2618-SCU-005

0045614

MAXWELL
S-CUBED Division

SORRENTO VALLEY OFFICE
3398 Carmel Mountain Road., San Diego, CA 92121-1095
P.O. Box 1620, La Jolla, CA 92038-1620

OCT 1991
RECEIVED
DATA RECEIPT

VOLUME 1 OF 2

DATE: October 29, 1991
REFERENCE NO.: 32359-04, SDG 2618

OCT 1996
RECEIVED
EDMC

Telephone (619) 453-0060 - FAX (619) 755-0474 - Division Office

Westinghouse Hanford Company

Hanford Operations and Engineering Contractor for the US Department of Energy
P.O. Box 1970 Richland, Wa. 99352

NONCONFORMANCE REPORT

Page 1 of ____

No. B 06175

1. MFR/ORG: MAXWELL S-CUBED DIVISION

ITEM/MATERIAL NAME: EWIR SAMPLE — PART NO.: N/A

DRAWING/SPEC. NO.: — REV.: N/A

PROGRAM/PROJECT: SITE-WIDE BACKGROUND — P.O./W.O. NO.:

UNUSUAL OCCURRENCE REPORT REQUIRED: ☒ YES ☒ NO — SYSTEM/END USE: — DATE: 01/28/92

2. DESCRIPTION OF NONCONFORMANCE

LABORATORY IS PERFORMING INORGANIC ANALYSIS (SOIL) WITHOUT UTILIZING A SOLID MATRIX LCS FOR CLP METALS ANALYSIS.

EXAMPLES: SDG #2630 & 2633

NOTE: THE LAB INDICATES THAT ALL METAL ANALYSIS (CLP) HAVE BEEN PERFORMED WITHOUT A SOIL LCS.

3. REQUIREMENT VIOLATED: "ONE SOLID LCS MUST BE PREPARED & ANALYZED FOR EVERY GROUP OF SOLID SAMPLES IN A SAMPLE DELIVERY GROUP....."

DOCUMENT	REV	ZONE/PARA
CLP-SOW INORGANICS	2/88	PART E, SECTION V, ITEM #8

M.A. Beck — ORIGINATOR
12500/05M — ORGANIZATION
01/28/92 — DATE

4. ASME CODE ITEM(s): ☐ NO ☐ YES. NOTIFY AUTHORIZED INSPECTOR.

WHC QAR

5. CAUSE OF NONCONFORMANCE

☐ PROCEDURES ☐ PERSONNEL ☐ MATERIALS
☐ EQUIPMENT ☒ OTHERS

REMARKS: See 8A

PR-07, EQ-001-002

6. CORRECTIVE ACTION TO ELIMINATE CAUSE

- S³ has obtained and is currently using a solid LCS sample for the QC requirement (see S³ letter to T. Washington 3/10

INITIATION DATE — SERIAL NO.

RESPONSIBLE ORG. REP. — TITLE — DATE

7. RECOMMENDED DISPOSITION: ☒ ACCEPT ☐ REJECT ☐ REPAIR ☐ REWORK ☐ OTHER

8. DISPOSITION JUSTIFICATION AND INSTRUCTIONS

S³ did perform the LCS at the required frequency using an aqueous standard prior to receiving and testing the solid LCS. The aqueous LCS results were evaluated in the applicable data packages and performance was documented with the validation paperwork.

9. ADDITIONAL REVIEWS REQUIRED (WHC ONLY): ☐ YES ☒ NO

IF YES, IDENTIFY:

10. SUPPLIER ENG. — SUPPLIER QA

10. DISPOSITION APPROVAL (WHC ONLY)

☒ APPROVED ☐ DISAPPROVED
☐ OTHER (SEE CONTINUATION SHEET)

J.A. Hoover — COGNIZANT ENGINEER — DATE 5/21/92

L.W. Vance — COGNIZANT QA ENGINEER — DATE 5/21/92

NA — AUTHORIZED INSPECTOR REVIEW — DATE

11. ADDITIONAL APPROVALS

NAME	TITLE	DATE	NAME	TITLE	DATE

12. DISPOSITION ACTION COMPLETE

L.W. Vance — NAME — DATE 5/21/92 — QTY. ACCEPT NA — QTY. REJ. NA — FOLLOW ON NCR

QA LOG NO. QA-92-013

The issuance and acceptance of this request in no way limits or affects the warranty provisions of the order. This request shall not establish a precedent or obligation to accept similar conditions in the future.

FOLLOW-UP LEVEL: A ☐ B ☐ C ☐

7310-104 (8-87)

MAXWELL
S-CUBED Division

SORRENTO VALLEY OFFICE
3398 Carmel Mountain Road., San Diego, CA 92121-10
P.O. Box 1620, La Jolla, CA 92038-16

March 27, 1992

Ted Washington
MSIN: T6-08
Office of Sample Management
Westinghouse Hanford Company
2355 Stevens Drive
Richland, WA 99352

Dear Mr. Washington:

We have recently been able to validate and confirm true values for the ERA solid LCS source using the CLP method. The validation study was performed by preparing and analyzing ten solid LCS samples using the CLP method and determining the average value obtained for each analyte and the appropriate windows of acceptability. This validation study was required by the solid LCS source since the certified true value determinations were based on the method 3050, SW-846 (see attached sheet).

Prior to the availability of validated solid LCS for CLP soil analysis, EPA-approved aqueous LCS spike solution was spiked into a clean, empty beaker and then prepared and analyzed by the CLP soil method. Thus quality control requirements for preparation and analysis are acceptable and confirm the reliability and validity of the associated samples using the available LCS at that time.

Sincerely,

Wipawan Nisamaneepong

Wipawan Nisamaneepong, Ph.D.
Inorganics Laboratory Manager

Instructions for the use of

PriorityPollutnT™/CLP Quality Control Standards

Inorganics in Soil **Caution:** Read instructions carefully before opening PriorityPollutnT™/CLP standards.

PriorityPollutnT™/CLP Quality Control Standards are designed to test your complete inorganic priority pollutant and CLP analysis procedure. The Trace Metals solid standard contains 24 trace metals (refer to the back of this sheet for a complete list). The Cyanide solid standard is designed for cyanide analysis, either a simple or a complex cyanide, or both, may be present.

I. Standard Preparation

The standards must be prepared by the following directions before analysis.

A. Trace Metals

Digest the standard using Method 3050, SW-846. This digestion is essentially a hot acid leach of the standard and is not a total digestion. The standard should then be analyzed by ICP and/or atomic absorption. Results different from the certified values will be obtained if a total digestion using hydrofluoric acid, perchloric acid or fusion is employed. Digest and analyze the sample for mercury using Method 7471, SW-846.

B. Cyanide

Prepare the standard using Method 9010 or 9012, SW-846. The preparation quoted is intended for use with an aqueous waste. The only required modification is to place 10 grams of the soil standard into the appropriate aliquot of water in the distillation flask (step 7.2.1). All other preparation steps should be followed. The digestate obtained is then analyzed for cyanide using Method 9010 (manual) or 9012 (automated), SW-846.

II. Standard Storage

Store the standards in a cool, dark place. The stability and certified values are unconditionally guaranteed for one year. Due to possible sample contamination, the guarantee is void after the standards are opened.

III. Standard Analysis

Remember ... PriorityPollutnT™/CLP standards are designed to help you evaluate the accuracy of your routine laboratory procedures. Therefore, analyze PriorityPollutnT™/CLP standards using your regular methods.

IV. Certified Results

The ERA certified and advisory range of values are included. The advisory range is the range of values that an experienced laboratory can expect to attain using the most precise methods and equipment. Certified and advisory values for ERA inorganic quality control standards are based on analytical results from applicable EPA reference methods. Certified values represent 100% recoveries for the analyses. Since many inorganic analytical methods do not yield 100% recoveries, especially for soil samples, ERA advisory ranges reflect typical recoveries from samples for the applicable EPA methodologies. The advisory ranges for these standards are wider than for ERA aqueous standards due to the variability of the SW-846 preparation methods.

SW-846

Inorganics in Soil has been prepared using a cleaned, dried and sieved topsoil substrate. The final product was digested by a variety of methods, including the recommended 3050 (SW-846), to evaluate the effect of digestion variability on the results the laboratory should obtain. The certified values and advisory ranges shown on the accompanying certification sheet were arrived at after extensive evaluation of the experimental results. It should be noted that antimony and molybdenum are especially difficult to quantitatively recover using Method 3050. Low recoveries may also be experienced for arsenic, selenium, silver, thallium and vanadium. The advisory ranges for these elements have been adjusted to reflect this fact.

Experiments conducted by ERA using a "weak acid" digestion with only hydrochloric acid significantly improved the recovery of antimony. Digestion of Inorganics in Soil by a closed vessel microwave methodology also decreased the recovery of silver to <10% of the certified value. High recoveries of the metals native to the soil matrix (e.g. aluminum, calcium, manganese, iron and magnesium) indicate a too vigorous digestion procedure. In general, it should be noted that Method 3050 is not an extremely rugged methodology and close attention should be paid to the procedure to insure recovery of the listed elements within the advisory ranges. ERA stresses that it is the responsibility of the individual laboratory to determine acceptable levels of performance for a particular analytical result depending on the intended use of the data.

* CLP

V. Safety

ERA products may be hazardous and are intended for use by professional laboratory personnel trained in the competent handling of such materials. Responsibility for the safe use of these products rests entirely with the buyer and/or user. If you need a Material Safety Data Sheet for any ERA product, please call toll-free at 1-800-ERA-0122.

MAXWELL
S-CUBED Division

FAX

TO:	M. Beck
FROM:	J. Goodin
DATE:	January 22, 1992
FAX NO:	(509) 373-3992
Pages to follow:	0

At S-Cubed, we do not have access to the EPA's solid LCS sample described in the CLP protocols because we are not currently under CLP contract with them for inorganic analysis. It might be possible to obtain some other solid reference material, but we have not yet found one containing all or even most of the metals. In the Quality Assurance Project Plan for Westinghouse Hanford Company, no solid LCS is specified and no solid LCS is discussed in the SW-846 (RCRA) methods. The LCS is used to determine laboratory consistency, for which purpose the liquid LCS is sufficient and allows us to monitor all of the metals of interest. We have recently analyzed a purchased solid reference standard, containing five of the metals, and would be glad to furnish you with these results. I hope that this explanation will satisfy your client. If you have any other questions or comments, please call me at (619) 587-8409.

CORRESPONDENCE DISTRIBUTION COVERSHEET

To: Distribution

From: Environmental Quality Assurance
H4-16 / 6-8557 / 6-9490

Subject: DISTRIBUTION OF NCR #B06175 (EQA-92-013)

INTERNAL DISTRIBUTION

Approval	Date	Name	Location	W/att
		M. A. Beck	T6-08	
		J. H. Kessner	T6-08	
		J. D. Hoover	H4-57	
		L. W. Vance	H4-16	
		APA	B5-20	
		QUEST	L4-86	
		EQA File	H4-16	

Jeanette
Fancy
Ford
Jeff

MAY 1992
RECEIVED
J.H. KESSNER

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector C. Kramer Date Sampled 9/24/91 Time ____ hours

Company Contact Chris Kramer Telephone (509) 376-4186

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B01417	(3) 120-ml	Soil	See attached Tables A-1, A-2
B01418	↓	↓	Each sample is to be analyzed
B01419			for all analytes by the method
B01420			shown except for fluoride *
B01421			Fluoride may be done by
B01422			ion chromatography.
B01425			
B01426			
B01427	↓	↓	
B01440	0 Bottles	(None)	Additional prep blank
			for all analyses. This sample number
			is provided to report and track this
			additional request. (See OSM correspondence.)
B01449	(3) 120-ml	Soil	
B01J0	↓	↓	* Analyze B01440—B01J5
B01J1			(additional prep blank plus 7 samples)
B01J2			for lithium by ICP in addition
B01J3			to preprinted Tables A-1 and A-2.
B01J4			
B01J5	↓	↓	

Field Information** B01417—27 are from Rattlesnake Springs 9/24/91. B01449—J5 are from archived Yakima Barricade Rockets (694896) transferred to (WHC) our custody 9/20/91.

Special Handling and/or Storage Sieve samples. Use the less-than 2 mm size fraction in analytical aliquots. Exclude stones, etc. larger than 2mm.

Possible Sample Hazards None.

PART II: LABORATORY SECTION

Received by ____ Title ____ Date ____

Analysis Required ____

*Indicate whether sample is soil, sludge, water, etc.

**Use back of page for additional information relative to sample location.

A-6000-406 (05/90)

Westinghouse Hanford Company	CHAIN OF CUSTODY Site-wide Background

Custody Form Initiator C.D. Kramer

Company Contact C. D. Kramer — Telephone (509) 376-4186

Project Designation/Sampling Locations Sigma V Archived Yakima Barricade Borehole 699-48-96, Rattlesnake Springs — Collection Date 9/20/91 9/24/91

Ice Chest No. RM A-1 — Field Logbook No. WHC-N-438

Bill of Lading/Airbill No. 2474253166 — Offsite Property No. W91-0-0579 #2

Method of Shipment Emery

Shipped to S-Cubed / San Diego, CA

Possible Sample Hazards/Remarks None

Sample Identification

	Soil			Soil
B01417	(3) 120 ml bottles ✓		B014H9✓	(3) 120 ml bottles
B01418	✓		B014J0✓	
B01419	✓		B014J1✓	
B01420	✓		B014J2✓	
B01421	✓		B014J3✓	
B01422	✓		B014J4✓	
B01425	✓		B014J5✓	✓
B01426	✓			
B01427	✓	✓		

B01440 : 0 bottles – Sample number to be used for reporting additional prep blank – Blank generated at S-Cubed, not enclosed

☐ Field Transfer of Custody

CHAIN OF POSSESSION (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
C. D. Kramer	J. Dufor Recd for Lab	9/30/91 10:30 am
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90)

Table A-1. Primary Inorganic Analytes.

Element	Typical expected (mg/kg)	Requested soil detection (mg/kg)	Requested method
Antimony	0 - 3	12	204.2 CLP-M
Arsenic	0 - 8	2	206.2 CLP-M
Barium	44 - 229	40	200.7 CLP-M
Beryllium	0 - 0.8	1	200.7 CLP-M
Cadmium	0 - 8	1	213.2 CLP-M
Chromium	2 - 48	2	200.7 CLP-M
Cobalt	0 - 15	10	200.7 CLP-M
Copper	0 - 20	5	200.7 CLP-M
Lead	1 - 13	0.6	239.2 CLP-M
Mercury	< 0.2	0.1	245.5 CLP-M
Nickel	6 - 25	8	200.7 CLP-M
Selenium	0 - 0.1	1	270.2 CLP-M
Silver	0 - 1.5	2	272.2 CLP-M
Thallium	0 - 0.2	2	279.2 CLP-M
Vanadium	24 - 96	10	200.7 CLP-M
Zinc	27 - 112	4	200.7 CLP-M

Table A-2. Secondary Inorganic Analytes.

Element	Typical expected (mg/kg)	Requested soil detection (mg/kg)	Requested method
Aluminum	3600 - 13300	40	200.7 CLP-M
Calcium	2000 - 14000	1000	200.7 CLP-M
Iron	19000 - 29000	20	200.7 CLP-M
Magnesium	2780 - 6910	1000	200.7 CLP-M
Manganese	164 - 2870	3	200.7 CLP-M
Molybdenum	< 4	0.5	7481
Potassium	455 - 2600	1000	200.7 CLP-M
Sodium	125 - 1710	1000	200.7 CLP-M
Silicon	200 - 2900	20	200.7 CLP-M
Titanium	500 - 3500	50	Any method capable of meeting the requested DL
Zirconium	15 - 65	5	Any method capable of meeting the requested DL
Chloride	0 - 20	1	300.0
Nitrate and nitrite	0 - 15	1	300.0
Phosphate	0 - 3	2	300.0
Sulfate	0 - 35	2	300.0
Fluoride	0 - 8	1	Extraction by 300.0, Analysis by ASTM D 3868 - 79
Ammonium	0 - 4	1	Any method capable of meeting the requested DL
Carbonate	Highly Variable	1.0%	ASTM D 4373 - 84

ICP 6010
FURN 7000
HG 7000

Anions

N-NH_3

ALK

Add Lithium by ICP (6010 or 200.7 or equivalent) for samples B014H9, B014J0, B014J1, B014J2, B014J3, B014J4, B014J5 plus additional prep blank B014H0!

PRECISION PRINTING SYSTEMS ® (800) 239-0016

EMERY WORLDWIDE — A CF Company

SIGNATURE AND TALLY RECORD

60029-48 (8/89) Litho USA

DATE: 09-27-91 SHIPMENT NO.: 247425316 6
SHIPPER: WESTINGHOUSE SHIPPING DEPT (509) 376-6665
REFERENCE NO.: W91-0-0579#2

SHIPPER NAME AND ADDRESS	CONSIGNEE NAME AND ADDRESS
WESTINGHOUSE SHIPPING DEPT (509) 376-6665 G2-06 US DEPARTMENT OF ENERGY C/O WESTINGHOUSE HANFORD COMPANY 2355 STEVENS DRIVE 1163 BUILDING PO BOX 1970 RICHLAND WA 99352	JOHN DEWALD S-CUBED 3398 CARMEL MT. ROAD SAN DIEGO CA 92121-1095

Pieces	Weight	Description/Marks	Emery Authorization No.
1	63 LBS	W91-0-0579#2 COOLER RM#A-1 SOIL SAMPLES	

EACH PERSON HANDLING OR TAKING CUSTODY OF THIS SHIPMENT MUST SIGN AND COMPLETE THE INFORMATION BELOW

Name of Person/Company	Transship Point/Destination	Signature of Person Accepting Custody	Time/Date
1 MARK W. BRYANT 1167/1100 WESTINGHOUSE SHIPPING	RICHLAND WA	Mark W Bryant	/09-27-91
2. Richard Thornally Liberty	Pasco Wa	Richard Thornally	[illegible]
3. Ted Vause EWW	PSC	Ted Vause	1540 9-27
4. K Rowden Horizon	PASCO	K Rowden	1545 9-27
5. J.T. HOPKINS EMERY	SAN	[illegible]	0900 9-30-91
6. R. Gillespie S-CUBED	SAN	R Gillespie	1030 9-30-91
7. H I Dufo	S CUBED LAB	H I Dufo	10:30 9-30-91
8.			

SPECIAL HANDLING INSTRUCTIONS

HDY COPY

Contractor [illegible]	**OFF-SITE PROPERTY CONTROL**	CONTROL NUMBER (To be obtained from PROPERTY MANAGEMENT) W11-C-[illegible]

PART I – TO BE COMPLETED BY ORIGINATOR

Department [illegible]	Section [illegible]	Unit

The following items are to be shipped from ☒ Contractor ☐ Vendor

Routing Emery ☒ Contractor ☐ Vendor

Shipped to [illegible]	Off-site Custodian Jim Dowell
	Full Title Project Eng.

Quantity	Description (Include Serial and any Government Tag Numbers)	Original Cost
1 Weight: 63 lbs	Poly Jar (Test (RH # A-1) - Glass jar in soil packed in vermiculite and steel can. - Sample # B01417, B01418, B01419, B01420, B01421, B01422, B01425, B01426, B01427, B01429, B01430, B01431, B01432, B01433, B01434, B01435	

☐ Classified ☐ Unclassified ☐ Shipped Under DOE Contract ☐ Shipped Under Contractor's Use Permit Contract

Necessity for the Off-Site Use of this Property

Program not available onsite.

Bill of Lading # 247425316 6

CERTIFICATION OF THE RADIATION MONITORING RELEASE MUST BE SECURED THE SAME DAY THAT MATERIAL IS DELIVERED TO SHIPPING.

RM Clearance for Public Release [illegible]	RM Survey No [illegible]	Date [illegible]
Location of Property (Area & Bldg.) [illegible] #12 Room V	Contact [illegible]	Phone [illegible]
Date Ready for Shipment	Cost Code to be Charged [illegible]	Approximate Date This Property will be Returned N/A
Originated By [illegible]	Date 9/27/91	Authorized By [illegible]	Date [illegible]
Signature and Name of Property Control	Custodian Date	Property Management Approval [illegible]	Date 9/27/91

PART II – TO BE COMPLETED BY SHIPPING

Signature of Recipient [illegible]	Return Order No.	Date Issued	Purchase Order No.	Date Issued
Date [illegible]				

DISTRIBUTION

By Originator	Shipping Operation – Sign all Copies and Forward to:
White, Green, Yellow, Pink – Property Management Goldenrod – Retain	White – Property Management Green – Property Control Custodian (Issuing Office) Yellow – Retain Pink – Originator

54-3000-479 (09/89)

8

1 of 2

MAXWELL S-CUBED Division

Lot No. 2618

Sample Log-In Sheet

DC No. ____-____-____

Date Received 9/30/91 Date Sampled 9/24/91 Client Code WHC

Time Received 10:30 Am

Received by (Sig.) [illegible] Custody Seals Present/Intact (Y) N Reporting Format: Summ. CLP Summ. (Full CLP) Disk

Airbill No. 247425316 6 Chain of Custody Present (Y) N Turnaround Req'd: 45d 30d 21d 14d 48hr Other 10 D

Charge No. 32359-04 Client Forms Present (Y) N Quality Control Req'd: Level 1(Low) 2(CLP) 3(RCRA) 4(Other) ORG Inorg

Case No./Proj. Code Site Wide Soil SDG No. 2618

S-Cubed No.	Sample Identification	Samp. Type	No. Cont.	Samp. Cond.	Samp. Stor.	A	B	C	D	E	F	G			All Info Agree	Notes
2618-1	BO 1417	S	0/3	OK	WS	X	X	X	X	X	X					
2	1418	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓					
3	1419	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓					
4	1420	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓					
5	1421	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓					
6	1422	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓					
7	1425	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓					
8	1426	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓					G = Lithium
9	1427	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓				J	F = AlK
10	1429	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	X			I	E = N-NH3
															H	D = Anions
															G	C = HG 7000
															F	B = FURN 7000
															E	A = ICP 6010

Container Types

Water ____

Soil 125ml x All

S = Soil/Sediment/Sludge
W = Aqueous
NAL = Non-Aqueous Liquid
NSS = Non-Soil Solid

Water MS, MSD ____

Soil MS, MSD ____

SDG Complete (Y) N

Review JD 10/1

SC-03, Rev. 7/91

2 of 2

MAXWELL S-CUBED Division

Lot No. 2618

Sample Log-In Sheet

DC No. ____-____-____

Date Received 9/30/91 Date Sampled 9/24/91 Client Code WHC

Time Received 10:30 AM

Received by (Sig.) [signature]

Airbill No. 247425316 6

Charge No. 32359.-04

Custody Seals Present/Intact (Y) N

Chain of Custody Present (Y) N

Client Forms Present (Y) N

Reporting Format: Summ. CLP Summ. (Full CLP) Disk

Turnaround Req'd: 45d 30d 21d 14d 48hr Other 10D

Quality Control Req'd: Level 1(Low) 2(CLP) 3(RCRA) 4(Other)

Case No./Proj. Code Site.W.oe.Soil SDG No. 2618

S-Cubed No.	Sample Identification	Samp. Type	No. Cont.	Samp. Cond.	Samp. Stor.	A	B	C	D	E	F	G			All Info Agree	Notes
2618-11	B014J0	S	0/3	OK	WA	X	X	X	X	X	X	X				
12	14J1	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	X				
13	14J2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	X				
14	14J3	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	X				
15	14J4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	X				
16	14J5	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	X				
2618-17	B014H0*	SB	0	OK	—	X	X	X	X	X	X	X				G = Lithium
																F = AIK
																E = N-NH3
	*Extra Prep Blank															D = Anions
																C = HG 7000
																B = Furn 7000
																A = ICP 6010

Container Types

Water ____

Soil 125ml x AI

S = Soil/Sediment/Sludge
W = Aqueous
NAL = Non-Aqueous Liquid
NSS = Non-Soil Solid

Water MS, MSD ____

Soil MS, MSD ____

SDG Complete (Y) N

Review JD 10/1

SC-03, Rev. 7/91

FORM OF PAYMENT

CASH ☐ GBL CBL ☐ FCCOD ☐

PPD ☒ COL ☐ OTH ☐ COMAT ☐

Ex. Date 9/30/91 Lot #2618 10:30am 32359-04

EMERY WORLDWIDE

A CF Company

SERVICES

UNITED STATES / CANADA: Same Day ☐ AM ☐ PM ☐ Second Day ☐ Saturday Delivery ☒

INTERNATIONAL: Express ☐ Preferred ☐ Standard ☐ Business Documents ☐ Customs Clearance ☐ Delivery ☐

PULL FOR SHPT. NO. TAB

E Shipper's Account Number: 850281585

Date: 09-27-91 Origin: PBC Shipment Number: 247425316 6

From:
WESTINGHOUSE SHIPPING DEPT (509) 376-6665
US DEPARTMENT OF ENERGY C/O
WESTINGHOUSE HANFORD
BLDG 1163
2355 STEVENS DRIVE
RICHLAND WA
Canada ☐
Customer's Reference Numbers: W01223 EK16A W91-0-0579#2
Zip: 99352

To:
JOHN DEWALD
S-CUBED
3398 CARMEL MT. ROAD
SAN DIEGO CA
Hold for Pick Up ☐ Canada ☐
E Consignee's Account Number
Zip: 92121-1095

Tariff Dest. Gateway

Check to Ship $

EMERY WORLDWIDE will collect consignee's check made payable only to the shipper for the value of the goods in the amount shown above.

Description	Pcs	Dimensions L	W	H	Total Pieces	Total Weight (in Lbs)
1 ICE CHEST RM#A-1 SOIL SAMPLES W91-0-0579#2	1	17	14	17	1	63

FOR INFORMATION OR RATES CALL 1-800 HI EMERY (1-800-443-6379)

Declared Value $

2 4 7 4 2 5 3 1 6 6

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S-CUBED Division

SORRENTO VALLEY OFFICE
3398 Carmel Mountain Road., San Diego, CA 92121-1095
P.O. Box 1620, La Jolla, CA 92038-1620

NARRATIVE

DATE: October 29, 1991
REFERENCE NO.: 32359-04, SDG 2618

WESTINGHOUSE HANFORD COMPANY - SITE WIDE SOIL

CLP METALS + LI, TI, ZR

The samples were analyzed according to the CLP 2/88 Inorganics Statement of Work for the HSL metals and Method 6010 for Li, Ti, and Zr. GFAA analysis for samples 2618-1 through 2618-16 were analyzed at a dilution factor of 11 due to high levels of Fe and Al in the samples. All sample results are reported in dry weight. There were significant levels of most analytes detected in the samples.

The quality control results were generally acceptable. Several percent recovery and duplicate problems were encountered during analysis due to matrix interferences. The linear curve for the mercury run places the zero at -0.2; 0.2 is the IDL. The Form 3's therefore, report CCBs at -0.2 and the soil prep blank at -.102. Since this is the IDL, the sample results are not affected or compromised. SOT

Telephone (619) 453-0060 - FAX (619) 755-0474 - Division Office

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-1

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-1____

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _97.3

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	11400		*	P
7440-36-0	Antimony	5.8	U	N	P
7440-38-2	Arsenic	6.5		W*	F
7440-39-3	Barium	100			P
7440-41-7	Beryllium	1.5			P
7440-43-9	Cadmium	0.31	U		P
7440-70-2	Calcium	5660			P
7440-47-3	Chromium	12.4			P
7440-48-4	Cobalt	14.5			P
7440-50-8	Copper	13.2			P
7439-89-6	Iron	31300			P
7439-92-1	Lead	11.1			F
7439-95-4	Magnesium	4540			P
7439-96-5	Manganese	468			P
7439-97-6	Mercury	0.10	U	N	CV
7440-02-0	Nickel	14.1			P
7440-09-7	Potassium	1580			P
7782-49-2	Selenium	4.5	U	WN	F
7440-22-4	Silver	1.0	U	N	P
7440-23-5	Sodium	379	B		P
7440-28-0	Thallium	3.4	U		F
7440-62-2	Vanadium	91.6			P
7440-66-6	Zinc	58.8			P

Color Before: _____ Clarity Before: _____ Texture: FINE__

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

BO_1417

FORM I - IN

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U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-1

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618___

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-1____

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _97.3

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

CAS No.	Analyte	Concentration	C	Q	M
7439-93-2	Lithium__	25.8			P_
7440-24-6	Titanium_	2010			P_
7440-31-5	Zirconium	31.6			P_

Color Before: _____ Clarity Before: _____ Texture: FINE__

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
BO_1417

FORM I - IN

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00003

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-2

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-2____

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _97.7

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	10300		*	P
7440-36-0	Antimony	5.7	U	N	P
7440-38-2	Arsenic	5.2		W*	F
7440-39-3	Barium	110			P
7440-41-7	Beryllium	1.3			P
7440-43-9	Cadmium	0.31	U		P
7440-70-2	Calcium	5230			P
7440-47-3	Chromium	12.5			P
7440-48-4	Cobalt	13.8			P
7440-50-8	Copper	15.5			P
7439-89-6	Iron	27000			P
7439-92-1	Lead	8.6		W	F
7439-95-4	Magnesium	5100			P
7439-96-5	Manganese	492			P
7439-97-6	Mercury	0.10	U	N	CV
7440-02-0	Nickel	16.0			P
7440-09-7	Potassium	1920			P
7782-49-2	Selenium	4.5	U	WN	F
7440-22-4	Silver	1.0	U	N	P
7440-23-5	Sodium	281	B		P
7440-28-0	Thallium	3.4	U		F
7440-62-2	Vanadium	66.1			P
7440-66-6	Zinc	52.2			P

Color Before: _____ Clarity Before: _____ Texture: FINE__

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

BO_1418

FORM I - IN

7/88

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-2

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-2____

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _97.7

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

CAS No.	Analyte	Concentration	C	Q	M
7439-93-2	Lithium__	25.2			P
7440-24-6	Titanium_	1530			P
7440-31-5	Zirconium	25.5			P

Color Before: _____ Clarity Before: _____ Texture: FINE__

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
BO_1418

FORM I - IN

7/88

00005

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-3

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-3____

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _97.8

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	5470		*	P
7440-36-0	Antimony	5.7	U	N	P
7440-38-2	Arsenic	3.1		W*	F
7440-39-3	Barium	94.0			P
7440-41-7	Beryllium	1.2			P
7440-43-9	Cadmium	0.31	U		P
7440-70-2	Calcium	6100			P
7440-47-3	Chromium	7.6			P
7440-48-4	Cobalt	13.0			P
7440-50-8	Copper	9.4			P
7439-89-6	Iron	27000			P
7439-92-1	Lead	5.1		W	F
7439-95-4	Magnesium	3210			P
7439-96-5	Manganese	383			P
7439-97-6	Mercury	0.10	U	N	CV
7440-02-0	Nickel	9.5			P
7440-09-7	Potassium	877			P
7782-49-2	Selenium	4.5	U	WN	F
7440-22-4	Silver	1.0	U	N	P
7440-23-5	Sodium	268	B		P
7440-28-0	Thallium	3.4	U		F
7440-62-2	Vanadium	97.9			P
7440-66-6	Zinc	51.3			P

Color Before: _____ Clarity Before: _____ Texture: FINE__

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
BO_1419

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-3

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-3____

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _97.8

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

CAS No.	Analyte	Concentration	C	Q	M
7439-93-2	Lithium__	15.3	U		P_
7440-24-6	Titanium_	2080			P_
7440-31-5	Zirconium	29.0			P_

Color Before: _____ Clarity Before: _____ Texture: FINE__

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

BO_1419

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-4

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-4____

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _96.4

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	10000		*	P
7440-36-0	Antimony_	5.8	U	N	P
7440-38-2	Arsenic__	3.6		W*	F
7440-39-3	Barium___	133			P
7440-41-7	Beryllium	1.2			P
7440-43-9	Cadmium__	0.31	U		P
7440-70-2	Calcium__	10200			P
7440-47-3	Chromium_	11.4			P
7440-48-4	Cobalt___	13.6			P
7440-50-8	Copper___	13.3			P
7439-89-6	Iron_____	26700			P
7439-92-1	Lead_____	6.9		W	F
7439-95-4	Magnesium	6910			P
7439-96-5	Manganese	704			P
7439-97-6	Mercury__	0.10	U	N	CV
7440-02-0	Nickel___	14.0			P
7440-09-7	Potassium	1610			P
7782-49-2	Selenium_	4.6	U	WN	F
7440-22-4	Silver___	1.0	U	N	P
7440-23-5	Sodium___	312	B		P
7440-28-0	Thallium_	3.4	U	W	F
7440-62-2	Vanadium_	74.0			P
7440-66-6	Zinc_____	50.2			P

Color Before: _____ Clarity Before: _____ Texture: FINE__

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

BO_1420

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-4

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-4____

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _96.4

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

CAS No.	Analyte	Concentration	C	Q	M
7439-93-2	Lithium__	15.6	U		P_
7440-24-6	Titanium_	1620			P_
7440-31-5	Zirconium	28.1			P_

Color Before: _____ Clarity Before: _____ Texture: FINE__

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

BO_1420

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-5

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-5____

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _96.9

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	9980		*	P
7440-36-0	Antimony_	5.8	U	N	P
7440-38-2	Arsenic__	5.0		W*	F
7440-39-3	Barium___	111			P
7440-41-7	Beryllium	1.2			P
7440-43-9	Cadmium__	0.31	U		P
7440-70-2	Calcium__	11200			P
7440-47-3	Chromium_	11.1			P
7440-48-4	Cobalt___	12.6			P
7440-50-8	Copper___	14.9			P
7439-89-6	Iron_____	23800			P
7439-92-1	Lead_____	7.9		W	F
7439-95-4	Magnesium	9790			P
7439-96-5	Manganese	434			P
7439-97-6	Mercury__	0.10	U	N	CV
7440-02-0	Nickel___	14.6			P
7440-09-7	Potassium	1860			P
7782-49-2	Selenium_	4.5	U	WN	F
7440-22-4	Silver___	1.0	U	N	P
7440-23-5	Sodium___	782			P
7440-28-0	Thallium_	3.4	U		F
7440-62-2	Vanadium_	54.1			P
7440-66-6	Zinc_____	46.4			P

Color Before: _____ Clarity Before: _____ Texture: FINE__

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
BO_1421

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1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-5

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-5____

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _96.9

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

CAS No.	Analyte	Concentration	C	Q	M
7439-93-2	Lithium__	18.3			P_
7440-24-6	Titanium_	1250			P_
7440-31-5	Zirconium	25.9			P_

Color Before: _____ Clarity Before: _____ Texture: FINE__

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
BO_1421

FORM I - IN

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U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-6

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-6____

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _97.3

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	10300		*	P
7440-36-0	Antimony	5.8	U	N	P
7440-38-2	Arsenic	5.0		W*	F
7440-39-3	Barium	116			P
7440-41-7	Beryllium	1.2			P
7440-43-9	Cadmium	0.31	U		P
7440-70-2	Calcium	10400			P
7440-47-3	Chromium	10.6			P
7440-48-4	Cobalt	12.8			P
7440-50-8	Copper	16.5			P
7439-89-6	Iron	23800			P
7439-92-1	Lead	8.3			F
7439-95-4	Magnesium	9150			P
7439-96-5	Manganese	506			P
7439-97-6	Mercury	0.10	U	N	CV
7440-02-0	Nickel	14.1			P
7440-09-7	Potassium	3280			P
7782-49-2	Selenium	4.5	U	WN	F
7440-22-4	Silver	1.0	U	N	P
7440-23-5	Sodium	5620			P
7440-28-0	Thallium	3.4	U		F
7440-62-2	Vanadium	80.7			P
7440-66-6	Zinc	46.9			P

Color Before: _____ Clarity Before: _____ Texture: FINE__

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

BD_1422

FORM I - IN

7/88

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-6

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-6____

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _97.3

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

CAS No.	Analyte	Concentration	C	Q	M
7439-93-2	Lithium__	26.6			P_
7440-24-6	Titanium_	1120			P_
7440-31-5	Zirconium	26.4			P_

Color Before: _____ Clarity Before: _____ Texture: FINE__

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
BO_1422

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1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-7

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-7____

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _97.4

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	8560		*	P
7440-36-0	Antimony	5.7	U	N	P
7440-38-2	Arsenic	3.2		*	F
7440-39-3	Barium	106			P
7440-41-7	Beryllium	1.1			P
7440-43-9	Cadmium	0.31	U		P
7440-70-2	Calcium	7200			P
7440-47-3	Chromium	9.3			P
7440-48-4	Cobalt	11.6			P
7440-50-8	Copper	12.3			P
7439-89-6	Iron	22500			P
7439-92-1	Lead	7.2			F
7439-95-4	Magnesium	4260			P
7439-96-5	Manganese	478			P
7439-97-6	Mercury	0.10	U	N	CV
7440-02-0	Nickel	12.6			P
7440-09-7	Potassium	2020			P
7782-49-2	Selenium	4.5	U	WN	F
7440-22-4	Silver	1.1		N	P
7440-23-5	Sodium	3390			P
7440-28-0	Thallium	3.4	U	W	F
7440-62-2	Vanadium	52.3			P
7440-66-6	Zinc	46.6			P

Color Before: _____ Clarity Before: _____ Texture: FINE__

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
BO_1425

FORM I - IN

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1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-7

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-7____

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _97.4

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

CAS No.	Analyte	Concentration	C	Q	M
7439-93-2	Lithium__	23.4			P_
7440-24-6	Titanium_	1240			P_
7440-31-5	Zirconium	23.5			P_

Color Before: _____ Clarity Before: _____ Texture: FINE__

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
BO_1425

FORM I - IN

7/88

00015

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-8

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-8____

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _99.4

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	6770		*	P
7440-36-0	Antimony_	5.6	U	N	P
7440-38-2	Arsenic__	4.0		*	F
7440-39-3	Barium___	92.8			P
7440-41-7	Beryllium	1.2			P
7440-43-9	Cadmium__	0.30	U		P
7440-70-2	Calcium__	10800			P
7440-47-3	Chromium_	8.2			P
7440-48-4	Cobalt___	15.0			P
7440-50-8	Copper___	9.7			P
7439-89-6	Iron_____	26400			P
7439-92-1	Lead_____	6.0			F
7439-95-4	Magnesium	3720			P
7439-96-5	Manganese	385			P
7439-97-6	Mercury__	0.10	U	N	CV
7440-02-0	Nickel___	10.7			P
7440-09-7	Potassium	1030			P
7782-49-2	Selenium_	4.4	U	WN	F
7440-22-4	Silver___	1.3		N	P
7440-23-5	Sodium___	309	B		P
7440-28-0	Thallium_	3.3	U	W	F
7440-62-2	Vanadium_	89.0			P
7440-66-6	Zinc_____	49.9			P

Color Before: _____ Clarity Before: _____ Texture: FINE__

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

BO_1426

FORM I - IN

7/88

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-8

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-8____

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _99.4

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

CAS No.	Analyte	Concentration	C	Q	M
7439-93-2	Lithium__	21.8			P_
7440-24-6	Titanium_	1980			P_
7440-31-5	Zirconium	29.6			P_

Color Before: _____ Clarity Before: _____ Texture: FINE__

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
BO_1426

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1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-9

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-9____

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _97.3

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7200		*	P
7440-36-0	Antimony	5.8	U	N	P
7440-38-2	Arsenic	4.5		W*	F
7440-39-3	Barium	83.4			P
7440-41-7	Beryllium	0.62			P
7440-43-9	Cadmium	0.31	U		P
7440-70-2	Calcium	37500			P
7440-47-3	Chromium	6.8			P
7440-48-4	Cobalt	6.1			P
7440-50-8	Copper	11.6			P
7439-89-6	Iron	12300			P
7439-92-1	Lead	3.8			F
7439-95-4	Magnesium	6250			P
7439-96-5	Manganese	214			P
7439-97-6	Mercury	0.10	U	N	CV
7440-02-0	Nickel	7.7			P
7440-09-7	Potassium	1470			P
7782-49-2	Selenium	4.5	U	WN	F
7440-22-4	Silver	1.0	U	N	P
7440-23-5	Sodium	2460			P
7440-28-0	Thallium	3.4	U		F
7440-62-2	Vanadium	27.3			P
7440-66-6	Zinc	24.2			P

Color Before: _____ Clarity Before: _____ Texture: FINE__

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-9

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-9____

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _97.3

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

CAS No.	Analyte	Concentration	C	Q	M
7439-93-2	Lithium__	23.3			P_
7440-24-6	Titanium_	587			P_
7440-31-5	Zirconium	14.7			P_

Color Before: _____ Clarity Before: _____ Texture: FINE__

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
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U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-10

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-10___

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _97.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6230		*	P
7440-36-0	Antimony	5.8	U	N	P
7440-38-2	Arsenic	3.8		W*	F
7440-39-3	Barium	72.8			P
7440-41-7	Beryllium	0.82			P
7440-43-9	Cadmium	0.31	U		P
7440-70-2	Calcium	3820			P
7440-47-3	Chromium	8.5			P
7440-48-4	Cobalt	7.4			P
7440-50-8	Copper	10.3			P
7439-89-6	Iron	14800			P
7439-92-1	Lead	7.2			F
7439-95-4	Magnesium	3820			P
7439-96-5	Manganese	346			P
7439-97-6	Mercury	0.10	U	N	CV
7440-02-0	Nickel	9.5			P
7440-09-7	Potassium	1140			P
7782-49-2	Selenium	4.5	U	N	F
7440-22-4	Silver	1.0	U	N	P
7440-23-5	Sodium	143	B		P
7440-28-0	Thallium	3.4	U		F
7440-62-2	Vanadium	27.9			P
7440-66-6	Zinc	32.6			P

Color Before: _____ Clarity Before: _____ Texture: MEDIUM

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

BO_14H9

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-10

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-10___

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _97.0

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

CAS No.	Analyte	Concentration	C	Q	M
7439-93-2	Lithium__	23.5			P_
7440-24-6	Titanium_	652			P_
7440-31-5	Zirconium	14.0			P_

Color Before: _____ Clarity Before: _____ Texture: MEDIUM

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-11

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-11___

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _97.4

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	8710		*	P
7440-36-0	Antimony_	5.7	U	N	P
7440-38-2	Arsenic__	2.3	U	*	F
7440-39-3	Barium___	64.7			P
7440-41-7	Beryllium	0.82			P
7440-43-9	Cadmium__	0.31	U		P
7440-70-2	Calcium__	11100			P
7440-47-3	Chromium_	13.2			P
7440-48-4	Cobalt___	7.8			P
7440-50-8	Copper___	14.5			P
7439-89-6	Iron____	15900			P
7439-92-1	Lead____	6.4			F
7439-95-4	Magnesium	4960			P
7439-96-5	Manganese	316			P
7439-97-6	Mercury__	0.10	U	N	CV
7440-02-0	Nickel___	13.4			P
7440-09-7	Potassium	1660			P
7782-49-2	Selenium_	4.5	U	N	F
7440-22-4	Silver___	1.0	U	N	P
7440-23-5	Sodium___	235	B		P
7440-28-0	Thallium_	3.4	U		F
7440-62-2	Vanadium_	31.6			P
7440-66-6	Zinc____	39.8			P

Color Before: _____ Clarity Before: _____ Texture: MEDIUM

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

BO_14JO

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-11

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-11___

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _97.4

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

CAS No.	Analyte	Concentration	C	Q	M
7439-93-2	Lithium__	26.8			P_
7440-24-6	Titanium_	681			P_
7440-31-5	Zirconium	10.3	U		P_

Color Before: _____ Clarity Before: _____ Texture: MEDIUM

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

BO_14JO

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-12

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-12___

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _97.3

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	8110		*	P
7440-36-0	Antimony	5.8	U	N	P
7440-38-2	Arsenic	2.4		*	F
7440-39-3	Barium	83.6			P
7440-41-7	Beryllium	0.82			P
7440-43-9	Cadmium	0.31	U		P
7440-70-2	Calcium	7790			P
7440-47-3	Chromium	16.6			P
7440-48-4	Cobalt	7.9			P
7440-50-8	Copper	17.2			P
7439-89-6	Iron	16400			P
7439-92-1	Lead	4.1			F
7439-95-4	Magnesium	4780			P
7439-96-5	Manganese	264			P
7439-97-6	Mercury	0.10	U	N	CV
7440-02-0	Nickel	17.8			P
7440-09-7	Potassium	1090			P
7782-49-2	Selenium	4.5	U	N	F
7440-22-4	Silver	1.0	U	N	P
7440-23-5	Sodium	238	B		P
7440-28-0	Thallium	3.4	U		F
7440-62-2	Vanadium	36.8			P
7440-66-6	Zinc	34.0			P

Color Before: _____ Clarity Before: _____ Texture: MEDIUM

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

BO_14J1

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-12

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-12___

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _97.3

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

CAS No.	Analyte	Concentration	C	Q	M
7439-93-2	Lithium	24.8			P
7440-24-6	Titanium	919			P
7440-31-5	Zirconium	12.7			P

Color Before: _____ Clarity Before: _____ Texture: MEDIUM

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

BO_14J1

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-13

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-13___

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _98.4

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	6800		*	P
7440-36-0	Antimony_	5.7	U	N	P
7440-38-2	Arsenic__	2.2	U	*	F
7440-39-3	Barium___	55.5			P
7440-41-7	Beryllium	0.61			P
7440-43-9	Cadmium__	0.30	U		P
7440-70-2	Calcium__	6140			P
7440-47-3	Chromium_	11.7			P
7440-48-4	Cobalt___	6.5			P
7440-50-8	Copper___	13.6			P
7439-89-6	Iron____	13200			P
7439-92-1	Lead____	4.6			F
7439-95-4	Magnesium	4120			P
7439-96-5	Manganese	227			P
7439-97-6	Mercury__	0.10	U	N	CV
7440-02-0	Nickel___	16.8			P
7440-09-7	Potassium	888			P
7782-49-2	Selenium_	4.5	U	WN	F
7440-22-4	Silver___	1.0	U	N	P
7440-23-5	Sodium___	204	B		P
7440-28-0	Thallium_	3.4	U		F
7440-62-2	Vanadium_	29.7			P
7440-66-6	Zinc____	30.9			P

Color Before: _____ Clarity Before: _____ Texture: MEDIUM

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-13

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-13___

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _98.4

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

CAS No.	Analyte	Concentration	C	Q	M
7439-93-2	Lithium__	23.2			P_
7440-24-6	Titanium_	832			P_
7440-31-5	Zirconium	11.8			P_

Color Before: _____ Clarity Before: _____ Texture: MEDIUM

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

BO_14J2

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-14

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-14___

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _96.9

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	8000		*	P
7440-36-0	Antimony	5.8	U	N	P
7440-38-2	Arsenic	3.7		*	F
7440-39-3	Barium	66.0			P
7440-41-7	Beryllium	0.83			P
7440-43-9	Cadmium	0.31	U		P
7440-70-2	Calcium	7320			P
7440-47-3	Chromium	12.7			P
7440-48-4	Cobalt	7.7			P
7440-50-8	Copper	14.3			P
7439-89-6	Iron	15100			P
7439-92-1	Lead	7.8			F
7439-95-4	Magnesium	4700			P
7439-96-5	Manganese	333			P
7439-97-6	Mercury	0.10	U	N	CV
7440-02-0	Nickel	13.5			P
7440-09-7	Potassium	2350			P
7782-49-2	Selenium	4.5	U	N	F
7440-22-4	Silver	1.0	U	N	P
7440-23-5	Sodium	140	B		P
7440-28-0	Thallium	3.4	U		F
7440-62-2	Vanadium	27.7			P
7440-66-6	Zinc	42.0			P

Color Before: _____ Clarity Before: _____ Texture: FINE__

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

BO_14J3

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1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-14

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-14___

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _96.9

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

CAS No.	Analyte	Concentration	C	Q	M
7439-93-2	Lithium__	16.8	_		P_
7440-24-6	Titanium_	589	_		P_
7440-31-5	Zirconium	10.3	U		P_

Color Before: _____ Clarity Before: _____ Texture: FINE__

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
BO_14J3

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-15

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-15___

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _98.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	7650		*	P
7440-36-0	Antimony_	5.7	U	N	P
7440-38-2	Arsenic__	2.5		*	F
7440-39-3	Barium___	46.2			P
7440-41-7	Beryllium	0.82			P
7440-43-9	Cadmium__	0.31	U		P
7440-70-2	Calcium__	5930			P
7440-47-3	Chromium_	19.8			P
7440-48-4	Cobalt___	8.5			P
7440-50-8	Copper___	13.4			P
7439-89-6	Iron_____	17700			P
7439-92-1	Lead_____	3.4			F
7439-95-4	Magnesium	5480			P
7439-96-5	Manganese	304			P
7439-97-6	Mercury__	0.10	U	N	CV
7440-02-0	Nickel___	20.5			P
7440-09-7	Potassium	1050			P
7782-49-2	Selenium_	4.5	U	N	F
7440-22-4	Silver___	1.0	U	N	P
7440-23-5	Sodium___	177	B		P
7440-28-0	Thallium_	3.4	U		F
7440-62-2	Vanadium_	38.5			P
7440-66-6	Zinc_____	41.8			P

Color Before: _____ Clarity Before: _____ Texture: MEDIUM

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
BO_14J4

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-15

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-15___

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _98.0

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

CAS No.	Analyte	Concentration	C	Q	M
7439-93-2	Lithium__	15.3	U		P_
7440-24-6	Titanium_	985			P_
7440-31-5	Zirconium	11.4			P_

Color Before: _____ Clarity Before: _____ Texture: MEDIUM

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
BO_14J4

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-16

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-16___

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _97.5

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7150		*	P
7440-36-0	Antimony	5.7	U	N	P
7440-38-2	Arsenic	4.2		*	F
7440-39-3	Barium	65.8			P
7440-41-7	Beryllium	0.72			P
7440-43-9	Cadmium	0.31	U		P
7440-70-2	Calcium	9340			P
7440-47-3	Chromium	24.0			P
7440-48-4	Cobalt	8.5			P
7440-50-8	Copper	17.3			P
7439-89-6	Iron	16500			P
7439-92-1	Lead	4.4			F
7439-95-4	Magnesium	5850			P
7439-96-5	Manganese	372			P
7439-97-6	Mercury	0.10	U	N	CV
7440-02-0	Nickel	26.6			P
7440-09-7	Potassium	823			P
7782-49-2	Selenium	4.5	U	N	F
7440-22-4	Silver	1.0	U	N	P
7440-23-5	Sodium	101	U		P
7440-28-0	Thallium	3.4	U		F
7440-62-2	Vanadium	33.2			P
7440-66-6	Zinc	39.3			P

Color Before: _____ Clarity Before: _____ Texture: MEDIUM

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
BD_14J5

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-16

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-16___

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _97.5

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

CAS No.	Analyte	Concentration	C	Q	M
7439-93-2	Lithium__	15.4	U		P_
7440-24-6	Titanium_	524			P_
7440-31-5	Zirconium	10.3	U		P_

Color Before: _____ Clarity Before: _____ Texture: MEDIUM

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
BO_14J5

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-17

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-17___

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: 100.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7.2	U	*	P
7440-36-0	Antimony	5.6	U	N	P
7440-38-2	Arsenic	0.20	U	*	F
7440-39-3	Barium	4.1	U		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.30	U		P
7440-70-2	Calcium	107	U		P
7440-47-3	Chromium	0.70	U		P
7440-48-4	Cobalt	1.6	U		P
7440-50-8	Copper	1.8	U		P
7439-89-6	Iron	6.9	U		P
7439-92-1	Lead	0.10	U		F
7439-95-4	Magnesium	249	U		P
7439-96-5	Manganese	0.60	U		P
7439-97-6	Mercury	0.10	U	N	CV
7440-02-0	Nickel	3.2	U		P
7440-09-7	Potassium	130	U		P
7782-49-2	Selenium	0.40	U	N	F
7440-22-4	Silver	1.0	U	N	P
7440-23-5	Sodium	98.7	U		P
7440-28-0	Thallium	0.30	U		F
7440-62-2	Vanadium	2.0	U		P
7440-66-6	Zinc	5.0	U		P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

BO_14HO

FORM I - IN

7/88

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-17

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-17___

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: 100.0

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

CAS No.	Analyte	Concentration	C	Q	M
7439-93-2	Lithium__	15.0	U		P_
7440-24-6	Titanium_	1.5	U		P_
7440-31-5	Zirconium	10.0	U		P_

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

BO_14HO

FORM I - IN

7/88

00035

MAXWELL
S-CUBED Division

SORRENTO VALLEY OFFICE
3398 Carmel Mountain Road., San Diego, CA 92121-1095
P.O. Box 1620, La Jolla, CA 92038-1620

NARRATIVE

DATE: October 29, 1991
REFERENCE NO.: 32359-04, SDG 2618

WESTINGHOUSE HANFORD COMPANY - SITE WIDE SOIL

ANIONS

The samples were analyzed according to Method 300.0. Several samples required dilutions for Cl and SO4 analysis. All sample results are reported in dry weight. There were significant levels detected in several samples.

The quality control results were acceptable.

SILICA

The samples were analyzed according to Method 370.1. There were no difficulties with the analysis. Si results are reorted as dissolved Si. All sample results are reported in dry weight. There were significant levles detected in several samples.

The quality control results were acceptable.

TOTAL ALKALINITY

The samples were analyzed according to Method 310.1. There were no difficulties with the analysis. All sample results are reported in dry weight. There were significant levels detected in the samples.

The quality control results were acceptable.

AMMONIA

The samples were analyzed according to Method 350.3. There were no difficulties with the analysis. All sample results are reported in dry weight. There low levels were detected in several samples.

The quality control results were acceptable. SOT

Telephone (619) 453-0060 - FAX (619) 755-0474 - Division Office

MAXWELL
S-CUBED Division

SORRENTO VALLEY OFFICE
3398 Carmel Mountain Road., San Diego, CA 92121-1095
P.O. Box 1620, La Jolla, CA 92038-1620

OCT 1991
RECEIVED
DATA RECEIPT

VOLUME 2 OF 2

DATE: October 29, 1991
REFERENCE NO.: 32359-04, SDG 2618

Telephone (619) 453-0060 - FAX (619) 755-0474 - Division Office

11-23-94

SAMPLE SUMMARY

S-Cubed Reference No. 32359-04, SDG No. 2618, Project Name: Site Wide Soil

S-Cubed Number	Sample ID	Date Received	Sample Type	Analysis										
				A	B	C	D	E	F	G	H	I	J	H
2618-1	BO 1417	9/30/91	SOIL					1	1	1	1	1	1	
2618-2	BO 1418	9/30/91	SOIL					3	3	3	3	3	3	
2618-3	BO 1419	9/30/91	SOIL					1	1	1	1	1	1	
2618-4	BO 1420	9/30/91	SOIL					1	1	1	1	1	1	
2618-5	BO 1421	9/30/91	SOIL					1	1	1	1	1	1	
2618-6	BO 1422	9/30/91	SOIL					1	1	1	1	1	1	
2618-7	BO 1425	9/30/91	SOIL					1	1	1	1	1	1	
2618-8	BO 1426	9/30/91	SOIL					1	1	1	1	1	1	
2618-9	BO 1427	9/30/91	SOIL					1	1	1	1	1	1	
2618-10	BO 14H9	9/30/91	SOIL					1	1	1	1	1	1	
2618-11	BO 14J0	9/30/91	SOIL					1	1	1	1	1	1	
2618-12	BO 14J1	9/30/91	SOIL					1	1	1	1	1	1	
2618-13	BO 14J2	9/30/91	SOIL					1	1	1	1	1	1	
2618-14	BO 14J3	9/30/91	SOIL					1	1	1	1	1	1	
2618-15	BO 14J4	9/30/91	SOIL					1	1	1	1	1	1	
2618-16	BO 14J5	9/30/91	SOIL					1	1	1	1	1	1	
2618-17	BO 14H0	9/30/91	SOIL					1	1	1	1	1	1	

Analysis Key:

A=VOACLP
B=SVOACLP
C=OCPCLP
D=TOC
E=ICPCLP+ Si, Ti, Zr, Li
F=FURNCLP
G=HGCLP
H=ANIONS
I=N-NH3
J=ALK

ANIONS ANALYSIS

LABORATORY:	S-CUBED	DATA REVIEWER: CAN 10/28/91	
CLIENT:	WHC	PROJECT REVIEWER:	
CASE:	SITE WIDE SOIL	CHARGE #:	32359-04
LOT #:	2618	DATE RECEIVED:	09/30/91
FILE#:	ANI0930	DATE PREP:	10/15-16/91
DISK:	ANI1017	DATE ANALYZED:	10/15-16/91
METHOD NO.	300.0	MATRIX:	SOIL

RESULTS: UNIT AS MG/KG DRY WEIGHT

LAB ID	F	CL	NO2	NO3	O-PO4	SO4
2618-1	1.85	20.3	< 0.2	25.3	1.37	50.9
2618-2	1.73	6.81	< 0.2	8.14	1.78	97.7
2618-3	0.644	25.4	< 0.2	2.93	1.43	13.1
2618-4	1.52	10.3	< 0.2	3.60	1.50	11.6
2618-5	1.39 (1)	370	< 0.2	4.65	1.46	102
2618-6	3.97 (1)	889	< 0.2	10.3	14.4	1480
2618-7	< 0.1	601	< 0.2	11.9	7.70	2600
2618-8	< 0.1	1.01	< 0.2	1.66	7.04	1.89
2618-9	< 1	543	< 0.2	3.39	< 0.5	833
2618-10	0.567	< 0.10	< 0.2	1.39	2.47	1.23
2618-11	< 0.1	0.508	< 0.2	1.62	< 0.5	1.18
2618-12	< 0.1	< 0.10	< 0.2	< 0.5	< 0.5	0.90
2618-13	< 0.1	0.789	0.300	2.75	< 0.5	1.27
2618-14	0.537	1.99	< 0.2	3.45	< 0.5	2.37
2618-15	0.337	0.54	< 0.2	1.32	< 0.5	1.26
2618-16	0.661	0.77	< 0.2	1.18	< 0.5	0.882

COMMENTS:

(1) - Calculated by peak height

LABORATORY: S-CUBED LOT #: 2618
ANALYST: MT
FILE#/DISK: ANI0930/ANI1017 MATRIX: SOIL

RESULT OF FLUORIDE: UNIT AS MG/KG

LAB ID	% MOISTURE	SAMPLE WT. (GM)	SAMPLE VOL ML	DIL. FACTOR	CONC. FOUND MG/L	FINAL CONC. MG/KG	ANALYSIS DATE	PREPARATION DATE	DETECTION LIMIT MG/L	DETECTION LIMIT MG/KG
2618-1	2.74	4	20	1	0.359	1.846	10/16/91	10/16/91	0.02	0.1
2618-1R2	2.74	4	20	1	0.353	1.815	10/16/91	10/16/91	0.02	0.1
2618-1S	2.74	4	20	1	1.451	7.459	10/16/91	10/16/91	0.02	0.1
2618-2	2.30	4	20	1	0.338	1.730	10/16/91	10/16/91	0.02	0.1
2618-3	2.24	4	20	1	0.126	0.644	10/16/91	10/16/91	0.02	0.1
2618-4	3.58	4	20	1	0.294	1.525	10/16/91	10/16/91	0.02	0.1
2618-5	3.14	4	20	1	0.270	1.394	10/16/91	10/16/91	0.02	0.1
2618-6	2.66	4	20	1	0.770	3.955	10/16/91	10/16/91	0.02	0.1
2618-7	2.65	4	20	1	< 0.02	< 0.10	10/16/91	10/16/91	0.02	0.1
2618-8	0.55	4	20	1	< 0.02	< 0.10	10/15/91	10/15/91	0.02	0.1
2618-9	2.73	4	20	1	< 0.2	< 1	10/15/91	10/15/91	0.02	0.1
2618-10	3.01	4	20	1	0.110	0.567	10/15/91	10/15/91	0.02	0.1
2618-11	2.57	4	20	1	< 0.02	< 0.10	10/16/91	10/16/91	0.02	0.1
2618-12	2.72	4	20	1	< 0.02	< 0.10	10/16/91	10/16/91	0.02	0.1
2618-13	1.59	4	20	1	< 0.02	< 0.10	10/16/91	10/16/91	0.02	0.1
2618-14	3.15	4	20	1	0.104	0.537	10/16/91	10/16/91	0.02	0.1
2618-15	1.97	4	20	1	0.066	0.337	10/16/91	10/16/91	0.02	0.1
2618-16	2.49	4	20	1	0.129	0.661	10/16/91	10/16/91	0.02	0.1

LABORATORY: S-CURED LOT #: 2618
ANALYST: MT
FILE#/DISK: ANI0930/ANI1017 MATRIX: SOIL

RESULT OF CHLORIDE: UNIT AS MG/KG

LAB ID	% MOISTURE	SAMPLE WT. (GM)	SAMPLE VOL ML	DIL. FACTOR	CONC. FOUND MG/L	FINAL CONC. MG/KG	ANALYSIS DATE	PREPARATION DATE	DETECTION LIMIT MG/L	DETECTION LIMIT MG/KG
2618-1	2.74	4	20	5	0.788	20.255	10/16/91	10/16/91	0.02	0.5
2618-1R	2.74	4	20	5	0.856	22.003	10/16/91	10/16/91	0.02	0.5
2618-1S	2.74	4	20	5	1.990	51.152	10/16/91	10/16/91	0.02	0.5
2618-2	2.30	4	20	1	1.330	6.807	10/16/91	10/16/91	0.02	0.1
2618-3	2.24	4	20	5	0.995	25.445	10/16/91	10/16/91	0.02	0.5
2618-4	3.58	4	20	1	1.990	10.319	10/16/91	10/16/91	0.02	0.1
2618-5	3.14	4	20	50	1.432	369.606	10/16/91	10/16/91	0.02	5
2618-6	2.66	4	20	100	1.730	888.638	10/16/91	10/16/91	0.02	10
2618-7	2.65	4	20	100	1.170	600.924	10/16/91	10/16/91	0.02	10
2618-8	0.55	4	20	1	0.201	1.011	10/15/91	10/15/91	0.02	0.1
2618-9	2.73	4	20	100	1.057	543.333	10/15/91	10/15/91	0.02	10
2618-10	3.01	4	20	1	< 0.02	< 0.1	10/15/91	10/15/91	0.02	0.1
2618-11	2.57	4	20	1	0.099	0.508	10/16/91	10/16/91	0.02	0.1
2618-12	2.72	4	20	1	< 0.02	< 0.1	10/16/91	10/16/91	0.02	0.1
2618-13	1.59	4	20	1	0.157	0.798	10/16/91	10/16/91	0.02	0.1
2618-14	3.15	4	20	1	0.385	1.988	10/16/91	10/16/91	0.02	0.1
2618-15	1.97	4	20	1	0.105	0.536	10/16/91	10/16/91	0.02	0.1
2618-16	2.49	4	20	1	0.150	0.769	10/16/91	10/16/91	0.02	0.1

LABORATORY: S-CUBED LOT #: 2618
ANALYST: MT
FILE#/DISK: ANI0930/ANI1017 MATRIX: SOIL

RESULT OF NITRITE: UNIT AS MG/KG

LAB ID	% MOISTURE	SAMPLE WT. (GM)	SAMPLE VOL ML	DIL. FACTOR	CONC. FOUND MG/L	FINAL CONC. MG/KG	ANALYSIS DATE	PREPARATION DATE	DETECTION LIMIT MG/L	DETECTION LIMIT MG/KG
2618-1	2.74	4	20	1	< 0.04	< 0.21	10/16/91	10/16/91	0.04	0.2
2618-1R	2.74	4	20	1	< 0.04	< 0.21	10/16/91	10/16/91	0.04	0.2
2618-1S	2.74	4	20	1	1.020	5.244	10/16/91	10/16/91	0.04	0.2
2618-2	2.30	4	20	1	< 0.04	< 0.20	10/16/91	10/16/91	0.04	0.2
2618-3	2.24	4	20	1	< 0.04	< 0.20	10/16/91	10/16/91	0.04	0.2
2618-4	3.58	4	20	1	< 0.04	< 0.21	10/16/91	10/16/91	0.04	0.2
2618-5	3.14	4	20	1	< 0.04	< 0.21	10/16/91	10/16/91	0.04	0.2
2618-6	2.66	4	20	1	< 0.04	< 0.21	10/16/91	10/16/91	0.04	0.2
2618-7	2.65	4	20	1	< 0.04	< 0.21	10/16/91	10/16/91	0.04	0.2
2618-8	0.55	4	20	1	< 0.04	< 0.20	10/16/91	10/16/91	0.04	0.2
2618-9	2.73	4	20	1	< 0.04	< 0.21	10/15/91	10/15/91	0.04	0.2
2618-10	3.01	4	20	1	< 0.04	< 0.21	10/15/91	10/15/91	0.04	0.2
2618-11	2.57	4	20	1	< 0.04	< 0.21	10/16/91	10/16/91	0.04	0.2
2618-12	2.72	4	20	1	< 0.04	< 0.21	10/16/91	10/16/91	0.04	0.2
2618-13	1.59	4	20	1	0.059	0.300	10/16/91	10/16/91	0.04	0.2
2618-14	3.15	4	20	1	< 0.04	< 0.21	10/16/91	10/16/91	0.04	0.2
2618-15	1.97	4	20	1	< 0.04	< 0.20	10/16/91	10/16/91	0.04	0.2
2618-16	2.49	4	20	1	< 0.04	< 0.21	10/16/91	10/16/91	0.04	0.2

LABORATORY: S-CUBED LOT #: 2618
ANALYST: MT
FILE#/DISK: ANI0930/ANI1017 MATRIX: SOIL

RESULT OF NITRATE: UNIT AS MG/KG

LAB ID	% MOISTURE	SAMPLE WT. (GM)	SAMPLE VOL ML	DIL. FACTOR	CONC. FOUND MG/L	FINAL CONC. MG/KG	ANALYSIS DATE	PREPARATION DATE	DETECTION LIMIT MG/L	DETECTION LIMIT MG/KG
2618-1	2.74	4	20	1	4.920	25.293	10/16/91	10/16/91	0.1	0.5
2618-1R	2.74	4	20	1	5.100	26.218	10/16/91	10/16/91	0.1	0.5
2618-1S	2.74	4	20	1	10.300	52.951	10/16/91	10/16/91	0.1	0.5
2618-2	2.3	4	20	1	1.590	8.137	10/16/91	10/16/91	0.1	0.5
2618-3	2.24	4	20	1	0.572	2.926	10/16/91	10/16/91	0.1	0.5
2618-4	3.58	4	20	1	0.695	3.604	10/16/91	10/16/91	0.1	0.5
2618-5	3.14	4	20	1	0.901	4.651	10/16/91	10/16/91	0.1	0.5
2618-6	2.66	4	20	1	2.000	10.273	10/16/91	10/16/91	0.1	0.5
2618-7	2.65	4	20	1	2.310	11.864	10/16/91	10/16/91	0.1	0.5
2618-8	0.55	4	20	1	0.331	1.664	10/15/91	10/15/91	0.1	0.5
2618-9	2.73	4	20	1	0.660	3.393	10/15/91	10/15/91	0.1	0.5
2618-10	3.01	4	20	1	0.479	2.469	10/15/91	10/15/91	0.1	0.5
2618-11	2.57	4	20	1	0.316	1.622	10/16/91	10/16/91	0.1	0.5
2618-12	2.72	4	20	1	0.322	1.655	10/16/91	10/16/91	0.1	0.5
2618-13	1.59	4	20	1	0.541	2.749	10/16/91	10/16/91	0.1	0.5
2618-14	3.15	4	20	1	0.669	3.454	10/16/91	10/16/91	0.1	0.5
2618-15	1.97	4	20	1	0.258	1.316	10/16/91	10/16/91	0.1	0.5
2618-16	2.49	4	20	1	0.231	1.184	10/16/91	10/16/91	0.1	0.5

LABORATORY: S-CUBED LOT #: 2618
ANALYST: MT
FILE#/DISK: ANI0930/ANI1017 MATRIX: SOIL

RESULT OF ORTHO-PHOSPHATE: UNIT AS MG/KG

LAB ID	% MOISTURE	SAMPLE WT. (GM)	SAMPLE VOL ML	DIL. FACTOR	CONC. FOUND MG/L	FINAL CONC. MG/KG	ANALYSIS DATE	PREPARATION DATE	DETECTION LIMIT MG/L	DETECTION LIMIT MG/KG
2618-1	2.74	4	20	1	0.267	1.373	10/16/91	10/16/91	0.1	0.5
2618-1R	2.74	4	20	1	0.272	1.398	10/16/91	10/16/91	0.1	0.5
2618-1S	2.74	4	20	1	4.830	24.830	10/16/91	10/16/91	0.1	0.5
2618-2	2.3	4	20	1	0.348	1.781	10/16/91	10/16/91	0.1	0.5
2618-3	2.24	4	20	1	0.280	1.432	10/16/91	10/16/91	0.1	0.5
2618-4	3.58	4	20	1	0.289	1.499	10/16/91	10/16/91	0.1	0.5
2618-5	3.14	4	20	1	0.282	1.456	10/16/91	10/16/91	0.1	0.5
2618-6	2.66	4	20	1	2.810	14.434	10/16/91	10/16/91	0.1	0.5
2618-7	2.65	4	20	1	1.500	7.704	10/16/91	10/16/91	0.1	0.5
2618-8	0.55	4	20	1	1.400	7.039	10/15/91	10/15/91	0.1	0.5
2618-9	2.73	4	20	1	< 0.10	< 0.51	10/15/91	10/15/91	0.1	0.5
2618-10	3.01	4	20	1	0.479	2.489	10/15/91	10/15/91	0.1	0.5
2618-11	2.57	4	20	1	< 0.10	< 0.51	10/16/91	10/16/91	0.1	0.5
2618-12	2.72	4	20	1	< 0.10	< 0.51	10/16/91	10/16/91	0.1	0.5
2618-13	1.59	4	20	1	< 0.10	< 0.51	10/16/91	10/16/91	0.1	0.5
2618-14	3.15	4	20	1	< 0.10	< 0.52	10/16/91	10/16/91	0.1	0.5
2618-15	1.97	4	20	1	< 0.10	< 0.51	10/16/91	10/16/91	0.1	0.5
2618-16	2.49	4	20	1	< 0.10	< 0.51	10/16/91	10/16/91	0.1	0.5

LABORATORY: S-CUBED LOT #: 2618
ANALYST: NT
FILE#/DISK: ANI0930/ANI1017 MATRIX: SOIL

RESULT OF SULPHATE: UNIT AS MG/KG

LAB ID	% MOISTURE	SAMPLE WT. (GM)	SAMPLE VOL ML	DIL. FACTOR	CONC. FOUND MG/L	FINAL CONC. MG/KG	ANALYSIS DATE	PREPARATION DATE	DETECTION LIMIT MG/L	DETECTION LIMIT MG/KG
2618-1	2.74	4	20	1	9.900	50.895	10/16/91	10/16/91	0.1	0.5
2618-1R	2.74	4	20	1	10.200	52.437	10/16/91	10/16/91	0.1	0.5
2618-1S	2.74	4	20	5	6.650	170.934	10/16/91	10/16/91	0.1	3
2618-2	2.3	4	20	5	3.820	97.748	10/16/91	10/16/91	0.1	3
2618-3	2.24	4	20	1	2.570	13.144	10/16/91	10/16/91	0.1	0.5
2618-4	3.58	4	20	1	2.240	11.616	10/16/91	10/16/91	0.1	0.5
2618-5	3.14	4	20	20	0.989	102.106	10/16/91	10/16/91	0.1	10
2618-6	2.66	4	20	50	5.760	1479.351	10/16/91	10/16/91	0.1	26
2618-7	2.65	4	20	100	5.070	2604.006	10/16/91	10/16/91	0.1	51
2618-8	0.55	4	20	1	0.376	1.890	10/15/91	10/15/91	0.1	0.5
2618-9	2.73	4	20	100	1.620	832.734	10/15/91	10/15/91	0.1	51
2618-10	3.01	4	20	1	0.239	1.232	10/15/91	10/15/91	0.1	0.5
2618-11	2.57	4	20	1	0.230	1.180	10/16/91	10/16/91	0.1	0.5
2618-12	2.72	4	20	1	0.176	0.905	10/16/91	10/16/91	0.1	0.5
2618-13	1.59	4	20	1	0.249	1.265	10/16/91	10/16/91	0.1	0.5
2618-14	3.15	4	20	1	0.460	2.375	10/16/91	10/16/91	0.1	0.5
2618-15	1.97	4	20	1	0.247	1.260	10/16/91	10/16/91	0.1	0.5
2618-16	2.49	4	20	1	0.172	0.882	10/16/91	10/16/91	0.1	0.5

S - CUBED

Trace Inorganics Report

Client: WHC
Project: SITE WIPE SOIL
Sample Receipt Date: 09/30/91

Analyts: WN 10/28/91
Review:

Analyte: Si Matrix: Soil Units: mg/kg Dry Weight

S - CUBED Sample No.	Client Sample ID	Sample Concentration
261817	B014H0	<0.5
261816	B014J5	5.64
261813	B014J2	7.06
26181	B01417	19.6
261811	B014J0	8.11
261812	B014J1	9.91
26182	B01418	31.4
26183	B01419	18.1
26184	B01420	32.0
26185	B01421	25.1
261815	B014J4	7.40
261814	B014J3	7.01
26186	B01422	21.2
26187	B01425	9.34
26188	B01426	21.5
26189	B01427	31.3
261810	B014H9	15.3

Method Detection Limit: 0.1
Preparation Method: 370.1
Analytical Method: 370.1
Preparation Date: 10/17/91
Analysis Date: 10/17/91

Comments:

Si results are reported as dissolved Si.

ALKALINITY ANALYSIS

LAB:	S-CUBED	DATA REVIEWER:	aN 10/28/91
CLIENT:	WHC	PROJECT REVIEWER:	
CASE:	SITE WIPE SOIL	CHARGE #:	32359-4
LOT #:	2618	DATE RECIEVED:	09/30/91
FILE #:	ALK0930	DATE PREP:	10/09/91
DISK #:	ALK1016	DATE ANALYZED:	10/09/91
METHOD NO.:	EPA 310.1	MATRIX:	SOIL

RESULTS: RESULTS AS DRY WEIGHT - MG/KG

LAB ID	CONCENTRATION
2618 - 1	510
2618 - 2	1520
2618 - 3	405
2618 - 4	18500
2618 - 5	13700
2618 - 6	15300
2618 - 7	10200
2618 - 8	4980
2618 - 9	27500
2618 - 10	306
2618 - 11	508
2618 - 12	611
2618 - 13	805
2618 - 14	1740
2618 - 15	1210
2618 - 16	508
2618 - 17	693

ALKALINITY ANALYSIS

LABORATORY: S-CUBED LOT #: 2618
ANALYST: PO

RESULT: UNIT AS MG/KG MATRIX: SOIL NORMALITY OF H2SO4: 0.0198

LAB ID	% SOLID	SAMPLE WT. (GM)	SAMPLE VOL ML	TITRANT ADDED ML	CONC. FOUND MG/L	FINAL CONC. MG/KG	SPIKE VALUE MG/L	SPIKE VALUE MG/KG	% RSD	% RECOVERY	METHOD DET. MG/L	METHOD DET. MG/KG
A	B	C	D	E	F	G	H	I	J	K	L	K
PBS1009-1			50	0.02	0.396						1	
LCS1009			50	2.40	47.124		50			94	1	
2628-1	98.36	1	50	0.30	5.544	281.8					1	51
2628-1R	98.36	1	50	0.30	5.544	281.8			0		1	51
2628-1S	98.36	1	50	2.60	51.084	2596.8	50	2459		94	1	51
2628-2	98.39	1	50	0.75	14.454	734.5					1	51
2628-3	97.88	1	50	0.55	10.494	536.1					1	51
2628-4	99.41	1	50	0.40	7.524	378.5					1	50
2628-5	99.32	1	50	14.0	276.804	13935.2					1	50
2628-6	98.90	1	50	0.30	5.544	280.3					1	51
PBS1009-2			50	0.02	0.396						1	
2628-7	95.66	1	50	6.50	128.304	6706.3					1	52
2628-8	98.71	1	50	1.00	19.404	982.9					1	51
2628-9	90.37	1	50	1.80	35.244	1950.0					1	55
2628-10	96.10	1	50	3.50	68.904	3585.0					1	52
2628-11	93.37	1	50	35.5	702.504	37619.4					1	54
2628-12	88.20	1	50	25.4	502.524	28487.8					1	57
2628-13	96.14	1	50	2.20	43.164	2244.9					1	52
2628-14	95.76	1	50	2.55	50.094	2615.6					1	52
2628-15	95.69	1	50	5.00	98.604	5152.3					1	52
2628-16	96.80	1	50	1.00	19.800	1022.7					1	52
PBS1009-3			50	0.02	0.396						1	
2628-17	96.11	1	50	0.30	5.940	309.0					1	52
2618-1	97.26	1	50	0.50	9.900	508.9					1	51
2618-1R	97.26	1	50	0.60	11.880	610.7			18		1	51
2618-1S	97.26	1	50	2.80	55.440	2850.1	50	2432		96	1	51
2618-2	97.70	1	50	1.50	29.700	1520.0					1	51
2618-3	97.76	1	50	0.40	7.920	405.1					1	51
2618-4	96.42	1	50	18.0	356.400	18481.6					1	52
2618-5	96.86	1	50	13.4	265.320	13696.1					1	52
2618-6	97.34	1	50	15.0	297.000	15255.8					1	51
2618-7	97.35	1	50	10.0	198.000	10169.5					1	51
PBS1009-4			50	0.03	0.594						1	
2618-8	99.45	1	50	5.00	99.000	4977.4					1	50
2618-9	97.27	1	50	27.0	534.600	27480.2					1	51
2618-10	96.99	1	50	0.30	5.940	306.2					1	52
2618-11	97.43	1	50	0.50	9.900	508.1					1	51
2618-12	97.28	1	50	0.60	11.880	610.6					1	51
2618-13	98.41	1	50	0.80	15.840	804.8					1	51
2618-14	96.85	1	50	1.70	33.660	1737.7					1	52
2618-15	98.03	1	50	1.20	23.760	1211.9					1	51
2618-16	97.51	1	50	0.50	9.900	507.6					1	51
2618-17	100	1	50	0.70	13.860	693.0					1	50
PBS1009-5		1	50	0.03	0.594	29.7					1	
2628-18	100	1	50	0.65	12.870	643.5					1	50

AMMONIA ANALYSIS

LABORATORY:	S-CUBED	DATA REVIEWER:	aw 10/28/91
CLIENT:	WHC	PROJECT REVIEWER:	
CASE:	SITE WIPE SOIL	CHARGE #:	32359-04
LOT #:	2618	DATE RECEIVED:	09/30/91
FILE#:	NH30930	DATE PREP:	10/18/91
DISK:	NH31024	DATE ANALYZED:	10/18/91
METHOD NO.	350.3	MATRIX:	SOIL
INSTRUMENT:	ORION ELECTRODE		

RESULTS: UNIT AS MG/KG DRY WEIGHT

LAB ID	CONCENTRATION
2618-1	0.91
2618-2	0.64
2618-3	1.94
2618-4	0.65
2618-5	< 0.15
2618-6	< 0.15
2618-7	0.95
2618-8	< 0.15
2618-9	1.32
2618-10	< 0.15
2618-11	< 0.15
2618-12	< 0.15
2618-13	< 0.15
2618-14	< 0.15
2618-15	< 0.15
2618-16	< 0.15

AMMONIA ANALYSIS

LABORATORY: S-CUBED LOT #: 2618
ANALYST: RM
FILE#/DISK: NH30930/NH31024 MATRIX: SOIL

LAB ID	% MOISTURE	SAMPLE WT. (GM)	SAMPLE VOL ML	DIL. FACTOR	CONC. FOUND MG/L	FINAL CONC MG/KG	ANALYSIS DATE	PREPARATION DATE	METHOD DETECTION MG/L	METHOD DETECTION MG/KG
ICV			50	1	1.1		10/18/91	10/18/91	0.03	
ICB			50	1	< 0.03		10/18/91	10/18/91	0.03	
LCS1018			50	1	2.55		10/18/91	10/18/91	0.03	
2618-1	2.74	10	50	1	0.18	0.91	10/18/91	10/18/91	0.03	0.15
2618-1R	2.74	10	50	1	0.16	0.81	10/18/91	10/18/91	0.03	0.15
2618-1S	2.74	10	50	1	2.52	12.95	10/18/91	10/18/91	0.03	0.15
2618-2	2.3	10	50	1	0.13	0.64	10/18/91	10/18/91	0.03	0.15
2618-3	2.24	10	50	1	0.38	1.94	10/18/91	10/18/91	0.03	0.15
2618-4	3.58	10	50	1	0.13	0.65	10/18/91	10/18/91	0.03	0.15
2618-5	3.14	10	50	1	< 0.03	< 0.15	10/18/91	10/18/91	0.03	0.15
2618-6	2.66	10	50	1	< 0.03	< 0.15	10/18/91	10/18/91	0.03	0.15
2618-7	2.65	10	50	1	0.19	0.95	10/18/91	10/18/91	0.03	0.15
2618-8	0.55	10	50	1	< 0.03	< 0.15	10/18/91	10/18/91	0.03	0.15
2618-9	2.73	10	50	1	0.26	1.32	10/18/91	10/18/91	0.03	0.15
2618-10	3.01	10	50	1	< 0.03	< 0.15	10/18/91	10/18/91	0.03	0.15
2618-11	2.57	10	50	1	< 0.03	< 0.15	10/18/91	10/18/91	0.03	0.15
2618-12	2.72	10	50	1	< 0.03	< 0.15	10/18/91	10/18/91	0.03	0.15
2618-13	1.59	10	50	1	< 0.03	< 0.15	10/18/91	10/18/91	0.03	0.15
2618-14	3.15	10	50	1	< 0.03	< 0.15	10/18/91	10/18/91	0.03	0.15
2618-15	1.97	10	50	1	< 0.03	< 0.15	10/18/91	10/18/91	0.03	0.15
2618-16	2.49	10	50	1	< 0.03	< 0.15	10/18/91	10/18/91	0.03	0.15
CCV1			50	1	1.07		10/18/91	10/18/91	0.03	
CCB1			50	1	< 0.03		10/18/91	10/18/91	0.03	

VALIDATION SUMMARY

Westinghouse
Hanford Company

OSH RCRA LEVEL C DATA ASSESSMENT

DATE 2/5/92 MAB

REVIEWED BY Mark A. Beck

LABORATORY S-Cubed

CASE # Site Wide Soil

SDG # 2618

SAMPLES/MATRIX all soil

B01417	B01418	B01419
B01420	B01421	B01422
B01425	B01426	B01427
B014H9	B014J0	B014J1
B014J2	B014J3	B014J4
B014J4	B014H0	

DATA ASSESSMENT SUMMARY

QUALITY CONTROL CHECK	ANALYSIS	Anions 300.0	Silica 370.1	Total Alkalinity, 310.1 Ammonia 3
1. Holding times		X	O	O
2. Blanks		O	O	O
3. matrix Spikes		O	O	O
4. Duplicates		O	O	O
5. Calibration		O	O	X
6. Other		X	X	X
7.				
8.				
9.				
10.				

O = data had no problems
X = data qualified due to minor problems
M = data qualified due to major problems/some data may be unusable

OVERALL ASSESSSMENT: The data are acceptable with the attached qualifications.

NOTES: The analysis summary sheets often only list samples by lab ID. See attached Sample Summary for cross-identifications.

o Refer to the corresponding attachments for explanation of any problems.

B014H0 not analyzed for anions

RCRA LEVEL C QC

Name Mark A. Beck Date 2/5/92 MAB.

QC Check: Holding Times

COMMENTS: Holding times were missed for nitrate (NO_3^-) nitrite (NO_2^-) and phosphate ($O\text{-}SO_4^{-2}$). However, as these anions; samples are soil, so the water holding times that were missed do not necessarily apply to soil. Nitrite is particularly sensitive to holding times

ACTION: Qualify all nitrate, nitrite and phosphate as estimate (UJ or J), except those phosphates > 5x IDL.

sample #	constituent	value/qual
all	NO_2^- nitrite	UJ or J
2618-13, B014J2		
all	NO_3^-	J
except 2618-12, B014J1		UJ
B01417, B01418, B01419, B01420, B01421, B014H9	$O\text{-}PO_4$	J
B014J4, B014J5, B014H7, B014H0, B014J1, B014J2, B014J3	$O\text{-}PO_4$	UJ

sample #	constituent	value/qual

1A of ___

RCRA LEVEL C QC

Name Mark A. Beck Date 2/5/92 MAB

QC Check: Holding Times Silica Alkalinity, ammonia

COMMENTS: No holding times are established for silica, alkalinity, holding times (for water) were missed. ~~Ex this was a ss~~ as these were soil samples which were prepped the same day as the analysis this reviewer does not feel qualification is warranted. ammonia met holding ~~time~~ requirements.

ACTION:

None - except the above comments.

sample #	constituent	value/qual	sample #	constituent	value/qual

RCRA LEVEL C QC

Name Mark A. Beck Date 2/5/92 MAB

QC Check: Blanks

COMMENTS: Anions - no anions were detected in the blanks. Alkalinity, ammonia and silica analyses all had blanks free of contaminants.

ACTION: Anions - none. Alkalinity ammonia, silica - none.

sample #	constituent	value/qual	sample #	constituent	value/qual

RCRA LEVEL C QC

Name Mark A. Beck Date 2/5/92 m.a.b.

QC Check: Matrix Spikes

COMMENTS: Anions - all analytes had acceptable spike recoveries. Silica, alkalinity, and ammonia all have matrix spike recoveries that were acceptable.

ACTION: Anions - none. Silica, alkalinity, and ~~and~~ ammonia - none.

sample #	constituent	value/qual	sample #	constituent	value/qual

RCRA LEVEL C QC

Name Mark A. Beck Date 2/5/92 MAB

QC Check: Duplicates

COMMENTS: Anions - all duplicate values had acceptable %RPD.
Silica, ammonia, and alkalinity all had acceptable %RPD's.

ACTION: anions - none. Silica ammonia, and alkalinity - none.

sample #	constituent	value/qual	sample #	constituent	value/qual

RCRA LEVEL C QC

Name Mark A. Beck Date 2/5/92 MAB

QC Check: Calibrations

COMMENTS: Anions - appropriate calibrations and (initial and continuing) were performed. all recoveries were acceptable (all analytes). Silica - appropriate calibrations were performed and met QC requirements. Alkalinity - no initial calibrations were run.

ACTION: Anions - none. Silica - none. Alkalinity - qualify all SDG 2618- samples as estimated (J) except B01417 - which was run before an acceptable matrix spike. Ammonia - appropriate standards were run no qualification

sample #	constituent	value/qual
all except B01417	alkalinity	J

sample #	constituent	value/qual

comments:
alkalinity - The only "calibration" measurements taken were LLCS (run right at the start of the analytical run) and the matrix spikes. Recoveries for all of these were acceptable. No calibration of any sort bracketed the last 15 analyses.
ammonia - appropriate standards were run and all met acceptance criteria.

RCRA LEVEL C QC

Name Mark A. Beck Date 2/5/93

QC Check: Other

COMMENTS: B01440 was not analyzed for anions, B01440 was to be a laboratory supplied soil blank. ~~It was also~~ B01440 was not analyzed for silica ~~cyanide~~ or ammonia.

ACTION: none except the above documentation.

sample #	constituent	value/qual	sample #	constituent	value/qual

MAXWELL
S-CUBED Division

SORRENTO VALLEY OFFICE
3398 Carmel Mountain Road., San Diego, CA 92121-109
P.O. Box 1620, La Jolla, CA 92038-162

NARRATIVE

DATE: October 29, 1991
REFERENCE NO.: 32359-04, SDG 2618

WESTINGHOUSE HANFORD COMPANY - SITE WIDE SOIL

ANIONS

The samples were analyzed according to Method 300.0. Several samples required dilutions for Cl and SO4 analysis. All sample results are reported in dry weight. There were significant levels detected in several samples.

The quality control results were acceptable.

SILICA

The samples were analyzed according to Method 370.1. There were no difficulties with the analysis. Si results are reorted as dissolved Si. All sample results are reported in dry weight. There were significant levles detected in several samples.

The quality control results were acceptable.

TOTAL ALKALINITY

The samples were analyzed according to Method 310.1. There were no difficulties with the analysis. All sample results are reported in dry weight. There were significant levels detected in the samples.

The quality control results were acceptable.

AMMONIA

The samples were analyzed according to Method 350.3. There were no difficulties with the analysis. All sample results are reported in dry weight. There low levels were detected in several samples.

The quality control results were acceptable.

ANIONS ANALYSIS

LABORATORY:	S-CUBED	DATA REVIEWER:	CN 10/28/91
CLIENT:	WHC	PROJECT REVIEWER:	
CASE:	SITE WIDE SOIL	CHARGE #:	32359-04
LOT #:	2618	DATE RECEIVED:	09/30/91
FILE#:	ANI0930	DATE PREP:	10/15-16/91
DISK:	ANI1017	DATE ANALYZED:	10/15-16/91
METHOD NO.	300.0	MATRIX:	SOIL

RESULTS: UNIT AS MG/KG DRY WEIGHT

LAB ID	F	CL	NO2	NO3	O-PO4	SO4
2618-1	1.85	20.3	< 0.2 UJ	25.3 J	1.37 UJ	50.9
2618-2	1.73	6.81	< 0.2	8.14	1.78	97.7
2618-3	0.644	25.4	< 0.2	2.93	1.43	13.1
2618-4	1.52	10.3	< 0.2	3.60	1.50	11.6
2618-5	1.39 (1)	370	< 0.2	4.65	1.46 J	102
2618-6	3.97 (1)	889	< 0.2	10.3	14.4	1480
2618-7	< 0.1	601	< 0.2	11.9	7.70	2600
2618-8	< 0.1	1.01	< 0.2	1.66	7.04	1.89
2618-9	< 1	543	< 0.2	3.39	< 0.5 UJ	833
2618-10	0.567	< 0.10	< 0.2	1.39	2.47 J	1.23
2618-11	< 0.1	0.508	< 0.2	1.62 J	< 0.5 UJ	1.18
2618-12	< 0.1	< 0.10	< 0.2 UJ	< 0.5 UJ	< 0.5	0.90
2618-13	< 0.1	0.789	0.300 J	2.75 J	< 0.5	1.27
2618-14	0.537	1.99	< 0.2 UJ	3.45	< 0.5	2.37
2618-15	0.337	0.54	< 0.2	1.32	< 0.5	1.26
2618-16	0.661	0.77	< 0.2 UJ	1.18 J	< 0.5 UJ	0.882

COMMENTS:

(1) - Calculated by peak height

2/5/92
MUE

S - CUBED

Trace Inorganics Report

Client: WHC
Project: SITE WIPE SOIL
Sample Receipt Date: 09/30/91

Analyts: WN 10/28/91

Review: _____

Analyte: Si Matrix: Soil Units: mg/kg
Dry weight

S - CUBED Sample No.	Client Sample ID	Sample Concentration
261817	B014H0	<0.5
261816	B014J5	5.64
261813	B014J2	7.06
26181	B01417	19.6
261811	B014J0	8.11
261812	B014J1	9.91
26182	B01418	31.4
26183	B01419	18.1
26184	B01420	32.0
26185	B01421	25.1
261815	B014J4	7.40
261814	B014J3	7.01
26186	B01422	21.2
26187	B01425	9.34
26188	B01426	21.5
26189	B01427	31.3
261810	B014H9	15.3

Method Detection Limit: 0.1
Preparation Method: 370.1
Analytical Method: 370.1
Preparation Date: 10/17/91
Analysis Date: 10/17/91

2/5/92
mah

Comments:

Si results are reported as dissolved Si.

00087

AMMONIA ANALYSIS

LABORATORY:	S-CUBED	DATA REVIEWER:	aw 10/28/91
CLIENT:	WHC	PROJECT REVIEWER:	
CASE:	SITE WIDE SOIL	CHARGE #:	32359-04
LOT #:	2618	DATE RECEIVED:	09/30/91
FILE#:	NH30930	DATE PREP:	10/18/91
DISK:	NH31024	DATE ANALYZED:	10/18/91
METHOD NO.	350.3	MATRIX:	SOIL
INSTRUMENT:	ORION ELECTRODE		

RESULTS: UNIT AS MG/KG DRY WEIGHT

LAB ID	CONCENTRATION
2618-1	0.91
2618-2	0.64
2618-3	1.94
2618-4	0.65
2618-5	< 0.15
2618-6	< 0.15
2618-7	0.95
2618-8	< 0.15
2618-9	1.32
2618-10	< 0.15
2618-11	< 0.15
2618-12	< 0.15
2618-13	< 0.15
2618-14	< 0.15
2618-15	< 0.15
2618-16	< 0.15

2/5/92
m.ab.

ALKALINITY ANALYSIS

LAB:	S-CUBED	DATA REVIEWER:	aN 10/28/91
CLIENT:	WHC	PROJECT REVIEWER:	
CASE:	SITE WIPE SOIL	CHARGE #:	32359-4
LOT #:	2618	DATE RECIEVED:	09/30/91
FILE #:	ALK0930	DATE PREP:	10/09/91
DISK #:	ALK1016	DATE ANALYZED:	10/09/91
METHOD NO.:	EPA 310.1	MATRIX:	SOIL

RESULTS: RESULTS AS DRY WEIGHT - MG/KG

LAB ID	CONCENTRATION
2618 - 1	510 ~~J~~ no qualifier
2618 - 2	1520 J
2618 - 3	405
2618 - 4	18500
2618 - 5	13700
2618 - 6	15300
2618 - 7	10200
2618 - 8	4980
2618 - 9	27500
2618 - 10	306
2618 - 11	508
2618 - 12	611
2618 - 13	805
2618 - 14	1740
2618 - 15	1210
2618 - 16	508
2618 - 17	693 J

2/5/92
mab

OSM INORGANIC DATA ASSESSMENT

DATE 2/5/92 mab.

REVIEWED BY Mark A. Beck

LABORATORY S-Cubed

CASE # Site Wide Soil

SDG # 2618

SAMPLES/MATRIX all soil

B01417 B01418 B01419
B01420 B01421 B01422
mab ~~B01423~~ B01425 B01426
B01427 B01449 B01450
B01451 B01452 B01453
B01454 B01455 B01460

DATA ASSESSMENT SUMMARY

	ICP	AA	Hg	CN
1. Calibrations (Form II)	O	O	O	
2. Blanks (III)	O	O	X	
3. ICS (IV)	O			
4. Matrix Spike (V)	M	M	M	
5. Duplicate Analysis (VI)	X	O	O	
6. LCS (VII)	O	O		
7. Serial Dilution (IX)	O			
8. GFAA		X		
9. Holding Times (XIV)	O	O	O	
10. Other QC	O	O	O	

O = data had no problems
X = data qualified due to minor problems
M = data qualified due to major problems/some data may be unusable

OVERALL ASSESSSMENT: The data are acceptable with the attached qualifiers noting any exceptions.

NOTES: WHC sample #'s are to be found in the lower left hand corner under "comments" on the EPA Form I's.
"ICP" includes Ti, Zr, Li (analyzed by EPA Method 6010, ICP), in addition to the CLP target list metals.

o Refer to the corresponding attachments for explanation of any problems.

INORGANIC QC - Calibrations

Name Mark A. Beck Date 2/5/92 MAB

COMMENTS: Appropriate initial and continuing calibration blank ~~and~~ analyses were run for all analytes. The mercury correlation coefficent is acceptable. All ICV and CCV standards met acceptance criteria.

ACTION: none - none needed

sample #	constituent	value/qual	sample #	constituent	value/qual

INORGANIC QC - Blanks

Name Mark A. Beck Date 2/5/92 MAB.

COMMENTS: No contaminants were detected in the blanks for ~~cont~~ any analytes except mercury. Mercury had ~~blank~~ blank values ~/0.2/.

ACTION: None, as the mercury blanks had an absolute value ≤ IDL, ~~and all other analytes~~ and the blanks were free from contamination from all other analytes.

sample #	constituent	value/qual	sample #	constituent	value/qual

INORGANIC QC - ICS

Name Mark A. Beck Date 2/5/92 MAB

COMMENTS: all ICP analysis runs had an ~~in~~ ICS run performed at both beginning and end of the run. all solution AB recoveries were within control limits. No ~~ab~~ analytes were found that were not present in the ICS solution.

ACTION: none - none needed.

sample #	constituent	value/qual	sample #	constituent	value/qual

INORGANIC QC - Matrix Spike

Name Mark A. Beck Date 2/5/92 MAB

COMMENTS: Antimony, lead, mercury, selenium, and titanium all had spike recoveries out of control limit. The recoveries were biased low. ~~Mag~~ Manganese recovery was out of control and biased high, as was silver.

ACTION: All antimony (Sb) and titanium (Ti) and Se analyses < IDL are rejected. Sb, Ti, Se results > IDL qualified w/ J (estimated). Lead, mercury, silver ~~Se~~ and manganese result qualified either UJ or J.

sample #	constituent	value/qual
~~B014/7 B014/18 B014/19~~ all	antimony Sb	R
all except	lead (Pb)	J
B014H0	lead (Pb)	UJ
all	mercury Hg	UJ
all	selenium Se	R
all	titanium Ti	J
except B014H0		R

sample #	constituent	value/qual
all except B014H0	manganese Mn	J
		no qualifier
B01425 B01426	silver	J
all other samples not listed above	silver	no qualifier needed

INORGANIC QC - Duplicate Analysis

Name Mark A. Beck Date 2/5/92 mab

COMMENTS: Aluminum, arsenic, silver, and sodium and titrium all ~~the~~ had % RPD outside the ±20% control limits. However only aluminum had sample and duplicate results >5xCRDL and therefore was the only analyte ~~subj~~ subject to that limit.

ACTION: none

sample #	constituent	value/qual
all except B014H0	al aluminum.	J
B014H0		UJ

sample #	constituent	value/qual
Comments (cont.)		
all other analyts met the ICRDL control limit, even though this limit may not have applied to them, due to the low concentration.		

INORGANIC QC - LCS

Name Mark A. Beck Date 2/5/92 MAB

COMMENTS: No Solid LCS was reported on Form VII-IA. All liquid LCS values for %R were within limits except for silver. Silver is exempt from the normal control limit. No Solid LCS is necessary, as contractual requirements have been met

ACTION: none.

sample #	constituent	value/qual	sample #	constituent	value/qual

INORGANIC QC - Serial Dilution

Name Mark G. Beck Date 2/5/92 MGB

COMMENTS: Chromium (Cr) and potassium (K) % differences that exceeded the control limit. The initial sample result was >10x the IDL but was less than 50x the IDL. As both were close to the 10x requirement no qualification is needed. Nickel, lithium, zirconium and sodium (continued)

ACTION: none.

sample #	constituent	value/qual

sample #	constituent	value/qual

comments (continued).
all had initial analysis values less than 10x IDL, and so no control limit applies ~~the~~ to those analytes.

INORGANIC QC - Holding Times

Name Mark A. Beck Date 2/5/92 MAB

COMMENTS: Holding times were met for all metals, including mercury.

ACTION: none, none needed.

sample #	constituent	value/qual	sample #	constituent	value/qual

INORGANIC QC - GFAA

Name Mark A. Beck Date 2/5/92 MAB

COMMENTS: all duplicate injections are within the specified control limits ~~if~~ (±20%RSD) if applicable (sample ≥ CRDL).
All arsenic absorbances for samples were < 50% of spike absorbance. No MSA needed even though most recoveries were out of control.

ACTION: none - none required.

sample #	constituent	value/qual

sample #	constituent	value/qual

comments continued.
selenium ~~not~~ % Recoveries that fail the %R criteria did not ~~so~~ necessitate an MSA since the spike ~~recov~~ absorbance is above >50% of the sample.
All lead recoveries were within acceptance criteria. The same was true of thallium as was true with lead.

INORGANIC QC - other

Name Mark A. Beck Date 2/5/92 MAB

COMMENTS: This SDG has been chosen to undergo a complete CLP Inorganics calculation overcheck.

ACTION: none, all overchecks show that the calculations for this SDG have been performed correctly.

sample #	constituent	value/qual	sample #	constituent	value/qual
Calibration					
AA				Na	$\frac{497000 ug/L}{500000 ug/L} \times 100 = 99.4\%$ ✓
	As	$\frac{46.3 ug/L}{50 ug/L} \times 100 = 92.6\%$ ✓			
ICP Check solution					
	Ca ~~initial~~ initial	$\frac{481000 ug/L}{500000 ug/L} \times 100 = 96.2\%$ ✓			
	final	$\frac{484000 ug/L}{500000 ug/L} \times 100 = 96.8\%$ ✓			

INORGANIC QC - other

Name Mark A. Beck Date 2/5/92 mab

COMMENTS: Calculation overcheck continued.

ACTION:

sample #	constituent	value/qual	sample #	constituent	value/qual
matrix spike					
Ni 261815 B014175	0.704 ug Ni/ml soln	1 g sample wet / 0.973 g sample dry	100 ml soln / 1 g sample wet	= 72.3 mg/Kg	
2618-1 B04417	0.137 ug/ml	g sample / 0.973 g dry	100 ml / 1 g sample wet	= 14.08	

$$\frac{72.3 - 14.08}{51.39} \times 100 = 113.3\%$$

INORGANIC QC - other

Name Mark A. Beck Date 2/5/92 m.d.

COMMENTS: Calibration overchecks

ACTION:

sample #	constituent	value/qual	sample #	constituent	value/qual

Duplicate

mg 43.7 ug/ml soln $\frac{1\,g\ wet}{0.973\,g}$ $\frac{100\,ml}{g\ wet}$ = 4491.2 mg/kg = ug/g

2618-1R
B01417R

2618-11 44.20 ug/ml $\frac{1\,g\ wet\ sample}{0.973\,g\ dry}$ $\frac{100\,ml}{1\,g\ wet\ sample}$ = 4542.65 ug/g = mg/kg
B01417

$\frac{4542.65 - 4491.2}{4518.2} \times 100 = 1.1\%$ ✓

↑ average

INORGANIC QC - other

Name Mark A. Beck Date 2/5/92 MAB

COMMENTS: Calibration overcheck.
All overchecks meet acceptance criteria.

ACTION: none - none needed.

sample #	constituent	value/qual	sample #	constituent	value/qual

Laboratory Control Sample

Ba 2.160 mg/ml = 2160 mg/L

$\frac{\text{found}}{\text{true}} = \frac{2160 \text{ mg/L}}{2000 \text{ mg/L}} \times 100 = 108\%$ ✓

serial dilution

K

2618-1L
B01417L
2.340 mg/ml = 2,340 mg/L x5 = 11,950

2618-1
B01417
15.400 mg/ml = 15,400 mg/L

$\frac{15400 - 11950}{15400} \times 100 = 22.4\%$ ✓

MAXWELL
S-CUBED Division

SORRENTO VALLEY OFFICE
3398 Carmel Mountain Road., San Diego, CA 92121-1095
P.O. Box 1620, La Jolla, CA 92038-1620

NARRATIVE

DATE: October 29, 1991
REFERENCE NO.: 32359-04, SDG 2618

WESTINGHOUSE HANFORD COMPANY - SITE WIDE SOIL

CLP METALS + LI, TI, ZR

The samples were analyzed according to the CLP 2/88 Inorganics Statement of Work for the HSL metals and Method 6010 for Li, Ti, and Zr. GFAA analysis for samples 2618-1 through 2618-16 were analyzed at a dilution factor of 11 due to high levels of Fe and Al in the samples. All sample results are reported in dry weight. There were significant levels of most analytes detected in the samples.

The quality control results were generally acceptable. Several percent recovery and duplicate problems were encountered during analysis due to matrix interferences. The linear curve for the mercury run places the zero at -0.2; 0.2 is the IDL. The Form 3's therefore, report CCBs at -0.2 and the soil prep blank at -.102. Since this is the IDL, the sample results are not affected or compromised.

SOT

U.S. EPA - CLP

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-1

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-1____

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _97.3

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	11400		*J	P
7440-36-0	Antimony_	5.8	~~U~~	~~N-GJ~~	~~P~~ R
7440-38-2	Arsenic__	6.5		~~W*~~	F
7440-39-3	Barium___	100			P
7440-41-7	Beryllium	1.5			P
7440-43-9	Cadmium__	0.31	U		P
7440-70-2	Calcium__	5660			P
7440-47-3	Chromium_	12.4			P
7440-48-4	Cobalt___	14.5			P
7440-50-8	Copper___	13.2			P
7439-89-6	Iron_____	31300			P
7439-92-1	Lead_____	11.1		J	F
7439-95-4	Magnesium	4540			P
7439-96-5	Manganese	468		J	P
7439-97-6	Mercury__	0.10	~~U~~	~~N-GJ~~	CV
7440-02-0	Nickel___	14.1			P
7440-09-7	Potassium	1580			P
7782-49-2	Selenium_	4.5	~~U~~	~~WN~~ R	F
7440-22-4	Silver___	1.0	U	~~N~~	P
7440-23-5	Sodium___	379	B		P
7440-28-0	Thallium_	3.4	U		F
7440-62-2	Vanadium_	91.6			P
7440-66-6	Zinc_____	58.8			P

Color Before: _____ Clarity Before: _____ Texture: FINE__

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

BO_1417

FORM I - IN

2/5/92 1/88

MGR

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1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-1

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-1____

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _97.3

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

CAS No.	Analyte	Concentration	C	Q	M
7439-93-2	Lithium__	25.8			P_
7440-24-6	Titanium_	2010		J	P_
7440-31-5	Zirconium	31.6			P_

Color Before: _____ Clarity Before: _____ Texture: FINE__

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
BO_1417

FORM I - IN 2/5/93 7/88

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U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-2

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-2____

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _97.7

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	10300		*J	P
7440-36-0	Antimony_	5.7	~~U~~	~~N~~ R	P
7440-38-2	Arsenic__	5.2		~~W*~~	F
7440-39-3	Barium___	110			P
7440-41-7	Beryllium	1.3			P
7440-43-9	Cadmium__	0.31	U		P
7440-70-2	Calcium__	5230			P
7440-47-3	Chromium_	12.5			P
7440-48-4	Cobalt___	13.8			P
7440-50-8	Copper___	15.5			P
7439-89-6	Iron_____	27000			P
7439-92-1	Lead_____	8.6		~~W~~ J	F
7439-95-4	Magnesium	5100			P
7439-96-5	Manganese	492		J	P
7439-97-6	Mercury__	0.10	~~U~~	~~N~~ UJ	CV
7440-02-0	Nickel___	16.0			P
7440-09-7	Potassium	1920			P
7782-49-2	Selenium_	4.5	~~U~~	~~WN~~ R	F
7440-22-4	Silver___	1.0	U	~~N~~	P
7440-23-5	Sodium___	281	B		P
7440-28-0	Thallium_	3.4	U		F
7440-62-2	Vanadium_	66.1			P
7440-66-6	Zinc_____	52.2			P

Color Before: _____ Clarity Before: _____ Texture: FINE__

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

BO_1418

FORM I - IN

2/5/92 7/88

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-2

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-2____

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _97.7

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

CAS No.	Analyte	Concentration	C	Q	M
7439-93-2	Lithium__	25.2			P
7440-24-6	Titanium_	1530		J	P
7440-31-5	Zirconium	25.5			P

Color Before: _____ Clarity Before: _____ Texture: FINE__

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
BD_1418

FORM I - IN

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-3

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-3____

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _97.8

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	5470		~~*~~ J	P
7440-36-0	Antimony	5.7	~~UI~~	~~N~~ R	P
7440-38-2	Arsenic	3.1		W*	F
7440-39-3	Barium	94.0			P
7440-41-7	Beryllium	1.2			P
7440-43-9	Cadmium	0.31	U		P
7440-70-2	Calcium	6100			P
7440-47-3	Chromium	7.6			P
7440-48-4	Cobalt	13.0			P
7440-50-8	Copper	9.4			P
7439-89-6	Iron	27000			P
7439-92-1	Lead	5.1		~~W~~ J	F
7439-95-4	Magnesium	3210			P
7439-96-5	Manganese	383		J	P
7439-97-6	Mercury	0.10	U	~~N~~ UJ	CV
7440-02-0	Nickel	9.5			P
7440-09-7	Potassium	877			P
7782-49-2	Selenium	4.5	~~UI~~	~~WN~~ R	F
7440-22-4	Silver	1.0	U	~~N~~	P
7440-23-5	Sodium	268	B		P
7440-28-0	Thallium	3.4	U		F
7440-62-2	Vanadium	97.9			P
7440-66-6	Zinc	51.3			P

Color Before: _____ Clarity Before: _____ Texture: FINE__

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

BD_1419

FORM I - IN

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-3

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-3____

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _97.8

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

CAS No.	Analyte	Concentration	C	Q	M
7439-93-2	Lithium__	15.3	U		P_
7440-24-6	Titanium_	2080		J	P_
7440-31-5	Zirconium	29.0			P_

Color Before: _____ Clarity Before: _____ Texture: FINE__

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
BO_1419

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-4

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-4____

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _96.4

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	10000		*J	P
7440-36-0	Antimony_	5.8	~~U~~	~~N~~ R	P
7440-38-2	Arsenic__	3.6		W*	F
7440-39-3	Barium___	133			P
7440-41-7	Beryllium	1.2			P
7440-43-9	Cadmium__	0.31	U		P
7440-70-2	Calcium__	10200			P
7440-47-3	Chromium_	11.4			P
7440-48-4	Cobalt___	13.6			P
7440-50-8	Copper___	13.3			P
7439-89-6	Iron____	26700			P
7439-92-1	Lead____	6.9		~~W~~ J	F
7439-95-4	Magnesium	6910			P
7439-96-5	Manganese	704		J	P
7439-97-6	Mercury__	0.10	U	~~N~~ UJ	CV
7440-02-0	Nickel___	14.0			P
7440-09-7	Potassium	1610			P
7782-49-2	Selenium_	4.6	U	~~WN~~ R	F
7440-22-4	Silver___	1.0	U	~~N~~	P
7440-23-5	Sodium___	312	B		P
7440-28-0	Thallium_	3.4	U	W	F
7440-62-2	Vanadium_	74.0			P
7440-66-6	Zinc____	50.2			P

Color Before: _____ Clarity Before: _____ Texture: FINE__

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

BO_1420

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-4

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-4____

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _96.4

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

CAS No.	Analyte	Concentration	C	Q	M
7439-93-2	Lithium__	15.6	U		P_
7440-24-6	Titanium_	1620		J	P_
7440-31-5	Zirconium	28.1			P_

Color Before: _____ Clarity Before: _____ Texture: FINE__

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
BO_1420

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2/5/92 7/88

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-5

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-5____

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _96.9

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	9980		~~*~~ J	P
7440-36-0	Antimony_	5.8	~~U~~	~~N~~ R	P
7440-38-2	Arsenic__	5.0		W*	F
7440-39-3	Barium___	111			P
7440-41-7	Beryllium	1.2			P
7440-43-9	Cadmium__	0.31	U		P
7440-70-2	Calcium__	11200			P
7440-47-3	Chromium_	11.1			P
7440-48-4	Cobalt___	12.6			P
7440-50-8	Copper___	14.9			P
7439-89-6	Iron_____	23800			P
7439-92-1	Lead_____	7.9		~~W~~ J	F
7439-95-4	Magnesium	9790			P
7439-96-5	Manganese	434		J	P
7439-97-6	Mercury__	0.10	U	~~N~~ UJ	CV
7440-02-0	Nickel___	14.6			P
7440-09-7	Potassium	1860			P
7782-49-2	Selenium_	4.5	U	~~WN~~ R	F
7440-22-4	Silver___	1.0	U	~~N~~	P
7440-23-5	Sodium___	782			P
7440-28-0	Thallium_	3.4	U		F
7440-62-2	Vanadium_	54.1			P
7440-66-6	Zinc_____	46.4			P

Color Before: _____ Clarity Before: _____ Texture: FINE__

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

BO_1421

FORM I - IN

2/4/92 7/88

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-5

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-5____

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _96.9

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

CAS No.	Analyte	Concentration	C	Q	M
7439-93-2	Lithium__	18.3			P_
7440-24-6	Titanium_	1250		J	P_
7440-31-5	Zirconium	25.9			P_

Color Before: _____ Clarity Before: _____ Texture: FINE__

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
BO_1421

FORM I - IN

2/5/92

7/88

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U.S. EPA - CLP

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-6

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-6____

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _97.3

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	10300		~~*~~ J	P
7440-36-0	Antimony	5.8	~~U~~	~~N~~ R	P
7440-38-2	Arsenic	5.0		~~W*~~	F
7440-39-3	Barium	116			P
7440-41-7	Beryllium	1.2			P
7440-43-9	Cadmium	0.31	U		P
7440-70-2	Calcium	10400			P
7440-47-3	Chromium	10.6			P
7440-48-4	Cobalt	12.8			P
7440-50-8	Copper	16.5			P
7439-89-6	Iron	23800			P
7439-92-1	Lead	8.3		J	F
7439-95-4	Magnesium	9150			P
7439-96-5	Manganese	506		J	P
7439-97-6	Mercury	0.10	U	~~N~~ aJ	CV
7440-02-0	Nickel	14.1			P
7440-09-7	Potassium	3280			P
7782-49-2	Selenium	4.5	U	~~WN~~ R	F
7440-22-4	Silver	1.0	U	~~N~~	P
7440-23-5	Sodium	5620			P
7440-28-0	Thallium	3.4	U		F
7440-62-2	Vanadium	80.7			P
7440-66-6	Zinc	46.9			P

Color Before: _____ Clarity Before: _____ Texture: FINE__

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

BO_1422

FORM I - IN

2/5/92 7/88

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00012

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-6

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-6____

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _97.3

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

CAS No.	Analyte	Concentration	C	Q	M
7439-93-2	Lithium__	26.6			P_
7440-24-6	Titanium_	1120		J	P_
7440-31-5	Zirconium	26.4			P_

Color Before: _____ Clarity Before: _____ Texture: FINE__

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-7

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-7____

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _97.4

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	8560		~~*~~ J	P
7440-36-0	Antimony	5.7	~~U~~	~~N~~ R	P
7440-38-2	Arsenic	3.2		*	F
7440-39-3	Barium	106			P
7440-41-7	Beryllium	1.1			P
7440-43-9	Cadmium	0.31	U		P
7440-70-2	Calcium	7200			P
7440-47-3	Chromium	9.3			P
7440-48-4	Cobalt	11.6			P
7440-50-8	Copper	12.3			P
7439-89-6	Iron	22500			P
7439-92-1	Lead	7.2		J	F
7439-95-4	Magnesium	4260			P
7439-96-5	Manganese	478		J	P
7439-97-6	Mercury	0.10	~~U~~	~~N~~ UJ	CV
7440-02-0	Nickel	12.6			P
7440-09-7	Potassium	2020			P
7782-49-2	Selenium	4.5	~~U~~	~~WN~~ R	F
7440-22-4	Silver	1.1		~~N~~ J	P
7440-23-5	Sodium	3390			P
7440-28-0	Thallium	3.4	U	W	F
7440-62-2	Vanadium	52.3			P
7440-66-6	Zinc	46.6			P

Color Before: _____ Clarity Before: _____ Texture: FINE__

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

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FORM I - IN

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-7

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-7____

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _97.4

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

CAS No.	Analyte	Concentration	C	Q	M
7439-93-2	Lithium__	23.4			P_
7440-24-6	Titanium_	1240		J	P_
7440-31-5	Zirconium	23.5			P_

Color Before: _____ Clarity Before: _____ Texture: FINE__

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-8

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-8____

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _99.4

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	6770		~~*~~ J	P
7440-36-0	Antimony_	5.6	~~U~~	~~N~~ R	P
7440-38-2	Arsenic__	4.0		~~*~~	F
7440-39-3	Barium___	92.8			P
7440-41-7	Beryllium	1.2			P
7440-43-9	Cadmium__	0.30	U		P
7440-70-2	Calcium__	10800			P
7440-47-3	Chromium_	8.2			P
7440-48-4	Cobalt___	15.0			P
7440-50-8	Copper___	9.7			P
7439-89-6	Iron_____	26400			P
7439-92-1	Lead_____	6.0		J	F
7439-95-4	Magnesium	3720			P
7439-96-5	Manganese	385		J	P
7439-97-6	Mercury__	0.10	~~U~~	~~N~~ UJ	CV
7440-02-0	Nickel___	10.7			P
7440-09-7	Potassium	1030			P
7782-49-2	Selenium_	4.4	~~U~~	~~W~~ N R	F
7440-22-4	Silver___	1.3		~~N~~ J	P
7440-23-5	Sodium___	309	B		P
7440-28-0	Thallium_	3.3	U	W	F
7440-62-2	Vanadium_	89.0			P
7440-66-6	Zinc_____	49.9			P

Color Before: _____ Clarity Before: _____ Texture: FINE__

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-8

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-8____

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _99.4

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

CAS No.	Analyte	Concentration	C	Q	M
7439-93-2	Lithium__	21.8			P_
7440-24-6	Titanium_	1980		J	P_
7440-31-5	Zirconium	29.6			P_

Color Before: _____ Clarity Before: _____ Texture: FINE__

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-9

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-9____

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _97.3

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7200		~~*~~ J	P
7440-36-0	Antimony	5.8	~~U~~	~~N~~ R	P
7440-38-2	Arsenic	4.5		~~W*~~	F
7440-39-3	Barium	83.4			P
7440-41-7	Beryllium	0.62			P
7440-43-9	Cadmium	0.31	U		P
7440-70-2	Calcium	37500			P
7440-47-3	Chromium	6.8			P
7440-48-4	Cobalt	6.1			P
7440-50-8	Copper	11.6			P
7439-89-6	Iron	12300			P
7439-92-1	Lead	3.8		J	F
7439-95-4	Magnesium	6250			P
7439-96-5	Manganese	214		J	P
7439-97-6	Mercury	0.10	~~U~~	~~N~~ UJ	CV
7440-02-0	Nickel	7.7			P
7440-09-7	Potassium	1470			P
7782-49-2	Selenium	4.5	~~U~~	~~WN~~ R	F
7440-22-4	Silver	1.0	U	~~N~~	P
7440-23-5	Sodium	2460			P
7440-28-0	Thallium	3.4	U		F
7440-62-2	Vanadium	27.3			P
7440-66-6	Zinc	24.2			P

Color Before: _____ Clarity Before: _____ Texture: FINE__

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-9

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-9____

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _97.3

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

CAS No.	Analyte	Concentration	C	Q	M
7439-93-2	Lithium__	23.3			P_
7440-24-6	Titanium_	587		J	P_
7440-31-5	Zirconium	14.7			P_

Color Before: _____ Clarity Before: _____ Texture: FINE__

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-10

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-10___

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _97.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	6230		* J	P
7440-36-0	Antimony_	5.8	~~U~~	~~N~~ R	P
7440-38-2	Arsenic__	3.8		~~W*~~	F
7440-39-3	Barium___	72.8			P
7440-41-7	Beryllium	0.82			P
7440-43-9	Cadmium__	0.31	U		P
7440-70-2	Calcium__	3820			P
7440-47-3	Chromium_	8.5			P
7440-48-4	Cobalt___	7.4			P
7440-50-8	Copper___	10.3			P
7439-89-6	Iron_____	14800			P
7439-92-1	Lead_____	7.2		J	F
7439-95-4	Magnesium	3820			P
7439-96-5	Manganese	346		J	P
7439-97-6	Mercury__	0.10	~~U~~	~~N~~ aJ	CV
7440-02-0	Nickel___	9.5			P
7440-09-7	Potassium	1140			P
7782-49-2	Selenium_	4.5	~~U~~	~~N~~ R	F
7440-22-4	Silver___	1.0	U	~~N~~	P
7440-23-5	Sodium___	143	B		P
7440-28-0	Thallium_	3.4	U		F
7440-62-2	Vanadium_	27.9			P
7440-66-6	Zinc_____	32.6			P

Color Before: _____ Clarity Before: _____ Texture: MEDIUM

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-10

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-10___

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _97.0

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

CAS No.	Analyte	Concentration	C	Q	M
7439-93-2	Lithium__	23.5			P_
7440-24-6	Titanium_	652		J	P_
7440-31-5	Zirconium	14.0			P_

Color Before: _____ Clarity Before: _____ Texture: MEDIUM

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-11

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-11___

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _97.4

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	8710		~~*~~ J	P_
7440-36-0	Antimony_	5.7	~~U~~	~~N~~ R	P_
7440-38-2	Arsenic__	2.3	U	~~*~~	F_
7440-39-3	Barium___	64.7			P_
7440-41-7	Beryllium	0.82			P_
7440-43-9	Cadmium__	0.31	U		P_
7440-70-2	Calcium__	11100			P_
7440-47-3	Chromium_	13.2			P_
7440-48-4	Cobalt___	7.8			P_
7440-50-8	Copper___	14.5			P_
7439-89-6	Iron_____	15900			P_
7439-92-1	Lead_____	6.4		J	F_
7439-95-4	Magnesium	4960			P_
7439-96-5	Manganese	316		J	P_
7439-97-6	Mercury__	0.10	~~U~~	~~N~~ UJ	CV
7440-02-0	Nickel___	13.4			P_
7440-09-7	Potassium	1660			P_
7782-49-2	Selenium_	4.5	~~U~~	~~N~~ R	F_
7440-22-4	Silver___	1.0	U	~~N~~	P_
7440-23-5	Sodium___	235	B		P_
7440-28-0	Thallium_	3.4	U		F_
7440-62-2	Vanadium_	31.6			P_
7440-66-6	Zinc_____	39.8			P_

Color Before: _____ Clarity Before: _____ Texture: MEDIUM

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-11

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-11___

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _97.4

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

CAS No.	Analyte	Concentration	C	Q	M
7439-93-2	Lithium	26.8			P
7440-24-6	Titanium	681		J	P
7440-31-5	Zirconium	10.3	U		P

Color Before: _____ Clarity Before: _____ Texture: MEDIUM

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-12

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-12___

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _97.3

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	8110		*J	P
7440-36-0	Antimony_	5.8	~~U~~	~~N~~ R	P
7440-38-2	Arsenic__	2.4		*	F
7440-39-3	Barium___	83.6			P
7440-41-7	Beryllium	0.82			P
7440-43-9	Cadmium__	0.31	U		P
7440-70-2	Calcium__	7790			P
7440-47-3	Chromium_	16.6			P
7440-48-4	Cobalt___	7.9			P
7440-50-8	Copper___	17.2			P
7439-89-6	Iron_____	16400			P
7439-92-1	Lead_____	4.1		J	F
7439-95-4	Magnesium	4780			P
7439-96-5	Manganese	264		J	P
7439-97-6	Mercury__	0.10	~~U~~	~~N~~ UJ	CV
7440-02-0	Nickel___	17.8			P
7440-09-7	Potassium	1090			P
7782-49-2	Selenium_	4.5	~~U~~	~~N~~ R	F
7440-22-4	Silver___	1.0	U	~~N~~	P
7440-23-5	Sodium___	238	B		P
7440-28-0	Thallium_	3.4	U		F
7440-62-2	Vanadium_	36.8			P
7440-66-6	Zinc_____	34.0			P

Color Before: _____ Clarity Before: _____ Texture: MEDIUM

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-12

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-12___

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _97.3

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

CAS No.	Analyte	Concentration	C	Q	M
7439-93-2	Lithium	24.8			P
7440-24-6	Titanium	919		J	P
7440-31-5	Zirconium	12.7			P

Color Before: _____ Clarity Before: _____ Texture: MEDIUM

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-13

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-13___

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _98.4

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	6800		*J	P
7440-36-0	Antimony	5.7	~~U~~	~~N~~ R	P
7440-38-2	Arsenic	2.2	U	*	F
7440-39-3	Barium	55.5			P
7440-41-7	Beryllium	0.61			P
7440-43-9	Cadmium	0.30	U		P
7440-70-2	Calcium	6140			P
7440-47-3	Chromium	11.7			P
7440-48-4	Cobalt	6.5			P
7440-50-8	Copper	13.6			P
7439-89-6	Iron	13200			P
7439-92-1	Lead	4.6		J	F
7439-95-4	Magnesium	4120			P
7439-96-5	Manganese	227		J	P
7439-97-6	Mercury	0.10	~~U~~	~~N~~ UJ	CV
7440-02-0	Nickel	16.8			P
7440-09-7	Potassium	888			P
7782-49-2	Selenium	4.5	~~U~~	~~WN~~ R	F
7440-22-4	Silver	1.0	U	~~N~~	P
7440-23-5	Sodium	204	B		P
7440-28-0	Thallium	3.4	U		F
7440-62-2	Vanadium	29.7			P
7440-66-6	Zinc	30.9			P

Color Before: _____ Clarity Before: _____ Texture: MEDIUM

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-13

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-13___

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _98.4

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

CAS No.	Analyte	Concentration	C	Q	M
7439-93-2	Lithium__	23.2			P_
7440-24-6	Titanium_	832		J	P_
7440-31-5	Zirconium	11.8			P_

Color Before: _____ Clarity Before: _____ Texture: MEDIUM

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-14

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-14___

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _96.9

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	8000		~~*~~ J	P
7440-36-0	Antimony	5.8	~~U~~	~~N~~ R	P
7440-38-2	Arsenic	3.7		~~*~~	F
7440-39-3	Barium	66.0			P
7440-41-7	Beryllium	0.83			P
7440-43-9	Cadmium	0.31	U		P
7440-70-2	Calcium	7320			P
7440-47-3	Chromium	12.7			P
7440-48-4	Cobalt	7.7			P
7440-50-8	Copper	14.3			P
7439-89-6	Iron	15100			P
7439-92-1	Lead	7.8		J	F
7439-95-4	Magnesium	4700			P
7439-96-5	Manganese	333		J	P
7439-97-6	Mercury	0.10	~~U~~	~~N~~ UJ	CV
7440-02-0	Nickel	13.5			P
7440-09-7	Potassium	2350			P
7782-49-2	Selenium	4.5	~~U~~	~~N~~ R	F
7440-22-4	Silver	1.0	U	~~N~~	P
7440-23-5	Sodium	140	B		P
7440-28-0	Thallium	3.4	U		F
7440-62-2	Vanadium	27.7			P
7440-66-6	Zinc	42.0			P

Color Before: _____ Clarity Before: _____ Texture: FINE__

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-14

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-14___

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _96.9

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

CAS No.	Analyte	Concentration	C	Q	M
7439-93-2	Lithium__	16.8			P_
7440-24-6	Titanium_	589		J	P_
7440-31-5	Zirconium	10.3	U		P_

Color Before: _____ Clarity Before: _____ Texture: FINE__

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
BO_14J3

FORM I - IN

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00029

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-15

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-15___

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _98.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum_	7650		~~*~~ J	P_
7440-36-0	Antimony_	5.7	~~U~~	~~N~~ R	P_
7440-38-2	Arsenic__	2.5		~~*~~	F_
7440-39-3	Barium___	46.2			P_
7440-41-7	Beryllium	0.82			P_
7440-43-9	Cadmium__	0.31	U		P_
7440-70-2	Calcium__	5930			P_
7440-47-3	Chromium_	19.8			P_
7440-48-4	Cobalt___	8.5			P_
7440-50-8	Copper___	13.4			P_
7439-89-6	Iron_____	17700			P_
7439-92-1	Lead_____	3.4		J	F_
7439-95-4	Magnesium	5480			P_
7439-96-5	Manganese	304		J	P_
7439-97-6	Mercury__	0.10	~~U~~	~~N~~ UJ	CV
7440-02-0	Nickel___	20.5			P_
7440-09-7	Potassium	1050			P_
7782-49-2	Selenium_	4.5	~~U~~	~~N~~ R	F_
7440-22-4	Silver___	1.0	U	~~N~~	P_
7440-23-5	Sodium___	177	B		P_
7440-28-0	Thallium_	3.4	U		F_
7440-62-2	Vanadium_	38.5			P_
7440-66-6	Zinc_____	41.8			P_

Color Before: _____ Clarity Before: _____ Texture: MEDIUM

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
BO_14J4

FORM I - IN 2/5/92 7/88

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U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-15

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-15___

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _98.0

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

CAS No.	Analyte	Concentration	C	Q	M
7439-93-2	Lithium__	15.3	U		P_
7440-24-6	Titanium_	985		J	P_
7440-31-5	Zirconium	11.4			P_

Color Before: _____ Clarity Before: _____ Texture: MEDIUM

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:
BO_14J4

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1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-16

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-16___

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _97.5

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7150		~~*~~ J	P
7440-36-0	Antimony	5.7	~~U~~	~~N~~ R	P
7440-38-2	Arsenic	4.2		~~*~~	F
7440-39-3	Barium	65.8			P
7440-41-7	Beryllium	0.72			P
7440-43-9	Cadmium	0.31	U		P
7440-70-2	Calcium	9340			P
7440-47-3	Chromium	24.0			P
7440-48-4	Cobalt	8.5			P
7440-50-8	Copper	17.3			P
7439-89-6	Iron	16500			P
7439-92-1	Lead	4.4		J	F
7439-95-4	Magnesium	5850			P
7439-96-5	Manganese	372		J	P
7439-97-6	Mercury	0.10	~~U~~	~~N~~ UJ	CV
7440-02-0	Nickel	26.6			P
7440-09-7	Potassium	823			P
7782-49-2	Selenium	4.5	~~U~~	~~N~~ R	F
7440-22-4	Silver	1.0	U	~~N~~	P
7440-23-5	Sodium	101	U		P
7440-28-0	Thallium	3.4	U		F
7440-62-2	Vanadium	33.2			P
7440-66-6	Zinc	39.3			P

Color Before: _____ Clarity Before: _____ Texture: MEDIUM

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

BO_14J5

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1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-16

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-16___

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: _97.5

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

CAS No.	Analyte	Concentration	C	Q	M
7439-93-2	Lithium__	15.4	U		P_
7440-24-6	Titanium_	524		J	P_
7440-31-5	Zirconium	10.3	U		P_

Color Before: _____ Clarity Before: _____ Texture: MEDIUM

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

BO_14J5

FORM I - IN

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U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-17

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-17___

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: 100.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7.2	~~U~~	~~*~~ UJ	P
7440-36-0	Antimony	5.6	~~U~~	~~N~~ R	P
7440-38-2	Arsenic	0.20	U	*	F
7440-39-3	Barium	4.1	U		P
7440-41-7	Beryllium	0.20	U		P
7440-43-9	Cadmium	0.30	U		P
7440-70-2	Calcium	107	U		P
7440-47-3	Chromium	0.70	U		P
7440-48-4	Cobalt	1.6	U		P
7440-50-8	Copper	1.8	U		P
7439-89-6	Iron	6.9	U		P
7439-92-1	Lead	0.10	~~U~~	UJ	F
7439-95-4	Magnesium	249	U		P
7439-96-5	Manganese	0.60	U	~~J~~	P
7439-97-6	Mercury	0.10	~~U~~	~~N~~ UJ	CV
7440-02-0	Nickel	3.2	U		P
7440-09-7	Potassium	130	U		P
7782-49-2	Selenium	0.40	~~U~~	~~N~~ R	F
7440-22-4	Silver	1.0	U	~~N~~	P
7440-23-5	Sodium	98.7	U		P
7440-28-0	Thallium	0.30	U		F
7440-62-2	Vanadium	2.0	U		P
7440-66-6	Zinc	5.0	U		P

- no qualifier for manganese

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

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FORM I - IN

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1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

2618-17

Lab Name: S_CUBED_____ Contract: 32359-04__

Lab Code: S3____ Case No.: SITE_ SAS No.: _____ SDG No.: 2618__

Matrix (soil/water): SOIL_ Lab Sample ID: 2618-17___

Level (low/med): LOW__ Date Received: 09/30/91

% Solids: 100.0

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

CAS No.	Analyte	Concentration	C	Q	M
7439-93-2	Lithium__	15.0	U		P_
7440-24-6	Titanium_	1.5	U	R	P_
7440-31-5	Zirconium	10.0	U		P_

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

BO_14HO

FORM I - IN 2/5/92 7/88

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