESS- MILL SCALE 2	PROCESS, MILL SCALE, RUN 2	Mill Scale		Hold
LTV-104	LTV- 062697- PROCESS- BLOW OUT- 2	PROCESS, SCRUBBER BLOW OUT, RUN 2	Scrubber Blow Out		Hold
LTV-105	LTV- 062697- PROCESS- SINTER- 2	PROCESS, SINTER FEED, RUN 2	Sinter Feed		Hold
LTV-106	LTV- 062797- PROCESS- SINTER- 3	PROCESS, SINTER FEED, RUN 3	Sinter Feed		Hold
LTV-107	LTV- 062797- PROCESS- BLOW OUT- 3	PROCESS, SCRUBBER BLOW OUT, RUN 3	Scrubber Blow Out		Hold
LTV-108	LTV- 062797- PROCESS- MILL SCALE 3	PROCESS, MILL SCALE, RUN 3	Mill Scale		Hold

LTV STEEL COMPANY
CHAIN OF CUSTODY

RELINQUISHED BY = Julie C. Swift DATE = July 1, 1997 RECEIVED BY: _____ DATE: _____
RELINQUISHED BY = _____ DATE = _____ RECEIVED BY: _____ DATE: _____

SAMPLE ID	FIELD ID						SAMPLE TYPE	PRESERVATIVE	COMMENTS	ANALYSIS
LTV-03	LTV-	062497-	M29-	OUTLET-	BH-	1	METHOD 29, OUTLET, RUN 1	HNO3/H2O2 BACK HALF		Metals
LTV-21	LTV-	062497-	M29-	INLET-	BH-	1	METHOD 29, INLET, RUN 1	HNO3/H2O2 BACK HALF		Metals
LTV-09	LTV-	062697-	M29-	OUTLET-	BH-	2	METHOD 29, OUTLET, RUN 2	HNO3/H2O2 BACK HALF		Metals
LTV-27	LTV-	062697-	M29-	INLET-	BH-	2	METHOD 29, INLET, RUN 2	HNO3/H2O2 BACK HALF		Metals
LTV-15	LTV-	062797-	M29-	OUTLET-	BH-	3	METHOD 29, OUTLET, RUN 3	HNO3/H2O2 BACK HALF		Metals
LTV-33	LTV-	062797-	M29-	INLET-	BH-	3	METHOD 29, INLET, RUN 3	HNO3/H2O2 BACK HALF		Metals
LTV-40	LTV-	062697-	M29-	OUTLET-	BH-	FB1	METHOD 29, OUTLET, FB1	HNO3/H2O2 BACK HALF		Metals
LTV-53	LTV-	062697-	M29-	INLET-	BH-	FB2	METHOD 29, INLET, FB2	HNO3/H2O2 BACK HALF		Metals
LTV-47	LTV-	062497-	M29-	OUTLET-	BH-	RB1	METHOD 29, OUTLET, RB1	HNO3/H2O2		Metals
LTV-60	LTV-	062597-	M29-	INLET-	BH-	RB2	METHOD 29, INLET, RB2	HNO3/H2O2		Metals
LTV-04	LTV-	062497-	M29-	OUTLET-	BHM-	1	METHOD 29, OUTLET, RUN 1	0.1N HNO3 RINSE - Hg		Metals
LTV-22	LTV-	062497-	M29-	INLET-	BHM-	1	METHOD 29, INLET, RUN 1	0.1N HNO3 RINSE - Hg		Metals
LTV-10	LTV-	062697-	M29-	OUTLET-	BHM-	2	METHOD 29, OUTLET, RUN 2	0.1N HNO3 RINSE - Hg		Metals
LTV-28	LTV-	062697-	M29-	INLET-	BHM-	2	METHOD 29, INLET, RUN 2	0 1N HNO3 RINSE - Hg		Metals
LTV-16	LTV-	062797-	M29-	OUTLET-	BHM-	3	METHOD 29, OUTLET, RUN 3	0.1N HNO3 RINSE - Hg		Metals
LTV-34	LTV-	062797-	M29-	INLET-	BHM-	3	METHOD 29, INLET, RUN 3	0.1N HNO3 RINSE - Hg		Metals
LTV-41	LTV-	062697-	M29-	OUTLET-	BHM-	FB1	METHOD 29, OUTLET, FB1	0.1N HNO3 RINSE - Hg		Metals
LTV-54	LTV-	062697-	M29-	INLET-	BHM-	FB2	METHOD 29, INLET, FB2	0.1N HNO3 RINSE - Hg		Metals

LTV STEEL COMPANY
CHAIN OF CUSTODY

RELINQUISHED BY = Julie L. Swift DATE = July 1, 1997 RECEIVED BY: _____ DATE: _____
RELINQUISHED BY = _____ DATE = _____ RECEIVED BY: _____ DATE: _____

SAMPLE ID	FIELD ID						SAMPLE TYPE	PRESERVATIVE	COMMENTS	ANALYSIS
LTV-06	LTV-	062497-	M29-	OUTLET-	HCl-	1	METHOD 29, OUTLET, RUN 1	8N HCl RINSE - Hg		Metals
LTV-24	LTV-	062497-	M29-	INLET-	HCl-	1	METHOD 29, INLET, RUN 1	8N HCl RINSE - Hg		Metals
LTV-12	LTV-	062697-	M29-	OUTLET-	HCl-	2	METHOD 29, OUTLET, RUN 2	8N HCl RINSE - Hg		Metals
LTV-30	LTV-	062697-	M29-	INLET-	HCl-	2	METHOD 29, INLET, RUN 2	8N HCl RINSE - Hg		Metals
LTV-18	LTV-	062797-	M29-	OUTLET-	HCl-	3	METHOD 29, OUTLET, RUN 3	8N HCl RINSE - Hg		Metals
LTV-36	LTV-	062797-	M29-	INLET-	HCl-	3	METHOD 29, INLET, RUN 3	8N HCl RINSE - Hg		Metals
LTV-43	LTV-	062697-	M29-	OUTLET-	HCl-	FB1	METHOD 29, OUTLET, FB1	8N HCl RINSE - Hg		Metals
LTV-56	LTV-	062697-	M29-	INLET-	HCl-	FB2	METHOD 29, INLET, FB2	8N HCl RINSE - Hg		Metals
LTV-49	LTV-	062497-	M29-	OUTLET-	HCl-	RB1	METHOD 29, OUTLET, RB1	8N HCl		Metals
LTV-62	LTV-	062797-	M29-	INLET-	HCl-	RB2	METHOD 29, INLET, RB2	8N HCl		Metals

LTV STEEL COMPANY
CHAIN OF CUSTODY

RELINQUISHED BY = Julie C. Swift DATE = July 1, 1997 RECEIVED BY: _____ DATE: _____
RELINQUISHED BY = _____ DATE = _____ RECEIVED BY: _____ DATE: _____

SAMPLE ID	FIELD ID						SAMPLE TYPE	PRESERVATIVE	COMMENTS	ANALYSIS
LTV-02	LTV-	062497-	M29-	OUTLET-	HN-	1	METHOD 29, OUTLET, RUN 1	NITRIC ACID PROBE RINSE		Metals
LTV-20	LTV-	062497-	M29-	INLET-	HN-	1	METHOD 29, INLET, RUN 1	NITRIC ACID PROBE RINSE		Metals
LTV-101	LTV-	062597-	M29-	INLET-	HN-	1A	METHOD 29, OUTLET, RUN 1	Nitric Acid Probe Rinse		Metals
LTV-08	LTV-	062697-	M29-	OUTLET-	HN-	2	METHOD 29, OUTLET, RUN 2	NITRIC ACID PROBE RINSE		Metals
LTV-26	LTV-	062697-	M29-	INLET-	HN-	2	METHOD 29, INLET, RUN 2	NITRIC ACID PROBE RINSE		Metals
LTV-14	LTV-	062797-	M29-	OUTLET-	HN-	3	METHOD 29, OUTLET, RUN 3	NITRIC ACID PROBE RINSE		Metals
LTV-32	LTV-	062797-	M29-	INLET-	HN-	3	METHOD 29, INLET, RUN 3	NITRIC ACID PROBE RINSE		Metals
LTV-38	LTV-	062697-	M29-	OUTLET-	HN-	FB1	METHOD 29, OUTLET, FB1	NITRIC ACID PROBE RINSE		Metals
LTV-51	LTV-	062697-	M29-	INLET-	HN-	FB2	METHOD 29, INLET, FB2	NITRIC ACID PROBE RINSE		Metals
LTV-96	LTV-	062597-	M29-	OUTLET-	HNO-	PB	METHOD 29, OUTLET, PROOF BLANK	0.1N HNO3 Rinse		Hold ~~Metals~~
LTV-97	LTV-	062597-	M29-	INLET-	HNO-	PB	METHOD 29, INTLET, PROOF BLANK	0.1N HNO3 Rinse		Hold ~~Metals~~
LTV-45	LTV-	062497-	M29-	OUTLET-	HNO-	RB1	METHOD 29, OUTLET, RB1	0.1N HNO3		Metals
LTV-58	LTV-	062697-	M29-	INLET-	HNO-	RB2	METHOD 29, INLET, RB2	0.1N HNO3		Metals

LTV STEEL COMPANY
CHAIN OF CUSTODY

RELINQUISHED BY = Julie L. Swift **DATE =** July 1, 1997 **RECEIVED BY:** _____ **DATE:** _____
RELINQUISHED BY = _____ **DATE =** _____ **RECEIVED BY:** _____ **DATE:** _____

SAMPLE ID	FIELD ID						SAMPLE TYPE	PRESERVATIVE	COMMENTS	ANALYSIS
LTV-05	LTV-	062497-	M29-	OUTLET-	KMnO-	1	METHOD 29, OUTLET, RUN 1	KMnO4 IMPINGERS		Metals
LTV-23	LTV-	062497-	M29-	INLET-	KMnO-	1	METHOD 29, INLET, RUN 1	KMnO4 IMPINGERS		Metals
LTV-11	LTV-	062697-	M29-	OUTLET-	KMnO-	2	METHOD 29, OUTLET, RUN 2	KMnO4 IMPINGERS		Metals
LTV-29	LTV-	062697-	M29-	INLET-	KMnO-	2	METHOD 29, INLET, RUN 2	KMnO4 IMPINGERS		Metals
LTV-17	LTV-	062797-	M29-	OUTLET-	KMnO-	3	METHOD 29, OUTLET, RUN 3	KMnO4 IMPINGERS		Metals
LTV-35	LTV-	062797-	M29-	INLET-	KMnO-	3	METHOD 29, INLET, RUN 3	KMnO4 IMPINGERS		Metals
LTV-42	LTV-	062697-	M29-	OUTLET-	KMnO-	FB1	METHOD 29, OUTLET, FB1	KMnO4 IMPINGERS		Metals
LTV-55	LTV-	062697-	M29-	INLET-	KMnO-	FB2	METHOD 29, INLET, FB2	KMnO4 IMPINGERS		Metals
LTV-48	LTV-	062497-	M29-	OUTLET-	KMnO-	RB1	METHOD 29, OUTLET, RB1	KMnO4		Metals
LTV-61	LTV-	062597-	M29-	INLET-	KMnO-	RB2	METHOD 29, INLET, RB2	KMnO4		Metals

LTV STEEL COMPANY
CHAIN OF CUSTODY

RELINQUISHED BY = Julie L. Swift DATE = July 1, 1997 RECEIVED BY: _____ DATE: _____
RELINQUISHED BY = _____ DATE = _____ RECEIVED BY: _____ DATE: _____

SAMPLE ID	FIELD ID						SAMPLE TYPE	PRESERVATIVE	COMMENTS	ANALYSIS
LTV-98	LTV-	062597-	M23-	OUTLET-	MeCl2-	PB	METHOD 23, INLET, PROOF BLANK	MeCl2 Rinse	Hold	~~Dioxins/PAH~~
LTV-63	LTV-	062497-	M23-	OUTLET-	PR-	1	METHOD 23, OUTLET, RUN 1	MeCl2/Acetone Probe Rinse		Dioxins/PAH
LTV-68	LTV-	062697-	M23-	OUTLET-	PR-	2	METHOD 23, OUTLET, RUN 2	MeCl2/Acetone Probe Rinse		Dioxins/PAH
LTV-73	LTV-	062797-	M23-	OUTLET-	PR-	3	METHOD 23, OUTLET, RUN 3	MeCl2/Acetone Probe Rinse		Dioxins/PAH
LTV-78	LTV-	062697-	M23-	OUTLET-	PR-	FB1	METHOD 23, OUTLET, FB 1	MeCl2/Acetone Probe Rinse		Dioxins/PAH
LTV-83	LTV-	062497-	M23-	OUTLET-	PR-	RB1	METHOD 23, OUTLET, RB 1	MeCl2/Acetone Probe Rinse		Dioxins/PAH
LTV-64	LTV-	062497-	M23-	OUTLET-	PRT/CRT-	1	METHOD 23, OUTLET, RUN 1	Toluene Probe Rinse		Dioxins/PAH
LTV-69	LTV-	062697-	M23-	OUTLET-	PRT/CRT-	2	METHOD 23, OUTLET, RUN 2	Toluene Probe Rinse		Dioxins/PAH
LTV-74	LTV-	062797-	M23-	OUTLET-	PRT/CRT-	3	METHOD 23, OUTLET, RUN 3	Toluene Probe Rinse		Dioxins/PAH
LTV-79	LTV-	062697-	M23-	OUTLET-	PRT/CRT-	FB1	METHOD 23, OUTLET, FB 1	Toluene Probe Rinse		Dioxins/PAH
LTV-84	LTV-	062497-	M23-	OUTLET-	PRT/CRT-	RB1	METHOD 23, OUTLET, RB 1	Toluene Probe Rinse		Dioxins/PAH
LTV-66	LTV-	062497-	M23-	OUTLET-	XAD-	1	METHOD 23, OUTLET, RUN 1	XAD Trap		Dioxins/PAH
LTV-71	LTV-	062697-	M23-	OUTLET-	XAD-	2	METHOD 23, OUTLET, RUN 2	XAD Trap		Dioxins/PAH
LTV-76	LTV-	062797-	M23-	OUTLET-	XAD-	3	METHOD 23, OUTLET, RUN 3	XAD Trap		Dioxins/PAH
LTV-81	LTV-	062697-	M23-	OUTLET-	XAD-	FB1	METHOD 23, OUTLET, FB 1	XAD Trap		Dioxins/PAH
LTV-86	LTV-	062497-	M23-	OUTLET-	XAD-	RB1	METHOD 23, OUTLET, RB 1	XAD Trap		Dioxins/PAH
LTV-65	LTV-	062497-	M23-	OUTLET-	F-	1	METHOD 23, OUTLET, RUN 1	Filter		Dioxins/PAH
LTV-70	LTV-	062697-	M23-	OUTLET-	F-	2	METHOD 23, OUTLET, RUN 2	Filter		Dioxins/PAH
LTV-75	LTV-	062797-	M23-	OUTLET-	F-	3	METHOD 23, OUTLET, RUN 3	Filter		Dioxins/PAH
LTV-80	LTV-	062697-	M23-	OUTLET-	F-	FB1	METHOD 23, OUTLET, FB 1	Filter		Dioxins/PAH
LTV-85	LTV-	062497-	M23-	OUTLET-	F-	RB1	METHOD 23, OUTLET, RB 1	Filter		Dioxins/PAH
LTV-67	LTV-	062497-	M23-	OUTLET-	IMP-	1	METHOD 23, OUTLET, RUN 1	Impingers and Rinses		Dioxins/PAH
LTV-72	LTV-	062697-	M23-	OUTLET-	IMP-	2	METHOD 23, OUTLET, RUN 2	Impingers and Rinses		Dioxins/PAH
LTV-77	LTV-	062797-	M23-	OUTLET-	IMP-	3	METHOD 23, OUTLET, RUN 3	Impingers and Rinses		Dioxins/PAH
LTV-82	LTV-	062697-	M23-	OUTLET-	IMP-	FB1	METHOD 23, OUTLET, FB 1	Impingers and Rinses		Dioxins/PAH
LTV-87	LTV-	062497-	M23-	OUTLET-	IMP-	RB1	METHOD 23, OUTLET, RB 1	Impingers and Rinses		Dioxins/PAH

Appendix E.4

Summary of Sampling Parameters

Facility:	LTV East Chicago
Date:	6/25/97
Location:	Inlet
Run Number:	1
Sample Type:	Multi metals

Total Sampling Time (min)	240.0
Corrected Barometric Pressure (in Hg)	29.36
Absolute Stack Pressure (in H2O)	28.95
Stack Static Pressure (in H2O)	-5.60
Average Stack Temperature (°F)	222.04
Stack Area (sq in)	8190.00
Actual Meter Volume (cu ft)	67.248
Average Meter Pressure (in H2O)	1.66
Average Meter Temperature (°F)	92.08
Moisture Collected (g)	93.20
Carbon Dioxide Concentration (%V)	2.5
Oxygen Concentration (%V)	19.0
Nitrogen Concentration (%V)	88.5
Dry Gas Meter Factor	0.9840
Nozzle Diameter (in)	0.103
Pitot Constant	0.84
Average Sampling Rate (dscfm)	0.259
Standard Metered Volume (dscf)	62.194
Standard Metered Volume (dscm)	1.761
Stack Moisture (%V)	6.60
Mole Fraction Dry Stack Gas	0.934
Dry Molecular Weight	31.96
Wet Molecular Weight	31.04
Stack Gas Velocity (fpm)	6236.47
Stack Gas Velocity (mpm)	1900.88
Volumetric Flow Rate (acfm)	354699.39
Volumetric Flow Rate (acmm)	10045.09
Volumetric Flow Rate (dscfm)	248105.45
Volumetric Flow Rate (dscmm)	7026.35
Percent Isokinetic	102.66
Percent Excess Air	433.62
Concentration (g/dscm)	0.00
Concentration (kg/hr)	0.00
Concentration (ppmv)	0.00
Emissions (lb/hr)	0.00

Facility:	LTV East Chicago
Date:	6/26/97
Location:	Inlet
Run Number:	2
Sample Type:	Multi metals

Total Sampling Time (min)	240.0
Corrected Barometric Pressure (in Hg)	29.45
Absolute Stack Pressure (in H2O)	29.04
Stack Static Pressure (in H2O)	-5.60
Average Stack Temperature (°F)	222.63
Stack Area (sq in)	8190.00
Actual Meter Volume (cu ft)	68.915
Average Meter Pressure (in H2O)	1.62
Average Meter Temperature (°F)	93.31
Moisture Collected (g)	98.60
Carbon Dioxide Concentration (%V)	3.3
Oxygen Concentration (%V)	18.8
Nitrogen Concentration (%V)	88.0
Dry Gas Meter Factor	0.9840
Nozzle Diameter (in)	0.103
Pitot Constant	0.84
Average Sampling Rate (dscfm)	0.266
Standard Metered Volume (dscf)	63.785
Standard Metered Volume (dscm)	1.806
Stack Moisture (%V)	6.79
Mole Fraction Dry Stack Gas	0.932
Dry Molecular Weight	32.07
Wet Molecular Weight	31.11
Stack Gas Velocity (fpm)	6057.53
Stack Gas Velocity (mpm)	1846.33
Volumetric Flow Rate (acfm)	344521.82
Volumetric Flow Rate (acmm)	9756.86
Volumetric Flow Rate (dscfm)	241027.11
Volumetric Flow Rate (dscmm)	6825.89
Percent Isokinetic	108.38
Percent Excess Air	416.70
Concentration (g/dscm)	0.00
Concentration (kg/hr)	0.00
Concentration (ppmv)	0.00
Emissions (lb/hr)	0.00

========== ========== ========= ========= ========= =========

Facility:	LTV East Chicago
Date:	6/27/97
Location:	Inlet
Run Number:	3
Sample Type:	Multi metals

Total Sampling Time (min)	240.0
Corrected Barometric Pressure (in Hg)	29.51
Absolute Stack Pressure (in H2O)	29.10
Stack Static Pressure (in H2O)	-5.60
Average Stack Temperature (°F)	198.00
Stack Area (sq in)	8190.00
Actual Meter Volume (cu ft)	67.276
Average Meter Pressure (in H2O)	1.68
Average Meter Temperature (°F)	96.88
Moisture Collected (g)	96.60
Carbon Dioxide Concentration (%V)	3.3
Oxygen Concentration (%V)	18.8
Nitrogen Concentration (%V)	88.0
Dry Gas Meter Factor	0.9840
Nozzle Diameter (in)	0.103
Pitot Constant	0.84
Average Sampling Rate (dscfm)	0.259
Standard Metered Volume (dscf)	62.045
Standard Metered Volume (dscm)	1.757
Stack Moisture (%V)	6.84
Mole Fraction Dry Stack Gas	0.932
Dry Molecular Weight	32.07
Wet Molecular Weight	31.11
Stack Gas Velocity (fpm)	6181.78
Stack Gas Velocity (mpm)	1884.21
Volumetric Flow Rate (acfm)	351588.97
Volumetric Flow Rate (acmm)	9957.00
Volumetric Flow Rate (dscfm)	255583.34
Volumetric Flow Rate (dscmm)	7238.12
Percent Isokinetic	99.42
Percent Excess Air	416.70
Concentration (g/dscm)	0.00
Concentration (kg/hr)	0.00
Concentration (ppmv)	0.00
Emissions (lb/hr)	0.00

========== ========== ========= ========= ========= =========

Facility:	LTV East Chicago
Date:	6/25/97
Location:	Outlet
Run Number:	1
Sample Type:	Multi metals

Total Sampling Time (min)	240.0
Corrected Barometric Pressure (in Hg)	29.18
Absolute Stack Pressure (in H2O)	29.31
Stack Static Pressure (in H2O)	1.80
Average Stack Temperature (°F)	117.50
Stack Area (sq in)	16286.02
Actual Meter Volume (cu ft)	166.707
Average Meter Pressure (in H2O)	0.83
Average Meter Temperature (°F)	92.17
Moisture Collected (g)	404.40
Carbon Dioxide Concentration (%V)	3.5
Oxygen Concentration (%V)	17.5
Nitrogen Concentration (%V)	79.0
Dry Gas Meter Factor	0.9840
Nozzle Diameter (in)	0.217
Pitot Constant	0.84
Average Sampling Rate (dscfm)	0.640
Standard Metered Volume (dscf)	153.538
Standard Metered Volume (dscm)	4.348
Stack Moisture (%V)	11.05
Mole Fraction Dry Stack Gas	0.890
Dry Molecular Weight	29.26
Wet Molecular Weight	28.02
Stack Gas Velocity (fpm)	3013.70
Stack Gas Velocity (mpm)	918.58
Volumetric Flow Rate (acfm)	340841.62
Volumetric Flow Rate (acmm)	9652.63
Volumetric Flow Rate (dscfm)	271558.40
Volumetric Flow Rate (dscmm)	7690.53
Percent Isokinetic	103.74
Percent Excess Air	519.01
Concentration (g/dscm)	0.00
Concentration (kg/hr)	0.00
Concentration (ppmv)	0.00
Emissions (lb/hr)	0.00

Facility:	LTV East Chicago
Date:	6/26/97
Location:	Outlet
Run Number:	2
Sample Type:	Multi metals

Total Sampling Time (min)	240.0
Corrected Barometric Pressure (in Hg)	29.35
Absolute Stack Pressure (in H2O)	29.36
Stack Static Pressure (in H2O)	0.18
Average Stack Temperature (°F)	117.83
Stack Area (sq in)	16286.02
Actual Meter Volume (cu ft)	157.579
Average Meter Pressure (in H2O)	0.83
Average Meter Temperature (°F)	91.94
Moisture Collected (g)	390.00
Carbon Dioxide Concentration (%V)	3.8
Oxygen Concentration (%V)	17.4
Nitrogen Concentration (%V)	78.9
Dry Gas Meter Factor	0.9840
Nozzle Diameter (in)	0.217
Pitot Constant	0.84
Average Sampling Rate (dscfm)	0.608
Standard Metered Volume (dscf)	146.035
Standard Metered Volume (dscm)	4.136
Stack Moisture (%V)	11.18
Mole Fraction Dry Stack Gas	0.888
Dry Molecular Weight	29.30
Wet Molecular Weight	28.03
Stack Gas Velocity (fpm)	2984.84
Stack Gas Velocity (mpm)	909.78
Volumetric Flow Rate (acfm)	337576.99
Volumetric Flow Rate (acmm)	9560.18
Volumetric Flow Rate (dscfm)	268854.67
Volumetric Flow Rate (dscmm)	7613.96
Percent Isokinetic	99.66
Percent Excess Air	506.97
Concentration (g/dscm)	0.00
Concentration (kg/hr)	0.00
Concentration (ppmv)	0.00
Emissions (lb/hr)	0.00

========== ========== ========= ========= ========= =========

Facility:	LTV East Chicago
Date:	6/27/97
Location:	Outlet
Run Number:	3
Sample Type:	Multi metals

Total Sampling Time (min)	240.0
Corrected Barometric Pressure (in Hg)	29.40
Absolute Stack Pressure (in H2O)	29.41
Stack Static Pressure (in H2O)	0.18
Average Stack Temperature (°F)	116.46
Stack Area (sq in)	16286.02
Actual Meter Volume (cu ft)	160.530
Average Meter Pressure (in H2O)	0.83
Average Meter Temperature (°F)	100.27
Moisture Collected (g)	369.60
Carbon Dioxide Concentration (%V)	3.3
Oxygen Concentration (%V)	18.8
Nitrogen Concentration (%V)	88.0
Dry Gas Meter Factor	0.9840
Nozzle Diameter (in)	0.217
Pitot Constant	0.84
Average Sampling Rate (dscfm)	0.612
Standard Metered Volume (dscf)	146.795
Standard Metered Volume (dscm)	4.157
Stack Moisture (%V)	10.61
Mole Fraction Dry Stack Gas	0.894
Dry Molecular Weight	32.07
Wet Molecular Weight	30.58
Stack Gas Velocity (fpm)	2865.84
Stack Gas Velocity (mpm)	873.51
Volumetric Flow Rate (acfm)	324119.17
Volumetric Flow Rate (acmm)	9179.06
Volumetric Flow Rate (dscfm)	260862.30
Volumetric Flow Rate (dscmm)	7387.62
Percent Isokinetic	103.25
Percent Excess Air	416.70
Concentration (g/dscm)	0.00
Concentration (kg/hr)	0.00
Concentration (ppmv)	0.00
Emissions (lb/hr)	0.00

========== ========== ========= ========= ========= =========

Facility:	LTV East Chicago
Date:	6/25/97
Location:	Outlet
Run Number:	1
Sample Type:	Dioxin

Total Sampling Time (min)	240.0
Corrected Barometric Pressure (in Hg)	29.18
Absolute Stack Pressure (in H2O)	29.31
Stack Static Pressure (in H2O)	1.80
Average Stack Temperature (°F)	117.46
Stack Area (sq in)	16286.02
Actual Meter Volume (cu ft)	160.748
Average Meter Pressure (in H2O)	0.81
Average Meter Temperature (°F)	93.92
Moisture Collected (g)	388.80
Carbon Dioxide Concentration (%V)	3.5
Oxygen Concentration (%V)	17.5
Nitrogen Concentration (%V)	79.0
Dry Gas Meter Factor	0.9960
Nozzle Diameter (in)	0.217
Pitot Constant	0.84
Average Sampling Rate (dscfm)	0.622
Standard Metered Volume (dscf)	149.293
Standard Metered Volume (dscm)	4.228
Stack Moisture (%V)	10.94
Mole Fraction Dry Stack Gas	0.891
Dry Molecular Weight	29.26
Wet Molecular Weight	28.03
Stack Gas Velocity (fpm)	2908.67
Stack Gas Velocity (mpm)	886.56
Volumetric Flow Rate (acfm)	328962.48
Volumetric Flow Rate (acmm)	9316.22
Volumetric Flow Rate (dscfm)	262438.55
Volumetric Flow Rate (dscmm)	7432.26
Percent Isokinetic	104.38
Percent Excess Air	519.01
Concentration (g/dscm)	0.00
Concentration (kg/hr)	0.00
Concentration (ppmv)	0.00
Emissions (lb/hr)	0.00

Facility:	LTV East Chicago
Date:	6/26/97
Location:	Outlet
Run Number:	2
Sample Type:	Dioxin

Total Sampling Time (min)	240.0
Corrected Barometric Pressure (in Hg)	29.35
Absolute Stack Pressure (in H2O)	29.36
Stack Static Pressure (in H2O)	0.18
Average Stack Temperature (°F)	117.33
Stack Area (sq in)	16286.02
Actual Meter Volume (cu ft)	158.400
Average Meter Pressure (in H2O)	0.81
Average Meter Temperature (°F)	88.17
Moisture Collected (g)	394.70
Carbon Dioxide Concentration (%V)	3.5
Oxygen Concentration (%V)	17.5
Nitrogen Concentration (%V)	79.0
Dry Gas Meter Factor	0.9960
Nozzle Diameter (in)	0.217
Pitot Constant	0.84
Average Sampling Rate (dscfm)	0.623
Standard Metered Volume (dscf)	149.562
Standard Metered Volume (dscm)	4.236
Stack Moisture (%V)	11.07
Mole Fraction Dry Stack Gas	0.889
Dry Molecular Weight	29.26
Wet Molecular Weight	28.01
Stack Gas Velocity (fpm)	2932.41
Stack Gas Velocity (mpm)	893.80
Volumetric Flow Rate (acfm)	331647.76
Volumetric Flow Rate (acmm)	9392.26
Volumetric Flow Rate (dscfm)	264711.06
Volumetric Flow Rate (dscmm)	7496.62
Percent Isokinetic	103.67
Percent Excess Air	519.01
Concentration (g/dscm)	0.00
Concentration (kg/hr)	0.00
Concentration (ppmv)	0.00
Emissions (lb/hr)	0.00

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(Please read Instructions on reverse before completing)

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15. SUPPLEMENTARY NOTES

16. ABSTRACT

Integrated iron and steel manufacturing is among the categories of major sources for which national emission standards for hazardous air pollutants (NESHAPS) are to be issued by November 2000 pursuant to Section 112 of the Clean Air Act. The integrated iron and steel manufacturing category includes mills that produce steel from iron ore. Key processes and unit operations include sinter production, iron production, steel making, continuous casting, and the preparation of semi-finished and finished products. Source tests are required to quantify and characterize the particulate matter (PM), hazardous air pollutant (HAP) emissions, and the performance of a sintering plant equipped with a venturi scrubber.

17 KEY WORDS AND DOCUMENT ANALYSIS

a DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Particulate Matter, Dioxin/Furan, PAH, Metals		

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