

**START**

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LK07-LAS

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# Lockheed Analytical Services

BECHTEL HANFORD, INC.

ANALYTICAL DATA REPORT

FOR

TOTAL CHROMIUM, HEXAVALENT CHROMIUM  
AND RADIOCHEMISTRY



RECORD COPY

LOG-IN NUMBER:	<u>L3065</u>
QUOTATION NUMBER:	<u>Q400000</u>
SAF:	<u>B94-009</u>
DOCUMENT FILE NUMBER:	<u>1001512</u>
WHC DOCUMENT CONTROL NO.:	<u>WHC-000084</u>
SDG NO.:	<u>LK07</u>



1  
11-24-94

**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).

**Preparation and Analysis Requirements**

- One water sample was received for SAF: B94-009 and prepared as batch 1001WH and analyzed for selected analytes as requested on the chain of custody.

Client ID	LAL #		Method
BOCJN3	L3065-2	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.

Kay McCann

October 7, 1994

Prepared By

Date

**CASE NARRATIVE  
INORGANIC METALS ANALYSES  
WATER**

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).

**Preparation and Analysis Requirements**

- One water sample was received in good condition on October 1, 1994 and logged in as L3065.
- The samples were prepared as Batch 1001WH and analyzed for selected analytes as requested on the chain of custody. Sample BOCJN3 (L3065-1) was used for matrix spike and duplicate, post-digestion spike and serial dilution. All data flags due to the performance of the above-mentioned QC are associated with every sample digested with this batch.

**Holding Time Requirements**

- All samples were analyzed within the method-specific holding times.

**Method Blanks**

- The level of analytes in the method blanks were less than the reporting detection limits.

**Internal Quality Control**

All internal quality control were within acceptance limits.

**Sample Results**

Due to high levels of Chromium in the sample, the results were determined by ICP Method 6010 instead of Graphite Furnace method 7191.

Amy O. Carpenter  
Prepared By

October 14, 1994  
Date

## CASE NARRATIVE RADIOCHEMICAL ANALYSES

The routine calibration and quality control analyses performed for this batch include as applicable: instrument calibration, initial and continuing calibration verification, quench monitoring standards, instrument background analysis, method blanks, yield tracer, laboratory control samples, and duplicate samples.

### Holding Time Requirements

All holding time requirements were met.

### Analytical Method

### Gross alpha beta

The gross alpha beta analysis was performed using LAL-91-SOP-0060. No problems were encountered during analysis. All QC criteria were met.

Yvonne M. Jacoby  
Prepared By

November 9, 1994  
Date

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

[Revised 08/28/92]

<b>For Use on the Analytical Data Reporting Forms</b>	
<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.
<b>For Use on the QC Data Reporting Forms</b>	
<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.

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

[Revised 08/28/92]

<b>For Use on the Analytical Data Reporting Forms</b>	
<b>B</b>	Any constituent that was also detected in the associated blank whose concentration was greater than the reporting detection limit (RDL) and/or minimum detectable activity (MDA).
<b>C</b>	Presence of high TDS in sample required reduction of sample size which increased the MDA.
<b>D</b>	Constituent detected in the diluted sample.
<b>E</b>	Constituent concentration exceeded the calibration or attenuation curve range.
<b>F</b>	<i>For Alpha Spectrometry Only</i> -- FWHM exceeded acceptance limits.
<b>H</b>	Sample analysis performed outside of method-specified maximum holding time requirement.
<b>Y</b>	Chemical yield exceeded acceptance limits.
<b>For Use on the QC Data Reporting Forms</b>	
<b>*</b>	QC data (i.e., percent recovery data for laboratory control standard and matrix spike; and RPD for replicate analyses) exceeded acceptance limits.
<b>a<sup>1</sup></b>	The spike recovery and/or RPD for matrix spike and 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 MDA.

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

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LOGIN CHAIN OF CUSTODY REPORT (ln01)  
Oct 03 1994, 02:25 pm

Login Number: L3065

Account: 512 Westinghouse Hanford Co. \* Richland, WA

Project: WESTINGHOUSE-HANFORD Westinghouse Hanford Project (Richland,WA)

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	Due PR Date
L3065-1 temp 0 CHROMIUM ONLY Location: 156RAD1-03 Water 1 S 6010 ICP METALS	BOCJN3	29-SEP-94	01-OCT-94	15-NOV-94
				Hold:28-MAR-95
L3065-2 temp 0 Location: 156RAD1-03 Water 1 S 7196 CHROMIUM (VI)	BOCJN3	29-SEP-94	01-OCT-94	15-NOV-94
				Hold:30-SEP-94
L3065-3 temp 0 Location: 156TMP-3 Water 1 S GR ALP/BETA LAL-0060	BOCJN3	29-SEP-94	01-OCT-94	15-NOV-94
				Hold:28-MAR-95
L3065-4 temp 0 Location: 156TMP-3 Water 1 S NONE	BOCJN3	29-SEP-94	01-OCT-94	15-NOV-94
				Hold:09-OCT-94
L3065-5 temp 0 Location: 156TMP-3 Water 1 S SCREENING	BOCJN3	29-SEP-94	01-OCT-94	15-NOV-94
				Hold:28-MAR-95
L3065-6 Location: Water 1 S EDD - DISK DEL. Water 1 S GC2 Water 1 S GCMS2 Water 1 S INORG TYPE 2 RPT	REPORT TYPE	01-OCT-94	01-OCT-94	15-NOV-94

\* CHANGED PRODUCT FOR L3065-1 FROM 7196 CHROMIUM(VI)  
TO 6010 ICP METALS (COMMENTS CHROMIUM ONLY)

LOG-IN ERROR

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Signature:

*R. Callison*

Date:

10-3-94

008

1001512

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LOGIN CHAIN OF CUSTODY REPORT (ln01)  
Oct 01 1994, 04:41 pm

Login Number: L3065

Account: 512 Westinghouse Hanford Co. \* Richland, WA

Project: WESTINGHOUSE-HANFORD Westinghouse Hanford Project (Richland,WA)

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	Due PR Date
L3065-1 temp 0 Location: 156RAD1-03 Water 1 S 7196	BOCJN3 CHROMIUM (VI)	29-SEP-94	01-OCT-94	15-NOV-94
		Hold:30-SEP-94		
L3065-2 temp 0 Location: 156RAD1-03 Water 1 S 7196	BOCJN3 CHROMIUM (VI)	29-SEP-94	01-OCT-94	15-NOV-94
		Hold:30-SEP-94		
L3065-3 temp 0 Location: 156RAD1-03 Water 1 S GR	BOCJN3 ALP/BETA LAL-0060	29-SEP-94	01-OCT-94	15-NOV-94
		Hold:28-MAR-95		
L3065-4 temp 0 Location: 156RAD1-03 Water 1 S NONE	BOCJN3	29-SEP-94	01-OCT-94	15-NOV-94
		Hold:09-OCT-94		
L3065-5 temp 0 Location: 156RAD1-03 Water 1 S SCREENING	BOCJN3	29-SEP-94	01-OCT-94	15-NOV-94
		Hold:28-MAR-95		
L3065-6 Location: Water 1 S EDD - DISK DEL. Water 1 S GC2 Water 1 S GCMS2 Water 1 S INORG TYPE 2 RPT	REPORT TYPE	01-OCT-94	01-OCT-94	15-NOV-94

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Signature: Paul C. DawsonDate: 10-1-94

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

Client Sample Number	LAL Sample Number	SDG Number	Matrix	Method
BOCJN3	L3065-1		Water	7196 CHROMIUM (V)
	L3065-2		Water	7196 CHROMIUM (V)
	L3065-3		Water	GR ALP/BETA LAL-(
	L3065-4		Water	NONE
	L3065-5		Water	SCREENING
REPORT TYPE	L3065-6		Water	EDD - DISK DEL.
	L3065-6		Water	GC2
	L3065-6		Water	GCMS2
	L3065-6		Water	INORG TYPE 2 RPT

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Westinghouse Hanford Company

L3065 CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround

Priority  
 Normal

Collector <i>Doug Bowers</i>	Company Contact P.H. Butcher	Telephone No. 376-4388
Project Designation 100-HR-3 Pump and Treat	Sampling Location 100 D	SAF No. B94-009
Ice Chest No. <i>GW3-029</i>	Field Logbook No. N/A	Method of Shipment Emergency
Shipped To Lockheed	Offsite Property No. <i>W94-0-0984-3</i>	Bill of Lading/Air Bill No. <i>1402135779</i>

Possible Sample Hazards/Remarks None Detected	Preservative	HNO3	NONE	HNO3	NONE														
	Type of Container	P/G	P/G	G	aGs														
	No. of Container(s)	1	1	<i>2 + 9</i>	<i>29-74</i>	<i>1 DAB</i>													
	Special Handling and/or Storage Maintain at 4 C	Volume	500mL	500mL	<i>2L</i>	40mL													
SAMPLE ANALYSIS		CHROM-IUM	CHROM-IUM-VI	TOTAL ALPHA, TOTAL BETA	ACTIVI-TY SCAN														

Sample No.	Matrix*	Date Sampled	Time Sampled																
BOCJ <i>N3</i>	W	9-29-94	1335	X	X	X	X												

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS				Matrix*	
Relinquished By <i>Doug Bowers ITH</i>	Date/Time <i>0830</i>	Received By <i>[Signature]</i>	Date/Time <i>0830</i>	Data Deliverable-Standalone  Analysis for Chromium-VI (by SW-846 Method 7196) is being requested for information only. The EAC Contractor recognizes that the 24-hour holding time will not be met.				<ul style="list-style-type: none"> <li>S = Soil</li> <li>SE = Sediment</li> <li>SO = Solid</li> <li>SL = Sludge</li> <li>W = Water</li> <li>O = Oil</li> <li>A = Air</li> <li>DS = Drum Solids</li> <li>DL = Drum Liquids</li> <li>T = Tissue</li> <li>WI = Wipe</li> <li>L = Liquid</li> <li>V = Vegetation</li> <li>X = Other</li> </ul>	
Relinquished By <i>[Signature]</i>	Date/Time <i>9-30-94</i>	Received By <i>[Signature]</i>	Date/Time <i>9-30-94</i>						
Relinquished By <i>[Signature]</i>	Date/Time <i>9-30-94</i>	Received By <i>[Signature]</i>	Date/Time <i>9-30-94</i>						
Relinquished By	Date/Time	Received By	Date/Time						

LABORATORY SECTION	Received By <i>Paul C Davis</i>	Title <i>Sample Log, In</i>	Date/Time <i>10-1-94 19:15 p.m</i>
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

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GWS-029

SAMPLE STATUS REPORT FOR N 2668. RAD SCREEN BOCJN3 TIME: 9/29/94 21:51  
 DISPATCHED: 9/14/94 19:28 SAMPLE HAS NOT BEEN SLURPED  
 RECEIVED: 9/29/94 21:44

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
****	*****	*****	***	***	*****
4271	TOT-ACT	< 5.00000E 01 pCi/G	N	Y	J12UP

END OF REPORT

BOCJN3  
 BW  
 9-30-94

Figure 1

**SAMPLE CHECK-IN LIST**

(1 Per Shipping Container)

Date/Time Received 10-1-94 13:15pm Client Name WESTINGHOUSE-HANFORD  
 Project/Client # B94-009 Batch or Case # \_\_\_\_\_  
 Cooler ID (if noted on outside of cooler) GW5-029

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  Dry  \_\_\_\_\_
6. Each sample is in a plastic bag? Yes  No  \_\_\_\_\_
7. Number of sample containers in cooler: 5
8. Samples have: \_\_\_\_\_ tape \_\_\_\_\_ hazard labels  
                            custody seals \_\_\_\_\_ appropriate sample labels
9. Samples are:  in good condition \_\_\_\_\_ leaking  
                           \_\_\_\_\_ broken \_\_\_\_\_ have air bubbles  
                           \_\_\_\_\_ other
10. Coolant Present? Yes  No  Sample Temperature 0°
11. The following paperwork should be accounted for (N/A if not applicable):  
     Chain of Custody #(s) \_\_\_\_\_  
     Request for Analysis #(s) \_\_\_\_\_  
     Airbill # Emery Carrier 1402135779
12. Have any anomalies been identified above? Yes  No
13. Memos have been initiated for all anomalies identified above? Yes  N/A

Printed Name/Signature PAUL COBIS Paul Cobis Date/Time 10-1-94 13:15pm

# Sample Login

## Login Review Checklist

Lot Number L3065

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?   | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 2. | Are all samples present?  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 3. | Are all matrices correct?<br><small>(e.g., TCLP analyses should be on a TCLP leachate, field blanks should be water)</small>  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 4. | Are all analyses on the chain of custody/login quotation included?  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 5. | Are analyses logged in for the correct container?<br><small>(e.g., analyses requiring preservation logged in for a preserved container and vice versa)</small>  | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 6. | Are samples logged in according to laboratory batching procedures?<br><small>(e.g., TCLP regular leaching and associated metals/semivolatile organics should be logged in on the same bottle)</small> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

### Login Chain of Custody Report

- |    |  |                                     |                                     |                          |
|----|--|-------------------------------------|-------------------------------------|--------------------------|
| 1. | Are the Collect, Receive, and Due dates correct for every sample?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/> |
| 2. | Have appropriate sample comments been included?<br><small>(e.g., MS/MSD designation, comments from the client concerning method modifications)</small> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

### Sample Receiving Checklist

- |    |   |                          |                          |                                     |
|----|---|--------------------------|--------------------------|-------------------------------------|
| 1. | Are any discrepancies between the chain of custody and the login noted?<br><small>(e.g., client IDs different on chains of custody and bottle labels, samples not sent, samples lost from breakage)</small> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|----|---|--------------------------|--------------------------|-------------------------------------|

Paul C Davis

10-1-94

Paul C Davis

10-1-94

Primary review signature

Date

Secondary review signature

Date

Lockheed Analytical Services  
Sample Receiving Checklist

Client Name: *Westinghouse Hanford* Job No. *L 3065* Cooler ID: *N/A*

**COOLER CONDITION UPON RECEIPT**

Temperature of cooler upon receipt: *02*

temperature of temp. blank upon receipt:

	Yes	No	* Comments/Discrepancies
custody seals intact	<input checked="" type="checkbox"/>		
chain of custody present	<input checked="" type="checkbox"/>		
blue ice (or equiv.) present/frozen	<input checked="" type="checkbox"/>		
rad survey completed	<input checked="" type="checkbox"/>		

**SAMPLE CONDITION UPON RECEIPT**

	Yes	No	* Comments/Discrepancies
all bottles labeled	<input checked="" type="checkbox"/>		
samples intact	<input checked="" type="checkbox"/>		
proper container used for sample type	<input checked="" type="checkbox"/>		
sample volume sufficient for analysis	<input checked="" type="checkbox"/>		
proper pres. indicated on the COC	<input checked="" type="checkbox"/>		
VOA's contain headspace			<i>N/A</i>

**MISCELLANEOUS ITEMS**

	Yes	No	* Comments/Discrepancies
samples with short holding times		<input checked="" type="checkbox"/>	<i>Chromium <del>III</del> Holding time past.</i>
samples to subcontract			

**ADDITIONAL COMMENTS/DISCREPANCIES** *These samples were received on 10-1-94 13:15. The lead from R&D Section was ~~not~~ advised to Segn Screening Laboratory to Client. Try to contact Kathleen Kelly was unsuccessful.*

Completed by / date: *Paul C Davis 10-1-94*

Sent to the client (date/initials): **\*\* Client's signature upon receipt:**

Notes: \* = contact the appropriate CSR of any discrepancies immediately upon receipt

\*\* = please review this information and return via facsimile to the appropriate CSR (702) 361-8146

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1001512

OFFICE OF SAMPLE MANAGEMENT  
RECORD OF DISPOSITION

ROD-B94-061  
Record of Disposition No.

DATE: 10/25/94

LABORATORY: Lockheed

PROJECT TITLE/NO.: 100-HR-3 Pump & Treat/B94-009

NCR NO.: N/A

SAMPLE IDENTIFICATION NUMBERS:

B0CJN3

DESCRIPTION OF EVENT:

Due to high levels, lab wants to run chrome by ICP instead of 7191.

DISPOSITION OF SAMPLES:

Run chrome by ICP instead of 7191 and note in case narrative.

APPROVAL SIGNATURES:

R. C. Smith / *R. C. Smith*  
OSM Project Coordinator (Print/Sign Name)

*10/25/94*  
Date

D. B. Blumenkranz / *D. B. Blumenkranz*  
Technical Representative (Print/Sign Name)

*10/28/94*  
Date

N/A  
Quality Assurance (Print/Sign Name)

Date

9613496.1478

LOCKHEED ANALYTICAL SERVICES

COMMON IONS AND ADDITIONAL ANALYTES

Sample Results

Client Sample ID: BOCJN3	Date Collected: 29-SEP-94
Matrix: Water	Date Received: 01-OCT-94

Constituent	Units	Method	Result	Reporting Det Limit	Data Qualifier(s)	Date Analyzed	LAS Batch ID	LAS Sample ID
Chromium, hexavalent	mg/L	7196	1.5	0.02	H	03-OCT-94	14316	L3065-2



RAD DATA REPORT (ra01)

Westinghouse Hanford Co. \* Richland, WA

Westinghouse Hanford Project (Richland,WA) (Project WESTINGHOUSE-HANFORD)

Client Sample ID: BOCJN3

LAL Sample ID: L3065-3

Date Collected: 29-SEP-94

Date Received: 01-OCT-94

Matrix: Water

Login Number: L3065

SDG: LK07

Constituent	Analyzed	Batch	Activity	Error	MDA	DataQual	Units
Gross Alpha	21-OCT-94	GR ALP/BETA LAL-0060_14305	8.9	3.3	3.1	C	pCi/L
Gross Beta	21-OCT-94	GR ALP/BETA LAL-0060_14305	7.2	2.4	3.4		pCi/L