9613453.1929

START

LK6677-LAS

0044670

LOCKHEED MARTIN

Lockheed Analytical Services

MAY 1996
RECEIVED
Data
Log In

Ms. Joan Kessner
Bechtel Hanford, Inc.
P. O. Box 969
1022 Lee Blvd.
Richland, WA 99352

ANALYTICAL DATA REPORT

FOR

METALS, CHLORIDE, FLUORIDE, NITRATE, NITRITE, PHOSPHATE, SULFATE, URANIUM TOTAL KPA, VOLATILE ORGANICS, AND GROSS ALPHA/BETA

JUN 1996
RECEIVED
EDMC

LOG-IN NUMBER:	L6677
QUOTATION NUMBER:	Q400000-B
SAF:	B96-083
DOCUMENT FILE NUMBER:	0326596
BHI DOCUMENT FILE NO.:	340
SDG NUMBER:	LK6677

9613453.1930

Sample Disposition Record

Control #: 96-0055
Revision #: 0
Date Initiated: 03/29/96

Section 1 - BACKGROUND

SAF #: B96-083
OU: 300-FF-2
Project ID: 300-FF-2 LFI
Task ID: 3
Sampling Event: 300-FF-2 Groundwater Sampling--Round 2
Laboratory: Quanterra
Project Coordinator: ME David
Task Manager: MJ Galgoul

Section 2 - SAMPLE INFORMATION

Number of Samples: All samples associated with B96-083 requiring Phosphorus analysis.
ID Numbers: All samples associated with B96-083 requiring Phosphorus analysis.
Matrix: Water
Collection Date: Approximately 3/19/96 through 4/2/96

Section 3 - ISSUE

Class: Lab Direction
NCR Number: N/A
Type: Revision of Direction--Change in method number
Description: The SAF call for Total Phosphorus to be run to EPA method 365.4. The laboratory is currently configured to analyze for Total Phosphorus via EPA method 365.1.

N/A
NCR Validation (Print/Sign) Date

Section 4 - DISPOSITION

Type: Repair
Description: For all samples associated with SAF B96-083 requiring Total Phosphorus, the analysis will b performed to EPA method number 365.4.

ME David 3/29/96
Project Coordinator (Print/Sign) Date

MJ Galgoul Michael J Galgoul 4-1-96
Task Manager (Print/Sign) Date

N/A
QA (Print/Sign) Date

Section 5 - INSPECTION (Issue Class: Nonconformance Only)

Inspection Number: N/A
Inspection Results: N/A

N/A
Inspector (Print/Sign) Date

9613453.1931

Lockheed Environmental Systems & Technologies Co.
Lockheed Analytical Services
975 Kelly Johnson Drive Las Vegas, Nevada 89119-3705
Telephone 702-361-0220 800-582-7605 Facsimile 702-361-8146

LOCKHEED MARTIN

May 1, 1996

MAY 1996 RECEIVED Data Log In

Joan Kessner
Bechtel Hanford, Inc.
3350 George Washington Way
MS B1-35
Richland, WA 99352

RE:	Log-in No:	L6677
	Quotation No:	Q400000-B
	SAF:	B96-083
	Document File No:	0326596
	WHC Document Control No:	340
	SDG No:	LK6677

The attached data report contains the analytical results of samples that were submitted to Lockheed Analytical Services on 26 March 1996. The temperature of the cooler upon receipt was 2°C. Sample containers received agree with the chain-of-custody documentation. Sample containers were received intact. Samples for nitrate/nitrite analysis were not received in time to meet the analytical holding time requirements.

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

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

If you have any questions concerning the analysis or the data please call Kathleen M. Hall at (509) 375-4741.

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

Sincerely,

Karen Hemann for

Kathleen M. Hall
Client Services Representative

cc: Client Services
Document Control

Lockheed Analytical Services

Log-in No.: L6677
Quotation No.: Q400000-B
SAF: B96-083
Document File No.: 0326596
WHC Document File No.: 340
SDG No.: LK6677
Page No.: 1

CASE NARRATIVE
INORGANIC NON METALS ANALYSES

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

Preparation and Analysis Requirements

- One water sample was received for LK6677 and analyzed in batch 326 bh for selected analytes as requested on the chain of custody. Quality control analysis was performed on the following samples:

Client ID	LAL #		Method
BOH877	L6677-14	MS, DUP	300.0 Chloride, Fluoride, Nitrate as Nitrogen, Nitrite as Nitrogen, Orthophosphate and Sulfate

Holding Time Requirements

- All samples were analyzed within the method-specific holding times with the following exception of Method 300.0 Nitrate as Nitrogen, Nitrite as Nitrogen, and Orthophosphate. The associated 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

April 2, 1996
Date

Lockheed Analytical Services

Log-in No.: L6677
Quotation No.: Q400000-B
SAF: B96-083
Document File No.: 0326596
WHC Document File No.: 340
SDG No.: LK6677
Page No.: 2

CASE NARRATIVE
INORGANIC METALS ANALYSES

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

Preparation and Analysis Requirements

All samples were received on March 26 1996. The samples were logged in as L6677 and were prepared and analyzed in batches 326 btT for total metals and 326 btD for dissolved metals.

Holding Time Requirements

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

Method Blanks

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

Internal Quality Control

- All Internal Quality Control were within acceptance limits.

Shellee McGrath
Prepared By

May 1, 1996
Date

CASE NARRATIVE
INORGANIC TOTAL URANIUM 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, and matrix spike duplicate samples.

Holding Time Requirements

All holding time requirements were met.

Total Uranium

The Total Uranium analysis was performed using LAL-91-SOP-0168. All samples were prepared in Workgroup U TOTAL KPA LAL-0168 35539 with a Method Blank (MBB), Laboratory Control Sample (LCS1), Duplicate (DUP) and Matrix Spike (MS). No problems were encountered during preparation or analysis. All QC criteria were met.

Shellee McGrath
Prepared By

April 26, 1996
Date

CASE NARRATIVE
ORGANIC ANALYSES

Analytical Method 8260 Volatiles Appendix IX

Analytical Batch 040296-8260-D1

Note: Sample BOH879 (L6677-7) was the native sample used for the matrix spike (35510MS) and matrix spike duplicate (35510MSD) analyzed in this analytical batch.

The MS, MSD, and laboratory control sample (35510LCS) solutions contained many target compounds in addition to the five (5) required spiked compounds.

The associated samples were analyzed within holding time on April 2, 1996. All instrument tunes, initial and continuing calibrations met QC criteria. Target compound Acetone was detected in the method blank (MB35510) but tentatively identified compounds (TICs) were not detected. All associated samples with a detected target compound as in the method blank were flagged with the qualifier "**B**". Surrogate recoveries were within QC limits except for Bromofluorobenzene with a slightly elevated recovery in sample BOH879 (35510MS). Compound recoveries were within QC limits in the MS, MSD, and LCS. The relative percent differences (RPDs) between the MS and MSD recoveries were within QC limits. All internal standard area counts and retention times were within QC limits for all samples. The concentration of Fluorotrichloromethane slightly exceeded the calibration range in 35510MS at 200 μg/L. The concentration of the highest standard analyzed for 8260 Volatiles is 200 μg/L, therefore, the concentration of 200 μg/L for Fluorotrichloromethane is still considered within the linear range.

Prepared By: Lydia M. Coleman

April 29, 1996

Lockheed Analytical Services

Log-in No.: L6677
Quotation No.: Q400000-B
SAF: B96-083
Document File No.: 0326596
WHC Document File No.: 340
SDG No.: LK6677
Page No.: 5

CASE NARRATIVE
RADIOCHEMICAL ANALYSES

The routine calibration and quality control (QC) 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, and duplicate samples.

Holding Time Requirements

All holding time requirements were met.

NOTE: Chemical recoveries and minimum detectable activities (MDAs) can be found on the preparation and calculation sheets of the attached raw data for each method.

Analytical Method Gross Alpha/Beta

The gross alpha/beta analysis was performed using standard operating procedure, LAL-91-SOP-0060. The samples were analyzed in workgroup 35168. The instrument calibration verification met criteria. The method blank was within QC criteria. The beta laboratory control sample (LCS) and matrix spike recoveries were within QC criteria. The alpha LCS recovery was out of QC criteria. Since all other QC criteria were within limits, data quality is not believed to be adversely affected. The duplicate recoveries were within QC criteria. The MDA exceeded the reporting detection limit due to the residue weight limitations forcing a volume reduction. The associated samples were flagged with a "C" qualifier. No re-analyses were performed.

Yvonne M. Jacoby
Prepared By

April 11, 1996
Date

9613453.1937

Revised Memos

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Apr 22 1996, 10:13 am

Login Number: L6677
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
L6677-1	B0H877	22-MAR-96	26-MAR-96		30-APR-96
TEMP 2					
Location: RFG01-43A					
Water 1 S SCREENING		Hold: 18-SEP-96			
L6677-2	B0H877	22-MAR-96	26-MAR-96		30-APR-96
TEMP 2 "WITH TICS" "APPENDIX IX"					
Location: 130					
Water 1 S 8260 VOLATILES		Hold: 05-APR-96			
L6677-3	B0H877	22-MAR-96	26-MAR-96		30-APR-96
TEMP 2					
Location: 130					
L6677-4	B0H877	22-MAR-96	26-MAR-96		30-APR-96
TEMP 2					
Location: RFG18-48A3					
L6677-5	B0H877	22-MAR-96	26-MAR-96		30-APR-96
TEMP 2					
Location: RFG18-48A3					
L6677-6	B0H877	22-MAR-96	26-MAR-96		30-APR-96
TEMP 2					
Location: RFG18-48A3					
L6677-7	B0H879	22-MAR-96	26-MAR-96		30-APR-96
*MS/MSD TEMP 2 "WITH TICS" "APPENDIX IX"					
Location: 130					
Water 1 S 8260 VOLATILES		Hold: 05-APR-96			
L6677-8	B0H879	22-MAR-96	26-MAR-96		30-APR-9
TEMP 2					
Location: 130					
L6677-9	B0H879	22-MAR-96	26-MAR-96		30-APR-9
TEMP 2					
Location: RFG18-48A3					
L6677-10	B0H879	22-MAR-96	26-MAR-96		30-APR-9
TEMP 2					
Location: RFG18-48A3					

0014

0326316

9615453.1958

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Apr 22 1996, 10:13 am

Login Number: L6677
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
L6677-11	B0H879	22-MAR-96	26-MAR-96		30-APR-96
TEMP 2					
Location: RFG18-48A3					
L6677-12	B0H877	22-MAR-96	26-MAR-96		30-APR-96
TEMP 2					
Location: RFG01-07B					
Water 1 S 6010 ICP METALS	Hold:18-SEP-96				
L6677-13	B0H877	22-MAR-96	26-MAR-96		30-APR-96
TEMP 2 "NO SUBSTITUTES FOR FURNACE"	"METALS As,Pb,Se,Tl"				
Location: RFG01-07B					
Water 1 S 7000 FURNACE METALS	Hold:18-SEP-96				
L6677-14	B0H877	22-MAR-96	26-MAR-96		30-APR-96
TEMP 2					
Location: RFG19-105C					
Water 1 S 300.0 CHLORIDE	Hold:19-APR-96				
Water 1 S 300.0 FLUORIDE	Hold:19-APR-96				
Water 1 S 300.0 NITRATE	Hold:24-MAR-96				
Water 1 S 300.0 NITRITE	Hold:24-MAR-96				
Water 1 S 300.0 PHOSPHATE	Hold:24-MAR-96				
Water 1 S 300.0 SULFATE	Hold:19-APR-96				
L6677-15	B0H877	22-MAR-96	26-MAR-96		30-APR-96
TEMP 2					
Location: 156-022E					
Water 1 S GR ALP/BETA LAL-0060	Hold:18-SEP-96				
L6677-16	B0H877	22-MAR-96	26-MAR-96		30-APR-96
TEMP 2					
Location: 155					
Water 1 S U TOTAL KPA (INORG)	Hold:18-SEP-96				
* L6677-17	B0H878	22-MAR-96	26-MAR-96		30-APR-96
TEMP 2					
Location: RFG01-07B					
Filt H20 15 S 6010 ICP METALS	Hold:18-SEP-96				
Filt H20 15 S 6010 ICP TRACE	Hold:18-SEP-96				
L6677-18	REPORT TYPE	26-MAR-96	26-MAR-96		30-APR-96
Location:					
Water 1 S EDD - DISK DEL.					
Water 1 S GCMS2					
Water 1 S INORG TYPE 2 RPT					

0015

C5060596

9613453.1939

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Apr 22 1996, 10:13 am

Login Number: L6677
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 RAD RPT TYPE 2				

*ADDED ICP TRACE
PER K. HALL

Signature: R. Callison

Date: 4-22-96

0016

C506596

9613453.1940

revised
3-27-96

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Mar 27 1996, 10:42 am

Login Number: L6677
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
L6677-1	B0H877	22-MAR-96	26-MAR-96		30-APR-96
TEMP 2					
Location: RFG01-43A					
Water 1 S SCREENING	Hold:18-SEP-96				
L6677-2	B0H877	22-MAR-96	26-MAR-96		30-APR-96
* TEMP 2 "WITH TICS"	"APPENDIX IX"				
Location: RFG18-48A3					
Water 1 S 8260 VOLATILES	Hold:05-APR-96				
L6677-3	B0H877	22-MAR-96	26-MAR-96		30-APR-96
TEMP 2					
Location: RFG18-48A3					
L6677-4	B0H877	22-MAR-96	26-MAR-96		30-APR-96
TEMP 2					
Location: RFG18-48A3					
L6677-5	B0H877	22-MAR-96	26-MAR-96		30-APR-96
TEMP 2					
Location: RFG18-48A3					
L6677-6	B0H877	22-MAR-96	26-MAR-96		30-APR-96
TEMP 2					
Location: RFG18-48A3					
L6677-7	B0H879	22-MAR-96	26-MAR-96		30-APR-96
TEMP 2 "WITH TICS"	"APPENDIX IX"				
* Location: RFG18-48A3					
Water 1 S 8260 VOLATILES	Hold:05-APR-96				
L6677-8	B0H879	22-MAR-96	26-MAR-96		30-APR-9
TEMP 2					
Location: RFG18-48A3					
L6677-9	B0H879	22-MAR-96	26-MAR-96		30-APR-9
TEMP 2					
Location: RFG18-48A3					
L6677-10	B0H879	22-MAR-96	26-MAR-96		30-APR-9
TEMP 2					
Location: RFG18-48A3					

* Products changed.

3-27-96

0017

0326596

9613453.1941

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Mar 27 1996, 10:42 am

Login Number: L6677
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
L6677-11	B0H879	22-MAR-96	26-MAR-96	30-APR-96
TEMP 2				
Location: RFG18-48A3				
L6677-12	B0H877	22-MAR-96	26-MAR-96	30-APR-96
TEMP 2				
Location: RFG01-07B				
Water 1 S 6010 ICP METALS		Hold:18-SEP-96		
L6677-13	B0H877	22-MAR-96	26-MAR-96	30-APR-96
TEMP 2 "NO SUBSTITUTES FOR FURNACE" "METALS As,Pb,Se,Tl"				
Location: RFG01-07B				
Water 1 S 7000 FURNACE METALS		Hold:18-SEP-96		
L6677-14	B0H877	22-MAR-96	26-MAR-96	30-APR-96
TEMP 2				
Location: RFG01-07B				
Water 1 S 300.0 CHLORIDE		Hold:19-APR-96		
Water 1 S 300.0 FLUORIDE		Hold:19-APR-96		
Water 1 S 300.0 NITRATE		Hold:24-MAR-96		
Water 1 S 300.0 NITRITE		Hold:24-MAR-96		
Water 1 S 300.0 PHOSPHATE		Hold:24-MAR-96		
Water 1 S 300.0 SULFATE		Hold:19-APR-96		
L6677-15	B0H877	22-MAR-96	26-MAR-96	30-APR-96
TEMP 2				
Location: 156TMP-1				
Water 1 S GR ALP/BETA LAL-0060		Hold:18-SEP-96		
L6677-16	B0H877	22-MAR-96	26-MAR-96	30-APR-96
TEMP 2				
Location: RFG01-07B				
Water 1 S U TOTAL KPA (INORG)		Hold:18-SEP-96		
L6677-17	B0H878	22-MAR-96	26-MAR-96	30-APR-96
TEMP 2				
Location: RFG01-07B				
Filt H20 15 S 6010 ICP METALS		Hold:18-SEP-96		
L6677-18	REPORT TYPE	26-MAR-96	26-MAR-96	30-APR-96
Location:				
Water 1 S EDD - DISK DEL.				
Water 1 S GCMS2				
Water 1 S INORG TYPE 2 RPT				
Water 1 S RAD RPT TYPE 2				

Signature: Paul E. Jones

Date: 3-28-96

0018

03265

9613453.1942

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Mar 26 1996, 02:28 pm

Login Number: L6677
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
L6677-1	B0H877	22-MAR-96	26-MAR-96		30-APR-96
TEMP 2					
Location: 156TMP-1					
Water 1 S SCREENING		Hold:18-SEP-96			
L6677-2	B0H877	22-MAR-96	26-MAR-96		30-APR-96
TEMP 2 "WITH TICS" "APPENDIX IX"					
Location: RFG18-48A3					
Water 1 S 8260A VOLATILES		Hold:05-APR-96			
L6677-3	B0H877	22-MAR-96	26-MAR-96		30-APR-96
TEMP 2					
Location: RFG18-48A3					
L6677-4	B0H877	22-MAR-96	26-MAR-96		30-APR-96
TEMP 2					
Location: RFG18-48A3					
L6677-5	B0H877	22-MAR-96	26-MAR-96		30-APR-96
TEMP 2					
Location: RFG18-48A3					
L6677-6	B0H877	22-MAR-96	26-MAR-96		30-APR-96
TEMP 2					
Location: RFG18-48A3					
L6677-7	B0H879	22-MAR-96	26-MAR-96		30-APR-96
TEMP 2 "WITH TICS" "APPENDIX IX"					
Location: RFG18-48A3					
Water 1 S 8260A VOLATILES		Hold:05-APR-96			
L6677-8	B0H879	22-MAR-96	26-MAR-96		30-APR-96
TEMP 2					
Location: RFG18-48A3					
L6677-9	B0H879	22-MAR-96	26-MAR-96		30-APR-96
TEMP 2					
Location: RFG18-48A3					
L6677-10	B0H879	22-MAR-96	26-MAR-96		30-APR-96
TEMP 2					
Location: RFG18-48A3					

0019
032659

9613453.1943

LOCKHEED ANALYTICAL SERVICES
LOGIN CHAIN OF CUSTODY REPORT (ln01)
Mar 26 1996, 02:28 pm

Login Number: L6677
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
L6677-11	B0H879	22-MAR-96	26-MAR-96		30-APR-96
TEMP 2					
Location: RFG18-48A3					
L6677-12	B0H877	22-MAR-96	26-MAR-96		30-APR-96
TEMP 2					
Location: 156TMP-1					
Water 1 S 6010 ICP METALS	Hold:18-SEP-96				
L6677-13	B0H877	22-MAR-96	26-MAR-96		30-APR-96
TEMP 2 "NO SUBSTITUTES FOR FURNACE" "METALS As,Pb,Se,Tl"					
Location: 156TMP-1					
Water 1 S 7000 FURNACE METALS	Hold:18-SEP-96				
L6677-14	B0H877	22-MAR-96	26-MAR-96		30-APR-96
TEMP 2					
Location: 156TMP-1					
Water 1 S 300.0 CHLORIDE	Hold:19-APR-96				
Water 1 S 300.0 FLUORIDE	Hold:19-APR-96				
Water 1 S 300.0 NITRATE	Hold:24-MAR-96				
Water 1 S 300.0 NITRITE	Hold:24-MAR-96				
Water 1 S 300.0 PHOSPHATE	Hold:24-MAR-96				
Water 1 S 300.0 SULFATE	Hold:19-APR-96				
L6677-15	B0H877	22-MAR-96	26-MAR-96		30-APR-96
TEMP 2					
Location: 156TMP-1					
Water 1 S GR ALP/BETA LAL-0060	Hold:18-SEP-96				
L6677-16	B0H877	22-MAR-96	26-MAR-96		30-APR-96
TEMP 2					
Location: 156TMP-1					
Water 1 S U TOTAL KPA (INORG)	Hold:18-SEP-96				
L6677-17	B0H878	22-MAR-96	26-MAR-96		30-APR-96
TEMP 2					
Location: 156TMP-1					
Filt H20 15 S 6010 ICP METALS	Hold:18-SEP-96				
L6677-18	REPORT TYPE	26-MAR-96	26-MAR-96		30-APR-96
Location:					
Water 1 S EDD - DISK DEL.					
Water 1 S GCMS2					
Water 1 S INORG TYPE 2 RPT					
Water 1 S RAD RPT TYPE 2					

Signature: Paula Dans

Date: 3-26-96

0020

03265

Bechtel Hanford, Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST L6677

Page 1 of 1

Data Turnaround
☐ Priority
■ Normal

Collector: Doug Bowers	Company Contact: L. C. Hulstrom	Telephone: (509) 372-9685
Project Designation: 300-FF-2 Groundwater Sampling	Sampling Location: 316-4 Crib, 618-10 and 618-11 Burial Ground	SAF No.: B96-083
Ice Chest No.: RM #7	Field Logbook No.: EFL - 1133	Method of Shipment: Federal Express
Shipped To: Lockheed	Offsite Property No.: W96-0-0640-34	Bill of Lading/Air Bill No.: 290-4653-857

Possible Sample Hazards/Remarks

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

SAMPLE ANALYSIS												
			Preservation	HCl	HNO3	HNO3	Cool 4°C	HNO3	HNO3	None		HNO3
			Type of Container	Gs	P/G	P/G	P/G	P/G	P/G	P/G		P/G
			No. of Container(s)	5	1	1	1	1	1	1		1
			Volume	40mL	500mL	500mL	500mL	1L	500mL	20mL		500mL
				VOA (App IX)	ICP Metals - TAL (Unfiltered)	As, Pb, Se, Tl	IC Anions - Cl, F, NO2, NO3, PO4, SO4	Gross Alpha, Gross Beta	Total Uranium	Activity Scan		ICP Metals - TAL (Filtered)
Sample No.	Matrix*	Date Sampled	Time Sampled									
B0H877	W	3-22-96	1022	X	X	X	X	X	X	X		
B0H878	W	3-22-96	1031									X
B0H879	W	3-22-96	0720	X								

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Doug Bowers	Date/Time: 3-22-96/1530	Received By: K. Trapp/K. Trapp	Date/Time: 3/22/96 1530
Relinquished By: K. Trapp/K. Trapp	Date/Time: 3/25/96 1033	Received By:	Date/Time:
Relinquished By:	Date/Time:	Received By:	Date/Time:
Relinquished By:	Date/Time:	Received By:	Date/Time:

SPECIAL INSTRUCTIONS
Analysis for NO2, NO3, and PO4 by method EPA 300.0 are for information only. The ERC Contractor acknowledges that the 48-hour holding time will not be met.

The Activity Scan is for all samples listed on this chain of custody.

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
	[illegible]	Sample Custodian	3-21-96 / 0900

FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

9513056.1444

0021032654

NON-RADIOLOGICAL SHIPMENT RELEASE

The contents of this shipment #W96-0-0640-34 have been reviewed and contains no radioactive material and therefore, are not subject to radiological control requirements.

Original signed by:

Kris A. Smith, Manager
Project Radiological Controls

9613453.1946

028288

Environmental Restoration Contractor **ERC Team**

Interoffice Memorandum

Job No. 22192
Written Response Required: NO
CCN: N/A
OU: N/A
TSD: N/A
ERA: N/A
Subject Code: 5830

TO:	W. S. Thompson	N1-28	DATE:	February 29, 1996
	G. C. Henckel	H4-80		
COPIES:	K. A. Smith	X0-23	FROM:	S. K. De Mers
	T. L. Lafreniere	X0-23		Radiological Controls
	D. E. Gergely	X0-23		T7-05/373-1913

SUBJECT: **Total Activities for Off-Site Shipments of Groundwater Samples to NRC Licensed Laboratories**

There is no need to perform total activities prior to offsite shipment to NRC licensed labs of samples taken from ground water wells located on the Hanford Site.

All wells reviewed to date for radiological content have shown no well with a total activity in excess of 2,000,000 pCi/l (2,000 pCi/gm), the Department Of Transportation limit for radioactive material. The highest activity in any known well is 1.56×10^6 pCi/l H^3.

While this does not constitute any release from radiological controls for worker protection, it does allow samples to be shipped based on historical laboratory data and save the expense of doing radiochemical analysis.

A copy of the most recent analytical data should be provided to the NRC licensed laboratory with the samples being shipped or if no data is available for new wells, the most recent data from adjacent wells.

0023326596

SAMPLE CHECK-IN LIST

Date/Time Received: 3-26-96 /0900 SDG#: _____

Work Order Number: _____ SAF #: B96-083

Shipping Container ID: RM #7 Chain of Custody # _____

1. Custody Seals on shipping container intact? Yes [X] No [ ]
2. Custody Seals dated and signed? Yes [X] No [ ]
3. Sample temperature 2°C
4. Vermiculite/packing materials is Wet [ ] Dry [x]
5. Each sample is in a plastic bag? Yes [x] No [ ]
6. Sample holding times exceeded? Yes [x] No [ ]

7. Samples have:
   - ____ tape
   - x custody seals
   - ____ hazard labels
   - ____ appropriate sample labels

8. Samples are:
   - x in good condition
   - ____ broken
   - ____ leaking
   - ____ have air bubbles

9. Is the information on the COC and Sample bottles in agreement?

   Yes[x] No [ ]

Notes: _____

Sample Custodian/Laboratory: Paula Davis / LAS Date: 3-26-96

~~Telephoned~~ Faxed To: Kathleen Hall On 3-26-96 By Paula Davis
Rec'd 3-26-96

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LOCKHEED MARTIN

Sample Login
Login Review Checklist

Lot Number L6677

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

SAMPLE SUMMARY REPORT	YES	NO	N/A	Comment
1. Are all sample ID's correct?	X			
2. Are all samples present?	X			
3. Are all matrices indicated correctly?	X			
4. Are all analyses on the COC logged in for the appropriate samples?	X			
5. Are all analyses logged in for the correct container?	X			
6. Are samples logged in according to LAS batching procedures?	X			

LOGIN CHAIN OF CUSTODY	YES	NO	N/A	Comment
1. Are the collect, receive, and due dates correct for every sample?	X			
2. Have all appropriate comments been indicated in the comment section?	X			

SAMPLE RECEIVING CHECKLIST	YES	NO	N/A	Comment
1. Are all discrepancies between the COC and the login noted (if applicable)?			X	

Paul Davis — primary review signature — 3-26-96 date

[illegible] — secondary review signature — 3-26-96 date

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Lockheed Analytical Services
Sample Receiving Checklist

Client Name: Bechtel- Hanford Job No. L6677 Cooler ID: n.A

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):		N.A	

MISCELLANEOUS ITEMS

	Yes	No	* Comments/Discrepancies
samples with short holding times	X		"nitrite/nitrates" This Sample was passed
samples to subcontract			THE 48 the Holding Time.

ADDITIONAL COMMENTS/DISCREPANCIES

Completed by / date: Paula Dass 3-26-96

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

Client Sample Number	LAL Sample Number	SDG Number	Matrix	Method
B0H877	L6677-1		Water	SCREENING
	L6677-2		Water	8260A VOLATILES
	L6677-12		Water	6010 ICP METALS
	L6677-13		Water	7000 FURNACE ME
	L6677-14		Water	300.0 CHLORIDE
	L6677-14		Water	300.0 FLUORIDE
	L6677-14		Water	300.0 NITRATE
	L6677-14		Water	300.0 NITRITE
	L6677-14		Water	300.0 PHOSPHATE
	L6677-14		Water	300.0 SULFATE
	L6677-15		Water	GR ALP/BETA LAL
	L6677-16		Water	U TOTAL KPA (IN
B0H878	L6677-17		Filt H20	6010 ICP METALS
B0H879	L6677-7		Water	8260A VOLATILES
REPORT TYPE	L6677-18		Water	EDD - DISK DEL.
	L6677-18		Water	GCMS2
	L6677-18		Water	INORG TYPE 2 RP
	L6677-18		Water	RAD RPT TYPE 4F

0027 03265

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LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: B0H877	Date Collected: 22-MAR-96
Matrix: Water	Date Received: 26-MAR-96
Percent Solids: N/A	

Constituent	Units	Method	Result	Project Reporting Limit	Data Qualifier(s)	Date Analyzed	LAS Batch|ID	LAS Sample|ID
Chloride	mg/L	300.0	16.	0.020		27-MAR-96	35320	L6677-14
Fluoride	mg/L	300.0	0.27	0.10		28-MAR-96	35321	L6677-14
Nitrate-N	mg/L	300.0	8.1	0.020	H	27-MAR-96	35322	L6677-14
Nitrite-N	mg/L	300.0	< 0.002	0.010	HU	27-MAR-96	35323	L6677-14
Ortho Phosphate	mg/L	300.0	< 0.002	0.10	HU	28-MAR-96	35324	L6677-14
Sulfate	mg/L	300.0	48.	0.10		27-MAR-96	35325	L6677-14

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LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: B0H877	Date Collected: 22-MAR-96
Matrix: Water	Date Received: 26-MAR-96
Percent Solids: N/A	

Constituent	Units	Method	Result	MDL	RDL	Data Qual	Dilution	Date Analyzed	LAS Batch ID	LAS Sample ID
ALUMINUM, TOTAL	mg/l	6010	0.13	0.036	0.20	B	1	25-APR-96	36140	L6677-12
BARIUM, TOTAL	mg/l	6010	0.065	0.0050	0.20	B	1	25-APR-96	36140	L6677-12
BERYLLIUM, TOTAL	mg/l	6010	< 0.0010	0.0010	0.0050	U	1	25-APR-96	36140	L6677-12
CADMIUM, TOTAL	mg/l	6010	< 0.0050	0.0050	0.0050	U	1	25-APR-96	36140	L6677-12
CALCIUM, TOTAL	mg/l	6010	58.	0.0090	5.0		1	25-APR-96	36140	L6677-12
CHROMIUM, TOTAL	mg/l	6010	< 0.0060	0.0060	0.010	U	1	25-APR-96	36140	L6677-12
COBALT, TOTAL	mg/l	6010	< 0.0070	0.0070	0.050	U	1	25-APR-96	36140	L6677-12
COPPER, TOTAL	mg/l	6010	< 0.0070	0.0070	0.025	U	1	25-APR-96	36140	L6677-12
IRON, TOTAL	mg/l	6010	0.24	0.0060	0.10		1	25-APR-96	36140	L6677-12
MAGNESIUM, TOTAL	mg/l	6010	14.	0.066	5.0		1	25-APR-96	36140	L6677-12
MANGANESE, TOTAL	mg/l	6010	0.074	0.0010	0.015		1	25-APR-96	36140	L6677-12
NICKEL, TOTAL	mg/l	6010	< 0.013	0.013	0.040	U	1	25-APR-96	36140	L6677-12
POTASSIUM, TOTAL	mg/l	6010	4.9	1.2	5.0	B	1	25-APR-96	36140	L6677-12
SILVER, TOTAL	mg/l	6010	< 0.0070	0.0070	0.010	U	1	25-APR-96	36140	L6677-12
SODIUM, TOTAL	mg/l	6010	19.	0.039	5.0		1	25-APR-96	36140	L6677-12
VANADIUM, TOTAL	mg/l	6010	< 0.0070	0.0070	0.050	U	1	25-APR-96	36140	L6677-12
ZINC, TOTAL	mg/l	6010	0.0040	0.0030	0.020	B	1	25-APR-96	36140	L6677-12
ANTIMONY, TOTAL	mg/l	7041	< 0.011	0.011	0.060	U	1	25-APR-96	36142	L6677-13
ARSENIC, TOTAL	mg/l	7060	0.0058	0.0030	0.010	B	1	25-APR-96	36142	L6677-13
LEAD, TOTAL	mg/l	7421	< 0.0020	0.0020	0.0030	U	1	25-APR-96	36142	L6677-13
SELENIUM, TOTAL	mg/l	7740	0.0043	0.0030	0.0050	B	1	25-APR-96	36142	L6677-13
THALLIUM, TOTAL	mg/l	7840	< 0.0040	0.0040	0.010	U	1	25-APR-96	36142	L6677-13

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LOCKHEED ANALYTICAL SERVICES

Sample Results

Client Sample ID: B0H878	Date Collected: 22-MAR-96
Matrix: Filt H20	Date Received: 26-MAR-96
Percent Solids: N/A	

Constituent	Units	Method	Result	MDL	RDL	Data Qual	Dilution	Date Analyzed	LAS Batch ID	LAS Sample ID
ALUMINUM, DISSOLVED	mg/l	6010	< 0.036	0.036	0.20	U	1	22-APR-96	36145	L6677-17
BARIUM, DISSOLVED	mg/l	6010	0.070	0.0050	0.20	B	1	22-APR-96	36145	L6677-17
BERYLLIUM, DISSOLVED	mg/l	6010	< 0.0010	0.0010	0.0050	U	1	22-APR-96	36145	L6677-17
CADMIUM, DISSOLVED	mg/l	6010	< 0.0050	0.0050	0.0050	U	1	22-APR-96	36145	L6677-17
CALCIUM, DISSOLVED	mg/l	6010	64.	0.0090	5.0		1	22-APR-96	36145	L6677-17
CHROMIUM, DISSOLVED	mg/l	6010	< 0.0060	0.0060	0.010	U	1	22-APR-96	36145	L6677-17
COBALT, DISSOLVED	mg/l	6010	< 0.0070	0.0070	0.050	U	1	22-APR-96	36145	L6677-17
COPPER, DISSOLVED	mg/l	6010	< 0.0070	0.0070	0.025	U	1	22-APR-96	36145	L6677-17
IRON, DISSOLVED	mg/l	6010	< 0.0060	0.0060	0.10	U	1	22-APR-96	36145	L6677-17
MAGNESIUM, DISSOLVED	mg/l	6010	16.	0.066	5.0		1	22-APR-96	36145	L6677-17
MANGANESE, DISSOLVED	mg/l	6010	0.066	0.0010	0.015		1	22-APR-96	36145	L6677-17
NICKEL, DISSOLVED	mg/l	6010	< 0.013	0.013	0.040	U	1	22-APR-96	36145	L6677-17
POTASSIUM, DISSOLVED	mg/l	6010	6.7	1.2	5.0		1	22-APR-96	36145	L6677-17
SILVER, DISSOLVED	mg/l	6010	< 0.0070	0.0070	0.010	U	1	22-APR-96	36145	L6677-17
SODIUM, DISSOLVED	mg/l	6010	20.	0.039	5.0		1	22-APR-96	36145	L6677-17
VANADIUM, DISSOLVED	mg/l	6010	0.0091	0.0070	0.050	B	1	22-APR-96	36145	L6677-17
ZINC, DISSOLVED	mg/l	6010	< 0.0030	0.0030	0.020	U	1	22-APR-96	36145	L6677-17
Antimony	mg/l	6010	< 0.0030	0.0030	0.060	U	1	30-APR-96	36146	L6677-17
Arsenic	mg/l	6010	0.0052	0.0030	0.010	B	1	30-APR-96	36146	L6677-17
Lead	mg/l	6010	< 0.0020	0.0020	0.0030	U	1	30-APR-96	36146	L6677-17
Selenium	mg/l	6010	< 0.0030	0.0030	0.0050	U	1	30-APR-96	36146	L6677-17
Thallium	mg/l	6010	< 0.0050	0.0050	0.010	U	1	30-APR-96	36146	L6677-17

LOCKHEED ANALYTICAL SERVICES

RAD DATA REPORT (ra01)

Bechtel Hanford, Inc. * Richland, WA

Bechtel Hanford Project (Project BECHTEL-HANFORD)

Client Sample ID: B0H877 LAL Sample ID: L6677-16

Date Collected: 22-MAR-96 Date Received: 26-MAR-96

Matrix: Water Login Number: L6677

Constituent	Analyzed	Batch	Activity	Error	MDA	DataQual	Units
Uranium	17-APR-96	U TOTAL KPA (INORG)_35539	9.25	0.48	2.0		ug/L

9615455.1965

Lockheed Analytical Laboratory
Metals Analytical Data
Technical Review Checklist
(Analyst)

Analyst Name (Print): RANDALL BURNS	Instrument: CHEMCHEK KPA II	Method: KPA

Batch Number	Client Name	Code	Comments	Bench Sheet included Y/N	ACS updated Y/N
326-BH	BECHTEL HANFORD	COMPLETE		Y	Y

CODE	ANOMALY
10	Prep Blank data was not within criteria
11	Laboratory Control Sample was not within criteria
12	Duplicate Precision was not met
13	Matrix Spike recovery was not within criteria
00	Other

Description	Yes	No	Comments
Completeness Review 1. Were the standard operating procedures (SOP) followed?	✓		
2. Are all raw data available and labeled properly (e.g., methods used, units, sample IDs, dilution factors, reruns)?	✓		
3. Are all abnormalities in the raw data noted and/or explained?	✓		
4. Were all the client samples analyzed for all constituents and QC as specified on the LAL Bench Sheets?	✓		
Data Quality Assessment 5. Was the sample properly preserved and analyzed within the method-specified holding time?	✓		
6. Were the instrument calibration criteria met?	✓		
7. Are the initial and continuing calibration verification samples data bracketing the samples of interest within criteria?	✓		
8. Are the bracketing initial and continuing calibration blank data within criteria?	✓		
9. *For ICP Only:* Are the interference check standard recovery data within criteria?			

Notes and comments:

I certify, to the best of my knowledge, that the data are acceptable and in compliance with the laboratory policies and client requests, except as noted above.

Randall Burns 4/24/96
Analyst Signature/Date

J. Mitchell-Hale 4/26/96
Secondary Reviewer Initials/Date

0071

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LOCKHEED ANALYTICAL SERVICES

VOLATILE ORGANICS BY GC/MS
8260 VOLATILES

Client Sample ID:	B0H877	LAL Sample ID:	L6677-2
Date Collected:	22-MAR-96	Date Received:	26-MAR-96
Date Analyzed:	02-APR-96	Analytical Dilution:	1
Matrix:	Water	Analytical Batch ID:	040296-8260-D1
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-D4	108%	84-122
Toluene-D8	102%	87-117
Bromofluorobenzene	107%	83-118

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Chloromethane	74-87-3	<10.	10.	
Vinyl Chloride	75-01-4	<10.	10.	
Bromomethane	74-83-9	<10.	10.	
Chloroethane	75-00-3	<10.	10.	
Fluorotrichloromethane	75-69-4	2.2	5.0	J
Acetone	67-64-1	5.7	100	BJ
1,1-Dichloroethene	75-35-4	<5.0	5.0	
Methylene Chloride	75-09-2	<5.0	5.0	
Carbon Disulfide	75-15-0	<5.0	5.0	
Vinyl Acetate	108-05-4	<5.0	5.0	
1,1-Dichloroethane	75-34-3	<5.0	5.0	
2-Butanone	78-93-3	<10.	10.	
trans-1,2-Dichloroethene	156-60-5	<5.0	5.0	
Chloroform	67-66-3	<5.0	5.0	
1,1,1-Trichloroethane	71-55-6	<5.0	5.0	
Carbon Tetrachloride	56-23-5	<5.0	5.0	
1,2-Dichloroethane	107-06-2	<5.0	5.0	
Benzene	71-43-2	<5.0	5.0	
Trichloroethene (TCE)	79-01-6	<5.0	5.0	
1,2-Dichloropropane	78-87-5	<5.0	5.0	
Bromodichloromethane	75-27-4	<5.0	5.0	
4-Methyl-2-Pentanone	108-10-1	<10.	10.	
2-Hexanone	591-78-6	<10.	10.	
cis-1,3-Dichloropropene	10061-01-5	<5.0	5.0	
trans-1,3-Dichloropropene	10061-02-6	<5.0	5.0	
1,1,2-Trichloroethane	79-00-5	<5.0	5.0	
Toluene	108-88-3	<5.0	5.0	
Chlorodibromomethane	124-48-1	<5.0	5.0	
Tetrachloroethene (PCE)	127-18-4	<5.0	5.0	
Chlorobenzene	108-90-7	<5.0	5.0	
Ethylbenzene	100-41-4	<5.0	5.0	
m,p-Xylenes	136777-61-2	<5.0	5.0	
o-Xylene	95-47-6	<5.0	5.0	
Styrene	100-42-5	<5.0	5.0	
Bromoform	75-25-2	<5.0	5.0	
1,1,2,2-Tetrachloroethane	79-34-5	<5.0	5.0	
1,3-Dichlorobenzene	541-73-1	<5.0	5.0	
1,4-Dichlorobenzene	106-46-7	<5.0	5.0	
1,2-Dichlorobenzene	95-50-1	<5.0	5.0	
Acetonitrile	75-05-8	<50.	50.	
Acrolein	107-02-8	<50.	50.	

0085

LOCKHEED ANALYTICAL SERVICES

VOLATILE ORGANICS BY GC/MS
8260 VOLATILES

Client Sample ID:	BOH877	LAL Sample ID:	L6677-2
Date Collected:	22-MAR-96	Date Received:	26-MAR-96
Date Analyzed:	02-APR-96	Analytical Dilution:	1
Matrix:	Water	Analytical Batch ID:	040296-8260-D1
		Preparation Dilution:	1.00

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Acrylonitrile	107-13-1	<15.	15.	
Allyl Chloride	107-05-1	<5.0	5.0	
Chloroprene	126-99-8	<10.	10.	
1,2-Dibromoethane	106-93-4	<5.0	5.0	
Dibromomethane	74-95-3	<5.0	5.0	
Dichlorodifluoromethane	75-71-8	<5.0	5.0	
1,4-Dioxane	123-91-1	<200	200	
Ethyl Cyanide	107-12-0	<10.	10.	
Ethyl Methacrylate	97-63-2	<5.0	5.0	
Iodomethane	74-88-4	<5.0	5.0	
Isobutanol	78-83-1	<100	100	
Methacrylonitrile	126-98-7	<5.0	5.0	
Methyl Methacrylate	80-62-6	<5.0	5.0	
1,1,1,2-Tetrachloroethane	630-20-6	<5.0	5.0	
1,2,4-Trichlorobenzene	120-82-1	<5.0	5.0	
1,2,3-Trichloropropane	96-18-4	<5.0	5.0	

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LOCKHEED ANALYTICAL SERVICES

VOLATILE ORGANICS BY GC/MS
TENTATIVELY IDENTIFIED COMPOUNDS
8260 VOLATILES

Client Sample ID:	BOH877	LAL Sample ID:	L6677-2
Date Collected:	22-MAR-96	Date Received:	26-MAR-96
Date Analyzed:	02-APR-96	Analytical Dilution:	1
Matrix:	Water	Analytical Batch ID:	040296-8260-D1
		Preparation Dilution:	1.00

Number of 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					

0087

LOCKHEED ANALYTICAL SERVICES

VOLATILE ORGANICS BY GC/MS
8260 VOLATILES

Client Sample ID:	BOH879	LAL Sample ID:	L6677-7
Date Collected:	22-MAR-96	Date Received:	26-MAR-96
Date Analyzed:	02-APR-96	Analytical Dilution:	1
Matrix:	Water	Analytical Batch ID:	040296-8260-D1
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-D4	113%	84-122
Toluene-D8	107%	87-117
Bromofluorobenzene	111%	83-118

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Chloromethane	74-87-3	<10.	10.	
Vinyl Chloride	75-01-4	<10.	10.	
Bromomethane	74-83-9	<10.	10.	
Chloroethane	75-00-3	<10.	10.	
Fluorotrichloromethane	75-69-4	<5.0	5.0	
Acetone	67-64-1	5.8	100	BJ
1,1-Dichloroethene	75-35-4	<5.0	5.0	
Methylene Chloride	75-09-2	<5.0	5.0	
Carbon Disulfide	75-15-0	<5.0	5.0	
Vinyl Acetate	108-05-4	<5.0	5.0	
1,1-Dichloroethane	75-34-3	<5.0	5.0	
2-Butanone	78-93-3	<10.	10.	
trans-1,2-Dichloroethene	156-60-5	<5.0	5.0	
Chloroform	67-66-3	<5.0	5.0	
1,1,1-Trichloroethane	71-55-6	<5.0	5.0	
Carbon Tetrachloride	56-23-5	<5.0	5.0	
1,2-Dichloroethane	107-06-2	<5.0	5.0	
Benzene	71-43-2	<5.0	5.0	
Trichloroethene (TCE)	79-01-6	<5.0	5.0	
1,2-Dichloropropane	78-87-5	<5.0	5.0	
Bromodichloromethane	75-27-4	<5.0	5.0	
4-Methyl-2-Pentanone	108-10-1	<10.	10.	
2-Hexanone	591-78-6	<10.	10.	
cis-1,3-Dichloropropene	10061-01-5	<5.0	5.0	
trans-1,3-Dichloropropene	10061-02-6	<5.0	5.0	
1,1,2-Trichloroethane	79-00-5	<5.0	5.0	
Toluene	108-88-3	<5.0	5.0	
Chlorodibromomethane	124-48-1	<5.0	5.0	
Tetrachloroethene (PCE)	127-18-4	<5.0	5.0	
Chlorobenzene	108-90-7	<5.0	5.0	
Ethylbenzene	100-41-4	<5.0	5.0	
m,p-Xylenes	136777-61-2	<5.0	5.0	
o-Xylene	95-47-6	<5.0	5.0	
Styrene	100-42-5	<5.0	5.0	
Bromoform	75-25-2	<5.0	5.0	
1,1,2,2-Tetrachloroethane	79-34-5	<5.0	5.0	
1,3-Dichlorobenzene	541-73-1	<5.0	5.0	
1,4-Dichlorobenzene	106-46-7	<5.0	5.0	
1,2-Dichlorobenzene	95-50-1	<5.0	5.0	
Acetonitrile	75-05-8	<50.	50.	
Acrolein	107-02-8	<50.	50.	

0088

LOCKHEED ANALYTICAL SERVICES

VOLATILE ORGANICS BY GC/MS
8260 VOLATILES

Client Sample ID:	BOH879	LAL Sample ID:	L6677-7
Date Collected:	22-MAR-96	Date Received:	26-MAR-96
Date Analyzed:	02-APR-96	Analytical Dilution:	1
Matrix:	Water	Analytical Batch ID:	040296-8260-D1
		Preparation Dilution:	1.00

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Acrylonitrile	107-13-1	<15.	15.	
Allyl Chloride	107-05-1	<5.0	5.0	
Chloroprene	126-99-8	<10.	10.	
1,2-Dibromoethane	106-93-4	<5.0	5.0	
Dibromomethane	74-95-3	<5.0	5.0	
Dichlorodifluoromethane	75-71-8	<5.0	5.0	
1,4-Dioxane	123-91-1	<200	200	
Ethyl Cyanide	107-12-0	<10.	10.	
Ethyl Methacrylate	97-63-2	<5.0	5.0	
Iodomethane	74-88-4	<5.0	5.0	
Isobutanol	78-83-1	<100	100	
Methacrylonitrile	126-98-7	<5.0	5.0	
Methyl Methacrylate	80-62-6	<5.0	5.0	
1,1,1,2-Tetrachloroethane	630-20-6	<5.0	5.0	
1,2,4-Trichlorobenzene	120-82-1	<5.0	5.0	
1,2,3-Trichloropropane	96-18-4	<5.0	5.0	

0089

LOCKHEED ANALYTICAL SERVICES

VOLATILE ORGANICS BY GC/MS
TENTATIVELY IDENTIFIED COMPOUNDS
8260 VOLATILES

Client Sample ID:	BOH879	LAL Sample ID:	L6677-7
Date Collected:	22-MAR-96	Date Received:	26-MAR-96
Date Analyzed:	02-APR-96	Analytical Dilution:	1
Matrix:	Water	Analytical Batch ID:	040296-8260-D1
		Preparation Dilution:	1.00

Number of 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					
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16					
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26					
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28					
29					

0090

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LOCKHEED ANALYTICAL SERVICES

SPIKED SAMPLE RESULT
VOLATILE ORGANICS BY GC/MS

Client Sample ID:	BOH879	LAL Sample ID:	35510MS
Date Collected:	22-MAR-96	Date Received:	26-MAR-96
Date Analyzed:	02-APR-96	Analytical Dilution:	1
		Analytical Batch ID:	040296-8260-D1
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-D4	117%	84-122
Toluene-D8	113%	87-117
Bromofluorobenzene	119% *	83-118

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Chloromethane	74-87-3	75.	10.	
Vinyl Chloride	75-01-4	70.	10.	
Bromomethane	74-83-9	68.	10.	
Chloroethane	75-00-3	49.	10.	
Fluorotrichloromethane	75-69-4	200	5.0	E
Acetone	67-64-1	6.4	100	BJ
1,1-Dichloroethene	75-35-4	62.	5.0	
Methylene Chloride	75-09-2	58.	5.0	
Carbon Disulfide	75-15-0	<5.0	5.0	
Vinyl Acetate	108-05-4	<5.0	5.0	
1,1-Dichloroethane	75-34-3	58.	5.0	
2-Butanone	78-93-3	<10.	10.	
trans-1,2-Dichloroethene	156-60-5	59.	5.0	
Chloroform	67-66-3	56.	5.0	
1,1,1-Trichloroethane	71-55-6	56.	5.0	
Carbon Tetrachloride	56-23-5	53.	5.0	
1,2-Dichloroethane	107-06-2	54.	5.0	
Benzene	71-43-2	55.	5.0	
Trichloroethene (TCE)	79-01-6	53.	5.0	
1,2-Dichloropropane	78-87-5	55.	5.0	
Bromodichloromethane	75-27-4	52.	5.0	
4-Methyl-2-Pentanone	108-10-1	<10.	10.	
2-Hexanone	591-78-6	<10.	10.	
cis-1,3-Dichloropropene	10061-01-5	51.	5.0	
trans-1,3-Dichloropropene	10061-02-6	52.	5.0	
1,1,2-Trichloroethane	79-00-5	53.	5.0	
Toluene	108-88-3	53.	5.0	
Chlorodibromomethane	124-48-1	49.	5.0	
Tetrachloroethene (PCE)	127-18-4	38.	5.0	
Chlorobenzene	108-90-7	53.	5.0	
Ethylbenzene	100-41-4	53.	5.0	
m,p-Xylenes	136777-61-2	110	5.0	
o-Xylene	95-47-6	55.	5.0	
Styrene	100-42-5	55.	5.0	
Bromoform	75-25-2	45.	5.0	
1,1,2,2-Tetrachloroethane	79-34-5	52.	5.0	
1,3-Dichlorobenzene	541-73-1	52.	5.0	
1,4-Dichlorobenzene	106-46-7	53.	5.0	
1,2-Dichlorobenzene	95-50-1	53.	5.0	
Acetonitrile	75-05-8	<50.	50.	
Acrolein	107-02-8	<50.	50.	

0094

LOCKHEED ANALYTICAL SERVICES

SPIKED SAMPLE RESULT
VOLATILE ORGANICS BY GC/MS

Client Sample ID:	BOH879	LAL Sample ID:	35510MS
Date Collected:	22-MAR-96	Date Received:	26-MAR-96
Date Analyzed:	02-APR-96	Analytical Dilution:	1
		Analytical Batch ID:	040296-8260-D1
		Preparation Dilution:	1.00

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Acrylonitrile	107-13-1	<15.	15.	
Allyl Chloride	107-05-1	<5.0	5.0	
Chloroprene	126-99-8	<10.	10.	
1,2-Dibromoethane	106-93-4	52.	5.0	
Dibromomethane	74-95-3	55.	5.0	
Dichlorodifluoromethane	75-71-8	100	5.0	
1,4-Dioxane	123-91-1	<200	200	
Ethyl Cyanide	107-12-0	<10.	10.	
Ethyl Methacrylate	97-63-2	<5.0	5.0	
Iodomethane	74-88-4	<5.0	5.0	
Isobutanol	78-83-1	<100	100	
Methacrylonitrile	126-98-7	75.	5.0	
Methyl Methacrylate	80-62-6	<5.0	5.0	
1,1,1,2-Tetrachloroethane	630-20-6	52.	5.0	
1,2,4-Trichlorobenzene	120-82-1	51.	5.0	
1,2,3-Trichloropropane	96-18-4	50.	5.0	

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LOCKHEED ANALYTICAL SERVICES

SPIKED SAMPLE RESULT
VOLATILE ORGANICS BY GC/MS

Client Sample ID:	BOH879	LAL Sample ID:	35510MSD
Date Collected:	22-MAR-96	Date Received:	26-MAR-96
Date Analyzed:	02-APR-96	Analytical Dilution:	1
		Analytical Batch ID:	040296-8260-D1
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-D4	107%	84-122
Toluene-D8	101%	87-117
Bromofluorobenzene	106%	83-118

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Chloromethane	74-87-3	71.	10.	
Vinyl Chloride	75-01-4	65.	10.	
Bromomethane	74-83-9	68.	10.	
Chloroethane	75-00-3	160	10.	
Fluorotrichloromethane	75-69-4	180	5.0	
Acetone	67-64-1	6.8	100	BJ
1,1-Dichloroethene	75-35-4	57.	5.0	
Methylene Chloride	75-09-2	54.	5.0	
Carbon Disulfide	75-15-0	<5.0	5.0	
Vinyl Acetate	108-05-4	<5.0	5.0	
1,1-Dichloroethane	75-34-3	54.	5.0	
2-Butanone	78-93-3	<10.	10.	
trans-1,2-Dichloroethene	156-60-5	55.	5.0	
Chloroform	67-66-3	53.	5.0	
1,1,1-Trichloroethane	71-55-6	52.	5.0	
Carbon Tetrachloride	56-23-5	49.	5.0	
1,2-Dichloroethane	107-06-2	51.	5.0	
Benzene	71-43-2	51.	5.0	
Trichloroethene (TCE)	79-01-6	49.	5.0	
1,2-Dichloropropane	78-87-5	52.	5.0	
Bromodichloromethane	75-27-4	48.	5.0	
4-Methyl-2-Pentanone	108-10-1	<10.	10.	
2-Hexanone	591-78-6	<10.	10.	
cis-1,3-Dichloropropene	10061-01-5	48.	5.0	
trans-1,3-Dichloropropene	10061-02-6	49.	5.0	
1,1,2-Trichloroethane	79-00-5	51.	5.0	
Toluene	108-88-3	49.	5.0	
Chlorodibromomethane	124-48-1	46.	5.0	
Tetrachloroethene (PCE)	127-18-4	35.	5.0	
Chlorobenzene	108-90-7	48.	5.0	
Ethylbenzene	100-41-4	49.	5.0	
m,p-Xylenes	136777-61-2	100	5.0	
o-Xylene	95-47-6	50.	5.0	
Styrene	100-42-5	50.	5.0	
Bromoform	75-25-2	42.	5.0	
1,1,2,2-Tetrachloroethane	79-34-5	49.	5.0	
1,3-Dichlorobenzene	541-73-1	46.	5.0	
1,4-Dichlorobenzene	106-46-7	48.	5.0	
1,2-Dichlorobenzene	95-50-1	48.	5.0	
Acetonitrile	75-05-8	<50.	50.	
Acrolein	107-02-8	<50.	50.	

0096

LOCKHEED ANALYTICAL SERVICES

SPIKED SAMPLE RESULT
VOLATILE ORGANICS BY GC/MS

Client Sample ID:	BOH879	LAL Sample ID:	35510MSD
Date Collected:	22-MAR-96	Date Received:	26-MAR-96
Date Analyzed:	02-APR-96	Analytical Dilution:	1
		Analytical Batch ID:	040296-8260-D1
		Preparation Dilution:	1.00

CONSTITUENT	CAS NO.	RESULT ug/L	PRACTICAL QUANTITATION LIMIT ug/L	DATA QUALIFIER(s)
Acrylonitrile	107-13-1	<15.	15.	
Allyl Chloride	107-05-1	<5.0	5.0	
Chloroprene	126-99-8	<10.	10.	
1,2-Dibromoethane	106-93-4	49.	5.0	
Dibromomethane	74-95-3	52.	5.0	
Dichlorodifluoromethane	75-71-8	94.	5.0	
1,4-Dioxane	123-91-1	<200	200	
Ethyl Cyanide	107-12-0	<10.	10.	
Ethyl Methacrylate	97-63-2	<5.0	5.0	
Iodomethane	74-88-4	<5.0	5.0	
Isobutanol	78-83-1	<100	100	
Methacrylonitrile	126-98-7	68.	5.0	
Methyl Methacrylate	80-62-6	<5.0	5.0	
1,1,1,2-Tetrachloroethane	630-20-6	49.	5.0	
1,2,4-Trichlorobenzene	120-82-1	48.	5.0	
1,2,3-Trichloropropane	96-18-4	47.	5.0	

LOCKHEED ANALYTICAL SERVICES

MATRIX SPIKE DATA SUMMARY
VOLATILE ORGANICS BY GC/MS

Client Sample ID:	BOH879	LAL Sample ID:	35510MS
Date Collected:	22-MAR-96	Date Received:	26-MAR-96
Date Analyzed:	02-APR-96	Analytical Dilution:	1
		Analytical Batch ID:	040296-8260-D1
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-D4	117%	84-122
Toluene-D8	113%	87-117
Bromofluorobenzene	119% *	83-118

Constituent	Spike Added ug/L	Sample Concentration ug/L	MS Concentration ug/L	% Recovery	QC Limits % Recovery
1,1-Dichloroethene	50.0	0.462	61.6	122	62-124
Benzene	50.0	0.339	55.0	109	68-128
Trichloroethene (TCE)	50.0	0.524	52.9	105	65-125
Toluene	50.0	0.466	53.5	106	69-129
Chlorobenzene	50.0	0.368	53.0	105	68-128

LOCKHEED ANALYTICAL SERVICES

MATRIX SPIKE DUPLICATE DATA SUMMARY
VOLATILE ORGANICS BY GC/MS

Client Sample ID:	BOH879	LAL Sample ID:	35510MSD
Date Collected:	22-MAR-96	Date Received:	26-MAR-96
Date Analyzed:	02-APR-96	Analytical Dilution:	1
		Analytical Batch ID:	040296-8260-D1
		Preparation Dilution:	1.00

SURROGATE	RECOVERY	QC Limits
1,2-Dichloroethane-D4	107%	84-122
Toluene-D8	101%	87-117
Bromofluorobenzene	106%	83-118

Constituent	Spike Added ug/L	MSD Concentration ug/L	% Recovery	RPD	QC Limits RPD	QC Limits % Recovery
1,1-Dichloroethene	50.0	57.3	114	7	14	62-124
Benzene	50.0	50.6	101	8	11	68-128
Trichloroethene (TCE)	50.0	48.6	96	9	14	65-125
Toluene	50.0	48.7	96	10	13	69-129
Chlorobenzene	50.0	48.5	96	9	13	68-128

0103

LOCKHEED ANALYTICAL SERVICES

VOLATILE INTERNAL STANDARD

AREA AND RT SUMMARY

Instrument ID: GC\MS-D

Date/Time Analyzed: 02-APR-96 09:12
LAL Batch ID: 040296-8260-D1

		IS1 (PFB) Area	RT	IS2 (DFB) Area	RT	IS3 (CBZ) Area	RT	IS4 (DCB) Area	RT
12 HOUR STD		675912	11.05	1078549	12.19	1147471	16.29	922343	20.35
UPPER LIMIT		1351824	11.55	2157098	12.69	2294942	16.79	1844686	20.85
LOWER LIMIT		337956	10.55	539274	11.69	573735	15.79	461171	19.85
Client Sample ID	LAL Sample ID								
BOH879	35510MS	566680	11.06	921667	12.20	961894	16.31	927047	20.36
BOH877	L6677-2	583023	11.06	922467	12.20	984319	16.31	898079	20.35
BOH879	L6677-7	585377	11.06	952817	12.20	996996	16.31	909309	20.35
Method Blank	MB35510	604511	11.06	951069	12.20	1008144	16.32	948514	20.36
BOH879	35510MSD	580986	11.06	953743	12.20	1010416	16.32	976498	20.36
Lab Ctrl Sample	LCS35510	658623	11.06	1051570	12.20	1107504	16.31	1075003	20.36

AREA UPPER LIMIT = +100% of internal standard area
AREA LOWER LIMIT = -50% of internal standard area
RT UPPER LIMIT = +0.50 minutes of internal standard RT
RT LOWER LIMIT = -0.50 minutes of internal standard RT

IS1 (PFB) = Pentafluorobenzene
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene-d5
IS4 (DCB) = 1,4-Dichlorobenzene-d4

LOCKHEED ANALYTICAL SERVICES

RAD DATA REPORT (ra01)

Bechtel Hanford, Inc. * Richland, WA

Bechtel Hanford Project (Project BECHTEL-HANFORD)

Client Sample ID: B0H877 | LAL Sample ID: L6677-15

Date Collected: 22-MAR-96 | Date Received: 26-MAR-96

Matrix: Water | Login Number: L6677

Constituent	Analyzed	Batch	Activity	Error	MDA	DataQual	Units
Gross Alpha	09-APR-96	GR ALP/BETA LAL-0060_35168	8.0	2.9	2.6	C	pCi/L
Gross Beta	09-APR-96	GR ALP/BETA LAL-0060_35168	19.3	2.5	2.3		pCi/L

LOCKHEED ANALYTICAL LABORATORY

SAMPLE PREPARATION LOG FOR GROSS ALPHA/BETA ANALYSIS

LAL-91-SOP-0060

Date Prep Started : _____

Workgroup Number : GR ALP/BETA LAL-0060_35168

Matrix : Water

Prep Due Date : ~~04/01/96~~ 4/9/96

CLIENT SAMPLE ID	LAL ID		QC	CHILD LAL ID	pH <2	ALQT VOL (L)	PLANCHET TARE WT (grams)	PLANCHET GROSS WT (grams)	* * *	SAMPLE WEIGHT (grams)	COMMENTS
L6649-13	35168DUP1	1	DUP1	35168-01	2	.130	8.5449	8.6430			
Lab Ctrl Sample	35168LCS1	2	LCS1	35168-02		.250	8.5547	8.5934			
Method Blank	35168MBB	3	MBB1	35168-03		.256	8.5364	8.5364			
L6661-13	35168MS1	4	MS1	35168-04		.220	8.5968	8.6998			
B0H8G2	L6649-13	5	SMP1	35168-05		.130	8.5863	8.6827			
B0H8F0	L6661-13	6	MSS1	35168-06		.220	8.6198	8.7263			
B0H877	L6677-15	7		35168-07		.250	8.5412	8.6489			
		8									
		9									
		10									
		11									
		12									
		13									
		14									
		15									
		16									
		17									
		18									
		19									
		20									
		21									
		22									
		23									
		24									

LCS Volume & RefDate	1.0 mL	8/1/90	MS Volume & RefDate	1.0 mL	1/5/96	Prep Anlst	CD
LCS Nuclide	Am-241	Sr-90	MS Nuclide	Am-241	Sr-90	Start Date	4/7/96
LCS Activity	9.81 pCi/mL	12.0 pCi/mL	MS Activity	8.40 pCi/mL	8.37 pCi/mL	Count Anlst	
LCS ID #	95-721-13-1		MS ID #	94-677-93-1			

Balance Number : 40020046 ( ) _____ ( )

Pipette Number : 71008 ( ) _____ ( )

LCS added by: _____

Witnessed by : _____

Comments : _____

Analyst [signature] Checked by: SV

Cnt Rm Custody\Date : SV 4-8-96

V95224

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LOCKHEED ANALYTICAL LABORATORY

SAMPLE PREPARATION LOG FOR GROSS ALPHA/BETA ANALYSIS

LAL-91-SOP-0060

Date Prep Started : 4/8/96
Workgroup Number : GR ALP/BETA LAL-0060_35168

Matrix : Water
Prep Due Date : 04/01/96

CLIENT SAMPLE ID	LAL ID		QC	CHILD LAL ID	pH <2	ALQT VOL (L)	PLANCHET TARE WT (grams)	PLANCHET GROSS WT (grams)	* * *	SAMPLE WEIGHT (grams)	COMMENTS
L6649-13	35168DUP1	1	DUP1	35168-01	2	0.130	8.5449	8.6430		0.0981	
Lab Ctrl Sample	35168LCS1	2	LCS1	35168-02	2	0.250	8.5547	8.5934		0.0387	
Method Blank	35168MBB	3	MBB1	35168-03	2	0.250	8.5364	8.5364		0.0000	
L6661-13	35168MS1	4	MS1	35168-04	2	0.220	8.5968	8.6998		0.1030	
B0H8G2	L6649-13	5	SMP1	35168-05	2	0.130	8.5863	8.6827		0.0964	
B0H8F0	L6661-13	6	MSS1	35168-06	2	0.220	8.6198	8.7263		0.1065	
B0H877	L6677-15	7		35168-07	2	0.250	8.5412	8.6489		0.1077	
		8									
		9									
		10									
		11									
		12									
		13									
		14									
		15									
		16									
		17									
		18									
		19									
		20									
		21									
		22									
		23									
		24									

LCS Volume & RefDate	1.0 mL; 08/01/90		MS Volume & RefDate	1.0 mL; 01/05/96		Prep Anlst	CD
LCS Nuclide	Am-241	Sr-90	MS Nuclide	Am-241	Sr-90	Start Date	4/8/96
LCS Activity	9.8 pCi/mL	12.0 pCi/mL	MS Activity	8.4 pCi/mL	8.4 pCi/mL	Count Anlst	
LCS ID #	95-721-13-1		MS ID #	94-677-93-1			

Balance Number : 40020046 ( )
( )

Pipette Number : 71008 ( )
( )

LCS added by: CD
Witnessed by : NA

Comments :

Analyst : [signature] Checked by: [signature]

V95224

0118

96135353.1971

PROJECT Gross Alpha/Beta 9515133.1972 (J) Continued From Page _____

SECONDARY/WORKING LEVEL STANDARD DILUTION RECORD

Dilution Source Information

Isotope:	Am-241 and Sr-90
Parent Barcode Number	AA0030 AA0046
Vendor or Certificate I.D. # of Parent Standard:	Am-241 IPL 388-100-1 Sr-90 NIST SRM 4919G
Diluted Source Logbook I.D. #:	Am-241 91-0225-60-1 Sr-90 91-0225-30-2
Balance Verification?:	Yes
Diluent Used:	0.1 N HNO_3

Dilution

*Diluent:	0.1 N HNO_3 + 42mg $Sr(NO_3)_2$/mL
*Density of diluent (g/ml):	NA
a: Parent Specific Activity:	Am-241 981 pCi/mL Sr-90 600 pCi/mL m 8/1/90
b: Amount of Source Transferred:	Am-241 0.5 mL Sr-90 0.5 ~~g~~ mL
c: Total amount of Dilution:	500 ~~g~~ mL
d: Total Volume of Dilution:	500 mL
e: Activity of Dilution (a * b / c):	NA
f: Activity of Dilution (a * b / d):	Am-241 9.81 pCi/mL Sr-90 12 pCi/mL m 8/1/90
Dilution Logbook I.D. #:	95-721-13-1

Prepared By: Joe Hutchinson Preparation Date: 8/23/95

Reviewed By: [illegible] Review Date: 8/24/95

*If the diluent remains unchanged from the diluent used for the dilution source, then a weight dilution of a volume unit source can be performed without a density conversion. If the diluent changes, a weighted proportion density conversion is necessary.

Read and Understood By

Signed _____ Date _____ Signed _____ Date _____

CERTIFICATE OF CALIBRATION
ALPHA STANDARD SOLUTION

Radionuclide	Am-241	Customer:	LOCKHEED ENGINEERING & SCIENCES Co
Half Life:	432.7 ± 0.5 years	P.O.No.:	06LAB1245
Catalog No.:	7241	Reference Date:	November 1 1991 12:00 PST.
Source No.:	388-100-1	Contained Radioactivity:	0.997 µCi.

Description of Solution

a. Mass of solution:	5.0007	grams.
b. Chemical form:	AmCl3 in 0.5N HCl	
c. Carrier content:	None added	
d. Density:	1.0077	gram/ml @ 20°C.

Radioimpurities

None detected

Radioactive Daughters

None detected

Radionuclide Concentration

0.1994 µCi/gram.

Method of Calibration

Weighed aliquots of the solution were assayed using a liquid scintillation counter.

Uncertainty of Measurement

a. Systematic uncertainty in instrument calibration:	±2.0%
b. Random uncertainty in assay:	±0.7%
c. Random uncertainty in weighing(s):	±0.0%
d. Total uncertainty at the 99% confidence level:	±2.7%

NIST Traceability

This calibration is implicitly traceable to the National Institute of Standards and Technology.

Notes

1. Nuclear data were taken from "Table of Isotopes", Seventh Edition, edited by Virginia S. Shirley.
2. IPL participates in an NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay(and later NIST certification) of Standard Reference Materials. (As in NRC Regulatory Guide 4.15)

Gary A. Gilmore
QUALITY CONTROL

ISOTOPE PRODUCTS LABORATORIES
1800 No. Keystone Street.,
Burbank, California 91504
(818) 843 - 7000

9613453.197
THIS IS A PHOTOCOPY OF THE CERTIFICATE
WHICH IS BEING MAILED TO YOU UNDER
SEPARATE COVER.

National Institute of Standards & Technology

Certificate

Standard Reference Material 4919-G
Radioactivity Standard

Radionuclide	Strontium-90
Source identification	4919-G
Source description	Solution in NIST borosilicate-glass ampoule (1)*
Solution composition	Strontium-90 plus yttrium-90 plus approximately 95 μg each of non-radioactive strontium and yttrium per gram of 1-molar hydrochloric acid (2)
Mass	Approximately 5.0 grams
Radioactivity concentration	4.514×10^3 Bq g^{-1}
Reference time	1200 EST August 1, 1990
Overall uncertainty	1.05 percent (3)
Photon-emitting impurities	None observed (4)
Alpha-particle-emitting impurities	None observed (5)
Half life	28.5 ± 0.2 years (6)
Measuring instrument	$4\pi\beta$ liquid-scintillation counter

This standard reference material was prepared in the Center for Radiation Research, Ionizing Radiation Division, Radioactivity Group, Dale D. Hoppes, Group Leader.

Gaithersburg, MD 20899
[illegible]uary, 1991

William P. Reed, Acting Chief
Office of Standard Reference Materials

*Notes on back

CERTIFICATE OF CALIBRATION
ALPHA STANDARD SOLUTION

Radionuclide	Am-241	Customer:	LOCKHEED ENGINEERING & SCIENCES Co.	
Half Life:	432.7 ± 0.5 years	P.O.No.:	06LAB1245	
Catalog No.:	7241	Reference Date:	November 1 1991	12:00 PST.
Source No.:	388-100-1	Contained Radioactivity:	0.997	µCi.

Description of Solution

a. Mass of solution:	5.0007	grams.
b. Chemical form:	AmCl3 in 0.5N HCl	
c. Carrier content:	None added	
d. Density:	1.0077	gram/ml @ 20°C.

Radioimpurities

None detected

Radioactive Daughters

None detected

Radionuclide Concentration

0.1994 µCi/gram.

Method of Calibration

Weighed aliquots of the solution were assayed using a liquid scintillation counter.

Uncertainty of Measurement

a. Systematic uncertainty in instrument calibration:	±2.0%
b. Random uncertainty in assay:	±0.7%
c. Random uncertainty in weighing(s):	±0.0%
d. Total uncertainty at the 99% confidence level:	±2.7%

NIST Traceability

This calibration is implicitly traceable to the National Institute of Standards and Technology.

Notes

1. Nuclear data were taken from "Table of Isotopes", Seventh Edition, edited by Virginia S. Shirley.
2. IPL participates in an NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay(and later NIST certification) of Standard Reference Materials. (As in NRC Regulatory Guide 4.15)

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Burbank, California 91504
(818) 843 - 7000

CERTIFICATE OF CALIBRATION
BETA STANDARD SOLUTION

Radionuclide	Sr-90	Customer:	LOCKHEED ENGINEERING & SCIENCES Co.
Half Life:	28.5 ± 0.2 years	P.O.No.:	06LAB1245
Catalog No.:	7090	Reference Date:	November 1 1991 12:00 PST.
Source No.:	388-99-2	Contained Radioactivity:	1.018 µCi.

Description of Solution

a. Mass of solution: 5.0012 grams.

b. Chemical form: SrCl2 in 0.1N HCl

c. Carrier content: None added

d. Density: 0.9996 gram/ml @ 20°C.

Radioimpurities

None (Y-90 daughter in equilibrium)

Radioactive Daughters

Y-90 daughter in equilibrium

Radionuclide Concentration

0.203 µCi/gram.

Method of Calibration

Weighed aliquots of the solution were assayed using a liquid scintillation counter.

Uncertainty of Measurement

a. Systematic uncertainty in instrument calibration: ±1.5%

b. Random uncertainty in assay: ±0.5%

c. Random uncertainty in weighing(s): ±0.0%

d. Total uncertainty at the 99% confidence level: ±2.0%

NIST Traceability

This calibration is implicitly traceable to the National Institute of Standards and Technology.

Notes

1. Nuclear data were taken from "Table of Isotopes", Seventh Edition, edited by Virginia S. Shirley.
2. IPL participates in an NIST measurement assurance program to establish and maintain implicit traceability for a number of nuclides, based on the blind assay(and later NIST certification) of Standard Reference Materials. (As in NRC Regulatory Guide 4.15)

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QUALITY CONTROL

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9613453.1977

SECONDARY/WORKING LEVEL STANDARD DILUTION RECORD

Dilution Source Information

Isotope:	Am-241 (432.7 yr) ; Sr/Y 90 (29.1 yr) MS
Parent ~~Barcode~~ Logbook Number	92-353-81-1 ; 94-0677-92-1
Vendor or Certificate I.D. # of Parent Standard:	
Diluted Source Logbook I.D. #:	see ABOVE
Balance Verification?:	Yes
Diluent Used:	1 M HNO3

Dilution

*Diluent:	1 M HNO3 + 10 ml Sr Carrier (10 mg/ml)		
*Density of diluent (g/ml):	1.0290		g/ml
	Am-241	Sr/Y-90 *	
a: Parent Specific Activity:	1002.4	; 1000.2	pCi/g @ 1/5/96
b: Amount of Source Transferred:	4.070	; 4.065	g
c: Total amount of Dilution:	500.01		g
d: Total Volume of Dilution:	514.5		ml
	Am-241	Sr/Y-90	
e: Activity of Dilution [a * b / c]:	8.16	8.13	pCi/g @ 1/5/96
f: Activity of Dilution (a * b / d):	8.40	8.37	pCi/ml
Dilution Logbook I.D. #:	94-0677-93-1		

* Sr/Y-90 in equilibrium. Activity reported = known Sr 90 activity * 2.

Prepared By: [signature] Preparation Date: 1/5/96

Reviewed By: Joe Hutchinson Review Date: 1/5/96

*If the diluent remains unchanged from the diluent used for the dilution source, then a weight dilution of a volume unit source can be performed without a density conversion. If the diluent changes, a weighted proportion density conversion is necessary.

Read and Understood By

Signed	Date	Signed	Date

9613453.1978

INITIAL STANDARD DILUTION RECORD

Standard Information:

Isotope:	Sr-90	Vendor:	IPL
Activity of Standard Received:	~~5.001~~ 1.018 uCi	Vendor I.D. #	—
Weight of Standard Received (g):	5.0012 g	LAL I.D. #:	AAØØ49
Standard Activity (pCi/g):	2.036E5 pCi/g	NIST Traceable ?	Yes
Halflife in Years or Days:	29.1 yrs	Certificate #:	388-99-2
Reference Date:	11/1/91	Receiver's Name:	FREE
		Date Received:	12/91

Primary Dilution

Balance Verification?:	Yes	
Diluent Used:	1 M HNO_3	(1.0290 g/ml)
a: Decay Corrected Standard Activity (pCi/g):	1.844 E5	pCi/g @ 1/5/96
b: Weight of the Source Transferred (g):	4.949	g
c: Total diluted weight (g):	100.01	g
d: Total Diluted Volume (mL)	97.19	mL
e: Activity of Dilution by Weight (pCi/g) [a * b / c]:	9125.0	pCi/g @ 1/5/96
f: Calculated Density of Solution (g/ml) [c / d]:	~~9389.8~~ 1.0290	g/mL
g: Activity of Dilution by Volume (pCi/mL) [e * f]:	9389.8	pCi/mL
h. Dilution Logbook I.D. #:	94-0677-91-1	

Prepared By: [signature] Preparation Date: 1/5/96

Reviewed By: Joe Hutchison Review Date: 1/5/96

Purity/Cross Check Performed By: _____ Check Date: _____

Signed	Date	Signed	Date

9613453.1979

SECONDARY/WORKING LEVEL STANDARD DILUTION RECORD

Dilution Source Information

Isotope:	Sr-90
Parent Barcode Number	AA0049
Vendor or Certificate I.D. # of Parent Standard:	~~94-0677-91-1~~ 388-99-2
Diluted Source Logbook I.D. #:	94-0677-91-1
Balance Verification?:	Yes
Diluent Used:	1.0 M HNO_3

Dilution

*Diluent:	1.0 M HNO_3	
*Density of diluent (g/ml):	1.0290	g/ml
a: Parent Specific Activity:	9125.0	pCi/g @ 1/5/96
b: Amount of Source Transferred:	6.012	g
c: Total amount of Dilution:	109.70	g
d: Total Volume of Dilution:	106.61	ml
e: Activity of Dilution (a * b / c):	500.09	pCi/g 1/5/96
f: Activity of Dilution (a * b / d):	514.6	pCi/ml
Dilution Logbook I.D. #:	94-0677-92-1	

Prepared By: [signature] Preparation Date: 1/5/96

Reviewed By: Joe Hutchison Review Date: 1/8/96

*If the diluent remains unchanged from the diluent used for the dilution source, then a weight dilution of a volume unit source can be performed without a density conversion. If the diluent changes, a weighted proportion density conversion is necessary.

Read and Understood By

Signed	Date	Signed	Date

PROJECT 1111-211 1.6 dia. filter & LCS

9613453.1980

Continued From Page

ISOTOPE DILUTION RECORD

Agnes Wong 4-9-93

Isotope: Am-241

Secondary/Working Level Dilution

Date: 4-9-93 Preparer's Name: A. Wong

Pipet Check / Balance Wt. Check Done (✓)

Diluted Source ID (log#): 91-225-60-1

Diluent used: 0.5 N HCl

A: Source activity: 21700 dpm/g (9774.8 pCi/g)

B: Amount of source transferred: 10.3235 g

C: Total amount of dilution: 100.1029 g

D: Activity of dilution (A*B/C): 2237.90 dpm/g

E: Density of Diluent: 1.0010 g/ml

★ F: Activity by volume (D*E): 2240.14 dpm/ml

Dilution Log Book ID: ~~92-335~~ RW 92-353-81-1

Reviewed by: [illegible] Date: 4/9/93

1.6" diameter filter LCS for Gamma Spec. (in petri dish and sealed) JSS 5/18/93

Prepared by Nee Van Nuyen 5/10/93 — Cut Whatman Glass Microfiber filter paper (originally 3" dia.) to 1.6" dia. — Pipetted on filter

^{137}Cs LAC-0199- 0.200 ml * 975.18 pCi/ml = 195.0 pCi (≡ 197.8 pCi 4-2-91)

^{60}Co LAC-0225-80-1 0.200 ml * 990.11 pCi/ml = 198.0 pCi (≡ 259.1 pCi 4-2-91)

(same pipette amounts as p.80R)

Continued on Page N/A

Read and Understood By

Agnes Wong — Signed — 4-9-93 — Date

Jack W. Schuett — Signed — 5-18-93 — Date