



Lockheed Analytical Services

File

LK31

B94-126

Ms. Joan Kessner
Bechtel Hanford, Inc.
345 Hill
Richland, WA 99352



ANALYTICAL DATA REPORT

FOR

METALS, CHLORIDE, NITRATE, NITRITE,
ORTHOPHOSPHATE, SULFATE, TURBIDITY,
SULFIDE, AMMONIA-NITROGEN AND
RADIOCHEMISTRY



LOG-IN NUMBER:	<u>L3551</u>
QUOTATION NUMBER:	<u>Q400000-B</u>
SAF:	<u>94-126</u>
DOCUMENT FILE NUMBER:	<u>1222596</u>
WHC DOCUMENT CONTROL NUMBER:	<u>126</u>
SDG NUMBER:	<u>LK31</u>

9613446.1922



Environmental Systems & Technologies Co.

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

Phone: (702) 361-0220
Phone: (800) 582-7605
Fax: (702) 361-8146

January 25, 1995

Ms. Joan Kessner
Bechtel Hanford, Inc.
345 Hills
P.O. Box 969
Richland, WA 99352

RE: Log-in No.: L3551
Quotation No.: Q400000-B
SAF: 94-126
Document File No.: 1222596
WHC Document Control No: 126
SDG No.: LK31



The attached data report contains the analytical results of samples that were submitted to Lockheed Analytical Services on 22 December 1994. The temperature of the cooler upon receipt was 4°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 Hall at (509) 943-4423.

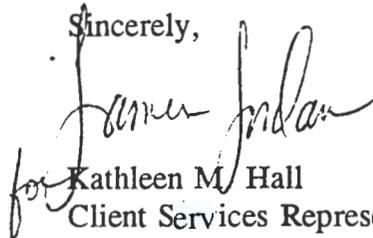
0060i

Lockheed Analytical Services

Log-in No.: L3551
Quotation No.: Q400000-B
SAF: 94-126
Document File No.: 1222596
WHC Document Control No.: 126
SDG No.: LK31

Release of this data report has been authorized by the Laboratory Director or the Director's designee as evidenced by the following signature.

" 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 Manger or a designee, as verified by the following signature."

Sincerely,

for Kathleen M. Hall
Client Services Representative

cc: Client Services
Document Control

Lockheed Analytical Services



Log-in No.: L3551
Quotation No.: Q400000-B
SAF: 94-126
Document File No.: 1222596
WHC Document Control No.: 126
SDG No.: LK31

CASE NARRATIVE INORGANIC NON METALS ANALYSES

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: B94-126 and prepared as batch 1222 WH and analyzed for selected analytes as requested on the chain of custody.

Holding Time Requirements

- All samples were analyzed within the method-specific holding times with the exception Method 300.0 Orthophosphate which was received from the client on the day the holding time expired. 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

January 19, 1995
Date

9613446.1925

Lockheed Analytical Services



Log-in No.: L3551
Quotation No.: Q400000-B
SAF: 94-126
Document File No.: 1222596
WHC Document Control No.: 126
SDG No.: LK31

CASE NARRATIVE INORGANIC TOTAL METALS 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).

Preparation and Analysis Requirements

- One water sample for total metals analysis. The sample was prepared as LAS Batch 1222WDT and analyzed for selected analytes as requested on the chain of custody. Sample BODHN5 (L3551-2) was used for matrix spike and duplicate, post-digestion spike and serial dilution analyses. All data flags due to the performance of the above-mentioned QC sample are also 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

- The following qualifiers are reported on the basis of the techniques employed to perform the analyses:
"P" ICP-AES

Nalini Prabhakar

01-19-95

Prepared By

Date

9613446.1926

Lockheed Analytical Services



Log-in No.: L3551
Quotation No.: Q400000-B
SAF: 94-126
Document File No.: 1222596
WHC Document Control No.: 126
SDG No.: LK31

CASE NARRATIVE INORGANIC DISSOLVED METALS 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) and duplicate sample(s).

Preparation and Analysis Requirements

One filtered water sample for dissolved metals analysis. As the measured turbidity of the samples was less than 1 NTU, they were batched as 1222WHD for selected analytes as requested on the chain of custody. For this sample batch sample BODHN6 (L3551-22) was used for matrix spike, duplicate and serial dilution analyses. All data flags due to the performance of the above-mentioned QC sample are also associated with every sample analyzed 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 with the following exceptions:

- In the analysis of calcium, the percent difference of serial dilution slightly exceeded control limit. This may be due to physical interferences. Calcium results for the associated samples are flagged with an "E".

Lockheed Analytical Services

Log-in No.: L3551
Quotation No.: Q400000-B
SAF: 94-126
Document File No.: 1222596
WHC Document Control No.: 126
SDG No.: LK31

Sample Results

- The following qualifiers are reported on the basis of the techniques employed to perform the analyses:

"P" ICP-AES

Forms X of this package include the laboratory quarterly IDL for each instrument used in analyses and the customers target reporting detection limits.

Nalini Prabhakar
Prepared By

01-19-95
Date

9613446.1928

Lockheed Analytical Services



Log-in No.: L3551
Quotation No.: Q400000-B
SAF: 94-126
Document File No.: 1222596
WHC Document Control No.: 126
SDG No.: LK31

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, matrix spike samples, 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.

Strontium

The strontium analysis was performed using LAL-91-SOP-0196. No problems were encountered during analysis. All QC criteria were met.

Technetium-99

The technetium-99 analysis was performed using LAL-91-SOP-0169. No problems were encountered during analysis. All QC criteria were met.

Tritium

The tritium analysis was performed using LAL-91-SOP-0066. No problems were encountered during analysis. All QC criteria were met.

Uranium-Isotopic

The uranium isotopic analysis was performed using LAL-91-SOP-0108. Noise in the spectrum of duplicate caused the sample duplicate analysis to be out of limits for U-234 and -235. The data is considered acceptable. All other QC criteria were met.

Yvonne M. Jacoby
Prepared By

January 25, 1995
Date

007

9613446.1929
Revised

LOGIN CHAIN OF CUSTODY REPORT (ln01)
Dec 30 1994, 10:00 am

Login Number: L3551
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
L3551-1 TEMP 4 Location: RFG01-43 Water 1 S SCREENING	BODHNS	20-DEC-94	22-DEC-94	26-JAN-95
		Hold:18-JUN-95		
L3551-2 TEMP 4 Location: 133 Water 1 S 6010 ICP METALS	BODHNS	20-DEC-94	22-DEC-94	26-JAN-95
		Hold:18-JUN-95		
L3551-3 TEMP 4 Location: 121 Water 1 S 300.0 CHLORIDE Water 1 S 300.0 NITRATE Water 1 S 300.0 NITRITE Water 1 S 300.0 PHOSPHATE Water 1 S 300.0 SULFATE	BODHNS	20-DEC-94	22-DEC-94	26-JAN-95
		Hold:17-JAN-95		
		Hold:22-DEC-94		
		Hold:22-DEC-94		
		Hold:22-DEC-94		
		Hold:17-JAN-95		
* L3551-4 TEMP 4 Location: 121 Water 1 S NONE	BODHNS	20-DEC-94	22-DEC-94	26-JAN-95
		Hold:30-DEC-94		
L3551-5 TEMP 4 Location: RFG19-66B Water 1 S 180.1 TURBIDITY	BODHNS	20-DEC-94	22-DEC-94	26-JAN-95
		Hold:22-DEC-94		
L3551-6 TEMP 4 Location: RFG19-5B Water 1 S 9030 SULFIDE	BODHNS	20-DEC-94	22-DEC-94	26-JAN-95
		Hold:27-DEC-94		
* * L3551-7 TEMP 4 Location: 121 Water 1 S 350.1 NH3/N Water 1 S 353.2 NITRATE	BODHNS	20-DEC-94	22-DEC-94	26-JAN-95
		Hold:17-JAN-95		
		Hold:17-JAN-95		
L3551-8 TEMP 4 Location: 156TMP-3 Water 1 S GR ALP/BETA LAL-0060	BODHNS	20-DEC-94	22-DEC-94	26-JAN-95
		Hold:18-JUN-95		

* Removed Analysis from L3551-4 per LAD. (353.2 Nitrates)

Page 1

Sample L3551-4 was not Preserved By Client. Analysis Required Preservative. 01-

* * Added Analysis to L3551-7 (353.2 Nitrates)

1222596

9613446.1930

LOGIN CHAIN OF CUSTODY REPORT (ln01)
Dec 30 1994, 10:00 am

Login Number: L3551
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
L3551-9 TEMP 4 Location: 156TMP-3	BODHN5	20-DEC-94	22-DEC-94	26-JAN-95
L3551-10 TEMP 4 Location: 156TMP-3	BODHN5	20-DEC-94	22-DEC-94	26-JAN-95
L3551-11 TEMP 4 Location: 156TMP-3 Water 1 S SR-90 LAL-0196	BODHN5	20-DEC-94	22-DEC-94	26-JAN-95
		Hold:18-JUN-95		
L3551-12 TEMP 4 Location: 156TMP-3	BODHN5	20-DEC-94	22-DEC-94	26-JAN-95
L3551-13 TEMP 4 Location: 156TMP-3	BODHN5	20-DEC-94	22-DEC-94	26-JAN-95
L3551-14 TEMP 4 Location: 156TMP-3 Water 1 S U-ISOTOPIC LAL-0108	BODHN5	20-DEC-94	22-DEC-94	26-JAN-95
		Hold:18-JUN-95		
L3551-15 TEMP 4 Location: 156TMP-3	BODHN5	20-DEC-94	22-DEC-94	26-JAN-95
L3551-16 TEMP 4 Location: 156TMP-3	BODHN5	20-DEC-94	22-DEC-94	26-JAN-95
L3551-17 TEMP 4 Location: EXPENDED Water 1 S TRITIUM(H3) LAL-0066	BODHN5	20-DEC-94	22-DEC-94	26-JAN-95
		Hold:18-JUN-95		
L3551-18 TEMP 4 Location: 156TMP-3 Water 1 S TC-99 LAL-0169	BODHN5	20-DEC-94	22-DEC-94	26-JAN-95
		Hold:18-JUN-95		

9613446.1931

LOGIN CHAIN OF CUSTODY REPORT (ln01)
Dec 30 1994, 10:00 am

Login Number: L3551
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
L3551-19 TEMP 4 Location: 156TMP-3	BODHN5	20-DEC-94	22-DEC-94	26-JAN-95
L3551-20 TEMP 4 Location: 156TMP-3	BODHN5	20-DEC-94	22-DEC-94	26-JAN-95
L3551-21 TEMP 4 Location: 156TMP-3	BODHN5	20-DEC-94	22-DEC-94	26-JAN-95
L3551-22 TEMP 4 Location: 133 Filt H2O 15 S 6010 ICP METALS	BODHN6	20-DEC-94	22-DEC-94	26-JAN-95
L3551-23 Location: Water Water	REPORT TYPE 1 S EDD - DISK DEL. 1 S INORG TYPE 4A RPT	22-DEC-94	22-DEC-94	26-JAN-95
		Hold: 18-JUN-95		

Signature: MMJ
Date: 12-30-94 010

1222596

9613446.1932

LOGIN CHAIN OF CUSTODY REPORT (ln01)
Dec 22 1994, 01:10 pm

Login Number: L3551
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
L3551-1 TEMP 4 Location: RFG01-43 Water 1 S SCREENING	BODHN5	20-DEC-94	22-DEC-94	26-JAN-95
		Hold:18-JUN-95		
L3551-2 TEMP 4 Location: RFG01-3A Water 1 S 6010 ICP METALS	BODHN5	20-DEC-94	22-DEC-94	26-JAN-95
		Hold:18-JUN-95		
L3551-3 TEMP 4 Location: 133 Water 1 S 300.0 CHLORIDE Water 1 S 300.0 NITRATE Water 1 S 300.0 NITRITE Water 1 S 300.0 PHOSPHATE Water 1 S 300.0 SULFATE	BODHN5	20-DEC-94	22-DEC-94	26-JAN-95
		Hold:17-JAN-95		
		Hold:22-DEC-94		
		Hold:22-DEC-94		
		Hold:22-DEC-94		
		Hold:17-JAN-95		
L3551-4 TEMP 4 Location: RFG01-3A Water 1 S 353.2 NITRATE	BODHN5	20-DEC-94	22-DEC-94	26-JAN-95
		Hold:17-JAN-95		
L3551-5 TEMP 4 Location: 133 Water 1 S 180.1 TURBIDITY	BODHN5	20-DEC-94	22-DEC-94	26-JAN-95
		Hold:22-DEC-94		
L3551-6 TEMP 4 Location: RFG01-3A Water 1 S 9030 SULFIDE	BODHN5	20-DEC-94	22-DEC-94	26-JAN-95
		Hold:27-DEC-94		
L3551-7 TEMP 4 Location: RFG01-3A Water 1 S 350.1 NH3/N	BODHN5	20-DEC-94	22-DEC-94	26-JAN-95
		Hold:17-JAN-95		
L3551-8 TEMP 4 Location: 157 Water 1 S GR ALP/BETA LAL-0060	BODHN5	20-DEC-94	22-DEC-94	26-JAN-95
		Hold:18-JUN-95		

9613446.1933

LOGIN CHAIN OF CUSTODY REPORT (ln01)
Dec 22 1994, 01:10 pm

Login Number: L3551
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
L3551-9 TEMP 4 Location: 157	BODHN5	20-DEC-94	22-DEC-94	26-JAN-95
L3551-10 TEMP 4 Location: 157	BODHN5	20-DEC-94	22-DEC-94	26-JAN-95
L3551-11 TEMP 4 Location: 157 Water 1 S SR-90 LAL-0196	BODHN5	20-DEC-94	22-DEC-94	26-JAN-95
		Hold:18-JUN-95		
L3551-12 TEMP 4 Location: 157	BODHN5	20-DEC-94	22-DEC-94	26-JAN-95
L3551-13 TEMP 4 Location: 157	BODHN5	20-DEC-94	22-DEC-94	26-JAN-95
L3551-14 TEMP 4 Location: 157 Water 1 S U-ISOTOPIC LAL-0108	BODHN5	20-DEC-94	22-DEC-94	26-JAN-95
		Hold:18-JUN-95		
L3551-15 TEMP 4 Location: 157	BODHN5	20-DEC-94	22-DEC-94	26-JAN-95
L3551-16 TEMP 4 Location: 157	BODHN5	20-DEC-94	22-DEC-94	26-JAN-95
L3551-17 TEMP 4 Location: 157 Water 1 S TRITIUM(H3) LAL-0066	BODHN5	20-DEC-94	22-DEC-94	26-JAN-95
		Hold:18-JUN-95		
L3551-18 TEMP 4 Location: 157 Water 1 S TC-99 LAL-0169	BODHN5	20-DEC-94	22-DEC-94	26-JAN-95
		Hold:18-JUN-95		

9613446.1934

LOGIN CHAIN OF CUSTODY REPORT (1n01)
Dec 22 1994, 01:10 pm

Login Number: L3551
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
L3551-19 TEMP 4 Location: 157	BODHN5	20-DEC-94	22-DEC-94	26-JAN-95
L3551-20 TEMP 4 Location: 157	BODHN5	20-DEC-94	22-DEC-94	26-JAN-95
L3551-21 TEMP 4 Location: 157	BODHN5	20-DEC-94	22-DEC-94	26-JAN-95
L3551-22 TEMP 4 Location: RFG01-3A Filt H20 15 S 6010	BODHN6 ICP METALS	20-DEC-94	22-DEC-94	26-JAN-95
L3551-23 Location: Water Water	REPORT TYPE 1 S EDD - DISK DEL. 1 S INORG TYPE 4A RPT	22-DEC-94	22-DEC-94	26-JAN-95
		Hold:18-JUN-95		

Signature: Paul C. Dampier
Date: 12-22-94

1222546

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

L3551

Page 1 of 1

Data Turnaround

Priority
 Normal

Collector A.J. SIMPSON	Company Contact R.E. Peterson	Telephone No. (509) 376-5858
Project Designation 100-HR-3 Groundwater Sampling-Round 8, Phase 1	Sampling Location 100-HR-3	SAF No. B94-126
Ice Chest No. 13W12-2249 SMT-TT2 BOWENHEAD II	Field Logbook No. FE-L-0057	Method of Shipment Federal Express
Shipped To Lockheed	Offsite Property No. W95-0-0073-44	Bill of Lading/Air Bill No. 290-4015-016

Possible Sample Hazards/Remarks	Preservative	HNO3	COOL 4C	H2SO4	COOL 4C*1	H2SO4	HNO3	COOL 4C	HCl	COOL 4C	HNO3			
		Type of Container	G	G	P	P	P	P/G	G	G	P/G	P		
No. of Container(s)		1	1	1	1	1	1	9	1	4	1			
Special Handling and/or Storage	Volume		1L	500mL	250mL	250mL	1L	500mL	1L	40mL	1L	20mL		1L
SAMPLE ANALYSIS	ICP METALS	ANIONS- NO2, NO3	TURBIDITY	SULFIDE	AMMONIA	TOTAL ALPHA, BETA, Sr-90, U-235, U-238	TRITIUM	Tc-99	ACTIVITY SCAN	ICP METALS				
	UNFILTERED	Cl, SO4, PO4, NO2, NO3								FILTERED				

Sample No.	Matrix*	Date Sampled	Time Sampled	ICP METALS	ANIONS	TURBIDITY	SULFIDE	AMMONIA	TOTAL ALPHA, BETA, Sr-90, U-235, U-238	TRITIUM	Tc-99	ACTIVITY SCAN	ICP METALS
B0DHN5	W	12/20/94	1020	X	X	X	X	X	X	X	X	X	
B0DHN6	W	12/20/94	1020										X

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS
Relinquished By <i>K. V. Lee</i>	Date/Time 12/20/94 1250	<p>*1. ZnAc+NaOH</p> <p>Data Deliverable-Standalone</p> <p>Sample analysis results for PO4, NO2, NO3 by EPA 300.0; and turbidity by EPA 180.1 is for information only. The ERC Contractor acknowledges that the 48 hour hold time will not be met.</p> <p>The Activity Scan is for both sample numbers.</p> <p style="text-align: center;">Stored in unit #3</p>
Received By <i>R. E. Peterson</i>	Date/Time 12-20-94	
Relinquished By <i>R. E. Peterson</i>	Date/Time 0800	
Received By <i>B. Whitton</i>	Date/Time 10-21-94	
Relinquished By	Date/Time	Matrix*
Received By	Date/Time	S = Soil
Relinquished By	Date/Time	SE = Sediment
Received By	Date/Time	SO = Solid
Relinquished By	Date/Time	SL = Sludge
Received By	Date/Time	W = Water
Relinquished By	Date/Time	O = Oil
Received By	Date/Time	A = Air
Relinquished By	Date/Time	DS = Drum Solids
Received By	Date/Time	DL = Drum Liquids
Relinquished By	Date/Time	T = Tissue
Received By	Date/Time	WI = Wipe
Relinquished By	Date/Time	L = Liquid
Received By	Date/Time	V = Vegetation
Relinquished By	Date/Time	X = Other

LABORATORY SECTION	Received By <i>W. M. ...</i>	Title <i>Sample Evaluation</i>	Date/Time 12-22-94 / 0915
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

06/13/16-1935

SAMPLE STATUS REPORT FOR N 4204. RAD SCREEN 199H4-47 TIME: 12/21/94 7:56
 DISPATCHED: 12/16/94 10: 0 SAMPLE HAS NOT BEEN SLURPED
 RECEIVED: 12/21/94 7:45

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
****	*****	*****	***	***	*****
4271	TOT-ACT	< 5.00000E 01 pCi/G	N	Y	XR5444

END OF REPORT

BODHNS
 BODHNG
 BW
 12-21-94

Figure 1

SAMPLE CHECK-IN LIST

(1 Per Shipping Container)

Date/Time Received 12-22-94/0915 Client Name Westinghouse/Hanford
 Project/Client # S&P NO B94-126 Batch or Case # N/A
 Cooler ID (if noted on outside of cooler) N/A

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: 29
8. Samples have:

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

<input checked="" type="checkbox"/> in good condition	<input type="checkbox"/> leaking
<input type="checkbox"/> broken	<input type="checkbox"/> have air bubbles
<input type="checkbox"/> other	
10. Coolant Present? Yes No [] Sample Temperature 4°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 # 290-4615-016 Carrier FODEX
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 Paul C Davis Date/Time 12-22-94 9:00 AM

Sample Login

Login Review Checklist

Lot Number L3551

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

Login Chain of Custody Report

- | | | | | |
|----|--|-------------|----------|----------|
| 1. | Are the Collect, Receive, and Due dates correct for every sample? | <u><</u> | <u>—</u> | <u>—</u> |
| 2. | Have appropriate sample comments been included?
<small>(e.g., MS/MSD designation, comments from the client concerning method modifications)</small> | <u>*</u> | <u>—</u> | <u>—</u> |

Sample Receiving Checklist

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

Paul Davis

12-22-94

M. M. Miller

12-22-94

Primary review signature Date

Secondary review signature Date

Lockheed Analytical Services
Sample Receiving Checklist

Client Name: *Westinghouse - Hartford*

Job No. *L-3551*

Cooler ID: *N/A*

COOLER CONDITION UPON RECEIPT

Temperature of cooler upon receipt:	<i>4°C</i>		
temperature of temp. blank upon receipt:	<i>—</i>		
	Yes	No	* Comments/Discrepancies
custody seals intact	<i>X</i>		
chain of custody present	<i>X</i>		
blue ice (or equiv.) present/frozen	<i>X</i>		
rad survey completed	<i>X</i>		

SAMPLE CONDITION UPON RECEIPT

	Yes	No	* Comments/Discrepancies
all bottles labeled	<i>X</i>		
samples intact	<i>X</i>		
proper container used for sample type	<i>X</i>		
sample volume sufficient for analysis	<i>X</i>		
proper pres. indicated on the COC	<i>X</i>		
VOA's contain headspace			<i>N/A</i>
are samples bi-phasic (if so, indicate sample ID'S):			<i>N/A</i>

MISCELLANEOUS ITEMS

	Yes	No	* Comments/Discrepancies
samples with short holding times	<i>X</i>		<i>unpreserved nitrate/nitrites</i>
samples to subcontract		<i>X</i>	

ADDITIONAL COMMENTS/DISCREPANCIES

Completed by / date: *Paul C. Jones 12-12-94*

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

9613446.1939

1022596

02:

9613446.1940

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

Client Sample Number	LAL Sample Number	SDG Number	Matrix	Method	
BODHN5 -	L3551-1		Water	SCREENING -	
	L3551-2		Water	6010 ICP METALS -	
	L3551-3		Water	300.0 CHLORIDE -	
	L3551-3		Water	300.0 NITRATE -	
	L3551-3		Water	300.0 NITRITE -	
	L3551-3		Water	300.0 PHOSPHATE -	
	L3551-3		Water	300.0 SULFATE -	
	L3551-4		Water	353.2 NITRATE -	
	L3551-5		Water	180.1 TURBIDITY -	
	L3551-6		Water	9030 SULFIDE -	
	L3551-7		Water	350.1 NH3/N -	
	L3551-8		Water	GR ALP/BETA LAL-0-	
	L3551-11		Water	SR-90 LAL-0196 -	
	L3551-14		Water	U-ISOTOPIC LAL-01	
	L3551-17		Water	TRITIUM(H3) LAL-0-	
	L3551-18		Water	TC-99 LAL-0169 -	
	BODHN6 -	L3551-22		Filt H2O	6010 ICP METALS -
	REPORT TYPE -	L3551-23		Water	EDD - DISK DEL -
L3551-23			Water	INORG TYPE 4A RPT -	

022

1222596

9613446.1941

CLP

1

INORGANIC ANALYSES DATA SHEET

CLIENT ID NO.

BODHN5

Lab Name: LOCKHEED_ANALYTICAL_SVC Contract: HANFORD

Lab Code: LOCK Case No.: 1222WH SAS No.: SDG No.: L3551W

Matrix (soil/water): WATER Lab Sample ID: L3551-2

Level (low/med): LOW Date Received: 12/22/94

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	34.0	B		P
7440-36-0	Antimony	50.0	U		P
7440-38-2	Arsenic	56.0	U		P
7440-39-3	Barium	13.4	B		P
7440-41-7	Beryllium	1.0	U		P
7440-43-9	Cadmium	4.0	U		P
7440-70-2	Calcium	29700			P
7440-47-3	Chromium	3.0	U		P
7440-48-4	Cobalt	6.0	U		P
7440-50-8	Copper	3.0	U		P
7439-89-6	Iron	49.3	B		P
7439-92-1	Lead	47.0	U		P
7439-95-4	Magnesium	5060			P
7439-96-5	Manganese	1.0	B		P
7440-02-0	Nickel	10.0	U		P
7440-09-7	Potassium	2040	B		P
7782-49-2	Selenium	90.0	U		P
7440-22-4	Silver	4.0	U		P
7440-23-5	Sodium	4870	B		P
7440-28-0	Thallium	500	U		P
7440-62-2	Vanadium	4.8	B		P
7440-66-6	Zinc	6.2	B		P

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

Horizontal lines for handwritten comments.

9613446.1942

CLP

1

INORGANIC ANALYSES DATA SHEET

CLIENT ID NO.

BODHN6

Lab Name: LOCKHEED_ANALYTICAL_SVC Contract: HANFORD

Lab Code: LOCK Case No.: 1222WH SAS No.: SDG No.: L3551F

Matrix (soil/water): WATER Lab Sample ID: L3551-22

Level (low/med): LOW Date Received: 12/22/94

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	16.0	U		P
7440-36-0	Antimony	50.0	U		P
7440-38-2	Arsenic	56.0	U		P
7440-39-3	Barium	13.4	B		P
7440-41-7	Beryllium	1.0	U		P
7440-43-9	Cadmium	4.0	U		P
7440-70-2	Calcium	34300		E	P
7440-47-3	Chromium	3.0	U		P
7440-48-4	Cobalt	6.0	U		P
7440-50-8	Copper	3.0	U		P
7439-89-6	Iron	7.0	U		P
7439-92-1	Lead	47.0	U		P
7439-95-4	Magnesium	5620			P
7439-96-5	Manganese	1.0	U		P
7440-02-0	Nickel	10.0	U		P
7440-09-7	Potassium	2170	B		P
7782-49-2	Selenium	90.0	U		P
7440-22-4	Silver	4.0	U		P
7440-23-5	Sodium	5350			P
7440-28-0	Thallium	500	U		P
7440-62-2	Vanadium	4.2	B		P
7440-66-6	Zinc	2.0	U		P

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

9613446.1943

LOCKHEED ANALYTICAL SERVICES

COMMON IONS AND ADDITIONAL ANALYTES

Sample Results

Client Sample ID: B0DHN5	Date Collected: 20-DEC-94
Matrix: Water	Date Received: 22-DEC-94

Constituent	Units	Method	Result	Reporting Det Limit	Data Qualifier(s)	Date Analyzed	LAS Batch ID	LAS Sample ID
Turbidity	NTU	180.1	0.00	N/A		22-DEC-94	17333	L3551-5
Chloride	mg/L	300.0	3.1	0.02		22-DEC-94	17328	L3551-3
Nitrate-N	mg/L	300.0	0.64	0.02		22-DEC-94	17326	L3551-3
Nitrite-N	mg/L	300.0	< 0.01	0.01		22-DEC-94	17329	L3551-3
Ortho Phosphate	mg/L	300.0	< 0.1	0.1	H	23-DEC-94	17330	L3551-3
Sulfate	mg/L	300.0	15.	0.1		22-DEC-94	17332	L3551-3
Ammonia Nitrogen	mg/L	350.1	< 0.05	0.05		04-JAN-95	17425	L3551-7
Nitrate-Nitrite-Nitrogen	mg/L	353.2	0.64	0.05		30-DEC-94	17565	L3551-7
Sulfide	mg/L	9030	< 3	3		23-DEC-94	17360	L3551-6

RAD DATA REPORT (ra01)

Bechtel Hanford, Inc. * Richland, WA

Bechtel Hanford Project (Project BECHTEL-HANFORD)

Client Sample ID: B0DHNS

LAL Sample ID: L3551-8

Date Collected: 20-DEC-94

Date Received: 22-DEC-94

Matrix: Water

Login Number: L3551

Constituent	Analyzed	Batch	Activity	Error	MDA	DataQual	Units
Gross Alpha	12-JAN-95	GR ALP/BETA LAL-0060_17419	0.65	0.93	1.6		pCi/L
Gross Beta	12-JAN-95	GR ALP/BETA LAL-0060_17419	4.4	1.5	2.1		pCi/L

RAD DATA REPORT (ra01)

Bechtel Hanford, Inc. * Richland, WA

Bechtel Hanford Project (Project BECHTEL-HANFORD)

Client Sample ID: B0DHN5

LAL Sample ID: L3551-11

Date Collected: 20-DEC-94

Date Received: 22-DEC-94

Matrix: Water

Login Number: L3551

Constituent	Analyzed	Batch	Activity	Error	MDA	DataQual	Units
Total radio-strontium	20-JAN-95	SR-90 LAL-0196_17434	-0.05	0.40	0.70		pCi/L

RAD DATA REPORT (ra01)

Bechtel Hanford, Inc. * Richland, WA

Bechtel Hanford Project (Project BECHTEL-HANFORD)

Client Sample ID: B0DHNS

LAL Sample ID: L3551-14

Date Collected: 20-DEC-94

Date Received: 22-DEC-94

Matrix: Water

Login Number: L3551

Constituent	Analyzed	Batch	Activity	Error	MDA	DataQual	Units
U-233/4	21-JAN-95	U-ISOTOPIC LAL-0108_17453	2.57	0.60	0.25		pCi/L
U-235	21-JAN-95	U-ISOTOPIC LAL-0108_17453	1.01	0.37	0.20		pCi/L
U-238	21-JAN-95	U-ISOTOPIC LAL-0108_17453	1.06	0.38	0.19		pCi/L

RAD DATA REPORT (ra01)

Bechtel Hanford, Inc. * Richland, WA

Bechtel Hanford Project (Project BECHTEL-HANFORD)

Client Sample ID: B0DHN5

LAL Sample ID: L3551-17

Date Collected: 20-DEC-94

Date Received: 22-DEC-94

Matrix: Water

Login Number: L3551

Constituent	Analyzed	Batch	Activity	Error	MDA	Dataqual	Units
H-3	30-DEC-94	TRITIUM(H3) LAL-0066_17467	120	200	250		pCi/L

RAD DATA REPORT (ra01)

Bechtel Hanford, Inc. * Richland, WA

Bechtel Hanford Project (Project BECHTEL-HANFORD)

Client Sample ID: B0DHNS

LAL Sample ID: L3551-18

Date Collected: 20-DEC-94

Date Received: 22-DEC-94

Matrix: Water

Login Number: L3551

Constituent	Analyzed	Batch	Activity	Error	MDA	DataQual	Units
Tc-99	22-JAN-95	TC-99 LAL-0169_17436	1.8	3.7	6.3		pCi/L

3/06/95

Data Validation Check List

for Project 100-HR-3

HEIS Samp Number	Client Sample Number	Master DP File Number	DP Sequence Number	Laboratory	Y N	VOA	Y N	SEMI VOA	Y N	PEST/PCB	Y N	WETCHEM	Y N	METALS	COMMENTS	Y N	RADCHEM	Date OSM Rcvd DP
BODHN5	Split of BODHN9	LK31		LOCKHEED	N		N		N		Y	2/03/95	Y	2/03/95	12/22/94 - SAF- B94-126	Y	2/03/95	2/03/95
BODHN6		LK31		LOCKHEED	N		N		N		N		Y	2/03/95	12/22/94 - SAF- B94-126	N		2/03/95

Data Entry Complete: DP DEA 3-6-95

DATATRAC gk
3-6-95

9613446
1996

Validation Rcvd 3-6-95

9613446.1950

Golder Associates Inc.

4104-148th Avenue, NE
Redmond, WA 98052
Telephone (206) 883-0777
Fax (206) 882-5498

RECORD COPY



March 3, 1995



Our ref: 943-1610.073.0400
94-1610/O/270

CH2M Hill
P.O. Box 1510
Richland, Washington 99352

ATTENTION: Ms. Jeanette Duncan

RE: TRANSMITTAL OF DATA VALIDATION PACKAGES
CONTRACT NO. MSH-SWV-315905

Dear Ms. Duncan:

This letter is to transmit the following data validation packages:

<u>SAF#</u>	<u>Project</u>	<u>Data Package</u>	<u>Analyses</u>
94-126	100-HR-3 PH1 Round 8	LK31-LAS	Inorganics, General Chemistry, Radiochemistry

Please call if you have any questions.

Sincerely,

GOLDER ASSOCIATES INC.

Christina I. Jensen
Task Manager

CIJ/lk

Enclosures

p:\enviroa\whc\div\dptran.ltr

9613446.1951
RECORD COPY

MEMORANDUM



TO: 100-HR-3 Round 8 Groundwater Project QA Record March 3, 1995
FR: Anne Jensen, Golder Associates Inc. *aj*
RE: RADIOCHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE
LK31-LAS (943-1610.073 LK31RAD.HR3)

INTRODUCTION

This memo presents the results of data validation on data package LK31-LAS prepared by Lockheed Analytical Services. Sample information is provided in the following table.

SAMPLE ID	COMMENTS	ANALYSIS	MEDIA
B0DHN5*	FIELD SPLIT	RADIOCHEMISTRY SEE ATTACHMENT 4	WATER

* - Indicates sample results which were 100% recalculated.

Data validation was conducted to level D in accordance with the WHC statement of work (WHC 1994), validation procedures (WHC 1993). Attachments 1 through 5 provide the following information as indicated below:

- Attachment 1. Glossary of Data Reporting Qualifiers
- Attachment 2. Summary of Data Qualifications
- Attachment 3. Qualified Data Summary and Annotated Laboratory Reports
- Attachment 4. Laboratory Narrative and Chain-of-Custody Documentation
- Attachment 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

This section presents a summary of the data quality in terms of the referenced validation criteria.

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met, with the exception of the deficiencies identified below.

Sample Result Verification. All sample results were supported in the raw data.

Detection Limits. Detection limit goals were met for all sample results.

Completeness. The data package was complete for all requested analyses. A total of one sample was validated in this data package with a total of eight determinations reported, all of which were deemed valid. This results in a completeness of 100 percent, which meets the 90% objective of the work plan.

MAJOR DEFICIENCIES

No major deficiencies were identified during data validation which required qualification of data as unusable.

MINOR DEFICIENCIES

The following minor deficiencies were identified during data validation which required qualification of data.

Laboratory Blanks

- Uranium-233/4, -235, and -238 were detected in the laboratory blank. Attachments 2 and 5 provide a summary of samples affected, data qualifications applied and supporting documentation.

Matrix Spike

- No matrix spike was analyzed for tritium. Attachments 2 and 5 provide a summary of samples affected and data qualifications applied.

FIELD QC

- Sample BODHN5 was identified as the field split of sample BODHL9. A comparison of these results will be made in the final summary report.

DATA REPORTING

- Reported sample results which are less than the minimum detectable activity (MDA) have been qualified as undetected (U) on the laboratory results form (see Attachment 3).

REFERENCES

WHC 1993, Data Validation Procedures for Radiochemical Analyses, WHC-SD-EN-SPP-001, Rev. 1, 1993. Westinghouse Hanford Company, Richland, Washington.

WHC 1994, Environmental and Waste Characterization Analytical Data Validation, Purchase Order MSH-SWV-315905; Validation Statement of Work, Revision 1.0, September 7, 1994; Westinghouse Hanford Company, Richland, Washington.

9613446.1953

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

ATTACHMENT 1

GLOSSARY OF RADIOCHEMISTRY DATA REPORTING QUALIFIERS

- U - Indicates the constituent was analyzed for, but was not detected at a concentration above the minimum detectable activity (MDA). The concentration reported is the MDA corrected for sample aliquot size, dilution factors and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.
- UJ - Indicates the constituent was analyzed for and was not detected at a concentration above the MDA. Due to a quality control deficiency identified during data validation, the concentration reported may not accurately reflect the sample MDA. The associated data should be considered usable for decision making purposes.
- J - Indicates the constituent was analyzed for and detected. The concentration reported is qualified as estimated due to a quality control deficiency identified during data validation. The associated data should be considered usable for decision making purposes.
- UR - Indicates the constituent was analyzed for and not detected. The concentration reported is qualified as unusable due to a quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.
- R - Indicates the constituent was analyzed for and detected. The concentration reported is qualified as unusable due to a quality control deficiency identified during data validation. The associated data should be considered unusable for decision making purposes.

9613446.1955

ATTACHMENT 2
SUMMARY OF DATA QUALIFICATIONS

9613446.1956

WHC-SD-EN-SPP-002, REV.2

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: LK31-LAS	REVIEWER: A. JENSEN	DATE: 3-03-95	PAGE <u>1</u> OF <u>1</u>
COMMENTS: RADIOCHEMISTRY			
COMPOUND/ANALYTE	QUALIFIER	SAMPLES AFFECTED	REASON
URANIUM-233/4 URANIUM-235 URANIUM-238	J	BODHN5	DETECTED IN PREPARATION BLANK
TRITIUM	UJ	BODHN5	NO MATRIX SPIKE ANALYZED

9613446.1957

ATTACHMENT 3

QUALIFIED DATA SUMMARY and ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: LK31-LAS

Parameter	Samp#	BODHN5	
	Date	12-20-94	
	Location	199-H4-47	
	Depth	---	
	Type	WATER	
	Comments	SPLIT	
	Units	Result	Q
URANIUM-233/234	pCi/L	2.570	J
URANIUM-235	pCi/L	1.010	J
URANIUM-238	pCi/L	1.060	J
GROSS ALPHA	pCi/L	0.650	U
GROSS BETA	pCi/L	4.400	
TRITIUM	pCi/L	120.000	UJ
TECHNETIUM-99	pCi/L	1.800	U
STRONTIUM	pCi/L	-0.050	U

The decimal places shown do not reflect the precision reported by the laboratory

Revised HRG
3/9/95

9603446.1958

9613446.1959

RAD DATA REPORT (ra01)

Bechtel Hanford, Inc. * Richland, WA

Bechtel Hanford Project (Project BECHTEL-HANFORD)

Client Sample ID: BODHN5

LAL Sample ID: L3551-14

Date Collected: 20-DEC-94

Date Received: 22-DEC-94

Matrix: Water

Login Number: L3551

Constituent	Analyzed	Batch	Activity	Error	MDA	DataQual	Units
U-233/4	21-JAN-95	U-ISOTOPIC LAL-0108_17453	2.57	J	0.60	0.25	pCi/L
U-235	21-JAN-95	U-ISOTOPIC LAL-0108_17453	1.01	J	0.37	0.20	pCi/L
U-238	21-JAN-95	U-ISOTOPIC LAL-0108_17453	1.06	J	0.38	0.19	pCi/L

*verified by
2/27/95*

9613446.1960

RAD DATA REPORT (ra01)

Bechtel Hanford, Inc. * Richland, WA

Bechtel Hanford Project (Project BECHTEL-HANFORD)

Client Sample ID: B0DHNS

LAL Sample ID: L3551-17

Date Collected: 20-DEC-94

Date Received: 22-DEC-94

Matrix: Water

Login Number: L3551

Constituent	Analyzed	Batch	Activity	Error	MDA	DataQual	Units
H-3	30-DEC-94	TRITIUM(H3) LAL-0066_17467	120	200	250		pCi/L

*verified aj
3/3/95*

9613446.1961

RAD DATA REPORT (ra01)

Bechtel Hanford, Inc. * Richland, WA

Bechtel Hanford Project (Project BECHTEL-HANFORD)

Client Sample ID: B0DHNS

LAL Sample ID: L3551-18

Date Collected: 20-DEC-94

Date Received: 22-DEC-94

Matrix: Water

Login Number: L3551

Constituent	Analyzed	Batch	Activity	Error	MDA	DataQual	Units
Tc-99	22-JAN-95	TC-99 LAL-0169_17436	1.8	3.7	6.3	U	pCi/L

*verified af
3/3/95*

*Revised
HRG 3/9/95*

~~412~~

011

9613446.1962

RAD DATA REPORT (ra01)

Bechtel Hanford, Inc. * Richland, WA

Bechtel Hanford Project (Project BECHTEL-HANFORD)

Client Sample ID: B0DHN5

LAL Sample ID: L3551-8

Date Collected: 20-DEC-94

Date Received: 22-DEC-94

Matrix: Water

Login Number: L3551

Constituent	Analyzed	Batch	Activity	Error	MDA	DataQual	Units
Gross Alpha	12-JAN-95	GR ALP/BETA LAL-0060_17419	0.65	U	0.93	1.6	pCi/L
Gross Beta	12-JAN-95	GR ALP/BETA LAL-0060_17419	4.4		1.5	2.1	pCi/L

*verified by
5/3/95*

408

9613446.1963

RAD DATA REPORT (ra01)

Bechtel Hanford, Inc. * Richland, WA

Bechtel Hanford Project (Project BECHTEL-HANFORD)

Client Sample ID: B0DHNS

LAL Sample ID: L3551-11

Date Collected: 20-DEC-94

Date Received: 22-DEC-94

Matrix: Water

Login Number: L3551

Constituent	Analyzed	Batch	Activity	Error	MDA	DataQual	Units
Total radio-strontium	20-JAN-95	SR-90 LAL-0196_17434	-0.05	U	0.40	0.70	pCi/L

*verified aj
3/3/95*

013 ~~409~~
409
4
1/1/95

9613446.1964

ATTACHMENT 4

LABORATORY NARRATIVE and CHAIN-OF-CUSTODY DOCUMENTATION

9613446.1965

Lockheed Analytical Services



Log-in No.: L3551
Quotation No.: Q400000-B
SAF: 94-126
Document File No.: 1222596
WHC Document Control No.: 126
SDG No.: LK31

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, matrix spike samples, 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.

Strontium

The strontium analysis was performed using LAL-91-SOP-0196. No problems were encountered during analysis. All QC criteria were met.

Technetium-99

The technetium-99 analysis was performed using LAL-91-SOP-0169. No problems were encountered during analysis. All QC criteria were met.

Tritium

The tritium analysis was performed using LAL-91-SOP-0066. No problems were encountered during analysis. All QC criteria were met.

Uranium-Isotopic

The uranium isotopic analysis was performed using LAL-91-SOP-0108. Noise in the spectrum of duplicate caused the sample duplicate analysis to be out of limits for U-234 and -235. The data is considered acceptable. All other QC criteria were met.

Yvonne M. Jacoby
Prepared By

January 25, 1995
Date

015

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

L3551

Data Turnaround

Priority
 Normal

Collector <i>A.J. SIMPSON</i>	Company Contact <i>R.E. Peterson</i>	Telephone No. <i>(509) 376-5858</i>
Project Designation <i>100-HR-3 Groundwater Sampling-Round 8, Phase 1</i>	Sampling Location <i>100-HR-3</i>	SAF No. <i>B94-126</i>
Ice Chest No. <i>SM-L-772 BONEHEAD II</i>	Field Logbook No. <i>FEI-L-0057</i>	Method of Shipment <i>Federal Express</i>
Shipped To <i>Lockheed</i>	Offsite Property No. <i>W95-0-0073-44</i>	Bill of Lading/Air Bill No. <i>290-4015-016</i>

Possible Sample Hazards/Remarks	Preservative	HNO3	COOL 4C	H2SO4	COOL 4C	*1	H2SO4	HNO3	COOL 4C	HCl	COOL 4C	HNO3			
		Type of Container	G	G	P	P	P	P/G	G	G	P/G	P	G		
	No. of Container(s)	1	1	1	1	1	1	9	1	4	1	1			
Special Handling and/or Storage <i>Maintain between 2 C and 6 C.</i>	Volume	1L	500ml	250ml	250ml	1L	500ml	1L	40ml	1L	20ml	1L			
SAMPLE ANALYSIS	ICP METALS		ANIONS- Cl, SO4, PO4, NO2, NO3	NO2, NO3	TURBID- ITY	SULFIDE	AMMONIA	TOTAL ALPHA, TOTAL BETA, Sr-90, U-235, U-238	TRITIUM	Tc-99	ACTIV- ITY SCAN		ICP METALS		
	UNFIL- TERED												FILTER- ED		

Sample No.	Matrix*	Date Sampled	Time Sampled												
BODHN5	W	12/20/94	1020	X	X	X	X	X	X	X	X	X			
BODHN6	W	12/20/94	1020										X		

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS				Matrix*	
Relinquished By <i>R. W. Lee</i>	Date/Time <i>12/20/94 1250</i>	Received By <i>R. E. Peterson</i>	Date/Time <i>12-20-94</i>	*1. ZnAc+NaOH Data Deliverable-Standalone Sample analysis results for PO4, NO2, NO3 by EPA 300.0; and turbidity by EPA 180.1 is for information only. The ERC Contractor acknowledges that the 48 hour hold time will not be met. The Activity Scan is for both sample numbers. <i>Stored in unit #3</i>				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>R. E. Peterson</i>	Date/Time <i>0800</i>	Received By <i>R. E. Peterson</i>	Date/Time <i>10-21-94</i>						
Relinquished By <i>OG</i>	Date/Time	Received By	Date/Time						

LABORATORY SECTION	Received By <i>M. M. Al</i>	Title <i>Sample Custodian</i>	Date/Time <i>12-22-94 / 0915</i>
FINAL SAMPLE DISPOSITION	Disposal Method <i>2</i>	Disposed By	Date/Time

9613446-1966

9613446.1967

ATTACHMENT 5

DATA VALIDATION SUPPORTING DOCUMENTATION

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-HR-3			DATA PACKAGE: LK31-LAS		
VALIDATOR: A. Jensen		LAB: Lockheed		DATE: 2/20/95	
CASE:			SDG:		
ANALYSES PERFORMED					
<input checked="" type="checkbox"/> Gross Alpha/Beta	<input checked="" type="checkbox"/> Strontium-90	<input checked="" type="checkbox"/> Technetium-99	<input checked="" type="checkbox"/> Alpha Spectroscopy	<input type="checkbox"/> Gamma Spectroscopy	
<input type="checkbox"/> Total Uranium	<input type="checkbox"/> Radium-22	<input checked="" type="checkbox"/> Tritium	<input type="checkbox"/>		
SAMPLES/MATRIX					
BODHNS / WATER					

1. Completeness N/A
 Technical verification forms present? **Yes** No N/A
 Comments: _____

2. Initial Calibration N/A
 Instruments/detectors calibrated within one year of sample analysis? **Yes** No N/A
 Initial calibration acceptable? **Yes** No N/A
 Standards NIST traceable? **Yes** No N/A
 Standards Expired? Yes **No** N/A
 Comments: _____

- 3. Continuing Calibration N/A
- Calibration checked within one week of sample analysis? . . . Yes No N/A
- Calibration check acceptable? Yes No N/A
- Calibration check standards NIST traceable? Yes No N/A
- Calibration check standards expired? Yes No N/A

Comments: _____

- 4. Blanks N/A
- Method blank analyzed? Yes No N/A
- Method blank results acceptable? *see note* Yes No N/A
- Analytes detected in method blank? Yes No N/A
- Field blank(s) analyzed? Yes No N/A
- Field blank results acceptable? Yes No N/A
- Analytes detected in field blank(s)? Yes No N/A
- Transcription/Calculation Errors? Yes No N/A

Comments: Uranium-234/235/238 were detected in the
method blank. Data qualification is applied to
sample BODHNS: "J".

- 5. Matrix Spikes N/A
- Matrix spike analyzed? *see note* Yes No N/A
- Spike recoveries acceptable? Yes No N/A
- Spike source traceable? Yes No N/A
- Spike source expired? Yes No N/A
- Transcription/Calculation Errors? Yes No N/A

Comments: No matrix spike was analyzed for tritium
data qualification is applied to sample BODHNS: "UJ"

- 6. Laboratory Control Samples N/A
- LCS analyzed? Yes No N/A
- LCS recoveries acceptable? Yes No N/A
- LCS traceable? Yes No N/A
- Transcription/Calculation Errors? Yes No N/A

Comments: _____

- 7. Chemical Recovery N/A
- Chemical carrier added? Yes No N/A
- Chemical recovery acceptable? Yes No N/A
- Chemical carrier traceable? Yes No N/A
- Chemical carrier expired? Yes No N/A
- Transcription/Calculation errors? Yes No N/A

Comments: _____

- 8. Duplicates N/A
- Duplicates Analyzed? Yes No N/A
- RPD Values Acceptable? Yes No N/A
- Transcription/Calculation Errors? Yes No N/A

Comments: _____

9. Field QC Samples N/A
- Field duplicate sample(s) analyzed? Yes No N/A
- Field duplicate RPD values acceptable? Yes No N/A
- Field split sample(s) analyzed? Yes No N/A
- Field split RPD values acceptable? . . . *See note* Yes No N/A
- Performance audit sample(s) analyzed? Yes No N/A
- Performance audit sample results acceptable? Yes No N/A

Comments: Sample BODHNS is the field split of
sample BODHL9. A comparison of these results
will be made in the final summary report.

10. Holding Times

Are sample holding times acceptable? Yes No N/A

Comments:	Analysis	Sample Date	Prep Date	Analysis Date	Prep Hold Time	Analysis Hold Time	Qualifier
	Grossα/B	12/20/94	N/A	1/12/95	N/A	≤ 180 days	NONE
BODHNS:	Strontium-90	↓	↓	1/20/95	↓	↓	↓
	Alpha Spec	↓	↓	1/21/95	↓	↓	↓
	Tritium	↓	12/29/94	12/30/94	≤ 7 days	↓	↓
	Technetium-99	↓	N/A	1/22/95	N/A	↓	↓

11. Results and Detection Limits (Levels D & E) N/A

- Results reported for all required sample analyses? Yes No N/A
- Results supported in raw data? Yes No N/A
- Results Acceptable? Yes No N/A
- Transcription/Calculation errors? Yes No N/A
- MDA's meet required detection limits? Yes No N/A
- Transcription/calculation errors? Yes No N/A

Comments: _____

9613446.1972

LOCKHEED ANALYTICAL SERVICES
RADIOCHEMISTRY ANALYTES

QC Data Summary for Reagent Blank Analysis

Analyte	Batch ID	MDA	Acceptance Limit	Date Analyzed	MBB result	Q
Gross alpha	17419	1.09	2.0	01/12/95	0.02	
Gross beta	17419	2.03	4.0	01/12/95	1.43	
Sr-90	17434	0.31	1.0	01/20/95	0.11	
Tc-99	17436	6.17	1.0	01/22/95	-0.29	
H3	17467	245	300	12/30/94	17.1	
U-234	17453	0.05	1.0	01/21/95	0.95	
U-235	17453	0.02	1.0	01/21/95	0.29	
U-238	17453	0.04	1.0	01/21/95	0.36	

U-234, U-235 and U-238 were detected in the method blank. Data qualification is applied to sample BDD#N5: "J".

aj 2/27/95

LK31.WK1

Gross Alpha	
HEIS No.:	BODHN5
	B4
Lab ID:	L3551-8
Aliquot:	2.50E-01
Net counts:	9
Bkg counts:	4
Spl count time:	100
Bkg count time:	100
EFFIC:	0.137
Calc.:	0.66
Rptd:	0.65
MDA calc:	1.6
MDA rptd:	1.6
Gross Beta	
HEIS No.:	BODHN5
	B4
Lab ID:	L3551-8
Aliquot:	2.50E-01
Net counts:	197
Bkg counts:	94.1
Spl count time:	100
Bkg count time:	100
a into b X TALK:	0.252
EFFIC:	0.419
Calc.:	4.4
Rptd:	4.4
MDA calc:	2.1
MDA rptd:	2.1
Strontium 90	
HEIS No.:	BODHN5
DETECTOR:	C3
Sample:	L3551-8
DECAY:	1
Sample amt (L):	5.00E-01
GROSS CNTS:	192
Count time:	200
GROSS BKG:	197
EFFIC.:	0.443
INGROWTH:	1.055
Yield:	0.939
Calc:	-0.05
Rptd:	-0.05
MDA, Calc:	0.75
MDA, rptd:	0.70

LK31.WK1

21-Feb-95, Page 1

LK31.WK1

Tritium	
HEIS No.	BODHN5
Lab ID	L3551-17
Aliquot, L	0.01
Gross counts, Blank	18.2
smpl, CPM	1.32
bkgd CPM	0.79
Count time	20
Efficiency, smpl	0.194
Efficiency, blank	0.186
Result, calc.	123
Result, rptd.	120
MDA, calc.	240
MDA, rptd.	240
Technetium	
HEIS No.	BODHN5
Lab ID	L3551-18
Aliquot, L	0.1
Gross CPM, Blank	2.39
Gross CPM, smpl	2.66
Efficiency	0.821
Yield	0.851
Count Time	60
Result, calc.	1.7
Result, rptd.	1.8
MDA, calc.	6.3
MDA, rptd.	6.3

LK31.WK1

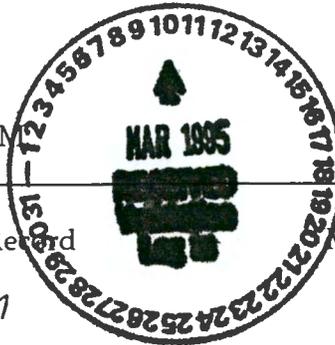
28-Feb-95, Page 1

LK31.WK1

Isotopic Uranium	
HEIS No.	BODHNS
Lab ID	L3551-18
Aliquot, L	0.2
Net counts tracer	709.3
DPM Tracer	10.2
U-233/4 Net cnt smpl	79.3
Efficiency	0.236
Yield	0.614
Count time, blank	1440.0
DPM, blank	0.016
U-233/4 Result, calc.	2.57
U-233/4 Result, rptd	2.57
U-233/4 MDA, calc.	0.20
U-233/4 MDA, rptd.	0.25
U-235 Net cnt smpl	31.3
U-235 Result, calc	1.01
U-235 Result, rptd	1.01
U-235 MDA, calc	0.20
U-235 MDA, rptd	0.2
U-238 Net cnt smpl	32.7
U-238 Result, calc	1.06
U-238 Result, rptd	1.06
U-238 MDA, calc	0.20
U-238 MDA, rptd	0.19

LK31.WK1

02-Mar-95, Page 1



TO: 100 HR 3 Round 8 Groundwater Project QA Record March 9, 1995
 FR: Heidi Gregerson, Golder Associates Inc. HRG
 RE: INORGANIC DATA VALIDATION SUMMARY FOR DATA PACKAGE
 LK31-LAS (943-1610.073 LK31INO.HR3)

INTRODUCTION

This memo presents the results of data validation on data package LK31-LAS prepared by Lockheed Analytical Services. Sample information is provided in the following table.

SAMPLE ID	COMMENTS	ANALYSIS	MEDIA
B0DHN5* B0DHN6	SPLIT SPLIT	INORGANICS SEE ATTACHMENT 4	WATER WATER
* - Indicates sample results which were 100% recalculated.			

Data validation was conducted to level D in accordance with the WHC statement of work (WHC 1994) and validation procedures (WHC 1993). Attachments 1 through 5 provide the following information as indicated below:

- Attachment 1. Glossary of Data Reporting Qualifiers
- Attachment 2. Summary of Data Qualifications
- Attachment 3. Qualified Data Summary and Annotated Laboratory Reports
- Attachment 4. Laboratory Narrative and Chain-of-Custody Documentation
- Attachment 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

This section presents a summary of the data quality in terms of the referenced validation criteria.

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met.

Sample Result Verification. All sample results were supported in the raw data.

Detection Limits. Detection limit goals were met for all sample results.

Completeness. The data package was complete for all requested analyses. Two samples were validated in this data package with a total of 44 determinations reported, all of which were deemed valid. This results in a completeness of 100%, which meets the 90% objective of the work plan.

001
 Revised HRG
 3/9/95

MAJOR DEFICIENCIES

No major deficiencies were identified during data validation which required qualification of data as unusable.

MINOR DEFICIENCIES

The following minor deficiencies were identified during data validation which required qualification of data.

Laboratory Blanks

- Antimony and copper were detected in the initial calibration blank at negative concentrations. Attachments 2 and 5 provide a summary of the samples affected, data qualification applied and supporting documentation.
- Vanadium, manganese, and zinc were detected in the continuing calibration blank at positive concentrations. Attachments 2 and 5 provide a summary of the samples affected, data qualifications applied and supporting documentation.
- Arsenic was detected in the preparation blank at a negative concentration. Attachments 2 and 5 provide a summary of samples affected, data qualifications applied and supporting documentation.

FIELD QC

- Samples B0DHN5 and B0DHN6 were identified as field splits and will be evaluated in the final summary report. Data qualification is not required for field QC. Attachment 3 provides a summary of the results.

REFERENCES

WHC 1993, Data Validation Procedures for Chemical Analyses, WHC-SD-EN-SPP-002, Rev. 2, 1993. Westinghouse Hanford Company, Richland, Washington.

WHC 1994, Environmental and Waste Characterization Analytical Data Validation, Purchase Order MSH-SWV-315905; Validation Statement of Work, Revision 1.0, September 7, 1994; Westinghouse Hanford Company, Richland, Washington.

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

Glossary of Inorganic Data Reporting Qualifiers.

- B - Indicates the constituent was analyzed for and detected. The concentration reported is less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL). The associated data should be considered usable for decision making purposes.
- U - Indicates the constituent was analyzed for and not detected. The concentration reported is the sample detection limit corrected for aliquot size, dilution and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.
- UJ - Indicates the constituent was analyzed for and not detected. Due to a minor quality control deficiency identified during data validation the concentration may not accurately reflect the sample detection limit. The associated data have been qualified as estimated but should be considered usable for decision making purposes.
- BJ - Indicates the constituent was analyzed for and detected at a concentration less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL). Due to a minor quality control deficiency identified during data validation the associated data have been qualified as estimated, but should be considered usable for decision making purposes.
- J - Indicates the constituent was analyzed for and detected. Due to a minor quality control deficiency identified during data validation the associated data have been qualified as estimated, but should be considered usable for decision making purposes.
- UR - Indicates the constituent was analyzed for and not detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.
- R - Indicates the constituent was analyzed for and detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.

9613446.1980

ATTACHMENT 2
SUMMARY OF DATA QUALIFICATIONS

9613446.1981

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: LK31-LAS	REVIEWER: H. Gregerson	DATE: 2-23-95	PAGE <u>1</u> OF <u>1</u>
COMMENTS: INORGANICS			
COMPOUND/ANALYTE	QUALIFIER	SAMPLES AFFECTED	REASON
ANTIMONY	UJ	B0DHN5	DETECTED IN INITIAL CALIBRATION BLANK AT NEGATIVE CONCENTRATION
ARSENIC	UJ	B0DHN5	DETECTED IN PREPARATION BLANK AT NEGATIVE CONCENTRATION
COPPER	UJ	B0DHN6	DETECTED IN INITIAL CALIBRATION BLANK AT NEGATIVE CONCENTRATION
MANGANESE	U	B0DHN5	DETECTED IN CONTINUING CALIBRATION BLANK AT POSITIVE CONCENTRATION
ZINC	U	B0DHN5	DETECTED IN CONTINUING CALIBRATION BLANK AT POSITIVE CONCENTRATION
VANADIUM	U	B0DHN6	DETECTED IN CONTINUING CALIBRATION BLANK AT POSITIVE CONCENTRATION

9613446.1982

ATTACHMENT 3

QUALIFIED DATA SUMMARY and ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: LK31-LAS

Parameter	Samp#	B0DHN5		B0DHN6	
	Date	12-20-94		12-20-94	
	Location	199-H4-47		199-H4-47	
	Depth	---		---	
	Type	WATER		WATER	
	Comments	SPLIT		SPLIT	
	Units	Result	Q	Result	Q
ALUMINUM	UG/L	34.000	B	16.000	U
ANTIMONY	UG/L	50.000	UJ	50.000	U
ARSENIC	UG/L	56.000	UJ	56.000	U
BARIUM	UG/L	13.400	B	13.400	B
BERYLLIUM	UG/L	1.000	U	1.000	U
CADMIUM	UG/L	4.000	U	4.000	U
CALCIUM	UG/L	29700.000		34300.000	
CHROMIUM	UG/L	3.000	U	3.000	U
COBALT	UG/L	6.000	U	6.000	U
COPPER	UG/L	3.000	U	3.000	UJ
IRON	UG/L	49.300	B	7.000	U
LEAD	UG/L	47.000	U	47.000	U
MAGNESIUM	UG/L	5060.000		5620.000	
MANGANESE	UG/L	1.000	U	1.000	U
NICKEL	UG/L	10.000	U	10.000	U
POTASSIUM	UG/L	2040.000	B	2170.000	B
SELENIUM	UG/L	90.000	U	90.000	U
SILVER	UG/L	4.000	U	4.000	U
SODIUM	UG/L	4870.000	B	5350.000	
THALLIUM	UG/L	500.000	U	500.000	U
VANADIUM	UG/L	4.800	B	4.200	U
ZINC	UG/L	6.200	U	2.000	U

The decimal places shown do not reflect the precision reported by the laboratory

*Verified
HGG 2/27/95*

9613446.1985

CLP

1
INORGANIC ANALYSES DATA SHEET

CLIENT ID NO.

B0DHN6

Lab Name: LOCKHEED_ANALYTICAL_SVC Contract: HANFORD

Lab Code: LOCK Case No.: 1222WH SAS No.: SDG No.: L3551F

Matrix (soil/water): WATER Lab Sample ID: L3551-22

Level (low/med): LOW Date Received: 12/22/94

% Solids: 0.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	16.0	U		P
7440-36-0	Antimony	50.0	X		P
7440-38-2	Arsenic	56.0	U		P
7440-39-3	Barium	13.4	B		P
7440-41-7	Beryllium	1.0	U		P
7440-43-9	Cadmium	4.0	U		P
7440-70-2	Calcium	34300		E	P
7440-47-3	Chromium	3.0	U		P
7440-48-4	Cobalt	6.0	U		P
7440-50-8	Copper	3.0	X		P
7439-89-6	Iron	7.0	U		P
7439-92-1	Lead	47.0	U		P
7439-95-4	Magnesium	5620			P
7439-96-5	Manganese	1.0	U		P
7440-02-0	Nickel	10.0	U		P
7440-09-7	Potassium	2170	B		P
7782-49-2	Selenium	90.0	U		P
7440-22-4	Silver	4.0	U		P
7440-23-5	Sodium	5350			P
7440-28-0	Thallium	500	U		P
7440-62-2	Vanadium	4.2	X		P
7440-66-6	Zinc	2.0	U		P

Q
UR HRS: 2/27/95
UJ
U

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

HRS 2/27/95
-045-
010

9613446.1986

ATTACHMENT 4

LABORATORY NARRATIVE and CHAIN-OF-CUSTODY DOCUMENTATION

Lockheed Analytical Services



Log-in No.: L3551
 Quotation No.: Q400000-B
 SAF: 94-126
 Document File No.: 1222596
 WHC Document Control No.: 126
 SDG No.: LK31

CASE NARRATIVE INORGANIC DISSOLVED METALS 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) and duplicate sample(s).

Preparation and Analysis Requirements

One filtered water sample for dissolved metals analysis. As the measured turbidity of the samples was less than 1 NTU, they were batched as 1222WHD for selected analytes as requested on the chain of custody. For this sample batch sample BODHN6 (L3551-22) was used for matrix spike, duplicate and serial dilution analyses. All data flags due to the performance of the above-mentioned QC sample are also associated with every sample analyzed 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 with the following exceptions:

- In the analysis of calcium, the percent difference of serial dilution slightly exceeded control limit. This may be due to physical interferences. Calcium results for the associated samples are flagged with an "E".

Lockheed Analytical Services

Log-in No.: L3551
Quotation No.: Q400000-B
SAF: 94-126
Document File No.: 1222596
WHC Document Control No.: 126
SDG No.: LK31

Sample Results

- The following qualifiers are reported on the basis of the techniques employed to perform the analyses:

"P" ICP-AES

Forms X of this package include the laboratory quarterly IDL for each instrument used in analyses and the customers target reporting detection limits.

Nalini Prabhakar
Prepared By

01-19-95
Date

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

L3551

Data Turnaround
 Priority
 Normal

Collector <i>A.J. SIMPSON</i>	Company Contact <i>R.E. Peterson</i>	Telephone No. <i>(509) 376-5858</i>
Project Designation <i>100-HR-3 Groundwater Sampling-Round 8, Phase 1</i>	Sampling Location <i>100-HR-3</i>	SAF No. <i>894-126</i>
Ice Chest No. <i>ISW12-2244</i>	Field Logbook No. <i>FEF-2-0057</i>	Method of Shipment <i>Federal Express</i>
Shipped To <i>Lockheed</i>	Offsite Property No. <i>W95-0-0073-44</i>	Bill of Lading/Air Bill No. <i>290-4015-016</i>

Possible Sample Hazards/Remarks	Preservative	HNO3	COOL 4C	H2SO4	COOL 4C	*1	H2SO4	HNO3	COOL 4C	HCl	COOL 4C	HNO3			
	Type of Container	G	G	P	P	P	P/G	G	G	P/G	P	G			
No. of Container(s)	1	1	1	1	1	1	1	9	1	4	1	1			
Special Handling and/or Storage Maintain between 2 C and 6 C.	Volume	1L	500mL	250mL	250mL	1L	500mL	1L	40mL	1L	20mL	1L			
SAMPLE ANALYSIS	ICP METALS														
	ANIONS- Cl, SO4, PO4, NO2, NO3														
	TURBIDITY														
	SULFIDE														
	AMMONIA														
	TOTAL ALPHA, TOTAL BETA, Sr-90, U-235, U-238														
	TRITIUM														
	Tc-99														
	ACTIVITY SCAN														
	ICP METALS FILTERED														

Sample No.	Matrix*	Date Sampled	Time Sampled	ICP METALS	ANIONS- Cl, SO4, PO4, NO2, NO3	TURBIDITY	SULFIDE	AMMONIA	TOTAL ALPHA, TOTAL BETA, Sr-90, U-235, U-238	TRITIUM	Tc-99	ACTIVITY SCAN	ICP METALS FILTERED
BODHN5	W	12/20/94	1020	X	X	X	X	X	X	X	X	X	
BODHN6	W	12/20/94	1020										X

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS		Matrix*	
Relinquished By <i>R. J. Lee</i>	Date/Time <i>12/20/94 1250</i>	Received By <i>R. E. Peterson</i>	Date/Time <i>12-20-94</i>	*1. ZnAc+NaOH Data Deliverable-Standalone Sample analysis results for PO4, NO2, NO3 by EPA 300.0; and turbidity by EPA 180.1 is for information only. The ERC Contractor acknowledges that the 48 hour hold time will not be met. The Activity Scan is for both sample numbers. <i>Stored in unit #3</i>		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>R. E. Peterson</i>	Date/Time <i>0800</i>	Received By <i>R. E. Peterson</i>	Date/Time <i>10-21-94</i>				
Relinquished By	Date/Time	Received By	Date/Time				
LABORATORY SECTION	Received By <i>M. M. [Signature]</i>	Title <i>Sample Custodian</i>	Date/Time <i>12-22-94 / 0915</i>				
FINAL SAMPLE DISPOSITION	Disposal Method <i>→</i>	Disposed By	Date/Time				

P10
15444

9613116-1989

ATTACHMENT 5
DATA VALIDATION SUPPORTING DOCUMENTATION

9613446-1991

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	<u>D</u>	E
PROJECT: 100 HR 3 Rnd 8 Gltz O			DATA PACKAGE: LK31-LAS		
VALIDATOR: H. Gregerson		LAB: Lockheed		DATE: 2/22/95	
CASE:			SDG:		
ANALYSES PERFORMED					
<input checked="" type="checkbox"/> CLP/ICP	<input type="checkbox"/> CLP/GFAA	<input type="checkbox"/> CLP/Hg	<input type="checkbox"/> CLP/Cyanide	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> SW-846/ICP	<input type="checkbox"/> SW-846/GFAA	<input type="checkbox"/> SW-846/Hg	<input type="checkbox"/> SW-846 Cyanide	<input type="checkbox"/>	<input type="checkbox"/>
SAMPLES/MATRIX	BODHNS		BODHNG / water		

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? Yes No N/A

Is a case narrative present? Yes No N/A

Comments: _____

2. HOLDING TIMES

Are sample holding times acceptable? Yes No N/A

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

- Were initial calibrations performed on all instruments? Yes No N/A
- Are initial calibrations acceptable? Yes No ^{1/3} N/A
- Are ICP interference checks acceptable? Yes No N/A
- Were ICV and CCV checks performed on all instruments? Yes No N/A
- Are ICV and CCV checks acceptable? Yes No N/A

Comments:

~~1. The ICP interference check for BODHNO₃ for Sb %R was outside control limits, however no qualification applied to associated sample. See attached supporting document. HCL 2/27/95~~

4. BLANKS

- Were ICB and CCB checks performed for all applicable analyses? Yes No N/A
- Are ICB and CCB results acceptable? Yes No ¹ N/A
- Were preparation blanks analyzed? Yes No N/A
- Are preparation blank results acceptable? Yes No ² N/A
- Were field/trip blanks analyzed? Yes No N/A
- Are field/trip blank results acceptable? Yes No N/A

Comments:

1. Mn, Zn, V, Sb, and Cu were detected in either the ICB or CCB and the associated samples were qualified. See supporting documents.

2. Arsenic was detected at negative concentration in prep blank, associated sample was qualified. See supporting documents.

5. ACCURACY

- Were spike samples analyzed? Yes No N/A
- Are spike sample recoveries acceptable? Yes No N/A
- Were laboratory control samples (LCS) analyzed? Yes No N/A
- Are LCS recoveries acceptable? Yes No N/A

Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

6. PRECISION

- Were laboratory duplicates analyzed? Yes No N/A
- Are laboratory duplicate samples RPD values acceptable? Yes No N/A
- Were ICP serial dilution samples analyzed? Yes No N/A
- Are ICP serial dilution %D values acceptable? Yes No N/A
- Are field duplicate RPD values acceptable? Yes No N/A
- Are field split RPD values acceptable? Yes No N/A

HB 2/25/95

Comments:

~~1. Lab duplicate RPD's for RADHHS were outside normal limits, however qualification was applied because the error was < 5 RPD's.~~

2. See attached Comments, A-22.

7. FURNACE AA QUALITY CONTROL

- Were duplicate injections performed as required? Yes No N/A
- Are duplicate injection %RSD values acceptable? Yes No N/A
- Were analytical spikes performed as required? Yes No N/A
- Are analytical spike recoveries acceptable? Yes No N/A
- Was MSA performed as required? Yes No N/A
- Are MSA results acceptable? Yes No N/A

Comments:

8. REPORTED RESULTS AND DETECTION LIMITS

- Are results reported for all requested analyses? Yes No N/A
- Are all results supported in the raw data? Yes No N/A
- Are results calculated properly? Yes No N/A
- Do results meet the CRDLs? Yes No N/A

Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

Comments (attach additional sheets as necessary): _____

2. RODAN5 and RODAN6 are field splits, however associated samples are in another sample delivery group and RPD's could not be calculated, but will be evaluated in the final summary.

3. ICP Serial Dilution %D for sample RODAN6 for Pb is exceeded, however no qualification applied because the sample result is less than 50 times the IRL.

9613446.1996

CLP

3
BLANKS

Lab Name: LOCKHEED_ANALYTICAL_SVC__

Contract: HANFORD__

Lab Code: LOCK__

Case No.: 1222WH

SAS No.: _____

SDG No.: L3551W

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L_

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L)						Preparation Blank		M
			1	C	2	C	3	C	C	M	
Aluminum	16.0	U	16.0	U	16.0	U	16.0	U	16.000	U	P
Antimony	(-55.1)	B	50.0	U	50.0	U	50.0	U	50.000	U	P
Arsenic	56.0	U	56.0	U	56.0	U	56.0	U	(-78.250)	B	P
Barium	9.0	U	9.0	U	9.0	U	9.0	U	9.000	U	P
Beryllium	1.0	U	1.0	U	1.0	U	1.0	U	1.000	U	P
Cadmium	4.0	U	4.0	U	4.0	U	4.0	U	4.000	U	P
Calcium	17.0	U	17.0	U	17.0	U	17.0	U	29.410	B	P
Chromium	3.0	U	3.0	U	3.0	U	3.0	U	3.000	U	P
Cobalt	6.0	U	6.0	U	6.0	U	6.0	U	6.000	U	P
Copper	3.0	U	3.0	U	3.0	U	3.0	U	3.000	U	P
Iron	7.0	U	7.0	U	7.0	U	7.4	B	9.260	B	P
Lead	47.0	U	47.0	U	47.0	U	47.0	U	47.000	U	P
Magnesium	36.0	U	36.0	U	36.0	U	36.0	U	36.000	U	P
Manganese	1.0	U	1.5	B	1.9	B	(2.6)	B	1.000	U	P
Nickel	10.0	U	10.0	U	10.0	U	10.0	U	10.000	U	P
Potassium	620.0	U	620.0	U	620.0	U	620.0	U	620.000	U	P
Selenium	90.0	U	90.0	U	90.0	U	90.0	U	90.000	U	P
Silver	4.0	U	4.0	U	4.0	U	4.0	U	4.000	U	P
Sodium	21.0	U	21.0	U	21.0	U	21.0	U	159.660	B	P
Thallium	500.0	U	500.0	U	500.0	U	500.0	U	500.000	U	P
Vanadium	3.0	U	3.0	U	3.0	U	3.0	U	3.000	U	P
Zinc	2.0	U	2.0	U	2.0	U	(2.9)	B	2.000	U	P

BODHNS

FORM III - IN

ILMO3.0

~~029~~
021

9613446.1997

CLP

3
BLANKS

Lab Name: LOCKHEED_ANALYTICAL_SVC__

Contract: HANFORD__

Lab Code: LOCK__

Case No.: 1222WH

SAS No.: _____

SDG No.: L3551F

Preparation Blank Matrix (soil/water): WATER

Preparation Blank Concentration Units (ug/L or mg/kg): UG/L__

Analyte	Initial Calib. Blank (ug/L)		Continuing Calibration Blank (ug/L)						Preparation Blank		M
		C	1	C	2	C	3	C		C	
Aluminum	16.0	U	16.0	U	16.0	U	16.0	U	16.000	U	P
Antimony	50.0	U	50.0	U	50.0	U	50.0	U	50.000	U	P
Arsenic	56.0	U	56.0	U	56.0	U	56.0	U	56.000	U	P
Barium	9.0	U	9.0	U	9.0	U	9.0	U	9.000	U	P
Beryllium	1.0	U	1.0	U	1.0	U	1.0	U	1.000	U	P
Cadmium	4.0	U	4.0	U	4.0	U	4.0	U	4.000	U	P
Calcium	17.0	U	17.0	U	17.0	U	17.0	U	17.000	U	P
Chromium	3.0	U	3.0	U	3.0	U	3.0	U	3.000	U	P
Cobalt	6.0	U	6.0	U	6.0	U	6.0	U	6.000	U	P
Copper	-3.2	B	3.0	U	3.0	U	3.0	U	-3.430	B	P
Iron	7.0	U	10.3	B	7.0	U	7.0	U	7.000	U	P
Lead	47.0	U	47.0	U	47.0	U	47.0	U	47.000	U	P
Magnesium	36.0	U	36.0	U	36.0	U	36.0	U	36.000	U	P
Manganese	1.0	U	3.2	B	1.1	B	1.5	B	1.000	U	P
Nickel	10.0	U	10.0	U	10.0	U	10.0	U	10.000	U	P
Potassium	620.0	U	620.0	U	620.0	U	620.0	U	620.000	U	P
Selenium	90.0	U	90.0	U	90.0	U	90.0	U	90.000	U	P
Silver	4.0	U	4.0	U	4.0	U	4.0	U	4.000	U	P
Sodium	21.0	U	42.0	B	-25.2	B	21.0	U	21.000	U	P
Thallium	500.0	U	500.0	U	500.0	U	500.0	U	500.000	U	P
Vanadium	3.0	U	3.4	B	3.0	U	3.0	U	3.000	U	P
Zinc	2.0	U	4.3	B	2.3	B	2.0	U	2.000	U	P

BODHNU

BODHNU

FORM III - IN

ILMO3.0

~~050~~

022

9613446.1998

RECORD COPY

MEMORANDUM



TO: 100 HR 3 Round 8 Groundwater Project QA Record

February 28, 1995

FR: Heidi Gregerson, Golder Associates Inc. *HRLG*

RE: GENERAL CHEMISTRY DATA VALIDATION SUMMARY FOR DATA PACKAGE LK31-LAS (943-1610.073 LK31GEN.HR3)

INTRODUCTION

This memo presents the results of data validation on data package LK31-LAS prepared by Lockheed Analytical Services. Sample information is provided in the following table.

SAMPLE ID	COMMENTS	ANALYSIS	MEDIA
B0DHN5*	SPLIT	GENERAL CHEMISTRY SEE ATTACHMENT 4	WATER
* - Indicates sample results which were 100% recalculated.			

Data validation was conducted to level D in accordance with the WHC statement of work (WHC 1994) and validation procedures (WHC 1993). Attachments 1 through 5 provide the following information as indicated below:

- Attachment 1. Glossary of Data Reporting Qualifiers
- Attachment 2. Summary of Data Qualifications
- Attachment 3. Qualified Data Summary and Annotated Laboratory Reports
- Attachment 4. Laboratory Narrative and Chain-of-Custody Documentation
- Attachment 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

This section presents a summary of the data quality in terms of the referenced validation criteria.

Precision. Goals for precision were met.

Accuracy. Goals for accuracy were met.

Sample Result Verification. All sample results were supported in the raw data.

Detection Limits. Detection limit goals were met for all sample results.

Completeness. The data package was complete for all requested analyses. A total of one sample was validated in this data package with a total of nine determinations reported, all of which were deemed valid. This results in a completeness of 100%, which meets the 90% objective of the work plan.

MAJOR DEFICIENCIES

No major deficiencies were identified during data validation which required qualification of data.

MINOR DEFICIENCIES

The following minor deficiencies were identified during data validation which required qualification of data.

Holding Times

- The holding time for phosphate was exceeded. Attachments 2 and 5 provide a summary of samples affected, data qualifications applied and supporting documentation.

FIELD QC

- B0DHN5 was identified as a field split of B0DHL9. The RPD will be evaluated in the final summary report.

REFERENCES

WHC 1993, Data Validation Procedures for Chemical Analyses, WHC-SD-EN-SPP-002, Rev. 2, 1993. Westinghouse Hanford Company, Richland, Washington.

WHC 1994, Environmental and Waste Characterization Analytical Data Validation, Purchase Order MSH-SWV-315905; Validation Statement of Work, Revision 1.0, September 7, 1994; Westinghouse Hanford Company, Richland, Washington.

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

Glossary of Inorganic Data Reporting Qualifiers.

- B - Indicates the constituent was analyzed for and detected. The concentration reported is less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL). The associated data should be considered usable for decision making purposes.
- U - Indicates the constituent was analyzed for and not detected. The concentration reported is the sample detection limit corrected for aliquot size, dilution and percent solids (in the case of solid matrices) by the laboratory. The associated data should be considered usable for decision making purposes.
- UJ - Indicates the constituent was analyzed for and not detected. Due to a minor quality control deficiency identified during data validation the concentration may not accurately reflect the sample detection limit. The associated data have been qualified as estimated but should be considered usable for decision making purposes.
- BJ - Indicates the constituent was analyzed for and detected at a concentration less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL). Due to a minor quality control deficiency identified during data validation the associated data have been qualified as estimated, but should be considered usable for decision making purposes.
- J - Indicates the constituent was analyzed for and detected. Due to a minor quality control deficiency identified during data validation the associated data have been qualified as estimated, but should be considered usable for decision making purposes.
- UR - Indicates the constituent was analyzed for and not detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.
- R - Indicates the constituent was analyzed for and detected. Due to a major quality control deficiency identified during data validation, the associated data have been qualified as unusable for decision making purposes.

ATTACHMENT 2
SUMMARY OF DATA QUALIFICATIONS

9613446.2003

WHC-SD-EN-SPP-002, REV.2

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: LK31-LAS	REVIEWER: H. Gregerson	DATE: 2-28-95	PAGE <u>1</u> OF <u>1</u>
COMMENTS: GENERAL CHEMISTRY			
COMPOUND/ANALYTE	QUALIFIER	SAMPLES AFFECTED	REASON
PHOSPHATE	UJ	B0DHN5	HOLDING TIME EXCEEDED

ATTACHMENT 3

QUALIFIED DATA SUMMARY and ANNOTATED LABORATORY REPORTS

Validated Data Summary, Data Package: LK31-LAS

Parameter	Samp#		BODHN5	
	Date	Location	12-20-94	199-H4-47
	Depth	Type	---	
	Comments	WATER SPLIT		
	Units	Result	Q	
TURBIDITY	NTU	0.000		
CHLORIDE	MG/L	3.100		
NITRATE	MG/L	0.640		
NITRITE	MG/L	0.010	U	
ORTHO-PHOSPHATE	MG/L	0.100	UJ	
SULFATE	MG/L	15.000		
AMMONIA	MG/L	0.050	U	
NITRATE+NITRITE	MG/L	0.640		
SULFIDE	MG/L	3.000	U	

The decimal places shown do not reflect the precision reported by the laboratory

*Verified
HRG 2/28/95*

9613446.2006

LOCKHEED ANALYTICAL SERVICES

COMMON IONS AND ADDITIONAL ANALYTES

Sample Results

Client Sample ID: B0DHN5	Date Collected: 20-DEC-94
Matrix: Water	Date Received: 22-DEC-94

Constituent	Units	Method	Result	Reporting Det Limit	Data Qualifier(s)	Date Analyzed	LAS Batch ID	LAS Sample ID
Turbidity	NTU	180.1	0.00	N/A		22-DEC-94	17333	L3551-5
Chloride	mg/L	300.0	3.1	0.02		22-DEC-94	17328	L3551-3
Nitrate-N	mg/L	300.0	0.64	0.02		22-DEC-94	17326	L3551-3
Nitrite-N	mg/L	300.0	< 0.01	0.01		22-DEC-94	17329	L3551-3
Ortho Phosphate	mg/L	300.0	< 0.1	0.1	H	23-DEC-94	17330	L3551-3
Sulfate	mg/L	300.0	15.	0.1		22-DEC-94	17332	L3551-3
Ammonia Nitrogen	mg/L	350.1	< 0.05	0.05		04-JAN-95	17425	L3551-7
Nitrate-Nitrite-Nitrogen	mg/L	353.2	0.64	0.05		30-DEC-94	17565	L3551-7
Sulfide	mg/L	9030	< 3	3		23-DEC-94	17360	L3551-6

HRG 2/23/95

~~265~~

009

ATTACHMENT 4

LABORATORY NARRATIVE and CHAIN-OF-CUSTODY DOCUMENTATION

Lockheed Analytical Services



Log-in No.: L3551
Quotation No.: Q40000-B
SAF: 94-126
Document File No.: 1222596
WHC Document Control No.: 126
SDG No.: LK31

CASE NARRATIVE INORGANIC NON METALS ANALYSES

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: B94-126 and prepared as batch 1222 WH and analyzed for selected analytes as requested on the chain of custody.

Holding Time Requirements

- All samples were analyzed within the method-specific holding times with the exception Method 300.0 Orthophosphate which was received from the client on the day the holding time expired. 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

January 19, 1995
Date

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

L3551

Data Turnaround

Priority
 Normal

Collector <i>A.J. SIMPSON</i>	Company Contact <i>R.E. Peterson</i>	Telephone No. <i>(509) 376-5858</i>
Project Designation <i>100-HR-3 Groundwater Sampling-Round 8, Phase 1</i>	Sampling Location <i>100-HR-3</i>	SAF No. <i>B94-126</i>
Ice Chest No. <i>13W12-2244</i>	Field Logbook No. <i>FEF-2-0057</i>	Method of Shipment <i>Federal Express</i>
Shipped To <i>Lockheed</i>	Offsite Property No. <i>W95-0-0073-44</i>	Bill of Lading/Air Bill No. <i>290-4015-016</i>

Possible Sample Hazards/Remarks	Preservative	HNO3	COOL 4C	H2SO4	COOL 4C	*1	H2SO4	HNO3	COOL 4C	HCl	COOL 4C	HNO3			
		Type of Container	G	G	P	P	P	P/G	G	G	P/G	P	G		
No. of Container(s)	1	1	1	1	1	1	1	9	1	4	1	1			
Special Handling and/or Storage	Volume	1L	500mL	250mL	250mL	1L	500mL	1L	40mL	1L	20mL	1L			
SAMPLE ANALYSIS	ICP METALS	ANIONS-Cl, SO4, PO4, NO2, NO3	NO2, NO3	TURBIDITY	SULFIDE	AMMONIA	TOTAL ALPHA, TOTAL BETA, Sr-90, U-235, U-238	TRITIUM	Tc-99	ACTIVITY SCAN	ICP METALS				
	UNFILTERED										FILTERED				

Sample No.	Matrix*	Date Sampled	Time Sampled	ICP METALS	ANIONS	NO2, NO3	TURBIDITY	SULFIDE	AMMONIA	TOTAL ALPHA, TOTAL BETA, Sr-90, U-235, U-238	TRITIUM	Tc-99	ACTIVITY SCAN	ICP METALS	FILTERED
BODHN5	W	12/20/94	1020	X	X	X	X	X	X	X	X	X	X		
BODHN6	W	12/20/94	1020											X	

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS			Matrix*	
Relinquished By <i>R. W. Lee</i>	Date/Time <i>12/20/94 1250</i>	Received By <i>ERC</i>	Date/Time <i>12-20-94</i>	*1. ZnAc+NaOH Data Deliverable-Standalone Sample analysis results for PO4, NO2, NO3 by EPA 300.0; and turbidity by EPA 180.1 is for information only. The ERC Contractor acknowledges that the 48 hour hold time will not be met. The Activity Scan is for both sample numbers. <i>stored in unit #3</i>			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>ERC</i>	Date/Time <i>0800</i>	Received By <i>B. Whitten</i>	Date/Time <i>10-21-94</i>					
Relinquished By	Date/Time	Received By	Date/Time					

LABORATORY SECTION	Received By <i>W. M. [Signature]</i>	Title <i>Sample Custodian</i>	Date/Time <i>12-22-94 / 0915</i>
FINAL SAMPLE DISPOSITION	Disposal Method <i>→</i>	Disposed By	Date/Time

012
10000551

9613446-2009

ATTACHMENT 5
DATA VALIDATION SUPPORTING DOCUMENTATION

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100 HR. 3 Rnd 3 (H ₂ O)			DATA PACKAGE: LK31-LAS		
VALIDATOR: H. Gregerson		LAB: Lockwood		DATE: 2/28/15	
CASE:			SDG:		
ANALYSES PERFORMED					
<input checked="" type="checkbox"/> Anions/IC	<input type="checkbox"/> TOC	<input type="checkbox"/> TOX	<input type="checkbox"/> TPH-418.1	Oil and Grease	Alkalinity
<input checked="" type="checkbox"/> Ammonia	<input type="checkbox"/> BOD/COD	<input type="checkbox"/> Chloride	<input type="checkbox"/> Chromium-VI	<input type="checkbox"/> pH	<input checked="" type="checkbox"/> NO ₃ /NO ₂
<input type="checkbox"/> Sulfate	<input type="checkbox"/> TDS	<input type="checkbox"/> TKN	<input type="checkbox"/> Phosphate	<input checked="" type="checkbox"/> Turbidity	<input checked="" type="checkbox"/> Sulfide
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SAMPLES/MATRIX BODHNS SLUDGE / water					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? Yes No N/A
 Is a case narrative present? Yes No N/A

Comments: _____

2. HOLDING TIMES

Are sample holding times acceptable? Yes No^{1.} N/A

Comments: _____
 is The holding time for Cr-Mn-PO₄ was exceeded and ~~the~~ sample BODHNS was qualified UJ.
 See supporting documents.

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

3. INSTRUMENT CALIBRATION

Was initial calibration performed for all applicable analyses? Yes No N/A
 Are initial calibration results acceptable? Yes No N/A
 Was a calibration check performed for all applicable analyses? Yes No N/A
 Are calibration check results acceptable? Yes No N/A

Comments: _____

4. BLANKS

Were laboratory blanks analyzed? Yes No N/A
 Are laboratory blank results acceptable? Yes No N/A
 Were field/trip blanks analyzed? Yes No N/A
 Are field/trip blank results acceptable? Yes No N/A

Comments: _____

5. ACCURACY

Were spike samples analyzed at the required frequency? Yes No N/A
 Are spike recoveries acceptable? Yes No N/A
 Were LCS analyses performed at the required frequency? Yes No ~~N/A~~ HRC
 Are LCS recoveries acceptable? Yes No ~~N/A~~ 3/9/15

Comments: _____

6. PRECISION

Were laboratory duplicate samples analyzed at the required frequency? Yes No N/A
 Are laboratory duplicate sample RPD values acceptable? Yes No N/A
 Are field duplicate RPD values acceptable? Yes No N/A
 Are field split RPD values acceptable? Yes No N/A

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

Comments:

1. BODHNS was identified a field split and will be evaluated in the final summary report.

7. ANALYTE QUANTITATION

Was analyte quantitation performed properly? Yes No N/A

Comments:

8. REPORTED RESULTS AND DETECTION LIMITS

Are results reported for all requested analyses? Yes No N/A

Are results supported in the raw data? Yes No N/A

Are results calculated properly? Yes No N/A

Do results meet the CRDLs? Yes No N/A

Comments:

Results that were reported as < detection limit on the sample result form were given U qualifiers.

