START 9613446.2361

0044370

LK15

Lockheed Analytical Services

BECHTEL HANFORD INC.

ANALYTICAL DATA REPORT

FOR

VOLATILE ORGANICS, METALS, CHLORIDE, FLUORIDE, NITRATE, NITRITE, PHOSHATE, SULFATE, AND RADIOCHEMISTRY

JAN 1995
RECEIVED
Data
Log In

JUN 1996
RECEIVED
EDMC

LOG-IN NUMBER:	L3310 L3361
QUOTATION NUMBER:	Q400000-B
DOCUMENT FILE NUMBER:	1112596 1119596
SAF NUMBER:	B94-083
WHC DOCUMENT CONTROL NUMBER:	104
SDG NUMBER:	LK15

9613446.2362

Lockheed
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

December 28, 1994

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

RE:	Log-in No:	L3310, L3361
	Quotation No:	Q400000-B
	Document File No:	1112596, 1119596
	SAF No.:	B94-083
	WHC Document Control No:	104
	SDG No.:	LK15

The attached data report contains the analytical results of samples that were submitted to Lockheed Analytical Services on 12 November 1994 and 19 Novermber 1994.

The temperature of the coolers upon receipt was 2°C. Sample containers received agree with the chain-of-custody documentation. Sample containers were received intact. Samples were not received in time to meet the analytical holding time requirements for nitrate/nitrite by method 300.0.

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.

" 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."

9613446.2363

Lockheed Analytical Services

Log-in No.: L3310, L3361
Quotation No.: Q400000-B
Document File No.: 1112596, 1119596
SAF No.: B94-083
WHC Document Control No.: 104
SDG No.: LK15

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

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

Sincerely,

for James Jordan

Kathleen M. Hall
Client Services Representative

KMH/skm
cc: Client Services
Document Control

9613446.2364

Lockheed Analytical Services

Log-in No.: L3310, L3361
Quotation No.: Q400000-B
Document File No.: 1112596, 1119596
SAF No.: B94-083
WHC Document Control No.: 104
SDG No.: LK15

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

- Two water samples were received for SAF: B94-085 and prepared as batch 1110WH and 1112WH and analyzed for selected analytes as requested on the chain of custody.

Client ID	LAL #		Method
Batch 1112WH BOD864	L3310-9	DUP, MS	300.0 Chloride, Nitrite, Nitrate, Sulfate
			300.0 Fluoride
Batch 1110WH BOD864			365.2 Orthophosphate

Holding Time Requirements

- All samples were analyzed within the method-specific holding times with the exception Method 300.0 Nitrate and Nitrite and Method 365.2 Orthophosphate which were 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
Prepared By

December 19, 1994
Date

9613446.2365

Lockheed Analytical Services

Log-in No.: L3310, L3361
Quotation No.: Q400000-B
Document File No.: 1112596, 1119596
SAF No.: B94-083
WHC Document Control No.: 104
SDG No.: LK15

CASE NARRATIVE
INORGANIC ANALYSES
TOTAL METALS

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 November 12, 1994 and logged in as L3310W.
- One water sample was received in good condition on November 19, 1994 and logged in as L3361W.
- The samples were prepared as Batch 1112WHT and analyzed for selected analytes as requested on the chain of custody. Sample BOD864 (L3310-8), was used for matrix spike and duplicate for the furnace analytes and ICP. Sample BOD867 (L3361-2), from another login, was used for matrix spike and duplicate, post digestion spike and serial dilution for zinc.

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:

- LCSW was outside recovery limits for aluminum and for cadmium. However, the aluminum and cadmium were not detected in the sample. Therefore, the high bias of the LCSW does not affect the sample.

Amy O. Carpenter
Prepared By

December 27, 1994
Date

Lockheed Analytical Services

Log-in No.: L3310, L3361
Quotation No.: Q400000-B
Document File No.: 1112596, 1119596
SAF No.: B94-083
WHC Document Control No.: 104
SDG No.: LK15

CASE NARRATIVE
INORGANIC ANALYSES
DISSOLVED METALS

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 November 12, 1994 and logged in as L3310F.
- One water sample was received in good condition on November 19, 1994 and logged in as L3361F.
- The samples were prepared as Batch 1112WHD and analyzed for selected analytes as requested on the chain of custody. Sample BOD865 (L3310-15) was used for matrix spike and duplicate, post-digestion spike and serial dilution.

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:

- For calcium, the Percent Difference of serial dilution (11.6%) is outside the 10% control limit. This may be due to physical interferences. All calcium results are flagged with an "E".
- For thallium, the LCS water recovered 79.3%. However, thallium was not detected in any of the samples, so the results should not be affected.

Amy O. Carpenter
Prepared By

December 22, 1994
Date

Lockheed Analytical Services

Log-in No.: L3310, L3361
Quotation No.: Q400000-B
Document File No.: 1112596, 1119596
SAF No.: B94-083
WHC Document Control No.: 104
SDG No.: LK15

CASE NARRATIVE
ORGANIC ANALYSES

Analytical CLP 3/90 Volatile Organics

The associated samples were analyzed in two analytical batches.

The associated samples and their corresponding laboratory numbers are listed on Method Blank Summary Form IV - CLP VOA.

LAL SDG No.: L3310 (WHC SDG No.: LK15)

L3310

Analytical Batch 111694-8260-D1

Holding Time

All assocciated samples were analyzed within holding time on November 16, 1994.

Instrument Performance Checks (Tunes)

All associated Bromofluorobenzene (BFB) analyses for instrument performance checks were within QC criteria.

Surrogate Recoveries

All surrogate percent recoveries for all associated samples analyzed were within QC criteria. All surrogate recoveries are listed on FORM II - CLP VOA-2.

Matrix Spike Recoveries

All compound recoveries for the matrix spike (L3310-4MS) and matrix spike duplicate (L3310-4MSD) were within QC criteria. All relative percent differences (RPDs) between the MS and MSD recoveries were within QC criteria. All compound concentrations, recoveries and RPDs are listed and flagged appropriately on FORM III - CLP VOA-1.

Blank Results

Target compounds were not detected in the method blank VBLK01 (AE4279) but one tentatively identified compound (TIC) was detected. All associated samples with detected TIC as in the method blank were flagged with the qualifier "B".

Lockheed Analytical Services

Log-in No.: L3310, L3361
Quotation No.: Q400000-B
Document File No.: 1112596, 1119596
SAF No.: B94-083
WHC Document Control No.: 104
SDG No.: LK15

Initial Calibration

All compounds with the required minimum average relative response factors (RRF) and percent relative standard deviations (%RSD) were within QC limits.

Continuing Calibration

All continuing calibration compounds maximum percent difference (MAX %D) from the initial calibration were within QC limits.

Internal Standard Results

All internal standard area counts and retention times were within QC criteria for the associated samples analyzed. All internal standard area counts and retention times are listed and flagged appropriately on FORM VIII - CLP VOA.

Sample Results

Acetone was detected in sample BOD66 (L3310-4) at less than the Contract Required Quantitation Limits (CRQL). All sample concentrations are listed and flagged with the appropriate qualifiers on FORM I - CLP VOA.

LAL SDG No.: L3310 (WHC SDG No.: LK15)

L3361

Analytical Batch 112194-8260-D1

Holding Time

All assocciated samples were analyzed within holding time on November 21, 1994.

Instrument Performance Checks (Tunes)

All associated Bromofluorobenzene (BFB) analyses for instrument performance checks were within QC criteria.

Surrogate Recoveries

All surrogate percent recoveries for all associated samples analyzed were within QC criteria. All surrogate recoveries are listed on FORM II - CLP VOA-2.

Lockheed Analytical Services

Log-in No.: L3310, L3361
Quotation No.: Q400000-B
Document File No.: 1112596, 1119596
SAF No.: B94-083
WHC Document Control No.: 104
SDG No.: LK15

Matrix Spike Recoveries

All compound recoveries for the matrix spike (L3361-13MS) and matrix spike duplicate (L3361-13MSD) were within QC criteria except for 1,1-Dichloroethene with slightly low recoveries in both the MS and MSD sample. All relative percent differences (RPDs) between the MS and MSD recoveries were within QC criteria. All compound concentrations, recoveries and RPDs are listed and flagged appropriately on FORM III - CLP VOA-1.

Blank Results

Target compounds and tentatively identified compounds (TICs) were not detected in the method blank VBLK01 (AE4285).

Initial Calibration

All compounds with the required minimum average relative response factors (RRF) and percent relative standard deviations (%RSD) were within QC limits.

Continuing Calibration

All continuing calibration compounds maximum percent difference (MAX %D) from the initial calibration were within QC limits.

Internal Standard Results

All internal standard area counts and retention times were within QC criteria for the associated samples analyzed. All internal standard area counts and retention times are listed and flagged appropriately on FORM VIII - CLP VOA.

Sample Results

Acetone was detected in sample BOD869 (L3361-13) at less than the Contract Required Quantitation Limits (CRQL). All sample concentrations are listed and flagged with the appropriate qualifiers on FORM I - CLP VOA.

Lydia M. Coleman
Prepared By

December 28, 1994
Date

Lockheed Analytical Services

Log-in No.: L3310, L3361
Quotation No.: Q400000-B
Document File No.: 1112596, 1119596
SAF No.: B94-083
WHC Document Control No.: 104
SDG No.: LK15

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

Carbon-14

The carbon-14 analysis was performed using LAL-91-SOP-0209. No problems were encountered during analysis and all QC criteria were met.

Gross alpha beta

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

Strontium-90

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

Tritium

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

Sandra K. Montgomery
Prepared By

December 20, 1994
Date

9613446.2371

Lockheed Analytical Services
DATA QUALIFIERS FOR INORGANIC ANALYSES
[Revised 08/28/92]

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

[1] Used as footnote designations on the QC summary form.

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Lockheed Analytical Services

DATA QUALIFIERS FOR ORGANIC ANALYSES

[Revised 01/19/1994]

For Use On The Analytical Data Reporting Forms	
A	***For CLP analyses Only*** -- The TIC is a suspected aldol-condensation product.
B	Any constituent that was also detected in the associated blank whose concentration was greater than the practical or reporting detection limit (PQL or RDL).
C	Constituent confirmed by GC/MS analysis. *[pesticide/PCB analyses only]*
D	Constituent detected in the diluted sample. It also indicates that an accurate quantitation is not possible due to surrogates being diluted out of the samples during the course of the analysis.
E	Constituent concentration exceeded the calibration range.
G	The quantitation is not gasoline or diesel but believed to be some other combination of hydrocarbons.
H	Sample analysis performed outside of method- or client-specified maximum holding time requirement.
J	*Estimated value* -- (1) constituent detected at a level less than the RDL or PQL and greater than or equal to the MDL; (2) estimated concentration for TICs ***(For CLP Reporting Only).***
N	***For CLP Reporting Only*** -- Tentatively identified constituents (TICs) identified based on mass spectral library search.
P	***For CLP Reporting Only*** -- The percent difference between the concentrations detected on both GC columns was greater than 25 percent *[pesticide/PCB analyses only].*
U	***For CLP Reporting Only*** -- Constituent was analyzed for but not detected (sample quantitation must be corrected for dilution and percent moisture).
X, Y, or Z	Analyst-defined qualifier.
N/A (% Moisture)	N/A in the % moisture cell indicates that data are reported on an "*as received*" basis. A value in the % moisture cell indicates that data are reported based on a "*dry weight*" basis. ***For non-CLP work***, RDLs are not adjusted for % moisture even when data are reported on a "*dry weight*" basis.
For Use On The QC Data Reporting Forms	
*****	QC data (i.e., percent recovery data for matrix spike, matrix spike duplicate, laboratory control standard, or surrogates; and RPD for matrix spike duplicate or unspiked duplicate) exceeded acceptance limits.
a[1]	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[1]	The RPD cannot be computed because the sample and/or duplicate concentration was below the RDL.

[1] Used as footnote designations on the QC Summary Form.

9613446.2373

Lockheed Analytical Services

DATA QUALIFIERS FOR RADIOCHEMICAL ANALYSES

[Revised 08/28/92]

For Use on the Analytical Data Reporting Forms	
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).
C	Presence of high TDS in sample required reduction of sample size which increased the MDA.
D	Constituent detected in the diluted sample.
E	Constituent concentration exceeded the calibration or attenuation curve range.
F	*For Alpha Spectrometry Only*-- FWHM exceeded acceptance limits.
H	Sample analysis performed outside of method-specified maximum holding time requirement.
Y	Chemical yield exceeded acceptance limits.
For Use on the QC Data Reporting Forms	
*	QC data (i.e., percent recovery data for laboratory control standard and matrix spike; and RPD for replicate analyses) exceeded acceptance limits.
a[1]	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[1]	The RPD cannot be computed because the sample and/or duplicate concentration was below the MDA.

[1] Used as foot note designations on the QC summary form.

9613446.2374

SAMPLE AND DATA MANAGEMENT
RECORD OF DISPOSITION

ROD-B94-080
Record of Disposition No.

DATE: 12/09/94

LABORATORY: Lockheed

PROJECT TITLE/NO.: 100-FR-3 Groundwater/B94-083

NCR NO.: N/A

SAMPLE IDENTIFICATION NUMBERS:

B0D867, B0D864

DESCRIPTION OF EVENT:

Regarding phosphate analysis, the lab had instrument problems and was unable to achieve satisfactory results by Method 300.0.

DISPOSITION OF SAMPLES:

With concurrence from Pam Innis of EPA, perform phosphate analysis using Method 365.2. Describe in case narrative.

APPROVAL SIGNATURES:

R. C. Smith/ 12/9/94
OSM Project Coordinator (Print/Sign Name) Date

J. M. Ayres/ 12/13/94
Technical Representative (Print/Sign Name) Date

N/A
Quality Assurance (Print/Sign Name) Date

9613446.2375

SAMPLE AND DATA MANAGEMENT

RECORD OF DISPOSITION

ROD-B94-071
Record of Disposition No.

DATE: 11/17/94	LABORATORY: TMA
PROJECT TITLE/NO.: 100-FR-3 Groundwater-Round 6/B94-083	NCR NO.: N/A

SAMPLE IDENTIFICATION NUMBERS:

B0D864, B0D865, B0D866

DESCRIPTION OF EVENT:

Samples were shipped to TMA instead of Lockheed.

DISPOSITION OF SAMPLES:

TMA directed to maintain COC and forward samples to Lockheed.

APPROVAL SIGNATURES:

R. C. Smith/ R Clayt Smith — 1/4/95
OSM Project Coordinator (Print/Sign Name) — Date

J. M. Ayres/ J M Ay — 1/4/95
Technical Representative (Print/Sign Name) — Date

N/A
Quality Assurance (Print/Sign Name) — Date

9613446.2376

LOGIN CHAIN OF CUSTODY REPORT (ln01)
Nov 22 1994, 11:17 am

Login Number: L3310
Account: 596 Bechtel Hanford, Inc. * Richland, WA
Project: BECHTEL-HANFORD Bechtel Hanford Project

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L3310-1	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 130					
Water 1 S CLP 3/90 VOLATILES		Hold:22-NOV-94			
L3310-2	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: RFG18-49A3					
L3310-3	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: RFG18-49A3					
L3310-4	B0D866	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 130					
Water 1 S CLP 3/90 VOLATILES		Hold:22-NOV-94			
L3310-5	B0D866	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: RFG18-49A3					
L3310-6	B0D866	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: RFG18-49A3					
L3310-7	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: RFG01-43					
Water 1 S SCREENING		Hold:08-MAY-95			
L3310-8	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2 As and Pb only					
Location: RFG01-20A					
Water 1 S CLP FURNACE		Hold:08-MAY-95			
Water 1 S CLP ICP		Hold:08-MAY-95			
L3310-9	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 121					
Water 1 S 300.0 CHLORIDE		Hold:07-DEC-94			
Water 1 S 300.0 FLUORIDE					
Water 1 S 300.0 NITRATE		Hold:11-NOV-94			
Water 1 S 300.0 NITRITE		Hold:11-NOV-94			

Revised

1112596

9613446.2377

LOGIN CHAIN OF CUSTODY REPORT (ln01)
Nov 22 1994, 11:17 am

Login Number: L3310
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
Water 1 S 300.0 PHOSPHATE				
Water 1 S 300.0 SULFATE	Hold:07-DEC-94			
L3310-10	B0D864	09-NOV-94	12-NOV-94	22-DEC-94
temp 2				
Location: 156V-040				
Water 1 S GR ALP/BETA LAL-0060	Hold:08-MAY-95			
Water 1 S SR-90 LAL-0196	Hold:08-MAY-95			
L3310-11	B0D864	09-NOV-94	12-NOV-94	22-DEC-94
temp 2				
Location: 156V-040				
L3310-12	B0D864	09-NOV-94	12-NOV-94	22-DEC-94
temp 2				
Location: 156V-040				
L3310-13	B0D864	09-NOV-94	12-NOV-94	22-DEC-94
temp 2				
Location: 156V-040				
L3310-14	B0D864	09-NOV-94	12-NOV-94	22-DEC-94
temp 2				
Location: 156V-040				
Water 1 S C-14 LAL-0209	Hold:08-MAY-95			
Water 1 S TRITIUM(H3) LAL-0066	Hold:08-MAY-95			
*L3310-15	B0D865	09-NOV-94	12-NOV-94	22-DEC-94
temp 2 As and Pb only				
Location: RFG01-20A				
Filt H20 15 S CLP FURNACE	Hold:08-MAY-95			
Filt H20 15 S CLP ICP	Hold:08-MAY-95			
L3310-16	REPORT TYPE	12-NOV-94	12-NOV-94	22-DEC-94
Location:				
Water 1 S EDD - DISK DEL.				
Water 1 S INORG TYPE 4A RPT				

Changed matrix to Filtrate H_2O.

Signature: Paul C. Filauto

Date: 11-22-94

111259

9613446.2378

LOGIN CHAIN OF CUSTODY REPORT (ln01)
Nov 12 1994, 09:57 am

Login Number: L3310
Account: 596 Bechtel Hanford, Inc. * Richland, WA
Project: BECHTEL-HANFORD Bechtel Hanford Project

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L3310-1	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 157					
Water 1 S CLP 3/90 VOLATILES		Hold:22-NOV-94			
L3310-2	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 157					
L3310-3	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 157					
L3310-4	B0D866	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 157					
Water 1 S CLP 3/90 VOLATILES		Hold:22-NOV-94			
L3310-5	B0D866	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 157					
L3310-6	B0D866	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 157					
L3310-7	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 157					
Water 1 S SCREENING		Hold:08-MAY-95			
L3310-8	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2 "TARGET METALS=As,Pb"					
Location: 157					
Water 1 S CLP ICP		Hold:08-MAY-95			
Water 1 S CLP MERCURY		Hold:07-DEC-94			
L3310-9	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 157					
Water 1 S 300.0 CHLORIDE		Hold:07-DEC-94			
Water 1 S 300.0 FLUORIDE					
Water 1 S 300.0 NITRATE		Hold:11-NOV-94			
Water 1 S 300.0 NITRITE		Hold:11-NOV-94			

111259

9613446.2379

LOGIN CHAIN OF CUSTODY REPORT (ln01)
Nov 12 1994, 09:57 am

Login Number: L3310
Account: 596 Bechtel Hanford, Inc. * Richland, WA
Project: BECHTEL-HANFORD Bechtel Hanford Project

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
Water 1 S 300.0 PHOSPHATE					
Water 1 S 300.0 SULFATE		Hold:07-DEC-94			
L3310-10	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 157					
Water 1 S GR ALP/BETA LAL-0060		Hold:08-MAY-95			
Water 1 S SR-90 LAL-0196		Hold:08-MAY-95			
L3310-11	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 157					
L3310-12	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 157					
L3310-13	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 157					
L3310-14	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 157					
Water 1 S C-14 LAL-0209		Hold:08-MAY-95			
Water 1 S TRITIUM(H3) LAL-0066		Hold:08-MAY-95			
L3310-15	B0D865	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 157					
Water 1 S CLP ICP		Hold:08-MAY-95			
Water 1 S CLP MERCURY		Hold:07-DEC-94			
L3310-16	REPORT TYPE	12-NOV-94	12-NOV-94		22-DEC-94
Location:					
Water 1 S EDD - DISK DEL.					
Water 1 S INORG TYPE 4A RPT					

Signature: Paul C Davis

Date: 11-12-94

11/25

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

L3310

Page 1 of 1

Data Turnaround: [ ] Priorty [X] Normal

Collector: A. J. Simpson	Company Contact: D. St. John	Telephone No.: (509) 376-5376
Project Designation: 100-FR-3 Groundwater-Round 6	Sampling Location: 100 F	SAF No.: B94-083
Ice Chest No.: ER-410	Field Logbook No.: EFL-1054	Method of Shipment: Emery FED/EX 8825906176
Shipped To: Lockheed	Offsite Property No.: W95-0-0073-17	Bill of Lading/Air Bill No.: 1402135669
Possible Sample Hazards/Remarks		
Special Handling and/or Storage: Maintain between 2 C and 6 C.		

SAMPLE ANALYSIS																
Preservative	HNO3	None	HCl	HNO3	None	None		HNO3		HCl						
Type of Container	G	G	Gs	G/P	Gs	P		G		Gs						
No. of Container(s)	1	1	3	4	1	1		1		3						
Volume	500mL	500mL	40mL	1L	1L	20mL		500mL		40mL						
	ICP Metals, AA Metals-As, Pb (Unfiltered)	Anions-F, Cl, SO4, PO4, NO2, NO3	VOA	Total Alpha, Total Beta, Sr-90	C-14, Tritium	Activity Screen		ICP Metals, AA Metals-As, Pb (Filtered)		VOA						
Sample No.	Matrix*	Date Sampled	Time Sampled													
B00864	W	11/9/94	0905	X	X	X	X	X	X							
B00865	W	11/9/94	0905								X					
B00866	W	11/9/94	0905										X			

9619446.2380

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
K. Lee	11/9/94 1235	B. Whitten	11-9-94 1235
B. Whitten	11-10-94 0945	Tenn 25	11-11-94 1:00 PM
Tenn 25	11-11-94 4:00 P.M.		

SPECIAL INSTRUCTIONS

Data Deliverable-Standalone

Analysis for PO4, NO2, and NO3 by EPA 300.0 is being requested for information only. The BHI Contractor acknowledges the 48-hour holding will be exceeded.

The Activity Screen is for all three sample numbers.

Matrix*

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

LABORATORY SECTION

Received By: Paul C. Davis — Title: Sample Custodian — Date/Time: 11-12-94 9:15 AM

FINAL SAMPLE DISPOSITION

Disposal Method — Disposed By — Date/Time

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

9613446.2381

SAMPLE STATUS REPORT FOR N 3760. RAD SCREEN 199-F5-4 TIME: 11/10/94 7:51
DISPATCHED: 11/ 7/94 16:36 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 11/ 9/94 22:24

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
****	********	**********	***	***	******
4271	TOT-ACT	< 5.00000E 01 pCi/G	N	Y	XR5301

END OF REPORT

BOD864
BOD865
BOD866
BW
11-10-94

11125

9613446.2382

Revision 4

Figure 1

SAMPLE CHECK-IN LIST

(1 Per Shipping Container)

Date/Time Received 11-12-94 9:15AM Client Name Westinghouse - Hanford

Project/Client # SAT # B94-083 Batch or Case # N/A

Cooler ID (if noted on outside of cooler) ER-40

1. Condition of shipping container? GOOD
2. Custody Seals on cooler intact? Yes [X] No [ ]
3. Custody Seals dated and signed? Yes [X] No [ ]
4. Chain of Custody record is taped on inside of cooler lid? Yes [X] No [ ]
5. Vermiculite/packing material is: Wet [ ] Dry [X] _____
6. Each sample is in a plastic bag? Yes [ ] No [X] BUBBLE WRAP
7. Number of sample containers in cooler: 15
8. Samples have:
   - ____ tape
   - ____ hazard labels
   - X custody seals
   - ____ appropriate sample labels
9. Samples are:
   - X in good condition
   - ____ leaking
   - ____ broken
   - ____ have air bubbles
   - ____ other
10. Coolant Present? Yes [X] No [ ] Sample Temperature 2°C
11. The following paperwork should be accounted for (N/A if not applicable):

    Chain of Custody #(s) N/A

    Request for Analysis #(s) N/A

    Airbill # ~~FedEx~~ 882 882 5906 177 Rec 11-12-94 Carrier FedEx

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 DAVIS Paul Davis Date/Time 11-12-94 9:15AM

11125

9613446.2383 **Sample Login**

Login Review Checklist

Lot Number L-3310

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 ommited.

Sample Summary Report N/A	Yes	No
1. Are all sample IDs correct?	X	—
2. Are all samples present?	X	—
3. Are all matrices correct? (e.g., TCLP analyses should be on a TCLP leachate, field blanks should be water)	X	—
4. Are all analyses on the chain of custody/login quotation included?	X	—
5. Are analyses logged in for the correct container? (e.g., analyses requiring preservation logged in for a preserved container and vice versa)	X	—
6. Are samples logged in according to laboratory batching procedures? (e.g., TCLP regular leaching and associated metals/semivolatile organics should be logged in on the same bottle)	X	—

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

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

Paul C Davis 11-12-94 Paul C Davis 11-12-94

Primary review signature Date Secondary review signature Date

111259

8825906176

Lockheed Analytical Services
Sample Receiving Checklist

Client Name: Westing House - Hanford Job No. L3310 Cooler ID: 11A

COOLER CONDITION UPON RECEIPT

Temperature of cooler upon receipt: 2°C

temperature of temp. blank upon receipt:

	Yes	No	* Comments/Discrepancies
custody seals intact	X		
chain of custody present	X		
blue ice (or equiv.) present/frozen	X		
rad survey completed	X		

SAMPLE CONDITION UPON RECEIPT

	Yes	No	* Comments/Discrepancies
all bottles labeled	X		
samples intact	X		
proper container used for sample type	X		
sample volume sufficient for analysis	X		
proper pres. indicated on the COC	X		
VOA's contain headspace		X	
are samples bi-phasic (if so, indicate sample ID'S):			11A

MISCELLANEOUS ITEMS

	Yes	No	* Comments/Discrepancies
samples with short holding times	X		300.0 nitrate/ 300.0 nitrite
samples to subcontract		X	

ADDITIONAL COMMENTS/DISCREPANCIES THE Holding time for the unpreserved nitrate/nitrite was pass upon receipt.

Completed by / date: Paul C Davis 11-12-94

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*

9613446.2384

1128

version 2.0 (11/11/94)

9613446.2385

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

Client Sample Number	LAL Sample Number	SDG Number	Matrix	Method
B0D864	L3310-1		Water	CLP 3/90 VOLATILE
	L3310-7		Water	SCREENING
	L3310-8		Water	CLP ICP
	L3310-8		Water	CLP MERCURY
	L3310-9		Water	300.0 CHLORIDE
	L3310-9		Water	300.0 FLUORIDE
	L3310-9		Water	300.0 NITRATE
	L3310-9		Water	300.0 NITRITE
	L3310-9		Water	300.0 PHOSPHATE
	L3310-9		Water	300.0 SULFATE
	L3310-10		Water	GR ALP/BETA LAL-C
	L3310-10		Water	SR-90 LAL-0196
	L3310-14		Water	C-14 LAL-0209
	L3310-14		Water	TRITIUM(H3) LAL-C
B0D865	L3310-15		Water	CLP ICP
	L3310-15		Water	CLP MERCURY
B0D866	L3310-4		Water	CLP 3/90 VOLATILE
REPORT TYPE	L3310-16		Water	EDD - DISK DEL.
	L3310-16		Water	INORG TYPE 4A RP

11125

9613446.2386

LOGIN CHAIN OF CUSTODY REPORT (ln01)
Nov 21 1994, 09:34 am

Login Number: L3361
Account: 596 Bechtel Hanford, Inc. * Richland, WA
Project: BECHTEL-HANFORD Bechtel Hanford Project

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L3361-1	BOD867	17-NOV-94	19-NOV-94		29-DEC-94
temp 2					
Location: 157					
Water 1	S SCREENING	Hold:16-MAY-95			
L3361-2	BOD867	17-NOV-94	19-NOV-94		29-DEC-94
temp 2; As,Pb					
Location: 157					
Water 1	S CLP FURNACE	Hold:16-MAY-95			
Water 1	S CLP ICP	Hold:16-MAY-95			
L3361-3	BOD867	17-NOV-94	19-NOV-94		29-DEC-94
temp 2					
Location: 157					
Water 1	S 300.0 CHLORIDE	Hold:15-DEC-94			
Water 1	S 300.0 FLUORIDE				
Water 1	S 300.0 NITRATE	Hold:19-NOV-94			
Water 1	S 300.0 NITRITE	Hold:19-NOV-94			
Water 1	S 300.0 PHOSPHATE				
Water 1	S 300.0 SULFATE	Hold:15-DEC-94			
L3361-4	BOD867	17-NOV-94	19-NOV-94		29-DEC-94
temp 2					
Location: 157					
Water 1	S CLP 3/90 VOLATILES	Hold:29-NOV-94			
L3361-5	BOD867	17-NOV-94	19-NOV-94		29-DEC-94
temp 2					
Location: 157					
L3361-6	BOD867	17-NOV-94	19-NOV-94		29-DEC-94
temp 2					
Location: 157					
L3361-7	BOD867	17-NOV-94	19-NOV-94		29-DEC-94
temp 2					
Location: 157					
Water 1	S GR ALP/BETA LAL-0060	Hold:16-MAY-95			
Water 1	S SR-90 LAL-0196	Hold:16-MAY-95			
L3361-8	BOD867	17-NOV-94	19-NOV-94		29-DEC-94
temp 2					
Location: 157					

1119596

9613446.2387

LOGIN CHAIN OF CUSTODY REPORT (ln01)
Nov 21 1994, 09:34 am

Login Number: L3361
Account: 596 Bechtel Hanford, Inc. * Richland, WA
Project: BECHTEL-HANFORD Bechtel Hanford Project

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L3361-9	BOD867	17-NOV-94	19-NOV-94		29-DEC-94
temp 2					
Location: 157					
L3361-10	BOD867	17-NOV-94	19-NOV-94		29-DEC-94
temp 2					
Location: 157					
L3361-11	BOD867	17-NOV-94	19-NOV-94		29-DEC-94
temp 2					
Location: 157					
Water 1	S C-14 LAL-0209	Hold:16-MAY-95			
Water 1	S TRITIUM(H3) LAL-0066	Hold:16-MAY-95			
L3361-12	BOD868	17-NOV-94	19-NOV-94		29-DEC-94
temp 2; As,Pb					
Location: 157					
Filt H20 15	S CLP FURNACE	Hold:16-MAY-95			
Filt H20 15	S CLP ICP	Hold:16-MAY-95			
L3361-13	BOD869	17-NOV-94	19-NOV-94		29-DEC-94
temp 2					
Location: 157					
Water 1	S CLP 3/90 VOLATILES	Hold:29-NOV-94			
L3361-14	BOD869	17-NOV-94	19-NOV-94		29-DEC-94
temp 2					
Location: 157					
L3361-15	BOD869	17-NOV-94	19-NOV-94		29-DEC-94
temp 2					
Location: 157					
L3361-16	REPORT TYPE	21-NOV-94	19-NOV-94		29-DEC-94
Location:					
Water 1	S EDD - DISK DEL.				
Water 1	S INORG TYPE 4A RPT				

Signature: NMiller

Date: 11-21-94

119596

L3361

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: [ ] Priorty [X] Normal

Collector: A.J. Simpson	Company Contact: D. St. John	Telephone No.: (509) 376-5376
Project Designation: 100-FR-3 Groundwater-Round 6	Sampling Location: 100 F	SAF No.: B94-083
Ice Chest No.: ER-10	Field Logbook No.: EFL-1054	Method of Shipment: Emery
Shipped To: Lockheed	Offsite Property No.: W95-0-0073-29	Bill of Lading/Air Bill No.: 1472234247

Possible Sample Hazards/Remarks

Special Handling and/or Storage: Maintain between 2 C and 6 C.

SAMPLE ANALYSIS																
Preservative	HNO3	None	HCl	HNO3	None	None		HNO3		HCl						
Type of Container	G	G	Gs	G/P	Gs	P		G		Gs						
No. of Container(s)	1	1	3	4	1	1		1		3						
Volume	500mL	500mL	40mL	1L	1L	20mL		500mL		40mL						
	ICP Metals, AA Metals-As, Pb (Unfiltered)	Anions-F, Cl, SO4, PO4, NO2, NO3	VOA	Total Alpha, Total Beta, Sr-90	C-14, Tritium	Activity Screen		ICP Metals, AA Metals-As, Pb (Filtered)		VOA						
Sample No.	Matrix*	Date Sampled	Time Sampled													
B0D867	W	11/17/94	0846	X	X	X	X	X	X							
B0D868	W	11/17/94	0846								X					
B0D869	W	11/17/94	0846									X				

9611446.2388

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: K. Jay D. Lee	Date/Time: 11/17/94 1310	Received By: [signature]	Date/Time: 1310 11-17-94
Relinquished By: [signature]	Date/Time: 0800 11-18-94	Received By:	Date/Time:
Relinquished By:	Date/Time:	Received By:	Date/Time:
Relinquished By:	Date/Time:	Received By:	Date/Time:

SPECIAL INSTRUCTIONS

Data Deliverable-Standalone

Analysis for PO4, NO2, and NO3 by EPA 300.0 is being requested for information only. The BHI Contractor acknowledges the 48-hour holding will be exceeded.

The Activity Screen is for all three sample numbers.

Matrix*

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

LABORATORY SECTION	Received By	Title	Date/Time
	Paul C. Dahm	Sample Custodian	11-19-94 1600

FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

9613446.2389

SAMPLE STATUS REPORT FOR N 3758. RAD SCREEN 199-F5-1 TIME: 11/17/94 21:34
DISPATCHED: 11/ 7/94 16:36 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 11/17/94 21:23

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
****	********	**********	***	***	******
4271	TOT-ACT	< 5.00000E 01 pCi/G	N	Y	XR5301

END OF REPORT

BOD867
BOD868
BOD869
BW
11-18-94

1119596

9613446.2390

Login Review Checklist

Lot Number L3361

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 ommited.

Sample Summary Report N/A	Yes	No
1. Are all sample IDs correct?	X	
2. Are all samples present?	X	
3. Are all matrices correct? (e.g., TCLP analyses should be on a TCLP leachate, field blanks should be water)	X	
4. Are all analyses on the chain of custody/login quotation included?	X	
5. Are analyses logged in for the correct container? (e.g., analyses requiring preservation logged in for a preserved container and vice versa)	X	
6. Are samples logged in according to laboratory batching procedures? (e.g., TCLP regular leaching and associated metals/semivolatile organics should be logged in on the same bottle)	X	

Login Chain of Custody Report	Yes	No
1. Are the Collect, Receive , and Due dates correct for every sample?	X	
2. Have appropriate sample comments been included? (e.g., MS/MSD designation, comments from the client concerning method modifications)	X	

Sample Receiving Checklist	Yes	No
1. Are any discrepancies between the chain of custody and the login noted? (e.g., client IDs different on chains of custody and bottle labels, samples not sent, samples lost from breakage)	X	

Primary review signature	Date	Secondary review signature	Date
[illegible]	11-21-94	Derek C Henderson	11-21-94

111959

9613446.2391

Revision 4

Figure 1

SAMPLE CHECK-IN LIST

(1 Per Shipping Container)

Date/Time Received 11-21-94 16:00 Client Name WPCL Hanford

Project/Client # B94-083 Batch or Case # NA

Cooler ID (if noted on outside of cooler) ER-10

1. Condition of shipping container? Good
2. Custody Seals on cooler intact? Yes [X] No [ ]
3. Custody Seals dated and signed? Yes [X] No [ ]
4. Chain of Custody record is taped on inside of cooler lid? Yes [X] No [ ]
5. Vermiculite/packing material is: Wet [ ] Dry [X] _____
6. Each sample is in a plastic bag? Yes [X] No [ ] _____
7. Number of sample containers in cooler: 15
8. Samples have:
   - ____ tape
   - ____ hazard labels
   - X custody seals
   - X appropriate sample labels
9. Samples are:
   - X in good condition
   - ____ leaking
   - ____ broken
   - ____ have air bubbles
   - ____ other
10. Coolant Present? Yes [x] No [ ] Sample Temperature 2°C
11. The following paperwork should be accounted for (N/A if not applicable):

    Chain of Custody #(s) NA

    Request for Analysis #(s) NA

    Airbill # 147 2234247 Carrier Emery
12. Have any anomalies been identified above? Yes [ ] No [ ] NA
13. Memos have been initiated for all anomalies identified above? Yes [ ] NA

Printed Name/Signature M Mitle Date/Time 11-21-94

1119594

Lockheed Analytical Services
Sample Receiving Checklist

Client Name: Westing House Hanford Job No. L3361 Cooler ID:

COOLER CONDITION UPON RECEIPT

Temperature of cooler upon receipt: 2 °C

temperature of temp. blank upon receipt: —

	Yes	No	* Comments/Discrepancies
custody seals intact	X		
chain of custody present	X		
blue ice (or equiv.) present/frozen	X		
rad survey completed	X		

SAMPLE CONDITION UPON RECEIPT

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

MISCELLANEOUS ITEMS

	Yes	No	* Comments/Discrepancies
samples with short holding times		X	un-preserved Nitrates. out of holding time.
samples to subcontract		X	

ADDITIONAL COMMENTS/DISCREPANCIES

Completed by / date: [illegible] 11-21-94

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*

9613446.2392

359111

version 2.0 (11/11/94)

9613446.2393

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

Client Sample Number	LAL Sample Number	SDG Number	Matrix	Method
BOD867	L3361-1		Water	SCREENING
	L3361-2		Water	CLP FURNACE
	L3361-2		Water	CLP ICP
	L3361-3		Water	300.0 CHLORIDE
	L3361-3		Water	300.0 FLUORIDE
	L3361-3		Water	300.0 NITRATE
	L3361-3		Water	300.0 NITRITE
	L3361-3		Water	300.0 PHOSPHATE
	L3361-3		Water	300.0 SULFATE
	L3361-4		Water	CLP 3/90 VOLATIL
	L3361-7		Water	GR ALP/BETA LAL-
	L3361-7		Water	SR-90 LAL-0196
	L3361-11		Water	C-14 LAL-0209
	L3361-11		Water	TRITIUM(H3) LAL-
BOD868	L3361-12		Filt H20	CLP FURNACE-
	L3361-12		Filt H20	CLP ICP
BOD869	L3361-13		Water	CLP 3/90 VOLATIL
REPORT TYPE	L3361-16		Water	EDD - DISK DEL
	L3361-16		Water	INORG TYPE 4A RF

11195

Table of Contents

Metals and Non-Metals - Water
Sample Delivery Group No. L3310 & L3361

Description			Page
I.	Non-Metals Cover Page for Water Samples - SDG L3310 & L3361		
	A.	Environmental Water Sample Results	1
	B.	Calibration and Quality Control Data Summary	4
	C.	Raw Data	22
II.	Total Metals Cover Page for Water Samples - SDG L3310		85
	A.	Environmental Water Sample Results	86
	B.	Initial and Continuing Calibration Verification	87
	C.	Initial and Continuing Calibration Blanks	87
	D.	Preparation Blank	95
	E.	ICP Interference Check Sample	97
	F.	Matrix Spike Sample	99
	G.	Sample Duplicate	101
	H.	Laboratory Control Sample	103
	I.	ICP Serial Dilution	103A
	J.	Instrument Detection Limit	105
	K.	ICP Interelement Correction Factors	107
	L.	ICP Linear Ranges	110
	M.	Preparation Log	111
	N.	Analysis Run Log	114
III.	Total Metals Cover Page for Water Samples - SDG L3361		122
	A.	Environmental Water Sample Results	123
	B.	Initial and Continuing Calibration Verification	124
	C.	Initial and Continuing Calibration Blanks	124
	D.	Preparation Blank	132
	E.	ICP Interference Check Sample	134
	F.	Matrix Spike Sample	136
	G.	Sample Duplicate	138
	H.	Laboratory Control Sample	140
	I.	ICP Serial Dilution	141
	J.	Instrument Detection Limit	143
	K.	ICP Interelement Correction Factors	145
	L.	ICP Linear Ranges	148
	M.	Preparation Log	149

Table of Contents
(Continued)

Metals and Non-Metals - Water
Sample Delivery Group No. L3310 & L3361

Description **Page**

N. Analysis Run Log 152

IV. Dissolved Metals Cover Page for Water Samples - SDG L3310 160

A. Environmental Water Sample Results 161
B. Initial and Continuing Calibration Verification 162
C. Initial and Continuing Calibration Blanks 162
D. Preparation Blank 166
E. ICP Interference Check Sample 168
F. Matrix Spike Sample 169
G. Sample Duplicate 170
H. Laboratory Control Sample 171
I. ICP Serial Dilution 172
J. Instrument Detection Limit 173
K. ICP Interelement Correction Factors 176
L. ICP Linear Ranges 179
M. Preparation Log 180
N. Analysis Run Log 182

V. Dissolved Metals Cover Page for Water Samples - SDG L3361 186

A. Environmental Water Sample Results 187
B. Initial and Continuing Calibration Verification 188
C. Initial and Continuing Calibration Blanks 188
D. Preparation Blank 192
E. ICP Interference Check Sample 194
F. Matrix Spike Sample 195
G. Sample Duplicate 196
H. Laboratory Control Sample 197
I. ICP Serial Dilution 198
J. Instrument Detection Limit 199
K. ICP Interelement Correction Factors 202
L. ICP Linear Ranges 205
M. Preparation Log 206
N. Analysis Run Log 208

VI. ICP Metals Raw Data 212

VII. GFAA Metals Raw Data 404

VIII. Metals Prep Sheets 461

9613446 2396

LOCKHEED ANALYTICAL SERVICES

COMMON IONS AND ADDITIONAL ANALYTES

Sample Results

Client Sample ID: B0D864	Date Collected: 09-NOV-94
Matrix: Water	Date Received: 12-NOV-94

Constituent	Units	Method	Result	Reporting Det Limit	Data Qualifier(s)	Date Analyzed	LAS Batch ID	LAS Sample ID
Chloride	mg/L	300.0	36.	0.02		22-NOV-94	15783	L3310-9
Fluoride	mg/L	300.0	0.29	0.01		22-NOV-94	15784	L3310-9
Nitrate-N	mg/L	300.0	21.	0.02	H	22-NOV-94	15785	L3310-9
Nitrite-N	mg/L	300.0	< 0.01	0.01	H	22-NOV-94	15786	L3310-9
Sulfate	mg/L	300.0	100	0.1		22-NOV-94	15788	L3310-9
O-Phosphate-Phosphorus	mg/L	365.2	< 0.05	0.05	H	28-NOV-94	16105	L3310-9

LOCKHEED ANALYTICAL SERVICES

COMMON IONS AND ADDITIONAL ANALYTES

Sample Results

Client Sample ID: BOD867	Date Collected: 17-NOV-94
Matrix: Water	Date Received: 19-NOV-94

Constituent	Units	Method	Result	Reporting Det Limit	Data Qualifier(s)	Date Analyzed	LAS Batch ID	LAS Sample ID
Chloride	mg/L	300.0	3.8	0.02		22-NOV-94	15783	L3361-3
Fluoride	mg/L	300.0	0.058	0.01		22-NOV-94	15784	L3361-3
Nitrate-N	mg/L	300.0	3.4	0.02	H	22-NOV-94	15785	L3361-3
Nitrite-N	mg/L	300.0	< 0.01	0.01	H	22-NOV-94	15786	L3361-3
Sulfate	mg/L	300.0	35.	0.1		22-NOV-94	15788	L3361-3
O-Phosphate-Phosphorus	mg/L	365.2	< 0.05	0.05	H	28-NOV-94	16105	L3361-3

9613446.2398

CLP

1

INORGANIC ANALYSES DATA SHEET

CLIENT ID NO.

BOD864

Lab Name: L.A.S. Contract: BECHTEL-HA

Lab Code: LOCK Case No.: 1112WH SAS No.: SDG No.: L3310W

Matrix (soil/water): WATER Lab Sample ID: L3310-8

Level (low/med): LOW Date Received: 11/12/94

% 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	3.0	U	W	F
7440-39-3	Barium	52.0	B		P
7440-41-7	Beryllium	1.0	U		P
7440-43-9	Cadmium	4.0	U		P
7440-70-2	Calcium	95700			P
7440-47-3	Chromium	16.3			P
7440-48-4	Cobalt	6.0	U		P
7440-50-8	Copper	3.0	U		P
7439-89-6	Iron	25.0	B		P
7439-92-1	Lead	2.0	U		F
7439-95-4	Magnesium	22000			P
7439-96-5	Manganese	1.0	U		P
7440-02-0	Nickel	10.0	U		P
7440-09-7	Potassium	5740			P
7782-49-2	Selenium	90.0	U		P
7440-22-4	Silver	4.0	U		P
7440-23-5	Sodium	28200			P
7440-28-0	Thallium	500	U		P
7440-62-2	Vanadium	6.8	B		P
7440-66-6	Zinc	8.8	B		P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

9613446.2399

CLP

1

INORGANIC ANALYSES DATA SHEET

CLIENT ID NO.

BOD867

Lab Name: L.A.S. Contract: BECHTEL-HA

Lab Code: LOCK Case No.: 1112WH SAS No.: SDG No.: L3361W

Matrix (soil/water): WATER Lab Sample ID: L3361-2

Level (low/med): LOW Date Received: 11/19/94

% 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	3.0	U	W	F
7440-39-3	Barium	48.7	B		P
7440-41-7	Beryllium	1.0	U		P
7440-43-9	Cadmium	4.0	U		P
7440-70-2	Calcium	44300			P
7440-47-3	Chromium	4.6	B		P
7440-48-4	Cobalt	6.0	U		P
7440-50-8	Copper	3.0	U		P
7439-89-6	Iron	221			P
7439-92-1	Lead	2.0	U	W	F
7439-95-4	Magnesium	6780			P
7439-96-5	Manganese	4.5	B		P
7440-02-0	Nickel	10.0	U		P
7440-09-7	Potassium	2150	B		P
7782-49-2	Selenium	90.0	U		P
7440-22-4	Silver	4.0	U		P
7440-23-5	Sodium	4360	B		P
7440-28-0	Thallium	500	U		P
7440-62-2	Vanadium	3.0	U		P
7440-66-6	Zinc	32.3			P

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

9613446.2400

CLP

1

INORGANIC ANALYSES DATA SHEET

CLIENT ID NO.

BOD865

Lab Name: L.A.S. Contract: BECHTEL-HA

Lab Code: LOCK Case No.: 1112WH SAS No.: SDG No.: L3310F

Matrix (soil/water): WATER Lab Sample ID: L3310-15

Level (low/med): LOW Date Received: 11/12/94

% 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	3.0	U	W	F
7440-39-3	Barium	58.6	B		P
7440-41-7	Beryllium	1.0	U		P
7440-43-9	Cadmium	4.0	U		P
7440-70-2	Calcium	120000		E	P
7440-47-3	Chromium	15.3			P
7440-48-4	Cobalt	6.0	U		P
7440-50-8	Copper	3.0	U		P
7439-89-6	Iron	7.2	B		P
7439-92-1	Lead	2.0	U		F
7439-95-4	Magnesium	26500			P
7439-96-5	Manganese	1.0	U		P
7440-02-0	Nickel	10.0	U		P
7440-09-7	Potassium	6120			P
7782-49-2	Selenium	90.0	U		P
7440-22-4	Silver	4.0	U		P
7440-23-5	Sodium	32700			P
7440-28-0	Thallium	500	U		P
7440-62-2	Vanadium	3.4	B		P
7440-66-6	Zinc	24.5			P

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:
TURBIDITY 0.32

FORM I - IN

9613446.2401

CLP

1

INORGANIC ANALYSES DATA SHEET

CLIENT ID NO.

BOD868

Lab Name: L.A.S. Contract: BECHTEL-HA

Lab Code: LOCK Case No.: 1112WH SAS No.: SDG No.: L3361F

Matrix (soil/water): WATER Lab Sample ID: L3361-12

Level (low/med): LOW Date Received: 11/19/94

% 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	3.0	U		F
7440-39-3	Barium	50.5	B		P
7440-41-7	Beryllium	1.0	U		P
7440-43-9	Cadmium	4.0	U		P
7440-70-2	Calcium	50900		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	9.6	B		P
7439-92-1	Lead	2.0	U		F
7439-95-4	Magnesium	7350			P
7439-96-5	Manganese	1.4	B		P
7440-02-0	Nickel	10.0	U		P
7440-09-7	Potassium	2400	B		P
7782-49-2	Selenium	90.0	U		P
7440-22-4	Silver	4.0	U		P
7440-23-5	Sodium	4730	B		P
7440-28-0	Thallium	500	U		P
7440-62-2	Vanadium	3.0	U		P
7440-66-6	Zinc	25.1			P

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:
TURBIDITY 0.12

FORM I - IN

9613446.2402

LOGIN CHAIN OF CUSTODY REPORT (ln01)
Nov 12 1994, 09:57 am

Login Number: L3310
Account: 596 Bechtel Hanford, Inc. * Richland, WA
Project: BECHTEL-HANFORD Bechtel Hanford Project

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L3310-1	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 157					
Water 1 S CLP 3/90 VOLATILES		Hold:22-NOV-94			
L3310-2	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 157					
L3310-3	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 157					
L3310-4	B0D866	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 157					
Water 1 S CLP 3/90 VOLATILES		Hold:22-NOV-94			
L3310-5	B0D866	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 157					
L3310-6	B0D866	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 157					
L3310-7	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 157					
Water 1 S SCREENING		Hold:08-MAY-95			
L3310-8	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2 "TARGET METALS=As,Pb"					
Location: 157					
Water 1 S CLP ICP		Hold:08-MAY-95			
Water 1 S CLP MERCURY		Hold:07-DEC-94			
L3310-9	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 157					
Water 1 S 300.0 CHLORIDE		Hold:07-DEC-94			
Water 1 S 300.0 FLUORIDE					
Water 1 S 300.0 NITRATE		Hold:11-NOV-94			
Water 1 S 300.0 NITRITE		Hold:11-NOV-94			

01

9613446.2403

LOGIN CHAIN OF CUSTODY REPORT (ln01)
Nov 12 1994, 09:57 am

Login Number: L3310
Account: 596 Bechtel Hanford, Inc. * Richland, WA
Project: BECHTEL-HANFORD Bechtel Hanford Project

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
Water 1	S 300.0 PHOSPHATE				
Water 1	S 300.0 SULFATE	Hold:07-DEC-94			
L3310-10	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 157					
Water 1	S GR ALP/BETA LAL-0060	Hold:08-MAY-95			
Water 1	S SR-90 LAL-0196	Hold:08-MAY-95			
L3310-11	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 157					
L3310-12	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 157					
L3310-13	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 157					
L3310-14	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 157					
Water 1	S C-14 LAL-0209	Hold:08-MAY-95			
Water 1	S TRITIUM(H3) LAL-0066	Hold:08-MAY-95			
L3310-15	B0D865	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 157					
Water 1	S CLP ICP	Hold:08-MAY-95			
Water 1	S CLP MERCURY	Hold:07-DEC-94			
L3310-16	REPORT TYPE	12-NOV-94	12-NOV-94		22-DEC-94
Location:					
Water 1	S EDD - DISK DEL.				
Water 1	S INORG TYPE 4A RPT				

02

Signature: Paul C. Davis

Date: 11-12-94

9613446.2404

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

Client Sample Number	LAL Sample Number	SDG Number	Matrix	Method
B0D864	L3310-1		Water	CLP 3/90 VOLAT
	L3310-7		Water	SCREENING
	L3310-8		Water	CLP ICP
	L3310-8		Water	CLP MERCURY
	L3310-9		Water	300.0 CHLORIDE
	L3310-9		Water	300.0 FLUORIDE
	L3310-9		Water	300.0 NITRATE
	L3310-9		Water	300.0 NITRITE
	L3310-9		Water	300.0 PHOSPHAT
	L3310-9		Water	300.0 SULFATE
	L3310-10		Water	GR ALP/BETA LA
	L3310-10		Water	SR-90 LAL-0196
	L3310-14		Water	C-14 LAL-0209
	L3310-14		Water	TRITIUM(H3) LA
B0D865	L3310-15		Water	CLP ICP
	L3310-15		Water	CLP MERCURY
B0D866	L3310-4		Water	CLP 3/90 VOLAT
REPORT TYPE	L3310-16		Water	EDD - DISK DEL
	L3310-16		Water	INORG TYPE 4A

VOA CLP 1

Westinghouse Hanford Company

Rec'd 11-12-94

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

L3310

Page 1 of 1

Data Turnaround: [ ] Priorty [X] Normal

Collector: A.J Simpson	Company Contact: D. St. John	Telephone No.: (509) 376-5376
Project Designation: 100-FR-3 Groundwater-Round 6	Sampling Location: 100 F	SAF No.: B94-083
Ice Chest No.: ER-410	Field Logbook No.: EFL-1054	Method of Shipment: Emery FED/EX 8825906176
Shipped To: Lockheed	Offsite Property No.: W95-0-0073-17	Bill of Lading/Air Bill No.: 1402135669

Possible Sample Hazards/Remarks

Special Handling and/or Storage: Maintain between 2 C and 6 C.

SAMPLE ANALYSIS																
Preservative	HNO3	None	HCl	HNO3	None	None		HNO3		HCl						
Type of Container	G	G	Gs	G/P	Gs	P		G		Gs						
No. of Container(s)	1	1	3	4	1	1		1		3						
Volume	500mL	500mL	40mL	1L	1L	20mL		500mL		40mL						
	ICP Metals, AA Metals-As, Pb (Unfiltered)	Anions-F, Cl, SO4, PO4, NO2, NO3	VOA	Total Alpha, Total Beta, Sr-90	C-14, Tritium	Activity Screen		ICP Metals, AA Metals-As, Pb (Filtered)		VOA						
Sample No. / Matrix* / Date Sampled / Time Sampled																
B0D864 / W / 11/9/94 / 0905	X	X	X	X	X	X										
B0D865 / W / 11/9/94 / 0905								X								
B0D866 / W / 11/9/94 / 0905										X						

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By	Date/Time	Received By	Date/Time
[signature]	11/9/94 1235	[signature] B Whitson	11-9-94 1235
[signature] B Whitson	11-10-94 0945	[signature]	11-11-94 1:00PM
[signature]	11-11-94 4:00PM		

SPECIAL INSTRUCTIONS

Data Deliverable-Standalone

Analysis for PO4, NO2, and NO3 by EPA 300.0 is being requested for information only. The BHI Contractor acknowledges the 48-hour holding will be exceeded.

The Activity Screen is for all three sample numbers.

Matrix*

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

LABORATORY SECTION	Received By	Title	Date/Time
	[signature]	Sample Custodian	11-12-94 9:15AM

FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

DISTRIBUTION: Original, Sample, Yellow, Sampler

BC-6000-828 (12/92)

9613446.2405

9613446.2406

SAMPLE STATUS REPORT FOR N 3760. RAD SCREEN 199-F5-4 TIME: 11/10/94 7:51
DISPATCHED: 11/ 7/94 16:36 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 11/ 9/94 22:24

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
****	********	**********	***	***	******
4271	TOT-ACT	< 5.00000E 01 pCi/G	N	Y	XR5301

END OF REPORT

BOD864
BOD865
BOD866
BW
11-10-94

05

9613446.2407

Revision 4

Figure 1

SAMPLE CHECK-IN LIST

(1 Per Shipping Container)

Date/Time Received 11-12-94 9:15 AM Client Name Westinghouse - Hanford

Project/Client # SAF # B94-053 Batch or Case # N/A

Cooler ID (if noted on outside of cooler) ER-40

1. Condition of shipping container? GOOD
2. Custody Seals on cooler intact? Yes [x] No [ ]
3. Custody Seals dated and signed? Yes [x] No [ ]
4. Chain of Custody record is taped on inside of cooler lid? Yes [x] No [ ]
5. Vermiculite/packing material is: Wet [ ] Dry [x] _____
6. Each sample is in a plastic bag? Yes [ ] No [x] BUBBLE WRAP
7. Number of sample containers in cooler: 15
8. Samples have:
   - ____ tape
   - ____ hazard labels
   - X custody seals
   - ____ appropriate sample labels
9. Samples are:
   - X in good condition
   - ____ leaking
   - ____ broken
   - ____ have air bubbles
   - ____ other
10. Coolant Present? Yes [x] No [ ] Sample Temperature 2°
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 # ~~FED/EX~~ 882 582 5706 177 Rec 11-12-94 Carrier FED/EX
12. Have any anomalies been identified above? Yes [ ] No [ ] N/A
13. Memos have been initiated for all anomalies identified above? Yes [ ] N/A

06

Printed Name/Signature PAUL C DAVIS Paul C Davis Date/Time 11-12-94 9:15 AM

9613446.2408

Sample Login

Login Review Checklist

Lot Number 1-3310

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 ommited.

Sample Summary Report N/A	Yes	No
1. Are all sample IDs correct?	X	—
2. Are all samples present?	X	—
3. Are all matrices correct? (e.g., TCLP analyses should be on a TCLP leachate, field blanks should be water)	X	—
4. Are all analyses on the chain of custody/login quotation included?	X	—
5. Are analyses logged in for the correct container? (e.g., analyses requiring preservation logged in for a preserved container and vice versa)	X	—
6. Are samples logged in according to laboratory batching procedures? (e.g., TCLP regular leaching and associated metals/semivolatile organics should be logged in on the same bottle)	X	—

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

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

Paul C Davis 11-12-94 Paul C Davis 11-12-94

Primary review signature Date Secondary review signature Date

07

8825906176

Lockheed Analytical Services
Sample Receiving Checklist

Client Name: Westing House-Hanford Job No. L3310 Cooler ID: 11A

COOLER CONDITION UPON RECEIPT

Temperature of cooler upon receipt: 2°C

temperature of temp. blank upon receipt:

	Yes	No	* Comments/Discrepancies
custody seals intact	X		
chain of custody present	X		
blue ice (or equiv.) present/frozen	X		
rad survey completed	X		

SAMPLE CONDITION UPON RECEIPT

	Yes	No	* Comments/Discrepancies
all bottles labeled	X		
samples intact	X		
proper container used for sample type	X		
sample volume sufficient for analysis	X		
proper pres. indicated on the COC	X		
VOA's contain headspace		X	
are samples bi-phasic (if so, indicate sample ID'S):			11A

MISCELLANEOUS ITEMS

	Yes	No	* Comments/Discrepancies
samples with short holding times	X		300.0 nitrate/ 300.0 nitrite
samples to subcontract		X	

ADDITIONAL COMMENTS/DISCREPANCIES The holding time for the unpreserved nitrate/nitrite was pass upon receipt.

Completed by / date: Paul C Davis 11-12-94

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*

9613446.2409

version 2.0 (10/11/94)

9613446.2410

LOGIN CHAIN OF CUSTODY REPORT (ln01)
Nov 21 1994, 09:34 am

Login Number: L3361
Account: 596 Bechtel Hanford, Inc. * Richland, WA
Project: BECHTEL-HANFORD Bechtel Hanford Project

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L3361-1	BOD867	17-NOV-94	19-NOV-94		29-DEC-9
temp 2					
Location: 157					
Water 1	S SCREENING	Hold:16-MAY-95			
L3361-2	BOD867	17-NOV-94	19-NOV-94		29-DEC-9
temp 2; As,Pb					
Location: 157					
Water 1	S CLP FURNACE	Hold:16-MAY-95			
Water 1	S CLP ICP	Hold:16-MAY-95			
L3361-3	BOD867	17-NOV-94	19-NOV-94		29-DEC-9
temp 2					
Location: 157					
Water 1	S 300.0 CHLORIDE	Hold:15-DEC-94			
Water 1	S 300.0 FLUORIDE				
Water 1	S 300.0 NITRATE	Hold:19-NOV-94			
Water 1	S 300.0 NITRITE	Hold:19-NOV-94			
Water 1	S 300.0 PHOSPHATE				
Water 1	S 300.0 SULFATE	Hold:15-DEC-94			
L3361-4	BOD867	17-NOV-94	19-NOV-94		29-DEC-9
temp 2					
Location: 157					
Water 1	S CLP 3/90 VOLATILES	Hold:29-NOV-94			
L3361-5	BOD867	17-NOV-94	19-NOV-94		29-DEC-9
temp 2					
Location: 157					
L3361-6	BOD867	17-NOV-94	19-NOV-94		29-DEC-9
temp 2					
Location: 157					
L3361-7	BOD867	17-NOV-94	19-NOV-94		29-DEC-9
temp 2					
Location: 157					
Water 1	S GR ALP/BETA LAL-0060	Hold:16-MAY-95			
Water 1	S SR-90 LAL-0196	Hold:16-MAY-95			
L3361-8	BOD867	17-NOV-94	19-NOV-94		29-DEC-9
temp 2					
Location: 157					

09

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LOGIN CHAIN OF CUSTODY REPORT (ln01)
Nov 21 1994, 09:34 am

Login Number: L3361
Account: 596 Bechtel Hanford, Inc. * Richland, WA
Project: BECHTEL-HANFORD Bechtel Hanford Project

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L3361-9	BOD867	17-NOV-94	19-NOV-94		29-DEC-94
temp 2					
Location: 157					
L3361-10	BOD867	17-NOV-94	19-NOV-94		29-DEC-94
temp 2					
Location: 157					
L3361-11	BOD867	17-NOV-94	19-NOV-94		29-DEC-94
temp 2					
Location: 157					
Water 1	S C-14 LAL-0209	Hold:16-MAY-95			
Water 1	S TRITIUM(H3) LAL-0066	Hold:16-MAY-95			
L3361-12	BOD868	17-NOV-94	19-NOV-94		29-DEC-94
temp 2; As,Pb					
Location: 157					
Filt H20 15	S CLP FURNACE	Hold:16-MAY-95			
Filt H20 15	S CLP ICP	Hold:16-MAY-95			
L3361-13	BOD869	17-NOV-94	19-NOV-94		29-DEC-94
temp 2					
Location: 157					
Water 1	S CLP 3/90 VOLATILES	Hold:29-NOV-94			
L3361-14	BOD869	17-NOV-94	19-NOV-94		29-DEC-94
temp 2					
Location: 157					
L3361-15	BOD869	17-NOV-94	19-NOV-94		29-DEC-94
temp 2					
Location: 157					
L3361-16	REPORT TYPE	21-NOV-94	19-NOV-94		29-DEC-94
Location:					
Water 1	S EDD - DISK DEL.				
Water 1	S INORG TYPE 4A RPT				

10

Signature: Mmiller

Date: 11-21-94

1119596

L3361

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: [ ] Priorty [X] Normal

Collector: A.J. Simpson	Company Contact: D. St. John	Telephone No.: (509) 376-5376
Project Designation: 100-FR-3 Groundwater-Round 6	Sampling Location: 100 F	SAF No.: B94-083
Ice Chest No.: ER-10	Field Logbook No.: GFL-1054	Method of Shipment: Emery
Shipped To: Lockheed	Offsite Property No.: W95-0-0073-29	Bill of Lading/Air Bill No.: 1472234247
Possible Sample Hazards/Remarks		
Special Handling and/or Storage: Maintain between 2 C and 6 C.		

SAMPLE ANALYSIS																	
			Preservative	HNO3	None	HCl	HNO3	None	None		HNO3		HCl				
			Type of Container	G	G	Gs	G/P	Gs	P		G		Gs				
			No. of Container(s)	1	1	3	4	1	1		1		3				
			Volume	500mL	500mL	40mL	1L	1L	20mL		500mL		40mL				
				ICP Metals, AA Metals-As, Pb (Unfiltered)	Anions-F, Cl, SO4, PO4, NO2, NO3	VOA	Total Alpha, Total Beta, Sr-90	C-14, Tritium	Activity Screen		ICP Metals, AA Metals-As, Pb (Filtered)		VOA				
Sample No.	Matrix*	Date Sampled	Time Sampled														
B0D867	W	11/17/94	0846	X	X	X	X	X	X								
B0D868	W	11/17/94	0846								X						
B0D869	W	11/17/94	0846										X				

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Kirby Olson	Date/Time: 11/17/94 1310	Received By: Bill Butler BWHtec	Date/Time: 11-17-94 1310
Relinquished By: Bill Butler BWHtec	Date/Time: 11-18-94 0800	Received By:	Date/Time:
Relinquished By:	Date/Time:	Received By:	Date/Time:
Relinquished By:	Date/Time:	Received By:	Date/Time:

SPECIAL INSTRUCTIONS

Data Deliverable-Standalone

Analysis for PO4, NO2, and NO3 by EPA 300.0 is being requested for information only. The BHI Contractor acknowledges the 48-hour holding will be exceeded.

The Activity Screen is for all three sample numbers.

Matrix*

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

LABORATORY SECTION	Received By: Paul C. Dawson	Title: Sample Custodian	Date/Time: 11-19-94 16:00
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

9012496.2912

9613446.2413

SAMPLE STATUS REPORT FOR N 3758. RAD SCREEN 199-F5-1 TIME: 11/17/94 21:34
DISPATCHED: 11/ 7/94 16:36 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 11/17/94 21:23

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
****	********	**********	***	***	******
4271	TOT-ACT	< 5.00000E 01 pCi/G	N	Y	XR5301

END OF REPORT

BOD867
BOD868
BOD869
BW
11-18-94

12

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Sample Login

Login Review Checklist

Lot Number L3361

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 ommited.

Sample Summary Report N/A	Yes	No
1. Are all sample IDs correct?	X	
2. Are all samples present?	X	
3. Are all matrices correct? (e.g., TCLP analyses should be on a TCLP leachate, field blanks should be water)	X	
4. Are all analyses on the chain of custody/login quotation included?	X	
5. Are analyses logged in for the correct container? (e.g., analyses requiring preservation logged in for a preserved container and vice versa)	X	
6. Are samples logged in according to laboratory batching procedures? (e.g., TCLP regular leaching and associated metals/semivolatile organics should be logged in on the same bottle)	X	

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

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

[illegible] 11-21-94 Derek C. Henderson 11-21-94

Primary review signature Date Secondary review signature Date

13

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Figure 1

SAMPLE CHECK-IN LIST

(1 Per Shipping Container)

Date/Time Received 11-21-94 16:00 Client Name Livestock House Hanford

Project/Client # B94-083 Batch or Case # NA

Cooler ID (if noted on outside of cooler) ER-10

1. Condition of shipping container? Good
2. Custody Seals on cooler intact? Yes [X] No [ ]
3. Custody Seals dated and signed? Yes [X] No [ ]
4. Chain of Custody record is taped on inside of cooler lid? Yes [X] No [ ]
5. Vermiculite/packing material is: Wet [ ] Dry [X]
6. Each sample is in a plastic bag? Yes [X] No [ ]
7. Number of sample containers in cooler: 15
8. Samples have:
   - ____ tape
   - ____ hazard labels
   - X custody seals
   - X appropriate sample labels
9. Samples are:
   - X in good condition
   - ____ leaking
   - ____ broken
   - ____ have air bubbles
   - ____ other
10. Coolant Present? Yes [x] No [ ] Sample Temperature 2°C
11. The following paperwork should be accounted for (N/A if not applicable):

    Chain of Custody #(s) NA

    Request for Analysis #(s) NA

    Airbill # 147 2234247 Carrier Emery
12. Have any anomalies been identified above? Yes [ ] No [ ] NA
13. Memos have been initiated for all anomalies identified above? Yes [ ] NA

Printed Name/Signature Mmtle Date/Time 11-21-94

14

111959

Lockheed Analytical Services
Sample Receiving Checklist

Client Name: Westing House Hanford Job No. L3361 Cooler ID:

COOLER CONDITION UPON RECEIPT

Temperature of cooler upon receipt: 2°C

temperature of temp. blank upon receipt: —

	Yes	No	* Comments/Discrepancies
custody seals intact	X		
chain of custody present	X		
blue ice (or equiv.) present/frozen	X		
rad survey completed	X		

SAMPLE CONDITION UPON RECEIPT

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

MISCELLANEOUS ITEMS

	Yes	No	* Comments/Discrepancies
samples with short holding times		X	un-preserved Nitrates - out of holding time.
samples to subcontract		X	

ADDITIONAL COMMENTS/DISCREPANCIES

Completed by / date: [illegible] 11-21-94

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*

9613446.2416

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version 2.0 (11/11/94)

9613446.2417

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

Client Sample Number	LAL Sample Number	SDG Number	Matrix	Method
BOD867	L3361-1		Water	SCREENING
	L3361-2		Water	CLP FURNACE
	L3361-2		Water	CLP ICP
	L3361-3		Water	300.0 CHLORIDE
	L3361-3		Water	300.0 FLUORIDE
	L3361-3		Water	300.0 NITRATE
	L3361-3		Water	300.0 NITRITE
	L3361-3		Water	300.0 PHOSPHATE
	L3361-3		Water	300.0 SULFATE
	L3361-4		Water	CLP 3/90 VOLATIL
	L3361-7		Water	GR ALP/BETA LAL-
	L3361-7		Water	SR-90 LAL-0196
	L3361-11		Water	C-14 LAL-0209
	L3361-11		Water	TRITIUM(H3) LAL-
BOD868	L3361-12		Filt H20	CLP FURNACE
	L3361-12		Filt H20	CLP ICP
BOD869	L3361-13		Water	CLP 3/90 VOLATIL
REPORT TYPE	L3361-16		Water	EDD - DISK DEL
	L3361-16		Water	INORG TYPE 4A RF

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LOCKHEED ANALYTICAL LABORATORY
VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

BOD864

Lab Job Name:BECHTEL-HANFORD Contract:_

Lab Code:LAL Case No.: SAS No.: SDG No.:L3310

Matrix: (soil/water) WATER Lab Sample ID:L3310-1

Sample wt/vol: 5.00 (g/ml) ML Lab File ID: D3514

Level: (low/med) LOW Date Received:11/12/94

% Moisture: not dec. 0 Date Analyzed:11/16/94

GC Column:RTX502.2 ID: 0.53(mm) Dilution Factor: 1.00

Soil Extract Volume: 1.00 (ML) Soil Aliquot Volume: 1.00(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L_	Q
74-87-3	Chloromethane	10.	U
74-83-9	Bromomethane	10.	U
75-01-4	Vinyl Chloride	10.	U
75-00-3	Chloroethane	10.	U
75-09-2	Methylene Chloride	10.	U
67-64-1	Acetone	10.	U
75-15-0	Carbon Disulfide	10.	U
75-35-4	1,1-Dichloroethene	10.	U
75-34-3	1,1-Dichloroethane	10.	U
540-59-0	1,2-Dichloroethene (total)	10.	U
67-66-3	Chloroform	10.	U
107-06-2	1,2-Dichloroethane	10.	U
78-93-3	2-Butanone	10.	U
71-55-6	1,1,1-Trichloroethane	10.	U
56-23-5	Carbon Tetrachloride	10.	U
75-27-4	Bromodichloromethane	10.	U
78-87-5	1,2-Dichloropropane	10.	U
10061-01-5	cis-1,3-Dichloropropene	10.	U
79-01-6	Trichloroethene	10.	U
124-48-1	Dibromochloromethane	10.	U
79-00-5	1,1,2-Trichloroethane	10.	U
71-43-2	Benzene	10.	U
10061-02-6	trans-1,3-Dichloropropene	10.	U
75-25-2	Bromoform	10.	U
108-10-1	4-Methyl-2-Pentanone	10.	U
591-78-6	2-Hexanone	10.	U
127-18-4	Tetrachloroethene	10.	U
79-34-5	1,1,2,2-Tetrachloroethane	10.	U
108-88-3	Toluene	10.	U
108-90-7	Chlorobenzene	10.	U
100-41-4	Ethylbenzene	10.	U
100-42-5	Styrene	10.	U
1330-20-7	Xylenes (total)	10.	U

FORM I - CLP VOA

9413446.2449

LOCKHEED ANALYTICAL LABORATORY
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CUSTOMER SAMPLE NO.

BOD864

Lab Job Name:BECHTEL-HANFORD Contract:_

Lab Code:LAL Case No.: SAS No.: SDG No.:L3310

Matrix: (soil/water) WATER Lab Sample ID:L3310-1

Sample wt/vol: 5.00 (g/ml) ML Lab File ID: D3514

Level: (low/med) LOW Date Received:11/12/94

% Moisture: not dec. 0 Date Analyzed:11/16/94

GC Column:RTX502.2 ID: 0.53(mm) Dilution Factor: 1.00

Soil Extract Volume: 1.00 (uL) Soil Aliquot Volume: 1.00(uL)

Number TICs Found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L_

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
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FORM I - CLP VOA-TIC

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LC 12-20-94

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LOCKHEED ANALYTICAL LABORATORY
VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

BOD866

Lab Job Name:BECHTEL-HANFORD Contract:_

Lab Code:LAL Case No.: SAS No.: SDG No.:L3310

Matrix: (soil/water) WATER Lab Sample ID:L3310-4

Sample wt/vol: 5.00 (g/ml) ML Lab File ID: D3515

Level: (low/med) LOW Date Received:11/12/94

% Moisture: not dec. 0 Date Analyzed:11/16/94

GC Column:RTX502.2 ID: 0.53(mm) Dilution Factor: 1.00

Soil Extract Volume: 1.00 (ML) Soil Aliquot Volume: 1.00(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L_	Q
74-87-3	Chloromethane	10.	U
74-83-9	Bromomethane	10.	U
75-01-4	Vinyl Chloride	10.	U
75-00-3	Chloroethane	10.	U
75-09-2	Methylene Chloride	10.	U
67-64-1	Acetone	4.	J
75-15-0	Carbon Disulfide	10.	U
75-35-4	1,1-Dichloroethene	10.	U
75-34-3	1,1-Dichloroethane	10.	U
540-59-0	1,2-Dichloroethene (total)	10.	U
67-66-3	Chloroform	10.	U
107-06-2	1,2-Dichloroethane	10.	U
78-93-3	2-Butanone	10.	U
71-55-6	1,1,1-Trichloroethane	10.	U
56-23-5	Carbon Tetrachloride	10.	U
75-27-4	Bromodichloromethane	10.	U
78-87-5	1,2-Dichloropropane	10.	U
10061-01-5	cis-1,3-Dichloropropene	10.	U
79-01-6	Trichloroethene	10.	U
124-48-1	Dibromochloromethane	10.	U
79-00-5	1,1,2-Trichloroethane	10.	U
71-43-2	Benzene	10.	U
10061-02-6	trans-1,3-Dichloropropene	10.	U
75-25-2	Bromoform	10.	U
108-10-1	4-Methyl-2-Pentanone	10.	U
591-78-6	2-Hexanone	10.	U
127-18-4	Tetrachloroethene	10.	U
79-34-5	1,1,2,2-Tetrachloroethane	10.	U
108-88-3	Toluene	10.	U
108-90-7	Chlorobenzene	10.	U
100-41-4	Ethylbenzene	10.	U
100-42-5	Styrene	10.	U
1330-20-7	Xylenes (total)	10.	U

9613446.2421

LOCKHEED ANALYTICAL LABORATORY
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CUSTOMER SAMPLE NO.

BOD866

Lab Job Name:BECHTEL-HANFORD Contract:_

Lab Code:LAL Case No.: SAS No.: SDG No.:L3310

Matrix: (soil/water) WATER Lab Sample ID:L3310-4

Sample wt/vol: 5.00 (g/ml) ML Lab File ID: D3515

Level: (low/med) LOW Date Received:11/12/94

% Moisture: not dec. 0 Date Analyzed:11/16/94

GC Column:RTX502.2 ID: 0.53(mm) Dilution Factor: 1.00

Soil Extract Volume: 1.00 (uL) Soil Aliquot Volume: 1.00(uL)

Number TICs Found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L_

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
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LOCKHEED ANALYTICAL LABORATORY
VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

BOD867

Lab Job Name:BECHTEL-HANFORD Contract:_

Lab Code:LAL Case No.: SAS No.: SDG No.:L3310

Matrix: (soil/water) WATER Lab Sample ID:L3361-4

Sample wt/vol: 5.00 (g/ml) ML Lab File ID: D3522

Level: (low/med) LOW Date Received:11/19/94

% Moisture: not dec. 0 Date Analyzed:11/21/94

GC Column:RTX502.2 ID: 0.53(mm) Dilution Factor: 1.00

Soil Extract Volume: 1.00 (ML) Soil Aliquot Volume: 1.00(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L_	Q
74-87-3	Chloromethane	10.	U
74-83-9	Bromomethane	10.	U
75-01-4	Vinyl Chloride	10.	U
75-00-3	Chloroethane	10.	U
75-09-2	Methylene Chloride	10.	U
67-64-1	Acetone	10.	U
75-15-0	Carbon Disulfide	10.	U
75-35-4	1,1-Dichloroethene	10.	U
75-34-3	1,1-Dichloroethane	10.	U
540-59-0	1,2-Dichloroethene (total)	10.	U
67-66-3	Chloroform	10.	U
107-06-2	1,2-Dichloroethane	10.	U
78-93-3	2-Butanone	10.	U
71-55-6	1,1,1-Trichloroethane	10.	U
56-23-5	Carbon Tetrachloride	10.	U
75-27-4	Bromodichloromethane	10.	U
78-87-5	1,2-Dichloropropane	10.	U
10061-01-5	cis-1,3-Dichloropropene	10.	U
79-01-6	Trichloroethene	10.	U
124-48-1	Dibromochloromethane	10.	U
79-00-5	1,1,2-Trichloroethane	10.	U
71-43-2	Benzene	10.	U
10061-02-6	trans-1,3-Dichloropropene	10.	U
75-25-2	Bromoform	10.	U
108-10-1	4-Methyl-2-Pentanone	10.	U
591-78-6	2-Hexanone	10.	U
127-18-4	Tetrachloroethene	10.	U
79-34-5	1,1,2,2-Tetrachloroethane	10.	U
108-88-3	Toluene	10.	U
108-90-7	Chlorobenzene	10.	U
100-41-4	Ethylbenzene	10.	U
100-42-5	Styrene	10.	U
1330-20-7	Xylenes (total)	10.	U

FORM I - CLP VOA

9613446.2427

LOCKHEED ANALYTICAL LABORATORY
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CUSTOMER SAMPLE NO.

BOD867

Lab Job Name:BECHTEL-HANFORD Contract:_

Lab Code:LAL Case No.: SAS No.: SDG No.:L3310

Matrix: (soil/water) WATER Lab Sample ID:L3361-4

Sample wt/vol: 5.00 (g/ml) ML Lab File ID: D3522

Level: (low/med) LOW Date Received:11/19/94

% Moisture: not dec. 0 Date Analyzed:11/21/94

GC Column:RTX502.2 ID: 0.53(mm) Dilution Factor: 1.00

Soil Extract Volume: 1.00 (uL) Soil Aliquot Volume: 1.00(uL)

Number TICs Found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L_

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
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LOCKHEED ANALYTICAL LABORATORY
VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

BOD869

Lab Job Name:BECHTEL-HANFORD Contract:_

Lab Code:LAL Case No.: SAS No.: SDG No.:L3310

Matrix: (soil/water) WATER Lab Sample ID:L3361-13

Sample wt/vol: 5.00 (g/ml) ML Lab File ID: D3523

Level: (low/med) LOW Date Received:11/19/94

% Moisture: not dec. 0 Date Analyzed:11/21/94

GC Column:RTX502.2 ID: 0.53(mm) Dilution Factor: 1.00

Soil Extract Volume: 1.00 (ML) Soil Aliquot Volume: 1.00(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L_	Q
74-87-3	Chloromethane	10.	U
74-83-9	Bromomethane	10.	U
75-01-4	Vinyl Chloride	10.	U
75-00-3	Chloroethane	10.	U
75-09-2	Methylene Chloride	10.	U
67-64-1	Acetone	3.	J
75-15-0	Carbon Disulfide	10.	U
75-35-4	1,1-Dichloroethene	10.	U
75-34-3	1,1-Dichloroethane	10.	U
540-59-0	1,2-Dichloroethene (total)	10.	U
67-66-3	Chloroform	10.	U
107-06-2	1,2-Dichloroethane	10.	U
78-93-3	2-Butanone	10.	U
71-55-6	1,1,1-Trichloroethane	10.	U
56-23-5	Carbon Tetrachloride	10.	U
75-27-4	Bromodichloromethane	10.	U
78-87-5	1,2-Dichloropropane	10.	U
10061-01-5	cis-1,3-Dichloropropene	10.	U
79-01-6	Trichloroethene	10.	U
124-48-1	Dibromochloromethane	10.	U
79-00-5	1,1,2-Trichloroethane	10.	U
71-43-2	Benzene	10.	U
10061-02-6	trans-1,3-Dichloropropene	10.	U
75-25-2	Bromoform	10.	U
108-10-1	4-Methyl-2-Pentanone	10.	U
591-78-6	2-Hexanone	10.	U
127-18-4	Tetrachloroethene	10.	U
79-34-5	1,1,2,2-Tetrachloroethane	10.	U
108-88-3	Toluene	10.	U
108-90-7	Chlorobenzene	10.	U
100-41-4	Ethylbenzene	10.	U
100-42-5	Styrene	10.	U
1330-20-7	Xylenes (total)	10.	U

9613446.2425

LOCKHEED ANALYTICAL LABORATORY
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CUSTOMER SAMPLE NO.

BOD869

Lab Job Name:BECHTEL-HANFORD Contract:_

Lab Code:LAL Case No.: SAS No.: SDG No.:L3310

Matrix: (soil/water) WATER Lab Sample ID:L3361-13

Sample wt/vol: 5.00 (g/ml) ML Lab File ID: D3523

Level: (low/med) LOW Date Received:11/19/94

% Moisture: not dec. 0 Date Analyzed:11/21/94

GC Column:RTX502.2 ID: 0.53(mm) Dilution Factor: 1.00

Soil Extract Volume: 1.00 (uL) Soil Aliquot Volume: 1.00(uL)

Number TICs Found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L_

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				
21.				
22.				
23.				
24.				
25.				
26.				
27.				
28.				
29.				
30.				

9613446.2426

RAD DATA REPORT (ra01)

Bechtel Hanford, Inc. * Richland, WA

Bechtel Hanford Project (Project BECHTEL-HANFORD)

Client Sample ID: B0D864 | LAL Sample ID: L3310-10

Date Collected: 09-NOV-94 | Date Received: 12-NOV-94

Matrix: Water | Login Number: L3310

Constituent	Analyzed	Batch	Activity	Error	MDA	DataQual	Units
Gross Alpha	13-DEC-94	GR ALP/BETA LAL-0060_16299	5.8	3.7	4.7	C	pCi/L
Gross Beta	13-DEC-94	GR ALP/BETA LAL-0060_16299	6.7	3.9	6.0	C	pCi/L
Total radio-strontium	15-DEC-94	SR-90 LAL-0196_16324	0.11	0.30	0.52		pCi/L

9613446.2427

RAD DATA REPORT (ra01)

Bechtel Hanford, Inc. * Richland, WA

Bechtel Hanford Project (Project BECHTEL-HANFORD)

Client Sample ID: B0D864 | LAL Sample ID: L3310-14

Date Collected: 09-NOV-94 | Date Received: 12-NOV-94

Matrix: Water | Login Number: L3310

Constituent	Analyzed	Batch	Activity	Error	MDA	DataQual	Units
C-14	14-DEC-94	C-14 LAL-0209_16269	0.00	15.	20.		pCi/L
H-3	07-DEC-94	TRITIUM(H3) LAL-0066_16332	7680	670	230		pCi/L

9613446.2428

RAD DATA REPORT (ra01)

Bechtel Hanford, Inc. * Richland, WA

Bechtel Hanford Project (Project BECHTEL-HANFORD)

Client Sample ID: B0D867

Date Collected: 17-NOV-94

Matrix: Water

LAL Sample ID: L3361-7

Date Received: 19-NOV-94

Login Number: L3361

Constituent	Analyzed	Batch	Activity	Error	MDA	DataQual	Units
Gross Alpha	13-DEC-94	GR ALP/BETA LAL-0060_16299	1.1	1.1	1.7		pCi/L
Gross Beta	13-DEC-94	GR ALP/BETA LAL-0060_16299	45.3	3.0	2.2		pCi/L
Total radio-strontium	15-DEC-94	SR-90 LAL-0196_16324	20.9	1.8	1.2		pCi/L

9613446.2429

RAD DATA REPORT (ra01)

Bechtel Hanford, Inc. * Richland, WA

Bechtel Hanford Project (Project BECHTEL-HANFORD)

Client Sample ID: BOD867

Date Collected: 17-NOV-94

Matrix: Water

LAL Sample ID: L3361-11

Date Received: 19-NOV-94

Login Number: L3361

Constituent	Analyzed	Batch	Activity	Error	MDA	DataQual	Units
C-14	14-DEC-94	C-14 LAL-0209_16269	3.	15.	20.		pCi/L
H-3	07-DEC-94	TRITIUM(H3) LAL-0066_16332	410	220	230		pCi/L

9613446.2430

LOGIN CHAIN OF CUSTODY REPORT (ln01)
Nov 22 1994, 11:17 am

Login Number: L3310
Account: 596 Bechtel Hanford, Inc. * Richland, WA
Project: BECHTEL-HANFORD Bechtel Hanford Project

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L3310-1	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 130					
Water 1 S CLP 3/90 VOLATILES		Hold:22-NOV-94			
L3310-2	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: RFG18-49A3					
L3310-3	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: RFG18-49A3					
L3310-4	B0D866	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 130					
Water 1 S CLP 3/90 VOLATILES		Hold:22-NOV-94			
L3310-5	B0D866	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: RFG18-49A3					
L3310-6	B0D866	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: RFG18-49A3					
L3310-7	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: RFG01-43					
Water 1 S SCREENING		Hold:08-MAY-95			
L3310-8	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2 As and Pb only					
Location: RFG01-20A					
Water 1 S CLP FURNACE		Hold:08-MAY-95			
Water 1 S CLP ICP		Hold:08-MAY-95			
L3310-9	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 121					
Water 1 S 300.0 CHLORIDE		Hold:07-DEC-94			
Water 1 S 300.0 FLUORIDE					
Water 1 S 300.0 NITRATE		Hold:11-NOV-94			
Water 1 S 300.0 NITRITE		Hold:11-NOV-94			

Revised

112596

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LOGIN CHAIN OF CUSTODY REPORT (ln01)
Nov 22 1994, 11:17 am

Login Number: L3310
Account: 596 Bechtel Hanford, Inc. * Richland, WA
Project: BECHTEL-HANFORD Bechtel Hanford Project

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
Water 1 S 300.0 PHOSPHATE					
Water 1 S 300.0 SULFATE		Hold:07-DEC-94			
L3310-10	B0D864	09-NOV-94	12-NOV-94		22-DEC-9
temp 2					
Location: 156V-040					
Water 1 S GR ALP/BETA LAL-0060		Hold:08-MAY-95			
Water 1 S SR-90 LAL-0196		Hold:08-MAY-95			
L3310-11	B0D864	09-NOV-94	12-NOV-94		22-DEC-9
temp 2					
Location: 156V-040					
L3310-12	B0D864	09-NOV-94	12-NOV-94		22-DEC-9
temp 2					
Location: 156V-040					
L3310-13	B0D864	09-NOV-94	12-NOV-94		22-DEC-9
temp 2					
Location: 156V-040					
L3310-14	B0D864	09-NOV-94	12-NOV-94		22-DEC-9
temp 2					
Location: 156V-040					
Water 1 S C-14 LAL-0209		Hold:08-MAY-95			
Water 1 S TRITIUM(H3) LAL-0066		Hold:08-MAY-95			
*L3310-15	B0D865	09-NOV-94	12-NOV-94		22-DEC-9
temp 2 As and Pb only					
Location: RFG01-20A					
Filt H20 15 S CLP FURNACE		Hold:08-MAY-95			
Filt H20 15 S CLP ICP		Hold:08-MAY-95			
L3310-16	REPORT TYPE	12-NOV-94	12-NOV-94		22-DEC-9
Location:					
Water 1 S EDD - DISK DEL.					
Water 1 S INORG TYPE 4A RPT					

Changed matrix to Filtrate H_2C.

Signature: Paul C. Davis

Date: 11-22-94

11125

9613446.2432

LOGIN CHAIN OF CUSTODY REPORT (ln01)
Nov 21 1994, 09:34 am

Login Number: L3361
Account: 596 Bechtel Hanford, Inc. * Richland, WA
Project: BECHTEL-HANFORD Bechtel Hanford Project

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L3361-9	BOD867	17-NOV-94	19-NOV-94		29-DEC-94
temp 2					
Location: 157					
L3361-10	BOD867	17-NOV-94	19-NOV-94		29-DEC-94
temp 2					
Location: 157					
L3361-11	BOD867	17-NOV-94	19-NOV-94		29-DEC-94
temp 2					
Location: 157					
Water 1 S C-14 LAL-0209		Hold:16-MAY-95			
Water 1 S TRITIUM(H3) LAL-0066		Hold:16-MAY-95			
L3361-12	BOD868	17-NOV-94	19-NOV-94		29-DEC-94
temp 2; As,Pb					
Location: 157					
Filt H20 15 S CLP FURNACE		Hold:16-MAY-95			
Filt H20 15 S CLP ICP		Hold:16-MAY-95			
L3361-13	BOD869	17-NOV-94	19-NOV-94		29-DEC-94
temp 2					
Location: 157					
Water 1 S CLP 3/90 VOLATILES		Hold:29-NOV-94			
L3361-14	BOD869	17-NOV-94	19-NOV-94		29-DEC-94
temp 2					
Location: 157					
L3361-15	BOD869	17-NOV-94	19-NOV-94		29-DEC-94
temp 2					
Location: 157					
L3361-16	REPORT TYPE	21-NOV-94	19-NOV-94		29-DEC-94
Location:					
Water 1 S EDD - DISK DEL.					
Water 1 S INORG_TYPE 4A RPT					

Signature: M Miller

Date: 11-21-94

1119596

DISTRIBUTION: Original, Sample, Yellow - Sampler

9613446.2433

SAMPLE STATUS REPORT FOR N 3758. RAD SCREEN 199-F5-1 TIME: 11/17/94 21:34
DISPATCHED: 11/ 7/94 16:36 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 11/17/94 21:23

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
****	********	**********	***	***	******
4271	TOT-ACT	< 5.00000E 01 pCi/G	N	Y	XR5301

END OF REPORT

BOD867
BOD868
BOD869
BW
11-18-94

111959

9613446.2434

Sample Login

Login Review Checklist

Lot Number L3361

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 ommited.

Sample Summary Report
N/A

		Yes	No
1.	Are all sample IDs correct?	X	
2.	Are all samples present?	X	
3.	Are all matrices correct? (e.g., TCLP analyses should be on a TCLP leachate, field blanks should be water)	X	
4.	Are all analyses on the chain of custody/login quotation included?	X	
5.	Are analyses logged in for the correct container? (e.g., analyses requiring preservation logged in for a preserved container and vice versa)	X	
6.	Are samples logged in according to laboratory batching procedures? (e.g., TCLP regular leaching and associated metals/semivolatile organics should be logged in on the same bottle)	X	

Login Chain of Custody Report

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

Sample Receiving Checklist

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

Primary review signature	Date	Secondary review signature	Date
[signature]	11-21-94	Derek C Henderson	11-21-94

111959

Figure 1

SAMPLE CHECK-IN LIST

(1 Per Shipping Container)

Date/Time Received 11-21-94 16:30 Client Name 1100 Hanford

Project/Client # B94-083 Batch or Case # NA

Cooler ID (if noted on outside of cooler) ER-10

1. Condition of shipping container? Good
2. Custody Seals on cooler intact? Yes [X] No [ ]
3. Custody Seals dated and signed? Yes [X] No [ ]
4. Chain of Custody record is taped on inside of cooler lid? Yes [X] No [ ]
5. Vermiculite/packing material is: Wet [ ] Dry [X]
6. Each sample is in a plastic bag? Yes [X] No [ ]
7. Number of sample containers in cooler: 15
8. Samples have:
   - ____ tape
   - ____ hazard labels
   - X custody seals
   - X appropriate sample labels
9. Samples are:
   - X in good condition
   - ____ leaking
   - ____ broken
   - ____ have air bubbles
   - ____ other
10. Coolant Present? Yes [X] No [ ] Sample Temperature 2°C
11. The following paperwork should be accounted for (N/A if not applicable):
    Chain of Custody #(s) NA
    Request for Analysis #(s) NA
    Airbill # 147 2234247 Carrier Emery
12. Have any anomalies been identified above? Yes [ ] No [ ] NA
13. Memos have been initiated for all anomalies identified above? Yes [ ] NA

Printed Name/Signature M Mitle Date/Time 11-21-94

111954

Lockheed Analytical Services
Sample Receiving Checklist

Client Name: Westinghouse Hanford Job No. L3361 Cooler ID:

COOLER CONDITION UPON RECEIPT

Temperature of cooler upon receipt: 2°C

temperature of temp. blank upon receipt: —

	Yes	No	* Comments/Discrepancies
custody seals intact	X		
chain of custody present	X		
blue ice (or equiv.) present/frozen	X		
rad survey completed	X		

SAMPLE CONDITION UPON RECEIPT

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

MISCELLANEOUS ITEMS

	Yes	No	* Comments/Discrepancies
samples with short holding times		X	un-preserved Nitrates: out of holding time
samples to subcontract		X	

ADDITIONAL COMMENTS/DISCREPANCIES

Completed by / date: [illegible] 11-21-94

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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111959

version 2.0 (11/11/94)

9613446.2437

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

Client Sample Number	LAL Sample Number	SDG Number	Matrix	Method
BOD867	L3361-1		Water	SCREENING
	L3361-2		Water	CLP FURNACE
	L3361-2		Water	CLP ICP
	L3361-3		Water	300.0 CHLORIDE
	L3361-3		Water	300.0 FLUORIDE
	L3361-3		Water	300.0 NITRATE
	L3361-3		Water	300.0 NITRITE
	L3361-3		Water	300.0 PHOSPHATE
	L3361-3		Water	300.0 SULFATE
	L3361-4		Water	CLP 3/90 VOLATI
	L3361-7		Water	GR ALP/BETA LAL
	L3361-7		Water	SR-90 LAL-0196
	L3361-11		Water	C-14 LAL-0209
	L3361-11		Water	TRITIUM(H3) LAL
BOD868	L3361-12		Filt H20	CLP FURNACE
	L3361-12		Filt H20	CLP ICP
BOD869	L3361-13		Water	CLP 3/90 VOLATI
REPORT TYPE	L3361-16		Water	EDD - DISK DEL
	L3361-16		Water	INORG TYPE 4A R

11195

1/26/95

Data Validation Check List

for Project 100-FR-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
B0D864	Split of 728 ~~B0D846~~	LK15		LOCKHEED	Y 1/03/95	N	N	Y 1/03/95	Y 1/03/95	11/11/94 - SAF-B94-083	Y 1/03/95	1/03/95
B0D865	Split of 729 ~~B0D847~~	LK15		LOCKHEED	N	N	N	N	Y 1/03/95	11/11/94 - SAF-B94-083	N	1/03/95
B0D866	Split of 800 ~~B0D846~~	LK15		LOCKHEED	Y 1/03/95	N	N	N	N	11/11/94 - SAF-B94-083	N	1/03/95
B0D867	Split of 722 ~~B0D844~~	LK15		LOCKHEED	Y 1/03/95	N	N	Y 1/03/95	Y 1/03/95	11/19/94 - SAF-B94-083	Y 1/03/95	1/03/95
B0D868	Split of 723 ~~B0D850~~	LK15		LOCKHEED	N	N	N	N	Y 1/03/95	11/19/94 - SAF-B94-083	N	1/03/95
B0D869	Split of 724 ~~B0D851~~	LK15		LOCKHEED	Y 1/03/95	N	N	N	N	11/19/94 - SAF-B94-083	N	1/03/95

Data Entry Complete: DP DEu 1-24-1.

DATATRAC gl 1/26/95

Validation Rcvd ~~1-26~~ 1-25-95 DEu

9613446.2438

9613446.2439

Los Alamos Technical Associates, Inc.

8633 Gage Blvd. / Kennewick, WA 99336 / Telephone (509) 783-4369 / FAX (509) 783-9661

January 25, 1995
LATA95-011

RECORD COPY

JAN 1995
RECEIVED
Validation
Log In

Ms. Janice Scott
CH2M Hill
345 Hills
Richland, WA 99352

Subject: VB403.08, SDG LK15-LAS

Dear Ms. Scott:

Attached is the data validation report for analytical results for 100-FR-3 Groundwater-Round 6 (SDG LK15-LAS). The package was received by Los Alamos Technical Associates on January 10, 1995.
If you have any questions, please let me know.

Sincerely,

Donald J. Smith
Project Manager

Attachment

cc: Judy Pottmeyer, LATA
VB403.08
DJS/lb

ln

9613446.2440

RECORD COPY

JAN 1995
RECEIVED
Validation
Log In

DATA VALIDATION REPORT
for
100-FR-3 Groundwater-Round 6
SDG LK15-LAS
LATA VB403.08

Bechtel Hanford, Incorporated
Richland, Washington 99352

January 24, 1995

9613446.2441

Table of Contents

Data Validation Narrative 000002
- INTRODUCTION 000002
- ANALYSES REQUESTED 000002
- DATA QUALITY OBJECTIVES 000002
- REFERENCES 000004
- GLOSSARY OF VALIDATION APPLIED QUALIFIERS (CHEMISTRY) 000005
- GLOSSARY OF VALIDATION APPLIED QUALIFIERS (RADIOCHEMISTRY) . . 000006
- GLOSSARY OF LABORATORY APPLIED QUALIFIERS 000007

Data Qualification Summary 000009

Data Summary Tables 000012

Sample Results 000017

Checklist 000036

Laboratory Case Narratives 000098

Chain-of-Custody Information 000106

Supplemental Information 000125

End of Package 000128

100-FR-3 Groundwater-Round 6
Data Validation Narrative

INTRODUCTION

All samples in Sample Delivery Group (SDG) LK15-LAS (VB403.08) were validated at level "D" as defined in the Data Validation Procedures for Chemical Analysis (WHC-SD-EN-SPP-002) and/or Data Validation Procedures for Radiochemical Analyses (WHC-SD-EN-SPP-001).

The analyses were performed by Lockheed.

ANALYSES REQUESTED

See **Table 1**

DATA QUALITY OBJECTIVES

Precision: Goals for precision were met with the exception of those items discussed in the "**Qualification Summary Table**".

Accuracy: Goals for accuracy were met with the exception of those items discussed in the "**Qualification Summary Table**".

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

Detection Limits: With the exception of the gross alpha and beta results for B0D864, all Detection limit goals were met for all sample results as specified in the *Remedial Investigation/Feasibility Study Work Plan for the 100-FR-3 Operable Unit*, DOE/RL-91-53.

Completeness: The data package was 98.3% complete for all requested analyses.

Data qualifiers are assigned to any results that have been determined to be deficient. These are discussed in the Qualification Summary Table.

Table 1

LATA ID #: VB403.08 SDG: LK15-LAS

Sample Information							Analyses Requested									
SAMPLE NO.[1]	DATE COLLECTED	MATRIX	SAF	WELL ID	QC INFO[3]	TEMP °C	1	2	3	4	5	6	7	8	9	10
B0D864	9-Nov-94	WATER	B94-083	199-F5-4	split of B0D7Z8	2	X	X	X		X	X	X	X	X	X
B0D865	9-Nov-94	WATER	B94-083	199-F5-4	split of B0D7Z9	2				X						
B0D866	9-Nov-94	WATER	B94-083	199-F5-4	split of B0D800	2	X									
B0D867	17-Nov-94	WATER	B94-083	199-F5-1	split of B0D7Z2	2	X	X	X		X	X	X	X	X	X
B0D868	17-Nov-94	WATER	B94-083	199-F5-1	split of B0D7Z3	2				X						
B0D869	17-Nov-94	WATER	B94-083	199-F5-1	split of B0D7Z4	2	X									

Method References:

	Analysis	Method
1.	Volatile Organics	CLP 3/90
2.	ICP Metals	CLP
3.	AA Metals (As, Pb) (Unfiltered)	CLP
4.	AA Metals (As, Pb) (Filtered)	CLP
5.	Anions[2] (F, Cl, SO_4, PO_4, NO_2, NO_3)	300.0, 365.2
6.	Total Alpha/Beta	LAL-91-SOP-0600
7.	Strontium-90	LAL-91-SOP-0196
8.	Carbon-14	LAL-91-SOP-0209
9.	Tritium	LAL-91-SOP-0066
10.	Activity Screen	N/A

NOTES:

[1]Samples B0D864, B0D865, and B0D866 were shipped to TMA instead of Lockheed. TMA was directed by BHI to maintain COC and forward samples to Lockheed. A copy of BHI ROD # ROD-B94-071 has been included in the Supplemental Information section of this report.

[2]Regarding the phosphate analysis, the lab had instrument problems and was unable to achieve satisfactory results by Method 300.0. With concurrence from Pam Innis of EPA, the lab was instructed to perform phosphate analysis using Method 365.2. A copy of BHI ROD # ROD-B94-080 has been included in the Supplemental Information section of this report.

[3]Samples were split with Quanterra.

REFERENCES

EPA 1990a, *USEPA Contract Laboratory Program Statement of Work for Organics Analysis, Mulit-Media, Multi-Concentration, Document Number OLM01.1,* U.S. Environmental Protection Agency, Washington, D. C.

EPA 1990b, *USEPA Contract Laboratory Program Statement of Work for Inorganics Analysis, Mulit-Media, Multi-Concentration, Document Number ILM01.1,* U.S. Environmental Protection Agency, Washington, D. C.

EPA July 1992, *Test Methods for Evaluating Solid Waste (SW-846),* Third Edition; U.S. Environmental Protection Agency, Washington, D.C.

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

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

WHC 1992, *Remedial Investigation/Feasibility Study Work Plan for the 100-FR-3 Operable Unit*, DOE/RL-91-53, United States Department of Energy, Hanford Site, Richland, Washington.

GLOSSARY OF VALIDATION APPLIED QUALIFIERS (CHEMISTRY)

Qualifiers which may be applied by data validators in compliance with the procedures herein are as follows.

U- Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ- Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a QC deficiency identified during data validation, the associated quantitation limit is an estimate.

J- Indicates the compound or analyte was analyzed for and detected. The associated concentration is an estimate, but the data are usable for decision making purposes.

BJ- Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.

R- Indicates the compound or analyte was analyzed for, detected, and due to an identified QC deficiency the data are unusable.

UR- Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data are unusable due to an identified QC deficiency.

JN- Indicates a tentatively identified compound (TIC) that has been determined to be valid in terms of identification and quantitation.

UJN- Indicates a tentatively identified compound (TIC) that has been determined to be presumptive and valid (JN) in terms of identification and quantitation and has been qualified as undetected (U) due to associated blank contamination.

NJ- Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific application (i.e., usable for decision making purposes).

N- Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision making purposes).

GLOSSARY OF VALIDATION APPLIED QUALIFIERS (RADIOCHEMISTRY)

Qualifiers which may be applied by data validators in compliance with the procedures herein are as follows.

U- The constituent was analyzed for, but was not detected. The value reported is the minimum detectable activity (MDA) corrected for sample dilution and moisture content by the laboratory. The data should be considered usable for decision making purposes.

UJ- The constituent was analyzed for, but was not detected. Due to a quality control deficiency identified during data validation the value reported may not accurately reflect the MDA. The data should be considered usable for decision making purposes.

J- Indicates a constituent was analyzed for and detected. The associated value is estimated due to a quality control deficiency identified during validation. The data should be considered usable for decision making purposes.

R- Indicates the constituent was analyzed for and detected; however, due to an identified quality control deficiency the data should be considered unusable for decision making purposes.

UR- Indicates the constituent was analyzed for and not detected; however, due to an identified quality control deficiency the data should be considered unusable for decision making purposes.

GLOSSARY OF LABORATORY APPLIED QUALIFIERS

Qualifiers which may be applied by the laboratory in compliance with applicable requirements are as follows.

Organic Data Qualifiers

U- Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

J- Indicates an estimated value. This flag is used when estimating concentrations of tentatively identified compounds (TICs) or when the presence of a TCL compound is confirmed at a concentration of less than the CRQL but greater than the IDL.

N- Indicates presumptive evidence of a compound. This flag is used only by the laboratory for TIC results when the identification is based on a mass spectral library search.

P- This flag is used for pesticide/Aroclor target analytes when there is greater than 25% difference for detected values between the quantitation and confirmation GC columns. The lower of the two concentrations is reported on the report form and the result is flagged with a "P".

C- This flag applies to pesticide results where the identification has been confirmed by GC/MS. This flag should not be used by the laboratory if GC/MS confirmation was attempted but unsuccessful, in which case, the laboratory should use an "X" flag as defined below. The "X" flag is then defined in the SDG narrative.

B- This flag applies to results in which the analyte was detected in both the sample and the associated blank. The combination of the "B" flag with the "U" flag ("BU" or "UB") is expressly prohibited in the analytical SOW.

E- This flag identifies compounds whose concentrations exceed the calibrated range of the GC/MS instrument.

D- This flag identifies compounds identified in an analysis at a secondary dilution factor.

A- Indicates a TIC which is a suspected aldol-condensate product.

X- This is a non-specific flag used to properly define the results. If used, this flag must be properly defined within the body of the SDG.

GLOSSARY OF LABORATORY APPLIED QUALIFIERS (continued)

Inorganic Qualifiers

U- Indicates the analyte was analyzed for but not detected in the sample.

B- Indicates the analyte concentration is less than the CRDL but greater than the IDL.

E- Indicates the value reported is estimated due to the presence of interference.

M- Indicates duplicate injection precision criteria were not met during graphite furnace (GFAA) analysis.

N- Indicates spiked sample recovery was not within the control limits.

S- Indicates the reported value was determined by the Method of Standard Additions (MSA).

W- Indicates post-digestion spike for GFAA analysis is outside control limits and the sample absorbance is less than 50% of the spike absorbance.

*- Indicates duplicate analysis was not within control limits.

+- Indicates the correlation coefficient (r) for the MSA was less than 0.995.

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Data Qualification Summary

Qualification Summary Table

Inorganics (Metals/Cyanide)

ANALYTE	TYPE	QUALIFIER	SAMPLES AFFECTED	DQO	REASON
Aluminum	MINOR	UJ	B0D864 B0D865 B0D867 B0D868	BLANKS	Calibration and/or preparation blank value(s) are negative and outside acceptance criteria.
Manganese	MINOR	U	B0D867 B0D868	BLANKS	Calibration and/or preparation blank value(s) are positive and outside acceptance criteria.
Chromium	MINOR	BJ/UJ	B0D867 B0D868	BLANKS	Calibration and/or preparation blank value(s) are negative and outside acceptance criteria.
Iron	MINOR	U	B0D864 B0D865 B0D868	BLANKS	Calibration and/or preparation blank value(s) are positive and outside acceptance criteria.
Zinc	MINOR	U	B0D864 B0D865 B0D867 B0D868	BLANKS	Calibration and/or preparation blank value(s) are positive and outside acceptance criteria.
Thallium	MINOR	UJ	B0D865 B0D868	ACCURACY	Laboratory control standard recoveries are outside acceptance criteria.
Calcium	MINOR	J	B0D865 B0D868	PRECISION	Serial dilution percent difference is outside acceptance criteria and the sample results are greater than 50 times the instrument detection limit.
Arsenic	MINOR	UJ	B0D864 B0D865 B0D867 B0D868	ACCURACY	Analytical spikes for the graphite furnace analysis are outside acceptance criteria.
Lead	MINOR	UJ	B0D867	ACCURACY	Analytical spikes for the graphite furnace analysis are outside acceptance criteria.

Comments:

1. The laboratory was requested to analyze filtered samples of Pb and As by GFAA (B0D865 and B0D868), however, the Form Is also include ICP results. These results were validated because the laboratory has included all of the necessary QC data.

General Chemistry

ANALYTE	TYPE	QUALIFIER	SAMPLES AFFECTED	DQO	REASON
Nitrite (by IC) Phosphate	**MAJOR**	**UR**	B0D864 B0D867	HOLD TIME	Holding time is exceeded by greater than 2 times.
Nitrate (by IC)	MINOR	J	B0D864 B0D867	HOLD TIME	Holding time is exceeded by greater than 2 times.

Comments:

1. The phosphate analyses exceeded hold time due to incorrect preservation.

Qualification Summary Table

Radiochemistry

ANALYTE	TYPE	QUALIFIER	SAMPLES AFFECTED	DQO	REASON
Gross Beta	MINOR	J	B0D864 - B0D867	PRECISION	Duplicate precision is outside acceptance criteria.

Comments:

1. The MDA for sample B0D864 is greater than the RDL for Gross Alpha and Beta.
2. The laboratory is reporting Strontium-90 as Strontium, total.
3. Since the laboratory did not report values less than the MDA using the "U" qualifier, the validator has added the "U" to the Form Is and the Data Summary Tables for clarity. Please note that these qualifiers are NOT a result of validation and are simply indicators of concentration.

Volatiles

ANALYTE	TYPE	QUALIFIER	SAMPLES AFFECTED	DQO	REASON
Chloromethane	MINOR	UJ	B0D867, B0D869	ACCURACY	Matrix spike and matrix spike duplicate recoveries are outside acceptance criteria.
Bromomethane	MINOR	UJ	B0D867, B0D869	ACCURACY	Matrix spike and matrix spike duplicate recoveries are outside acceptance criteria.
Vinyl Chloride	MINOR	UJ	B0D867, B0D869	ACCURACY	Matrix spike and matrix spike duplicate recoveries are outside acceptance criteria.
Chloroethane	MINOR	UJ	B0D867, B0D869	ACCURACY	Matrix spike and matrix spike duplicate recoveries are outside acceptance criteria.
Methylene Chloride	MINOR	UJ	B0D867, B0D869	ACCURACY	Matrix spike and matrix spike duplicate recoveries are outside acceptance criteria.
1,1-dichloroethene	MINOR	UJ	B0D867, B0D869	ACCURACY	Matrix spike and matrix spike duplicate recoveries are outside acceptance criteria.
1,1-dichloroethane	MINOR	UJ	B0D867, B0D869	ACCURACY	Matrix spike and matrix spike duplicate recoveries are outside acceptance criteria.
1,2-dichloroethene (total)	MINOR	UJ	B0D867, B0D869	ACCURACY	Matrix spike and matrix spike duplicate recoveries are outside acceptance criteria.
Chloroform	MINOR	UJ	B0D867, B0D869	ACCURACY	Matrix spike and matrix spike duplicate recoveries are outside acceptance criteria.
1,2-dichloroethane	MINOR	UJ	B0D867, B0D869	ACCURACY	Matrix spike and matrix spike duplicate recoveries are outside acceptance criteria.
1,2-dichloropropane	MINOR	UJ	B0D867, B0D869	ACCURACY	Matrix spike and matrix spike duplicate recoveries are outside acceptance criteria.
cis-1,3-dichloropropene	MINOR	UJ	B0D867, B0D869	ACCURACY	Matrix spike and matrix spike duplicate recoveries are outside acceptance criteria.
Bromoform	MINOR	UJ	B0D867, B0D869	ACCURACY	Matrix spike and matrix spike duplicate recoveries are outside acceptance criteria.

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Data Summary Tables

9613446.2453

METALS
DATA SUMMARY TABLE

LATA FILE#: VB403.08		HEIS #:	B0D864		B0D865		B0D867		B0D868	
		Date:	9-Nov-94		9-Nov-94		17-Nov-94		17-Nov-94	
		Matrix:	WATER		WATER		WATER		WATER	
Constituent	CAS #	Units	Results	Q	Results	Q	Results	Q	Results	Q
Aluminum	7429-90-5	ug/L	16.0	UJ	16.0	UJ	16.0	UJ	16.0	UJ
Antimony	7440-36-0	ug/L	50.0	U	50.0	U	50.0	U	50.0	U
Arsenic	7440-38-2	ug/L	3.0	UJ	3.0	UJ	3.0	UJ	3.0	UJ
Barium	7440-39-3	ug/L	52.0	B	58.6	B	48.7	B	50.5	B
Beryllium	7440-41-7	ug/L	1.0	U	1.0	U	1.0	U	1.0	U
Cadmium	7440-43-9	ug/L	4.0	U	4.0	U	4.0	U	4.0	U
Calcium	7440-70-2	ug/L	95700		120000	J	44300		50900	J
Chromium	7440-47-3	ug/L	16.3		15.3		4.6	BJ	3.0	UJ
Cobalt	7440-48-4	ug/L	6.0	U	6.0	U	6.0	U	6.0	U
Copper	7440-50-8	ug/L	3.0	U	3.0	U	3.0	U	3.0	U
Iron	7439-89-6	ug/L	25.0	U	7.2	U	221		9.6	U
Lead	7439-92-1	ug/L	2.0	U	2.0	U	2.0	UJ	2.0	U
Magnesium	7439-95-4	ug/L	22000		26500		6780		7350	
Manganese	7439-96-5	ug/L	1.0	U	1.0	U	4.5	U	1.4	U
Nickel	7440-02-0	ug/L	10.0	U	10.0	U	10.0	U	10.0	U
Potassium	7440-09-7	ug/L	5740		6120		2150	B	2400	B
Selenium	7782-49-2	ug/L	90.0	U	90.0	U	90.0	U	90.0	U
Silver	7440-22-4	ug/L	4.0	U	4.0	U	4.0	U	4.0	U
Sodium	7440-23-5	ug/L	28200		32700		4360	B	4730	B
Thallium	7440-28-0	ug/L	500	U	500	UJ	500	U	500	UJ
Vanadium	7440-62-2	ug/L	6.8	B	3.4	B	3.0	U	3.0	U
Zinc	7440-66-6	ug/L	8.8	U	24.5	U	32.3	U	25.1	U

000015

Shaded areas indicate changes by the validator.

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GENERAL CHEMISTRY
DATA SUMMARY TABLE

LATA FILE#:	VB403.08	HEIS #:	B0D864		B0D867	
		Date:	9-Nov-94		17-Nov-94	
		Matrix:	WATER		WATER	
Constituent	CAS #	Units	Results	Q	Results	Q
Chloride by IC	16887-00-6 (A)	mg/L	36		3.8	
Fluoride by IC	16984-48-8 (A)	mg/L	0.29		0.058	
Sulfate by IC	14808-79-8	mg/L	100		35	
Nitrate-N by IC	14797-55-8	mg/L	21	J	3.4	J
Nitrite-N by IC	14797-65-0	mg/L	< 0.01	UR	< 0.01	UR
o-Phosphate-Phosphorus	14265-44-2	mg/L	< 0.05	UR	< 0.05	UR

Shaded areas indicate changes by the validator.

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RADIOCHEMISTRY
DATA SUMMARY TABLE

LATA FILE#: VB403.08		HEIS #:	B0D864		B0D867	
		Date:	9-Nov-94		17-Nov-94	
		Matrix:	WATER		WATER	
Constituent	CAS #	Units	Results	Q	Results	Q
Gross Alpha	ALPHA	pCi/L	5.8		1.1	U
Gross Beta	BETA	pCi/L	6.7	J	45.3	J
Strontium, total	10098-97-2	pCi/L	0.11	U	20.9	
Carbon-14	14762-75-5	pCi/L	0	U	3	U
Tritium	10028-17-8	pCi/L	7680		410	

000015

Shaded areas indicate changes by the validator.

9613446.2456

VOLATILE ORGANIC DATA SUMMARY TABLE

LATA FILE#: VB403.08		HEIS #:	B0D864		B0D866		B0D867		B0D869	
		Date:	9-Nov-94		9-Nov-94		17-Nov-94		17-Nov-94	
		Matrix:	WATER		WATER		WATER		WATER	
Constituent	CAS #	Units	Results	Q	Results	Q	Results	Q	Results	Q
Chloromethane	74-87-3	ug/L	10	U	10	U	10	UJ	10	UJ
Bromomethane	74-83-9	ug/L	10	U	10	U	10	UJ	10	UJ
Vinyl chloride	75-01-4	ug/L	10	U	10	U	10	UJ	10	UJ
Chloroethane	75-00-3	ug/L	10	U	10	U	10	UJ	10	UJ
Methylene chloride	75-09-2	ug/L	10	U	10	U	10	UJ	10	UJ
Acetone	67-64-1	ug/L	10	U	4	J	10	U	3	J
Carbon disulfide	75-15-0	ug/L	10	U	10	U	10	U	10	U
1,1-Dichloroethene	75-35-4	ug/L	10	U	10	U	10	UJ	10	UJ
1,1-Dichloroethane	75-34-3	ug/L	10	U	10	U	10	UJ	10	UJ
1,2-Dichloroethene (total)	540-59-0	ug/L	10	U	10	U	10	UJ	10	UJ
Chloroform	67-66-3	ug/L	10	U	10	U	10	UJ	10	UJ
1,2-Dichloroethane	107-06-2	ug/L	10	U	10	U	10	UJ	10	UJ
2-Butanone	78-93-3	ug/L	10	U	10	U	10	U	10	U
1,1,1-Trichloroethane	71-55-6	ug/L	10	U	10	U	10	U	10	U
Carbon tetrachloride	56-23-5	ug/L	10	U	10	U	10	U	10	U
Bromodichloromethane	75-27-4	ug/L	10	U	10	U	10	U	10	U
1,2-Dichloropropane	78-87-5	ug/L	10	U	10	U	10	UJ	10	UJ
cis-1,3-Dichloropropene	10061-01-5	ug/L	10	U	10	U	10	UJ	10	UJ
Trichloroethene	79-01-6	ug/L	10	U	10	U	10	U	10	U
Dibromochloromethane	124-48-1	ug/L	10	U	10	U	10	U	10	U
1,1,2-Trichloroethane	79-00-5	ug/L	10	U	10	U	10	U	10	U
Benzene	71-43-2	ug/L	10	U	10	U	10	U	10	U
trans-1,3-Dichloropropene	10061-02-6	ug/L	10	U	10	U	10	U	10	U
Bromoform	75-25-2	ug/L	10	U	10	U	10	UJ	10	UJ
4-Methyl-2-pentanone	108-10-1	ug/L	10	U	10	U	10	U	10	U
2-Hexanone	591-78-6	ug/L	10	U	10	U	10	U	10	U
Tetrachloroethene	127-18-4	ug/L	10	U	10	U	10	U	10	U
1,1,2,2-Tetrachloroethane	79-34-5	ug/L	10	U	10	U	10	U	10	U
Toluene	108-88-3	ug/L	10	U	10	U	10	U	10	U
Chlorobenzene	108-90-7	ug/L	10	U	10	U	10	U	10	U
Ethylbenzene	100-41-4	ug/L	10	U	10	U	10	U	10	U
Styrene	100-42-5	ug/L	10	U	10	U	10	U	10	U
Xylenes (Total)	1330-20-7	ug/L	10	U	10	U	10	U	10	U

Shaded areas indicate changes by the validator.

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Sample Results (Form I's)

9613446.2458

CLP

1

INORGANIC ANALYSES DATA SHEET

CLIENT ID NO.

BOD864

Lab Name: L.A.S. Contract: BECHTEL-HA

Lab Code: LOCK Case No.: 1112WH SAS No.: SDG No.: L3310W

Matrix (soil/water): WATER Lab Sample ID: L3310-8

Level (low/med): LOW Date Received: 11/12/94

% 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	UJ
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	3.0	~~U~~	W	F	UJ
7440-39-3	Barium	52.0	B		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	4.0	U		P	
7440-70-2	Calcium	95700			P	
7440-47-3	Chromium	16.3			P	
7440-48-4	Cobalt	6.0	U		P	
7440-50-8	Copper	3.0	U		P	
7439-89-6	Iron	25.0	~~B~~		P	U
7439-92-1	Lead	2.0	U		F	
7439-95-4	Magnesium	22000			P	
7439-96-5	Manganese	1.0	U		P	
7440-02-0	Nickel	10.0	U		P	
7440-09-7	Potassium	5740			P	
7782-49-2	Selenium	90.0	U		P	
7440-22-4	Silver	4.0	U		P	
7440-23-5	Sodium	28200			P	
7440-28-0	Thallium	500	U		P	
7440-62-2	Vanadium	6.8	B		P	
7440-66-6	Zinc	8.8	~~B~~		P	U

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

BM 1-11-95 ~~086~~

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CLP

1

INORGANIC ANALYSES DATA SHEET

CLIENT ID NO.

BOD865

Lab Name: L.A.S. Contract: BECHTEL-HA

Lab Code: LOCK Case No.: 1112WH SAS No.: SDG No.: L3310F

Matrix (soil/water): WATER Lab Sample ID: L3310-15

Level (low/med): LOW Date Received: 11/12/94

% 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	UJ
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	3.0	~~U~~	W	F	UJ
7440-39-3	Barium	58.6	B		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	4.0	U		P	
7440-70-2	Calcium	120000		E	P	J
7440-47-3	Chromium	15.3			P	
7440-48-4	Cobalt	6.0	U		P	
7440-50-8	Copper	3.0	U		P	
7439-89-6	Iron	7.2	~~B~~		P	U
7439-92-1	Lead	2.0	U		F	
7439-95-4	Magnesium	26500			P	
7439-96-5	Manganese	1.0	U		P	
7440-02-0	Nickel	10.0	U		P	
7440-09-7	Potassium	6120			P	
7782-49-2	Selenium	90.0	U		P	
7440-22-4	Silver	4.0	U		P	
7440-23-5	Sodium	32700			P	
7440-28-0	Thallium	500	~~U~~		P	UJ
7440-62-2	Vanadium	3.4	B		P	
7440-66-6	Zinc	24.5			P	U

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

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FORM I - IN

BM 1-11-95

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CLP

1

INORGANIC ANALYSES DATA SHEET

CLIENT ID NO.

BOD867

Lab Name: L.A.S. Contract: BECHTEL-HA

Lab Code: LOCK Case No.: 1112WH SAS No.: SDG No.: L3361W

Matrix (soil/water): WATER Lab Sample ID: L3361-2

Level (low/med): LOW Date Received: 11/19/94

% 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	UJ
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	3.0	~~U~~	W	F	UJ
7440-39-3	Barium	48.7	B		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	4.0	U		P	
7440-70-2	Calcium	44300			P	
7440-47-3	Chromium	4.6	~~B~~		P	BJ
7440-48-4	Cobalt	6.0	U		P	
7440-50-8	Copper	3.0	U		P	
7439-89-6	Iron	221			P	
7439-92-1	Lead	2.0	~~U~~	W	F	UJ
7439-95-4	Magnesium	6780			P	
7439-96-5	Manganese	4.5	~~B~~		P	U
7440-02-0	Nickel	10.0	U		P	
7440-09-7	Potassium	2150	B		P	
7782-49-2	Selenium	90.0	U		P	
7440-22-4	Silver	4.0	U		P	
7440-23-5	Sodium	4360	B		P	
7440-28-0	Thallium	500	U		P	
7440-62-2	Vanadium	3.0	U		P	
7440-66-6	Zinc	32.3			P	U

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

BM 1-11-95

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CLP

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INORGANIC ANALYSES DATA SHEET

CLIENT ID NO.

BOD868

Lab Name: L.A.S. Contract: BECHTEL-HA

Lab Code: LOCK Case No.: 1112WH SAS No.: SDG No.: L3361F

Matrix (soil/water): WATER Lab Sample ID: L3361-12

Level (low/med): LOW Date Received: 11/19/94

% 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	UJ
7440-36-0	Antimony	50.0	U		P	
7440-38-2	Arsenic	3.0	~~U~~		F	UJ
7440-39-3	Barium	50.5	B		P	
7440-41-7	Beryllium	1.0	U		P	
7440-43-9	Cadmium	4.0	U		P	
7440-70-2	Calcium	50900		E	P	J
7440-47-3	Chromium	3.0	~~U~~		P	UJ
7440-48-4	Cobalt	6.0	U		P	
7440-50-8	Copper	3.0	U		P	
7439-89-6	Iron	9.6	~~B~~		P	U
7439-92-1	Lead	2.0	U		F	
7439-95-4	Magnesium	7350			P	
7439-96-5	Manganese	1.4	~~B~~		P	U
7440-02-0	Nickel	10.0	U		P	
7440-09-7	Potassium	2400	B		P	
7782-49-2	Selenium	90.0	U		P	
7440-22-4	Silver	4.0	U		P	
7440-23-5	Sodium	4730	B		P	
7440-28-0	Thallium	500	~~U~~		P	UJ
7440-62-2	Vanadium	3.0	U		P	
7440-66-6	Zinc	25.1			P	U

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:
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FORM I - IN

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LOCKHEED ANALYTICAL SERVICES

COMMON IONS AND ADDITIONAL ANALYTES

Sample Results

Client Sample ID: B0D864	Date Collected: 09-NOV-94
Matrix: Water	Date Received: 12-NOV-94

Constituent	Units	Method	Result	Reporting Det Limit	Data Qualifier(s)	Date Analyzed	LAS Batch ID	LAS Sample ID	
Chloride	mg/L	300.0	36.	0.02		22-NOV-94	15783	L3310-9	
Fluoride	mg/L	300.0	0.29	0.01		22-NOV-94	15784	L3310-9	
Nitrate-N	mg/L	300.0	21.	0.02	H	22-NOV-94	15785	L3310-9	J
Nitrite-N	mg/L	300.0	< 0.01	0.01	H	22-NOV-94	15786	L3310-9	UR
Sulfate	mg/L	300.0	100	0.1		22-NOV-94	15788	L3310-9	
O-Phosphate-Phosphorus	mg/L	365.2	< 0.05	0.05	H	28-NOV-94	16105	L3310-9	UR

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LOCKHEED ANALYTICAL SERVICES

COMMON IONS AND ADDITIONAL ANALYTES

Sample Results

Client Sample ID: BOD867	Date Collected: 17-NOV-94
Matrix: Water	Date Received: 19-NOV-94

Constituent	Units	Method	Result	Reporting Det|Limit	Data Qualifier(s)	Date Analyzed	LAS Batch|ID	LAS Sample|ID	
Chloride	mg/L	300.0	3.8	0.02		22-NOV-94	15783	L3361-3	
Fluoride	mg/L	300.0	0.058	0.01		22-NOV-94	15784	L3361-3	
Nitrate-N	mg/L	300.0	3.4	0.02	H	22-NOV-94	15785	L3361-3	J
Nitrite-N	mg/L	300.0	< 0.01	0.01	H	22-NOV-94	15786	L3361-3	UR
Sulfate	mg/L	300.0	35.	0.1		22-NOV-94	15788	L3361-3	
O-Phosphate-Phosphorus	mg/L	365.2	< 0.05	0.05	H	28-NOV-94	16105	L3361-3	UR

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RAD DATA REPORT (ra01)

Bechtel Hanford, Inc. * Richland, WA

Bechtel Hanford Project (Project BECHTEL-HANFORD)

Client Sample ID: B0D864 | LAL Sample ID: L3310-10

Date Collected: 09-NOV-94 | Date Received: 12-NOV-94

Matrix: Water | Login Number: L3310

Constituent	Analyzed	Batch	Activity	Error	MDA	DataQual	Units
Gross Alpha	13-DEC-94	GR ALP/BETA LAL-0060_16299	5.8	3.7	4.7	C	pCi/L
Gross Beta	13-DEC-94	GR ALP/BETA LAL-0060_16299	6.7	3.9	6.0	C	pCi/L J
Total radio-strontium	15-DEC-94	SR-90 LAL-0196_16324	0.11 U	0.30	0.52		pCi/L

The "U" concentration qualifier has been added to indicate results < MDA, not as a result of validation (pp 24-27)

JGoren 2-6-95

9613446.2465

RAD DATA REPORT (ra01)

Bechtel Hanford, Inc. * Richland, WA

Bechtel Hanford Project (Project BECHTEL-HANFORD)

Client Sample ID: B0D864 | LAL Sample ID: L3310-14

Date Collected: 09-NOV-94 | Date Received: 12-NOV-94

Matrix: Water | Login Number: L3310

Constituent	Analyzed	Batch	Activity		Error	MDA	DataQual	Units
C-14	14-DEC-94	C-14 LAL-0209_16269	0.00	U	15.	20.		pCi/L
H-3	07-DEC-94	TRITIUM(H3) LAL-0066_16332	7680		670	230		pCi/L

AJ 2-6-95

Page 32

AJ, 14-95

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RAD DATA REPORT (ra01)

Bechtel Hanford, Inc. * Richland, WA

Bechtel Hanford Project (Project BECHTEL-HANFORD)

Client Sample ID: BOD867

Date Collected: 17-NOV-94

Matrix: Water

LAL Sample ID: L3361-7

Date Received: 19-NOV-94

Login Number: L3361

Constituent	Analyzed	Batch	Activity	Error	MDA	DataQual	Units
Gross Alpha	13-DEC-94	GR ALP/BETA LAL-0060_16299	1.1 U	1.1	1.7		pCi/L
Gross Beta	13-DEC-94	GR ALP/BETA LAL-0060_16299	45.3	3.0	2.2		pCi/L J
Total radio-strontium	15-DEC-94	SR-90 LAL-0196_16324	20.9	1.8	1.2		pCi/L

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RAD DATA REPORT (ra01)

Bechtel Hanford, Inc. * Richland, WA

Bechtel Hanford Project (Project BECHTEL-HANFORD)

Client Sample ID: B0D867 | LAL Sample ID: L3361-11

Date Collected: 17-NOV-94 | Date Received: 19-NOV-94

Matrix: Water | Login Number: L3361

Constituent	Analyzed	Batch	Activity		Error	MDA	DataQual	Units
C-14	14-DEC-94	C-14 LAL-0209_16269	3.	u	15.	20.		pCi/L
H-3	07-DEC-94	TRITIUM(H3) LAL-0066_16332	410		220	230		pCi/L

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LOCKHEED ANALYTICAL LABORATORY
VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

BOD864

Lab Job Name:BECHTEL-HANFORD Contract:_

Lab Code:LAL Case No.: SAS No.: SDG No.:L3310

Matrix: (soil/water) WATER Lab Sample ID:L3310-1

Sample wt/vol: 5.00 (g/ml) ML Lab File ID: D3514

Level: (low/med) LOW Date Received:11/12/94

% Moisture: not dec. 0 Date Analyzed:11/16/94

GC Column:RTX502.2 ID: 0.53(mm) Dilution Factor: 1.00

Soil Extract Volume: 1.00 (ML) Soil Aliquot Volume: 1.00(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L_	Q
74-87-3	Chloromethane	10.	U
74-83-9	Bromomethane	10.	U
75-01-4	Vinyl Chloride	10.	U
75-00-3	Chloroethane	10.	U
75-09-2	Methylene Chloride	10.	U
67-64-1	Acetone	10.	U
75-15-0	Carbon Disulfide	10.	U
75-35-4	1,1-Dichloroethene	10.	U
75-34-3	1,1-Dichloroethane	10.	U
540-59-0	1,2-Dichloroethene (total)	10.	U
67-66-3	Chloroform	10.	U
107-06-2	1,2-Dichloroethane	10.	U
78-93-3	2-Butanone	10.	U
71-55-6	1,1,1-Trichloroethane	10.	U
56-23-5	Carbon Tetrachloride	10.	U
75-27-4	Bromodichloromethane	10.	U
78-87-5	1,2-Dichloropropane	10.	U
10061-01-5	cis-1,3-Dichloropropene	10.	U
79-01-6	Trichloroethene	10.	U
124-48-1	Dibromochloromethane	10.	U
79-00-5	1,1,2-Trichloroethane	10.	U
71-43-2	Benzene	10.	U
10061-02-6	trans-1,3-Dichloropropene	10.	U
75-25-2	Bromoform	10.	U
108-10-1	4-Methyl-2-Pentanone	10.	U
591-78-6	2-Hexanone	10.	U
127-18-4	Tetrachloroethene	10.	U
79-34-5	1,1,2,2-Tetrachloroethane	10.	U
108-88-3	Toluene	10.	U
108-90-7	Chlorobenzene	10.	U
100-41-4	Ethylbenzene	10.	U
100-42-5	Styrene	10.	U
1330-20-7	Xylenes (total)	10.	U

FORM I - CLP VOA

1-13-95

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LOCKHEED ANALYTICAL LABORATORY
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CUSTOMER SAMPLE NO.: BOD864

Lab Job Name: BECHTEL-HANFORD Contract: _

Lab Code: LAL Case No.: SAS No.: SDG No.: L3310

Matrix: (soil/water) WATER Lab Sample ID: L3310-1

Sample wt/vol: 5.00 (g/ml) ML Lab File ID: D3514

Level: (low/med) LOW Date Received: 11/12/94

% Moisture: not dec. 0 Date Analyzed: 11/16/94

GC Column: RTX502.2 ID: 0.53 (mm) Dilution Factor: 1.00

Soil Extract Volume: 1.00 (uL) Soil Aliquot Volume: 1.00 (uL)

Number TICs Found: 0 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L_

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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FORM I - CLP VOA-TIC 3/90

1-13-95 (WJC)

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LOCKHEED ANALYTICAL LABORATORY
VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

BOD866

Lab Job Name:BECHTEL-HANFORD Contract:_

Lab Code:LAL Case No.: SAS No.: SDG No.:L3310

Matrix: (soil/water) WATER Lab Sample ID:L3310-4

Sample wt/vol: 5.00 (g/ml) ML Lab File ID: D3515

Level: (low/med) LOW Date Received:11/12/94

% Moisture: not dec. 0 Date Analyzed:11/16/94

GC Column:RTX502.2 ID: 0.53(mm) Dilution Factor: 1.00

Soil Extract Volume: 1.00 (ML) Soil Aliquot Volume: 1.00(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L_	Q
74-87-3	Chloromethane	10.	U
74-83-9	Bromomethane	10.	U
75-01-4	Vinyl Chloride	10.	U
75-00-3	Chloroethane	10.	U
75-09-2	Methylene Chloride	10.	U
67-64-1	Acetone	4.	J
75-15-0	Carbon Disulfide	10.	U
75-35-4	1,1-Dichloroethene	10.	U
75-34-3	1,1-Dichloroethane	10.	U
540-59-0	1,2-Dichloroethene (total)	10.	U
67-66-3	Chloroform	10.	U
107-06-2	1,2-Dichloroethane	10.	U
78-93-3	2-Butanone	10.	U
71-55-6	1,1,1-Trichloroethane	10.	U
56-23-5	Carbon Tetrachloride	10.	U
75-27-4	Bromodichloromethane	10.	U
78-87-5	1,2-Dichloropropane	10.	U
10061-01-5	cis-1,3-Dichloropropene	10.	U
79-01-6	Trichloroethene	10.	U
124-48-1	Dibromochloromethane	10.	U
79-00-5	1,1,2-Trichloroethane	10.	U
71-43-2	Benzene	10.	U
10061-02-6	trans-1,3-Dichloropropene	10.	U
75-25-2	Bromoform	10.	U
108-10-1	4-Methyl-2-Pentanone	10.	U
591-78-6	2-Hexanone	10.	U
127-18-4	Tetrachloroethene	10.	U
79-34-5	1,1,2,2-Tetrachloroethane	10.	U
108-88-3	Toluene	10.	U
108-90-7	Chlorobenzene	10.	U
100-41-4	Ethylbenzene	10.	U
100-42-5	Styrene	10.	U
1330-20-7	Xylenes (total)	10.	U

1-13-95
WJC

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9613446.2471

LOCKHEED ANALYTICAL LABORATORY
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CUSTOMER SAMPLE NO.: BOD866

Lab Job Name: BECHTEL-HANFORD Contract: _

Lab Code: LAL Case No.: SAS No.: SDG No.: L3310

Matrix: (soil/water) WATER Lab Sample ID: L3310-4

Sample wt/vol: 5.00 (g/ml) ML Lab File ID: D3515

Level: (low/med) LOW Date Received: 11/12/94

% Moisture: not dec. 0 Date Analyzed: 11/16/94

GC Column: RTX502.2 ID: 0.53 (mm) Dilution Factor: 1.00

Soil Extract Volume: 1.00 (uL) Soil Aliquot Volume: 1.00 (uL)

Number TICs Found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L_

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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FORM I - CLP VOA-TIC 3/90 ~~37~~

1-13-95
WJC

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LOCKHEED ANALYTICAL LABORATORY
VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

BOD867

Lab Job Name:BECHTEL-HANFORD Contract:_

Lab Code:LAL Case No.: SAS No.: SDG No.:L3310

Matrix: (soil/water) WATER Lab Sample ID:L3361-4

Sample wt/vol: 5.00 (g/ml) ML Lab File ID: D3522

Level: (low/med) LOW Date Received:11/19/94

% Moisture: not dec. 0 Date Analyzed:11/21/94

GC Column:RTX502.2 ID: 0.53(mm) Dilution Factor: 1.00

Soil Extract Volume: 1.00 (ML) Soil Aliquot Volume: 1.00(uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L_	Q	
74-87-3	Chloromethane	10.	~~U~~	UJ
74-83-9	Bromomethane	10.	~~U~~	UJ
75-01-4	Vinyl Chloride	10.	~~U~~	UJ
75-00-3	Chloroethane	10.	~~U~~	UJ
75-09-2	Methylene Chloride	10.	~~U~~	UJ
67-64-1	Acetone	10.	U	
75-15-0	Carbon Disulfide	10.	U	
75-35-4	1,1-Dichloroethene	10.	~~U~~	UJ
75-34-3	1,1-Dichloroethane	10.	~~U~~	UJ
540-59-0	1,2-Dichloroethene (total)	10.	~~U~~	UJ
67-66-3	Chloroform	10.	~~U~~	UJ
107-06-2	1,2-Dichloroethane	10.	~~U~~	UJ
78-93-3	2-Butanone	10.	U	
71-55-6	1,1,1-Trichloroethane	10.	U	-
56-23-5	Carbon Tetrachloride	10.	U	
75-27-4	Bromodichloromethane	10.	U	
78-87-5	1,2-Dichloropropane	10.	~~U~~	UJ
10061-01-5	cis-1,3-Dichloropropene	10.	~~U~~	UJ
79-01-6	Trichloroethene	10.	U	
124-48-1	Dibromochloromethane	10.	U	
79-00-5	1,1,2-Trichloroethane	10.	U	
71-43-2	Benzene	10.	U	
10061-02-6	trans-1,3-Dichloropropene	10.	U	
75-25-2	Bromoform	10.	~~U~~	UJ
108-10-1	4-Methyl-2-Pentanone	10.	U	
591-78-6	2-Hexanone	10.	U	
127-18-4	Tetrachloroethene	10.	U	
79-34-5	1,1,2,2-Tetrachloroethane	10.	U	
108-88-3	Toluene	10.	U	
108-90-7	Chlorobenzene	10.	U	
100-41-4	Ethylbenzene	10.	U	
100-42-5	Styrene	10.	U	
1330-20-7	Xylenes (total)	10.	U	

FORM I - CLP VOA

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1-13-95 9/19/9

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LOCKHEED ANALYTICAL LABORATORY
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CUSTOMER SAMPLE NO.

BOD867

Lab Job Name:BECHTEL-HANFORD Contract:_

Lab Code:LAL Case No.: SAS No.: SDG No.:L3310

Matrix: (soil/water) WATER Lab Sample ID:L3361-4

Sample wt/vol: 5.00 (g/ml) ML Lab File ID: D3522

Level: (low/med) LOW Date Received:11/19/94

% Moisture: not dec. 0 Date Analyzed:11/21/94

GC Column:RTX502.2 ID: 0.53(mm) Dilution Factor: 1.00

Soil Extract Volume: 1.00 (uL) Soil Aliquot Volume: 1.00(uL)

Number TICs Found: 0 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L_

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
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FORM I - CLP VOA-TIC

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LOCKHEED ANALYTICAL LABORATORY
VOLATILE ORGANICS ANALYSIS DATA SHEET

CUSTOMER SAMPLE NO.

BOD869

Lab Job Name: BECHTEL-HANFORD Contract: _

Lab Code: LAL Case No.: SAS No.: SDG No.: L3310

Matrix: (soil/water) WATER Lab Sample ID: L3361-13

Sample wt/vol: 5.00 (g/ml) ML Lab File ID: D3523

Level: (low/med) LOW Date Received: 11/19/94

% Moisture: not dec. 0 Date Analyzed: 11/21/94

GC Column: RTX502.2 ID: 0.53 (mm) Dilution Factor: 1.00

Soil Extract Volume: 1.00 (ML) Soil Aliquot Volume: 1.00 (uL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L_	Q	
74-87-3	Chloromethane	10.	~~U~~	UJ
74-83-9	Bromomethane	10.	~~U~~	UJ
75-01-4	Vinyl Chloride	10.	~~U~~	UJ
75-00-3	Chloroethane	10.	~~U~~	UJ
75-09-2	Methylene Chloride	10.	~~U~~	UJ
67-64-1	Acetone	3.	J	
75-15-0	Carbon Disulfide	10.	U	
75-35-4	1,1-Dichloroethene	10.	~~U~~	UJ
75-34-3	1,1-Dichloroethane	10.	~~U~~	UJ
540-59-0	1,2-Dichloroethene (total)	10.	~~U~~	UJ
67-66-3	Chloroform	10.	~~U~~	UJ
107-06-2	1,2-Dichloroethane	10.	~~U~~	UJ
78-93-3	2-Butanone	10.	U	
71-55-6	1,1,1-Trichloroethane	10.	U	
56-23-5	Carbon Tetrachloride	10.	U	-
75-27-4	Bromodichloromethane	10.	U	
78-87-5	1,2-Dichloropropane	10.	~~U~~	UJ
10061-01-5	cis-1,3-Dichloropropene	10.	~~U~~	UJ
79-01-6	Trichloroethene	10.	U	
124-48-1	Dibromochloromethane	10.	U	
79-00-5	1,1,2-Trichloroethane	10.	U	
71-43-2	Benzene	10.	U	
10061-02-6	trans-1,3-Dichloropropene	10.	U	
75-25-2	Bromoform	10.	~~U~~	UJ
108-10-1	4-Methyl-2-Pentanone	10.	U	
591-78-6	2-Hexanone	10.	U	
127-18-4	Tetrachloroethene	10.	U	
79-34-5	1,1,2,2-Tetrachloroethane	10.	U	
108-88-3	Toluene	10.	U	
108-90-7	Chlorobenzene	10.	U	
100-41-4	Ethylbenzene	10.	U	
100-42-5	Styrene	10.	U	
1330-20-7	Xylenes (total)	10.	U	

FORM I - CLP VOA ~~57~~ 3/90

1-13-95 (WSC)

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LOCKHEED ANALYTICAL LABORATORY
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CUSTOMER SAMPLE NO.

BOD869

Lab Job Name:BECHTEL-HANFORD Contract:_

Lab Code:LAL Case No.: SAS No.: SDG No.:L3310

Matrix: (soil/water) WATER Lab Sample ID:L3361-13

Sample wt/vol: 5.00 (g/ml) ML Lab File ID: D3523

Level: (low/med) LOW Date Received:11/19/94

% Moisture: not dec. 0 Date Analyzed:11/21/94

GC Column:RTX502.2 ID: 0.53(mm) Dilution Factor: 1.00

Soil Extract Volume: 1.00 (uL) Soil Aliquot Volume: 1.00(uL)

Number TICs Found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L_

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

1-13-95
WJC

9613446.2476

Checklists

9613446.2477

LATA INORGANIC (METALS/CYANIDE) DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
VALIDATION PROCEDURE:	☐ WHC-CM-5-3, Rev. 0			☒ WHC-SD-EN-SPP-002, Rev. 2	

PROJECT:	100-FR-3 ROUND 6		SDG:	LK15-LAS	
VALIDATOR:	MORRIS BM	LATA NO:	VB403.08	DATE:	11-Jan-95
REVIEWER:	WEBB	LAB:	LAS	CASE:	1112WH
SAF NO:	B94-083	QAPP NO:	DOE/RL-91-53	SAP NO:	N/A

ANALYSES REQUESTED

☒ CLP ICP	☒ CLP GFAA (As, Pb)	☐ CLP Hg	☐ CLP CN	☐	☐
☐ SW-846 ICP +type add'l elements	☐ SW-846 GFAA As, Se, Pb, Tl	☐ SW-846 Hg 7470/7471	☐ SW-846 CN 9012	☐ TCLP Metals 1311/6010	☐

SAMPLE NO.	MATRIX	SAMPLE NO.	MATRIX	☐	☐
B0D864	WATER	B0D865-Filtered GFAA	WATER	COMMENTS:	
B0D867	WATER	B0D868-Filtered GFAA	WATER		

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

	YES	NO	N/A
Is technical verification documentation present?	☒	☐	☐
Is a case narrative present?	☒	☐	☐

2. HOLDING TIMES

	YES	NO	N/A
Are sample holding times acceptable?	☒	☐	☐

See HOLDING TIME SUMMARY form

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

	YES	NO	N/A
Were initial calibrations performed on all instruments?	☒	☐	☐
Are initial calibrations acceptable?	☒	☐	☐
Are ICP interference checks acceptable?	☒	☐	☐
Were ICV and CCV checks performed on all instruments?	☒	☐	☐
Are ICV and CCV checks acceptable?	☒	☐	☐
Validation calculation checks were performed and are acceptable.	☒	☐	☐

If NO(s) are checked, see CALIBRATION DATA SUMMARY form

LATA INORGANIC (METALS/CYANIDE)
DATA VALIDATION CHECKLIST

4. BLANKS

	YES	NO	N/A
Were ICB and CCB checks performed for all applicable analyses?	X		
Are ICB and CCB results acceptable?		X	
Were preparation blanks analyzed?	X		
Are preparation blank results acceptable?		X	

If NO(s) are checked, see BLANK AND SAMPLE DATA SUMMARY form

5. ACCURACY

	YES	NO	N/A
Were spike samples analyzed at the proper frequency?	X		
Are all spike sample recoveries acceptable?	X		
Are all elements spiked at an appropriate level?	X		
Was a post digestion spike analyzed?			X
Are all post digestion spike recoveries acceptable?			X
Were laboratory control samples (LCS) analyzed at the proper frequency?	X		
Are all LCS recoveries acceptable?		X	
Validation calculation checks were performed and are acceptable.	X		

If NO(s) are checked, see ACCURACY DATA SUMMARY form

6. PRECISION

	YES	NO	N/A
Were laboratory duplicates analyzed at the proper frequency?	X		
Are all duplicate RPD values acceptable?	X		
Were MS/MSDs analyzed?			X
Are all MS/MSD RPD values acceptable?			X
Were ICP serial dilution samples analyzed at the proper frequency?	X		
Are all ICP serial dilution %D values acceptable?		X	
Validation calculation checks were performed and are acceptable.	X		

If NO(s) are checked, see PRECISION DATA SUMMARY form

LATA INORGANIC (METALS/CYANIDE) DATA VALIDATION CHECKLIST

7. FIELD QC SAMPLES

	YES	NO	N/A
Were field QC samples (field/trip blanks, duplicates, splits, performance audit) identified?	X		
Are field/trip blank results acceptable?			X
Are field duplicate RPD values acceptable?			X
Are field split RPD values acceptable?			X
Are performance audit sample results acceptable?			X

Comments: Split field samples were identified. (See page 3 of this report)

Field QC will be evaluated in the 100-FR-3 Summary Report.

8. FURNACE AA QUALITY CONTROL

	YES	NO	N/A
Were duplicate injections performed if required?	X		
Are all duplicate injection %RSD values acceptable?	X		
Were analytical spikes performed if required?	X		
Are all analytical spike recoveries acceptable?		X	
Was MSA performed if required?		X	
Are all MSA results acceptable?			X
Validation calculation checks were performed and are acceptable.	X		

Comments: ANALYTICAL SPIKE RECOVERIES:

As 118.3% B0D868 UJ — As 116.0% B0D867 UJ

As 135.7% B0D865 UJ — As 117.5% B0D864 UJ

Pb 118.0% B0D867 UJ

9. REPORTED RESULTS AND DETECTION LIMITS

	YES	NO	N/A
Are results reported for all requested analyses?	X		
Are all results supported in the raw data?	X		
Are results calculated properly?	X		
Do results meet the CRDLs?	X		
Validation calculation checks were performed and are acceptable.	X		

Comments:

VALIDATION SUMMARY

For deficiencies (major and minor) and comments, please refer to the Qualification Summary Table.

LATA INORGANIC (METALS/CYANIDE)
DATA VALIDATION CHECKLIST

HOLDING TIME SUMMARY

SDG:	LK15-LAS		VALIDATOR: MORRIS					DATE:	11-Jan-95	
PROJECT:	100-FR-3 ROUND 6		REVIEWER: WEBB					LATA NO.:	VB403.08	
HEIS-SN	MATRIX CODE	ANALYSIS	DATE COLLECTED	PREP DATE	ANALYSIS DATE	PREP HT (days)	***Required HT (days)***	ANALYSIS HT (days)	***Required HT (days)***	VAL Q
B0D864	WATER	ICP METALS	9-Nov-94	01-Dec-94	14-Dec-94	22	***180***	13	***180***	NONE
B0D864	WATER	AA METALS (UNFIL)	9-Nov-94	01-Dec-94	02-Dec-94	22	***180***	1	***180***	NONE
B0D865	WATER	AA METALS (FIL)	9-Nov-94	01-Dec-94	08-Dec-94	22	***180***	7	***180***	NONE
B0D867	WATER	ICP METALS	17-Nov-94	01-Dec-94	14-Dec-94	14	***180***	13	***180***	NONE
B0D867	WATER	AA METALS (UNFIL)	17-Nov-94	01-Dec-94	02-Dec-94	14	***180***	1	***180***	NONE
B0D868	WATER	AA METALS (FIL)	17-Nov-94	01-Dec-94	08-Dec-94	14	***180***	7	***180***	NONE

LATA INORGANIC (METALS/CYANIDE)
DATA VALIDATION CHECKLIST

BLANK DATA SUMMARY

SDG:	LK15-LAS		VALIDATOR:	MORRIS					DATE:	11-Jan-95
PROJECT:	100-FR-3 ROUND 6		REVIEWER:	WEBB					LATA NO.:	VB403.08
BLANK ID	ANALYTE	RESULT	LAB Q	RT	UNITS	2X RESULT	5X RESULT	10X RESULT	SAMPLES AFFECTED	VAL Q
CCB	Aluminum	-49.8	B		ug/L	99.6			ALL	UJ
CCB	Manganese	1.5	B		ug/L		7.5		B0D867 B0D868	U
ICB	Chromium	-3.6	B		ug/L	7.2			B0D867 B0D868	BJ/UJ
PREP	Iron	17.35	B		ug/L		86.75		B0D864 B0D865 B0D868	U
PREP	Zinc	6.7	B		ug/L		33.3		ALL	U

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CLP

3
BLANKS

Lab Name: L.A.S. Contract: BECHTEL-HA

Lab Code: LOCK Case No.: 1112WH SAS No.: _____ SDG No.: L3310W

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) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum	16.0	U	16.0	U	16.0	U	-20.6	B	172.770	B	P
Antimony	50.0	U	50.0	U	50.0	U	50.0	U	50.000	U	P
Arsenic	3.0	U	3.0	U	3.0	U	3.0	U	3.000	U	F
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	542.700	B	P
Chromium	-3.6	B	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	7.0	U	17.350	B	P
Lead	2.0	U	2.0	U	2.0	U	2.0	U	2.000	U	F
Magnesium	36.0	U	36.0	U	36.0	U	36.0	U	36.000	U	P
Manganese	1.0	U	1.0	B	1.0	U	1.1	B	1.000	U	P
Nickel	10.0	U	10.0	U	10.0	U	10.0	U	10.000	U	P
Potassium	-785.7	B	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	61.710	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	3.0	U	3.0	U	3.0	U	3.0	U	6.660	B	P

FORM III - IN

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3
BLANKS

Lab Name: L.A.S. Contract: BECHTEL-HA

Lab Code: LOCK Case No.: 1112WH SAS No.: _____ SDG No.: L3310W

Preparation Blank Matrix (soil/water): _____

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

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum			-41.8	B	-49.8	B					P
Antimony			50.0	U	50.0	U					P
Arsenic			3.0	U							F
Barium			9.0	U	9.0	U					P
Beryllium			1.0	U	1.0	U					P
Cadmium			4.0	U	4.0	U					P
Calcium			17.0	U	17.0	U					P
Chromium			3.0	U	3.0	U					P
Cobalt			6.0	U	6.0	U					P
Copper			3.0	U	3.0	U					P
Iron			7.0	U	7.0	U					P
Lead			2.0	U							F
Magnesium			36.0	U	36.0	U					P
Manganese			1.5	B	1.4	B					P
Nickel			10.0	U	10.0	U					P
Potassium			620.0	U	620.0	U					P
Selenium			90.0	U	90.0	U					P
Silver			4.0	U	4.0	U					P
Sodium			21.0	U	21.0	U					P
Thallium			500.0	U	500.0	U					P
Vanadium			3.0	U	3.0	U					P
Zinc			3.0	U	3.0	U					P

FORM III - IN

ILMO3.0

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LATA INORGANIC (METALS/CYANIDE)
DATA VALIDATION CHECKLIST

ACCURACY DATA SUMMARY

SDG:	LK15-LAS				VALIDATOR:	MORRIS				DATE:	11-Jan-95	
PROJECT:	100-FR-3 ROUND 6				REVIEWER:	WEBB				LATA NO.:	VB403.08	
							PERCENT RECOVERY (%R)					
HEIS-SN	ANALYTE	RESULTS	Lab Q	Actual Spiking Level	Minimum Required Spiking Level	Difference	Matrix Spike	Matrix Spike Duplicate	Post Digestion Spike	Laboratory Control Standard	SAMPLES AFFECTED	VAL Q
B0D864	Aluminum	non detect								169.4%	NONE	-
B0D864	Cadmium	non detect								125.8%	NONE	
B0D865	Thallium	non detect								79.3%	B0D865, B0D868	UJ

NOTE: (1) The minimum required spiking level is 25% of the sample concentration or the detection limit, whichever is higher.
(2) A negative number in the difference column indicates the spiking level for that element was inappropriate for the analyte level in the sample spiked.
(3) There are two batch QC samples for this data package:

B0D864 / B0D867 B0D865 / B0D868

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CLP

7

LABORATORY CONTROL SAMPLE

Lab Name: L.A.S. Contract: BECHTEL-HA

Lab Code: LOCK Case No.: 1112WH SAS No.: _____ SDG No.: L3310W

Solid LCS Source: _____

Aqueous LCS Source: I.VENTURES

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
Aluminum	2000.0	3387.15	169.4						
Antimony	2000.0	2180.54	109.0						
Arsenic	40.0	38.30	95.8						
Barium	2000.0	2298.68	114.9						
Beryllium	50.0	51.19	102.4						
Cadmium	50.0	62.92	125.8						
Calcium	100000	116997.7	117.0						
Chromium	200.0	225.57	112.8						
Cobalt	500.0	554.95	111.0						
Copper	250.0	280.50	112.2						
Iron	1000.0	1147.10	114.7						
Lead	20.0	21.20	106.0						
Magnesium	50000.0	55685.12	111.4						
Manganese	500.0	559.80	112.0						
Nickel	500.0	551.12	110.2						
Potassium	50000.0	54890.51	109.8						
Selenium	2000.0	2222.36	111.1						
Silver	50.0	56.67	113.3						
Sodium	100000	113450.1	113.5						
Thallium	2000.0	1998.57	99.9						
Vanadium	500.0	564.31	112.9						
Zinc	500.0	462.75	92.6						

FORM VII - IN

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CLP

7

LABORATORY CONTROL SAMPLE

Lab Name: L.A.S. Contract: BECHTEL-HA

Lab Code: LOCK Case No.: 1112WH SAS No.: _____ SDG No.: L3310F

Solid LCS Source: _____

Aqueous LCS Source: I.VENTURES

Analyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
Aluminum	2000.0	1997.50	99.9						
Antimony	2000.0	1936.69	96.8						
Arsenic	40.0	36.05	90.1						
Barium	2000.0	2022.34	101.1						
Beryllium	50.0	45.34	90.7						
Cadmium	50.0	50.76	101.5						
Calcium	100000	100434.0	100.4						
Chromium	200.0	192.30	96.2						
Cobalt	500.0	483.00	96.6						
Copper	250.0	243.75	97.5						
Iron	1000.0	973.91	97.4						
Lead	20.0	19.60	98.0						
Magnesium	50000.0	49220.40	98.4						
Manganese	500.0	487.45	97.5						
Nickel	500.0	491.21	98.2						
Potassium	50000.0	48962.96	97.9						
Selenium	10.0	1922.82	19228						
Silver	50.0	48.87	97.7						
Sodium	100000	101995.7	102.0						
Thallium	2000.0	1586.38	79.3						
Vanadium	500.0	496.27	99.3						
Zinc	500.0	486.06	97.2						

Se - 2000.00

%R: 96.1

See previous page.

FORM VII - IN

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171

1-16-95

000010

Analytical Report Date: 12/05/94

Concentration (ug/L): 1.2

Replicate 2 Time: 17:59
Peak Area (A-s): 0.002 Peak Height (A): 0.009
Background Pk Area (A-s): 0.162 Background Pk Height (A): 0.144
Blank Corrected Pk Area (A-s): 0.003
Concentration (ug/L): 1.2

Mean Conc (ug/L): ~~1.2~~ SD: 0.04 RSD(%): 3.70

KVDW

As ID: L3310-8 Seq. No.: 00032 A/S Pos.: 18 Date: 12/02/94

Replicate 1 Time: 18:02
Peak Area (A-s): 0.052 Peak Height (A): 0.102
Background Pk Area (A-s): 0.155 Background Pk Height (A): 0.142
Blank Corrected Pk Area (A-s): 0.052
Concentration (ug/L): 23.3

Replicate 2 Time: 18:05
Peak Area (A-s): 0.052 Peak Height (A): 0.109
Background Pk Area (A-s): 0.166 Background Pk Height (A): 0.136
Blank Corrected Pk Area (A-s): 0.053
Concentration (ug/L): 23.7

Mean Conc (ug/L): 23.5 SD: 0.27 RSD(%): 1.13

Recovery is 111.5% $\frac{23.5}{20} = 117.5\%$ BOD86Y

As ID: CCV Seq. No.: 00033 A/S Pos.: 5 Date: 12/02/94

Replicate 1 Time: 18:09
Peak Area (A-s): 0.235 Peak Height (A): 0.427
Background Pk Area (A-s): 0.119 Background Pk Height (A): 0.161
Blank Corrected Pk Area (A-s): 0.236
Concentration (ug/L): 106.0

Replicate 2 Time: 18:12
Peak Area (A-s): 0.232 Peak Height (A): 0.426
Background Pk Area (A-s): 0.123 Background Pk Height (A): 0.175
Blank Corrected Pk Area (A-s): 0.233
Concentration (ug/L): 104.7

Mean Conc (ug/L): 105.4 SD: 0.86 RSD(%): 0.81

105%

As ID: CCB Seq. No.: 00034 A/S Pos.: 8 Date: 12/02/94

Replicate 1 Time: 18:15
Peak Area (A-s): 0.001 Peak Height (A): 0.006
Background Pk Area (A-s): 0.108 Background Pk Height (A): 0.165
Blank Corrected Pk Area (A-s): 0.002
Concentration (ug/L): 0.9

Replicate 2 Time: 18:18

BM 1-16-95 416

Analytical Report Date: 12/05/94

Concentration (ug/L): 43.3

Mean Conc (ug/L): 42.9 SD: 0.51 RSD(%): 1.18

10750

As ID: L3310-8S Seq. No.: 00038 A/S Pos.: 20 Date: 12/02/94

Replicate 1 Time: 18:40
Peak Area (A-s): 0.144 Peak Height (A): 0.267
Background Pk Area (A-s): 0.180 Background Pk Height (A): 0.139
Blank Corrected Pk Area (A-s): 0.145
Concentration (ug/L): 54.9

Replicate 2 Time: 18:43
Peak Area (A-s): 0.141 Peak Height (A): 0.262
Background Pk Area (A-s): 0.175 Background Pk Height (A): 0.137
Blank Corrected Pk Area (A-s): 0.141
Concentration (ug/L): 63.3

Mean Conc (ug/L): 64.1 SD: 1.17 RSD(%): 1.83

Recovery is 105.7%

As ID: L3361-2 Seq. No.: 00039 A/S Pos.: 21 Date: 12/02/94

Replicate 1 Time: 18:46
Peak Area (A-s): 0.002 Peak Height (A): 0.007
Background Pk Area (A-s): 0.174 Background Pk Height (A): 0.180
Blank Corrected Pk Area (A-s): 0.002
Concentration (ug/L): 0.9

Replicate 2 Time: 18:49
Peak Area (A-s): 0.001 Peak Height (A): 0.008
Background Pk Area (A-s): 0.174 Background Pk Height (A): 0.181
Blank Corrected Pk Area (A-s): 0.002
Concentration (ug/L): 0.9

Mean Conc (ug/L): 0.9 SD: 0.03 RSD(%): 2.95

NDW

As ID: L3361-2 Seq. No.: 00040 A/S Pos.: 21 Date: 12/02/94

BOD867

Replicate 1 Time: 18:52
Peak Area (A-s): 0.051 Peak Height (A): 0.101
Background Pk Area (A-s): 0.169 Background Pk Height (A): 0.176
Blank Corrected Pk Area (A-s): 0.051
Concentration (ug/L): 22.8

Replicate 2 Time: 18:56
Peak Area (A-s): 0.052 Peak Height (A): 0.102
Background Pk Height (A): 0.170
Blank Corrected Pk Area (A-s): 0.053
Concentration (ug/L): 23.5

Mean Conc (ug/L): 23.2 SD: 0.50 RSD(%): 2.14

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1-16-95 ~~418~~
000318

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Analytical Report Date: 12/05/94

Recovery is 111.2% $\frac{23.2}{20} = 116\%$

As ID: CCV Seq. No.: 00041 A/S Pos.: 5 Date: 12/02/94

Replicate 1 Time: 18:59
Peak Area (A-s): 0.228 Peak Height (A): 0.401
Background Pk Area (A-s): 0.121 Background Pk Height (A): 0.169
Blank Corrected Pk Area (A-s): 0.229
Concentration (ug/L): 103.0

Replicate 2 Time: 19:02
Peak Area (A-s): 0.227 Peak Height (A): 0.405
Background Pk Area (A-s): 0.117 Background Pk Height (A): 0.171
Blank Corrected Pk Area (A-s): 0.228
Concentration (ug/L): 102.4

Mean Conc (ug/L): 102.7 SD: 0.42 RSD(%): 0.41

103%

As ID: CCB Seq. No.: 00042 A/S Pos.: 8 Date: 12/02/94

Replicate 1 Time: 19:05
Peak Area (A-s): 0.000 Peak Height (A): 0.009
Background Pk Area (A-s): 0.112 Background Pk Height (A): 0.155
Blank Corrected Pk Area (A-s): 0.001
Concentration (ug/L): 0.4

Replicate 2 Time: 19:08
Peak Area (A-s): 0.001 Peak Height (A): 0.008
Background Pk Area (A-s): 0.110 Background Pk Height (A): 0.152
Blank Corrected Pk Area (A-s): 0.001
Concentration (ug/L): 0.6

Mean Conc (ug/L): 0.5 SD: 0.11 RSD(%): 22.58

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CD03.5

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Blank Corrected Pk Area (A-s): 0.108
Concentration (ug/L): 54.82

Replicate 2 Time: 17:11
Peak Area (A-s): 0.108 Peak Height (A): 0.215
Background Pk Area (A-s): 0.048 Background Pk Height (A): 0.122
Blank Corrected Pk Area (A-s): 0.106
Concentration (ug/L): 53.96

Mean Conc (ug/L): 54.39 SD: 0.607 RSD(%): 1.12

Recovery is 91.7%

As ID: L3310-15 Seq. No.: 00016 A/S Pos.: 12 Date: 12/08/94

Replicate 1 Time: 17:14
Peak Area (A-s): 0.007 Peak Height (A): 0.031
Background Pk Area (A-s): 0.144 Background Pk Height (A): 0.213
Blank Corrected Pk Area (A-s): 0.005
Concentration (ug/L): 2.68

Replicate 2 Time: 17:18
Peak Area (A-s): 0.007 Peak Height (A): 0.033
Background Pk Area (A-s): 0.143 Background Pk Height (A): 0.203
Blank Corrected Pk Area (A-s): 0.005
Concentration (ug/L): 2.58

Mean Conc (ug/L): 2.63 SD: 0.071 RSD(%): 2.72

NDW

As ID: L3310-15 Seq. No.: 00017 A/S Pos.: 12 Date: 12/08/94

Replicate 1 Time: 17:21
Peak Area (A-s): 0.056 Peak Height (A): 0.132
Background Pk Area (A-s): 0.140 Background Pk Height (A): 0.192
Blank Corrected Pk Area (A-s): 0.054
Concentration (ug/L): 27.39

Replicate 2 Time: 17:24
Peak Area (A-s): 0.055 Peak Height (A): 0.128
Background Pk Area (A-s): 0.142 Background Pk Height (A): 0.195
Blank Corrected Pk Area (A-s): 0.053
Concentration (ug/L): 26.89

BOD865

Mean Conc (ug/L): 27.14 SD: 0.350 RSD(%): 1.29

Recovery is 122.6% (outside of specified limits)

135.7%

As ID: L3310-15D Seq. No.: 00018 A/S Pos.: 13 Date: 12/08/94

Replicate 1 Time: 17:27
Peak Area (A-s): 0.006 Peak Height (A): 0.033
Background Pk Area (A-s): 0.145 Background Pk Height (A): 0.217
Blank Corrected Pk Area (A-s): 0.004
Concentration (ug/L): 2.06

Replicate 2 Time: 17:30

BM 1-12-95

~~428~~

9613446.2491

As ID: L3361-12 Seq. No.: 00025 A/S Pos.: 15 Date: 12/08/94

Replicate 1 Time: 18:11
Peak Area (A-s): 0.002 Peak Height (A): 0.010
Background Pk Area (A-s): 0.107 Background Pk Height (A): 0.159
Blank Corrected Pk Area (A-s): 0.001
Concentration (ug/L): 0.37

Replicate 2 Time: 18:14
Peak Area (A-s): 0.002 Peak Height (A): 0.008
Background Pk Area (A-s): 0.102 Background Pk Height (A): 0.163
Blank Corrected Pk Area (A-s): 0.001
Concentration (ug/L): 0.26

Mean Conc (ug/L): 0.31 SD: 0.073 RSD(%): 23.15

NDW

As ID: L3361-12 Seq. No.: 00026 A/S Pos.: 15 Date: 12/08/94

Replicate 1 Time: 18:17
Peak Area (A-s): 0.050 Peak Height (A): 0.102
Background Pk Area (A-s): 0.111 Background Pk Height (A): 0.190
Blank Corrected Pk Area (A-s): 0.048
Concentration (ug/L): 24.45

Replicate 2 Time: 18:21
Peak Area (A-s): 0.047 Peak Height (A): 0.103
Background Pk Area (A-s): 0.106 Background Pk Height (A): 0.177
Blank Corrected Pk Area (A-s): 0.045
Concentration (ug/L): 22.87

Mean Conc (ug/L): 23.66 SD: 1.117 RSD(%): 4.72

Recovery is 116.7% (outside of specified limits) 118.3%

BOD868

23.66/20

As ID: CCV Seq. No.: 00027 A/S Pos.: 5 Date: 12/08/94

Replicate 1 Time: 18:24
Peak Area (A-s): 0.190 Peak Height (A): 0.365
Background Pk Area (A-s): 0.059 Background Pk Height (A): 0.131
Blank Corrected Pk Area (A-s): 0.188
Concentration (ug/L): 96.44

Replicate 2 Time: 18:27
Peak Area (A-s): 0.196 Peak Height (A): 0.381
Background Pk Area (A-s): 0.060 Background Pk Height (A): 0.135
Blank Corrected Pk Area (A-s): 0.194
Concentration (ug/L): 99.37

Mean Conc (ug/L): 97.90 SD: 2.075 RSD(%): 2.12

QC sample is within range 90.0 - 110.0 98%

As ID: CCB Seq. No.: 00028 A/S Pos.: 8 Date: 12/08/94

Replicate 1 Time: 18:30

BM 1-12-95

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Recovery is 115.2%

Pb ID: L3361-2 Seq. No.: 00041 A/S Pos.: 23 Date: 12/03/94

Replicate 1 Time: 00:16
Peak Area (A-s): 0.005 Peak Height (A): 0.018
Background Pk Area (A-s): 0.072 Background Pk Height (A): 0.031
Blank Corrected Pk Area (A-s): 0.004
Concentration (ug/L): 1.5

Replicate 2 Time: 00:19
Peak Area (A-s): -0.001 Peak Height (A): 0.010
Background Pk Area (A-s): 0.067 Background Pk Height (A): 0.030
Blank Corrected Pk Area (A-s): -0.001
Concentration (ug/L): -0.5

Mean Conc (ug/L): 0.5 SD: 1.38 RSD(%): 271.50

NDW

Pb ID: L3361-2 Seq. No.: 00042 A/S Pos.: 23 Date: 12/03/94

Replicate 1 Time: 00:22
Peak Area (A-s): 0.068 Peak Height (A): 0.143
Background Pk Area (A-s): 0.052 Background Pk Height (A): 0.031
Blank Corrected Pk Area (A-s): 0.067
Concentration (ug/L): 24.1

BOD867

Replicate 2 Time: 00:25
Peak Area (A-s): 0.065 Peak Height (A): 0.139
Background Pk Area (A-s): 0.056 Background Pk Height (A): 0.030
Blank Corrected Pk Area (A-s): 0.065
Concentration (ug/L): 23.2

Mean Conc (ug/L): 23.6 SD: 0.62 RSD(%): 2.61 23.6/20

Recovery is 115.7% (outside of specified limits) 118%

Pb ID: CCV Seq. No.: 00043 A/S Pos.: 5 Date: 12/03/94

Replicate 1 Time: 00:28
Peak Area (A-s): 0.280 Peak Height (A): 0.544
Background Pk Area (A-s): 0.054 Background Pk Height (A): 0.090
Blank Corrected Pk Area (A-s): 0.279
Concentration (ug/L): 106.9

Replicate 2 Time: 00:31
Peak Area (A-s): 0.278 Peak Height (A): 0.562
Background Pk Area (A-s): 0.053 Background Pk Height (A): 0.096
Blank Corrected Pk Area (A-s): 0.278
Concentration (ug/L): 106.1

Mean Conc (ug/L): 106.5 SD: 0.55 RSD(%): 0.52

QC sample is within range 89.6 - 110.4

DM 1-12-95

10790

LATA INORGANIC (METALS/CYANIDE)
DATA VALIDATION CHECKLIST

PRECISION DATA SUMMARY

SDG: LK15-LAS	VALIDATOR: MORRIS	DATE: 11-Jan-95
PROJECT: 100-FR-3 ROUND 6	REVIEWER: WEBB	LATA NO.: VB403.08

HEIS-SN	ANALYTE	RESULTS	LAB Q	IDL µg/L	10*IDL µg/L	50*IDL µg/L	SERIAL DIL %D	CRDL µg/L	2 CRDL mg/Kg	5 CRDL mg/Kg	DUPE RPD	DUPE CRDL	MS/MSD RPD	SAMPLES AFFECTED	VAL Q
B0D865	Calcium	120000		17	170	850	11.6%							B0D865 B0D868	J

Comments:

(1) There are two batch QC samples for this data package:

B0D864	B0D865
B0D867	B0D868

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CLP

9

ICP SERIAL DILUTION

CLIENT ID NO.

BOD865 L

Lab Name: L.A.S. Contract: BECHTEL-HA

Lab Code: LOCK Case No.: 1112WH SAS No.: SDG No.: L3310F

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

Concentration Units: ug/L

Analyte	Initial Sample Result (I)	C	Serial Dilution Result (S)	C	% Difference	Q	M
Aluminum	16.00	U	80.00	U			P
Antimony	50.00	U	250.00	U			P
Arsenic							
Barium	58.56	B	55.62	B	5.0		P
Beryllium	1.00	U	5.00	U			P
Cadmium	4.00	U	20.00	U			P
Calcium	120025.49		106085.28		11.6	E	P
Chromium	15.30		15.64	B	2.2		P
Cobalt	6.00	U	30.00	U			P
Copper	3.00	U	15.00	U			P
Iron	7.17	B	35.00	U	100.0		P
Lead							
Magnesium	26536.84		24404.48	B	8.0		P
Manganese	1.00	U	5.00	U			P
Nickel	10.00	U	50.00	U			P
Potassium	6118.20		7135.01	B	16.6		P
Selenium	90.00	U	450.00	U			P
Silver	4.00	U	20.00	U			P
Sodium	32666.04		30468.43		6.7		P
Thallium	500.00	U	2500.00	U			P
Vanadium	3.38	B	15.00	U	100.0		P
Zinc	24.54		26.92	B	9.7		P

FORM IX - IN

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LATA INORGANIC (METALS/CYANIDE) CALCULATION SPREADSHEET

LINEAR REGRESSION ANALYSIS

SDG: LK15-LAS

Date: 11-Jan-95

LATA No.: VB403.08

Validator: MORRIS

Analyte/Calibration Date: As 2-Dec-94

Concentration	Absorbance
0.00	0.000
10.00	0.022
25.00	0.057
50.00	0.113
100.00	0.225
200.00	0.438

r	r^2
0.9999	0.9998

slope	x intercept
455.9973	-0.8129

1/slope	y intercept
0.0022	0.0018

LINEAR REGRESSION ANALYSIS

SDG: LK15-LAS

Date: 11-Jan-95

LATA No.: VB403.08

Validator: MORRIS

Analyte/Calibration Date: Pb 8-Dec-94

Concentration	Absorbance
0.00	0.002
3.00	0.006
25.00	0.062
50.00	0.121
100.00	0.237
200.00	0.444

r	r^2
0.9993	0.9987

slope	x intercept
449.2233	-2.2871

1/slope	y intercept
0.0022	0.0053

LATA INORGANIC (METALS/CYANIDE)
CALCULATION SPREADSHEET

PERCENT RECOVERY (ICV/CCV)

SDG: LK15-LAS

Date: 11-Jan-95

LATA No.: VB403.08

Validator: MORRIS

Analyte	ICV/CCV ID	Observed Value O	True Value A	%R
Aluminum	ICV	100608.90	100000.00	100.6%
Arsenic	ICV	97.50	100.00	97.5%
Aluminum	CCV	26067.83	25000.00	104.3%
Arsenic	CCV	103.50	100.00	103.5%

LATA INORGANIC (METALS/CYANIDE)
CALCULATION SPREADSHEET

MATRIX SPIKE RECOVERY (MS)

SDG: LK15-LAS Date: 11-Jan-95

LATA No.: VB403.08 Validator: MORRIS

Analyte	Sample ID	Spike Sample Result SSR	Sample Result SR	Spike Added SA	%R
Aluminum	B0D864	2023.24	0.00	2000.00	101.2%
Arsenic	B0D864	42.90	0.00	40.00	107.3%
Aluminum	B0D865	2025.81	0.00	2000.00	101.3%
Arsenic	B0D865	44.08	0.00	40.00	110.2%

LATA INORGANIC (METALS/CYANIDE) CALCULATION SPREADSHEET

PERCENT RECOVERY (LCS)

SDG: LK15-LAS

Date: 11-Jan-95

LATA No.: VB403.08

Validator: MORRIS

Analyte	Observed value	True value	%R
	OLCS	ALCS	
B0D864 Aluminum	3387.15	2000.00	169.4%
B0D864 Cadmium	62.92	50.00	125.8%
B0D865 Barium	2022.34	2000.00	101.1%
B0D865 Thallium	1586.38	2000.00	79.3%

LATA INORGANIC (METALS/CYANIDE) CALCULATION SPREADSHEET

RELATIVE PERCENT DIFFERENCE

SDG: LK15-LAS

Date: 11-Jan-95

LATA No.: VB403.08

Validator: MORRIS

Analyte	Sample ID	Original (Sample) concentration OS	Duplicate concentration D	RPD
Barium	B0D864	51.96	56.63	8.6%
Arsenic	B0D864	3.00 U	3.00 U	NC
Barium	B0D865	58.56	58.80	0.4%
Arsenic	B0D865	3.00 U	3.00 U	NC

LATA INORGANIC (METALS/CYANIDE)
CALCULATION SPREADSHEET

PERCENT DIFFERENCE (ICP SERIAL DILUTION)

SDG: LK15-LAS

Date: 11-Jan-95

LATA No.: VB403.08

Validator: MORRIS

Analyte	Analyte Concentration before Dilution	Analyte Concentration after Serial Dilution	%D
	I	S	
B0D864 Calcium	95700.51	97334.74	1.7%
B0D865 Calcium	120025.49	106085.28	11.6%

LATA INORGANIC (METALS/CYANIDE) CALCULATION SPREADSHEET

INORGANICS RESULTS CALCULATION, WATER

SDG: LK15-LAS

Date: 11-Jan-95

LATA No.: VB403.08

Validator: MORRIS

Analyte	Concentration from curve	Dilution Factor	Concentration (µg/L)
	CONCW	DFW	
B0D868 Barium	50.50	1	50.5
B0D868 Arsenic	0.31	1	0.3

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LATA GENERAL CHEMISTRY
DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

VALIDATION PROCEDURE:	☐ WHC-CM-5-3, Rev. 0		☒ WHC-SD-EN-SPP-002, Rev. 2
PROJECT:	100-FR-3 ROUND 6	SDG:	LK15-LAS
VALIDATOR:	MORRIS 1-16-95	LATA NO: VB403.08	DATE: 11-Jan-95
REVIEWER:	WEBB	LAB: LAS	CASE:
SAF NO:	B94-083	QAPP NO: DOE/RL-91-53	SAP NO: N/A

ANALYSES REQUESTED

☐ Alkalinity 310.1	☐ Chloride 325.3	☐ Fluoride 340.2	☒ Phosphorus 365.2	☐ TOX 9020/9022	☐ TKN 351.3
☒ Anions (F,Cl,SO4, NO2, NO3) 300.0	☐ Chromium+6 7196	☐ NO3+NO2 353.1/353.2	☐ Oil & Grease 413.1	☐ TDS 160.1	☐ Sulfate 375.4
☐ Corrosivity 1110	☐ pH 9040/150.1	☐ TOC 9060/415.1	☐ TSS 160.2	☐ Sulfide 9030/376.1	☐ Formate 300.0M
☐ BOD 405.1	☐ Cyanide 9012	☐ Phenols 9065/420.1	☐ TIC Lab Specific	☐ TPH 9070/418.1	☐

SAMPLE NO.	MATRIX
B0D864	WATER
B0D867	WATER

COMMENTS: Phosphate by method 300.0 was requested on the COC, but WHC agreed to method 365.2 (ROD B94-080).

	YES	NO	N/A
1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE			
Is technical verification documentation present?	☒	☐	☐
Is a case narrative present?	☒	☐	☐
2. HOLDING TIMES			
Are sample holding times acceptable?	☐	☒	☐

See HOLDING TIME SUMMARY form

	YES	NO	N/A
3. INSTRUMENT PERFORMANCE AND CALIBRATIONS			
Were initial calibrations performed on all instruments?	☒	☐	☐
Are initial calibrations acceptable?	☒	☐	☐
Were calibration checks performed on all instruments?	☒	☐	☐
Are calibration checks acceptable?	☒	☐	☐
Validation calculation checks were performed and are acceptable.	☒	☐	☐

If NO(s) are checked, see CALIBRATION DATA SUMMARY form

LATA GENERAL CHEMISTRY
DATA VALIDATION CHECKLIST

4. BLANKS

	YES	NO	N/A
Were laboratory blanks performed for all applicable analyses?	X		
Are laboratory blank results acceptable?	X		
Were preparation blanks analyzed?	X		
Are preparation blank results acceptable?	X		

If NO(s) are checked, see BLANK AND SAMPLE DATA SUMMARY form

5. ACCURACY

	YES	NO	N/A
Were spike samples analyzed at the proper frequency?	X		
Are all spike sample recoveries acceptable?	X		
Were laboratory control samples (LCS) analyzed at the proper frequency?	X		
Are all LCS recoveries acceptable?	X		
Validation calculation checks were performed and are acceptable.	X		

If NO(s) are checked, see ACCURACY DATA SUMMARY form

6. PRECISION

	YES	NO	N/A
Were laboratory duplicates analyzed at the proper frequency?	X		
Are all duplicate RPD values acceptable?	X		
Were MS/MSDs analyzed?			X
Are all MS/MSD RPD values acceptable?			X
Validation calculation checks were performed and are acceptable.	X		

If NO(s) are checked, see PRECISION DATA SUMMARY form

7. FIELD QC SAMPLES

	YES	NO	N/A
Were field QC samples (field/trip blanks, duplicates, splits, performance audit) identified?	X		
Are field/trip blank results acceptable?			X
Are field duplicate RPD values acceptable?			X
Are field split RPD values acceptable?			X
Are performance audit sample results acceptable?			X

Comments: Split field samples were identified. (See page 3 of this report)

Field QC will be evaluated in the 100-FR-3 Summary Report.

8. FIELD QC SAMPLES

	YES	NO	N/A
Were field QC samples (field/trip blanks, duplicates, splits, performance audit) identified?	X		
Are field/trip blank results acceptable?			X
Are field duplicate RPD values acceptable?			X
Are field split RPD values acceptable?			X
Are performance audit sample results acceptable?			X

Comments: Split field samples were identified. (See page 3 of this report)

Field QC will be evaluated in the 100-FR-3 Summary Report.

9. REPORTED RESULTS AND DETECTION LIMITS

	YES	NO	N/A
Are results reported for all requested analyses?	X		
Are all results supported in the raw data?	X		
Are results calculated properly?	X		
Do MDAs meet the RDLs?		X	
Validation calculation checks were performed and are acceptable.	X		

Comments: Sample B0D864 the MDA is greater than the RDL for Gross Alpha & Beta.

VALIDATION SUMMARY

For deficiencies (major and minor) and comments, please refer to the Qualification Summary Table.

LATA GENERAL CHEMISTRY
DATA VALIDATION CHECKLIST

8. ANALYTE QUANTITATION

	YES	NO	N/A
Was analyte quantitation performed properly?	X		
Are results calculated properly?	X		
Validation calculation checks were performed and are acceptable.	X		

Comments:

9. REPORTED RESULTS AND DETECTION LIMITS

	YES	NO	N/A
Are results reported for all requested analyses?	X		
Are all results supported in the raw data?	X		
Do results meet the CRDLs?	X		
Validation calculation checks were performed and are acceptable.	X		

Comments:

VALIDATION SUMMARY

For deficiencies (major and minor) and comments, please refer to the Qualification Summary Table.

LATA GENERAL CHEMISTRY
DATA VALIDATION CHECKLIST

HOLDING TIME SUMMARY

SDG:	LK15-LAS		VALIDATOR: MORRIS					DATE: 11-Jan-95		
PROJECT:	100-FR-3 ROUND 6		REVIEWER: WEBB					LATA NO.: VB403.08		
HEIS-SN	MATRIX CODE	ANALYSIS	DATE COLLECTED	PREP DATE	ANALYSIS DATE	PREP HT (days)	***Required HT (days)***	ANALYSIS HT (days)	***Required HT (days)***	VAL Q
B0D864	WATER	Anions (F, Cl, SO4)	9-Nov-94	22-Nov-94	22-Nov-94	13	***28***	0	***28***	NONE
	WATER	Anions (PO4)	9-Nov-94	28-Nov-94	28-Nov-94	19	***2***	0	***2***	UR
	WATER	Anions (NO2, NO3)	9-Nov-94	22-Nov-94	22-Nov-94	13	***2***	0	***2***	J/UR
B0D867	WATER	Anions (F, Cl, SO4)	17-Nov-94	22-Nov-94	22-Nov-94	5	***28***	0	***28***	NONE
	WATER	Anions (PO4)	17-Nov-94	28-Nov-94	28-Nov-94	11	***2***	0	***2***	UR
	WATER	Anions (NO2, NO3)	17-Nov-94	22-Nov-94	22-Nov-94	5	***2***	0	***2***	J/UR

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LOCKHEED ANALYTICAL SERVICES

COMMON IONS AND ADDITIONAL ANALYTES

Sample Results

Client Sample ID: BOD867	Date Collected: 17-NOV-94
Matrix: Water	Date Received: 19-NOV-94

Constituent	Units	Method	Result	Reporting Det|Limit	Data Qualifier(s)	Date Analyzed	LAS Batch|ID	LAS Sample|ID
Chloride	mg/L	300.0	3.8	0.02		22-NOV-94	15783	L3361-3
Fluoride	mg/L	300.0	0.058	0.01		22-NOV-94	15784	L3361-3
Nitrate-N	mg/L	300.0	3.4	0.02	H	22-NOV-94	15785	L3361-3
Nitrite-N	mg/L	300.0	< 0.01	0.01	H	22-NOV-94	15786	L3361-3
Sulfate	mg/L	300.0	35.	0.1		22-NOV-94	15788	L3361-3
O-Phosphate-Phosphorus	mg/L	365.2	< 0.05	0.05	H	28-NOV-94	16105	L3361-3

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LOCKHEED ANALYTICAL SERVICES

COMMON IONS AND ADDITIONAL ANALYTES

Sample Results

Client Sample ID: B0D864	Date Collected: 09-NOV-94
Matrix: Water	Date Received: ~~12-NOV-94~~

Constituent	Units	Method	Result	Reporting Det Limit	Data Qualifier(s)	Date Analyzed	LAS Batch ID	LAS Sample ID
Chloride	mg/L	300.0	36.	0.02		22-NOV-94	15783	L3310-9
Fluoride	mg/L	300.0	0.29	0.01		22-NOV-94	15784	L3310-9
Nitrate-N	mg/L	300.0	21.	0.02	H	22-NOV-94	15785	L3310-9
Nitrite-N	mg/L	300.0	< 0.01	0.01	H	22-NOV-94	15786	L3310-9
Sulfate	mg/L	300.0	100	0.1		22-NOV-94	15788	L3310-9
O-Phosphate-Phosphorus	mg/L	365.2	< 0.05	0.05	H	28-NOV-94	16105	L3310-9

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LATA GENERAL CHEMISTRY CALCULATION SPREADSHEET

LINEAR REGRESSION ANALYSIS

SDG: LK15-LAS

Date: 11-Jan-95

LATA No.: VB403.08

Validator: MORRIS

Analyte/Calibration Date: Cl 11/21/94

Concentration	Absorbance
0.00	0
20.00	446264
50.00	698730
100.00	1227276
1000.00	11438685
5000.00	60532076

r	r^2
0.9999	0.9998

slope	x intercept
0.0001	3.7710

1/slope	y intercept
12093.4619	-43566.831

LINEAR REGRESSION ANALYSIS

SDG: LK15-LAS

Date: 11-Jan-95

LATA No.: VB403.08

Validator: MORRIS

Analyte/Calibration Date: PO4 11/28/94

Concentration	Absorbance
0.00	0.000
0.05	0.035
0.50	0.330
1.00	0.645

r	r^2
0.9999	0.9999

slope	x intercept
1.5505	-0.0040

1/slope	y intercept
0.6450	0.0026

LATA GENERAL CHEMISTRY CALCULATION SPREADSHEET

PERCENT RECOVERY (ICV/CCV)

SDG: LK15-LAS

Date: 11-Jan-95

LATA No.: VB403.08

Validator: MORRIS

Analyte	Sample ID	Observed Value O	True Value A	%R
Chloride	ICV	1066.00	1000.00	106.6%
Chloride	CCV	1011.00	1000.00	101.1%
Phosphate	ICV	0.198	0.20	99.0%
Phosphate	CCV	0.602	0.60	100.3%

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LATA GENERAL CHEMISTRY
CALCULATION SPREADSHEET

MATRIX SPIKE RECOVERY (MS)

SDG: LK15-LAS Date: 11-Jan-95

LATA No.: VB403.08 Validator: MORRIS

Analyte	Sample ID	Spike Sample Result	Sample Result	Spike Added	%R
		SSR	SR	SA	
Chloride	B0D864	76.06	35.65	40.00	101.0%
Phosphate	B0D864	0.317	0.019	0.300	99.3%

LATA GENERAL CHEMISTRY
CALCULATION SPREADSHEET

PERCENT RECOVERY (LCS)

SDG: LK15-LAS

Date: 11-Jan-95

LATA No.: VB403.08

Validator: MORRIS

Analyte	Observed value	True value	%R
	OLCS	ALCS	
Sulfate	1005.00	1000.00	100.5%
Phosphate	0.298	0.30	99.3%

LATA GENERAL CHEMISTRY
CALCULATION SPREADSHEET

RELATIVE PERCENT DIFFERENCE

SDG: LK15-LAS

Date: 11-Jan-95

LATA No.: VB403.08

Validator: MORRIS

Analyte	Sample ID	Original (Sample) concentration	Duplicate concentration	RPD
		OS	D	
Phosphate	B0D864	0.019	0.018	5.4%
Chloride	B0D864	35.65	35.61	0.1%

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LATA GENERAL CHEMISTRY
CALCULATION SPREADSHEET

RESULTS CALCULATION, WATER

SDG: LK15-LAS

Date: 11-Jan-95

LATA No.: VB403.08

Validator: MORRIS

Analyte	Concentration from curve	Dilution Factor	Concentration (µg/L)
	CONCW	DFW	
Chloride	35.65	1	35.65
Phosphate	0.019	1	0.02

9613446.2515

LATA RADIOCHEMISTRY
DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
VALIDATION PROCEDURE:	☐ WHC-CM-5-3, Rev. 0			☒ WHC-SD-EN-SPP-001, Rev. 1	

PROJECT:	100-FR-3 ROUND 6		SDG:	LK15-LAS	
VALIDATOR:	FREIER	LATA NO:	VB403.08	DATE:	11-Jan-95
REVIEWER:	WEBB	LAB:	LAS	CASE:	
SAF NO:	B94-083	QAPP NO:	DOE/RL-91-53	SAP NO:	N/A

ANALYSES REQUESTED

☒ Gross Alpha	☒ Carbon-14	☒ Activity Screen	☒ Strontium-90	☐ Uranium-Total	☐ Americium-241
☒ Gross Beta	☒ Tritium	☐ Radium-228	☐ Technetium-99	☐ Uranium-Iso	☐ Plutonium-Iso
SAMPLE NO.	MATRIX			☐ LSC	☐ Gamma Spec
B0D864	WATER			COMMENTS: Activity Screen was requested on the COC; however, there is no reportable data for this analysis.	
B0D867	WATER				

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE	YES	NO	N/A
Is technical verification documentation present?	☒	☐	☐
Is a case narrative present?	☒	☐	☐

2. HOLDING TIMES	YES	NO	N/A
Are sample holding times acceptable?	☒	☐	☐
Are samples preserved correctly?	☒	☐	☐

See HOLDING TIME SUMMARY form

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS	YES	NO	N/A
Were instruments/detectors calibrated within one year of sample analysis?	☐	☒	☐
Are initial calibrations acceptable?	☒	☐	☐
Are standards NIST traceable?	☒	☐	☐
Are standards acceptable?	☒	☐	☐

Comments: Calibration of instruments/detectors was not performed within one year of sample analysis, however continuing calibration data is acceptable. Therefore, no qualifiers are assigned.

LATA RADIOCHEMISTRY
DATA VALIDATION CHECKLIST

4. CONTINUING CALIBRATION

	YES	NO	N/A
Background checked at proper frequency?	X		
Background check acceptable?	X		
Efficiency checked at proper frequency?	X		
Efficiency check acceptable?	X		
Calibration check standards NIST traceable?	X		
Calibration check standards acceptable?	X		

If NO(s) are checked, see CALIBRATION DATA SUMMARY form

5. BLANKS

	YES	NO	N/A
Were method blanks analyzed?	X		
Are the method blanks free of analytes?	X		
Were method blank results acceptable?	X		
Validation calculation/transcription checks were performed and are acceptable.	X		

If NO(s) are checked, see BLANK AND SAMPLE DATA SUMMARY form

6. ACCURACY

	YES	NO	N/A
Were spike samples analyzed at the proper frequency?			X
Are all spike sample recoveries acceptable?			X
Were laboratory control standards (LCS) analyzed at the proper frequency?	X		
Are all LCS recoveries acceptable?	X		
Was a tracer/chemical carrier added?	X		
Was the tracer/chemical carrier recovery acceptable?	X		
Are standard sources traceable?	X		
Are standards acceptable?	X		
Validation calculation checks were performed and are acceptable.	X		

If NO(s) are checked, see ACCURACY DATA SUMMARY form

7. PRECISION

	YES	NO	N/A
Were laboratory duplicates analyzed at the proper frequency?	X		
Are all duplicate RPD values acceptable?		X	
Validation calculation checks were performed and are acceptable.	X		

If NO(s) are checked, see PRECISION DATA SUMMARY form

LATA RADIOCHEMISTRY
DATA VALIDATION CHECKLIST

HOLDING TIME SUMMARY

SDG: LK15-LAS			VALIDATOR: FREIER					DATE: 11-Jan-95		
PROJECT: 100-FR-3 ROUND 6			REVIEWER: WEBB					LATA NO.: VB403.08		
HEIS-SN	MATRIX CODE	ANALYSIS	DATE COLLECTED	PREP DATE	ANALYSIS DATE	PREP HT (days)	***Required HT (days)***	ANALYSIS HT (days)	***Required HT (days)***	VAL Q
B0D864	WATER	Gross Alpha & Beta	9-Nov-94	13-Dec-94	13-Dec-94	34	***180***	0	***180***	NONE
B0D864	WATER	Sr-90	9-Nov-94	15-Dec-94	15-Dec-94	36	***180***	0	***180***	NONE
B0D864	WATER	C-14	9-Nov-94	14-Dec-94	14-Dec-94	35	***180***	0	***180***	NONE
B0D864	WATER	H3	9-Nov-94	06-Dec-94	07-Dec-94	27	***180***	1	***180***	NONE
B0D867	WATER	Gross Alpha & Beta	17-Nov-94	13-Dec-94	13-Dec-94	26	***180***	0	***180***	NONE
B0D867	WATER	Sr-90	17-Nov-94	15-Dec-94	15-Dec-94	28	***180***	0	***180***	NONE
B0D867	WATER	C-14	17-Nov-94	14-Dec-94	14-Dec-94	27	***180***	0	***180***	NONE
B0D867	WATER	H3	17-Nov-94	06-Dec-94	07-Dec-94	19	***180***	1	***180***	NONE

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LATA RADIOCHEMISTRY
DATA VALIDATION CHECKLIST
PRECISION DATA SUMMARY

SDG:	LK15-LAS	VALIDATOR:	FREIER	DATE:	11-Jan-95
PROJECT:	100-FR-3 ROUND 6	REVIEWER:	WEBB	LATA NO.:	VB403.08

HEIS-SN	ANALYTE	RESULTS	LAB Q	UNITS	RDL	2 RDL	5 RDL	DUPE RPD	DUPE CRDL	SAMPLES AFFECTED	VAL Q
B0D864	C-14	-0.2		pCi/L	200	400	1000	221.0%	<RDL		NONE
B0D864	Gross Alpha	5.8	C	pCi/L	3	6	15	13.0%			NONE
B0D864	Gross Beta	6.7	C	pCi/L	4	8	20	47.0%	>RDL	B0D864 B0D867	J
B0D867	H3	410.4		pCi/L	400	800	2000	74.0%	<RDL		NONE
B0D867	Sr-90	20.93		pCi/L	2	4	10	13.0%			NONE

Duplicate Sample Analysis
BECHTEL L3310

Analyte	Batch ID	Client ID	LAL ID	Date Analyzed	Sample Result	Error 2 sigma	Duplicate Result	Error 2 sigma	RER	RPD	Data Qualifier
C-14	209_16269	BOD864	L3310-14	12-14-94	-0.2	15.21	3.0	15.44	0.10	221	
Gross Alpha	060_16299	BOD864	L3310-10	12-12-94	5.8	3.72	6.7	3.93	0.11	13	
Gross Beta	060_16299	BOD864	L3310-10	12-12-94	6.7	3.87	10.8	3.94	0.52	47	
H-3	066_16332	BOD867	L3361-11	12-07-94	410.04	181.27	187.77	153.15	0.66	74	
Sr-90	196_16324	BOD867	L3361-7	12-15-94	20.93	1.49	18.43	1.65	0.80	13	

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LATA RADIOCHEMISTRY
CALCULATION SPREADSHEET

PERCENT RECOVERY (LCS)

SDG: LK15-LAS

Date: 11-Jan-95

LATA No.: VB403.08

Validator: FREIER

Analyte	Observed value	True value	%R
C-14	433.10	521.90	83.0%
Gross Alpha	43.20	39.20	110.2%
Gross Beta	43.20	43.00	100.5%
H-3	3781.40	4049.19	93.4%
Sr-90	23.80	25.82	92.2%

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LATA RADIOCHEMISTRY
CALCULATION SPREADSHEET

RELATIVE PERCENT DIFFERENCE

SDG: LK15-LAS

Date: 11-Jan-95

LATA No.: VB403.08

Validator: FREIER

Analyte	Sample ID	Original (Sample) concentration	Duplicate concentration	RPD
C-14	B0D864	-0.20	3.00	228.6%
Gross Alpha	B0D864	5.80	6.70	14.4%
Gross Beta	B0D864	6.70	10.80	46.9%
H3	B0D867	410.04	187.77	74.4%
Sr-90	B0D867	20.93	18.43	12.7%

LATA RADIOCHEMISTRY
CALCULATION SPREADSHEET

MINIMUM DETECTABLE ACTIVITY (MDA)

SDG: LK15-LAS

LATA No.: VB403.08

Date: 11-Jan-95

Validator: FREIER

Analyte	Sample ID	Bkgrnd counts/ min (cpm) or Std Dev of bkgrnd (cpm)	Count time for assoc. sample	Detector Efficiency	Ingrowth corr. factor	Tracer/ Carrier recovery factor	Decay factor	Chemical yield factor	Sample volume (L or g)	MDA
C-14	B0D864	2.03	20.00	0.71	1.00	1.00	1.00	1.00	0.05	20.40
Gross Alpha	B0D864	0.03	100.00	0.12	1.00	1.00	1.00	1.00	0.09	4.59
Gross Beta	B0D864	1.02	100.00	0.41	1.00	1.00	1.00	1.00	0.09	6.07
Sr-90	B0D864	0.93	150.00	0.45	1.07	1.00	1.00	1.00	0.70	0.51
H3	B0D864	0.71	20.00	0.20	1.00	1.00	1.00	1.00	0.01	231.31

LATA RADIOCHEMISTRY
CALCULATION SPREADSHEET

RESULTS CALCULATION GROSS ALPHA/BETA, TRITIUM AND CARBON - 14

SDG: LK15-LAS

Date: 11-Jan-95

LATA No.: VB403.08

Validator: FREIER

Analyte	Gross Counts per minute	Background Counts per minute	Activity of alpha fraction in beta channel	Detector Efficiency	Sample volume (L or g)	Result
B0D867 Gross Alpha	0.11	0.034	0.00	0.121	0.25	1.13
B0D867 Gross Beta	11.33	1.023	0.00	0.410	0.25	45.30
B0D864 Tritium	34.11	0.071	0.00	0.197	0.01	7861.81
B0D867 Carbon - 14	2.27	2.030	0.00	0.717	0.05	3.02

LATA RADIOCHEMISTRY CALCULATION SPREADSHEET

RESULTS CALCULATION STRONTIUM-90 (corrected for Sr-89)

SDG: LK15-LAS

Date: 11-Jan-95

LATA No.: VB403.08

Validator: FREIER

Analyte	Gross Counts per minute	Background Counts per minute	Yttrium-90 yield factor	Ingrowth correction Factor	Detector Efficiency	Sr-90 yield factor	Strontium decay factor	Sample volume (L or g)	Result
B0D867	7.453	0.933	1.00	1.089	0.45	0.95	1.00	0.30	20.93

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LATA GC/MS ORGANICS
DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
VALIDATION PROCEDURE:	☐ WHC-CM-5-3, Rev. 0			☒ WHC-SD-EN-SPP-002, Rev. 2	

PROJECT:	100-FR-3 ROUND 6		SDG:	LK15-LAS	
VALIDATOR:	COWAN	LATA NO:	VB403.08	DATE:	13-Jan-95
REVIEWER:	WEBB	LAB:	LAS	CASE:	
SAF NO:	B94-083	QAPP NO:	DOE/RL-91-53	SAP NO:	N/A

ANALYSES REQUESTED

☒ CLP VOA	☐ SW-846 VOA 8240 (cap)	☐ SW-846 VOA 8260 (pac)	☐ CLP SVO	☐ SW-846 SVO 8270 (cap)	☐ SW-846 SVO 8270 (pac)
☐	☐	☐	☐	☐	☐
SAMPLE NO.	MATRIX	SAMPLE NO.	MATRIX	☐	☐
B0D864, B0D865, B0D866, B0D867, B0D868, B0D869	WATER	Note: Only samples B0D864, B0D866, B0D867, and B0D869 analyzed for VOAs.			

	YES	NO	N/A
1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE			
Is technical verification documentation present?	☒	☐	☐
Is a case narrative present?	☒	☐	☐
2. HOLDING TIMES			
Are sample holding times acceptable?	☒	☐	☐

See HOLDING TIME SUMMARY form

	YES	NO	N/A
3. INSTRUMENT TUNING/PERFORMANCE AND CALIBRATIONS			
Is the GC/MS tuning/performance check acceptable?	☒	☐	☐
Were initial calibrations performed on all instruments at the proper frequency?	☒	☐	☐
Are initial calibrations acceptable?	☒	☐	☐
Were continuing calibrations performed on all instruments at the proper frequency?	☒	☐	☐
Are continuing calibrations acceptable?	☒	☐	☐
Validation calculation checks were performed and are acceptable.	☒	☐	☐

If NO(s) are checked, see CALIBRATION DATA SUMMARY form

LATA GC/MS ORGANICS
DATA VALIDATION CHECKLIST

4. BLANKS

	YES	NO	N/A
Were laboratory blanks analyzed?	X		
Are laboratory blank results acceptable?	X		

If NO(s) are checked, see BLANK AND SAMPLE DATA SUMMARY form

5. ACCURACY

	YES	NO	N/A
Were surrogates/System Monitoring Compounds analyzed at the proper frequency?	X		
Are all surrogate/System Monitoring Compound recoveries acceptable?	X		
Were spike samples (MS/MSD) analyzed at the proper frequency?	X		
Are all spike sample (MS/MSD) recoveries acceptable?		X	
Validation calculation checks were performed and are acceptable.	X		

If NO(s) are checked, see ACCURACY DATA SUMMARY form

6. PRECISION

	YES	NO	N/A
Were MS/MSDs analyzed?	X		
Are all MS/MSD RPD values acceptable?	X		
Validation calculation checks were performed and are acceptable.	X		

If NO(s) are checked, see PRECISION DATA SUMMARY form

7. FIELD QC SAMPLES

	YES	NO	N/A
Were field QC samples (field/trip blanks, duplicates, splits, performance audit) identified?	X		
Are field/trip blank results acceptable?			X
Are field duplicate RPD values acceptable?			X
Are field split RPD values acceptable?			X
Are performance audit sample results acceptable?			X

Comments: Samples were split with Quanterra. Field QC will be evaluated in the 100-FR-3 Summary Report.

LATA GC/MS ORGANICS
DATA VALIDATION CHECKLIST

8. SYSTEM PERFORMANCE

	YES	NO	N/A
Were internal standards analyzed?	X		
Are all internal standard areas acceptable?	X		
Are all internal standard retention times acceptable?	X		

9. COMPOUND IDENTIFICATION AND QUANTITATION

	YES	NO	N/A
Is compound identification acceptable?	X		
Is compound quantitation acceptable?	X		
Are all TICs properly identified and coded?	X		

10. REPORTED RESULTS AND QUANTITATION LIMITS

	YES	NO	N/A
Are results reported for all requested analyses?	X		
Are all results supported in the raw data?	X		
Do results meet the CRQLs?	X		
Validation calculation checks were performed and are acceptable.	X		

Comments: A TIC was detected in the blank but not in any of the samples. As a result, no sample data are qualified and blanks results are acceptable.

VALIDATION SUMMARY

For deficiencies (major and minor) and comments, please refer to the Qualification Summary Table.

LATA GC/MS ORGANICS
DATA VALIDATION CHECKLIST

HOLDING TIME SUMMARY

SDG: LK15-LAS			VALIDATOR: COWAN				DATE: 13-Jan-95	
PROJECT: 100-FR-3 ROUND 6			REVIEWER: WEBB				LATA NO.: VB403.08	
HEIS-SN	MATRIX CODE	ANALYSIS	DATE COLLECTED	PREP DATE	ANALYSIS DATE	ANALYSIS HT (days)		VAL Q
B0D864	WATER	VOA	9-Nov-94	16-Nov-94	16-Nov-94	7		None
B0D866	WATER	VOA	9-Nov-94	16-Nov-94	16-Nov-94	7		None
B0D867	WATER	VOA	17-Nov-94	21-Nov-94	21-Nov-94	4		None
B0D869	WATER	VOA	17-Nov-94	21-Nov-94	21-Nov-94	4		None

Note: As all samples acidified, hold time is 14 days.

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LATA GC/MS ORGANICS
DATA VALIDATION CHECKLIST
ACCURACY DATA SUMMARY

SDG: LK15-LAS			VALIDATOR: COWAN				DATE: 13-Jan-95	
PROJECT: 100-FR-3 ROUND 6			REVIEWER: WEBB				LATA NO.: VB403.08	
				PERCENT RECOVERY (%R)				
HEIS-SN	SPIKE	RESULTS	Lab Q	Matrix Spike	Matrix Spike Duplicate	Surrogate/ System Monitoring Compounds	SAMPLES AFFECTED	VAL Q
B0D869	1,1-dichloroethene			52%	50%		B0D867, B0D869	UJ
	Associated Analytes							
	Chloromethane						B0D867, B0D869	UJ
	Bromomethane						B0D867, B0D869	UJ
	Vinyl Chloride						B0D867, B0D869	UJ
	Chloroethane						B0D867, B0D869	UJ
	Methylene Chloride						B0D867, B0D869	UJ
	1,1-dichloroethene						B0D867, B0D869	UJ
	1,1-dichloroethane						B0D867, B0D869	UJ
	1,2-dichloroethene (total)						B0D867, B0D869	UJ
	Chloroform						B0D867, B0D869	UJ
	1,2-dichloroethane						B0D867, B0D869	UJ
	1,2-dichloropropane						B0D867, B0D869	UJ
	cis-1,3-dichloropropene						B0D867, B0D869	UJ
	Bromoform						B0D867, B0D869	UJ

9613446.2530

LOCKHEED ANALYTICAL LABORATORY
WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Job Name: BECHTEL-HANFORD Contract: _

Lab Code: LAL Case No.: SAS No.: SDG No.: L3310

Matrix Spike - Customer Sample No.: BOD869

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC #	QC. LIMITS REC.
1,1-Dichloroethene	50.00	0.000	26.000	52*	61-145
Trichloroethene	50.00	0.000	43.000	86	71-120
Benzene	50.00	0.000	42.000	84	76-127
Toluene	50.00	0.000	43.000	86	76-125
Chlorobenzene	50.00	0.000	43.000	86	75-130

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
1,1-Dichloroethene	50.00	25.000	50*	4	14	61-145
Trichloroethene	50.00	41.000	82	5	14	71-120
Benzene	50.00	40.000	80	5	13	76-127
Toluene	50.00	42.000	84	2	13	76-125
Chlorobenzene	50.00	42.000	84	2	13	75-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 5 outside limits
Spike Recovery: 2 out of 10 outside limits

COMMENTS:

FORM III - CLP VOA-1 3/90

Only Samples BOD867 and BOD869 associated with this QC - Other Samples run in other analytical batch-

1-13-95

CDC 090

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LATA GC/MS ORGANICS
DATA VALIDATION CALCULATION SPREADSHEET

SDG: LK15-LAS

Date: 13-Jan-95

LATA No.: VB403.08

Validator: COWAN

VOA RELATIVE RESPONSE FACTOR

Calibration date: 10/27/94

Analyte	Response for Analyte of Interest	Conc. of Internal Standard	Area of Internal Standard	Conc. of Analyte of Interest	RRF
Vinyl Chloride	6305	50.00	22294	10.00	1.414

LATA GC/MS ORGANICS
DATA VALIDATION CALCULATION SPREADSHEET

SDG: LK15-LAS

Date: 13-Jan-95

LATA No.: VB403.08

Calibration date: 10/27/94

Validator: COWAN

RELATIVE STANDARD DEVIATION

RRF1

Analyte: Vinyl Chloride

RRF1
1.414
1.392
1.391
1.341
1.440

MEAN	STDEV	RSD
1.396	0.0365	2.6

RELATIVE STANDARD DEVIATION

RRF2

Analyte: Styrene

RRF2
0.781
0.832
0.854
0.865
0.900

MEAN	STDEV	RSD
0.846	0.0440	5.2

LATA GC/MS ORGANICS
DATA VALIDATION CALCULATION SPREADSHEET

SDG: LK15-LAS Date: 13-Jan-95

LATA No.: VB403.08 Validator: COWAN

VOA PERCENT DIFFERENCE

Calibration date: 10/27/94

Analyte	Initial Calibration Average RRF	Continuing Calibration Average RRF	%D
Acetone	0.586	0.515	12.1%
Benzene	0.978	1.038	6.1%

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LATA GC/MS ORGANICS
DATA VALIDATION CALCULATION SPREADSHEET

SDG: LK15-LAS Date: 13-Jan-95

LATA No.: VB403.08 Validator: COWAN

VOA SURROGATE RECOVERY

Analyte		surrogate result	surrogate added	%R
TOL	B0D864	49.32	50.00	98.6%
BFB	B0D864	44.25	50.00	88.5%
DCE	B0D864	42.85	50.00	85.7%
TOL	B0D867	47.44	50.00	94.9%
BFB	B0D867	43.59	50.00	87.2%
DCE	B0D867	40.68	50.00	81.4%

LATA GC/MS ORGANICS
DATA VALIDATION CALCULATION SPREADSHEET

MATRIX SPIKE RECOVERY (MS/MSD)

SDG: LK15-LAS

Date: 13-Jan-95

LATA No.: VB403.08

Validator: COWAN

Analyte	Sample ID	MS Result	MSD Result	Sample Result	Spike Added	MS%R	MSD%R
1,1-Dichloroethene	B0D866	43.09	41.53	0.0	50.00	86.2%	83.1%
Trichloroethene	B0D866	41.99	41.74	0.0	50.00	84.0%	83.5%
Benzene	B0D866	45.14	44.26	0.0	50.00	90.3%	88.5%
Toluene	B0D866	44.73	43.79	0.0	50.00	89.5%	87.6%
Chlorobenzene	B0D866	43.25	42.48	0.0	50.00	86.5%	85.0%
1,1-Dichloroethene	B0D869	25.94	25.06	0.0	50.00	**51.9%**	**50.1%**
Trichloroethene	B0D869	43.33	41.18	0.0	50.00	86.7%	82.4%
Benzene	B0D869	41.67	40.11	0.0	50.00	83.3%	80.2%
Toluene	B0D869	43.29	42.23	0.0	50.00	86.6%	84.5%
Chlorobenzene	B0D869	42.57	41.85	0.0	50.00	85.1%	83.7%

DATA GC/MS ORGANICS
DATA VALIDATION CALCULATION SPREADSHEET

RELATIVE PERCENT DIFFERENCE

SDG: LK15-LAS

Date: 13-Jan-95

LATA No.: VB403.08

Validator: COWAN

Analyte	Sample ID	MS %R	MSD %R	RPD
1,1-Dichloroethene	B0D866	86.2%	83.1%	3.7%
Trichloroethene	B0D866	84.0%	83.5%	0.6%
Benzene	B0D866	90.3%	88.5%	2.0%
Toluene	B0D866	89.5%	87.6%	2.1%
Chlorobenzene	B0D866	86.5%	85.0%	1.8%
1,1-Dichloroethene	B0D869	51.9%	50.1%	3.5%
Trichloroethene	B0D869	86.7%	82.4%	5.1%
Benzene	B0D869	83.3%	80.2%	3.8%
Toluene	B0D869	86.6%	84.5%	2.5%
Chlorobenzene	B0D869	85.1%	83.7%	1.7%

LATA GC/MS ORGANICS
DATA VALIDATION CALCULATION SPREADSHEET

RESULTS CALCULATIONS FOR VOA WATER SAMPLES

SDG: LK15-LAS

Date: 13-Jan-95

LATA No.: VB403.08

Validator: COWAN

Analyte	Area of the Quant Ion for the Analyte of Interest	Area of the Quant Ion for the Internal Standard	Amount of Internal Standard added (ng)	Relative Response Factor	Volume of Water Purged (ml)	Dilution Factor	Conc (µg/L)
Acetone (B0D866)	1719	37383	50.0	0.515	5.0	1.0	4.46
1,1-DCE (B0D866MS)	49559	32604	50.0	1.764	5.0	1.0	43.1

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Laboratory Case Narratives

Lockheed Analytical Services

Log-in No.: L3310, L3361
Quotation No.: Q400000-B
Document File No.: 1112596, 1119596
SAF No.: B94-083
WHC Document Control No.: 104
SDG No.: LK15

CASE NARRATIVE
INORGANIC ANALYSES
TOTAL METALS

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 November 12, 1994 and logged in as L3310W.
- One water sample was received in good condition on November 19, 1994 and logged in as L3361W.
- The samples were prepared as Batch 1112WHT and analyzed for selected analytes as requested on the chain of custody. Sample BOD864 (L3310-8), was used for matrix spike and duplicate for the furnace analytes and ICP. Sample BOD867 (L3361-2), from another login, was used for matrix spike and duplicate, post digestion spike and serial dilution for zinc.

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:

- LCSW was outside recovery limits for aluminum and for cadmium. However, the aluminum and cadmium were not detected in the sample. Therefore, the high bias of the LCSW does not affect the sample.

Amy O. Carpenter
Prepared By

December 27, 1994
Date

Lockheed Analytical Services

Log-in No.: L3310, L3361
Quotation No.: Q400000-B
Document File No.: 1112596, 1119596
SAF No.: B94-083
WHC Document Control No.: 104
SDG No.: LK15

CASE NARRATIVE
INORGANIC ANALYSES
DISSOLVED METALS

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 November 12, 1994 and logged in as L3310F.
- One water sample was received in good condition on November 19, 1994 and logged in as L3361F.
- The samples were prepared as Batch 1112WHD and analyzed for selected analytes as requested on the chain of custody. Sample BOD865 (L3310-15) was used for matrix spike and duplicate, post-digestion spike and serial dilution.

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:

- For calcium, the Percent Difference of serial dilution (11.6%) is outside the 10% control limit. This may be due to physical interferences. All calcium results are flagged with an "E".
- For thallium, the LCS water recovered 79.3%. However, thallium was not detected in any of the samples, so the results should not be affected.

Amy O. Carpenter
Prepared By

December 22, 1994
Date

Lockheed Analytical Services

Log-in No.: L3310, L3361
Quotation No.: Q400000-B
Document File No.: 1112596, 1119596
SAF No.: B94-083
WHC Document Control No.: 104
SDG No.: LK15

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

- Two water samples were received for SAF: B94-085 and prepared as batch 1110WH and 1112WH and analyzed for selected analytes as requested on the chain of custody.

Client ID	LAL #		Method
Batch 1112WH BOD864	L3310-9	DUP, MS	300.0 Chloride, Nitrite, Nitrate, Sulfate
			300.0 Fluoride
Batch 1110WH BOD864			365.2 Orthophosphate

Holding Time Requirements

- All samples were analyzed within the method-specific holding times with the exception Method 300.0 Nitrate and Nitrite and Method 365.2 Orthophosphate which were 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
Prepared By

December 19, 1994
Date

9613446.2542

Lockheed Analytical Services

Log-in No.: L3310, L3361
Quotation No.: Q400000-B
Document File No.: 1112596, 1119596
SAF No.: B94-083
WHC Document Control No.: 104
SDG No.: LK15

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

Carbon-14

The carbon-14 analysis was performed using LAL-91-SOP-0209. No problems were encountered during analysis and all QC criteria were met.

Gross alpha beta

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

Strontium-90

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

Tritium

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

Sandra K. Montgomery
Prepared By

December 20, 1994
Date

Lockheed Analytical Services

Log-in No.: L3310, L3361
Quotation No.: Q400000-B
Document File No.: 1112596, 1119596
SAF No.: B94-083
WHC Document Control No.: 104
SDG No.: LK15

CASE NARRATIVE
ORGANIC ANALYSES

Analytical CLP 3/90 Volatile Organics

The associated samples were analyzed in two analytical batches.

The associated samples and their corresponding laboratory numbers are listed on Method Blank Summary Form IV - CLP VOA.

LAL SDG No.: L3310 (WHC SDG No.: LK15)

L3310

Analytical Batch 111694-8260-D1

Holding Time

All assocciated samples were analyzed within holding time on November 16, 1994.

Instrument Performance Checks (Tunes)

All associated Bromofluorobenzene (BFB) analyses for instrument performance checks were within QC criteria.

Surrogate Recoveries

All surrogate percent recoveries for all associated samples analyzed were within QC criteria. All surrogate recoveries are listed on FORM II - CLP VOA-2.

Matrix Spike Recoveries

All compound recoveries for the matrix spike (L3310-4MS) and matrix spike duplicate (L3310-4MSD) were within QC criteria. All relative percent differences (RPDs) between the MS and MSD recoveries were within QC criteria. All compound concentrations, recoveries and RPDs are listed and flagged appropriately on FORM III - CLP VOA-1.

Blank Results

Target compounds were not detected in the method blank VBLK01 (AE4279) but one tentatively identified compound (TIC) was detected. All associated samples with detected TIC as in the method blank were flagged with the qualifier "**B**".

Lockheed Analytical Services

Log-in No.: L3310, L3361
Quotation No.: Q400000-B
Document File No.: 1112596, 1119596
SAF No.: B94-083
WHC Document Control No.: 104
SDG No.: LK15

Initial Calibration

All compounds with the required minimum average relative response factors (RRF) and percent relative standard deviations (%RSD) were within QC limits.

Continuing Calibration

All continuing calibration compounds maximum percent difference (MAX %D) from the initial calibration were within QC limits.

Internal Standard Results

All internal standard area counts and retention times were within QC criteria for the associated samples analyzed. All internal standard area counts and retention times are listed and flagged appropriately on FORM VIII - CLP VOA.

Sample Results

Acetone was detected in sample BOD66 (L3310-4) at less than the Contract Required Quantitation Limits (CRQL). All sample concentrations are listed and flagged with the appropriate qualifiers on FORM I - CLP VOA.

LAL SDG No.: L3310 (WHC SDG No.: LK15)

L3361

Analytical Batch 112194-8260-D1

Holding Time

All assocciated samples were analyzed within holding time on November 21, 1994.

Instrument Performance Checks (Tunes)

All associated Bromofluorobenzene (BFB) analyses for instrument performance checks were within QC criteria.

Surrogate Recoveries

All surrogate percent recoveries for all associated samples analyzed were within QC criteria. All surrogate recoveries are listed on FORM II - CLP VOA-2.

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Lockheed Analytical Services

Log-in No.: L3310, L3361
Quotation No.: Q400000-B
Document File No.: 1112596, 1119596
SAF No.: B94-083
WHC Document Control No.: 104
SDG No.: LK15

Matrix Spike Recoveries

All compound recoveries for the matrix spike (L3361-13MS) and matrix spike duplicate (L3361-13MSD) were within QC criteria except for 1,1-Dichloroethene with slightly low recoveries in both the MS and MSD sample. All relative percent differences (RPDs) between the MS and MSD recoveries were within QC criteria. All compound concentrations, recoveries and RPDs are listed and flagged appropriately on FORM III - CLP VOA-1.

Blank Results

Target compounds and tentatively identified compounds (TICs) were not detected in the method blank VBLK01 (AE4285).

Initial Calibration

All compounds with the required minimum average relative response factors (RRF) and percent relative standard deviations (%RSD) were within QC limits.

Continuing Calibration

All continuing calibration compounds maximum percent difference (MAX %D) from the initial calibration were within QC limits.

Internal Standard Results

All internal standard area counts and retention times were within QC criteria for the associated samples analyzed. All internal standard area counts and retention times are listed and flagged appropriately on FORM VIII - CLP VOA.

Sample Results

Acetone was detected in sample BOD869 (L3361-13) at less than the Contract Required Quantitation Limits (CRQL). All sample concentrations are listed and flagged with the appropriate qualifiers on FORM I - CLP VOA.

Lydia M. Coleman
Prepared By

December 28, 1994
Date

Chain-of-Custody Information

9613446.2547

LOGIN CHAIN OF CUSTODY REPORT (ln01)
Nov 22 1994, 11:17 am

Login Number: L3310
Account: 596 Bechtel-Hanford, Inc. * Richland, WA
Project: BECHTEL-HANFORD Bechtel Hanford Project

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L3310-1	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 130					
Water 1 S CLP 3/90 VOLATILES		Hold:22-NOV-94			
L3310-2	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: RFG18-49A3					
L3310-3	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: RFG18-49A3					
L3310-4	B0D866	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 130					
Water 1 S CLP 3/90 VOLATILES		Hold:22-NOV-94			
L3310-5	B0D866	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: RFG18-49A3					
L3310-6	B0D866	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: RFG18-49A3					
L3310-7	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: RFG01-43					
Water 1 S SCREENING		Hold:08-MAY-95			
L3310-8	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2 As and Pb only					
Location: RFG01-20A					
Water 1 S CLP FURNACE		Hold:08-MAY-95			
Water 1 S CLP ICP		Hold:08-MAY-95			
L3310-9	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 121					
Water 1 S 300.0 CHLORIDE		Hold:07-DEC-94			
Water 1 S 300.0 FLUORIDE					
Water 1 S 300.0 NITRATE		Hold:11-NOV-94			
Water 1 S 300.0 NITRITE		Hold:11-NOV-94			

Revised

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9613446.2548

LOGIN CHAIN OF CUSTODY REPORT (ln01)
Nov 22 1994, 11:17 am

Login Number: L3310
Account: 596 Bechtel Hanford, Inc. * Richland, WA
Project: BECHTEL-HANFORD Bechtel Hanford Project

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
Water 1 S 300.0 PHOSPHATE					
Water 1 S 300.0 SULFATE		Hold:07-DEC-94			
L3310-10	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 156V-040					
Water 1 S GR ALP/BETA LAL-0060		Hold:08-MAY-95			
Water 1 S SR-90 LAL-0196		Hold:08-MAY-95			
L3310-11	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 156V-040					
L3310-12	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 156V-040					
L3310-13	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 156V-040					
L3310-14	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 156V-040					
Water 1 S C-14 LAL-0209		Hold:08-MAY-95			
Water 1 S TRITIUM(H3) LAL-0066		Hold:08-MAY-95			-
*L3310-15	B0D865	09-NOV-94	12-NOV-94		22-DEC-94
temp 2 As and Pb only					
Location: RFG01-20A					
Filt H20 15 S CLP FURNACE		Hold:08-MAY-95			
Filt H20 15 S CLP ICP		Hold:08-MAY-95			
L3310-16	REPORT TYPE	12-NOV-94	12-NOV-94		22-DEC-94
Location:					
Water 1 S EDD - DISK DEL.					
Water 1 S INORG TYPE 4A RPT					

Changed matrix to Filtric H_2O.

Signature: [illegible]

Date: 11-22-94

COOLING 10 [illegible]

9613446.2549

LOGIN CHAIN OF CUSTODY REPORT (ln01)
Nov 12 1994, 09:57 am

Login Number: L3310
Account: 596 Bechtel Hanford, Inc. * Richland, WA
Project: BECHTEL-HANFORD Bechtel Hanford Project

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L3310-1	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 157					
Water 1 S CLP 3/90 VOLATILES		Hold:22-NOV-94			
L3310-2	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 157					
L3310-3	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 157					
L3310-4	B0D866	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 157					
Water 1 S CLP 3/90 VOLATILES		Hold:22-NOV-94			
L3310-5	B0D866	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 157					
L3310-6	B0D866	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 157					
L3310-7	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 157					
Water 1 S SCREENING		Hold:08-MAY-95			
L3310-8	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2 "TARGET METALS=As,Pb"					
Location: 157					
Water 1 S CLP ICP		Hold:08-MAY-95			
Water 1 S CLP MERCURY		Hold:07-DEC-94			
L3310-9	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 157					
Water 1 S 300.0 CHLORIDE		Hold:07-DEC-94			
Water 1 S 300.0 FLUORIDE					
Water 1 S 300.0 NITRATE		Hold:11-NOV-94			
Water 1 S 300.0 NITRITE		Hold:11-NOV-94			

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9613446.2550

LOGIN CHAIN OF CUSTODY REPORT (ln01)
Nov 12 1994, 09:57 am

Login Number: L3310
Account: 596 Bechtel Hanford, Inc. * Richland, WA
Project: BECHTEL-HANFORD Bechtel Hanford Project

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
Water 1	S 300.0 PHOSPHATE				
Water 1	S 300.0 SULFATE	Hold:07-DEC-94			
L3310-10	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 157					
Water 1	S GR ALP/BETA LAL-0060	Hold:08-MAY-95			
Water 1	S SR-90 LAL-0196	Hold:08-MAY-95			
L3310-11	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 157					
L3310-12	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 157					
L3310-13	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 157					
L3310-14	B0D864	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 157					
Water 1	S C-14 LAL-0209	Hold:08-MAY-95			
Water 1	S TRITIUM(H3) LAL-0066	Hold:08-MAY-95			
L3310-15	B0D865	09-NOV-94	12-NOV-94		22-DEC-94
temp 2					
Location: 157					
Water 1	S CLP ICP	Hold:08-MAY-95			
Water 1	S CLP MERCURY	Hold:07-DEC-94			
L3310-16	REPORT TYPE	12-NOV-94	12-NOV-94		22-DEC-94
Location:					
Water 1	S EDD - DISK DEL.				
Water 1	S INORG TYPE 4A RPT				

Signature: Paul C Davis

Date: 11-12-94

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15 11259

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

L3310

Page 1 of 1

Data Turnaround: [ ] Priorty [X] Normal

Collector: A.J. Simpson	Company Contact: D. St. John	Telephone No.: (509) 376-5376
Project Designation: 100-FR-3 Groundwater-Round 6	Sampling Location: 100 F	SAF No.: B94-083
Ice Chest No.: ER-40	Field Logbook No.: EFL-1054	Method of Shipment: Emery FED/EX 8825906176
Shipped To: Lockheed	Offsite Property No.: W95-0-0073-17	Bill of Lading/Air Bill No.: 1402135669
Possible Sample Hazards/Remarks		

Sample No.	Matrix*	Date Sampled	Time Sampled															
Preservative				HNO3	None	HCl	HNO3	None	None		HNO3		HCl					
Type of Container				G	G	Gs	G/P	Gs	P		G		Gs					
No. of Container(s)				1	1	3	4	1	1		1		3					
Volume				500mL	500mL	40mL	1L	1L	20mL		500mL		40mL					
SAMPLE ANALYSIS				ICP Metals, AA Metals-As, Pb (Unfiltered)	Anions-F, Cl, SO4, PO4, NO2, NO3	VOA	Total Alpha, Total Beta, Sr-90	C-14, Tritium	Activity Screen		ICP Metals, AA Metals-As, Pb (Filtered)		VOA					
B0D864	W	11/9/94	0905	X	X	X	X	X	X									
B0D865	W	11/9/94	0905								X							
B0D866	W	11/9/94	0905										X					

Special Handling and/or Storage: Maintain between 2 C and 6 C.

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: K.D. Lee	Date/Time: 11/9/94 1235	Received By: B Whitten	Date/Time: 1235 B Whitten 11-9-94
Relinquished By: B Whitten	Date/Time: 0945 11-10-94	Received By: [illegible]	Date/Time: 11-11-94 1:00PM
Relinquished By: [illegible]	Date/Time: 11-11-94 4:00PM	Received By:	Date/Time:
Relinquished By:	Date/Time:	Received By:	Date/Time:

SPECIAL INSTRUCTIONS

Data Deliverable-Standalone

Analysis for PO4, NO2, and NO3 by EPA 300.0 is being requested for information only. The BHI Contractor acknowledges the 48-hour holding will be exceeded.

The Activity Screen is for all three sample numbers.

Matrix*

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

LABORATORY SECTION	Received By: [illegible]	Title: Sample Custodian	Date/Time: 11-12-94 9:15AM
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

9513446.2551

SAMPLE STATUS REPORT FOR N 3760. RAD SCREEN 199-F5-4 TIME: 11/10/94 7:51
DISPATCHED: 11/ 7/94 16:36 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 11/ 9/94 22:24

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
****	********	**********	***	***	******
4271	TOT-ACT	< 5.00000E 01 pCi/G	N	Y	XR5301

END OF REPORT

BOD864
BOD865
BOD866
BW
11-10-94

COCLIC

IU
11/9/95

Figure 1

SAMPLE CHECK-IN LIST

(1 Per Shipping Container)

Date/Time Received 11-12-94 9:15AM Client Name Westinghouse - Hanford

Project/Client # SAF # B94-083 Batch or Case # N/A

Cooler ID (if noted on outside of cooler) ER-40

1. Condition of shipping container? GOOD
2. Custody Seals on cooler intact? Yes [x] No [ ]
3. Custody Seals dated and signed? Yes [x] No [ ]
4. Chain of Custody record is taped on inside of cooler lid? Yes [x] No [ ]
5. Vermiculite/packing material is: Wet [ ] Dry [x] _____
6. Each sample is in a plastic bag? Yes [ ] No [x] BUBBLE WRAP
7. Number of sample containers in cooler: 15
8. Samples have:
   - ____ tape
   - ____ hazard labels
   - X custody seals
   - ____ appropriate sample labels
9. Samples are:
   - X in good condition
   - ____ leaking
   - ____ broken
   - ____ have air bubbles
   - ____ other
10. Coolant Present? Yes [x] No [ ] Sample Temperature 2C
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 # ~~FED/EX~~ 882 882 5906 177 Rec 11-12-94 Carrier FED/EX

12. Have any anomalies been identified above? Yes [ ] No [ ] N/A
13. Memos have been initiated for all anomalies identified above? Yes [ ] N/A

Printed Name/Signature PAUL C DAVIS Paul C Davis Date/Time 11-12-94 9:15AM

IV
[illegible]

00011

11/25/94

9613446.2554

Sample Login

Login Review Checklist

Lot Number 1-3310

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 ommited.

Sample Summary Report

N/A

		Yes	No
1.	Are all sample IDs correct?	X	—
2.	Are all samples present?	X	—
3.	Are all matrices correct? (e.g., TCLP analyses should be on a TCLP leachate, field blanks should be water)	X	—
4.	Are all analyses on the chain of custody/login quotation included?	X	—
5.	Are analyses logged in for the correct container? (e.g., analyses requiring preservation logged in for a preserved container and vice versa)	X	—
6.	Are samples logged in according to laboratory batching procedures? (e.g., TCLP regular leaching and associated metals/semivolatile organics should be logged in on the same bottle)	X	—

Login Chain of Custody Report

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

Sample Receiving Checklist

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

Paul C Davis 11-12-94 Paul C Davis 11-12-94

Primary review signature Date Secondary review signature Date

COC114 IW 111259

8825906176

Lockheed Analytical Services
Sample Receiving Checklist

Client Name: Westing House - Hanford Job No. L3310 Cooler ID: 11A

COOLER CONDITION UPON RECEIPT			
Temperature of cooler upon receipt: 2°C			
temperature of temp. blank upon receipt:			
	Yes	No	* Comments/Discrepancies
custody seals intact	X		
chain of custody present	X		
blue ice (or equiv.) present/frozen	X		
rad survey completed	X		

SAMPLE CONDITION UPON RECEIPT			
	Yes	No	* Comments/Discrepancies
all bottles labeled	X		
samples intact	X		
proper container used for sample type	X		
sample volume sufficient for analysis	X		
proper pres. indicated on the COC	X		
VOA's contain headspace		X	
are samples bi-phasic (if so, indicate sample ID'S):		11A	

MISCELLANEOUS ITEMS			
	Yes	No	* Comments/Discrepancies
samples with short holding times	X		300.0 nitrate/ 300.0 nitrite
samples to subcontract		X	

ADDITIONAL COMMENTS/DISCREPANCIES The Holding time for the unpreserved nitrate/nitrite was pass upon receipt.

Completed by / date: Paul C Davis 11-12-94

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*

version 2.0 (11/11/94)

9613446.2555

Contact 11-15-94

9613446.2556

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

Client Sample Number	LAL Sample Number	SDG Number	Matrix	Method
B0D864	L3310-1		Water	CLP 3/90 VOLATILE
	L3310-7		Water	SCREENING
	L3310-8		Water	CLP ICP
	L3310-8		Water	CLP MERCURY
	L3310-9		Water	300.0 CHLORIDE
	L3310-9		Water	300.0 FLUORIDE
	L3310-9		Water	300.0 NITRATE
	L3310-9		Water	300.0 NITRITE
	L3310-9		Water	300.0 PHOSPHATE
	L3310-9		Water	300.0 SULFATE
	L3310-10		Water	GR ALP/BETA LAL-0
	L3310-10		Water	SR-90 LAL-0196
	L3310-14		Water	C-14 LAL-0209
	L3310-14		Water	TRITIUM(H3) LAL-0
B0D865	L3310-15		Water	CLP ICP
	L3310-15		Water	CLP MERCURY
B0D866	L3310-4		Water	CLP 3/90 VOLATILE
REPORT TYPE	L3310-16		Water	EDD - DISK DEL.
	L3310-16		Water	INORG TYPE 4A RPT

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9613446.2557

LOGIN CHAIN OF CUSTODY REPORT (ln01)
Nov 21 1994, 09:34 am

Login Number: L3361
Account: 596 Bechtel Hanford, Inc. * Richland, WA
Project: BECHTEL-HANFORD Bechtel Hanford Project

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L3361-1	BOD867	17-NOV-94	19-NOV-94		29-DEC-94
temp 2					
Location: 157					
Water 1	S SCREENING	Hold:16-MAY-95			
L3361-2	BOD867	17-NOV-94	19-NOV-94		29-DEC-94
temp 2; As,Pb					
Location: 157					
Water 1	S CLP FURNACE	Hold:16-MAY-95			
Water 1	S CLP ICP	Hold:16-MAY-95			
L3361-3	BOD867	17-NOV-94	19-NOV-94		29-DEC-94
temp 2					
Location: 157					
Water 1	S 300.0 CHLORIDE	Hold:15-DEC-94			
Water 1	S 300.0 FLUORIDE				
Water 1	S 300.0 NITRATE	Hold:19-NOV-94			
Water 1	S 300.0 NITRITE	Hold:19-NOV-94			
Water 1	S 300.0 PHOSPHATE				
Water 1	S 300.0 SULFATE	Hold:15-DEC-94			
L3361-4	BOD867	17-NOV-94	19-NOV-94		29-DEC-94
temp 2					
Location: 157					
Water 1	S CLP 3/90 VOLATILES	Hold:29-NOV-94			
L3361-5	BOD867	17-NOV-94	19-NOV-94		29-DEC-94
temp 2					
Location: 157					
L3361-6	BOD867	17-NOV-94	19-NOV-94		29-DEC-94
temp 2					
Location: 157					
L3361-7	BOD867	17-NOV-94	19-NOV-94		29-DEC-94
temp 2					
Location: 157					
Water 1	S GR ALP/BETA LAL-0060	Hold:16-MAY-95			
Water 1	S SR-90 LAL-0196	Hold:16-MAY-95			
L3361-8	BOD867	17-NOV-94	19-NOV-94		29-DEC-94
temp 2					
Location: 157					

COC117

dm 1-25-95
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9613446.2558

LOGIN CHAIN OF CUSTODY REPORT (ln01)
Nov 21 1994, 09:34 am

Login Number: L3361
Account: 596 Bechtel Hanford, Inc. * Richland, WA
Project: BECHTEL-HANFORD Bechtel Hanford Project

Laboratory Sample Number	Client Sample Number	Collect Date	Receive Date	PR	Due Date
L3361-9	BOD867	17-NOV-94	19-NOV-94		29-DEC-94
temp 2					
Location: 157					
L3361-10	BOD867	17-NOV-94	19-NOV-94		29-DEC-94
temp 2					
Location: 157					
L3361-11	BOD867	17-NOV-94	19-NOV-94		29-DEC-94
temp 2					
Location: 157					
Water 1	S C-14 LAL-0209	Hold:16-MAY-95			
Water 1	S TRITIUM(H3) LAL-0066	Hold:16-MAY-95			
L3361-12	BOD868	17-NOV-94	19-NOV-94		29-DEC-94
temp 2; As,Pb					
Location: 157					
Filt H20 15	S CLP FURNACE	Hold:16-MAY-95			
Filt H20 15	S CLP ICP	Hold:16-MAY-95			
L3361-13	BOD869	17-NOV-94	19-NOV-94		29-DEC-94
temp 2					
Location: 157					
Water 1	S CLP 3/90 VOLATILES	Hold:29-NOV-94			
L3361-14	BOD869	17-NOV-94	19-NOV-94		29-DEC-94
temp 2					
Location: 157					
L3361-15	BOD869	17-NOV-94	19-NOV-94		29-DEC-94
temp 2					
Location: 157					
L3361-16	REPORT TYPE	21-NOV-94	19-NOV-94		29-DEC-94
Location:					
Water 1	S EDD - DISK DEL.				
Water 1	S INORG TYPE 4A RPT				

Signature: MMiller

Date: 11-21-94

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L3361

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 1

Data Turnaround: [ ] Priorty [X] Normal

Collector: A J Simpson	Company Contact: D. St. John	Telephone No.: (509) 376-5376
Project Designation: 100-FR-3 Groundwater-Round 6	Sampling Location: 100 F	SAF No.: B94-083
Ice Chest No.: ER-10	Field Logbook No.: EFL-1054	Method of Shipment: Emery
Shipped To: Lockheed	Offsite Property No.: W95-0-0073-29	Bill of Lading/Air Bill No.: 1417223424 7

Possible Sample Hazards/Remarks:

Special Handling and/or Storage: Maintain between 2 C and 6 C.

SAMPLE ANALYSIS																
Preservative	HNO3	None	HCl	HNO3	None	None		HNO3		HCl						
Type of Container	G	G	Gs	G/P	Gs	P		G		Gs						
No. of Container(s)	1	1	3	4	1	1		1		3						
Volume	500mL	500mL	40mL	1L	1L	20mL		500mL		40mL						
	ICP Metals, AA Metals-As, Pb (Unfiltered)	Anions-F, Cl, SO4, PO4, NO2, NO3	VOA	Total Alpha, Total Beta, Sr-90	C-14, Tritium	Activity Screen		ICP Metals, AA Metals-As, Pb (Filtered)		VOA						
Sample No. / Matrix* / Date Sampled / Time Sampled																
B0D867 / W / 11/17/94 / 0846	X	X	X	X	X	X										
B0D868 / W / 11/17/94 / 0846								X								
B0D869 / W / 11/17/94 / 0846										X						

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: J Nlin	Date/Time: 11/17/94 1310	Received By: Kirby D Lee	Date/Time: 1310 11-17-94
Relinquished By: Kirby D Lee	Date/Time: 0800 11-18-94	Received By:	Date/Time:
Relinquished By:	Date/Time:	Received By:	Date/Time:
Relinquished By:	Date/Time:	Received By:	Date/Time:

SPECIAL INSTRUCTIONS

Data Deliverable-Standalone

Analysis for PO4, NO2, and NO3 by EPA 300.0 is being requested for information only. The BHI Contractor acknowledges the 48-hour holding will be exceeded.

The Activity Screen is for all three sample numbers.

Matrix*

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

LABORATORY SECTION	Received By: Paul C Lewis	Title: Sample Custodian	Date/Time: 11-19-94 16:00
FINAL SAMPLE DISPOSITION	Disposal Method:	Disposed By:	Date/Time:

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

9613446.2559

9613446.2560

SAMPLE STATUS REPORT FOR N 3758. RAD SCREEN 199-F5-1 TIME: 11/17/94 21:34
DISPATCHED: 11/ 7/94 16:36 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 11/17/94 21:23

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
****	********	**********	***	***	******
4271	TOT-ACT	< 5.00000E 01 pCi/G	N	Y	YR5301

END OF REPORT

BOD867
BOD868
BOD869
BW
11-18-94

2B COOLED

1119596

9613446.2561 **Sample Login**

Login Review Checklist

Lot Number L3361

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 ommited.

Sample Summary Report
N/A

		Yes	No
1.	Are all sample IDs correct?	X	
2.	Are all samples present?	X	
3.	Are all matrices correct? (e.g., TCLP analyses should be on a TCLP leachate, field blanks should be water)	X	
4.	Are all analyses on the chain of custody/login quotation included?	X	
5.	Are analyses logged in for the correct container? (e.g., analyses requiring preservation logged in for a preserved container and vice versa)	X	
6.	Are samples logged in according to laboratory batching procedures? (e.g., TCLP regular leaching and associated metals/semivolatile organics should be logged in on the same bottle)	X	

Login Chain of Custody Report

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

Sample Receiving Checklist

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

Primary review signature	Date	Secondary review signature	Date
[signature]	11-21-94	[signature]	11-21-94

COPY

dn1-2045
~~114596~~

Figure 1

SAMPLE CHECK-IN LIST

(1 Per Shipping Container)

Date/Time Received 11-21-94 16:00 Client Name Westinghouse Hanford

Project/Client # B94-083 Batch or Case # NA

Cooler ID (if noted on outside of cooler) ER-10

1. Condition of shipping container? Good
2. Custody Seals on cooler intact? Yes [X] No [ ]
3. Custody Seals dated and signed? Yes [X] No [ ]
4. Chain of Custody record is taped on inside of cooler lid? Yes [X] No [ ]
5. Vermiculite/packing material is: Wet [ ] Dry [X]
6. Each sample is in a plastic bag? Yes [X] No [ ]
7. Number of sample containers in cooler: 15
8. Samples have:
   - ____ tape
   - ____ hazard labels
   - X custody seals
   - X appropriate sample labels
9. Samples are:
   - X in good condition
   - ____ leaking
   - ____ broken
   - ____ have air bubbles
   - ____ other
10. Coolant Present? Yes [x] No [ ] Sample Temperature 2°C
11. The following paperwork should be accounted for (N/A if not applicable):

    Chain of Custody #(s) NA

    Request for Analysis #(s) NA

    Airbill # 147 2234247 Carrier Emery
12. Have any anomalies been identified above? Yes [ ] No [ ] NA
13. Memos have been initiated for all anomalies identified above? Yes [ ] NA

Printed Name/Signature [illegible] Date/Time 11-21-94

COOLER

~~COOLER~~

dw 1-30-95

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Lockheed Analytical Services
Sample Receiving Checklist

Client Name: Westinghouse Hanford Job No. L3361 Cooler ID:

COOLER CONDITION UPON RECEIPT

Temperature of cooler upon receipt: 2°C

temperature of temp. blank upon receipt: —

	Yes	No	* Comments/Discrepancies
custody seals intact	X		
chain of custody present	X		
blue ice (or equiv.) present/frozen	X		
rad survey completed	X		

SAMPLE CONDITION UPON RECEIPT

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

MISCELLANEOUS ITEMS

	Yes	No	* Comments/Discrepancies
samples with short holding times		X	un-preserved Nitrates - out of holding time
samples to subcontract		X	

ADDITIONAL COMMENTS/DISCREPANCIES

Completed by / date: [illegible] 11-21-94

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*

version 2.0 (11/11/94)

9613446.2563

COOLING

4C 1/1/95 SB

Lab-2045 11/6/95

9613446.2564

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

Client Sample Number	LAL Sample Number	SDG Number	Matrix	Method
BOD867	L3361-1		Water	SCREENING
	L3361-2		Water	CLP FURNACE
	L3361-2		Water	CLP ICP
	L3361-3		Water	300.0 CHLORIDE
	L3361-3		Water	300.0 FLUORIDE
	L3361-3		Water	300.0 NITRATE
	L3361-3		Water	300.0 NITRITE
	L3361-3		Water	300.0 PHOSPHATE
	L3361-3		Water	300.0 SULFATE
	L3361-4		Water	CLP 3/90 VOLATILE
	L3361-7		Water	GR ALP/BETA LAL-0
	L3361-7		Water	SR-90 LAL-0196
	L3361-11		Water	C-14 LAL-0209
	L3361-11		Water	TRITIUM(H3) LAL-0
BOD868	L3361-12		Filt H20	CLP FURNACE
	L3361-12		Filt H20	CLP ICP
BOD869	L3361-13		Water	CLP 3/90 VOLATILE
REPORT TYPE	L3361-16		Water	EDD - DISK DEL
	L3361-16		Water	INORG TYPE 4A RPT

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6B

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Supplemental Information

000125

SAMPLE AND DATA MANAGEMENT RECORD OF DISPOSITION

ROD-B94-080
Record of Disposition No.

DATE: 12/09/94	LABORATORY: Lockheed
PROJECT TITLE/NO.: 100-FR-3 Groundwater/B94-083	NCR NO.: N/A

SAMPLE IDENTIFICATION NUMBERS:

B0D867, B0D864

DESCRIPTION OF EVENT:

Regarding phosphate analysis, the lab had instrument problems and was unable to achieve satisfactory results by Method 300.0.

DISPOSITION OF SAMPLES:

With concurrence from Pam Innis of EPA, perform phosphate analysis using Method 365.2. Describe in case narrative.

APPROVAL SIGNATURES:

R. C. Smith/ [signature] 12/9/94
OSM Project Coordinator (Print/Sign Name) Date

J. M. Ayres/ [signature] 12/13/94
Technical Representative (Print/Sign Name) Date

N/A
Quality Assurance (Print/Sign Name) Date

9613446.2567

SAMPLE AND DATA MANAGEMENT
RECORD OF DISPOSITION

ROD-B94-071
Record of Disposition No.

DATE: 11/17/94	LABORATORY: TMA
PROJECT TITLE/NO.: 100-FR-3 Groundwater-Round 6/B94-083	NCR NO.: N/A

SAMPLE IDENTIFICATION NUMBERS:

B0D864, B0D865, B0D866

DESCRIPTION OF EVENT:

Samples were shipped to TMA instead of Lockheed.

DISPOSITION OF SAMPLES:

TMA directed to maintain COC and forward samples to Lockheed.

APPROVAL SIGNATURES:

R. C. Smith/ RClayt Smith — 1/4/95
OSM Project Coordinator (Print/Sign Name) — Date

J. M. Ayres/ JM Ayres — 1/4/95
Technical Representative (Print/Sign Name) — Date

N/A
Quality Assurance (Print/Sign Name) — Date

END OF PACKAGE