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**START**

0043824

LK26

**Lockheed**  
*Environmental Systems & Technologies Co.*

Lockheed Analytical Services  
975 Kelly Johnson Drive  
Las Vegas, Nevada 89119-3705

December 30, 1994  
Phone: (702) 361-0220  
Phone: (800) 582-7605  
Fax: (702) 361-8146

Ms. Doris Ayres  
Bechtel Hanford, Inc.  
345 Hills P.O. Box 969  
Richland, WA 99352



RE: Log-in No.: L3440  
Quotation No.: Q400000-B  
SAF: B94-089  
Document File No.: 1203596  
WHC Document File No.: 115  
SDG No.: LK26

**RECORD COPY**

The attached data report contains the analytical results of samples that were submitted to Lockheed Analytical Services on 3 December 1994. The temperature of the cooler upon receipt was 2°C. Sample containers received agree with the chain-of-custody documentation. Sample containers were received intact. Samples were received in time to meet the analytical holding time requirements.

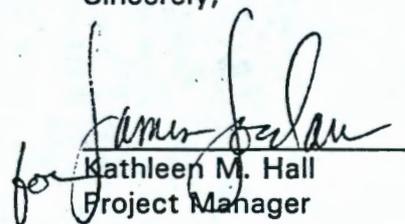
The case narratives included in the following attachments provide a detailed description of all events that occurred during sample preparation, analysis, and data review specific to the samples and analytical methods requested.

A list of data qualifiers, chain-of-custody forms, sample receiving checklist, and log-in report are also enclosed representing the samples received within this group.

If you have any questions concerning the analysis or the data please call Kathleen M. Hall at (509) 943-4423.

" I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature".

Sincerely,

  
Kathleen M. Hall  
Project Manager

kmh:sm

cc: Client Services  
Document Control

**CASE NARRATIVE  
INORGANIC NON-METALS ANALYSES  
WATER**

The routine calibration and quality control analyses performed for this batch include as applicable: initial and continuing calibration verification, initial and continuing calibration blanks, method blank(s), laboratory control sample(s), matrix spike sample(s), and duplicate sample(s).

Client ID	LAL #		Method
BOD922	L3440-2	DUP, MS	7196 Hexavalent Chromium

**Holding Time Requirements**

- The sample for Method 7196 Hexavalent Chromium was received from the client out of holding time. Analyses proceeded at the direction of the client and the applicable samples are flagged with an "H".

**Method Blanks**

- The concentration levels of all the requested analytes in the method blank were below the reporting detection limits.

**Internal Quality Control**

- All Internal Quality Control were within acceptance limits.

Shellee McGrath  
Prepared By

December 30, 1994  
Date

## CASE NARRATIVE INORGANIC ANALYSES

The routine calibration and quality control analyses performed for this batch include as applicable: instrument tune (ICP/MS only), initial and continuing calibration verification, initial and continuing calibration blanks, method blank(s), laboratory control sample(s), ICP interference check samples (ICP only), serial dilutions, analytical (post-digestion) spike samples, matrix spike (predigestion) sample(s), duplicate sample(s).

### Holding Times-

All samples were analyzed within the method-specific holding times

### Method Blanks-

The method blanks were free of contamination.

### Internal Quality Control-

All Internal Quality Control were within acceptance limits.

Due to high levels of Chromium in the sample, the analysis was determined by Method 200.7.

Shellee McGrath  
Prepared By

December 30, 1994  
Date

**Lockheed Analytical Services**  
**DATA QUALIFIERS FOR INORGANIC ANALYSES**

[Revised 08/28/92]

For Use on the Analytical Data Reporting Forms	
<b>B</b>	<i>For CLP Analyses Only</i> – Reported value is less than the contract required detection limit (CRDL) but greater than or equal to the instrument detection limit (IDL).
<b>C</b>	<i>For Routine, Non-CLP Analyses Only</i> – Any constituent that was also detected in the associated blank whose concentration was greater than the reporting detection limit (RDL).
<b>D</b>	Presence of high levels of interfering constituents required dilution of sample which increased the RDL by the dilution factor.
<b>E</b>	Estimated value due to presence of interference.
<b>H</b>	Sample analysis performed outside of method-or client-specified maximum holding time requirement.
<b>M</b>	<i>For CLP Analyses Only</i> – Duplicate injection precision criterion was not met.
<b>N</b>	Matrix spike recovery exceeded acceptance limits.
<b>S</b>	Reported value was determined from the method of standard addition.
<b>U</b>	<i>For CLP Reporting Only</i> – Constituent was analyzed for but not detected (sample quantitation must be corrected for dilution and percent moisture).
<b>W</b>	<i>For AAS Only</i> – Post-digestion spike for Furnace AAS did not meet acceptance criteria and sample absorbance is less than 50% of spike absorbance.
<b>X, Y, or Z</b>	Analyst-defined qualifier.
<b>*</b>	Relative percent difference (RPD) for duplicate analysis exceeded acceptance limits.
<b>+</b>	Correlation coefficient (r) for the MSA is less than 0.995.
For Use on the QC Data Reporting Forms	
<b>a<sup>1</sup></b>	The spike recovery and/or RPD for matrix spike and matrix spike duplicates cannot be evaluated due to insufficient spiking level compared to the elevated sample analyte concentration.
<b>b<sup>1</sup></b>	The RPD cannot be computed because the sample and/or duplicate concentration was below the RDL.

<sup>1</sup> Used as footnote designations on the QC summary form.

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LOGIN CHAIN OF CUSTODY REPORT (1n01)  
Dec 09 1994, 12:48 pm

Login Number: L3440  
Account: 596 Bechtel Hanford, Inc. \* Richland, WA  
Project: BECHTEL-HANFORD Bechtel Hanford Project

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	Due PR Date
L3440-1 TEMP 2 Location: RFG01-19A Water 1 S 200.7 METALS	B0D922	01-DEC-94	03-DEC-94	12-JAN-95
			Hold:30-MAY-95	
L3440-2 TEMP 2 Location: RFG19-104B Water 1 S 7196 CHROMIUM (VI)	B0D922	01-DEC-94	03-DEC-94	12-JAN-95
			Hold:02-DEC-94	
L3440-3 TEMP 2 Location: RFG01-43 Water 1 S SCREENING	B0D922	01-DEC-94	03-DEC-94	12-JAN-95
			Hold:30-MAY-95	
L3440-4 Location: Water 1 S EDD - DISK DEL. Water 1 S INORG TYPE 2 RPT	REPORT TYPE	05-DEC-94	03-DEC-94	12-JAN-95

\* CHANGED 218.2 CHROMIUM TO  
200.7 METALS DUE TO HIGH  
CHROMIUM LEVEL IN SAMPLE

R. Callison 12-9-94  
(LAB REQUEST)

Page 1

Signature: Murillo

Date: 12-9-94 05

1203596

9613426.0991

LOGIN CHAIN OF CUSTODY REPORT (ln01)  
Dec 05 1994, 11:49 am

Login Number: L3440  
Account: 596 Bechtel Hanford, Inc. \* Richland, WA  
Project: BECHTEL-HANFORD Bechtel Hanford Project

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	Due PR Date
L3440-1 TEMP 2 Location: RFG01-19A Water 1 S 218.2 CHROMIUM	BOD922	01-DEC-94	03-DEC-94	12-JAN-95
L3440-2 TEMP 2 Location: RFG01-19A Water 1 S 7196 CHROMIUM (VI)	BOD922	01-DEC-94	03-DEC-94	12-JAN-95
L3440-3 TEMP 2 Location: RFG01-19A Water 1 S SCREENING	BOD922	01-DEC-94	03-DEC-94	12-JAN-95
L3440-4 Location: Water 1 S EDD - DISK DEL. Water 1 S INORG TYPE 2 RPT	REPORT TYPE	05-DEC-94	03-DEC-94	12-JAN-95

3

Page 1

Signature: Paul C. James  
Date: 12-05-94

203596A

Contractor <b>BHI</b>	<b>OFF-SITE PROPERTY CONTROL</b>	CONTROL NO. <i>(To be obtained from PROPERTY MANAGEMENT)</i> <b>W95-0-0073-36</b>
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**PART I - TO BE COMPLETED BY ORIGINATOR**

Department <b>ER Eng Support</b>	Section <b>Field &amp; Analytical Supp</b>	Unit <b>ER Field Sampling</b>
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The following items are to be shipped from  Contractor  Vendor

Routing **Fed. Ex.**  Prepaid  Collect

Shipped to Company **Lockheed Analytical Services**  
 Address **975 Kelly Johnson Drive**  
**Las Vegas, NV 89119**  
 City State Zip Code  
 Country

Off-site Custodian  
  
 On-site Custodian Payroll No.

Qty.	Property No.	Description (include Manufacture Name, Model, Serial No.)	Acquisition Cost
1  59 lbs		Sample #: <b>B00922</b> Cooler ID: <b>ER-2A</b> Polycooler with groundwater samples packed in wet ice and vermiculite	N/A
1  1bs		<del>Sample #: Cooler ID: Polycooler with groundwater samples packed in wet ice and vermiculite</del>	<del>N/A</del>

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

Necessity for the off-site use of this property  
 Required for Project Work. List Project No. **100-HR-3-RET**  
 Business Trip  
 Off-site Assignment  
 Shipment to Subcontractor. List Subcontract No.  
 Other (Please specify) **Bill of lading # 2986 2904613442**  
**Sampling supports RI/FS work in the 100-HR-3 AREA**

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

RM Clearance for Public Release	RM Survey No. <b>100-HR-3-off-0519</b>	Date <b>12-2-94</b>
---------------------------------	---	------------------------

Location of and Contact for Property (Name/Phone No./Bldg./Area)  
**P. H. Butcher / (703) 276-4388**

Date Ready for Shipment <b>12-2-94</b>	Cost Code to be Charged <b>ITE2072 P35B1</b>	Approximate Date This Property will be Returned
Originated By <b>B.T. WHITTEN</b>	Date <b>12-2-94</b>	Authorized By <i>[Signature]</i>
Property Representative Signature <i>[Signature]</i>	Date	Property Management Approval <i>[Signature]</i>
		Date <b>12/2/94</b>

**PART II - TO BE COMPLETED BY SHIPPING**

Authorized Shipping Signature <i>[Signature]</i>	Date <b>12-2-94</b>
---	------------------------

**DISTRIBUTION (AFTER FINAL SIGNATURES)**

White - Property Management    Yellow - Shipping    Green - Accounts Payable    Pink - Originator    Goldenrod - Property Management

Westinghouse Hanford Company

L3440

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Date Turnaround

Priority  
 Normal

Collector <i>Doug Bowers</i>	Company Contact RC SMITH/DB BLUMENKRAZ	Telephone No. (509) 372-2537
Project Designation 100-HR-3 PUMP & TREAT - ROUTINE SAMPLES	Sampling Location 100 AREAS	SAF No. 894-089
Ice Chest No. <i>ER-2A</i>	Field Logbook No. <i>N/A</i>	Method of Shipment <del>EMERY</del> <i>FEDEX</i>
Shipped To LOCKHEED	Offsite Property No. <i>W95-0-0073-36</i>	Bill of Lading/Air Bill No. <i>2904013442</i>

Possible Sample Hazards/Remarks	Preservative			
	HNO3 <2	COOL 4	COOL 4	
Special Handling and/or Storage COOL TO 4 DEGREES CENTIGRADE	Type of Container	G	G	G/P
	No. of Container(s)	1	1	1
SAMPLE ANALYSIS	Volume	1000ml	500ml	20ml
		CHROMIUM - TOTAL	CHROMIUM(VI)	ACTIVITY SCREEN

Sample No.	Matrix*	Date Sampled	Time Sampled			
B00922	W	12-1-94	1057	X	X	X

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS		Matrix*	
Relinquished By <i>Doug Bowers</i> <i>Amy Bowers</i>	Date/Time <i>0735</i> <i>12-2-94</i>	Received By <i>Paul C Daulton</i>	Date/Time <i>0750</i> <i>12-2-94</i>	NOTE: Data Deliverable - Summary Analysis for Chromium(VI) by SW-846 7196 is being requested for INFORMATION ONLY. The ERC Contractor recognizes that the 24-hour holding time will not be met.		S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air DS = Drum Solids DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other	
Relinquished By <i>Paul C Daulton</i>	Date/Time <i>0800</i> <i>12-2-94</i>	Received By	Date/Time				
Relinquished By	Date/Time	Received By	Date/Time				
Relinquished By	Date/Time	Received By	Date/Time				

LABORATORY SECTION	Received By <i>Paul C Daulton</i>	Title <i>Sample Custodian</i>	Date/Time <i>12-03-94 10:00 AM</i>
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

9613426-1993

1203596A

SAMPLE STATUS REPORT FOR N 3884. RAD SCREEN BOD919 TIME: 12/ 2/94 8:20  
DISPATCHED: 11/16/94 14:59 SAMPLE HAS NOT BEEN SLURPED  
RECEIVED: 12/ 2/94 8: 1

EXT. DETER. RESULTS OR STATUS  
\*\*\*\* \*\*\*\*\*  
4271 TOT-ACT < 5.00000E 01 pci/G

OUT OF GOOD CHARGE  
RANGE? ANS? CODE  
\*\*\* \*\*  
N Y PE35A

END OF REPORT

BOD922  
BW  
12-2-94

Figure 1

# SAMPLE CHECK-IN LIST

(1 Per Shipping Container)

Date/Time Received 12-03-94 10:00 AM Client Name W.P. Stine House Harbor  
 Project/Client # B94-089 Batch or Case #                       
 Cooler ID (if noted on outside of cooler) ~~17A~~ ER-2A

1. Condition of shipping container? GOOD
2. Custody Seals on cooler intact? Yes  No
3. Custody Seals dated and signed? Yes  No
4. Chain of Custody record is taped on inside of cooler lid? Yes  No
5. Vermiculite/packing material is: Wet  <sup>12-03-94</sup> Dry
6. Each sample is in a plastic bag? Yes  No
7. Number of sample containers in cooler: 3
8. Samples have:
 

<u>          </u> tape	<u>          </u> hazard labels
<input checked="" type="checkbox"/> custody seals	<input checked="" type="checkbox"/> appropriate sample labels
9. Samples are:
 

<input checked="" type="checkbox"/> in good condition	<u>          </u> leaking
<u>          </u> broken	<u>          </u> have air bubbles
<u>          </u> other	
10. Coolant Present? Yes  No  Sample Temperature 2°C
11. The following paperwork should be accounted for (N/A if not applicable):
 

Chain of Custody #(s) N/A

Request for Analysis #(s) N/A

Airbill # 290 4613 442 Carrier FED EX
12. Have any anomalies been identified above? Yes  No  N/A
13. Memos have been initiated for all anomalies identified above? Yes  N/A

Printed Name/Signature Paul C Davis Date/Time 12-03-94 1:00 PM

# Sample Login

## Login Review Checklist

Lot Number L3440

The login review should be conducted by that person logging in the samples as well as a peer. Please use this checklist to ensure that such reviews occur in a uniform basis. Please sign and date below to verify that a login review has occurred. This checklist should be affixed to each login package prior to distribution.

For an effective login review, at a minimum, five reports from the login process are required. These are the chain of custody (or equivalent), the login chain of custody report, the sample summary report, the sample receiving checklist, and the login quotation. Before beginning a review, ensure that these five components are available. For jobs with single component samples, the sample summary report may be omitted.

### Sample Summary Report

Yes No

N/A

- 1. Are all sample IDs correct? X - -
- 2. Are all samples present? X - -
- 3. Are all matrices correct? X - -  
(e.g., TCLP analyses should be on a TCLP leachate, field blanks should be water)
- 4. Are all analyses on the chain of custody/login quotation included? X - -
- 5. Are analyses logged in for the correct container? X - -  
(e.g., analyses requiring preservation logged in for a preserved container and vice versa)
- 6. Are samples logged in according to laboratory batching procedures? X - -  
(e.g., TCLP regular leaching and associated metals/semivolatile organics should be logged in on the same bottle)

### Login Chain of Custody Report

- 1. Are the Collect, Receive, and Due dates correct for every sample? X - -
- 2. Have appropriate sample comments been included? - - (4/1)  
(e.g., MS/MSD designation, comments from the client concerning method modifications)

### Sample Receiving Checklist

- 1. Are any discrepancies between the chain of custody and the login noted? - - (4/1)  
(e.g., client IDs different on chains of custody and bottle labels, samples not sent, samples lost from breakage)

Paul Davis

12-05-94

M. Miller

12-05-94

Primary review signature

Date

Secondary review signature

Date



9613426.0998

Lockheed Analytical Laboratory  
SAMPLE SUMMARY REPORT (su02)  
Bechtel Hanford, Inc. \* Richland, WA

Client Sample Number	LAL Sample Number	SDG Number	Matrix	Method
BOD922 -	L3440-1 L3440-2 L3440-3		Water Water Water	218.2 CHROMIUM - 7196 CHROMIUM (VI) SCREENING -
REPORT TYPE -	L3440-4 L3440-4		Water Water	EDD - DISK DEL. - INORG TYPE 2 RPT -

9613426.1999

## LOCKHEED ANALYTICAL SERVICES

## COMMON IONS AND ADDITIONAL ANALYTES

## Sample Results

Client Sample ID: B0D922	Date Collected: 01-DEC-94
Matrix: Water	Date Received: 03-DEC-94

Constituent	Units	Method	Result	Reporting Det Limit	Date Qualifier(s)	Date Analyzed	LAS Batch ID	LAS Sample ID
Chromium, hexavalent	mg/L	7196	1.2	0.2	D(1:10)H	05-DEC-94	16507	L3440-2

9613426.1000

LOCKHEED ANALYTICAL SERVICES

COMMON IONS AND ADDITIONAL ANALYTES

QC Data Summary For Reagent Blank Analysis

Constituent	Units	Reporting Detection Limit	LAS Batch ID	Date Analyzed	Reagent Blank Result	Data Qualifier
Chromium, hexavalent	mg/L	.02	16507	12/05/94	< .02	

9613426.1001

LOCKHEED ANALYTICAL SERVICES

COMMON IONS AND ADDITIONAL ANALYTES

QC Data Summary For Duplicate Sample Analysis

Client Sample ID B0D922

Constituent	Units	LAS Batch ID	LAS Sample ID	Date Analyzed	Sample Result	Duplicate Result	Relative Percent Difference	Data Qualifier
Chromium, hexavalent	mg/L	16507	L3440-2	12/05/94	1.25	1.25	0	

9613426.1002

LOCKHEED ANALYTICAL SERVICES

COMMON IONS AND ADDITIONAL ANALYTES

QC Data Summary For Matrix Spike Sample Analysis

Client Sample ID B0D922

Constituent	Units	LAS Batch ID	LAS Sample ID	Date Analyzed	Matrix Spike Result	Sample Result	Spike Added	(%) Recovery	Data Qualifier
Chromium, hexavalent	mg/L	16507	L3440-2	12/05/94	1.74	1.25	0.500	98	

9613426.1003

LOCKHEED ANALYTICAL SERVICES

COMMON IONS AND ADDITIONAL ANALYTES

QC Data Summary For Laboratory Control Sample Analysis

Constituent	Units	LAS Batch ID	Date Analyzed	LCS True Value	LCS Result	(%) Recovery
Chromium, hexavalent	mg/L	16507	12/05/94	0.0500	0.0483	97

## TOTAL METALS RESULTS

Client Sample ID: BOD922	Date Collected: 12-01-94	Matrix: water
LAL Batch ID(s): 1203 wh	Date Received: 12-03-94	

Constituents	Method	Concentration (mg/L)	IDL (mg/L)	RDL (mg/L)	Data Qualifier(s)	Date Analyzed	LAL ID
Chromium	200.7	1.3	0.005	0.010		12-16-94	L3440-1

Comments:

**QC DATA SUMMARY****Method Blank Analysis Data Results**

LAL Batch ID(s): 1203 wh

Constituent	LAL Sample ID	Date Analyzed	QC Sample Analyses
			Reagent Blank (mg/L)
Chromium	pbW1203wh	12-16-94	<0.010

Comments:

**QC DATA SUMMARY**  
For Duplicate Sample Data Results

LAL Batch ID(s): 1203 wh

Constituent	Client Sample ID	LAL Sample ID	Date Analyzed	QC Sample Analyses			
				Sample Concentration (mg/L)	Duplicate Concentration (mg/L)	Relative Percent Difference (%)	Data Qualifier
Chromium	BOD922	L3440-1	12-16-94	1.262	1.269	0.55	

Comments:

**QC DATA SUMMARY**  
**For Matrix Spike Sample Recovery Data Results**

LAL Batch ID(s): 1203 wh

Constituent	Client Sample ID	LAL Sample ID	Date Analyzed	QC Sample Analyses				
				Matrix Spike Result (mg/L)	Sample Result (mg/L)	Spike Added (mg/L)	(%) Recovery	Data Qualifier
Chromium	BOD922	L3440-1	12-16-94	1.484	1.262	0.20	111	a

"a" - The matrix spike recovery is not reported. The sample concentration was greater than four times the spiking level.

Comments:

**QC DATA SUMMARY**

For Laboratory Control Sample Recovery Data Results

LAL Batch ID(s): 1203 wh

Constituent	Client Sample ID	LAL Sample ID	Date Analyzed	QC Sample Analyses			
				Laboratory Control Sample Result (mg/L)	True Value (mg/L)	(%) Recovery	Data Qualifier
Chromium	NA	LCSW1203wh	12-16-94	0.2017	0.20	101	

Comments: