UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

155

REGION III
CENTRAL REGIONAL LABORATORY
201 DEFENSE HIGHWAY
SUITE 200
ANNAPOLIS, MARYLAND 21401

QUALITY
ASSURANCE
BRANCH

DATE : November 28, 1994

SUBJECT: Region III Data QA Review

FROM : Susanne M. Stevens, Acting
Region III ESAT RPO (3ES30)

TO : Lisa Marino
Regional Project Manager (3HW42)

Attached is the inorganic data validation report for the Koppers Co. Fac. Plant Site (Case 22758) completed by the Region III Environmental Services Assistance Team (ESAT) contractor under the direction of Region III ESD.

If you have any questions regarding this review, please call me at (410) 573-6832.

Attachment

cc: Chris Burns, TetraTech

TID File: 03941138

Printed on Recycled Paper

Lockheed
Environmental Systems

Environmental Services Assistance Teams
Region 3
1419 Forest Drive, Suite 104
Annapolis, Maryland 21403

Phone: (410) 268-7705
Fax: (410) 268-8472

DATE: NOVEMBER 25, 1994

SUBJECT: INORGANIC DATA VALIDATION (IM1 LEVEL)
Case 22758 SITE: KOPPERS CO. FACTORY PLANT

FROM: BYRON LEO BL
INORGANIC DATA REVIEWER

for MAHBOOBEH MECANIC MP
SENIOR OVERSIGHT CHEMIST

TO: SUSANNE STEVENS
ESAT ACTING REGIONAL PROJECT OFFICER

THROUGH: DALE S. BOSHART DSB
ESAT TEAM MANAGER

OVERVIEW

Case 22758 consisted of one (1) soil sample analyzed for metals by Skinner and Sherman Laboratories Inc. (SKINER) according to the Contract Laboratory Program (CLP) Routine Analytical Services (RAS) Statement of Work (SOW) ILM02.1.

SUMMARY

All analytes were successfully analyzed in the given sample.

The data were validated according to the IM1 Level procedure, which includes the review of all QC forms except the ones for the Contract Required Detection Limit (CRDL) standard recovery, and excludes the review of the raw data.

Areas of concern with respect to data usability are given below according to the seriousness of the problem.

MINOR ISSUES

The continuing calibration (CCB) and preparation (PB) blanks had reported results greater than the Instrument Detection Limit (IDL) for the analytes given below. The reported results for these analytes in the affected samples which are less than five times the blank concentration may be biased high and have been qualified "B".

Blank	Analyte(s)
CCB	Calcium (Ca), Zinc (Zn)
PB	Cobalt (Co)

The ICP serial dilution results were outside the control limit (10% D) for the lead (Pb) analyte. The reported result for this analyte is estimated and has been qualified "J".

The laboratory duplicate results were outside the control limit (± 2xCRDL) for the copper (Cu) analyte. The reported result for this analyte is estimated and has been qualified "J".

The matrix spike recovery was low (30%-75%) for the antimony (Sb), chromium (Cr), Cu and vanadium (V) analytes. The reported results and quantitation limits for these analytes may be biased low and have been qualified "L" and "UL", respectively, unless superseded by the "J" qualifier.

NOTES

The laboratory analyzed the arsenic (As), Pb, selenium (Se) and thallium (Tl) analytes using the ICP method, and had IDL values less than CRDL.

The data were reviewed in accordance with the Innovative Approaches (IM1 Level) For Validation of Inorganic Data, September, 1992 and the National Functional Guidelines for Evaluating Inorganic Analyses, with modifications for use within Region III.

ATTACHMENTS

APPENDIX A ANNOTATED FORM I

APPENDIX B GLOSSARY OF DATA QUALIFIER CODES

APPENDIX C SUPPORT DOCUMENTATION

DCN: 22758CFP.NAR

APPENDIX A

ANNOTATED FORM I

Review: ~~I~~M1 Level

Location: KOPS861 OI/16-18

U.S. EPA - CLP
1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MCND49

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: 22758 SAS No.: SDG No.: MCND49

Matrix (soil/water): SOIL Lab Sample ID: 10145-01S

Level (low/med): LOW Date Received: 10/17/94

% Solids: 80.9

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	QV	M
7429-90-5	Aluminum	1460				P
7440-36-0	Antimony	3.2	U	N	UL	P
7440-38-2	Arsenic	0.60	B			P
7440-39-3	Barium	3.7	B			P
7440-41-7	Beryllium	0.60	B			P
7440-43-9	Cadmium	0.18	U			P
7440-70-2	Calcium	161	B		B	P
7440-47-3	Chromium	75.0		N	L	P
7440-48-4	Cobalt	1.9	B		B	P
7440-50-8	Copper	34.1		N*	J	P
7439-89-6	Iron	22000				P
7439-92-1	Lead	8.3		E	J	P
7439-95-4	Magnesium	138	B			P
7439-96-5	Manganese	9.3				P
7439-97-6	Mercury	0.06	U			CV
7440-02-0	Nickel	8.8	B			P
7440-09-7	Potassium	41.8	B			P
7782-49-2	Selenium	0.58	U			P
7440-22-4	Silver	0.67	U			P
7440-23-5	Sodium	15.8	B			P
7440-28-0	Thallium	0.39	U			P
7440-62-2	Vanadium	127		N	L	P
7440-66-6	Zinc	10.5			B	P
	Cyanide					NR

Color Before: RED Clarity Before: QV = QUALIFIER AFTER VALIDATION NE

Color After: RED Clarity After: Artifacts:

Comments:

FORM I - IN ILM02.02

AR305152

APPENDIX B

GLOSSARY OF QUALIFIER CODES

GLOSSARY OF DATA QUALIFIER CODES (INORGANIC)

CODES RELATED TO IDENTIFICATION
(confidence concerning presence or absence of analytes):

U = Not detected. The associated number indicates approximate sample concentration necessary to be detected.

(NO CODE) = Confirmed identification.

B = Not detected substantially above the level reported in laboratory or field blanks.

R = Unusable result. Analyte may or may not be present in the sample. Supporting data necessary to confirm result.

CODES RELATED TO QUANTITATION
(can be used for both positive results and sample quantitation limits):

J = Analyte Present. Reported value may not be accurate or precise.

K = Analyte present. Reported value may be biased high. Actual value is expected to be lower.

L = Analyte present. Reported value may be biased low. Actual value is expected to be higher.

[] = Analyte present. As values approach the IDL the quantitation may not be accurate.

UJ = Not detected, quantitation limit may be inaccurate or imprecise.

UL = Not detected, quantitation limit is probably higher.

OTHER CODES

Q = No analytical result.

APPENDIX C

SUPPORT DOCUMENTATION

U.S. EPA - CLP

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: 22758 SAS No.: SDG No.: MCND49

SOW No.: ILM02.1

EPA Sample No.	Lab Sample ID.
MCND49	10145-01S
MCND49D	10145-01S2
MCND49S	10145-01DS

NOV 18 1994
RECEIVED

Were ICP interelement corrections applied? Yes/No YES
Were ICP background corrections applied? Yes/No YES
If yes-were raw data generated before application of background corrections? Yes/No NO

Comments:

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: Name: Kirk D. Johnson

Date: 11/16/94 Title: USEPA Data Manager

EPA

United States Environmental Protection Agency
Contract Laboratory Program Sample Management Office
PO Box 818 Alexandria, VA 22313
703-557-2490 FTS 557-2490

Inorganic Traffic Report & Chain of Custody Record

(For Inorganic CLP Analysis)

SAS No. (if applicable):

Case No.: 22759

1. Project Code: 4232-05
Account Code:
2. Region No.: III
Sampling Co.: Tetra Tech
4. Date Shipped: 10-14-94
Carrier: FED Ex

Regional Information:

Sampler (Name): David E. Neidigh

Airbill Number: 1973699221

Non-Superfund Program:

Sampler Signature: David E. Neidigh

5. Ship To: TMA/Skinner & Sherman Labs Inc
300 Second Avenue
Waltham MA 02254
617-890-7200
ATTN: Sample Custodian

Site Name: Koppers Company

3. Type of Activity

	Lead	Pre-Remedial	Remedial	Removal
SF			RIFS ☒	CLEM
PRP ☒		PA	RD	REMA
ST		SSI	RA	REM
FED		LSI	O&M	OIL
			NPLD	UST

City, State: Newport DE
Site Spill ID:

6. Preservative (Enter in Column D)
1. HCl
2. HNO_3
3. NaOH
4. H_2SO_4
5. $K_2CR_2O_7$
6. Ice only
7. Other (Specify)
N. Not preserved

7. Sample Description (Enter in Column A)
1. Surface Water
2. Ground Water
3. Leachate
4. Rinsate
5. Soil/Sediment
6. Oil (High only)
7. Waste (High only)
8. Other (Specify)

CLP Sample Numbers (from labels)	A Enter # from Box 7	B Conc. Low Med High	C Sample Type: Comp./ Grab	D Preservative from Box 6	E - RAS Analysis: Metals Total	Metals Dissolved	Cyanide	Low Conc. only: Nitrate/ Nitrite	Fluoride	High only: pH	Conductivity	F Regional Specific Tracking Number or Tag Numbers	G Station Location Number	H Mo/Day/ Year/Time Sample Collection	I Sampler Initials	J Corresp. CLP Org. Samp. No.	K Enter Appropriate Qualifier for Designated Field QC (B = Blank S = Spike D = Duplicate PE = Perform. Eval. — = Not a QC Sample)
MCND49	5	L	G	6	X							3-1153860	KOPSB610I/16-18	10-14-94 0955	DEN	CNI=49	—

Shipment for Case complete? (Y/N): Y

Page 1 of 1

Sample used for a spike and/or duplicate:

Additional Sampler Signatures:

Chain of Custody Seal Number:

CHAIN OF CUSTODY RECORD

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
David E. Neidigh	10-14-94 1600				
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks Is custody seal intact? Y/N/none	

Split Samples ☐ Accepted (Signature) NA
☐ Declined

EPA Form 9110-1 (Rev. 5-91) Replaces EPA Form (2075-6), previous edition which may be used

DISTRIBUTION:
Green - Region Copy for Return to ... k - SMO Copy White - Lab Copy for return to Region Yellow - Lab

SEE REVERSE FOR ADDITIONAL STANDARD INSTRUCTIONS

Inorg-1

AR305157

I 350736

PAGE 1 OF 1
(1)

RESUBMITTED

EPA SAMPLE SHIPPING LOG

ARCI TETI

(REQUIRED FOR ALL SAMPLES SENT THROUGH THE CONTRACT LAB PROGRAM)

PROJECT SITE NAME: Former Koppers Facility EPA PROJ. OFFICER: Lisa Marino
RAS NO. 22758 SAS NO: TASK OR SET NO.
PROJECT SITE LEADER: E. Rogers PHONE NO. (302) 738-7551
PROJECT SAMPLE COORDINATOR: " " PHONE NO. (302) 738-7551

SAS REQUEST (DETAILS REQUIRED)
(10)

R3U5158

QC SAMPLE INFORMATION AND/OR COMMENTS	CONC (LOW/ MED/ HIGH)	SAMPLE PHASE (AQ/ SOL)	TYPE OF REQUEST (ORG.DIO OR INOR) SAS)	EPA SAMPLE NO.	ORGANICS OR INORGANICS											
					LAB. NAME	DATE SHIPPED	DATA RECEIVED (XX-OUT ITEMS NOT REQUESTED)						LAB NAME	SAS REQUEST (ITEMIZE)	DATE SHIP'D	DATA REC'D
							VOA	BNA	PEST	TCDD	METALS	CN				
(2)	(3)	(4)	(5)	(6)	(7)	(8)	←			(9)		→	(11)	(12)	(13)	
TB	LOW	AQ	ORG	CNF 36	RECNY	10/14/94		X	X	X	X	X				
	LOW	SOL	ORG	CNF 49	RECNY	10/14/94			X	X	X	X				
	LOW	SOL	INORG	MCND 47	SKINER	10/14/94	X	X	X	X	↓ ✓	X	Rec'd	11/18/94		

FINAL SAMPLING: YES ☒; NO ☐; FINAL SHIPPING DATE: 10/14/94
(14)

REVISION 02/90

TMA
Thermo Analytical Inc.

300 Second Avenue
Post Office Box 521
Waltham, MA 02254-0521
(617) 890-7200
FAX (617) 890-3883

NOV 18 1994
RECEIVED

Federal Express Airbill #1241599572

November 16, 1994

USEPA Contract Laboratory Program (CLP)
Sample Management Office (SMO)
300 North Lee Street, Suite 200
Alexandria, VA 22314

Attention: Data Receiver

Dear Sir:

Enclosed is the Sample Data Package for the Inorganic Analyses of Case 22758 and SDG MCND49. The samples were analyzed under Skinner and Sherman Work Order #S410145.

Some or all of the elements traditionally analyzed by Graphite Furnace AA have been analyzed by a Thermo Jarrell Ash ICAP61E Trace Analyzer. The ICAP61E Trace Analyzer is a standard simultaneous ICP and nebulizer optimized to achieve instrument detection limits below the CLP CRDL for arsenic, selenium, lead and thallium. For selenium and lead, the instrument utilizes both the first and second orders of the analytical wavelength in order to achieve better simultaneous background correction and stability. The instrument analyzes for the interfering elements in order to apply interelement corrections only. These interfering elements are not used for analytical data reporting purposes.

Please feel free to call if there are any questions concerning the enclosed.

Sincerely,

TMA/SKINNER & SHERMAN LABORATORIES, INC.

Kirk Johnson
Contract Laboratory Program
EPA Data Manager

Encl. Data Audit Staff, EMSL-LV, Federal #1241599581
Annette Lage, Region III, Federal #1241599597

U.S. EPA - CLP

3.

BLANKS

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: 22758 SAS No.: SDG No.: MCND49

Preparation Blank Matrix (soil/water): SOIL

Preparation Blank Concentration Units (ug/L or mg/kg): MG/KG

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum	16.6	U	23.2	B	16.6	U	36.4	B	5.270	B	P
Antimony	13.8	U	13.8	U	13.8	U	13.8	U	2.760	U	P
Arsenic	1.7	U	1.7	U	1.7	U	1.7	U	0.340	U	P
Barium	2.6	U	2.6	U	2.6	U	2.6	U	0.520	U	P
Beryllium	0.7	U	0.7	U	0.7	U	0.7	U	0.140	U	P
Cadmium	0.8	U	0.8	U	1.6	B	0.8	U	0.160	U	P
Calcium	52.1	B	150.3	B	21.2	U	95.2	B	-74.728	B	P
Chromium	6.7	U	6.7	U	6.7	U	6.7	U	1.340	U	P
Cobalt	3.5	B	1.8	U	3.0	B	2.6	B	0.786	B	P
Copper	10.7	B	14.9	B	10.7	B	13.5	B	2.844	B	P
Iron	6.1	U	14.8	B	14.5	B	15.9	B	3.536	B	P
Lead	0.7	U	0.7	U	0.7	U	0.7	U	0.140	U	P
Magnesium	36.5	U	94.9	B	36.5	U	80.4	B	7.300	U	P
Manganese	0.9	U	1.1	B	0.9	U	0.9	U	0.270	B	P
Mercury	0.1	U	0.1	U	0.1	U	0.1	U	0.050	U	CV
Nickel	4.1	U	4.1	U	4.1	U	4.1	U	0.820	U	P
Potassium	78.5	U	78.5	U	78.5	U	78.5	U	15.700	U	P
Selenium	2.5	U	2.5	U	2.5	U	2.5	U	0.500	U	P
Silver	2.9	U	2.9	U	2.9	U	2.9	U	0.580	U	P
Sodium	48.5	U	48.5	U	48.5	U	48.5	U	9.700	U	P
Thallium	1.7	U	1.7	U	1.7	U	1.7	U	0.340	U	P
Vanadium	1.9	U	1.9	U	1.9	U	1.9	U	0.380	U	P
Zinc	9.4	B	17.2	B	9.4	B	15.6	B	0.360	U	P
Cyanide											NR

MCND49

U.S. EPA - CLP

5A

SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

MCND49S

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: 22758 SAS No.: SDG No.: MCND49

Matrix (soil/water): SOIL Level (low/med): LOW

% Solids for Sample: 80.9

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum									NR
Antimony	75-125	62.4239		3.1884	U	117.72	53.0	N	P
Arsenic	75-125	389.3578		0.6040	B	470.89	82.6		P
Barium	75-125	464.8890		3.6551	B	470.89	97.9		P
Beryllium	75-125	11.6169		0.5984	B	11.77	93.6		P
Cadmium	75-125	11.0542		0.1848	U	11.77	93.9		P
Calcium									NR
Chromium	75-125	103.4905		75.0390		47.09	60.4	N	P
Cobalt	75-125	112.2420		1.9177	B	117.72	93.7		P
Copper	75-125	67.3071		34.1370		58.86	56.4	N	P
Iron									NR
Lead	75-125	127.5084		8.2798		117.72	101.3		P
Magnesium									NR
Manganese	75-125	116.4730		9.2950		117.72	91.0		P
Mercury	75-125	0.5121		0.0562	U	0.62	82.6		CV
Nickel	75-125	114.1397		8.8075	B	117.72	89.5		P
Potassium									NR
Selenium	75-125	410.9012		0.5776	U	470.89	87.3		P
Silver	75-125	11.0989		0.6700	U	11.77	94.3		P
Sodium									NR
Thallium	75-125	440.7322		0.3928	U	470.89	93.6		P
Vanadium	75-125	192.5128		127.3431		117.72	55.4	N	P
Zinc	75-125	114.6106		10.5241		117.72	88.4		P
Cyanide									NR

Comments:

U.S. EPA - CLP

6

DUPLICATES

EPA SAMPLE NO.

MCND49D

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: 22758 SAS No.: SDG No.: MCND49

Matrix (soil/water): SOIL Level (low/med): LOW

% Solids for Sample: 80.9 % Solids for Duplicate: 80.2

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit	Sample (S)	C	Duplicate (D)	C	RPD	Q	M
Aluminum		1461.8255		1590.8287		8.5		P
Antimony		3.1884	U	3.3447	U			P
Arsenic		0.6040	B	0.4120	U	200.0		P
Barium		3.6551	B	3.8343	B	4.8		P
Beryllium		0.5984	B	0.6544	B	8.9		P
Cadmium		0.1848	U	0.1939	U			P
Calcium		160.8470	B	151.6106	B	5.9		P
Chromium		75.0390		79.9898		6.4		P
Cobalt		1.9177	B	2.2225	B	14.7		P
Copper	5.8	34.1370		23.8396		35.5	*	P
Iron		22021.6490		26685.0869		19.1		P
Lead		8.2798		7.8114		5.8		P
Magnesium		138.2138	B	127.2401	B	8.3		P
Manganese	3.5	9.2950		8.3303		10.9		P
Mercury		0.0562	U	0.0589	U			CV
Nickel	9.2	8.8075	B	14.4381		48.4		P
Potassium		41.8008	B	50.8253	B	19.5		P
Selenium		0.5776	U	0.6059	U			P
Silver		0.6700	U	1.0519	B	200.0		P
Sodium		15.8312	B	46.8964	B	99.0		P
Thallium		0.3928	U	0.4120	U			P
Vanadium		127.3431		143.1179		11.7		P
Zinc	4.6	10.5241		14.0648		28.8		P
Cyanide								NR

AR305162

U.S. EPA - CLP

9

ICP SERIAL DILUTIONS

EPA SAMPLE NO.

MCND49L

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: 22758 SAS No.: SDG No.: MCND49

Matrix (soil/water): SOIL Level (low/med): LOW

Concentration Units: ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	M
Aluminum	6327.00		5969.00		5.7		P
Antimony	13.80	U	69.00	U			P
Arsenic	2.61	B	11.19	B	328.7		P
Barium	15.82	B	13.00	U	100.0		P
Beryllium	2.59	B	3.50	U	100.0		P
Cadmium	0.80	U	4.00	U			P
Calcium	696.17	B	872.20	B	25.3		P
Chromium	324.78		302.35		6.9		P
Cobalt	8.30	B	13.10	B	57.8		P
Copper	147.75		136.40		7.7		P
Iron	95313.00		91360.00		4.1		P
Lead	35.84		42.76		19.3	E	P
Magnesium	598.21	B	502.05	B	16.1		P
Manganese	40.23		42.70	B	6.1		P
Mercury							NR
Nickel	38.12	B	27.20	B	28.6		P
Potassium	180.92	B	392.50	U	100.0		P
Selenium	2.50	U	12.50	U			P
Silver	2.90	U	14.50	U			P
Sodium	68.52	B	242.50	U	100.0		P
Thallium	1.70	U	24.58	B			P
Vanadium	551.16		513.55		6.8		P
Zinc	45.55		92.90	B	104.0		P

U.S. EPA - CLP

10

INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: 22758 SAS No.: SDG No.: MCND49

ICP ID Number: P1 Date: 10/15/94

Flame AA ID Number:

Furnace AA ID Number:

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum	308.20		200	16.6	P
Antimony	206.80		60	13.8	P
Arsenic			10		NR
Barium	493.40		200	2.6	P
Beryllium	313.00		5	0.7	P
Cadmium	226.50		5	0.8	P
Calcium	317.90		5000	21.2	P
Chromium	267.70		10	6.7	P
Cobalt	228.60		50	1.8	P
Copper	324.70		25	3.4	P
Iron	259.90		100	6.1	P
Lead			3		NR
Magnesium	279.00		5000	36.5	P
Manganese	257.60		15	0.9	P
Mercury			0.2		NR
Nickel	231.60		40	4.1	P
Potassium	766.40		5000	78.5	P
Selenium			5		NR
Silver	328.00		10	2.9	P
Sodium	588.90		5000	48.5	P
Thallium			10		NR
Vanadium	292.40		50	1.9	P
Zinc	213.80		20	1.8	P

Comments:

P1: THERMO JARRELL-ASH ICAP61 (#10782)

U.S. EPA - CLP

10

INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: 22758 SAS No.: SDG No.: MCND49

ICP ID Number: Date: 10/15/94

Flame AA ID Number: M3

Furnace AA ID Number:

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum			200		NR
Antimony			60		NR
Arsenic			10		NR
Barium			200		NR
Beryllium			5		NR
Cadmium			5		NR
Calcium			5000		NR
Chromium			10		NR
Cobalt			50		NR
Copper			25		NR
Iron			100		NR
Lead			3		NR
Magnesium			5000		NR
Manganese			15		NR
Mercury	253.70		0.2	0.1	CV
Nickel			40		NR
Potassium			5000		NR
Selenium			5		NR
Silver			10		NR
Sodium			5000		NR
Thallium			10		NR
Vanadium			50		NR
Zinc			20		NR

Comments:
M3: LDC ANALYTICAL #050941

U.S. EPA - CLP

10

INSTRUMENT DETECTION LIMITS (QUARTERLY)

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: 22758 SAS No.: SDG No.: MCND49

ICP ID Number: P0 Date: 10/15/94

Flame AA ID Number:

Furnace AA ID Number:

Analyte	Wave-length (nm)	Back-ground	CRDL (ug/L)	IDL (ug/L)	M
Aluminum			200		NR
Antimony			60		NR
Arsenic	189.00		10	1.7	P
Barium			200		NR
Beryllium			5		NR
Cadmium			5		NR
Calcium			5000		NR
Chromium			10		NR
Cobalt			50		NR
Copper			25		NR
Iron			100		NR
Lead	220.30		3	0.7	P
Magnesium			5000		NR
Manganese			15		NR
Mercury			0.2		NR
Nickel			40		NR
Potassium			5000		NR
Selenium	196.00		5	2.5	P
Silver			10		NR
Sodium			5000		NR
Thallium	190.80		10	1.7	P
Vanadium			50		NR
Zinc			20		NR

Comments:

P0: THERMO JARRELL-ASH ICAP61E (#171390)

U.S. EPA - CLP

13
PREPARATION LOG

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: 22758 SAS No.: SDG No.: MCND49

Method: CV

EPA Sample No.	Preparation Date	Weight (gram)	Volume (mL)
LCSS	11/01/94	0.20	100
MCND49	11/01/94	0.22	100
MCND49D	11/01/94	0.21	100
MCND49S	11/01/94	0.20	100
PBS	11/01/94	0.20	100

U.S. EPA - CLP

13
PREPARATION LOG

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: 22758 SAS No.: SDG No.: MCND49

Method: P

EPA Sample No.	Preparation Date	Weight (gram)	Volume (mL)
LCSS	11/07/94	1.00	200
MCND49	11/07/94	1.07	200
MCND49D	11/07/94	1.02	200
MCND49S	11/07/94	1.05	200
PBS	11/07/94	1.00	200

U.S. EPA - CLP

14

ANALYSIS RUN LOG

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D2-0039

Lab Code: SKINER Case No.: 22758 SAS No.: SDG No.: MCND49

Instrument ID Number: P1 Method: P

Start date: 11/09/94 End date: 11/09/94

EPA Sample No.	D/F	Time	% R	Analytes																						
				ALB	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
S0	1.00	1327		X	X		X	X	X	X	X	X	X	X		X	X		X	X		X	X		X	X	
S	1.00	1329		X						X				X		X				X			X				
S	1.00	1331			X		X	X	X		X	X	X				X		X						X	X	
S	1.00	1333																				X					
ICV	1.00	1336		X			X	X	X	X	X	X	X	X		X	X		X	X		X	X		X	X	
ICV	1.00	1339			X																						
ICB	1.00	1342		X	X		X	X	X	X	X	X	X	X		X	X		X	X		X	X		X	X	
ICSA	1.00	1344		X	X		X	X	X	X	X	X	X	X		X	X		X	X		X	X		X	X	
ICSAB	1.00	1347		X	X		X	X	X	X	X	X	X	X		X	X		X	X		X	X		X	X	
	1.00	1349			X			X	X		X	X	X				X		X			X			X	X	
CCV	1.00	1352		X	X		X	X	X	X	X	X	X	X		X	X		X	X		X	X		X	X	
CCB-1	1.00	1354		X	X		X	X	X	X	X	X	X	X		X	X		X	X		X	X		X	X	
PBS	1.00	1357		X	X		X	X	X	X	X	X	X	X		X	X		X	X		X	X		X	X	
LCSS	1.00	1400		X	X		X	X	X	X	X	X	X	X		X	X		X	X		X	X		X	X	
ZZZZZZ	1.00	1402																									
MCND49	1.00	1405		X	X		X	X	X	X	X	X	X	X		X	X		X	X		X	X		X	X	
MCND49D	1.00	1407		X	X		X	X	X	X	X	X	X	X		X	X		X	X		X	X		X	X	
MCND49S	1.00	1410			X		X	X	X		X	X	X				X		X			X			X	X	
MCND49L	5.00	1412		X	X		X	X	X	X	X	X	X	X		X	X		X	X		X	X		X	X	
MCND49A	1.00	1421			X						X		X														
CCV	1.00	1424		X	X		X	X	X	X	X	X	X	X		X	X		X	X		X	X		X	X	
CCB-2	1.00	1427		X	X		X	X	X	X	X	X	X	X		X	X		X	X		X	X		X	X	
ICSA	1.00	1429		X	X		X	X	X	X	X	X	X	X		X	X		X	X		X	X		X	X	
ICSAB	1.00	1432		X	X		X	X	X	X	X	X	X	X		X	X		X	X		X	X		X	X	
CRI	1.00	1434			X			X	X		X	X	X				X		X			X			X	X	
CCV	1.00	1437		X	X		X	X	X	X	X	X	X	X		X	X		X	X		X	X		X	X	
CCB-3	1.00	1439		X	X		X	X	X	X	X	X	X	X		X	X		X	X		X	X		X	X	

FORM XIV - IN ILM02.1

AR305169