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Los Alamos
NATIONAL LABORATORY
EST. 1943

Associate Director for
Environmental Programs
P.O. Box 1663, MS M991
Los Alamos, New Mexico 87545
(505) 606-2337/Fax (505) 665-1812

Date: APR 15 2011
Refer To: EP2011-0168

Mr. Brian Snyder, Water Division Director
Acting Public Utilities Division Director
Sangre de Cristo Water Division
City of Santa Fe
801 West San Mateo
P.O. Box 909
Santa Fe, New Mexico 87504

Subject: Los Alamos National Laboratory Sitewide Monitoring Program Drinking Water Results for the City of Santa Fe Buckman Water Supply Wells

Dear Mr. Snyder:

This report, prepared by Los Alamos National Laboratory (the Laboratory), provides the analytical results from the November 10, 2010, sampling of the City of Santa Fe's Buckman Wells Nos. 1, 6, and 8 for low-level tritium analysis. All results were below the U.S. Environmental Protection Agency (EPA) drinking water standard.

Routine monitoring of select Buckman water supply wells is conducted in accordance with the April 22, 2010, sampling and analysis plan cooperatively developed between the Laboratory and City of Santa Fe staff. Under this plan, Buckman Wells Nos. 1, 6, and 8 will be sampled quarterly by the Laboratory: twice per year for full-suite analysis (radiologicals [including tritium], general inorganics [including perchlorate], metals [including chromium], and organics); and twice per year for low-level tritium.

The attached CD contains the following items: (1) American Radiation Services (ARSL) data report; and (2) an Excel file of all analytical results (Tables 1 and 2) with a glossary of laboratory qualification codes, secondary validation codes, and secondary validation reason codes. The analytical results are as follows.

Tritium: Samples from Buckman Wells Nos. 1, 6, and 8 were submitted to ARSL for low-level tritium analysis. Historically, all low-level tritium samples were submitted to the University of Miami Tritium Laboratory (UMTL) for analysis. Beginning in early 2010, however, the Laboratory's contract with UMTL expired, and the new contract was awarded to ARSL. Accordingly, results from ARSL may not be directly comparable with those from UMTL because of differences in each laboratory's minimum detectable activity (MDA) and counting uncertainty. Analytical results are discussed below and presented in Table 1.0.

34504

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National Nuclear Security Administration of the U.S. Department of Energy

- Tritium results from the sampling of Buckman Wells Nos. 1, 6, and 8 on November 10, 2010, were as follows.

  - Buckman Well No. 1: 3.45 pCi/L
  - Buckman Well No. 6: 3.32 pCi/L
  - Buckman Well No. 8: 3.26 pCi/L

While tritium measurements from the two laboratories differ in sensitivity, all the data confirm tritium levels are far below the 20,000 pCi/L EPA MCL.

Field Parameters: Results from the measurement of field parameters—conductivity, temperature, turbidity, dissolved oxygen, redox potential, and pH—are presented in Table 2.0. All results are compliant with the EPA Secondary Drinking Water Regulations.

In summary, all results presented in this report are below EPA drinking water standards.

If you would like additional information regarding this report, please contact Bob Beers at (505) 667-7969 (bbeers@lanl.gov).

Sincerely,

B. G. Schappell for MJG

Michael J. Graham, Associate Director
Environmental Programs
Los Alamos National Laboratory

MAY 2011

MG/CD/SP/BB:sm

Attachment: CD with the following items:
(1) ARSL data report
(2) Excel file of Tables 1.0–2.0 and a glossary of laboratory qualification codes, secondary validation codes, and secondary validation reason codes (LA-UR-11-10275)

Cy: (w/att.)
Claudia Borchert, City of Santa Fe, 801 West San Mateo, Santa Fe, NM 87505
Michael Gonzales, City of Santa Fe, 801 West San Mateo, Santa Fe, NM 87505
Alex Puglisi, City of Santa Fe, 801 West San Mateo, Santa Fe, NM 87505
James Bearzi, NMED-HWB, 2905 Rodeo Park Drive East, Building 1, Santa Fe, NM 87505
Margaret Ryan, NMED-DWB, P.O. Box 5469, Santa Fe, NM 87502
Neil Weber, San Ildefonso Pueblo
Gene Turner, DOE-LASO, MS A316
Bob Beers, ENV-RCRA, MS K490
RPF, MS M707

Cy: (Letter and CD and/or DVD only))
Laurie King, EPA Region 6, Dallas, TX
Steve Yanicak, NMED-DOE-OB, MS M894
Hai Shen, DOE-LASO, MS A316
Steve Paris, EP-CAP, MS M992
Suzanne Coyne, IRM-DCS, MS M992
William Alexander, EP-BPS, MS M992

Cy: (w/o att.)
Tom Skibitski, NMED-OB, Santa Fe, NM (date-stamped letter emailed)
Annette Russell, DOE-LASO, MS A316 (date-stamped letter emailed)
Michael B. Mallory, PADOPS, A102 (date-stamped letter emailed)
James C. Cantwell, ADESHQ, MS K491 (date-stamped letter emailed)
Mike Saladen, ENV-RCRA, MS K490 (date-stamped letter emailed)
Danny Katzman, EP-ET, MS M992 (date-stamped letter emailed)
Craig Douglass, EP-CAP, MS M992 (date-stamped letter emailed)
Michael J. Graham, ADEP, MS M991 (date-stamped letter emailed)

Table 1.0
Buckman Wells Nos. 1, 6, and 8
Low-Level Tritium

Location Name	Start Date	Analyte	Analyte Desc	Anyl Meth Code	Fld Prep Code		Std Result	Units	Std Uncertainty (1s)	Std Mda	Lab Qual Code	Concat Flag Code	Fld Qc Type Code	Lab Code	Sample Id
Buckman 1	11/10/2010	H-3	Tritium	Generic:Low_Level_Tritium	UF		3.45	pCi/L	0.93	2.40				ARSL	Buckman1-11-1944
Buckman 6	11/10/2010	H-3	Tritium	Generic:Low_Level_Tritium	UF		3.32	pCi/L	0.89	2.30				ARSL	Buckman06-11-1970
Buckman 8	11/10/2010	H-3	Tritium	Generic:Low_Level_Tritium	UF		3.26	pCi/L	0.86	2.27				ARSL	Buckman08-11-2042

Table 2.0
Buckman Wells Nos. 1, 6, and 8
Field Parameters

Location Name	Start Date	Analyte	Analyte Desc	Fld Prep Code	Result	Units	Lab Code	Sample Id
Buckman 1	11/10/2010	DO	Dissolved Oxygen	UF	6.69	mg/L	FLD	Buckman1-11-1944
Buckman 1	11/10/2010	ORP	Oxidation Reduction Potential	UF	308.1	mV	FLD	Buckman1-11-1944
Buckman 1	11/10/2010	SPEC_CONDC	Specific Conductance	UF	435	uS/cm	FLD	Buckman1-11-1944
Buckman 1	11/10/2010	TEMP	Temperature	UF	18.03	deg C	FLD	Buckman1-11-1944
Buckman 1	11/10/2010	TURB	Turbidity	UF	0.37	NTU	FLD	Buckman1-11-1944
Buckman 1	11/10/2010	pH	pH	UF	7.99	SU	FLD	Buckman1-11-1944
Buckman 6	11/10/2010	DO	Dissolved Oxygen	UF	5.86	mg/L	FLD	Buckman06-11-1970
Buckman 6	11/10/2010	ORP	Oxidation Reduction Potential	UF	486.3	mV	FLD	Buckman06-11-1970
Buckman 6	11/10/2010	SPEC_CONDC	Specific Conductance	UF	638	uS/cm	FLD	Buckman06-11-1970
Buckman 6	11/10/2010	TEMP	Temperature	UF	20.15	deg C	FLD	Buckman06-11-1970
Buckman 6	11/10/2010	TURB	Turbidity	UF	2.13	NTU	FLD	Buckman06-11-1970
Buckman 6	11/10/2010	pH	pH	UF	6.58	SU	FLD	Buckman06-11-1970
Buckman 8	11/10/2010	DO	Dissolved Oxygen	UF	5.6	mg/L	FLD	Buckman08-11-2042
Buckman 8	11/10/2010	ORP	Oxidation Reduction Potential	UF	350.3	mV	FLD	Buckman08-11-2042
Buckman 8	11/10/2010	SPEC_CONDC	Specific Conductance	UF	560	uS/cm	FLD	Buckman08-11-2042
Buckman 8	11/10/2010	TEMP	Temperature	UF	22.82	deg C	FLD	Buckman08-11-2042
Buckman 8	11/10/2010	TURB	Turbidity	UF	3.73	NTU	FLD	Buckman08-11-2042
Buckman 8	11/10/2010	pH	pH	UF	7.21	SU	FLD	Buckman08-11-2042

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1 (800) 401-4277 • Fax (225) 381-2996

American Radiation Services Analytical Reports

for

Los Alamos National Laboratory

Request Number: 11-473

2609 North River Road • Port Allen, Louisiana 70767
1 (800) 401-4277 • Fax (225) 381-2996

American Radiation Services Analytical Reports

for

Los Alamos National Laboratory Request: 11-473

Original COC

Thursday, November 11, 2010

REQUEST NUMBER: 11-473

LOS ALAMOS
NATIONAL LABORATORY

ATTN: Danny Coleman
American Radiation Services - Primary
1726 Wooddale Court
Baton Rouge, LA 70806

These Samples are on:
LANL Request Number:11-473
Per Agreement Number:63641-001-10
Project Cost Code: WEPR1158W100

Please analyse the enclosed samples according to the schedule indicated:

SHIP DATE: 11/11/2010
TURNAROUND/REPORT DUE: 12/11/2010
TURNAROUND REQ'D: 30 Days

RAD SCREENING: Yes, Below Background
LAB REQUEST COMMENTS:

LANL ER SMO CONTACT:
Signature:

PRIORITY	METHOD CODE	CNTNR	SAMPLE ID	SAMPLE MATRIX	DATE SAMPLED	SPECIAL INSTRUCTIONS
	Generic:Low_Level_Tritium	1	Buckman1-11-1944	WG	11/10/2010	
		1	Buckman06-11-1970	WG	11/10/2010	
		1	Buckman08-11-2042	WG	11/10/2010	

Final Page of REQUEST NUMBER 11-473

Thursday, November 11, 2010

LAB CHAIN OF CUSTODY DOCUMENT NUMBER: 11-473C

REQUEST NUMBER: 11-473

LOS ALAMOS
NATIONAL LABORATORY

ATTN: Danny Coleman
American Radiation Services - Primary
1726 Wooddale Court
Baton Rouge, LA 70806
LAB REQUEST COMMENTS:

TURNAROUND/REPORT DUE: 12/11/2010
TURNAROUND REQ'D: 30

SAMPLE ID	CTNR	CTNR DESC	ORDER	PRESERV	MATRIX
Buckman1-11-1944	1	POLY	WSP-LL-H-3	None	WG
Buckman06-11-1970	1	POLY	WSP-LL-H-3	None	WG
Buckman08-11-2042	1	POLY	WSP-LL-H-3	None	WG

Relinquished By:	Date	Time	Received By:	Date	Time
[illegible]	11/11/10	3:00	[illegible]	11-16-10	11:08
Printed Name / Signature			Printed Name / Signature		
Printed Name / Signature			Printed Name / Signature		
Printed Name / Signature			Printed Name / Signature		

Received for DISPOSAL By: **Date** **Time** **Remarks:**

Printed Name Signature

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American Radiation Services Analytical Reports

for

Los Alamos National Laboratory Request: 11-473

Case Narrative

ARS INTERNATIONAL

2609 North River Road • Port Allen, Louisiana 70767
1 (800) 401-4277 • Fax (225) 381-2996

March 14, 2011

LANL
Keith Greene
PO Box 1663 MS M992
Los Alamos, NM 87545

Request Number: **11-473**
LANL Sample ID: Buckman1-11-1944; Buckman06-11-1970; Buckman08-11-2042.

Dear Mr. Greene;

On November 16, 2010, ARS International received three (3) water samples to be analyzed for Low Level Tritium.

The samples underwent enrichment and were counted using the appropriate counting equipment and QA/QC for this type of analysis. Results of the analysis and QA/QC are attached in the data package.

The client and QA/QC samples were counted with a count time sufficient to meet quality control parameters for counting equipment and were within acceptance criteria and statistical sound detection limits.

If you have any questions please do not hesitate to call at 225.381.2991 or email LANL@amrad.com.

Sincerely,

Eugene Mulligan

Laboratory Management
ARS International

ARS INTERNATIONAL
2609 North River Road • Port Allen, Louisiana 70767
1 (800) 401-4277 • Fax (225) 381-2996

COVER PAGE

PROJECT SAMPLE IDENTIFICATION
CROSS-REFERENCE
TO ARS SAMPLE LABORATORY IDs

Subcontract (LANL Agreement Number) 63641-001-10

Request Number	LANL PROJECT SAMPLE ID NUMBER	American Radiation Services SAMPLE ID NUMBER(S)
11-473	Buckman1-11-1944	ARS1-10-02491-001
11-473	Buckman06-11-1970	ARS1-10-02491-002
11-473	Buckman08-11-2042	ARS1-10-02491-003

ANALYTICAL METHODS
Tritium analyses were performed using **ARS-040 Tritium Assay in Water Samples Using Electrolytic Enrichment.**

ANALYTICAL RESULTS
The result data that are flagged with "U" indicate that the activity is below the MDC.

American Radiation Services Project Manager/Laboratory Director's Comments:
"I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this sample data package and the computer-readable EDD, as applicable, submitted on diskette or by modem, has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature."

"I certify that this electronic image and all hardcopies produced from this image accurately represent the data and is in compliance with the LANL specific requirements, both technically and for completeness, other than the conditions detailed above or in the sample data package narrative. Release, by submission through email, the data contained in this electronic image and the computer-readable EDD (as applicable), has been authorized by the laboratory Manager/Technical Director or the Manager's designee."

Signature	Title	Date
Dwyane Mulligan	Laboratory Management, ARS International	3-14-11

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American Radiation Services Analytical Reports

for

Los Alamos National Laboratory

Low Level Tritium by Low Level Liquid Scintillation Counting

2609 North River Road, Port Allen, Louisiana 70767
1 (800) 401-4277 FAX (225) 381-2996

ARS Sample Delivery Group:	ARS1-10-02491	**Request or PO Number:**	11-473
Client Sample ID:	Buckman1-11-1944	**ARS Sample ID:**	ARS1-10-02491-001
Sample Collection Date:	11/10/10	**Date Received:**	11/16/10
Sample Matrix:	Aqueous	**Report Date:**	03/14/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
Enriched H-3	1.080	0.290	0.750	0.360		TU	ARS-040	03/04/11 00:00	JR	NA

NOTES: Project Cost Code WEPR1158W100

Project Manager Review

Notes: *American Radiation Services, Inc. assumes no liability for the use or interpretation of any analytical results provided other than the cost of the analysis itself. Reproduction of this report in less than full requires the written consent of the American Radiation Services, Inc.*

LELAP Certificate# 01949 NELAP Certificate # E87558

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ARS Sample Delivery Group:	ARS1-10-02491	**Request or PO Number:**	11-473
Client Sample ID:	Buckman06-11-1970	**ARS Sample ID:**	ARS1-10-02491-002
Sample Collection Date:	11/10/10	**Date Received:**	11/16/10
Sample Matrix:	Aqueous	**Report Date:**	03/14/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
Enriched H-3	1.040	0.280	0.720	0.350		TU	ARS-040	03/04/11 00:00	JR	NA

NOTES: Project Cost Code WEPR1158W100

Project Manager Review

Notes: *American Radiation Services, Inc. assumes no liability for the use or interpretation of any analytical results provided other than the cost of the analysis itself. Reproduction of this report in less than full requires the written consent of the American Radiation Services, Inc.*

LELAP Certificate# 01949 NELAP Certificate # E87558

ARS INTERNATIONAL

2609 North River Road, Port Allen, Louisiana 70767

1 (800) 401-4277 FAX (225) 381-2996

ARS Sample Delivery Group:	ARS1-10-02491	**Request or PO Number:**	11-473
Client Sample ID:	Buckman08-11-2042	**ARS Sample ID:**	ARS1-10-02491-003
Sample Collection Date:	11/10/10	**Date Received:**	11/16/10
Sample Matrix:	Aqueous	**Report Date:**	03/14/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
Enriched H-3	1.020	0.270	0.710	0.350		TU	ARS-040	03/04/11 00:00	JR	NA

NOTES: Project Cost Code WEPR1158W100

Project Manager Review

Notes: *American Radiation Services, Inc. assumes no liability for the use or interpretation of any analytical results provided other than the cost of the analysis itself. Reproduction of this report in less than full requires the written consent of the American Radiation Services, Inc.*

LELAP Certificate# 01949 NELAP Certificate # E87558

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QC Results Report

Sample Delivery Group: ARS1-10-02491
Date Received: 11/16/2010

Laboratory Control Sample Evaluation

Analysis Batch	QC Type	Analyte	Analysis Results	CSU 1 (1s)	MDC	Expected Value	Qual	Report Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Percent Recovery (%)	LCS Acceptance Range
ARS1-B10-05618	LCS	H3	8.470	1.310	0.770	8.340		TU	ARS-040	3/2/11 0:00	JR	102	75%-125%

Blank Evaluation

Analysis Batch	QC Type	Analyte	Analysis Results	CSU 1 (1s)	MDC	Expected Value	Qual	Report Units	Analysis Test Method	Analysis Date/Time	Analysis Technician
ARS1-B10-05618	MBL	H3	-1.190	0.260	0.680	NA	U	TU	ARS-040	3/3/11 0:00	JR

Sample RER Duplicate Evaluation

Analysis Batch	QC Type	Analysis Description	Result 1	CSU 1 (1s)	Result 2	CSU 2 (1s)	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	RER	RER AcceptanceRange
ARS1-B10-05618	LCSD	H3	8.470	1.310	9.130	1.410		TU	ARS-040	3/3/11 0:00	JR	0.24	< 1

Sample DER Duplicate Evaluation

Analysis Batch	QC Type	Analysis Description	Result 1	CSU 1 (1s)	Result 2	CSU 2 (1s)	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	DER	DER AcceptanceRange
ARS1-B10-05618	LCSD	H3	8.470	1.310	9.130	1.410		TU	ARS-040	3/3/11 0:00	JR	0.69	< 3

Susan Beese
Project Manager Review

Notes: American Radiation Services, Inc. assumes no liability for the use or interpretation of any analytical results provided other than the cost of the analysis itself. Reproduction of this report in less than full requires the written consent of ARS International.

LELAP Certificate# 01949 NELAP Certificate # E87558

Expected Value Calculations LANL

ARS Batch Number: ARS1-B10 - 05618

LCS	**CALCULATED EXPECTED VALUE**	=	26.863	TU 8.340			
			Range	21.490	-	32.235	
LCSD	**CALCULATED EXPECTED VALUE**	=	26.822	8.327			
			Range	21.458	-	32.186	

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American Radiation Services Analytical Reports

for

Los Alamos National Laboratory

Low Level Tritium by Low Level Liquid Scintillation Counting Samples

QC Evaluation

EPA Method: ARS-040
Batch ID: ARS1-B10-05618
SDG's: ARS1-10-2492; 2491; 2509; 2510; 2511

LCS	27.2900	**CSU (2s)**	8.2900
LCSD	29.4000	**CSU-D (2s)**	8.9300

DER = $\frac{\text{abs(LSC-LSCD)}}{\text{sqr((2s CSU/2)^2)+((2s CSU-D/2)^2) } \textit{at 1 sigma}}$ = **< 3**

DER $\frac{2.11}{6.0923928}$ = 0.346334 **< 3**

% RPD= $\frac{\text{ABS(LCS - LSCD)}}{\text{(LCS+LCSD)/2}}$ * 100 = **< 25%**

%RPD $\frac{2.11}{28.345}$ *100 = 7.443994 **< 25%**

The *RPD* shall be less than 25% or other client-applied criteria

RER= $\frac{\text{abs((LCS-LCSD))}}{\text{(CSU)+(CSD) } \textit{at 2 sigma}}$ = **<1** ***<--LANL Requirement***

RER = $\frac{2.11}{17.2200}$ 0.12253194 **<1**

Blank Information

	Act	CSU(2s)	MDA	Act>MDA
AM-241				
U-234				
U-235				
U-238				
Pu-238				
Pu-239/240				
Th-228				
Th-230				
Th-232				
H3	-3.84	1.61	2.19	
Ra-226				
Ra-228				
Total U				
Pb-210				
Po-209				
Sr-90				
TC-99				
NI-63				

*MDA should be below RDL
*Blank activity must be below MDA
*Blank activity must be < 1.65*CSU (DOE only)

ACT = -3.84
CSU = 1.61
Is ACT<1.65*CSU? **YES**

ARS Tritium Enrichment Calculations

Procedures	ARS-040 , ARS-060
ARS File ID Number	10-02482; 2491; 2509; 2510; 2511
ARS Batch ID Number	ARS1-B10-05618

Enrichment Factor Curve coeff. - Power y = a * x^b	
a	8.978E-01
b	-9.611E-01
c	

Bkg Quench Curve coeff. - Polynomial y = ax^3+bx^2+cx+d	
a	-2.318E-06
b	2.724E-03
c	-1.090E+00
d	1.383E+02

lambda	1.3863E-04	ACF (def. = 1)	1
Syserror	0.15	Reporting Units	TU
Coverage Factor	1	UCF	7.151
		Aliquot must be entered in liters!!	

Sample ID	Initial Mass sample (g) V_i	Mass Na2O2 added (g) mi	Final mass electrolyzed sample w/ NaOH (g) V_F	Mass equivalent NaOH (g) m_f	Final Mass Electrolyzed sample (g pure H2O) V_f	Volume factor X	Enrichment Factor Y	Average Sample CPM R_s	Bkg CPM R_b	QIP tSIE	Detector Eff (decimal) Eff	Aliquot Aliquot	Enter aliq. in final Rep. Units Units	Activity reference date T_o	Start Date of Count T_c	Total Sample Count Duration (min) t cnt (min)	Total Bkg Count Duration (min) t cnt (min)	Decay Correction to To DF	Sample Activity Conc. AC_i	Standard Counting Uncertainty CU	Counting Uncertainty 1s CU	Combined Standard Uncertainty 1s CSU	Minimum Detectable Conc. MDC	Decision Level Conc. DLC	Reporting Units Units
ARS1-B10-05618-01	503.97	2.00	11.67	2.06	9.81	0.02	40.36	5	1.55	552.66	0.3125	0.00500	L	2/25/2009	3/2/2011	360	360	0.90311	8.47	0.33	0.33	1.31	0.77	0.37	TU
ARS1-B10-05618-02	504.74	2.00	12.50	2.06	10.44	0.02	37.33	5	1.55	559.26	0.3137	0.00500	L	2/25/2009	3/3/2011	360	360	0.90298	9.13	0.36	0.36	1.41	0.83	0.40	TU
ARS1-B10-05618-03	505.04	2.00	11.49	2.06	9.43	0.02	41.19	1	1.55	552.74	0.3125	0.00500	L	3/13/2011	3/3/2011	360	360	1.00137	-1.19	0.16	0.18	0.26	0.68	0.33	TU
ARS1-B10-05618-04	492.05	2.02	11.78	2.08	9.70	0.02	39.09	2	1.55	555.57	0.3130	0.00502	L	11/9/2010	3/3/2011	360	360	0.9843	1.04	0.23	0.23	0.28	0.72	0.35	TU
ARS1-B10-05618-05	500.17	2.01	9.69	2.07	7.62	0.02	50.08	40	1.55	566.39	0.3149	0.00503	L	11/10/2010	3/3/2011	360	360	0.98444	68.86	0.61	0.61	10.35	0.56	0.27	TU
ARS1-B10-05618-07	499.25	2.01	11.20	2.07	9.13	0.02	42.02	2	1.55	555.37	0.3130	0.00501	L	11/9/2010	3/4/2011	360	360	0.98417	0.97	0.21	0.21	0.26	0.67	0.33	TU
ARS1-B10-05618-08	496.29	2.00	10.23	2.08	8.17	0.02	46.49	2	1.55	552.08	0.3124	0.00389	L	11/10/2011	3/4/2011	360	360	1.03539	1.08	0.24	0.24	0.29	0.75	0.36	TU
ARS1-B10-05618-09	497.25	2.02	12.37	2.08	10.29	0.02	37.31	2	1.55	548.49	0.3115	0.00502	L	11/10/2011	3/4/2011	360	360	1.03539	1.04	0.23	0.23	0.26	0.72	0.35	TU
ARS1-B10-05618-10	493.65	2.00	12.04	2.06	9.98	0.02	38.16	2	1.55	548.40	0.3118	0.00500	L	11/10/2011	3/4/2011	360	360	1.03539	1.02	0.23	0.23	0.27	0.71	0.35	TU
ARS1-B10-05618-11	500.41	2.00	12.09	2.06	10.03	0.02	38.47	6	1.70	587.47	0.3205	0.00501	L	11/17/2010	3/8/2011	360	360	0.98471	9.88	0.34	0.34	1.52	0.75	0.37	TU
ARS1-B10-05618-12	492.12	1.99	12.67	2.05	10.62	0.02	35.84	6	1.70	576.12	0.3173	0.00502	L	11/17/2010	3/9/2011	360	360	0.98458	10.70	0.36	0.36	1.65	0.81	0.40	TU
ARS1-B10-05618-13	486.78	2.02	12.58	2.08	10.50	0.02	35.85	40	1.70	597.10	0.3232	0.00502	L	11/16/2010	3/9/2011	360	360	0.98444	93.53	0.83	0.83	14.05	0.80	0.39	TU
ARS1-B10-05618-15	496.95	2.00	11.59	2.06	9.53	0.02	40.14	8	1.70	587.77	0.3205	0.00501	L	11/11/2010	3/9/2011	360	360	0.98376	13.89	0.36	0.36	2.12	0.72	0.35	TU
ARS1-B10-05618-16	492.30	2.01	11.87	2.07	9.80	0.02	38.73	5	1.70	579.51	0.3182	0.00502	L	11/11/2010	3/9/2011	360	360	0.98376	7.58	0.31	0.31	1.18	0.75	0.37	TU
ARS1-B10-05618-17	495.86	2.01	13.27	2.07	11.20	0.02	34.30	5	1.70	594.71	0.3225	0.00501	L	11/11/2010	3/10/2011	360	360	0.98362	8.47	0.35	0.35	1.32	0.84	0.41	TU
ARS1-B10-05618-18	500.10	2.00	11.54	2.06	9.48	0.02	40.59	15	1.70	582.89	0.3192	0.00501	L	11/11/2010	3/10/2011	360	360	0.98362	29.13	0.47	0.47	4.39	0.72	0.35	TU
ARS1-B10-05618-19	495.16	2.01	12.34	2.07	10.27	0.02	37.23	5	1.70	590.76	0.3214	0.00500	L	11/16/2010	3/10/2011	360	360	0.9843	7.84	0.32	0.32	1.22	0.78	0.38	TU
ARS1-B10-05618-20	503.55	2.00	13.26	2.06	11.20	0.02	34.81	5	1.70	592.76	0.3219	0.00500	L	11/16/2010	3/10/2011	360	360	0.9843	8.37	0.35	0.35	1.30	0.83	0.41	TU
ARS1-B10-05618-21	502.44	2.00	11.78	2.06	9.72	0.02	39.81	5	1.70	581.40	0.3166	0.00501	L	11/12/2010	3/11/2011	360	360	0.98362	7.38	0.31	0.31	1.15	0.73	0.36	TU
ARS1-B10-05618-22	498.54	2.00	11.73	2.06	9.67	0.02	39.71	6	1.70	582.46	0.3191	0.00502	L	11/12/2010	3/11/2011	360	360	0.98362	9.61	0.33	0.33	1.48	0.73	0.36	TU
ARS1-B10-05618-23	492.59	2.00	12.09	2.06	10.03	0.02	37.89	5	1.70	590.19	0.3212	0.00504	L	11/12/2010	3/11/2011	360	360	0.98362	7.65	0.32	0.32	1.19	0.76	0.37	TU

ARS Tritium Enrichment Calculations

Procedures	ARS-040 , ARS-060
ARS File ID Number	10-02492; 2491; 2509; 2510; 2511
ARS Batch ID Number	ARS1-B10-05618

Enrichment Factor Curve coeff. - Power y = a * x^b		Bkg Quench Curve coeff. - Polynomial y = ax^3+bx^2+cx+d	
a	8.978E-01	a	-2.319E-06
b	-9.611E-01	b	2.724E-03
c		c	-1.060E+00
		d	1.383E+02

lambda	1.3863E-04	ACF (def. = 1)	1
Syserror	0.15	Reporting Units	pCi
Coverage Factor	1.96	UCF	2.22

Sample ID	Initial Mass sample (g) V_i	Mass Na2O2 added (g) mi	Final mass electrolyzed sample w/ NaOH (g) V_f	Mass equivalent NaOH (g) m_f	Final Mass Electrolyzed sample (g pure H2O) V_f	Volume factor X	Enrichment Factor Y	Average Sample CPM R_s	Bkg CPM R_b	QIP tSIE	Detector Eff (decimal) Eff	Aliquot Aliquot	Enter aliq. in final Rep Units Units	Activity reference date T_o	Start Date of Count T_c	Total Sample Count Duration (min) t cnt (min)	Total Bkg Count Duration (min) t cnt (min)	Decay Correction to To DF	Sample Activity Conc. AC_i	Standard Counting Uncertainty CU	Counting Uncertainty 1.96s CU	Combined Standard Uncertainty 1.96s CSU	Minimum Detectable Conc. MDC	Decision Level Conc. DLC	Reporting Units Units
ARS1-B10-05618-01	503.97	2.00	11.67	2.06	9.61	0.02	40.36	5	1.55	552.66	0.3125	0.00500	L	2/25/2009	3/2/2011	360	360	0.90311	27.29	1.07	2.09	8.29	2.47	1.21	pCi/L
ARS1-B10-05618-02	504.74	2.00	12.50	2.06	10.44	0.02	37.33	5	1.55	559.26	0.3137	0.00500	L	2/25/2009	3/3/2011	360	360	0.90299	29.40	1.15	2.25	8.93	2.66	1.30	pCi/L
ARS1-B10-05618-03	505.04	2.00	11.49	2.06	9.43	0.02	41.19	1	1.55	552.74	0.3125	0.00500	L	3/13/2011	3/3/2011	360	360	1.00137	-3.84	0.59	1.15	1.61	2.19	1.07	pCi/L
ARS1-B10-05618-04	492.05	2.02	11.78	2.08	9.70	0.02	39.09	2	1.55	555.57	0.3130	0.00502	L	11/9/2010	3/3/2011	360	360	0.9843	3.36	0.74	1.45	1.75	2.33	1.14	pCi/L
ARS1-B10-05618-05	500.17	2.01	9.69	2.07	7.62	0.02	50.08	40	1.55	566.39	0.3149	0.00503	L	11/10/2010	3/3/2011	360	360	0.98444	221.80	1.96	3.84	65.32	1.80	0.88	pCi/L
ARS1-B10-05618-07	499.25	2.01	11.20	2.07	9.13	0.02	42.02	2	1.55	555.37	0.3130	0.00501	L	11/9/2010	3/4/2011	360	360	0.98417	3.13	0.69	1.35	1.64	2.17	1.06	pCi/L
ARS1-B10-05618-08	496.29	2.00	10.23	2.06	8.17	0.02	46.49	2	1.55	552.08	0.3124	0.00389	L	11/10/2011	3/4/2011	360	360	1.03539	3.47	0.76	1.50	1.81	2.41	1.18	pCi/L
ARS1-B10-05618-09	497.25	2.02	12.37	2.08	10.29	0.02	37.31	2	1.55	546.49	0.3115	0.00502	L	11/10/2011	3/4/2011	360	360	1.03539	3.36	0.74	1.45	1.76	2.33	1.14	pCi/L
ARS1-B10-05618-10	493.85	2.00	12.04	2.06	9.98	0.02	38.16	2	1.55	548.40	0.3118	0.00500	L	11/10/2011	3/4/2011	360	360	1.03539	3.30	0.73	1.42	1.72	2.29	1.12	pCi/L
ARS1-B10-05618-11	500.41	2.00	12.09	2.06	10.03	0.02	38.47	6	1.70	587.47	0.3205	0.00501	L	11/17/2010	3/8/2011	360	360	0.96471	31.84	1.08	2.12	9.60	2.42	1.18	pCi/L
ARS1-B10-05618-12	492.12	1.99	12.87	2.05	10.62	0.02	35.64	6	1.70	576.12	0.3173	0.00502	L	11/17/2010	3/9/2011	360	360	0.98458	34.47	1.17	2.30	10.39	2.62	1.28	pCi/L
ARS1-B10-05618-13	486.78	2.02	12.58	2.08	10.50	0.02	35.85	40	1.70	597.10	0.3232	0.00502	L	11/16/2010	3/9/2011	360	360	0.98444	301.26	2.68	5.25	88.73	2.57	1.28	pCi/L
ARS1-B10-05618-15	496.95	2.00	11.59	2.06	9.53	0.02	40.14	8	1.70	567.77	0.3205	0.00501	L	11/11/2010	3/9/2011	360	360	0.98376	44.75	1.17	2.29	13.35	2.32	1.14	pCi/L
ARS1-B10-05618-16	492.30	2.01	11.87	2.07	9.80	0.02	38.73	5	1.70	579.51	0.3162	0.00502	L	11/11/2010	3/9/2011	360	360	0.98376	24.43	1.01	1.98	7.45	2.42	1.18	pCi/L
ARS1-B10-05618-17	495.86	2.01	13.27	2.07	11.20	0.02	34.30	5	1.70	594.71	0.3225	0.00501	L	11/11/2010	3/10/2011	360	360	0.98362	27.27	1.13	2.21	8.32	2.70	1.32	pCi/L
ARS1-B10-05618-18	500.10	2.00	11.54	2.06	9.48	0.02	40.59	15	1.70	582.89	0.3192	0.00501	L	11/11/2010	3/10/2011	360	360	0.96362	93.83	1.52	2.98	27.75	2.31	1.13	pCi/L
ARS1-B10-05618-19	495.16	2.01	12.34	2.07	10.27	0.02	37.23	5	1.70	590.76	0.3214	0.00500	L	11/16/2010	3/10/2011	360	360	0.9843	25.24	1.04	2.05	7.70	2.50	1.22	pCi/L
ARS1-B10-05618-20	503.55	2.00	13.26	2.06	11.20	0.02	34.81	5	1.70	592.76	0.3219	0.00500	L	11/16/2010	3/10/2011	360	360	0.9843	26.95	1.11	2.18	8.22	2.67	1.31	pCi/L
ARS1-B10-05618-21	502.44	2.00	11.78	2.08	9.72	0.02	39.81	5	1.70	581.40	0.3188	0.00501	L	11/12/2010	3/11/2011	360	360	0.98362	23.77	0.98	1.93	7.25	2.36	1.15	pCi/L
ARS1-B10-05618-22	498.54	2.00	11.73	2.06	9.67	0.02	39.71	6	1.70	582.46	0.3191	0.00502	L	11/12/2010	3/11/2011	360	360	0.98362	30.96	1.05	2.06	9.33	2.36	1.15	pCi/L
ARS1-B10-05618-23	492.59	2.00	12.09	2.06	10.03	0.02	37.69	5	1.70	590.19	0.3212	0.00504	L	11/12/2010	3/11/2011	360	360	0.98362	24.63	1.02	2.00	7.51	2.44	1.19	pCi/L

ARS Tritium Enrichment Calculations

Procedures	ARS-040 , ARS-060
ARS File ID Number	10-02492; 2491; 2509; 2510; 2511
ARS Batch ID Number	ARS1-B10-05618

Enrichment Factor Curve coeff. - Power y = a * x^b	
a	8.978E-01
b	-9.811E-01
c	

Bkg Quench Curve coeff. - Polynomial y = ax^3+bx^2+cx+d	
a	-2.319E-06
b	2.724E-03
c	-1.060E+00
d	1.383E+02

lambda	1.3863E-04	ACF (def. = 1)	1
Syserror	0.15	Reporting Units	pCi
Coverage Factor	1	UCF	2.22

Sample ID	Initial Mass sample (g) V_i	Mass Na2O2 added (g) mi	Final mass electrolyzed sample w/ NaOH (g) V_f	Mass equivalent NaOH (g) m_f	Final Mass Electrolyzed sample (g pure H2O) V_f	Volume factor X	Enrichment Factor Y	Average Sample CPM R_s	Bkg CPM R_b	QIP tSIE	Detector Eff (decimal) Eff	Aliquot Aliquot	Enter aliq. in final Rep. Units Units	Activity reference date T_o	Start Date of Count T_c	Total Sample Count Duration (min) t cnt (min)	Total Bkg Count Duration (min) t cnt (min)	Decay Correction to To DF	Sample Activity Conc. AC_i	Standard Counting Uncertainty CU	Counting Uncertainty 1s CU	Combined Standard Uncertainty 1s CSU	Minimum Detectable Conc. MDC	Decision Level Conc. DLC	Reporting Units Units
ARS1-B10-05618-01	503.97	2.00	11.67	2.06	9.61	0.02	40.36	5	1.55	552.66	0.3125	0.00500	L	2/25/2009	3/2/2011	360	360	0.90311	27.29	1.07	1.07	4.23	2.47	1.21	pCi/L
ARS1-B10-05618-02	504.74	2.00	12.50	2.08	10.44	0.02	37.33	5	1.55	559.26	0.3137	0.00500	L	2/25/2009	3/3/2011	360	360	0.90299	29.40	1.15	1.15	4.56	2.66	1.30	pCi/L
ARS1-B10-05618-03	505.04	2.00	11.49	2.06	9.43	0.02	41.19	1	1.55	552.74	0.3125	0.00500	L	3/13/2011	3/3/2011	360	360	1.00137	-3.84	0.59	0.59	0.82	2.19	1.07	pCi/L
ARS1-B10-05618-04	492.05	2.02	11.78	2.08	9.70	0.02	39.09	2	1.55	555.57	0.3130	0.00502	L	11/9/2010	3/3/2011	360	360	0.9843	3.36	0.74	0.74	0.90	2.33	1.14	pCi/L
ARS1-B10-05618-05	500.17	2.01	9.89	2.07	7.62	0.02	50.08	40	1.55	566.39	0.3149	0.00503	L	11/10/2010	3/3/2011	360	360	0.98444	221.80	1.96	1.96	33.33	1.80	0.88	pCi/L
ARS1-B10-05618-07	499.25	2.01	11.20	2.07	9.13	0.02	42.02	2	1.55	555.37	0.3130	0.00501	L	11/9/2010	3/4/2011	360	360	0.98417	3.13	0.69	0.69	0.83	2.17	1.08	pCi/L
ARS1-B10-05618-08	496.29	2.00	10.23	2.06	8.17	0.02	46.49	2	1.55	552.08	0.3124	0.00389	L	11/10/2011	3/4/2011	360	360	1.03539	3.47	0.76	0.76	0.93	2.41	1.18	pCi/L
ARS1-B10-05618-09	497.25	2.02	12.37	2.08	10.29	0.02	37.31	2	1.55	546.49	0.3115	0.00502	L	11/10/2011	3/4/2011	360	360	1.03539	3.36	0.74	0.74	0.90	2.33	1.14	pCi/L
ARS1-B10-05618-10	493.65	2.00	12.04	2.06	9.98	0.02	38.16	2	1.55	548.40	0.3118	0.00500	L	11/10/2011	3/4/2011	360	360	1.03539	3.30	0.73	0.73	0.88	2.29	1.12	pCi/L
ARS1-B10-05618-11	500.41	2.00	12.09	2.06	10.03	0.02	38.47	6	1.70	587.47	0.3205	0.00501	L	11/17/2010	3/8/2011	360	360	0.98471	31.84	1.08	1.08	4.90	2.42	1.18	pCi/L
ARS1-B10-05618-12	492.12	1.99	12.67	2.05	10.62	0.02	35.84	6	1.70	576.12	0.3173	0.00502	L	11/17/2010	3/9/2011	360	360	0.96456	34.47	1.17	1.17	5.30	2.62	1.28	pCi/L
ARS1-B10-05618-13	486.78	2.02	12.58	2.08	10.50	0.02	35.85	40	1.70	597.10	0.3232	0.00502	L	11/18/2010	3/9/2011	360	360	0.96444	301.26	2.68	2.68	45.27	2.57	1.26	pCi/L
ARS1-B10-05618-15	496.95	2.00	11.59	2.06	9.53	0.02	40.14	8	1.70	587.77	0.3205	0.00501	L	11/11/2010	3/9/2011	360	360	0.96376	44.75	1.17	1.17	6.81	2.32	1.14	pCi/L
ARS1-B10-05618-16	492.30	2.01	11.87	2.07	9.80	0.02	38.73	5	1.70	579.51	0.3182	0.00502	L	11/11/2010	3/9/2011	360	360	0.96376	24.43	1.01	1.01	3.80	2.42	1.18	pCi/L
ARS1-B10-05618-17	495.88	2.01	13.27	2.07	11.20	0.02	34.30	5	1.70	594.71	0.3225	0.00501	L	11/11/2010	3/10/2011	360	360	0.96362	27.27	1.13	1.13	4.24	2.70	1.32	pCi/L
ARS1-B10-05618-18	500.10	2.00	11.54	2.06	9.48	0.02	40.58	15	1.70	582.89	0.3192	0.00501	L	11/11/2010	3/10/2011	360	360	0.96362	93.83	1.52	1.52	14.16	2.31	1.13	pCi/L
ARS1-B10-05618-19	495.16	2.01	12.34	2.07	10.27	0.02	37.23	5	1.70	590.76	0.3214	0.00500	L	11/16/2010	3/10/2011	360	360	0.9843	25.24	1.04	1.04	3.93	2.50	1.22	pCi/L
ARS1-B10-05618-20	503.55	2.00	13.26	2.06	11.20	0.02	34.81	5	1.70	592.76	0.3219	0.00500	L	11/16/2010	3/10/2011	360	360	0.9843	26.95	1.11	1.11	4.19	2.67	1.31	pCi/L
ARS1-B10-05618-21	502.44	2.00	11.78	2.06	9.72	0.02	39.81	5	1.70	581.40	0.3188	0.00501	L	11/12/2010	3/11/2011	360	360	0.98362	23.77	0.98	0.98	3.70	2.36	1.15	pCi/L
ARS1-B10-05618-22	498.54	2.00	11.73	2.06	9.67	0.02	39.71	6	1.70	582.46	0.3191	0.00502	L	11/12/2010	3/11/2011	360	360	0.98362	30.98	1.05	1.05	4.76	2.36	1.15	pCi/L
ARS1-B10-05618-23	492.59	2.00	12.09	2.06	10.03	0.02	37.69	5	1.70	590.19	0.3212	0.00504	L	11/12/2010	3/11/2011	360	360	0.98362	24.63	1.02	1.02	3.83	2.44	1.19	pCi/L

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American Radiation Services Analytical Reports

for

Los Alamos National Laboratory

Low Level Tritium by Low Level Liquid Scintillation Counting

Laboratory Records

Analysis Batch Report

ARS INTERNATIONAL

Analysis Batch ID **ARS1-B10-05618**

Method **ARS-054** **Analysis** **LSC-A-022** **Matrix** **AQ**

Description **Low Level Tritium by Enrichment**

ABatch Sample ID	Type	Blind Iso1	Blind Iso2	Blind Iso3	SDG	FR	Run	Client ID	Isotope Group	Lab Deadline
ARS1-B10-05618-01	LCS	B-11110								
ARS1-B10-05618-02	LCSD	B-11111								
ARS1-B10-05618-03	MBL									
ARS1-B10-05618-04	TRG				**ARS1-10-02492**	002	1	CAMO-11-1269	STD	12/07/10
ARS1-B10-05618-05	TRG				**ARS1-10-02492**	003	1	CAMO-11-1271	STD	12/07/10
ARS1-B10-05618-07	TRG				**ARS1-10-02492**	005	1	CAMO-11-1302	STD	12/07/10
ARS1-B10-05618-08	TRG				**ARS1-10-02491**	001	1	Buckman1-11-1944	STD	12/13/10
ARS1-B10-05618-09	TRG				**ARS1-10-02491**	002	1	Buckman06-11-1970	STD	12/13/10
ARS1-B10-05618-10	TRG				**ARS1-10-02491**	003	1	Buckman08-11-2042	STD	12/13/10
ARS1-B10-05618-11	TRG				**ARS1-10-02509**	001	1	CASA-11-1365	STD	12/14/10
ARS1-B10-05618-12	TRG				**ARS1-10-02509**	002	1	CASA-11-1367	STD	12/14/10
ARS1-B10-05618-13	TRG				**ARS1-10-02510**	001	1	CASA-11-1360	STD	12/14/10
ARS1-B10-05618-15	TRG				**ARS1-10-02510**	003	1	CASA-11-1371	STD	12/14/10
ARS1-B10-05618-16	TRG				**ARS1-10-02510**	004	1	CASA-11-1373	STD	12/14/10
ARS1-B10-05618-17	TRG				**ARS1-10-02510**	005	1	CASA-11-1374	STD	12/14/10
ARS1-B10-05618-18	TRG				**ARS1-10-02510**	006	1	CASA-11-1376	STD	12/14/10
ARS1-B10-05618-19	TRG				**ARS1-10-02510**	007	1	CASA-11-1379	STD	12/14/10
ARS1-B10-05618-20	TRG				**ARS1-10-02510**	008	1	CASA-11-1380	STD	12/14/10
ARS1-B10-05618-21	TRG				**ARS1-10-02511**	001	1	CAMO-11-1262	STD	12/14/10
ARS1-B10-05618-22	TRG				**ARS1-10-02511**	002	1	CAMO-11-1265	STD	12/14/10
ARS1-B10-05618-23	TRG				**ARS1-10-02511**	003	1	CAMO-11-1285	STD	12/14/10

82203 10-02492-002-1 **XRAD**

82204 10-02492-003-1 **XRAD**

82205 10-02492-005-1 **XRAD**

82206 10-02491-001-1 **XRAD**

82207 10-02491-002-1 **XRAD**

82208 10-02491-003-1 **XRAD**

82209 10-02509-001-1 **XRAD**

82210 10-02509-002-1 **XRAD**

82211 10-02510-001-1 **XRAD**

82212 10-02510-003-1 **XRAD**

82213 10-02510-004-1 **XRAD**

82214 10-02510-005-1 **XRAD**

82215 10-02510-006-1 **XRAD**

82216 10-02510-007-1 **XRAD**

82217 10-02510-008-1 **XRAD**

82218 10-02511-001-1 **XRAD**

82219 10-02511-002-1 **XRAD**

82220 10-02511-003-1 **XRAD**

LCS Report
Analytical Batch: ARS1-B10-05618

BlindID	ABatch	ABatchSampleID	BlindGroup	StdID	Isotope	ExpectedAddition	ExpectedValue	EmptyWt	GrossWt	NetWt	UserID	ModDate	ExpectedValue_CT	MidPointCountDate	KnownValue
B-11110	ARS1-B10-05618	ARS1-B10-05618-01	B-H3	S-0206	H-3	5	2.721946554	17.18	22.22	5.04	TBYRD	12/6/2010			
B-11111	ARS1-B10-05618	ARS1-B10-05618-02	B-H3	S-0206	H-3	5	2.721946554	17.22	22.26	5.04	TBYRD	12/6/2010			

ARS-054

ID_31001_054	ABatch	ABatchSampleID	ClientID	Aliquot1	AliquotUnits1	IC_ID1	Aliquot2	AliquotUnits2	IC_ID2	UserID	ModDate
8011	ARS1-B10-05618	ARS1-B10-05618-01		5	g					JRABER	03/13/2011 17:01:16
8012	ARS1-B10-05618	ARS1-B10-05618-02		5	g					JRABER	03/13/2011 17:01:16
8013	ARS1-B10-05618	ARS1-B10-05618-03		5	g					JRABER	03/13/2011 17:01:16
8014	ARS1-B10-05618	ARS1-B10-05618-04	CAMO-11-1269	5.02	g	82203				JRABER	03/13/2011 17:01:16
8015	ARS1-B10-05618	ARS1-B10-05618-05	CAMO-11-1271	5.03	g	82204				JRABER	03/13/2011 17:01:17
8016	ARS1-B10-05618	ARS1-B10-05618-07	CAMO-11-1302	5.01	g	82205				JRABER	03/13/2011 17:01:17
8017	ARS1-B10-05618	ARS1-B10-05618-08	Buckman1-11-1944	3.89	g	82206				JRABER	03/13/2011 17:01:17
8018	ARS1-B10-05618	ARS1-B10-05618-09	Buckman06-11-1970	5.02	g	82207				JRABER	03/13/2011 17:01:18
8019	ARS1-B10-05618	ARS1-B10-05618-10	Buckman08-11-2042	5	g	82208				JRABER	03/13/2011 17:01:18
8020	ARS1-B10-05618	ARS1-B10-05618-11	CASA-11-1365	5.01	g	82209				JRABER	03/13/2011 17:01:18
8021	ARS1-B10-05618	ARS1-B10-05618-12	CASA-11-1367	5.02	g	82210				JRABER	03/13/2011 17:01:18
8022	ARS1-B10-05618	ARS1-B10-05618-13	CASA-11-1360	5.02	g	82211				JRABER	03/13/2011 17:01:19
8023	ARS1-B10-05618	ARS1-B10-05618-15	CASA-11-1371	5.01	g	82212				JRABER	03/13/2011 17:01:19
8024	ARS1-B10-05618	ARS1-B10-05618-16	CASA-11-1373	5.02	g	82213				JRABER	03/13/2011 17:01:20
8025	ARS1-B10-05618	ARS1-B10-05618-17	CASA-11-1374	5.01	g	82214				JRABER	03/13/2011 17:01:20
8026	ARS1-B10-05618	ARS1-B10-05618-18	CASA-11-1376	5.01	g	82215				JRABER	03/13/2011 17:01:20
8027	ARS1-B10-05618	ARS1-B10-05618-19	CASA-11-1379	5	g	82216				JRABER	03/13/2011 17:01:21
8028	ARS1-B10-05618	ARS1-B10-05618-20	CASA-11-1380	5	g	82217				JRABER	03/13/2011 17:01:21
8029	ARS1-B10-05618	ARS1-B10-05618-21	CAMO-11-1262	5.01	g	82218				JRABER	03/13/2011 17:01:21
8030	ARS1-B10-05618	ARS1-B10-05618-22	CAMO-11-1265	5.02	g	82219				JRABER	03/13/2011 17:01:21
8031	ARS1-B10-05618	ARS1-B10-05618-23	CAMO-11-1285	5.04	g	82220				JRABER	03/13/2011 17:01:22

Assay Definition-

Assay Description:
LLH3 Assay in DPM Mode

Assay Type: DPM (Single)
Report Name: Report1
Output Data Path: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3\20110302_1306
Raw Results Path: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3\20110302_1306\20110302_1306.results
RTF File Name: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3\20110302_1306\Report1.rtf
Comma-Delimited File Name: C:\Packard\Tricarb\Results\H3 Low Level\Low Level H3\20110302_1306\Report1.txt
Assay File Name: C:\Packard\TriCarb\Assays\Low Level H3.lsa

Count Conditions-

Nuclide: LL H3
Quench Indicator: tSIE/AEC
External Std Terminator (sec): 0.5 2s%
Pre-Count Delay (min): 0.00
Quench Set:
Low Energy: ARS LL H3
Count Time (min): 360.00
Count Mode: Low Level
Assay Count Cycles: 1 Repeat Sample Count: 1
#Vials/Sample: 1 Calculate % Reference: Off

Background Subtract: Off
Low CPM Threshold: Off
2 Sigma % Terminator: On - Any Region

Regions	LL	UL	2Sigma % Terminator
A	0.0	18.6	0.50
B	0.0	2000.0	0.00
C	0.0	2000.0	0.00

Count Corrections-

Static Controller: On Luminescence Correction: Off
Colored Samples: Off Heterogeneity Monitor: Off
Coincidence Time (nsec): 18 Delay Before Burst (nsec): 75

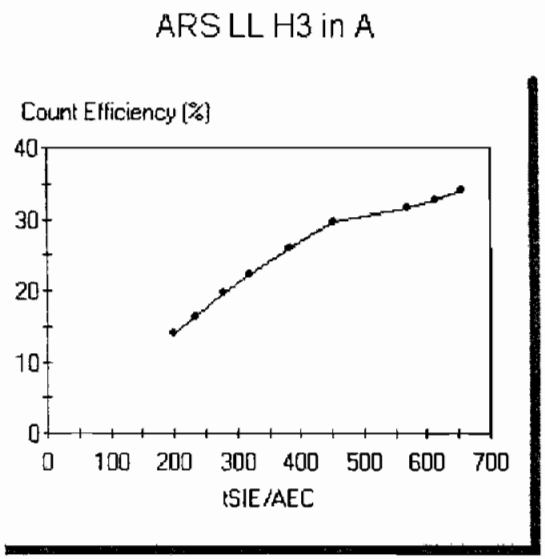
Half Life-

Half Life Correction: Off

Regions	Half Life	Units	Reference Date	Reference Time

A
B
C

Cycle 1 Results
Quench Curve Block Data



Date Acquired: 11/19/2010
Date Modified:
ARS LL H3 in A

tSIE/AEC	Count Efficiency (%)
655.11	34.08
613.27	32.77
569.42	31.54
454.14	29.55
383.12	26.06
318.52	22.25
280.21	19.79
235.97	16.48
199.12	13.98

P#	S#	SMPL_ID	Count Time	CPMA	DPM1	tSIE	Eff	Nucl In A	DATE	TIME	MESSAGES
2	1	BACKGROUND	360.00	1.700	5.32	583.51		31.94	3/8/2011	11:42:40 AM	
2	2	B10-05618-11	360.00	1.948	6.08	587.47		32.05	3/8/2011	5:54:51 PM	
2	3	B10-05618-12	360.00	1.862	5.87	576.12		31.73	3/9/2011	12:12:51 AM	
2	4	B10-05618-13	360.00	12.914	39.96	597.10		32.32	3/9/2011	6:30:49 AM	
2	5	B10-05618-15	360.00	2.459	7.67	587.77		32.05	3/9/2011	12:46:04 PM	
2	6	B10-05618-16	360.00	1.692	5.32	579.51		31.82	3/9/2011	6:58:27 PM	
2	7	B10-05618-17	360.00	1.741	5.40	594.71		32.25	3/10/2011	1:10:48 AM	
2	8	B10-05618-18	360.00	4.733	14.83	582.89		31.92	3/10/2011	7:23:05 AM	
2	9	B10-05618-19	360.00	1.659	5.16	590.76		32.14	3/10/2011	1:35:26 PM	
2	10	B10-05618-20	360.00	1.763	5.47	592.76		32.19	3/10/2011	7:47:41 PM	
2	11	B10-05618-21	360.00	1.642	5.15	581.40		31.88	3/11/2011	1:59:56 AM	
2	12	B10-05618-22	360.00	1.810	5.67	582.46		31.91	3/11/2011	8:12:07 AM	
Missing vial 13.											
2	14	~~Sample #14~~ B10-05618-23	360.00	1.666	5.19	590.19		32.12	3/11/2011	2:24:30 PM	

JDR 3-13-2011

P#	S#	SMPL_ID	Count Time	CPMA	DPM1	tSIE	Eff Nucl In A	DATE	TIME	MESSAGES
2	1	BACKGROUND	360.00	1.549	5.06	515.36	30.61	3/2/2011	1:15:11 PM	
2	2	B10-05618-01	360.00	4.861	15.55	552.66	31.25	3/2/2011	7:27:35 PM	
2	3	B10-05618-02	360.00	4.962	15.82	559.26	31.37	3/3/2011	1:40:11 AM	
2	4	B10-05618-03	360.00	1.270	4.06	552.74	31.25	3/3/2011	7:52:42 AM	
2	5	B10-05618-04	360.00	1.672	5.34	555.57	31.30	3/3/2011	2:04:51 PM	
2	6	B10-05618-05	360.00	39.768	126.29	566.39	31.49	3/3/2011	8:16:54 PM	
2	7	B10-05618-07	360.00	1.650	5.27	555.37	31.30	3/4/2011	2:29:11 AM	
2	8	B10-05618-08	360.00	1.573	5.04	552.08	31.24	3/4/2011	8:41:15 AM	
2	9	B10-05618-09	360.00	1.555	4.99	546.49	31.15	3/4/2011	2:53:14 PM	
2	10	B10-05618-10	360.00	1.791	5.74	548.40	31.18	3/4/2011	9:05:24 PM	

Tritium Enrichment Data

Procedures: **ARS-040**

Date: 1/25/2011

ARS File ID Numbers: ARS1-10-02492; 02491; 02509; 02510; 02511

ARS Batch ID: ARS1-B10-05618

		Vf'								Aliquot					
	A Batch ID:	Gross Sample Recovered	Enrichment factor	Cryo-Distil Flask #	Tare Wt Cryo-distil flask	Gross Wt flask + Sample	Recovered Water	Tare Weight of LSC Vial	Vial + Sample	Net Sample	*Wt of Vial, Sample& Dead Water Filler if used*	*Net Dead Water Added*	Tare Wt b/f Cocktail	Gross Wt Vial + Sample + Cocktail	Net Wt of Cocktail Added
1	ARS1-B10-05618-01	11.67	43.19	N/A,N/A	101.30	107.24	5.94	6.61	11.61	5.00	0.00	0.00	11.61	26.60	14.99
2	ARS1-B10-05618-02	12.50	40.38	N/A,N/A	96.37	102.71	6.34	6.62	11.62	5.00	0.00	0.00	11.62	26.62	15.00
3	ARS1-B10-05618-03	11.49	43.95	N/A,N/A	116.24	122.64	6.40	6.47	11.47	5.00	0.00	0.00	11.47	26.46	14.99
4	ARS1-B10-05618-04	11.78	41.77	N/A,7	116.63	124.89	8.26	6.61	11.63	5.02	0.00	0.00	11.63	26.61	14.98
5	ARS1-B10-05618-05	9.69	51.62	N/A,N/A	100.72	106.88	6.16	6.48	11.51	5.03	0.00	0.00	11.51	26.55	15.04
6		0.00	–				0.00			0.00		0.00			0.00
7	ARS1-B10-05618-07	11.20	44.58	E,N/A	90.54	96.91	6.37	6.51	11.52	5.01	0.00	0.00	11.52	26.51	14.99
8	ARS1-B10-05618-08	10.23	48.51	N/A,11	100.68	104.61	3.93	6.47	10.36	3.89	11.47	1.11	11.47	26.51	15.04
9	ARS1-B10-05618-09	12.37	40.20	N/A,N/A	109.65	118.40	8.75	6.56	11.58	5.02	0.00	0.00	11.58	26.57	14.99
10	ARS1-B10-05618-10	12.04	41.00	N/A,N/A	107.46	115.83	8.37	6.60	11.60	5.00	0.00	0.00	11.60	26.61	15.01
11	ARS1-B10-05618-11	12.09	41.39	G,N/A	99.68	108.19	8.51	6.59	11.60	5.01	0.00	0.00	11.60	26.59	14.99
12	ARS1-B10-05618-12	12.67	38.84	N/A,7	116.64	125.45	8.81	6.48	11.50	5.02	0.00	0.00	11.50	26.49	14.99
13	ARS1-B10-05618-13	12.58	38.69	N/A,N/A	101.71	110.60	8.89	6.64	11.66	5.02	0.00	0.00	11.66	26.66	15.00
14		0.00	–				0.00			0.00		0.00			0.00
15	ARS1-B10-05618-15	11.59	42.88	N/A,N/A	92.13	99.84	7.71	6.84	11.85	5.01	0.00	0.00	11.85	26.86	15.01
16	ARS1-B10-05618-16	11.87	41.47	N/A,11	116.24	121.48	5.24	6.62	11.64	5.02	0.00	0.00	11.64	26.64	15.00
17	ARS1-B10-05618-17	13.27	37.37	N/A,N/A	91.48	101.14	9.66	6.67	11.68	5.01	0.00	0.00	11.68	26.67	14.99
18	ARS1-B10-05618-18	11.54	43.34	N/A,N/A	107.43	115.29	7.86	6.58	11.59	5.01	0.00	0.00	11.59	26.58	14.99
19	ARS1-B10-05618-19	12.34	40.13	N/A,N/A	121.80	130.53	8.73	6.52	11.52	5.00	0.00	0.00	11.52	26.51	14.99
20	ARS1-B10-05618-20	13.26	37.98	N/A,7	96.40	105.87	9.47	6.52	11.52	5.00	0.00	0.00	11.52	26.51	14.99
21	ARS1-B10-05618-21	11.78	42.65	G,N/A	99.83	108.11	8.28	6.50	11.51	5.01	0.00	0.00	11.51	26.51	15.00
22	ARS1-B10-05618-22	11.73	42.50	N/A,N/A	92.18	100.07	7.89	6.58	11.60	5.02	0.00	0.00	11.60	26.59	14.99
23	ARS1-B10-05618-23	12.09	40.74	N/A,11	116.23	121.43	5.20	6.50	11.54	5.04	0.00	0.00	11.54	26.53	14.99
24		0.00	–				0.00			0.00		0.00			0.00
25		0.00	–				0.00			0.00		0.00			0.00
26		0.00	–				0.00			0.00		0.00			0.00
27		0.00	–				0.00			0.00		0.00			0.00
28		0.00	–				0.00			0.00		0.00			0.00
29		0.00	–				0.00			0.00		0.00			0.00

Chemist Signature: Jonny D. Rahm

ARS, International
Port Allen Lab

Tritium Enrichment Data

Procedures: **ARS-040**

Date: 1/25/2011

ARS File ID Numbers: ARS1-10-02492; 02491; 02509; 02510; 02511

ARS Batch ID: ARS1-B10-05618

	A Batch ID:	Enrichment Cell No.	Tare Wt of Electrolysis Cell & Electrodes	Tare Wt Reservoir	mi Wt Na_2O_2	Gross Weight of Sample Reservoir	Vi Gross Sample Added	Electrolysis Start Date & Time	Start AMP	Start Bath C°	Electolysis End Date & Time	End Bath C°	End Wt of Cell + Resv. + Sample
1	ARS1-B10-05618-01	1	331.10	199.96	2.00	703.93	503.97	1-14-11 1427	5.00	2.0	2-10-11 0815	2.0	542.73
2	ARS1-B10-05618-02	2	336.73	189.29	2.00	694.03	504.74	1-14-11 1429	5.00	2.0	2-10-11 0824	2.0	538.52
3	ARS1-B10-05618-03	3	334.75	193.00	2.00	698.04	505.04	1-14-11 1439	5.00	2.0	2-10-11 0934	2.0	539.24
4	ARS1-B10-05618-04	77	335.44	200.65	2.02	692.70	492.05	1-15-11 1019	5.00	2.0	2-11-11 1007	2.0	547.87
5	ARS1-B10-05618-05	59	337.02	195.13	2.01	695.30	500.17	1-15-11 1026	5.00	2.0	2-11-11 0815	2.0	541.84
6							0.00						
7	ARS1-B10-05618-07	12	331.50	194.44	2.01	693.69	499.25	1-15-11 1033	5.00	2.0	2-12-11 1358	2.0	537.14
8	ARS1-B10-05618-08	68	334.86	194.80	2.00	691.09	496.29	1-15-11 1039	5.00	2.0	2-13-11 0815	2.0	539.89
9	ARS1-B10-05618-09	51	334.59	200.61	2.02	697.86	497.25	1-15-11 1101	5.00	2.0	2-13-11 0821	2.0	547.57
10	ARS1-B10-05618-10	95	334.30	195.64	2.00	689.29	493.65	1-15-11 1106	5.00	2.0	2-14-11 0901	2.0	541.98
11	ARS1-B10-05618-11	26	335.14	193.93	2.00	694.34	500.41	1-15-11 1113	5.00	2.0	2-15-11 0815	2.0	541.16
12	ARS1-B10-05618-12	28	332.11	195.01	1.99	687.13	492.12	1-15-11 1131	5.00	2.0	2-17-11 1143	2.0	539.79
13	ARS1-B10-05618-13	42	330.48	192.00	2.02	678.78	486.78	1-15-11 1136	5.00	2.0	2-17-11 1057	2.0	535.06
14							0.00						
15	ARS1-B10-05618-15	35	339.81	193.87	2.00	690.82	496.95	1-15-11 1649	5.00	2.0	2-19-11 1107	2.0	545.27
16	ARS1-B10-05618-16	61	335.70	207.28	2.01	699.58	492.30	2-1-11 1316	5.00	2.0	2-18-11 0819	2.0	554.85
17	ARS1-B10-05618-17	93	337.22	187.78	2.01	683.64	495.86	2-1-11 1328	5.00	2.0	2-19-11 1642	2.0	538.27
18	ARS1-B10-05618-18	6	331.11	198.44	2.00	698.54	500.10	2-1-11 1337	5.00	2.0	2-18-11 0815	2.0	541.09
19	ARS1-B10-05618-19	49	334.82	190.18	2.01	685.34	495.16	2-1-11 1405	5.00	2.0	2-19-11 1357	2.0	537.34
20	ARS1-B10-05618-20	76	333.96	186.75	2.00	690.30	503.55	2-1-11 1420	5.00	2.0	2-20-11 0815	2.0	533.97
21	ARS1-B10-05618-21	7	334.55	190.36	2.00	692.80	502.44	2-1-11 1430	5.00	2.0	2-20-11 1152	2.0	536.69
22	ARS1-B10-05618-22	50	332.03	201.04	2.00	699.58	498.54	2-1-11 1502	5.00	2.0	2-21-11 1324	2.0	544.80
23	ARS1-B10-05618-23	21	333.69	199.08	2.00	691.67	492.59	2-1-11 1523	5.00	2.0	2-20-11 1424	2.0	544.86
24							0.00						
25							0.00						
26							0.00						
27							0.00						
28							0.00						
29							0.00						

Chemist Signature: Jimmy D. Ralin

Beta Liquid Scintillation Counter Log Book

Date	Time	ARS Sample I.D. Number	Batch Number	Liquid Scintillation File Number	Technician Initials
2-28-11	0940	S-0251-V4	C-14 Std verif	1118	[illegible]
↓	↓	S-0251-V5	↓	↓	[illegible]
3-1-11	1100 ~~1130~~ JR 3-1-11	Background ~~S-8~~ JR 3-1-11	C-14 Std. verif.	1101	[illegible]
↓	↓	S-0250-V1	↓	↓	[illegible]
↓	↓	S-0250-V2	↓	↓	[illegible]
↓	↓	S-0250-V3	↓	↓	[illegible]
↓	↓	S-0250-V4	↓	↓	[illegible]
↓	↓	S-0250-V5	↓	↓	[illegible]
↓	↓	S-0251-V1	↓	↓	[illegible]
↓	↓	S-0251-V2	↓	↓	[illegible]
↓	↓	S-0251-V3	↓	↓	[illegible]
↓	↓	S-0251-V4	↓	↓	[illegible]
↓	↓	S-0251-V5	↓	↓	[illegible]
3-2-2011	1118	SNC 51	QA	QA	JDR
↓	↓	Background	B10-05618	1306	JDR
↓	↓	B10-05618-01	↓	↓	JDR
↓	↓	B10-05618-02	↓	↓	JDR
↓	↓	B10-05618-03	↓	↓	JDR
↓	↓	B10-05618-04	↓	↓	JDR
↓	↓	B10-05618-05	↓	↓	JDR

Reviewed By: [illegible] Date: 3-9-11
Initials

Beta Liquid Scintillation Counter Log Book

Date	Time	ARS Sample I.D. Number	Batch Number	Liquid Scintillation File Number	Technician Initials
3-2-2011	1118	B10-05618-07	B10-05618	1306	JDR
↓	↓	B10-05618-08	↓	↓	JDR
↓	↓	B10-05618-09	↓	↓	JDR
↓	↓	B10-05618-10	↓	↓	JDR
3-6-11	1510	SNC 51	QA	QA	JDR
↓	↓	Background	B11-00901	1703	JDR
↓	↓	B11-00901-04	↓	↓	JDR
↓	↓	B11-00901-05	↓	↓	JDR
↓	↓	B11-00901-06	↓	↓	JDR
↓	↓	B11-00901-07	↓	↓	JDR
↓	↓	B11-00901-08	↓	↓	JDR
↓	↓	B11-00901-09	↓	↓	JDR
↓	↓	B11-00901-10	↓	↓	JDR
↓	↓	B11-00901-11	↓	↓	JDR
↓	↓	B11-00901-12	↓	↓	JDR
↓	↓	B11-00901-13	↓	↓	JDR
↓	↓	B11-00901-14	↓	↓	JDR
↓	↓	B11-00901-15	↓	↓	JDR
↓	↓	B11-00901-16	↓	↓	JDR
↓	↓	B11-00901-17	↓	↓	JDR

Reviewed By: LSW Initials Date: 3-7-11

Beta Liquid Scintillation Counter Log Book

Date	Time	ARS Sample I.D. Number	Batch Number	Liquid Scintillation File Number	Technician Initials
3-6-11	1510	B11-00901-18	B11-00901	1703	JDR
↓	↓	B11-00901-19	↓	↓	JDR
↓	↓	B11-00901-20	↓	↓	JDR
3-7-11 LSW ↓	↓	B11-00901-21	↓	↓	JDR
3-8-11	1133	B10-05618-11	B10-05618	1133	JDR
↓	↓	B10-05618-12	↓	↓	JDR
↓	↓	B10-05618-13	↓	↓	JDR
↓	↓	B10-05618-15	↓	↓	JDR
↓	↓	B10-05618-16	↓	↓	JDR
↓	↓	B10-05618-17	↓	↓	JDR
↓	↓	B10-05618-18	↓	↓	JDR
↓	↓	B10-05618-19	↓	↓	JDR
↓	↓	B10-05618-20	↓	↓	JDR
↓	↓	B10-05618-21	↓	↓	JDR
↓	↓	B10-05618-22	↓	↓	JDR
↓	↓	B10-05618-23	↓	↓	JDR
	N/A				
		JDR	3-13-2011		
				Data unavailable - LSW 3-14-11	

Reviewed By: LSW Date: 3-14-11
Initials

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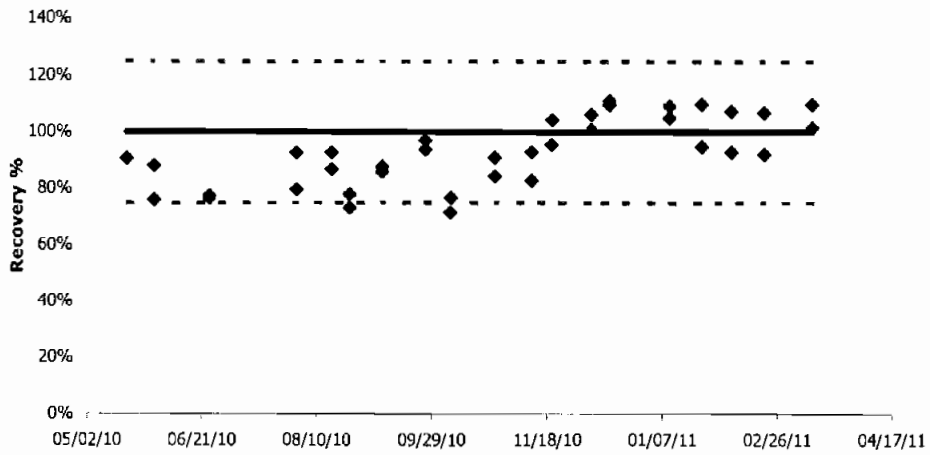
Low Level Tritium by Low Level Liquid Scintillation Counting

Control Charts

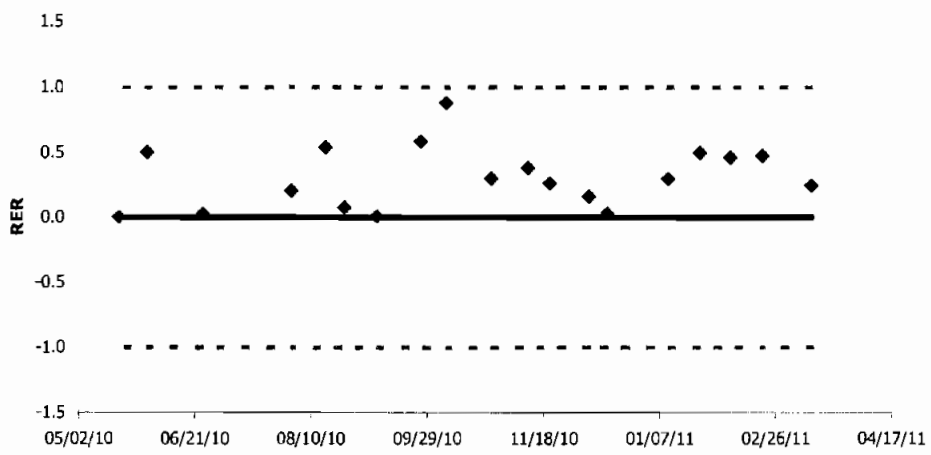
QC Chart

LLH-3 LCS



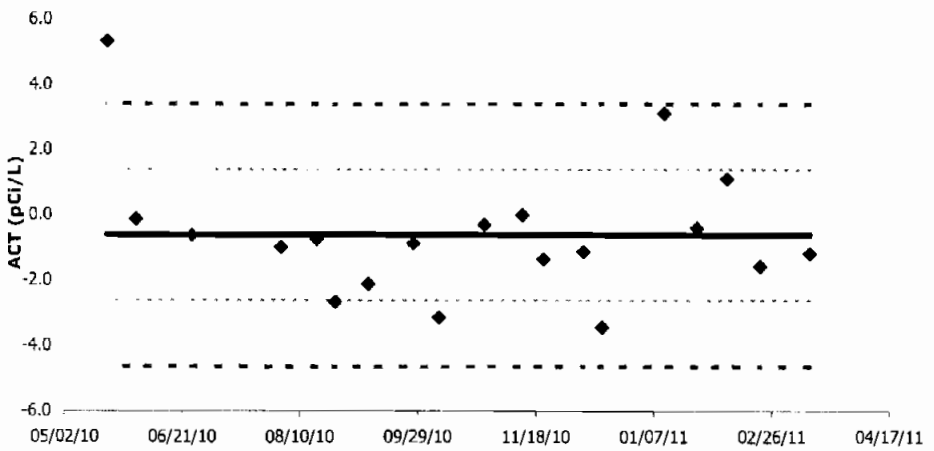
Average	STDEV	n	UCL	LCL
0.9323	0.1172	20	1.2500	0.7500

LLH-3 RER



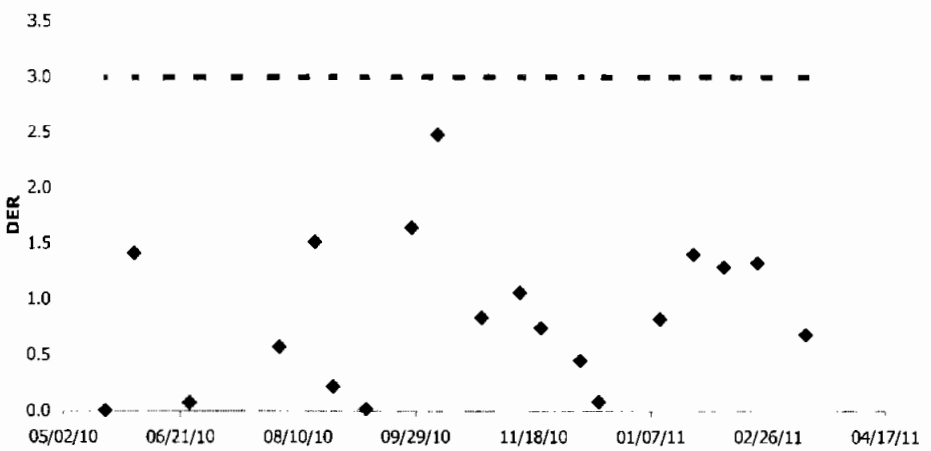
		n	UCL	LCL
		20	1.0000	-1.0000

LLH-3 Blank



Average	STDEV	n	UCL	LCL
-0.6165	2.0081	20	3.3998	-4.6328

LLH-3 DER



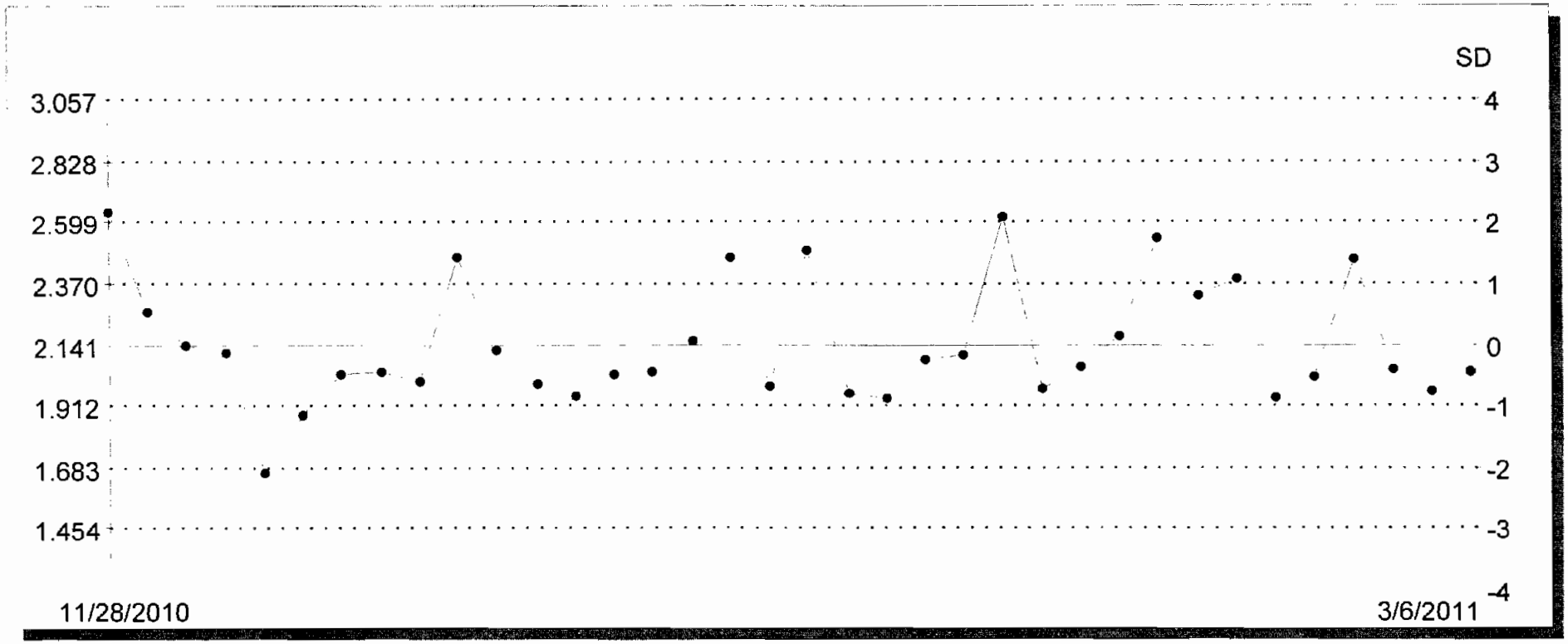
		n	UCL	
		20	3.0000	

3H Background
Total # pts : 5212
Valid # pts : 36
Mean : 2.14
SD : 0.23

Date	Value	Valid Pt
Nov 28, 2010	2.63	X
Nov 28, 2010	2.26	X
Nov 28, 2010	2.14	X
Nov 28, 2010	2.11	X
Nov 28, 2010	1.66	X
Nov 28, 2010	1.88	X
Nov 28, 2010	2.03	X
Nov 30, 2010	2.04	X
Dec 02, 2010	2.00	X
Dec 08, 2010	2.46	X
Dec 13, 2010	2.12	X
Dec 15, 2010	1.99	X
Dec 22, 2010	1.95	X
Dec 29, 2010	2.03	X
Dec 30, 2010	2.04	X
Jan 03, 2011	2.15	X
Jan 05, 2011	2.47	X
Jan 10, 2011	1.99	X
Jan 11, 2011	2.49	X
Jan 14, 2011	1.96	X
Jan 19, 2011	1.94	X
Jan 21, 2011	2.09	X
Jan 27, 2011	2.10	X
Jan 29, 2011	2.62	X
Feb 01, 2011	1.97	X
Feb 07, 2011	2.06	X
Feb 09, 2011	2.17	X
Feb 10, 2011	2.54	X
Feb 13, 2011	2.33	X
Feb 18, 2011	2.39	X
Feb 22, 2011	1.94	X
Feb 24, 2011	2.02	X
Feb 25, 2011	2.46	X
Feb 28, 2011	2.05	X
Mar 02, 2011	1.96	X
Mar 06, 2011	2.04	X

3H Background

Total # pts	: 5212
Valid # pts	: 36
Mean	: 2.14
SD	: 0.23

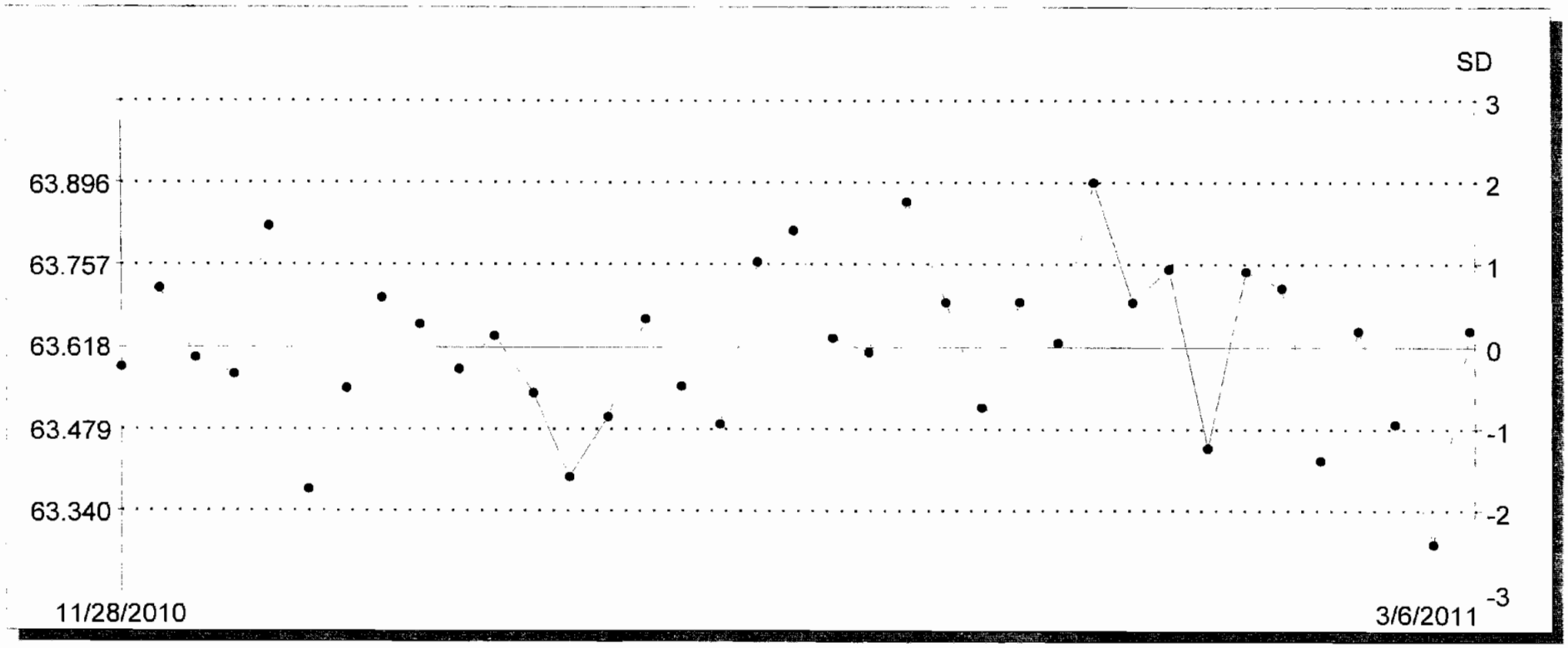


3H Efficiency
Total # pts : 5283
Valid # pts : 37
Mean : 63.62
SD : 0.14

Date	Value	Valid Pt
Nov 28, 2010	63.58	X
Nov 28, 2010	63.72	X
Nov 28, 2010	63.60	X
Nov 28, 2010	63.57	X
Nov 28, 2010	63.82	X
Nov 28, 2010	63.38	X
Nov 28, 2010	63.55	X
Nov 30, 2010	63.70	X
Nov 30, 2010	63.66	X
Dec 02, 2010	63.58	X
Dec 08, 2010	63.64	X
Dec 13, 2010	63.54	X
Dec 15, 2010	63.39	X
Dec 22, 2010	63.50	X
Dec 29, 2010	63.66	X
Dec 30, 2010	63.55	X
Jan 03, 2011	63.49	X
Jan 05, 2011	63.76	X
Jan 10, 2011	63.82	X
Jan 11, 2011	63.63	X
Jan 14, 2011	63.61	X
Jan 19, 2011	63.87	X
Jan 21, 2011	63.69	X
Jan 27, 2011	63.52	X
Jan 29, 2011	63.69	X
Feb 01, 2011	63.62	X
Feb 07, 2011	63.90	X
Feb 09, 2011	63.69	X
Feb 10, 2011	63.75	X
Feb 13, 2011	63.45	X
Feb 18, 2011	63.75	X
Feb 22, 2011	63.72	X
Feb 24, 2011	63.43	X
Feb 25, 2011	63.65	X
Feb 28, 2011	63.49	X
Mar 02, 2011	63.28	X
Mar 06, 2011	63.64	X

3H Efficiency

Total # pts	: 5283
Valid # pts	: 37
Mean	: 63.62
SD	: 0.14



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Tritium- Screening by Low Level Liquid Scintillation Counting

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Tritium-Screening by Low Level Liquid Scintillation Counting

Samples

Procedures: **ARS-060** **ARS-040** *Section 14.1 Tritium Screen in Clean Water without Distillation*

ARS File ID Numbers: ARS1-10-02492; 2509; 2510; 2511
ARS Batch ID: ARS1-B10-05617

	Sample ID:	COUNT TIME	CPMA	Background CPMA	Eff Nucl In A	Aliquot (grams)	ACTIVITY	units	MDA	Sample Must be analyzed as LSC-A-001
1	B10-05617-04	120	1.490	1.181	30.72	5.01	90.437	pCi/L	172.3216	NO
2	B10-05617-05	120	1.996	1.181	30.91	5.00	237.539	pCi/L	171.6049	~~YES, analyze by LSC-A-001~~. NO JB 12-13-10
3	B10-05617-06	120	2.554	1.181	31.29	5.05	391.400	pCi/L	167.8424	YES, analyze by LSC-A-001.
4	B10-05617-07	120	1.371	1.181	31.08	5.00	55.074	pCi/L	170.6663	NO
5	B10-05617-08	120	1.404	1.181	30.74	5.04	64.836	pCi/L	171.1844	NO
6	B10-05617-09	120	1.407	1.181	30.72	5.03	65.882	pCi/L	171.6364	NO
7	B10-05617-10	120	1.365	1.181	31.26	5.03	52.712	pCi/L	168.6715	NO
8	B10-05617-11	120	1.256	1.181	30.91	5.01	21.816	pCi/L	171.2624	NO
9	B10-05617-12	120	1.472	1.181	30.93	5.02	84.422	pCi/L	170.8107	NO
10	B10-05617-13	120	1.823	1.181	30.98	5.00	186.694	pCi/L	171.2172	~~YES, analyze by LSC-A-001~~. NO JB 12-13-10
11	B10-05617-14	120	3.169	1.181	30.83	5.04	576.314	pCi/L	170.6847	YES, analyze by LSC-A-001.
12	B10-05617-15	120	1.593	1.181	30.96	5.05	118.700	pCi/L	169.6314	NO
13	B10-05617-16	120	1.407	1.181	30.96	5.00	65.763	pCi/L	171.3278	NO
14	B10-05617-17	120	1.577	1.181	30.95	5.00	115.269	pCi/L	171.3831	NO
15	B10-05617-18	120	1.547	1.181	30.99	5.01	106.186	pCi/L	170.8203	NO
16	B10-05617-19	120	1.451	1.181	30.85	5.00	78.847	pCi/L	171.9387	NO
17	B10-05617-20	120	1.649	1.181	30.98	5.01	135.823	pCi/L	170.8754	NO
18	B10-05617-21	120	1.452	1.181	31	5.00	78.756	pCi/L	171.1067	NO
19	B10-05617-22	120	1.501	1.181	30.88	5.02	92.986	pCi/L	171.0873	NO
20	B10-05617-23	120	1.586	1.181	30.97	5.03	117.110	pCi/L	170.2509	NO
21							#DIV/0!	pCi/L	#DIV/0!	#DIV/0!
22							#DIV/0!	pCi/L	#DIV/0!	#DIV/0!
23							#DIV/0!	pCi/L	#DIV/0!	#DIV/0!

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Tritium-Screening by Low Level Liquid Scintillation Counting

Laboratory Records

Analysis Batch Report

ARS INTERNATIONAL

Analysis Batch ID **ARS1-B10-05617**

Method **ARS-054** **Analysis** **LSC-A-021** **Matrix** **AQ**

Description **Low Level Tritium Screen**

ABatch Sample ID	Type	Blind Iso1	Blind Iso2	Blind Iso3	SDG	FR	Run	Client ID	Isotope Group	Lab Deadline
ARS1-B10-05617-01	LCS									
ARS1-B10-05617-02	LCSD									
ARS1-B10-05617-03	MBL									
ARS1-B10-05617-04	TRG				**ARS1-10-02492**	002	1	CAMO-11-1269	STD	12/07/10
ARS1-B10-05617-05	TRG				**ARS1-10-02492**	003	1	CAMO-11-1271	STD	12/07/10
ARS1-B10-05617-06	TRG				**ARS1-10-02492**	004	1	CAMO-11-1273	STD	12/07/10
ARS1-B10-05617-07	TRG				**ARS1-10-02492**	005	1	CAMO-11-1302	STD	12/07/10
ARS1-B10-05617-08	TRG				**ARS1-10-02491**	001	1	Buckman1-11-1944	STD	12/13/10
ARS1-B10-05617-09	TRG				**ARS1-10-02491**	002	1	Buckman06-11-1970	STD	12/13/10
ARS1-B10-05617-10	TRG				**ARS1-10-02491**	003	1	Buckman08-11-2042	STD	12/13/10
ARS1-B10-05617-11	TRG				**ARS1-10-02509**	001	1	CASA-11-1365	STD	12/14/10
ARS1-B10-05617-12	TRG				**ARS1-10-02509**	002	1	CASA-11-1367	STD	12/14/10
ARS1-B10-05617-13	TRG				**ARS1-10-02510**	001	1	CASA-11-1360	STD	12/14/10
ARS1-B10-05617-14	TRG				**ARS1-10-02510**	002	1	CASA-11-1363	STD	12/14/10
ARS1-B10-05617-15	TRG				**ARS1-10-02510**	003	1	CASA-11-1371	STD	12/14/10
ARS1-B10-05617-16	TRG				**ARS1-10-02510**	004	1	CASA-11-1373	STD	12/14/10
ARS1-B10-05617-17	TRG				**ARS1-10-02510**	005	1	CASA-11-1374	STD	12/14/10
ARS1-B10-05617-18	TRG				**ARS1-10-02510**	006	1	CASA-11-1376	STD	12/14/10
ARS1-B10-05617-19	TRG				**ARS1-10-02510**	007	1	CASA-11-1379	STD	12/14/10
ARS1-B10-05617-20	TRG				**ARS1-10-02510**	008	1	CASA-11-1380	STD	12/14/10
ARS1-B10-05617-21	TRG				**ARS1-10-02511**	001	1	CAMO-11-1262	STD	12/14/10
ARS1-B10-05617-22	TRG				**ARS1-10-02511**	002	1	CAMO-11-1265	STD	12/14/10
ARS1-B10-05617-23	TRG				**ARS1-10-02511**	003	1	CAMO-11-1285	STD	12/14/10

76448 10-02492-002-1 **XRAD**
76449 10-02492-003-1 **XRAD**
76450 10-02492-004-1 **XRAD**
76451 10-02492-005-1 **XRAD**
76452 10-02491-001-1 **XRAD**
76453 10-02491-002-1 **XRAD**
76454 10-02491-003-1 **XRAD**
76455 10-02509-001-1 **XRAD**
76456 10-02509-002-1 **XRAD**
76457 10-02510-001-1 **XRAD**
76458 10-02510-002-1 **XRAD**
76459 10-02510-003-1 **XRAD**
76460 10-02510-004-1 **XRAD**
76461 10-02510-005-1 **XRAD**
76462 10-02510-006-1 **XRAD**
76463 10-02510-007-1 **XRAD**
76464 10-02510-008-1 **XRAD**
76465 10-02511-001-1 **XRAD**
76466 10-02511-002-1 **XRAD**
76467 10-02511-003-1 **XRAD**

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ARS-054

ID_31001_054	ABatch	ABatchSampleID	ClientID	Aliquot1	AliquotUnits1	IC_ID1	Aliquot2	AliquotUnits2	IC_ID2	UserID	ModDate
7145	ARS1-B10-05617	ARS1-B10-05617-01		1	g					JRABER	12/07/2010 14:45:34
7146	ARS1-B10-05617	ARS1-B10-05617-02		1	g					JRABER	12/07/2010 14:45:34
7147	ARS1-B10-05617	ARS1-B10-05617-03		1	g					JRABER	12/07/2010 14:45:34
7148	ARS1-B10-05617	ARS1-B10-05617-04	CAMO-11-1269	5.01	g	76448				JRABER	12/07/2010 14:45:34
7149	ARS1-B10-05617	ARS1-B10-05617-05	CAMO-11-1271	5	g	76449				JRABER	12/07/2010 14:45:34
7150	ARS1-B10-05617	ARS1-B10-05617-06	CAMO-11-1273	5.05	g	76450				JRABER	12/07/2010 14:45:34
7151	ARS1-B10-05617	ARS1-B10-05617-07	CAMO-11-1302	5	g	76451				JRABER	12/07/2010 14:45:34
7152	ARS1-B10-05617	ARS1-B10-05617-08	Buckman1-11-1944	5.04	g	76452				JRABER	12/07/2010 14:45:34
7153	ARS1-B10-05617	ARS1-B10-05617-09	Buckman06-11-1970	5.03	g	76453				JRABER	12/07/2010 14:45:35
7154	ARS1-B10-05617	ARS1-B10-05617-10	Buckman08-11-2042	5.03	g	76454				JRABER	12/07/2010 14:45:35
7155	ARS1-B10-05617	ARS1-B10-05617-11	CASA-11-1365	5.01	g	76455				JRABER	12/07/2010 14:45:35
7156	ARS1-B10-05617	ARS1-B10-05617-12	CASA-11-1367	5.02	g	76456				JRABER	12/07/2010 14:45:35
7157	ARS1-B10-05617	ARS1-B10-05617-13	CASA-11-1360	5	g	76457				JRABER	12/07/2010 14:45:35
7158	ARS1-B10-05617	ARS1-B10-05617-14	CASA-11-1363	5.04	g	76458				JRABER	12/07/2010 14:45:35
7159	ARS1-B10-05617	ARS1-B10-05617-15	CASA-11-1371	5.05	g	76459				JRABER	12/07/2010 14:45:35
7160	ARS1-B10-05617	ARS1-B10-05617-16	CASA-11-1373	5	g	76460				JRABER	12/07/2010 14:45:36
7161	ARS1-B10-05617	ARS1-B10-05617-17	CASA-11-1374	5	g	76461				JRABER	12/07/2010 14:45:36
7162	ARS1-B10-05617	ARS1-B10-05617-18	CASA-11-1376	5.01	g	76462				JRABER	12/07/2010 14:45:36
7163	ARS1-B10-05617	ARS1-B10-05617-19	CASA-11-1379	5	g	76463				JRABER	12/07/2010 14:45:36
7164	ARS1-B10-05617	ARS1-B10-05617-20	CASA-11-1380	5.01	g	76464				JRABER	12/07/2010 14:45:36
7165	ARS1-B10-05617	ARS1-B10-05617-21	CAMO-11-1262	5	g	76465				JRABER	12/07/2010 14:45:36
7166	ARS1-B10-05617	ARS1-B10-05617-22	CAMO-11-1265	5.02	g	76466				JRABER	12/07/2010 14:45:36
7167	ARS1-B10-05617	ARS1-B10-05617-23	CAMO-11-1285	5.03	g	76467				JRABER	12/07/2010 14:45:37

Low Low Level H-3 Testing

Assay Definition-

Assay Description:
Low Low Level Tritium

Assay Type: DPM (Single)
Report Name: Report1
Output Data Path: C:\Packard\Tricarb\Results\ARS\Low Low Level Tritium\20101208_1858
Raw Results Path: C:\Packard\Tricarb\Results\ARS\Low Low Level Tritium\20101208_1858\20101208_1858.results
RTF File Name: C:\Packard\Tricarb\Results\ARS\Low Low Level Tritium\20101208_1858\Report1.rtf
Comma-Delimited File Name: C:\Packard\Tricarb\Results\ARS\Low Low Level Tritium\20101208_1858\Report1.txt
Assay File Name: C:\Packard\TriCarb\Assays\Low Low Level Tritium.lsa

Count Conditions-

Nuclide: H-3 LL
Quench Indicator: tSIE/AEC
External Std Terminator (sec): 0.5 2s%
Pre-Count Delay (min): 0.00
Quench Set:
Low Energy: ARS LL H3
Count Time (min): 120.00
Count Mode: Low Level
Assay Count Cycles: 1 Repeat Sample Count: 1
#Vials/Sample: 1 Calculate % Reference: Off

Background Subtract: Off
Low CPM Threshold: Off
2 Sigma % Terminator: On - Any Region

Regions	LL	UL	2Sigma % Terminator
A	2.0	18.6	0.50
B	0.0	2000.0	0.00
C	0.0	2000.0	0.00

Count Corrections-

Static Controller: On Luminescence Correction: Off
Colored Samples: Off Heterogeneity Monitor: Off
Coincidence Time (nsec): 18 Delay Before Burst (nsec): 75

Half Life-

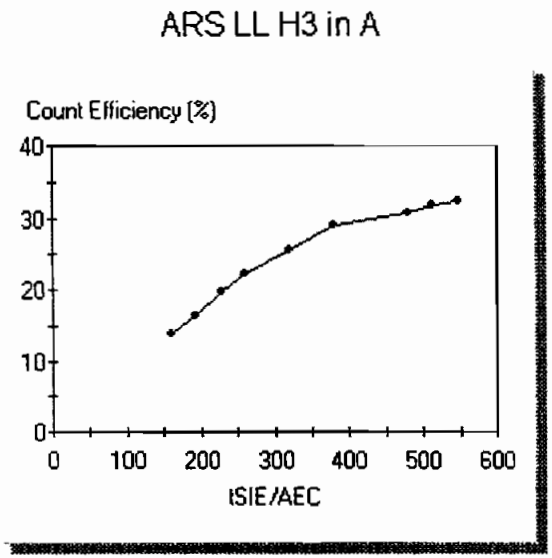
Half Life Correction: Off

Regions	Half Life	Units	Reference Date	Reference Time

Low Low Level H-3 Testing

A
B
C

Cycle 1 Results
Quench Curve Block Data



Date Acquired: 11/30/2010
Date Modified:
ARS LL H3 in A

tSIE/AEC	Count Efficiency (%)
548.77	32.48
512.15	31.92
480.70	30.66
380.48	28.98
321.20	25.72
261.54	22.30
228.13	19.65
193.83	16.47
159.53	13.75

Low Low Level H-3 Testing

P#	S#	SMPL_ID	Count Time	CPMA	DPM1	tSIE	Eff Nucl In A	DATE	TIME	MESSAGES
41	1	BACKGROUND	120.00	1.181	3.807	489.61	31.02	12/8/2010	7:08:03 PM	
41	2	B10-05617-04	120.00	1.490	4.850	482.20	30.72	12/8/2010	9:18:35 PM	
41	3	B10-05617-05	120.00	1.996	6.456	486.94	30.91	12/8/2010	11:29:03 PM	
41	4	B10-05617-06	120.00	2.554	8.162	496.49	31.29	12/9/2010	1:41:15 AM	
41	5	B10-05617-07	120.00	1.371	4.411	491.05	31.08	12/9/2010	3:53:24 AM	
41	6	B10-05617-08	120.00	1.404	4.568	482.73	30.74	12/9/2010	6:03:54 AM	
41	7	B10-05617-09	120.00	1.407	4.579	482.15	30.72	12/9/2010	8:14:22 AM	
41	8	B10-05617-10	120.00	1.365	4.367	495.56	31.26	12/9/2010	10:24:50 AM	
41	9	B10-05617-11	120.00	1.256	4.065	486.87	30.91	12/9/2010	12:35:19 PM	
41	10	B10-05617-12	120.00	1.472	4.759	487.48	30.93	12/9/2010	2:45:50 PM	
41	11	B10-05617-13	120.00	1.823	5.885	488.76	30.98	12/9/2010	4:56:21 PM	
41	12	B10-05617-14	120.00	3.169	10.277	484.93	30.83	12/9/2010	7:06:54 PM	
41	13	B10-05617-15	120.00	1.593	5.145	488.24	30.96	12/9/2010	9:19:07 PM	
41	14	B10-05617-16	120.00	1.407	4.546	488.17	30.96	12/9/2010	11:29:39 PM	
41	15	B10-05617-17	120.00	1.577	5.096	487.86	30.95	12/10/2010	1:40:09 AM	
41	16	B10-05617-18	120.00	1.547	4.993	488.86	30.99	12/10/2010	3:50:40 AM	
41	17	B10-05617-19	120.00	1.451	4.701	485.54	30.85	12/10/2010	6:01:11 AM	
41	18	B10-05617-20	120.00	1.649	5.322	488.64	30.98	12/10/2010	8:11:43 AM	
41	19	B10-05617-21	120.00	1.452	4.684	489.24	31.00	12/10/2010	10:22:14 AM	
41	20	B10-05617-22	120.00	1.501	4.862	486.08	30.88	12/10/2010	12:32:46 PM	
41	21	B10-05617-23	120.00	1.586	5.122	488.33	30.97	12/10/2010	2:43:18 PM	

Beta Liquid Scintillation Counter Log Book

Date	Time	ARS Sample I.D. Number	Batch Number	Liquid Scintillation File Number	Technician Initials
12-3-10	1437	B10-05533-06	B10-05533	0949	[illegible]
↓	↓	B10-05533-07	↓	↓	[illegible]
↓	↓	B10-05533-08	↓	↓	[illegible]
↓	↓	B10-05533-09	↓	↓	[illegible] LSW 12-06-10
12-7-2010	1457	SNC 117	QA	QA	JDR
↓	↓	Background	B10-05617	1858	JDR
↓	↓	B10-05617-04	↓	↓	JDR
↓	↓	B10-05617-05	↓	↓	JDR
↓	↓	B10-05617-06	↓	↓	JDR
↓	↓	B10-05617-07	↓	↓	JDR
↓	↓	B10-05617-08	↓	↓	JDR
↓	↓	B10-05617-09	↓	↓	JDR
↓	↓	B10-05617-10	↓	↓	JDR
↓	↓	B10-05617-11	↓	↓	JDR
↓	↓	B10-05617-12	↓	↓	JDR
↓	↓	B10-05617-13	↓	↓	JDR
↓	↓	B10-05617-14	↓	↓	JDR
↓	↓	B10-05617-15	↓	↓	JDR
↓	↓	B10-05617-16	↓	↓	JDR
↓	↓	B10-05617-17	↓	↓	JDR

Reviewed By: LSW Date: 12-15-10
Initials

Beta Liquid Scintillation Counter Log Book

Date	Time	ARS Sample I.D. Number	Batch Number	Liquid Scintillation File Number	Technician Initials
12-7-10	1457	B10-05617-18	B10-05617	1858	JDR
↓	↓	B10-05617-19	↓	↓	JDR
↓	↓	B10-05617-20	↓	↓	JDR
↓	↓	B10-05617-21	↓	↓	JDR
↓	↓	B10-05617-22	↓	↓	JDR
↓	↓	B10-05617-23	↓	↓	JDR
12-9-10	1259	Background	B10-05546	1645	JDR
↓	↓	B10-05546-01	↓	↓	JDR
↓	↓	B10-05546-02	↓	↓	JDR
↓	↓	B10-05546-03	↓	↓	JDR
↓	↓	B10-05546-04	↓	↓	JDR
↓	↓	B10-05546-05	↓	↓	JDR
↓	↓	B10-05546-06	↓	↓	JDR
↓	↓	B10-05546-07	↓	↓	JDR
↓	↓	B10-05546-08	↓	↓	JDR
↓	↓	B10-05546-09	↓	↓	JDR
↓	↓	B10-05546-10	↓	↓	JDR
↓	↓	B10-05546-11	↓	↓	JDR
↓	↓	B10-05546-12	↓	↓	JDR
↓	↓	B10-05546-13	↓	↓	JDR

LSW 12-10-10

Reviewed By: LSW Date: 12-15-10
Initials

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American Radiation Services Analytical Reports

for

Los Alamos National Laboratory

Tritium-Screening by Low Level Liquid Scintillation Counting

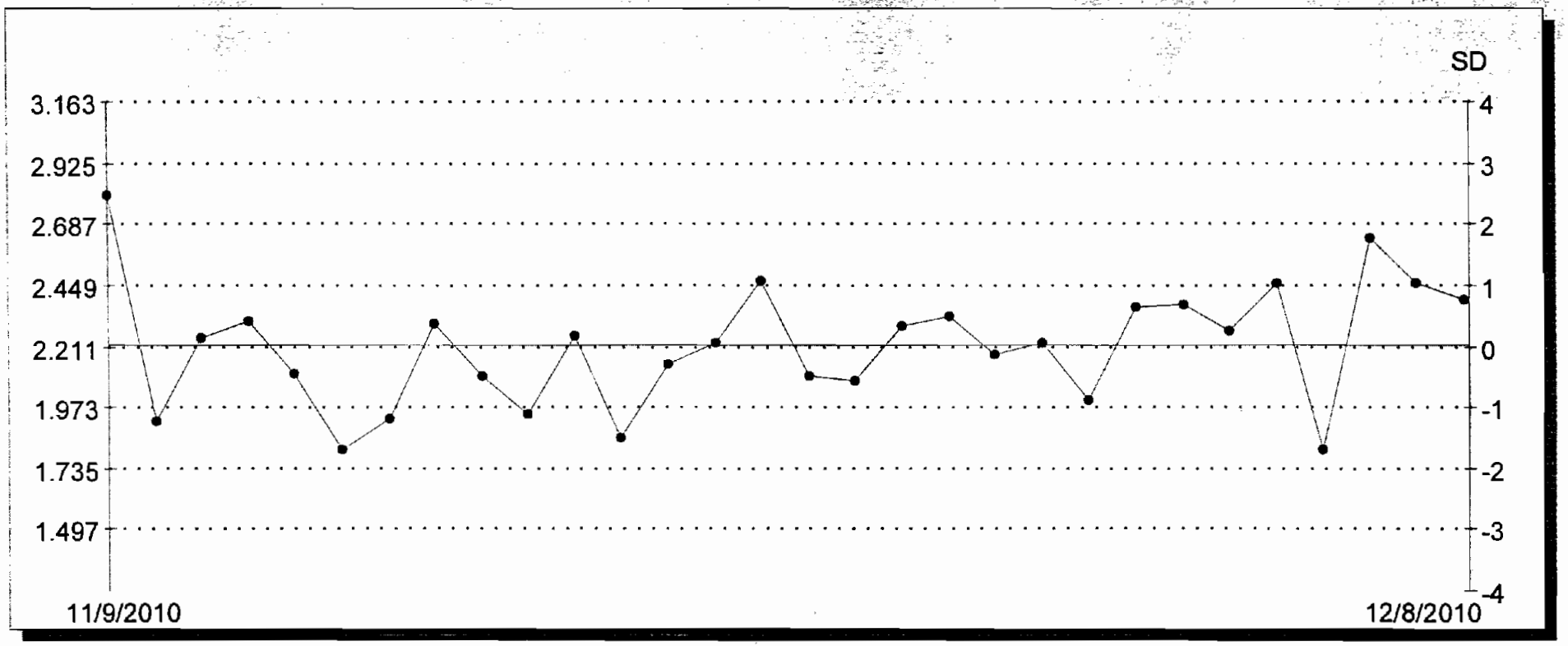
Control Charts

3H Background
Total # pts : 1507
Valid # pts : 30
Mean : 2.21
SD : 0.24

Date	Value	Valid Pt
Nov 09, 2010	2.80	X
Nov 10, 2010	1.92	X
Nov 11, 2010	2.24	X
Nov 15, 2010	2.31	X
Nov 16, 2010	2.10	X
Nov 17, 2010	1.80	X
Nov 17, 2010	1.93	X
Nov 17, 2010	2.30	X
Nov 17, 2010	2.09	X
Nov 17, 2010	1.94	X
Nov 22, 2010	2.25	X
Nov 25, 2010	1.85	X
Nov 28, 2010	2.14	X
Nov 28, 2010	2.23	X
Nov 28, 2010	2.47	X
Nov 28, 2010	2.09	X
Nov 28, 2010	2.08	X
Nov 28, 2010	2.29	X
Nov 29, 2010	2.33	X
Nov 29, 2010	2.18	X
Nov 29, 2010	2.22	X
Nov 29, 2010	2.01	X
Nov 29, 2010	2.36	X
Nov 29, 2010	2.38	X
Nov 30, 2010	2.28	X
Nov 30, 2010	2.45	X
Nov 30, 2010	1.81	X
Dec 02, 2010	2.63	X
Dec 05, 2010	2.46	X
Dec 08, 2010	2.39	X

3H Background

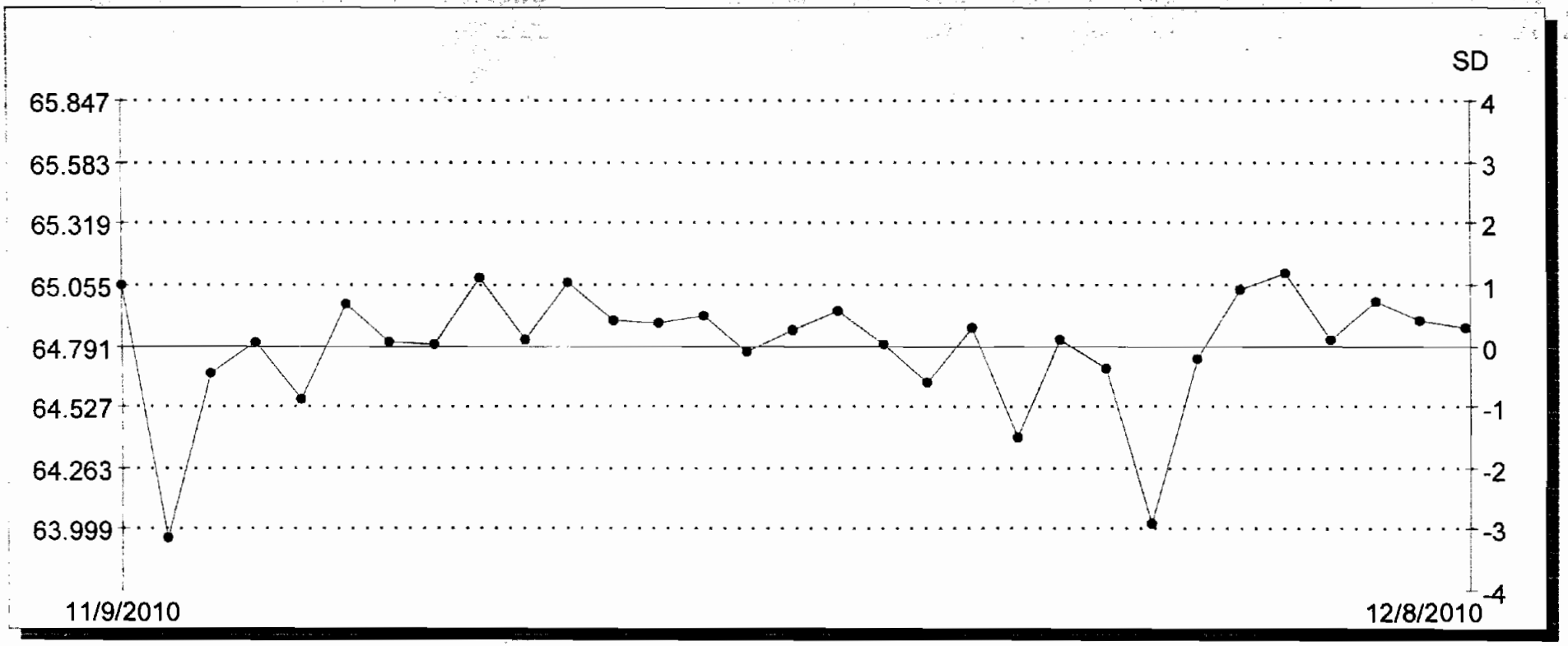
Total # pts	: 1507
Valid # pts	: 30
Mean	: 2.21
SD	: 0.24



3H Efficiency
Total # pts : 1545
Valid # pts : 31
Mean : 64.79
SD : 0.26

Date	Value	Valid Pt
Nov 09, 2010	65.05	X
Nov 10, 2010	63.96	X
Nov 11, 2010	64.67	X
Nov 15, 2010	64.81	X
Nov 16, 2010	64.56	X
Nov 17, 2010	64.97	X
Nov 17, 2010	64.81	X
Nov 17, 2010	64.79	X
Nov 17, 2010	65.08	X
Nov 17, 2010	64.82	X
Nov 22, 2010	65.07	X
Nov 25, 2010	64.90	X
Nov 28, 2010	64.89	X
Nov 28, 2010	64.92	X
Nov 28, 2010	64.77	X
Nov 28, 2010	64.86	X
Nov 28, 2010	64.94	X
Nov 28, 2010	64.80	X
Nov 29, 2010	64.63	X
Nov 29, 2010	64.87	X
Nov 29, 2010	64.40	X
Nov 29, 2010	64.82	X
Nov 29, 2010	64.69	X
Nov 29, 2010	64.02	X
Nov 30, 2010	64.73	X
Nov 30, 2010	65.03	X
Nov 30, 2010	65.11	X
Nov 30, 2010	64.82	X
Dec 02, 2010	64.99	X
Dec 05, 2010	64.90	X
Dec 08, 2010	64.87	X

3H Efficiency
Total # pts : 1545
Valid # pts : 31
Mean : 64.79
SD : 0.26



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American Radiation Services Analytical Reports

for

Los Alamos National Laboratory

Low Level Liquid Scintillation Counting

Calibration Information

QUALITY CONTROL PROGRAM

AMERICAN RADIATION SERVICES
RADIOACTIVE REFERENCE SOLUTIONS

ANNUAL ACTIVITY VERIFICATION

VERIFICATION DATE: 5/13/2010 0:00 *date counted*
STANDARD REFERENCE #: S-0206

Principal Radionuclide		Half Life, Years		Half Life, Days
H-3	*ENTER -->*		*OR -->*	4.4998E+03
		1.232E+01		4.4998E+03

Radionuclide: H-3 Dilution Reference Date: 2/25/2009 8:30

Dilution Activity	3.01	pCi per gram ===> dpm/g	6.68
Verif. Date Decay Corrected	2.81	pCi per gram ===> dpm/g	6.24

Minimum of 3 Required

Trial ID	Sample Counts	Count Time (min)	Detector	Efficiency	Bkg. (cpm)	Net Weight	Decay Corrected Activity Result (dpm/g)	Decay Corrected Activity Result (pCi/g)
S-0206-V1B	11.98	1	LSC	0.3328	1.62	5.040	6.18	2.78
S-0206-V2B	11.42	1	LSC	0.3186	1.62	5.010	6.13	2.76
S-0206-V3B	12.01	1	LSC	0.3360	1.62	4.990	6.19	2.79
S-0206-V4B	11.75	1	LSC	0.3275	1.62	5.010	6.17	2.78
S-0206-V5B	11.45	1	LSC	0.3196	1.62	5.020	6.13	2.76

	Average	6.16	2.77
	Two Sigma Uncertainty	0.06	0.02
10% Max *PASS*	Standard Deviation percent of known concentration	0.45%	0.45%
	Target Activity	6.24	2.81
5% Max *PASS*	% Diff	-1.27%	-1.27%

Verification Expiration Date: May 13, 2011

Prepared & Counted By: Jeremy Raber Date: 5/13/2010 0:00

Verified & Approved By: Eugene Mulligan Date: 5/14/2010

QC Approval: Amy Engel Date: 5/14/2010

S-0206		
H-3	Verified	*5/14/10*
SL	**Expires**	**5/14/11**
Manufactuer	**NIST**	
Sol Matrix	H2O	
Ref No	NIST 4361C	
Tech	M. Thibodeaux	
Parent ID	S-0152	

RADIOACTIVE STANDARDS -- BATON ROUGE LABORATORY

STD ID: S-0206

ARS INTERNATIONAL

Add/Edit *Secondary Stds*

Planning	
Planning Comments	Create a Low Level H3 LCS solution.
Target dpm/g (on dil. date)	6.66
Target Final volume mL	500
Appx mass g of Parent Sol'n	49.8188436
Appx vol ml of Parent Sol'n	49.91868096
Expected Addition for Analysis g	5

Standards Preparation / Dilution	
Secondary Solution #	S-0206
Dilution Date (New Ref Date)	02/25/2009 08:30
Ampoule, Empty (g)	
Ampoule /Solution Gross (g)	
Net Wt Removed (g)	
Transfer Container, empty (g)	103.64
Container Plus Solution (g)	153.45
Net Wt Transferred (g)	49.81
DPM Xferred on 02/25/2009 08:30	3329.408875
Diluent/matrix	Dead H2O
Diluent Density Cont, empty (g)	
Test Mass of 5 ml of Diluent (g)	
Diluent Density Test - (g/mL)	
Dilution Empty Container Mass (g)	198.75
Dilution Full Cont g (if measured)	697.31
Dilution Final Volume ml (if measured)	500
Final Dilution Density (g/mL)	0.99712
Final Dilution Measured Mass g	498.56
Comments	Use as H3LL LCS creation. Dilution performed as stated above by M Thibodeaux on 2/25/09. -BJS 2/25/09
Final Dilution dpm/g	6.678050535
Final Dil New Ref Date/Time	02/25/2009 08:30

Parent Standard Data

Parent Solution Reference #	NIST 4361C		
Parent Solution #	S-0152		
Parent Principal Radionuclide	H-3	Half Life (Days)	4499.8000000
Parent Reference Date	09/03/1998 11:00		
Parent Certified Act	120.54	Cert Act/Vol Units	dpm g
Parent Cert Act Uncert 1 Sigma	0.0076		
Parent Sp. Gravity G/Ml	0.998		
Parent Supplier	NIST		
Parent Date Recvd	12/04/06		
Parent Received By	LU		
Parent Cert Exp Data			
Parent Matrix	H2O		
Certified dpm/g At Ref Date	120.54		
Certified dpm/g on 02/25/2009 08:30	66.84217777		
Parent Comments	Liquid in a 500-ml borosilicate-glass media bottle with teflon-lined screw cap. Approximately 500 grams		
Parent Tech	M. Thibodeaux		
Is_Primary	FALSE		
Is_LCS	TRUE		
Is_Tracer	FALSE		
Is_Calib	FALSE		

Standards Activity as of: 03/02/11 08:49

Active	Std ID	Isotope	PSCLT	Verification Date	Exp Date	Status	Ref Date	Ref ACT (dpm)	ACT at Date Above (dpm/g)	Halflife (days)	Parent ID	Expended Date	Comments
A	S-0195	Ra-226	PC			Not Ver	06/24/08	7.7832E+02	777.4105	5.840E+05			Primary Ra-226 standard for calibration.
A	S-0196	Ra-226	SLC			Not Ver	07/03/08	2.3567E+02	235.3992	5.840E+05	S-0195		Calibration standard for Ra-226
A	S-0197	Ra-228	SL	11/11/10	11/11/11	OK	07/10/08	4.4972E+01	32.7047	2.100E+03	S-0127		LCS for Ra-228
A	S-0198	Ra-226	SL	09/24/09	09/24/10	EXP	07/07/08	1.4986E+03	1486.9276	5.840E+05	S-0193		[illegible]
A	S-0199	Ni-63	SL	04/14/10	04/14/11	OK	08/25/08	4.5399E+01	44.6162	3.660E+04	S-0178		Ni-63 LCS dilution with 7.5 mL of 2 mg/mL Ni carrier added to the soln
A	S-0200	Sr-89	PC			Not Ver	09/17/08	1.9942E+04	0.0916	5.053E-01			Primary Sr-89 calibration standard
A	S-0206	H-3	SL	05/14/10	05/14/11	OK	02/25/09	6.6781E+00	5.9632	4.500E+03	S-0152		Use as H3LL LCS creation. Dilution performed as stated above by M [illegible]ab
A	S-0210	Ba-133	PT			Not Ver	05/15/09	7.6431E+02	678.9627	3.840E+03			Primary Ba-133 tracer
A	S-0211	Ba-133	ST			Not Ver	05/18/09	4.5236E+02	402.0655	3.840E+03	S-0210		Intermediate level tracer solution. Dilution performed as stated above
A	S-0212	Ba-133	SLT	05/21/09	05/21/10	EXP	05/18/09	9.9546E+00	8.8477	3.840E+03	S-0211		[illegible]
A	S-0213	Ba-133	SLT	05/25/09	05/25/10	EXP	05/23/09	6.6543E+01	59.1979	3.840E+03	S-0211		
A	S-0215	C-14	P			Not Ver	09/03/90	5.4020E+04	53885.5647	2.082E+06			C-14 for Calibration use only (5 ml Ampoule)
A	S-0216	AM-241	P			Not Ver	05/16/07	1.0640E+02	105.7545	1.579E+05			Parent Am-241 Working Soln (1g in 5 ml NIST borosilicate-glass ampoule
A	S-0218	C-14	SC	08/05/09	08/05/10	EXP	07/22/09	2.0419E+05	294132.2897	2.082E+06	S-0215		[illegible]
A	S-0220	Am-241	P			Not Ver	08/19/09	2.6725E+01	26.6594	1.579E+05			No certificate for this standard on file in the QA office. NTIs is no
A	S-0221	Am-241	SL	08/05/10	08/05/11	OK	08/19/09	2.6725E+01	26.6594	1.579E+05	S-0220		[illegible]
A	S-0222	PU-242	PT	09/28/09	09/28/10	EXP	09/23/09	2.6314E+01	26.3142	1.365E+08			
A	S-0223	PU-242	SLT	10/06/10	10/06/11	OK	09/25/09	7.6699E+00	7.6699	1.365E+08	S-0222		[illegible]
A	S-0224	Ra-226	SL	11/11/10	11/11/11	OK	11/04/09	6.4243E+01	64.2063	5.840E+05	S-0198		Ra-226 LCS stock solution. Dilution performed as stated above by B Ste
A	S-0225	Sr-89	PC			Not Ver	10/01/09	1.0276E+05	85.4692	5.053E+01			Primary Sr-89 standard. 5 ml liquid in flame sealed vial.
A	S-0226	PU-239	SC	11/19/09	11/19/10	EXP	11/16/09	1.9777E+03	1977.6583	8.807E+06	S-0186		Pu-239 calibration standard. Dilution performed as stated above by B S
A	S-0227	U-238	PC			Not Ver	05/17/07	1.7557E+02	175.5667	1.632E+12			Primary U-238 calibration standard. 5ml liquid in flame sealed vial.
A	S-0228	U-238	SC	11/19/09	11/19/10	EXP	11/17/09	2.6904E+02	269.0445	1.632E+12	S-0227		Uranium standard for use in creating Alpha Spec check sources. Dilutio
A	S-0229	Sr-89	SC	11/18/09	07/28/10	EXP	11/18/09	1.7112E+04	27.4954	5.053E+01	S-0225		[illegible]
A	S-0230	U-238	PL			Not Ver	11/23/09	1.8617E+02	186.1684	1.632E+12			Primary U-238, 235, 234 standard. 5ml liquid in flame sealed vial.
A	S-0231	Th-230	SL	10/18/10	10/18/11	OK	02/19/10	1.2559E+01	12.5584	2.753E+07	S-0172		[illegible]
A	S-0232	Th-229	PT			Not Ver	01/28/05	1.1940E+02	119.3314	2.681E+06			
A	S-0233	Th-229	SLT	02/22/10	02/22/11	EXP	01/28/05	1.1940E+02	119.3314	2.681E+06	S-0232		[illegible]
A	S-0234	Sr-90	PL			Not Ver	03/04/10	4.5500E+02	444.1340	1.041E+04			Previously logged as T11c. Sr-90 standard to be used for creating LCS
A	S-0235	Sr-90	SL			Not Ver	03/12/10	4.4497E+01	43.4570	1.041E+04	S-0234		[illegible]
A	S-0236	Sr-90	SL	03/17/10	03/17/11	OK	03/17/10	4.8169E+01	47.0591	1.041E+04	S-0160		Sr-90 LCS standard. Dilution performed as stated above by B Steffens
A	S-0237	H-3	SL	03/22/10	03/22/11	OK	03/22/10	3.5037E+03	3322.3454	4.500E+03	S-0031		[illegible]
A	S-0240	Sr-90	SL	04/13/10	04/13/11	OK	04/13/10	4.8132E+01	47.1081	1.041E+04	S-0160		Painesville Sr-90 LCS standard. Dilution performed as stated above by
A	S-0241	U-232	ST	06/11/10	06/11/11	OK	06/09/10	9.1520E+00	9.0852	2.516E+04	S-0161		[illegible]
A	S-0242	Pu-239	PL			Not Ver	11/23/09	6.5202E+03	6519.9187	8.807E+06			Primary Pu-239 standard. 5ml liquid in flame sealed vial.
A	S-0243	Sr-90	PL	07/01/10	07/01/11	OK	07/01/09	1.3200E+00	1.2675	1.041E+04			[illegible]
A	S-0244	Th-230	PL	07/01/10	07/01/11	OK	07/01/09	6.5900E-01	0.6590	2.753E+07			Mapep air filter used as QC for LDEQ GB air filter particulate samples
A	S-0245	Fe-55	SC	08/18/10	08/18/11	OK	08/13/10	2.6617E+00	2.3109	9.860E+02	S-0183		[illegible]
A	S-0246	Th-229	ST	10/18/10	10/18/11	OK	09/20/10	1.1204E+01	11.2039	2.681E+06	S-0233		Th-229 tracer standard. Dilution performed as stated above by B Steffe
A	S-0247	H-3	SL	10/13/10	10/13/11	OK	10/11/10	5.6100E+00	5.4887	4.500E+03	S-0237		[illegible]
A	S-0248	Pu-242	PT			Not Ver	01/01/10	2.6770E+01	26.7699	1.365E+08			Primary Pu-242 standard in flame-sealed 5 ml borosilicate-glass ampoul
A	S-0249	C-14	PC			Not Ver	02/03/11	7.5243E+03	7514.2331	2.082E+06			Primary C-14 calibration standard.
A	S-0250	C-14	S	03/07/11	03/07/12	OK	02/17/11	4.7591E+00	4.7590	2.090E+06	S-0153		C-14 LCS standard. Dilution performed as stated above by B Steffens.
A	S-0251	C-14	SC	03/07/11	03/07/12	OK	02/21/11	1.1123E+04	11122.8495	2.082E+06	S-0249		[illegible]
I	S-0001	Am-241	S	04/30/08	04/30/09	EXP	03/16/06	5.1937E+01	51.5251	1.579E+05	S-0069	10/12/09	S-0001 Working level Am241 solution - Information entered from dilutio

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American Radiation Services Analytical Reports

for

Los Alamos National Laboratory

Folder Duplicate

Report Compilation Checklist

ARS SDG: 10-02491 **Client Name:** LANL **Sample Matrix:** AQ

LEVEL 1 COMPONENTS	1st Reviewer	
1) Cover Page Complete and Accurate (see ARS-059)?	~~Yes~~ No N/A	
2) Technical Review Checklist(s) Complete and Accurate?	~~Yes~~ No N/A	
3) Case Narrative Complete and Accurate (see ARS-059)?	~~Yes~~ No N/A	
4) Form 1s Present for all Samples and Tests?	~~Yes~~ No N/A	
5) Client Specific Components are Present and Complete?	~~Yes~~ No N/A	

LEVEL 2 COMPONENTS	1st Reviewer	
6) Batch Quality Control Report is Present and Accurate?	~~Yes~~ No N/A	
7) DQO Report is Present and Accurate?	~~Yes~~ No N/A	
8) Client Specific Batch QC Components are Present and Complete?	~~Yes~~ No N/A	

LEVEL 3 COMPONENTS	1st Reviewer	
9) Efficiencies are Present?	~~Yes~~ No N/A	
10) Calibrations are Present?	~~Yes~~ No N/A	
11) Backgrounds are Present?	~~Yes~~ No N/A	
12) Spectrum Analysis is Present?	~~Yes~~ No N/A	
13) Spectral Plots are Present?	~~Yes~~ No N/A	
14) Plateaus are Present?	~~Yes~~ No N/A	
15) Control Charts are Present?	~~Yes~~ No N/A	
16) Other:	Yes No ~~N/A~~	

LEVEL 4 COMPONENTS	1st Reviewer	
17) Preparation Raw Data Present, Signed and Complete?	~~Yes~~ No N/A	
18) Instrument Raw Data Present and Complete?	~~Yes~~ No N/A	
19) Calibration Certificates Present?	~~Yes~~ No N/A	
20) Copies of Log Book Pages Present?	~~Yes~~ No N/A	
21) Sample Receiving Documentation Present?	~~Yes~~ No N/A	
22) LIMS Reports Present?	~~Yes~~ No N/A	
23) Applicable Correspondence Present?	~~Yes~~ No N/A	
24) Other:	Yes No ~~N/A~~	

Susan Weese 3-14-11
Report Generator Signature Date

[illegible] 3-14-11
Management Review Signature Date

ARS-059
07/03/2009

LSC
Technical Review Checklist

ARS SDG ARS1-10-02491

Sample Matrix: AQ **Aliquot** (Circle One) : Dry As Received Filtered Other: _____

Required QC Samples (Mark all that apply): Blank LCS LCSD Sample Dup MS MSD

ARS A. Batch ID(s): **Batch A:** ARS1-B10-05618 **Batch B:** N/A **Batch C:** N/A

Test Method(s): LSC-A-022 N/A N/A

A. RADIOCHEMICAL PREPARATION REVIEW

	Chemist Review	Verifier Review
1) 100% of Manual Transcriptions Verified?	Yes No N/A	Yes No N/A
2) 100% of Manual Calculations Verified?	Yes No N/A	Yes No N/A
3) Blank Composition/Configuration Matches Calibration?	Yes No N/A	Yes No N/A
4) Deviations from procedure are documented and verified?	Yes No N/A	Yes No N/A
5) Appropriate Cocktail Selected?	Yes No N/A	Yes No N/A

6) Sample Prep Anomaly? ☑ No ☐ Yes (See Tech Notes) NCR # (If initiated): _____

Jenny D. Rahn 3-2-2011 — Chemist Signature, Date

Sue Jones 3-2-11 — Verifier Review Signature, Date

B. ANALYSIS REVIEW

	Analyst Review	QA Officer Review
1) Calibrations Valid and Current?	Yes No N/A	Yes No N/A
2) Backgrounds Valid and Current?	Yes No N/A	Yes No N/A
3) Source Checks Completed and Acceptable?	Yes No N/A	Yes No N/A

QA Officer Signature: [illegible] Date: 3-14-11

	Analyst Review	Technicial Review
4) Background Checks Complete and Acceptable?	Yes No N/A	Yes No N/A
5) 100% of Manually Entered Parameters Verified Accurate?	Yes No N/A	Yes No N/A
6) Appropriate QC samples initiated at required frequency?	Yes No N/A	Yes No N/A
6) Test/Sample Specific Parameters (See ARS-059 for details)		
a) Analysis Parameters Checked and Correct and Peak Shapes are Acceptable?	Yes No N/A	Yes No N/A
b) Spectra show no Evidence of Interferences?	Yes No N/A	Yes No N/A
c) Sample Quench for All Samples within Range of Quench Curve?	Yes No N/A	Yes No N/A

JDR 3-13-11

7) Analysis Anomaly? ☑ No ☐ Yes (See Comments) NCR # (If initiated): _____

Jenny D. Rahn 3-13-11 — Analyst Signature, Date

N/A — Technicial Reviewer Signature, Date

Batch A: ARS1-B10-05618

LSC
Technical Review Checklist

C. BATCH QC VALIDATION

	Proj. Mgr. Review			QA Officer Review		
1) Activity + 3xCSU a Negative Number?	Yes	~~No~~	N/A	Yes	~~No~~	N/A
2) RDL Criteria are Met?	~~Yes~~	No	N/A	Yes	No	N/A
3) Method Blank Criterion Met?	~~Yes~~	No	N/A	Yes	No	N/A
4) LCS/LCD Criteria Met?	~~Yes~~	No	N/A	Yes	No	N/A
5) Duplicate (Sample Duplicate, LCSD, MSD) Criteria Met?	~~Yes~~	No	N/A	Yes	No	N/A
6) MS/MSD Criteria Met?	Yes	No	~~N/A~~	Yes	No	N/A

7) Batch QC Anomaly? ☑ No ☐ Yes (See Tech Notes) NCR # (If initiated): _____

Project Manager Signature	Date	QA Officer Signature	Date
Susan Leex	3-14-11	[illegible]	3-14-11

GENERAL COMMENTS

LSC
Technical Review Checklist

ARS SDG ARS1-10-02491

Sample Matrix: AQ **Aliquot** (Circle One) : Dry As Received Filtered Other: _____

Required QC Samples (Mark all that apply): Blank LCS LCSD Sample Dup MS MSD

ARS A. Batch ID(s):	**Batch A:**	ARS1-B10-05617	**Batch B:**	N/A	**Batch C:** N/A
Test Method(s):		LSC-A-021		N/A	N/A

A. RADIOCHEMICAL PREPARATION REVIEW

	Chemist Review	Verifier Review
1) 100% of Manual Transcriptions Verified?	~~Yes~~ No N/A	~~Yes~~ No N/A
2) 100% of Manual Calculations Verified?	Yes No ~~N/A~~	Yes No ~~N/A~~
3) Blank Composition/Configuration Matches Calibration?	Yes No ~~N/A~~	Yes No ~~N/A~~
4) Deviations from procedure are documented and verified?	Yes No ~~N/A~~	Yes No ~~N/A~~
5) Appropriate Cocktail Selected?	~~Yes~~ No N/A	~~Yes~~ No N/A

6) Sample Prep Anomaly? ☑ **No** ☐ **Yes** (See Tech Notes) **NCR #** (If initiated): _____

Jimmy D. Rahn 12-7-2010 — **Chemist Signature** **Date**

Jamal Brown 12-7-10 — **Verifier Review Signature** **Date**

B. ANALYSIS REVIEW

	Analyst Review	QA Officer Review
1) Calibrations Valid and Current?	~~Yes~~ No N/A	(Yes) No N/A
2) Backgrounds Valid and Current?	~~Yes~~ No N/A	(Yes) No N/A
3) Source Checks Completed and Acceptable?	~~Yes~~ No N/A	(Yes) No N/A

VPM — **QA Officer Signature** 3-14-4 — **Date**

	Analyst Review	Technicial Review
4) Background Checks Complete and Acceptable?	~~Yes~~ No N/A	Yes No N/A
5) 100% of Manually Entered Parameters Verified Accurate?	~~Yes~~ No N/A	~~Yes~~ No N/A
6) Appropriate QC samples initiated at required frequency?	~~Yes~~ JDR 12-12-10 No ~~N/A~~	Yes No N/A
6) Test/Sample Specific Parameters (See ARS-059 for details)		
a) Analysis Parameters Checked and Correct and Peak Shapes are Acceptable?	~~Yes~~ No N/A	Yes No N/A
b) Spectra show no Evidence of Interferences?	~~Yes~~ No N/A	Yes No N/A
c) Sample Quench for All Samples within Range of Quench Curve?	~~Yes~~ No N/A	Yes No N/A

N/A JDR 12-12-10

7) Analysis Anomaly? ☑ **No** ☐ **Yes** (See Comments) **NCR #** (If initiated): _____

Jimmy D. Rahn 12-12-10 — **Analyst Signature** **Date**

N/A — **Technicial Reviewer Signature** **Date**

Batch A: ARS1-B10-05617

LSC
Technical Review Checklist

C. BATCH QC VALIDATION

	Proj. Mgr. Review	QA Officer Review
1) Activity + 3xCSU a Negative Number?	Yes No ~~N/A~~	Yes No (N/A)
2) RDL Criteria are Met?	Yes No ~~N/A~~	Yes No (N/A)
3) Method Blank Criterion Met?	Yes No ~~N/A~~	Yes No (N/A)
4) LCS/LCD Criteria Met?	Yes No ~~N/A~~	Yes No (N/A)
5) Duplicate (Sample Duplicate, LCSD, MSD) Criteria Met?	Yes No ~~N/A~~	Yes No (N/A)
6) MS/MSD Criteria Met?	Yes No ~~N/A~~	Yes No (N/A)

7) Batch QC Anomaly? ☑ No ☐ Yes (See Tech Notes) NCR # (If initiated): _____

Susan Reese 3-14-11
Project Manager Signature Date

VHM 3-14-11
QA Officer Signature Date

GENERAL COMMENTS

SDG Report - Samples and Containers

SDG Specific Data

SDG	ARS1-10-02491	TAT Days	30	Project Type	Environmental
Sample Count	Rpt Level 4	Date Received	11/16/2010	COC Number	11-473C
Client	Los Alamos National Laboratory	Client Deadline	12/16/2010	PO Number	63641-001-10
Client Code	114	Internal Deadline	12/15/2010	Job Number	WEPR1158W100
Profile Number	PN-00094	Lab Deadline	12/13/2010	Job Location	
Comments					

Samples and Containers (➔) Checked In Thus Far

FR	ClientID	Matrix	SampleStartDate	SampleEndDate	Disp	Hold	Arch	Storage	X	Units	Y	Units	Z	Units	Comments
001	Buckman1-11-1944	AQ	11/10/10 12:00 PM	11/10/10 12:00 PM	H	90	5	LL3H							
➔	IC_ID	Cnt	Volume_mL	Wt_g	pH_Orig	pH_Final	CPM	uR_Hr	Storage	VOA	Head Sp	AF Units	AF Rate	AF Mins	AF Total Vol
	75204	1	1000.00				30	13		N	N/A				
002	Buckman06-11-1970	AQ	11/10/10 12:00 PM	11/10/10 12:00 PM	H	90	5	LL3H							
➔	IC_ID	Cnt	Volume_mL	Wt_g	pH_Orig	pH_Final	CPM	uR_Hr	Storage	VOA	Head Sp	AF Units	AF Rate	AF Mins	AF Total Vol
	75205	1	1000.00				35	12		N	N/A				
003	Buckman08-11-2042	AQ	11/10/10 12:00 PM	11/10/10 12:00 PM	H	90	5	LL3H							
➔	IC_ID	Cnt	Volume_mL	Wt_g	pH_Orig	pH_Final	CPM	uR_Hr	Storage	VOA	Head Sp	AF Units	AF Rate	AF Mins	AF Total Vol
	75206	1	1000.00				30	13		N	N/A				

SDG Report - Analysis Assignments

Temp SDG	ARS1-10-02491	Sample Count	[illegible]
Client	Los Alamos National Laboratory	Analysis Count	2-6

Samples Count Totals per Analysis

Analysis Code	Analysis Description	Samples Count
LSC-A-021	Low Level Tritium Screen in (Aqueous)	3
LSC-A-022	Low Level Tritium by Enrichment Process in (Aqueous [AQ])	3

Analyses Assigned Per Fraction

Fraction	Analysis Code	X = Assigned
001	LSC-A-021	X
001	LSC-A-022	X
002	LSC-A-021	X
002	LSC-A-022	X
003	LSC-A-021	X
003	LSC-A-022	X

DQO Report for SDG
ARS1-10-02491

Analysis Code	Group	Isotope	Activity Units	Aliquot Units	ProcedureNo	RDL	LCS_LL	LCS_UL	MS_LL	MS_UL	RadY_LL	RadY_UL	GravY_LL	GravY_LL	RER	RPD	DiltionReq	RoughPrepReq	BlankCorrectionMDA	BlankCorrectionAll	CountTimeReq	AliquotRequired
LSC-A-021	STC	H-3		TU	ARS-054	0.00E+00	75	125	60	140	30	110	40	110	1.00	25	FALSE	FALSE	FALSE	FALSE		
LSC-A-022	STC	Enriched H-3		TU	ARS-054	0.00E+00	75	125	60	140	30	110	40	110	1.00	25	FALSE	FALSE	FALSE	FALSE		

ARS FILE TRACKING SHEET

SDG: ARS1-10-02491

Task	Date / Time	Initials
Date & Time Samples Received	11-16-10/11:08	CWB
ICOC Initiated / Storage Location: LL3H	11-16-10/11:52	CWB
Technical Checks Performed	See Batch	—
Report Written / EDD Generated: 3-14-11 / 1120 | SDL (Date/Time, Initials)	3-14-11/1120	SDL
Quality Assurance Checks Performed on Report	3-14-11 1528	VM
Management Check Performed on Report		
Preliminary Report Sent		
Report E-mailed		
Report Faxed		
Report Reviewed		
Report Mailed		
Invoice Completed Invoice #:_____		
Report Imaged		

SPECIAL REQUIREMENTS

Requirement	Yes	No
3 Hour Rush		✓
24 Hour Rush		✓
48 Hour Rush		✓
Special Invoicing *see notes* Mgmt. Approval:_____		✓

NOTES:

ARS-062
04/23/2010

COMPANY NAME: Los Alamos National Lab. **SDG:** ARS1-10-02491

SHIPPING CONTAINER

Good Condition	☑ Yes	☐ No
Radioactive	☐ Yes	☑ No
UN2910	☐ Yes	☑ No
Sec. Seals	☑ Yes	☐ No
Seals Intact	☑ Yes ☐ No ☐ N/A	
Air Bill	☐ Yes	☑ No

COC PRESENT WITH SAMPLES

COC	☑ Yes	☐ No

SAMPLE CONTAINER(S)

Good Condition	☑ Yes	☐ No
Sec. Seals	☑ Yes	☐ No
Seal Intact	☑ Yes ☐ No ☐ N/A	
Marked Radioactive	☐ Yes	☑ No

Samples Rcv 3

Matrix [AF , (AQ), BI , FE , LT , SI , SO , UR , VG]

External and Internal Surveys

Exposure Rate Meter:	M3 242361	Serial No.:	M44-2 PR264266	Calibration Due Date:	4-19-11
Count Rate Meter:	M2 154859	Serial No.:	M44-9 PR184559	Calibration Due Date:	4/6-11

Background Exposure Rate (µR/hr)	22	Max. Exposure Rate on Shipping Containers Externals (Plus Bkgd)	20	µR/hr
Background Count Rate (cpm)	50	Max. Removable Count Rate on Shipping Containers Externals (Plus Bkgd)	60	cpm
		Max. Removable Count Rate on Shipping Containers Internals (Plus Bkgd)	60	cpm

Sample Label/Comments/Notes	pH Orig (pH ≤ 2 is Acceptable)	pH Final	Mark if Preserve	Acid Lot #	Weight(g) / Volume(mL)	µR/hr (Acceptance Limits <500 µR/hr)	cpm (Acceptance Limits <100 cpm/cm²)
Buckman-11-1944					1000	13	30
Buckman-11-1970					1000	12	35
Buckman-11-2042					1000	13	30

Surveyors' Name: [signature] Date/Time Surveyed: 11-10-10 / 11:20

S:\Procedures_Controlled\Controlled Forms\ARS-062 Sample Receipt Inspection Form

DISCREPANT SAMPLE RECEIPT REPORT

For Sample Receiving Use

SDG: _____ **Receipt Date/Time:** _____/_____ **Matrix:** _____

Client Name: LANL

Problem Description:

The following; Buckman 06-11-1970, Buckman 08-11-2042, and Buckman 1-11-1944 are present but missing COC

For Project Manager Use

Client Notified (Y | N): _____ **Date/Time Client Notified:** 11·12·10 / 11:04

Client/PM Resolution:

emailed Keith & Joylene
They mailed us a COC for these
3 samples (Req # 11-473)

Client Notified that TAT Starts from Resolution of DSRR (Y | N): _____

Date/Time DSRR Resolved: 11·16·10 / 10:35 **PM Initials:** SDL

For Sample Receiving Use

Action Taken:

Receive the COC and checked in samples as normal.

Signature: [signature] **Date/Time:** 11/6/10 / 11:08
Sample Custodian

ARS-062-002 r1 S:\Procedures_Controlled/Control Forms

Table 1.0
Buckman Wells Nos. 1, 6, and 8
Low-Level Tritium

Location Name	Start Date	Analyte	Analyte Desc	Anyl Meth Code	Fld Prep Code		Std Result	Units	Std Uncertainty (1s)	Std Mda	Lab Qual Code	Concat Flag Code	Fld Qc Type Code	Lab Code	Sample Id
Buckman 1	11/10/2010	H-3	Tritium	Generic:Low_Level_Tritium	UF		3.45	pCi/L	0.93	2.40				ARSL	Buckman1-11-1944
Buckman 6	11/10/2010	H-3	Tritium	Generic:Low_Level_Tritium	UF		3.32	pCi/L	0.89	2.30				ARSL	Buckman06-11-1970
Buckman 8	11/10/2010	H-3	Tritium	Generic:Low_Level_Tritium	UF		3.26	pCi/L	0.86	2.27				ARSL	Buckman08-11-2042

Table 2.0
Buckman Wells Nos. 1, 6, and 8
Field Parameters

Location Name	Start Date	Analyte	Analyte Desc	Fld Prep Code	Result	Units	Lab Code	Sample Id
Buckman 1	11/10/2010	DO	Dissolved Oxygen	UF	6.69	mg/L	FLD	Buckman1-11-1944
Buckman 1	11/10/2010	ORP	Oxidation Reduction Potential	UF	308.1	mV	FLD	Buckman1-11-1944
Buckman 1	11/10/2010	SPEC_CONDC	Specific Conductance	UF	435	uS/cm	FLD	Buckman1-11-1944
Buckman 1	11/10/2010	TEMP	Temperature	UF	18.03	deg C	FLD	Buckman1-11-1944
Buckman 1	11/10/2010	TURB	Turbidity	UF	0.37	NTU	FLD	Buckman1-11-1944
Buckman 1	11/10/2010	pH	pH	UF	7.99	SU	FLD	Buckman1-11-1944
Buckman 6	11/10/2010	DO	Dissolved Oxygen	UF	5.86	mg/L	FLD	Buckman06-11-1970
Buckman 6	11/10/2010	ORP	Oxidation Reduction Potential	UF	486.3	mV	FLD	Buckman06-11-1970
Buckman 6	11/10/2010	SPEC_CONDC	Specific Conductance	UF	638	uS/cm	FLD	Buckman06-11-1970
Buckman 6	11/10/2010	TEMP	Temperature	UF	20.15	deg C	FLD	Buckman06-11-1970
Buckman 6	11/10/2010	TURB	Turbidity	UF	2.13	NTU	FLD	Buckman06-11-1970
Buckman 6	11/10/2010	pH	pH	UF	6.58	SU	FLD	Buckman06-11-1970
Buckman 8	11/10/2010	DO	Dissolved Oxygen	UF	5.6	mg/L	FLD	Buckman08-11-2042
Buckman 8	11/10/2010	ORP	Oxidation Reduction Potential	UF	350.3	mV	FLD	Buckman08-11-2042
Buckman 8	11/10/2010	SPEC_CONDC	Specific Conductance	UF	560	uS/cm	FLD	Buckman08-11-2042
Buckman 8	11/10/2010	TEMP	Temperature	UF	22.82	deg C	FLD	Buckman08-11-2042
Buckman 8	11/10/2010	TURB	Turbidity	UF	3.73	NTU	FLD	Buckman08-11-2042
Buckman 8	11/10/2010	pH	pH	UF	7.21	SU	FLD	Buckman08-11-2042

Table S5-7 Secondary Validation Reason Codes

Valid Rea	Valid Reason Desc
C12d	VOC_C12d
DR12a	ORGANIC_ODRO12a
DR3b	ORGANIC_ODRO3b
DR9a	ORGANIC_ODRO9a
G_LIA	The sample was lost in analysis. Results are not available for this sample.
G_MDA	The limit type (e.g. MDA, MDC, or DLC) was not reported by the analytical laboratory; the reported limit value has been saved in the MDA field.
G_NQ	No data qualifier flag has been applied to this sample result.
G_TPU	Result less than or equal to 3 * 1-sigma TPU, therefore not detected (U).
G165b	GAMMA_GR165b
G165c	GAMMA_GR165c
G16b	GAMMA_G16b
G16bc	GAMMA_GR16bc
G16c	GAMMA_G16c
G3TPU	The sample result is less than or equal to three times the 1-sigma total propagated uncertainty.
G9a	GAMMA_G9a
G9ra	GAMMA_G9ra
GADM1	GAMMA_GADMIN1
GADMI	GAMMA_GADMIN1
GCZ	CST put zeros in the TPU field to indicate non-detects, therefore not detected (U).
GI16b	GAMMA_GI16b
GI16c	GAMMA_GI16c
GI16d	GAMMA_GI16d
GI4	GAMMA_GI4
GI5	GAMMA_GI5
GIQ	GIQ
GIR16	GAMMA_GIR16c
GJCST	Chemical Sciences and Technology validators assigned a J qualifier to this sample result. The hardcopy validation report should be reviewed to determine the reason for applying the J qualifier.
GJLAB	GJLAB_GAMMA
GLCS	The percent recovery from the laboratory control sample for this analyte was less than 10%.
GNONE	A reason code is not available in the database for the data qualifier(s) applied to this sample result.
GNPO	The reported result should be regarded as rejected because no peak was observed for this radionuclide in the gamma spectrum.
GNQ	The reported result should regarded as rejected because the the gamma spectrum peak was not quantitated.
GR1	The tracer yield information is missing. Data may not be acceptable for use.
GR10	GAMMA_GR10
GR10a	GAMMA_GR10a
GR11	GAMMA_GR11
GR15b	GAMMA_GR15b
GR15c	GAMMA_GR15c
GR16	GAMMA_GR16
GR165	GAMMA_GR165b
GR166	GAMMA_GR166
GR16a	GAMMA_GR16a
GR16b	GAMMA_GR16b
GR16c	GAMMA_GR16c
GR16d	GAMMA_GR16d
GR16g	GAMMA_GR16g
GR17c	GAMMA_GR17c
GR19	The validator identified quality deficiencies in the reported data that require qualification.
GR1a	The tracer %R value is less than 10%.
GR1c	The MDC for the affected analytes are qualified as estimated because the associated tracer recoverywas less than 30% but greater than 10% and the result is a non-detect.
GR1d	The results for the affected analytes are qualified as estimated and biased high because the associated tracer yield was greater than 105%.
GR3	The matrix spike information is missing. Data may not be acceptable for use.
GR3a	ORGANIC_OGRO3a
GR3b	ORGANIC_OGRO3b
GR3c	ORGANIC_OGRO3c
GR3d	ORGANIC_OGRO3d
GR3e	The results for the affected analytes are qualified as estimated and biased low because the associate matrix spike recovery was less than the LAL but greater than 10%, and the results are non-detect.
GR4	GAMMA_GR4
GR4a	The resluts for the affected analytes should be regarded as not-detected (U) because the associated sample concentration is less than or equal to 5x the associated sample concentration.
GR5	GAMMA_GR5
GR54	GAMMA_GR54
GR5a	The MDC and/or TPU documentation is missing. Data may not be acceptable for use.
GR5b	GR5b
GR6	GAMMA_GR6
GR6a	GR6a
GR6b	The results for the affected analytes should be regarded as rejected because the LCS %R was less than 10%.
GR6c	The results for the affected analytes are qualified as estimated and biased low because the associated LCS was less than the LAL but greater than 10%, and the results are detected.
GR6d	The results for the affected analytes are qualified as estimated and biased low because the associated LCS was less than the LAL but greater than 10%, and the results are non-detect.
GR6e	GR6e
GR7	GAMMA_GR7
GR7a	The results for the affected analytes are qualified as estimated because the associated duplicate results were prepared separately from the original analysis.
GR7b	GAMMA_GR7b
GR7c	The affected analytes are qualified as as rejected because the RER was greater than 4
GR8	GAMMA_GR8
GR9	GAMMA_GR9
GR9a	GAMMA_GR9a
GR9b	GAMMA_GR9b
GRA	GAMMA_GRA
GRLAB	R Lab Gamma
GRNA	GAMMA_GRNA
GRR16	GAMMA_GRR16c
GRR1b	GAMMA_GRR1b
GRR6c	GAMMA_GRR16c
GSI	The reported result for this radionuclide should be regarded as rejected (R) due to spectral interference in the gamma spectrum.
GTI	The reported result should be regarded as rejected because the radionuclide identification based on the gamma spectrum is tentative.
GUJC	This analyte should be regarded as not detected because the analytical laboratory assigned a U lab qualifier. Chemical Sciences and Technology validators assigned the J qualifier. The hardcopy validation report should be reviewed to determine the reason for applying the J qualifier.
GULAB	This analyte should be regarded as not detected because the analytical laboratory assigned a U lab qualifier.
GUP_R	Gamma:Units and matrix inconsistent.
GZR	The result for this radionuclide was reported as zero (0); therefore this analyte should be regarded as not detected.
GZUNC	Chemical Sciences and Technology division reported this result with an uncertainty value of zero(0), indicating that this analyte should be regarded as not detected.
H10	The affected analytes are considered suspect because the sample was diluted without any target analytes identified due to matrix interference.
H11	The required retention time information is missing. Data may not be acceptable for use.
H11a	The affected analytes should be regarded as rejected because the associated retention times have shifted by more than 0.05 minutes from the initial calibration.
H12	Required LCS data are missing. The LCS analyte recoveries could not be evaluated. Data may not be acceptable for use.
H12a	H12a
H12b	HEXP_H12b
H12c	HEXP_H12c
H12d	HEXP_H12d
H14a	Insufficient sample volume was received for a matrix spike and/or a matrix spike duplicate analysis.
H14b	The matrix spike and/or the matrix spike duplicate analyses were not performed on a sample associated with a LANL request number.
H14c	The matrix spike and/or the matrix spike duplicate were analyzed on a sample associated with a different LANL request number but no summary was included.
H15	Because the sample was damaged, lost, or of insufficient quantity, the laboratory was unable to analyze it.
H16	Required calibration information is missing or samples were analyzed on an expired calibration. Data may not be acceptable for use.
H19	The validator identified quality deficiencies in the reported data that require qualification.
H3	The surrogate percent recovery is greater than the UAL, which indicates the potential for a high bias in the results and the potential for false positive results
H3a	The surrogate percent recovery is less than the LAL but greater than 10%R, which indicates the potential for a low bias in the detected results.
H3b	The surrogate is less than 10%R, which indicates the potential for a severely low bias in the results.
H3c	The reporting limit is approximated for nondetects because a surrogate percent recovery is lower than the LAL but greater than or equal to 10%R, which indicates an increased potential for false negative results.
H3d	The surrogate recovery is less than 10% and the result is a nondetect, which indicates significant potential for false negative results.
H3e	At least one surrogate percent recovery exceeds its upper UAL and at least one surrogate is less than its LAL, which indicates a greater than normal degree of uncertainty in the data.
H3f	At least one surrogate is less than 10%R and the sample result is a detect, which indicates the potential for a severely low bias ir results.
H3g	Required surrogate information is missing. Data may not be acceptable for use.
H4	The sample result is greater than the EQL and less than five times the concentration of the related analyte in the blank, which indicates that the reported detection is considered indistinguishable from blank contamination.
H4a	The affected analytes are considered estimated and biased high because this analyte was identified in the method blank but was greater than 5x.
H4b	Required method blank information is missing. Data may not be acceptable for use.
H5	The sample result is less than the EQL and less than five times the concentration of the analyte in the method blank, which indicates the reported detection is considered indistinguishable from contamination in the blank.
H5a	Method-blank data is missing, or method blank was not analyzed. Data may not be acceptable for use.
H6	The recovery of the LCS analyte is greater than the UAL, which indicates the potential for high bias in the results and for false positive results.
H6a	HEXP_H6a
H6b	The of the LCS analyte percent recovery is less than the LAL and greater than or equal to 10%R, which indicates (1) the reporting limit is approximate and probably biased low for nondetected results, and (2) that detected results likely are biased low.
H6c	H6c
H6d	The result is a nondetect and the %R value of surrogates or the analyte in the LCS is less than 10%R, which indicates a greatly increased potential for false negative results.
H7	The affected results were not analyzed with a valid 5 point calibration cuvre and/or a standard at the reporting limit.
H7a	HEXP_H7a
H7c	The affected analytes should be regarded as estimated and/or rejected because the associated analyte did not have a standard at the reporting limit.
H8	HEXP_H8
H8a	The required confirmation column analysis data is missing. Data may not be acceptable for use.
H9	The holding time is exceeded. The data user should conduct a technical evaluation of the data of interest with respect to the effects of exceeding the holding time. Factors to consider include how long the holding time was exceeded, sample preservation, sample storage practices, use of the data, levels of contamination found in the sample, and the physical, chemical, and biological stability of the target analytes in the sample matrix.
H9a	H9a
H9b	HEXP_H9b
Hba	HEXP_Hba
HEQLM	The result should be regarded as estimated (J) because the result was less than the EQL, but greater than the MDL.
HERB	ORGANIC_HERB 3A
HERB1	ORGANIC_HERB12A
HERB3	ORGANIC_HERB3
HERB4	ORGANIC_HERB4
HERB8	ORGANIC_HERB8
HERB9	ORGANIC_HERB9
HHOLD	The result should regarded as rejected (R) because the holding time was exceeded by more than 2 times.
HJCST	CST assigned the J qualifier, need hard-copy to determine CST's reason.
HNONE	No reason for historic HEXP data.
HNQ	HNQ
HQCBL	The J or R qualifier should not be accepted because the qualifier was assigned by CST based on a non-certified standard. The J or R qualifier should be ignored.
HR12a	ORGANIC_HERB12A
HR12b	ORGANIC_HERB12B
HR12c	ORGANIC_HERB12C
HR12d	ORGANIC_HERB12D
HR3a	ORGANIC_HERB 3A
HR3b	ORGANIC_HERB 3D
HR3d	ORGANIC_HERB3D
HR9	ORGANIC_HERB 9
HRLAB	R Lab HEXP
HSM	HEXP_SPECTRAL MATCH
HUJCS	This analyte should be regarded as not detected because the laboratory assigned a U lab qualifier. CST assigned the J qualifier, need hard-copy to determine CST's reason.
HUJL	HUJL
HUJLA	HUJLA_HEXP
HULAB	This analyte should be regarded as not detected because the laboratory assigned a U lab qualifier.
HWQ1	Relative percent difference of the MS/MSD is greater than the acceptance criteria.
HWQ10	Calibration Verification %D exceeded 60%
HWQ2	The spike percent recovery value is greater than or equal to the upper acceptance limit and the result is a detect, which indicates a potential high bias in the sample results.
HWQ3	The spike percent recovery value is greater than 10% and less than the lower acceptance limit, which indicates a potential low bias in the results.
HWQ4	The spike percent recovery value is less than 10% which increases the potential for false negatives being reported. This could be caused by analytical interferences.
HWQ5	Non-specified quality control failure - see validation report
HWQ6	The sample was improperly preserved.
HWQ7	Calibration % RSD was greater than the acceptance criteria but less than 60%
HWQ8	Calibration % RSD was greater than 60%
HWQ9	Calibration verification %D exceeded acceptance criteria but was less than 60%
I	INORGANIC_I
I1	The sample result was reported as detected between the IDL and the EDL. Reported result may be less precise than results which are reported as being above the EDL.
I10	The duplicate sample RPD is greater than the advisory limit and the sample result is a detect. Manual review is suggested to determine the source of the difference between analyses.
I10a	The duplicate sample RPD is greater than the advisory limit and the sample result is a nondetect. Manual review is suggested to determine the source of the difference between analyses.
I10b	The affected analytes should be regarded as estimated because the duplicate results were not analyzed on a LANL sample.
I10c	The affected analytes should be regarded as estimated because the duplicate results exceeded the RPD requirements.
I10d	The affected analytes should be regarded as estimated because the duplicate results were greater than 2x the RL and the RPD was greater than 20 for wates and 35 for soils.
I110	INORGANIC_I110
I113a	INORGANIC_I113a
I114b	INORGANIC_I114b
I13	INORGANIC_I13
I134b	INORGANIC_I134b
I13a	Insufficient sample volume was received for a duplicate-sample analysis.
I13b	The duplicate-sample analysis was not performed on a sample associated with this request number.
I13d	INORGANIC_I13d
I14	I14
I14a	Insufficient sample volume was received for a matrix-spike analysis.
I14b	The matrix-spike analysis was not performed on a sample associated with this request number.
I15	The sample was damaged, lost, or there was insufficient quantity and the analytical laboratory was unable to analyze it.
I15a	An ICV was not reported for this sample.
I15b	A CCV was not reported for this sample.
I16	Relative percent difference is greater than 10% in the serial dilution sample.
I16a	The affected analytes should be regarded as rejected because the ICV/CCV recovered high.
I16b	INORGANIC_I16b
I16c	The affected analytes should be regarded as estimated because the ICV/CCV recovered low.
I16d	The affected analytes should be regarded as rejected because the ICV/CCV recovered less than 10%.
I16e	The affected analytes should be regarded as rejected because the initial calibrations corralation coefficient was less than 0.995
I16z	The affected analytes should be regarded as rejected because the ICV/CCV was not analyzed with the associated samples.
I17d	INORGANIC_I17d
I18	The affected analytes should be regarded as estimated because a serial dilution sample was not analyzed.
I18a	The affected analytes should be regarded as estimated because a serial dilution sample was not analyzed on a LANL sample.
I18b	The affected analytes should be regarded as estimated because the serial dilution sample RPD exceeded criteria.
I19	INORGANIC_I19
I1a	INORGANIC_I1a
I20	INORGANIC_I20
I24b	INORGANIC_I24b
I2h	INORGANIC_I2h
I3	The spike percent recovery value is greater than or equal to the upper acceptance limit (125%) but less than or equal to 150% and the result is a detect, which indicates a potential high bias in the sample results.
I3a	The spike percent recovery value is greater than 30% and less than the lower acceptance limit (75%), and the sample result is a detect, which indicates a potential low bias in the results.
I3b	INORGANIC_I3b
I3c	INORGANIC_I3c
I3d	The spike percent recovery value is less than 30%, and the result is a nondetect, which increases the potential for false negatives being reported. This could be caused by analytical interferences.
I3e	The spike percent recovery value is greater than 30% and less than the lower acceptance limit (75%), and the sample result is a nondetect, which indicates a potential for false negatives being reported.
I3e I	INORGANIC_I3e I4
I3eI4	INORGANIC_I3e I4
I3f	The spike percent recovery value is less than 30% and the sample result is a detect, which indicates a potential low bias.
I3g	The sample result is undetected and the spike percent recovery value is greater than 150%, which indicates a potential bias in the sample result.
I3h	The sample result is detected and the spike percent recovery value is greater than 150%, which indicates a potential high bias in the sample result.
I3j	INORGANIC_I3j
I3l	INORGANIC_I3l
I4	INORGANIC_I4
I4a	In comparison with the preparation blank, the sample result is greater than the EDL but less than or equal to five times the concentration of the related analyte in the blank.
I4b	Preparation blank data was not reported by the analytical laboratory.
I5	The sample result is less than the estimated detection limit (EDL) and is considered to be not detected.
I6	The percent recovery value of the analyte in the LCS is greater than the upper acceptance limit, which indicates a potential for quantitation problems in the analyses and the potential for false positive results being reported.
I6a	The percent recovery value of the analyte in the LCS is less than the lower acceptance limit and the analyte is a detect, which indicates a potential for quantitation problems in the analyses and the potential for false negative results being reported.
I6b	The percent recovery value of the analyte in the LCS is less than the lower acceptance limit and the analyte is a nondetect, which indicates a potential for quantitation problems in the analyses and the potential for false negative results being reported.
I6c	The corresponding LCS or LCS analyte was not analyzed with the associated batch.
I7	The ICS percent recovery value is greater than 120% and the result is a detect, which indicates potential quantitation problems in the analyses and the potential for false positive results being reported.
I7a	The ICS percent recovery value is greater than or equal to 50% and less than 80% and the result is a detect, which indicates a potential for a low bias.
I7b	The ICS percent recovery value is less than 50%, which indicates a greatly increased potential for false negative sample results being reported.
I7c	The ICS percent recovery value is greater than or equal to 50% and less than 80%, and result is a nondetect, which indicates a potential for false negative results being reported.
I7d	The ICS data was not provided by the analytical laboratory.
I9	The holding time is exceeded. Positive results may be biased low and nondetected analytes may be false negatives. An evaluation of the data with respect to the technical implications of exceeding the holding time is recommended. Factors to consider include sample preservation; sample storage practices; data use; levels of contamination found in the sample; and the physical, chemical, and biological stability of the target analytes in the sample matrix.
I9a	The affected analytes should be regarded as estimated because the extraction holding time was exceeded by 2 times the acceptable holding time.
IADM1	INORGANIC_IADMIN1
IADMI	INORGANIC_IADMIN1
IB	Instrument broken
ICSTZ	CST put zeros in the TPU field to indicate non-detects, therefore not detected (U).
Id	INORGANIC_Id
IDRPD	IDRPD
IEQL	INORGANIC_IEQL/MDL
IEQL/	INORGANIC_IEQL/MDL
IH6a	INORGANIC_IH6a
IHOLD	IHOLD
IICP	IICP
IJCST	CST assigned the J qualifier, need hard-copy to determine CST's reason.
IJLAB	IJLAB
ILCS	ILCS
ILIA	ILIA
ILOWS	VOC_LOWSTD
ILS	VOC_LOW STD
IMS10	IMS10
IMS30	IMS30
INONE	No Reason for historical inorganic data
INQ	INQ
IPM	INORGANIC_IPM
IQCBL	IQCBL
IR10b	INORGANIC_IR10b
IR14b	INORGANIC_IR14b
IR3	INORGANIC_IR3
IR3a	INORGANIC_IR3a
IR4	INORGANIC_IR4
IR5	INORGANIC_IR5
IR6a	INORGANIC_IR6a
IR7	INORGANIC_IR7
IR9a	INORGANIC_IR9a
IR9b	INORGANIC_IR9b
IRCST	CST assigned the R qualifier, need hard-copy to determine CST's reason.
Is	INORGANIC_Is
IU1	INORGANIC_IU1
IU3e	INORGANIC_IU3e
IUA	INORGANIC_IUA
IUJCS	This analyte should be regarded as not detected because the laboratory assigned a U lab qualifier. CST assigned the J qualifier, need hard-copy to determine CST's reason.
IUJLA	IUJLA
IULAB	This analyte should be regarded as not detected because the laboratory assigned a U lab qualifier.
IUP_R	Inorganic:Units and matrix inconsistent.
IUUJ	This analyte should be regarded as not detected because the laboratory assigned a U lab qualifier. CST assigned the J qualifier, need hard-copy to determine CST's reason.
IV3a	INORGANIC_IV3a
IWQ1	The sample temperature was elevated
IWQ2	Negative blank samples results were greater than the MDL
IWQ3	Failed serial dilution RPD
IWQ4	Sample should have been preserved by acidification, but was not. Error not corrected at laboratory.
IWQ5	Sample should not have been acidified, but was. Error could not be corrected at laboratory.
IWQ6	Non-specified quality control failure - see validation report
IWQ7	Reporting limit verification recovery was greater than the acceptance criteria
IZR	IZR
J-	VOC_J-
J_LAB	The analytical laboratory qualified the detected result as estimated (J) because the result was less the PQL but greater than the MDL
J+	VOC_J+
LB	Gross contamination exists from a source other than the standard.
LB1	Method-blank data is missing, or method blank was not analyzed at the required frequency.
LB2	ICB/CCB data is missing, or ICB/CCB was not run at the required frequency.
LB9	The sample result is less than five times the concentration of the related analyte in the blank.
LC1	The frequency of the CCV did not meet method criteria.
LC2	The CCV %D failed high.
LC3	The CCV %D failed low.
LCO	Suspected carry over. Compound detected in sample at value < 5X PQL. The previous sample had a value > high standard and required dilution.
LDL1	No CRI was analysed to verify the reporting limit.
LDL2	The CRI recovery failed high.
LDL3	The CRI recovery failed low.
LDS1	An initial dilution was performed and the surrogate recovery was >/= 10% OR < 10% but some sample results are > PQL.
LDS2	An initial dilution was performed and the surrogate recovery was 0% and sample results are non-detect.
LDS3	The sample result in a diluted sample was non-detect.
LDS4	The instrument response for a diluted sample result was < half the lowest calibration standard and the sample result is detect.
LH1	The holding time is exceeded for sample analysis
LH2	The holding time is exceeded for sample extraction
LH3	The holding time is exceeded by greater than twice the specified holding time
LI	Required calibration information is missing or samples were analyzed on an expired calibration. Data may not be acceptable for use.
LI2	A second source ICV (or second standard made from the same stock) was not used to verify the Ical.
LI3	The initial calibration %RSD or correlation coefficient failed to meet acceptance criteria.
LI4	The initial calibration slope or RF criteria were not met.
LI5	The initial calibration y-intercept criteria were not met.
LI6	An insufficient number of calibration standards were used and/or all standards were not analyzed within a 24 hour period. Data may not be acceptable for use.
LI7	Points were removed from the calibration curve and the reporting limits were not adjusted accordingly.
LIR1	Chorine isotope ratio criteria not met.
LIS	Required IS information is missing.
LIS1	The IS area count failed high.
LIS2	The IS area count failed low.
LIS4	The IS RT is > 30secs from that of the associated standard.
LIV2	The ICV %D failed high.
LIV3	The ICV %D failed low.
LL1	The frequency of the LCS did not meet the specified criteria.
LL2	The LCS %R failed high.
LL3	The LCS %R failed low.
LL4	The LCS %Rs failed both high and low, or the LCS/LSCD RPD failed to meet criteria.
LMS1	An applicable MS/MSD analysis was not performed.
LMS2	The MS/MSD %R failed high.
LMS3	The MS/MSD %R failed low.
LMS4	Relative percent difference of the MS/MSD is greater than the acceptance criteria or the recoveries fail both high and low.
LOW S	VOC_LOW STD
LOWST	VOC_LOWSTD
LP1	The sample was improperly preserved.
LP3	Sample not maintained at required temperature
LR1	The sample result exceeded the calibration range.
LR2	Because the sample was damaged, lost, or of insufficient quantity, the laboratory was unable to analyze it.
LRP1	There is no measure of precison for the sample ie. No replicate, MSD or LCSD was performed.
LRP2	The replicate precision criteria are not met.
LS	Required surrogate information is missing. Data may not be acceptable for use.
LS1	Surrogate failed high.
LS2	Surrogate failed low.
LS4	The surrogate %R in the blank did not meet acceptance criteria.
LWQ1	Non-specified quality control failure - see report
MDL	ORGANIC_OEQL/MDL
N3TPU	NONE_<3*TPU Result less than or equal to 3 * 1-sigma TPU, therefore not detected (U).
NJCST	NONE_J_CST
NJLAB	NONE_J_LAB
NND	NONE_NONDETECT
NNQ	NONE_NQ
NQ	The analytical laboratory did not qualifiy the analyte as not detected and/or any other standard qualifire. The analyte is detected in the sample.
NS12a	SVOC_SVV12a
NS12c	SVOC_SVV12c
NS1a	SVOC_SVVS1a
NUA	NONE_NUA
NULAB	NONE_U_LAB This analyte should be regarded as not detected because the laboratory assigned a U lab qualifier.
NUP_R	Units and matrix inconsistent.
O12d	ORGANIC_OSV12d
O5XBL	ORGANIC_O5XBLANK
ODRO1	ORGANIC_ODRO12a
ODRO3	ORGANIC_ODRO3
ODRO4	ORGANIC_ODRO4
ODRO5	ODRO5_ORGANIC
ODRO7	ODRO7_ORGANIC
ODRO9	ORGANIC_ODRO9
OEQL/	ORGANIC_OEQL/MDL
OGR3b	OGR3b_ORGANIC
OGR3c	OGR3c_ORGANIC
OGRO3	ORGANIC_OGRO3
OGRO7	OGRO7_ORGANIC
OGRO9	ORGANIC_OGRO9
OH12b	ORGANIC_OH12b
OH9	ORGANIC_OH9
OI3	ORGANIC_OI3
OI4	ORGANIC_OI4
OI9	ORGANIC_OI9
ONONE	ORGANIC_ONONE
ONQ	ONQ
OP12a	ORGANIC_OP12a
OP12b	ORGANIC_OP12b
OP3	ORGANIC_OP3
OP3a	ORGANIC_OP3a
OP3b	ORGANIC_OP3b
OP3c	ORGANIC_OP3c
OP3d	ORGANIC_OP3d
OP4	ORGANIC_OP4
OP5	ORGANIC_OP5
OP6	ORGANIC_OP6
OP7	ORGANIC_OP7
OP7a	ORGANIC_OP7a
OP9	ORGANIC_OP9
OP9a	OP9a Organic
OPa	ORGANIC_OPa
OR1	INORGANIC_OR1
OSIN	ORGANIC_OSIN
OSV12	ORGANIC_OSV12d
OSV1a	ORGANIC_OSV1a
OSV3	ORGANIC_OSV3
OSV3a	ORGANIC_OSV3a
OSV4	ORGANIC_OSV4
OSV4a	ORGANIC_OSV4a
OSV7	ORGANIC_OSV7
OSV7a	ORGANIC_OSV7a
OSV9	ORGANIC_OSV9
OUJLA	O_UJ_LAB
OULAB	O_U_LAB This analyte should be regarded as not detected because the laboratory assigned a U lab qualifier.
OV3	OV3
OV36	ORGANIC_OV36
OV3a	ORGANIC_OV3a
OV3b	ORGANIC_OV3b
OV3c	ORGANIC_OV3c
OV4	INORGANIC_OV4
OV7	ORGANIC_OV7
OV7a	ORGANIC_OV7a
OV9	ORGANIC_OV9
P10	The breakdown criteria have been exceeded, which indicates poor instrument performance, which can result in a low bias in the reported results and potential fthe labile compounds Endrin and 4,4'–DDT.
P10a	The breakdown criteria have been exceeded, which indicates poor instrument performance, which can result in a high bias in the reported results and potential false positive results for the breakdown products Endrin ketone, Endrin aldehyde, DDD, and DDE.
P10b	The breakdown recovery data are missing. The analyte breakdown could not be evaluated.
P10c	The affected analytes are considered suspect because the sample was diluted without any target analytes identified due to matrix interference.
P11	The surrogate retention time has shifted by more than 0.05 min, possibly affecting analyte identification and causing false positives or negatives to be reported.
P11a	The surrogate recovery data are missing. Surrogate recoveries could not be evaluated.
P11b	The affected analytes are considered estimated because the confirmed analytes was outside the retention time windows.
P12	The LCS data are missing. The LCS analyte recoveries could not be evaluated.
P12a	The LCS analyte is less than 10%R, which indicates the potential for a severely low bias in the results.
P12b	The LCS analyte is greater than 10%R but less than the LAL, which indicates the potential for a low bias in the results.
P12c	The result is a nondetect and the LCS analyte is greater than 10%R but less than the LAL, which indicates the potential for false negative results.
P12d	The LCS analyte %R value is greater than the UAL, which indicates the potential for high bias in the results and for false positive results.
P13	The Florisil cleanup not conducted; interferences may have increased analytical uncertainty and the potential for both false positives and false negatives.
P13a	The GPC cleanup was not conducted on this soil sample; interferences may have increased analytical uncertainty and the potential for both false positives and false negatives.

P13b	The appropriate cleanup was not conducted; interferences may have increased the analytical uncertainty and the potential for both false positives and false negatives. Examples of required cleanups are sulfur contamination (sulfur cleanup required), interferences in PCB samples (sulfuric acid cleanup required), and high molecular weight interferences in water samples (GPC cleanup required).
P14a	Insufficient sample volume was received for a matrix spike and/or a matrix spike duplicate analysis.
P14b	The matrix spike and/or the matrix spike duplicate analysis were not performed on a sample associated with a LANL request number.
P14c	The matrix spike and/or the matrix spike duplicate were analyzed on a sample associated with a different LANL request number but no summary was included.
P15	Because the sample was damaged, lost, or of insufficient quantity, the laboratory was unable to analyze it.
P16	Required continuing calibration information is missing. Data may not be acceptable for use.
P19	The validator identified quality deficiencies in the reported data that require qualification.T
P23B	P23B
P3	The surrogate %R value is greater than the UAL, which indicates the a potential for a high bias in the results and a potential for false positive results.
P3a	The surrogate is greater than 10%R but less than the LAL, which indicates the potential for low bias in the results.
P3b	The surrogate is less than 10%R, which indicates the potential for a severely low bias in the results.
P3c	The result is less than the EQL and the surrogate %R value is greater than10 % but less than the LAL, which indicates a potential for false negative results being reported.
P3d	The result is less than the EQL and the surrogate less than 10%R, which indicates a significant potential for false negative results.
P3e	One surrogate recovery is greater than the UAL and one surrogate recovery is less than the LAL, which indicates increased uncertainty in reported results.
P3f	The surrogate information is missing. Data may not be acceptale for use.
P4	The sample result is a detect but less than 5 times the concentration of the related analyte in the blank, which indicates that the reported detection is considered indistinguishable from blank contamination.
P46	PESTPCB_P46
P4a	The method blank or instrument blank documentation is missing.
P4b	The surrogate information is missing. Data may not be acceptale for use.T
P5	PESTPCB_P5
P6	PESTPCB_P6
P7	The percent relative standard deviation (%RSD) or percent difference (%D) exceeds the applicable acceptance criterion, which indicates potential quantitation problems in the analyses and the potential for false negative results.
P77	The affected analytes are considered estimated because the associated continuing calibration standard was not analyzed within 72 hours of the initial analysis. This is for multi-component analytes.
P7a	The multicomponent analyte standard was not analyzed within 72 hrs of a multicomponent analyte detection. Quantitation of the multicomponent detection in the sample may not be accurate.
P7b	PESTPCB_P7b
P7c	PESTPCB_P7c
P8	This analyte should be regarded as not-detected because it was not confirmed on a second dissimilar column.
P8a	The required confirmation column analysis data is missing. Data may not be acceptable for use.
P9	The holding time is exceeded. The data user should conduct a technical evaluation of the data of interest with respect to the impact of exceeding the holding time. Factors to consider include sample preservation, sample storage practices, use of the data, levels of contamination found in the sample, and the physical, chemical, and biological stability of the target analytes in the sample matrix.
P913	PESTPCB_P913
P9a	The affected analytes should be regarded as estimated because the extraction holding time was exceeded by 2 times the acceptable holding time.
P9b	The results for the affected analytes are rejected because the analytical holding time was exceeded.
PC	PESTPCB_PC
PEQL	P_EQL/MDL The result should be regarded as estimated (J) because the result was less than the EQL, but greater than the MDL.
PHOLD	P_HOLD_TIME
PJCST	P_J_CST
PJLAB	PJLAB_PESTPCB
PLIA	P_LIA
PNONE	No reason for historic AROCLOR data.
PNQ	P_NQ
PQCBL	P_QC_BLIND
PS10	P_Surr < 10%
PUJCS	This analyte should be regarded as not detected because the laboratory assigned a U lab qualifier. CST assigned the J qualifier, need hard-copy to determine CST's reason.
PUJLA	P_U_LAB
PULAB	This analyte should be regarded as not detected because the laboratory assigned a U lab qualifier.
PV3	PESTPCB_PV3
PV4	PESTPCB_PV4
PWQ1	No MS/MSD data was included in the data package.
PWQ10	Calibration verification %D exceeded acceptance criteria but was less than 60%
PWQ11	Calibration Verification %D exceeded 60%
PWQ2	Relative percent difference of the MS/MSD is greater than the acceptance criteria.
PWQ3	The spike percent recovery value is greater than or equal to the upper acceptance limit and the result is a detect, which indicates a potential high bias in the sample results.
PWQ4	The spike percent recovery value is greater than 10% and less than the lower acceptance limit, which indicates a potential low bias in the results.
PWQ5	The spike percent recovery value is less than 10% which increases the potential for false negatives being reported. This could be caused by analytical interferences.
PWQ6	Non-specified quality control failure - see validation report
PWQ7	The sample was improperly preserved.
PWQ8	Calibration % RSD was greater than the acceptance criteria but less than 60%
PWQ9	Calibration % RSD was greater than 60%
R 6B	RAD_R 6B
R_MDA	R_MDA
R1	The tracer /carrier %R value is < 10%.
R10	RAD_R10
R10a	RAD_R10a
R10b	RAD_R10b
R11	The results for the affected analytes should be regarded as not-detected (U) because the associated sample concentration was less than 3x the 1 sigma TPU.
R11a	RAD_R11a
R11b	RAD_R11b
R11c	RAD_R11c
R11d	RAD_R11d
R14	RAD_R14
R14a	Insufficient sample volume was received for a matrix-spike analysis.
R14b	The matrix-spike analysis was not performed on a sample associated with this RN
R16	RAD_R16
R16a	Result is greater than the MDC for the following fission and activation products with half-lives less than 365 days: Ce-144, Co-57 54, Pa-233, Se-75, and Zn-65.
R16b	Result is greater than the MDC for the following radionuclides not reliably measured by gamma spectroscopy: Ac-228, Ba-140, Bi-212, I-129, La-140, Np-237, Pa-231, Pa-234, Pb-210, Pb-211, Ra,-223, Ra-224, Ra-226, and Rn-219.
R16c	Result is greater than the MDC for the following naturally occurring radionuclides that are reliably measured by gamma spectroscopy and that can provide an indication of the quality of the gamma spectroscopy measurement: Bi-211, Bi-214, K-40, Pb-212, Pb-214, Th-227, Th-234, Tl-208, and annihilation radiation.
R16d	Result is greater than the MDC for the following six radionuclides typically used by the analytical labs in their LCSs for instrument calibration and checks on instrument performance: Cd-109, Ce-139, Hg-203, Sn-113, Sr-85, and Y-88.
R19	The validator identified quality deficiencies in the reported data that require qualification.
R1a	The tracer %R value is 10-30% inclusive and the sample result is greater than the MDA.
R1b	The tracer %R value is 10-30% inclusive and the sample result is less than the MDA.
R1c	The MDC for the affected analytes are qualified as estimated because the associated tracer recoverywas less than 30% but greater than 10% and the result is a non-detect.
R1d	The results for the affected analytes are qualified as estimated and biased high because the associated tracer yield was greater than 105%.
R1e	The tracer/carrier %R value is not reported.
R1x	The tracer %R value is less than 10%.
R1z	The tracer %R value is less than 30% but greater than 10% and the sample result is a detect.
R3	The matrix spike %R value is greater than the upper limit and the sample result is greater than the MDA.
R3a	The matrix spike %R value is less than the lower limit and the sample result is greater than the MDA.
R3b	The matrix-spike %R value is less than 10% and the result is not-detected.
R3c	The matrix spike %R value is less than the lower limit and the sample result is less than the MDA.
R3d	The results for the affected analytes are qualified as estimated and biased low because the associate matrix spike recovery was less than the LAL but greater than 10%, and the results are detected.
R3e	The results for the affected analytes are qualified as estimated and biased low because the associate matrix spike recovery was less than the LAL but greater than 10%, and the results are non-detect.
R3TPU	P_UJ_LAB
R4	The sample result is greater than the MDA but less than 5 times the amount found in the blank.
R4a	The resluts for the affected analytes should be regarded as not-detected (U) because the associated sample concentration is less than or equal to 5x the associated sample concentration.
R4b	Blank data is either missing from or not reported in the data record package.
R4z	The method blank information is missing. The data may be acceptable for use.
R5	Analyte is not detected because the amount reported is less than the MDC.
R5a	The MDC and/or TPU documentation is missing. Data may not be acceptable for use.
R5b	This analyte should be regarded as rejected because spectral interferences prevents positive identification of the analytes.
R6	Recovery of the analyte in the LCS is greater than the upper limit and the analyte result is greater than the MDA.
R6a	Recovery of analyte in the LCS is less than the lower limit and the analyte is greater than the MDA in the sample.
R6b	The results for the affected analytes should be regarded as rejected because the LCS %R was less than 10%.
R6c	The results for the affected analytes are qualified as estimated and biased low because the associated LCS was less than the LAL but greater than 10%, and the results are detected.
R6d	The results for the affected analytes are qualified as estimated and biased low because the associated LCS was less than the LAL but greater than 10%, and the results are non-detect.
R6e	The LCS data is missing from the data record package.
R7	The duplicate information is missing. Data may not be acceptable for use.
R7a	The results for the affected analytes are qualified as estimated because the associated duplicate results were prepared separately from the original analysis.
R7b	The duplicate and sample results have a DER (duplicate error ratio) that is greater than 2.0.
R7c	The affected analytes are qualified as as rejected because the RER was greater than 4
R8	RAD_R8
R9	The results for the affected analytes should be regarded as estimated because the hloding time was exceeded.
R96	RAD_R96
R9a	The results for the affecteed anaytes should be regarded as rejected because the holding time was exceeded by 2x the method published holding times.
R9b	RAD_R9b
RA	R_Accidentally_
Rb	RAD_Rb
RB7	RAD_RB7
RC0TP	R_CST_ZERO_TPU
RC0UN	R_CST_0_UNC
RI14a	RAD_RI14a
RI14b	RAD_RI14b
RI3	RAD_RI3
RI3a	RAD_RI3a
RI4	RAD_RI4
RI5	RAD_RI5
RI6	RAD_RI6
RIA	RAD_RIA
RIB	RAD_RIB
RJCST	R_J_CST
RJLAB	R_J_LAB
RLIA	R_LIA
RNONE	No reason for historic RAD data.
RNQ	R_NQ
RPA	RAD_RPA
RQCBL	RQCBL_RAD
RQCMX	R_Samp_QC_Mixed
RRLAB	R Lab RAD
RSQLP	RAD_SQLPLUR9B
RT30	R_Tracer < 30%
RUJCS	This analyte should be regarded as not detected because the laboratory assigned a U lab qualifier. CST assigned the J qualifier, need hard-copy to determine CST's reason.
RUJLA	RUJLA_RAD
RULAB	This analyte should be regarded as not detected because the laboratory assigned a U lab qualifier.
RUP_R	RAD: Units and matrix inconsistent.
RWQ1	Planchets were flamed
RWQ2	Result values are less than than 3 times the MDC
RWQ3	Less than the negative MDC
RWQ4	Planchets were not flamed
RWQ5	The tracer %R value is greater than 105% but less than 125%
RWQ6	The tracer %R value is greater than 125%
RWQ7	Non-specified quality control failure - see validation report
RZUNC	R_ZERO_UNCERT
SEQLM	The result should be regarded as estimated (J) because the result was less than the EQL, but greater than the MDL.
SHOLD	SHOLD
SJCST	SJCST
SJLAB	SJLAB
SNQ	SNQ
SPECT	HEXP_SPECTRAL MATCH
SQCBL	SQCBL
SQLPL	RAD_SQLPLUR9B
SRO9	ORGANIC_SRO9
SSU10	SSU10
SUJCS	This analyte should be regarded as not detected because the laboratory assigned a U lab qualifier. CST assigned the J qualifier, need hard-copy to determine CST's reason.
SUJLA	SUJLA
SULAB	SULAB
SV0	The IS retention time has shifted by more than ?30 sec, which could affect compound identification and result in false positives or negatives.
SV1	The IS area count for the quantitating IS is outside the -50%-+100% window in relation to the previous continuing calibration, which could affect the quantitation accuracy of the associated analytes and the correct quantitation of surrogate %R values.
SV10	The affected analytes are considered suspect because the sample was diluted without any target analytes identified due to matrix interference.
SV11	TICs are not reported but were requested by ER Project. The validator contacted the laboratory that had not provided TICs.
SV12	The LCS documentation is missing. Data may not be acceptable for use.
SV12a	The LCS percent recovery was less than 10%.
SV12b	The LCS percent recovery was less than the LAL but greater than 10% and the result is detected.
SV12c	The LCS percent recovery was less than the LAL but greater than 10% and the result is not detected.
SV12d	The affected analytes should be regarded as estimated and biased high because the LCS percent recovery was greater than the UAL.
SV13c	SVOC_SV13c
SV15	Because the sample was damaged, lost, or of insufficient quantity, the laboratory was unable to analyze it.
SV16	Required calibration information is missing or samples were analyzed on an expired calibration. Data may not be acceptable for use.
SV16a	The results for the affected analytes are rejected because the instrument performance sample (DFTPP) did not pass method acceptance criteria
SV19	The affected analytes are qualified because the data validator identified quality deficiencies in the reported data.
SV1a	The area count for the quantitating IS is less than 50% of the area count for the previous continuing calibration, greatly increasing the potential for false negative results.
SV1b	The area count for the quantitating IS is greater than 200% of the area count for the previous continuing calibration.
SV2	The quantitating IS area count is less than 10% of the expected value, which indicates increased potential for false negative results and other possible problems with sample quantitation.
SV2a	Required IS information is missing. Data may not be acceptable for use.
SV2c	SVOC_SV2c
SV3	The %R values for two or more surrogates in either SV fraction is greater than the UAL, which indicates the potential for high bias in the results and the potential for false positive results.
SV3a	Two or more surrogates in either SV fraction are greater than or equal to 10%R but less than the LAL, which indicates the porential for low bias in the results.
SV3b	A surrogate in the related fraction is less than 10%R, and the result is a detect, which indicates the potential for severely low bias in the results.
SV3c	The result is a nondetect and two or more surrogates are greater than or equal to 10%R but less than the LAL, which indicates increased potential for false negative results.
SV3d	The result is a nondetect and a surrogate in the related fraction is less than 10%R, which indicates a greatly increased potential for false negative results.
SV3e	The %R value of one surrogate in a fraction is greater than the UAL and one is less than the LAL but greater than or equal to 10%R, which indicates a greater than normal uncertainty in the results.
SV3f	Required surrogate information is missing. Data may not be acceptable for use.
SV4	The sample result is greater than the EQL and less than or equal to 5 times (10 times for common phthalates) the concentration of the related analyte in the blank, which indicates the reported detection is considered indistinguishable from contamination in the blank.
SV4a	The affected analytes are considered estimated and biased high because this analyte was identified in the method blank but was greater than 5x (10x for common lab contaminates).
SV4b	Required method blank information is missing. Data may not be acceptable for use.
SV5	The sample result is less than the EQL and less than or eqaul to 5 times (10 times for common phthalates) the concentration of the analyte in the blank, which indicates the detected result was indistinguishable from contamination in the blank.
SV5a	Method-blank data is missing, or method blank was not analyzed. Data may not be acceptable for use.
SV5v7	SVOC_SV5v7a
SV6	SVOC_SV6
SV6b	SVOC_SV6b
SV7	The affected results were not analyzed with a valid 5 point calibration cuvre and/or a standard at the reporting limit.
SV7a	The affected analytes were analyzed with a initial calibration curve that exceeded the %RSD criteria and/or a continuing calibration standard that exceeded %D criteria.
SV7b	The affected analytes were analyzed with a RRF of less than 0.05.
SV8	The affected analyte is considered not detected because mass spectrum did not meet specifications.
SV8a	The mass spectrum documentation is missing. Data may not be acceptable for use.
SV9	The extraction holding time is exceeded. The data user should evaluate the data of interest with respect to the effect of exceedin holding time. Factors to consider include sample preservation, sample storage practices, use of the data, levels of contamination found in the sample, and the physical, chemical, and biological stability of the target analytes in the sample matrix.
SV9a	The affected analytes are regarded as rejected because the extraction holding time was exceeded by 2x the method published holding time requirements.
SV9b	The affected analytes are regarded as rejected because the analytical holding time was exceeded.
SVA	SVOC_SVA
SVC	SVOC_SVC
SVD	SVOC_SVD
SVI	SVOC_SVI
SVIA	SVOC_SVIA
SVNON	No reason for historic SVOC data.
SVPM	SVOC_SVPM
SVS	SVOC_SVS
SVV12	SVOC_SVV12a
SVV1a	SVOC_SVV1a
SVV3	SVOC_SVV3
SVV4	SVOC_SVV4
SVV5	SVOC_SVV5
SVV7a	SVOC_SVV7a
SVV9	SVOC_SVV9
SVVS1	SVOC_SVVS1a
SWQ1	Relative percent difference of the MS/MSD is greater than the acceptance criteria.
SWQ10	Calibration Verification %D exceeded 60%
SWQ11	The LCS recovery was greater than the acceptance criteria
SWQ2	The spike percent recovery value is greater than or equal to the upper acceptance limit and the result is a detect, which indicates a potential high bias in the sample results.
SWQ3	The spike percent recovery value is greater than 10% and less than the lower acceptance limit, which indicates a potential low bias in the results.
SWQ4	The spike percent recovery value is less than 10% which increases the potential for false negatives being reported. This could be caused by analytical interferences.
SWQ5	Non-specified quality control failure - see validation report
SWQ6	The sample was improperly preserved.
SWQ7	Calibration % RSD was greater than the acceptance criteria but less than 60%
SWQ8	Calibration %RSD exceeded 60%
SWQ9	Calibration Verification %D was greater than the acceptance criteria but less than 60%
U_LAB	The analytical laboratory qualified the analyte as not detected.
UNK	Unknown
V	VOC_V
V+	VOC_V+
V0	The IS retention time has shifted by more than ?30 seconds, which could affect compound identification and cause false positives or negatives to be reported.
V1	The IS area count for the quantitating IS is outside the -50%-+100% window in relation to the previous continuing calibration. This condition could affect the quantitation accuracy of the associated analytes.
V10	The affected analytes are considered suspect because the sample was diluted without any target analytes identified due to matrix interference.
V11	TICs are not reported by the analytical laboratory but were requested by the ER Project. The analytical laboratory was contacted and TICs were not provided.
V12	The LCS documentation is missing. The data may not be acceptable for use.
V126	VOC_V126
V12a	The LCS percent recovery was less than 10%.
V12b	The LCS percent recovery was less than the LAL but greater than 10%. The result is biased low and is detected.
V12c	The LCS percent recovery was less than the LAL but greater than 10%. The result was not-detected.
V12d	The LCS percent recovery was greater than the UAL. The result is detected and biased high.
V14a	Insufficient sample volume was received for a matrix spike and/or a matrix spike duplicate analysis.
V14b	The matrix spike and/or the matrix spike duplicate analysis was not performed on a sample associated with a LANL request number.
V14c	The matrix spike a nd/or the matrix spike duplicate was analyzed on a sample associated with a different LANL request number but no summary was included.
V15	Because the sample was damaged, lost, or of insufficient quantity, the laboratory was unable to analyze it.
V16	Required calibration information is missing or samples were analyzed on an expired calibration. Data may not be acceptable for use.
V16a	The results should be regarded as rejected because the BFB instrument performance sample did not pass method acceptance criteria.
V19	The validator identified quality deficiencies in the reported data that require qualification.
V1a	The area count for the quantitating IS is less than 50% of the area count for the previous continuing calibration, greatly increasing the potential for false negative results.
V1b	This analyte should be regarded as estimated because the IS failed high.
V1c	VOC_V1c
V1s	VOC_V1s
V2	The quantitating IS area is less than 10% of the expected value, which indicates an increased potential for false negative results and possibly other problems with sample quantitation.
V2a	Required IS information is missing. Data may not be acceptable for use.
V3	The surrogate percent recovery is greater than the UAL, which indicates the potential for a high bias in the results and the potential for false positive results.
V3a	The surrogate is less than the LAL but greater than or equal to 10%R, which indicates the potential for a low bias in the results.
V3b	The surrogate is less than 10%R and the result is a detect, which indicates the potential for a severely low bias in the results.
V3c	The surrogate is less than LAL and the result is a non-detect, which indicates the potential for a low bias in the results.
V3d	The surrogate is less than 10%R and the result is a nondetect, which indicates a greatly increased potential for false negative results.
V3e	At least one surrogate is greater than the UAL and one surrogate is less than the LAL, which indicates a greater than normal degree of uncertainty in the result.
V3f	Required surrogate information is missing. Data may not be acceptable for use.
V4	The sample result is less than or equal to 5 times (10 times for acetone, methylene chloride, and 2-butanone) the concentration of the related analyte in the method blank, which indicates the reported detection is considered indistinguishable from contamination in the blank.
V4a	The affected analytes are considered estimated and biased high because this analyte was identified in the method blank but was greater than 5x (10x for common lab contaminates).
V4b	Required method blank information is missing. Data may not be acceptable for use.
V5	VOC_V5
V5a	Method-blank data is missing, or method blank was not analyzed. Data may not be acceptable for use.
V5c	VOC_V5c
V6b	VOC_V6b
V7	The affected results were not analyzed with a valid 5 point calibration cuvre and/or a standard at the reporting limit.
V76	VOC_V76
V78	VOC_V78
V7a	The affected analytes were analyzed with a initial calibration curve that exceeded the %RSD criteria and/or a continuing calibration standard that exceeded %D criteria.
V7b	The affected analytes were analyzed with a RRF of less than 0.05.
V8	The affected analyte is considered not detected because mass spectrum did not meet specifications.
V8a	The mass spectrum documentation is missing. Data may not be acceptable for use.
V9	The analytical and/or extraction holding time is exceeded. The data user should evaluate the data of interest with respect to the effects of exceeding the holding time. Factors to consider include sample preservation, sample storage practices, use of the data, levels of contamination found in the sample, and the physical, chemical, and biological stability of the target analytes in the sample matrix.
V9a	The affected analytes are regarded as rejected because the analytical/extraction holding time was exceeded by 2x the method published holding time requirements.
VC4	VOC_VC4
VEQL	The result should be regarded as estimated (J) because the result was less than the EQL, but greater than the MDL.
VI1	VOC_VI1
VI4	VOC_VI4
VI45	VOC_VI45
VIA	VOC_VIA
VIC	VOC_VIC
VJCST	VJCST
VJLAB	VJLAB
VLA	VOC_VLA
VNONE	No reason for historic VOC data.
VNQ	VNQ
VO	VOC_VO
VP	VOC_VP
VQCBL	VQCBL
VR5	VOC_VR5
VR7b	VOC_VR7b
VS	VOC_SPECTRUM
VSV1	VOC_VSV1
VSV1a	VOC_VSV1a
VSV3b	VOC_VSV3b
VSV3c	VOC_VSV3c
VSV4	VOC_VSV4
VSV5	VOC_VSV5
VSV7	VOC_VSV7
VSV7a	VOC_VSV7a
VU7a	VOC_VU7a
VUCST	VUCST
VUJCS	This analyte should be regarded as not detected because the laboratory assigned a U lab qualifier. CST assigned the J qualifier, need hard-copy to determine CST's reason.
VUJLA	VUJLA
VULAB	This analyte should be regarded as not detected because the laboratory assigned a U lab qualifier.
VUP_R	VOC: Units and matrix inconsistent.
VWQ1	Relative percent difference of the MS/MSD is greater than the acceptance criteria.
VWQ10	Calibration Verification %D exceeded 60%
VWQ11	The LCS recovery was greater than the acceptance criteria
VWQ2	The spike percent recovery value is greater than or equal to the upper acceptance limit but and the result is a detect, which indicates a potential high bias in the sample results.
VWQ3	The spike percent recovery value is greater than 10% and less than the lower acceptance limit, which indicates a potential low bias in the results.
VWQ4	The spike percent recovery value is less than 10% which increases the potential for false negatives being reported. This could be caused by analytical interferences.
VWQ5	Non-specified quality control failure - see validation report
VWQ6	The sample was improperly preserved.
VWQ7	Calibration % RSD was greater than the acceptance criteria but less than 60%
VWQ8	Calibration %RSD exceeded 60%
VWQ9	Calibration Verification %D was greater than the acceptance criteria but less than 60%

Table S5-6.

Valid Flag
A
DNA
GUP
IUP
J
J-
J+
JN-
JN+
JPM
LIMIT
MS
MSD
N
NJ
NQ
NUP
P
PM
R
RPM
RUP
U
UA
UJ
VUP

Table 55-5 Laboratory Qualification Codes

Lab Qual	Club Qual	Desc
*		* (Inorganic) - The result for this analyte in the Laboratory Replicate analysis was outside acceptance criter
**		** (Organic) and (Inorganic) - The result for this analyte in the Laboratory Control Sample analysis was outside acceptance crite
		* (Inorganic) - The result for this analyte in the Laboratory Replicate analysis was outside acceptance criteria. (E) (Organic) - The result for this anlayte exceeded the up
		range of the instrument initial calibration curve. (E) (Inorganic) (ICP-AES) - The result for this analyte in the serial dilution analysis was outside acceptance criteria. (E)
*E		(Inorganic) (GFAA) - The result for this analyte failed one or more CLP acceptance criteria as explained in the case narrative.
		(B) (Organic) - This analyte was detected in the associated Laboratory Method Blank and the sample. (B) (Inorganic) - The result for this analyte was greater than I
B		Instrument Detection Limit but less than the Contract Required Detection Limit.
		(B) (Organic) - This analyte was detected in the associated Laboratory Method Blank and the sample. (B) (Inorganic) - The result for this analyte was greater than I
		Instrument Detection Limit but less than the Contract Required Detection Limit. * (Inorganic) - The result for this analyte in the Laboratory Replicate analysis was outside
B*		acceptance criteria.
		(B) (Organic) - This analyte was detected in the associated Laboratory Method Blank and the sample. (B) (Inorganic) - The result for this analyte was greater than I
		Instrument Detection Limit but less than the Contract Required Detection Limit. * (Inorganic) - The result for this analyte in the Laboratory Replicate analysis was outside
		acceptance criteria. (E) (Organic) - The result for this anlayte exceeded the upper range of the instrument initial calibration curve. (E) (Inorganic) (ICP-AES) - The result for this
		analyte in the serial dilution analysis was outside acceptance criteria. (E) (Inorganic) (GFAA) - The result for this analyte failed one or more CLP acceptance criteria as
B*E		explained in the case narrative.
		(B) (Organic) - This analyte was detected in the associated Laboratory Method Blank and the sample. (B) (Inorganic) - The result for this analyte was greater than I
		Instrument Detection Limit but less than the Contract Required Detection Limit. (E) (Organic) - The result for this anlayte exceeded the upper range of the instrument initial
		calibration curve. (E) (Inorganic) (ICP-AES) - The result for this analyte in the serial dilution analysis was outside acceptance criteria. (E) (Inorganic) (GFAA) - The result for
BE		analyte failed one or more CLP acceptance criteria as explained in the case narrative.
		(B) (Organic) - This analyte was detected in the associated Laboratory Method Blank and the sample. (B) (Inorganic) - The result for this analyte was greater than I
		Instrument Detection Limit but less than the Contract Required Detection Limit. (E) (Organic) - The result for this anlayte exceeded the upper range of the instrument initial
		calibration curve. (E) (Inorganic) (ICP-AES) - The result for this analyte in the serial dilution analysis was outside acceptance criteria. (E) (Inorganic) (GFAA) - The result for
		analyte failed one or more CLP acceptance criteria as explained in the case narrative. * (Inorganic) - The result for this analyte in the Laboratory Replicate analysis was outside
BE*		acceptance criteria.
		(B) (Organic) - This analyte was detected in the associated Laboratory Method Blank and the sample. (B) (Inorganic) - The result for this analyte was greater than I
		Instrument Detection Limit but less than the Contract Required Detection Limit. (E) (Organic) - The result for this anlayte exceeded the upper range of the instrument initial
		calibration curve. (E) (Inorganic) (ICP-AES) - The result for this analyte in the serial dilution analysis was outside acceptance criteria. (E) (Inorganic) (GFAA) - The result for
		analyte failed one or more CLP acceptance criteria as explained in the case narrative. (N) (Organic) - The reported analyte is a tentitively identified compound (TIC). (N)
BEN		(Inorganic) - The result for this anlayte in the matrix spike sample was outside acceptance criteria.
		(B) (Organic) - This analyte was detected in the associated Laboratory Method Blank and the sample. (B) (Inorganic) - The result for this analyte was greater than I
		Instrument Detection Limit but less than the Contract Required Detection Limit. (E) (Organic) - The result for this anlayte exceeded the upper range of the instrument initial
		calibration curve. (E) (Inorganic) (ICP-AES) - The result for this analyte in the serial dilution analysis was outside acceptance criteria. (E) (Inorganic) (GFAA) - The result for
		analyte failed one or more CLP acceptance criteria as explained in the case narrative. (N) (Organic) - The reported analyte is a tentitively identified compound (TIC). (N)
		(Inorganic) - The result for this anlayte in the matrix spike sample was outside acceptance criteria. * (Inorganic) - The result for this analyte in the Laboratory Replicate analysis
BEN*		was outside acceptance criteria.
		(B) (Organic) - This analyte was detected in the associated Laboratory Method Blank and the sample. (B) (Inorganic) - The result for this analyte was greater than I
		Instrument Detection Limit but less than the Contract Required Detection Limit. (J) (Organic/General Inorganics) - The result for this analyte was greater than the Method
BJ		Detection Limit (MDL) but less than the Practical Quantitaion Limit (PQL).
		(B) (Organic) - This analyte was detected in the associated Laboratory Method Blank and the sample. (J) (Organic) - The reported analyte is a tentitively identified compos
BJN		(TIC). (N) (Organic) - The reported analyte is a tentitively identified compound (TIC).
		(B) (Organic) - This analyte was detected in the associated Laboratory Method Blank and the sample. (B) (Inorganic) - The result for this analyte was greater than the
		Instrument Detection Limit but less than the Contract Required Detection Limit. (J) (Organic/General Inorganics) - The result for this analyte was greater than the Method
		Detection Limit (MDL) but less than the Practical Quantitaion Limit (PQL). (P) (Pesticides/PCBs) - The quantitative results for this analyte between the primary and secondary
		GC columns were greater than 25% difference. (P) (SW-846 EPA Method 8310 High Pressure Liquid Chromotography, HPLC results) - The quantitative results for this anal
BJP		between the primary and secondary HPLC columns or primary and secondary HPLC detectors were greater than 40% difference.
		(B) (Organic) - This analyte was detected in the associated Laboratory Method Blank and the sample. (B) (Inorganic) - The result for this analyte was greater than I
		Instrument Detection Limit but less than the Contract Required Detection Limit. (J) (Organic/General Inorganics) - The result for this analyte was greater than the Method
		Detection Limit (MDL) but less than the Practical Quantitaion Limit (PQL). (P) (Pesticides/PCBs) - The quantitative results for this analyte between the primary and secondary
		GC columns were greater than 25% difference. (P) (SW-846 EPA Method 8310 High Pressure Liquid Chromotography, HPLC results) - The quantitative results for this anal
		between the primary and secondary HPLC columns or primary and secondary HPLC detectors were greater than 40% difference. (X) (Organic/Inorganic) - The result for this
BJPX		analyte should be regarded as not detected.
		(B) (Organic) - This analyte was detected in the associated Laboratory Method Blank and the sample. (B) (Inorganic) - The result for this analyte was greater than I
		Instrument Detection Limit but less than the Contract Required Detection Limit. (N) (Organic) - The reported analyte is a tentitively identified compound (TIC). (N) (Inorganic) -
BN		The result for this anlayte in the matrix spike sample was outside acceptance criteria.
		(B) (Organic) - This analyte was detected in the associated Laboratory Method Blank and the sample. (B) (Inorganic) - The result for this analyte was greater than I
		Instrument Detection Limit but less than the Contract Required Detection Limit. (N) (Organic) - The reported analyte is a tentitively identified compound (TIC). (N) (Inorganic) -
		The result for this anlayte in the matrix spike sample was outside acceptance criteria. * (Inorganic) - The result for this analyte in the Laboratory Replicate analysis was outside
BN*		acceptance criteria.
		(B) (Organic) - This analyte was detected in the associated Laboratory Method Blank and the sample. (B) (Inorganic) - The result for this analyte was greater than I
		Instrument Detection Limit but less than the Contract Required Detection Limit. (N) (Organic) - The reported analyte is a tentitively identified compound (TIC). (N) (Inorganic) -
		The result for this anlayte in the matrix spike sample was outside acceptance criteria. (E) (Organic) - The result for this anlayte exceeded the upper range of the instrument
		initial calibration curve. (E) (Inorganic) (ICP-AES) - The result for this analyte in the serial dilution analysis was outside acceptance criteria. (E) (Inorganic) (GFAA) - The result
BNE		for this analyte failed one or more CLP acceptance criteria as explained in the case narrative.
		(B) (Organic) - This analyte was detected in the associated Laboratory Method Blank and the sample. (B) (Inorganic) - The result for this analyte was greater than the
		Instrument Detection Limit but less than the Contract Required Detection Limit. (P) (Pesticides/PCBs) - The quantitative results for this analyte between the primary and
		secondary GC columns were greater than 25% difference. (P) (SW-846 EPA Method 8310 High Pressure Liquid Chromotography, HPLC results) - The quantitative results for
BP		this analyte between the primary and secondary HPLC columns or primary and secondary HPLC detectors were greater than 40% difference.
		(B) (Organic) - This analyte was detected in the associated Laboratory Method Blank and the sample. (B) (Inorganic) - The result for this analyte was greater than I
		Instrument Detection Limit but less than the Contract Required Detection Limit. (P) (Pesticides/PCBs) - The quantitative results for this analyte between the primary and
		secondary GC columns were greater than 25% difference. (P) (SW-846 EPA Method 8310 High Pressure Liquid Chromotography, HPLC results) - The quantitative results for
		this analyte between the primary and secondary HPLC columns or primary and secondary HPLC detectors were greater than 40% difference. (X) (Organic/Inorganic) - The
BPX		result for this analyte should be regarded as not detected.
		(B) (Organic) - This analyte was detected in the associated Laboratory Method Blank and the sample. (B) (Inorganic) - The result for this analyte was greater than I
		Instrument Detection Limit but less than the Contract Required Detection Limit. (W) (Inorganic GFAA CLP) - The result for this analyte in the post-digestion spike sample was
BW		outside acceptance criteria.
BX		(B) (Organic) - This analyte was detected in the associated Laboratory Method Blank and the sample. (X) Diode array didn't confi
D		(D) (Organic) - The result for this analyte was reported from a dilutio
		(D) (Organic) - The result for this analyte was reported from a dilution. (J) (Organic/General Inorganics) - The result for this analyte was greater than the Method Detection Li
DJ		(MDL) but less than the Practical Quantitaion Limit (PQL).
DNA		did not analyze due to broken equipment
		(D) (Organic) - The result for this analyte was reported from a dilution. (P) (Pesticides/PCBs) - The quantitative results for this analyte between the primary and secondary GC
		columns were greater than 25% difference. (P) (SW-846 EPA Method 8310 High Pressure Liquid Chromotography, HPLC results) - The quantitative results for this analyte
DP		between the primary and secondary HPLC columns or primary and secondary HPLC detectors were greater than 40% difference.
		(D) (Organic) - The result for this analyte was reported from a dilution. (P) (Pesticides/PCBs) - The quantitative results for this analyte between the primary and secondary
		columns were greater than 25% difference. (P) (SW-846 EPA Method 8310 High Pressure Liquid Chromotography, HPLC results) - The quantitative results for this analyte
		between the primary and secondary HPLC columns or primary and secondary HPLC detectors were greater than 40% difference. (X) (Organic/Inorganic) - The result for this
DPX		analyte should be regarded as not detected.
		(E) (Organic) - The result for this anlayte exceeded the upper range of the instrument initial calibration curve. (E) (Inorganic) (ICP-AES) - The result for this analyte in the se
		dilution analysis was outside acceptance criteria. (E) (Inorganic) (GFAA) - The result for this analyte failed one or more CLP acceptance criteria as explained in the case
E		narrative.
		(E) (Organic) - The result for this anlayte exceeded the upper range of the instrument initial calibration curve. (E) (Inorganic) (ICP-AES) - The result for this analyte in the se
		dilution analysis was outside acceptance criteria. (E) (Inorganic) (GFAA) - The result for this analyte failed one or more CLP acceptance criteria as explained in the case
E*		narrative. * (Inorganic) - The result for this analyte in the Laboratory Replicate analysis was outside acceptance criteria.
		(E) (Organic) - The result for this anlayte exceeded the upper range of the instrument initial calibration curve. (E) (Inorganic) (ICP-AES) - The result for this analyte in the serial
		dilution analysis was outside acceptance criteria. (E) (Inorganic) (GFAA) - The result for this analyte failed one or more CLP acceptance criteria as explained in the case
EJ		narrative. (J) (Organic/General Inorganics) - The result for this analyte was greater than the Method Detection Limit (MDL) but less than the Practical Quantitaion Limit (PQL).
		(E) (Organic) - The result for this anlayte exceeded the upper range of the instrument initial calibration curve. (E) (Inorganic) (ICP-AES) - The result for this analyte in the se
		dilution analysis was outside acceptance criteria. (E) (Inorganic) (GFAA) - The result for this analyte failed one or more CLP acceptance criteria as explained in the case
		narrative. (J) (Organic/General Inorganics) - The result for this analyte was greater than the Method Detection Limit (MDL) but less than the Practical Quantitaion Limit (PQL
EJ*		(Inorganic) - The result for this analyte in the Laboratory Replicate analysis was outside acceptance criteria.
		(E) (Organic) - The result for this anlayte exceeded the upper range of the instrument initial calibration curve. (E) (Inorganic) (ICP-AES) - The result for this analyte in the se
		dilution analysis was outside acceptance criteria. (E) (Inorganic) (GFAA) - The result for this analyte failed one or more CLP acceptance criteria as explained in the case
		narrative. (J) (Organic/General Inorganics) - The result for this analyte was greater than the Method Detection Limit (MDL) but less than the Practical Quantitaion Limit (PQL)
		(N) (Organic) - The reported analyte is a tentitively identified compound (TIC). (N) (Inorganic) - The result for this anlayte in the matrix spike sample was outside acceptance
EJN		criteria.
		(E) (Organic) - The result for this anlayte exceeded the upper range of the instrument initial calibration curve. (E) (Inorganic) (ICP-AES) - The result for this analyte in the se
		dilution analysis was outside acceptance criteria. (E) (Inorganic) (GFAA) - The result for this analyte failed one or more CLP acceptance criteria as explained in the case
		narrative. (N) (Organic) - The reported analyte is a tentitively identified compound (TIC). (N) (Inorganic) - The result for this anlayte in the matrix spike sample was outside
EN		acceptance criteria.
		(E) (Organic) - The result for this anlayte exceeded the upper range of the instrument initial calibration curve. (E) (Inorganic) (ICP-AES) - The result for this analyte in the serial
		dilution analysis was outside acceptance criteria. (E) (Inorganic) (GFAA) - The result for this analyte failed one or more CLP acceptance criteria as explained in the case
		narrative. (N) (Organic) - The reported analyte is a tentitively identified compound (TIC). (N) (Inorganic) - The result for this anlayte in the matrix spike sample was outside
EN*		acceptance criteria. * (Inorganic) - The result for this analyte in the Laboratory Replicate analysis was outside acceptance criteria.
H		(H) (Organic/Inorganic) - The required extraction or analysis holding time for this result was exceeds
		(H) (Organic/Inorganic) - The required extraction or analysis holding time for this result was exceeded. * (Organic) and (Inorganic) - The result for this analyte in the Labora
		Control Sample analysis was outside acceptance criteria.
H*		(H) (Organic/Inorganic) - The required extraction or analysis holding time for this result was exceeded. (J) (Organic/General Inorganics) - The result for this analyte was gre
HJ		than the Method Detection Limit (MDL) but less than the Practical Quantitaion Limit (PQL).
		(H) (Organic/Inorganic) - The required extraction or analysis holding time for this result was exceeded. (J) (Organic/General Inorganics) - The result for this analyte was gre
		than the Method Detection Limit (MDL) but less than the Practical Quantitaion Limit (PQL). * (Inorganic) - The result for this analyte in the Laboratory Replicate analysis was
HJ*		outside acceptance criteria.
		(I) (DIOXIN) The lab is reporting an interference for the associated congener. The reported concentration is an Estimated Maximum Possible Concentration (EMPC) due to
I		reported interference.
		(d15N) - The d15N of nitrate is a signature of the nitrate present in a sample. Therefore, nitrate has to be present to have a signature. A d15N value can not be given to a bla
		since the blank does not have nitrate. This is different than most analytical methods where you would run a blank and use the designator: "non detect" or detected, but below
INS		detection limit.
J		(J) (Organic/General Inorganics) - The result for this analyte was greater than the Method Detection Limit (MDL) but less than the Practical Quantitaion Limit (PQL).
		(J) (Organic/General Inorganics) - The result for this analyte was greater than the Method Detection Limit (MDL) but less than the Practical Quantitaion Limit (PQL)
J*		(Inorganic) - The result for this analyte in the Laboratory Replicate analysis was outside acceptance criteria.
		(J) (Organic/General Inorganics) - The result for this analyte was greater than the Method Detection Limit (MDL) but less than the Practical Quantitaion Limit (PQL).
		(Organic) - The reported analyte is a tentitively identified compound (TIC). (N) (Inorganic) - The result for this anlayte in the matrix spike sample was outside acceptance
JN		criteria.
		(J) (Organic/Inorganic/General Inorganics) - The result for this analyte was greater than the Method Detection Limit (MDL) but less than the Practical Quantitaion Limit (PC
		(N) (Organic) - The reported analyte is a tentitively identified compound (TIC). (N) (Inorganic) - The result for this anlayte in the matrix spike sample was outside acceptance
JN*		criteria. * (Inorganic) - The result for this analyte in the Laboratory Replicate analysis was outside acceptance criteria.
		(J) (Organic/General Inorganics) - The result for this analyte was greater than the Method Detection Limit (MDL) but less than the Practical Quantitaion Limit (PQL).
		(Pesticides/PCBs) - The quantitative results for this analyte between the primary and secondary GC columns were greater than 25% difference. (P) (SW-846 EPA Method
JP		8310 High Pressure Liquid Chromotography, HPLC results) - The quantitative results for this analyte between the primary and secondary HPLC columns or primary and
		secondary HPLC detectors were greater than 40% difference.
		(J) (Organic/General Inorganics) - The result for this analyte was greater than the Method Detection Limit (MDL) but less than the Practical Quantitaion Limit (PQL). (P)
		(Pesticides/PCBs) - The quantitative results for this analyte between the primary and secondary GC columns were greater than 25% difference. (P) (SW-846 EPA Method
		8310 High Pressure Liquid Chromotography, HPLC results) - The quantitative results for this analyte between the primary and secondary HPLC columns or primary and
JPX		secondary HPLC detectors were greater than 40% difference. (X) (Organic/Inorganic) - The result for this analyte should be regarded as not detected.
		(J) (Organic/General Inorganics) - The result for this analyte was greater than the Method Detection Limit (MDL) but less than the Practical Quantitaion Limit (PQL).
JX		(Organic/Inorganic) - The result for this analyte should be regarded as not detected.
L		(L) (Inorganic) - The result for this analyte in the serial dilution sample indicates physical and chemical interferences are preser
LT		(LT) (Rad) - The result for this analyte is affected by spectral interferenc
		(N) (Organic) - The reported analyte is a tentitively identified compound (TIC). (N) (Inorganic) - The result for this anlayte in the matrix spike sample was outside acceptai
N		criteria.
		(N) (Organic) - The reported analyte is a tentitively identified compound (TIC). (N) (Inorganic) - The result for this anlayte in the matrix spike sample was outside acceptai
N*		criteria. * (Inorganic) - The result for this analyte in the Laboratory Replicate analysis was outside acceptance criteria.
		(P) (Pesticides/PCBs) - The quantitative results for this analyte between the primary and secondary GC columns were greater than 25% difference. (P) (SW-846 EPA Meth
		8310 High Pressure Liquid Chromotography, HPLC results) - The quantitative results for this analyte between the primary and secondary HPLC columns or primary and
P		secondary HPLC detectors were greater than 40% difference.
		(P) (Pesticides/PCBs) - The quantitative results for this analyte between the primary and secondary GC columns were greater than 25% difference. (P) (SW-846 EPA Meth
		8310 High Pressure Liquid Chromotography, HPLC results) - The quantitative results for this analyte between the primary and secondary HPLC columns or primary and
		secondary HPLC detectors were greater than 40% difference. (J) (Organic/General Inorganics) - The result for this analyte was greater than the Method Detection Limit (MDL)
PJ		but less than the Practical Quantitaion Limit (PQL).
		(P) (Pesticides/PCBs) - The quantitative results for this analyte between the primary and secondary GC columns were greater than 25% difference. (P) (SW-846 EPA Method
		8310 High Pressure Liquid Chromotography, HPLC results) - The quantitative results for this analyte between the primary and secondary HPLC columns or primary and
PX		secondary HPLC detectors were greater than 40% difference. (X) (Organic/Inorganic) - The result for this analyte should be regarded as not detected.
Q		(Q) The result for this analyte was reported at an elevated reporting lim
R		(Inorganic) -The data are not useable. Organic -The data are unusable (compound may or may not be present.) Resampling and reanalysis is necessary for verification.
SI		(SI) (Rad) - Gamma spectroscopy result should be regarded as an uncertain identification due to spectral interferenc
SQ		(SQ) (Rad) - Gamma spectroscopy result should be regarded as an uncertain identification due to spectral interferenc
TI		(TI) (Rad) - Gamma spectroscopy result should be regarded as an uncertain identification due to spectral interferenc
U		(U) (Organic/Inorganic) - The result for this analyte was not detected at the specified reporting lim
		(U) (Organic/Inorganic) - The result for this analyte was not detected at the specified reporting limit. * (Inorganic) - The result for this analyte in the Laboratory Replicate anal
U*		was outside acceptance criteria.
		(U) (Organic/Inorganic) - The result for this analyte was not detected at the specified reporting limit. (E) (Organic) - The result for this anlayte exceeded the upper range of
		instrument initial calibration curve. (E) (Inorganic) (ICP-AES) - The result for this analyte in the serial dilution analysis was outside acceptance criteria. (E) (Inorganic) (GFAA) -
UE		The result for this analyte failed one or more CLP acceptance criteria as explained in the case narrative.
		(U) (Organic/Inorganic) - The result for this analyte was not detected at the specified reporting limit. (E) (Inorganic) (ICP-AES) - The result for this analyte in the serial dilu
		analysis was outside acceptance criteria. (E) (Inorganic) (GFAA) - The result for this analyte failed one or more CLP acceptance criteria as explained in the case narrative. *
UE*		(Inorganic) - The result for this analyte in the Laboratory Replicate analysis was outside acceptance criteria.
		(U) (Organic/Inorganic) - The result for this analyte was not detected at the specified reporting limit. (E) (Organic) - The result for this anlayte exceeded the upper range of
		instrument initial calibration curve. (E) (Inorganic) (ICP-AES) - The result for this analyte in the serial dilution analysis was outside acceptance criteria. (E) (Inorganic) (GFAA) -
		The result for this analyte failed one or more CLP acceptance criteria as explained in the case narrative. (N) (Organic) - The reported analyte is a tentitively identified compound
UEN		(TIC). (N) (Inorganic) - The result for this anlayte in the matrix spike sample was outside acceptance criteria.
		(U) (Organic/Inorganic) - The result for this analyte was not detected at the specified reporting limit. (H) (Organic/Inorganic) - The required extraction or analysis holding time
UH		this result was exceeded.
		(U) (Organic/Inorganic) - The result for this analyte was not detected at the specified reporting limit. (H) (Organic/Inorganic) - The required extraction or analysis holding time
UH*		this result was exceeded. * (Inorganic) - The result for this analyte in the Laboratory Replicate analysis was outside acceptance criteria.
UI		(UI) (Rad) - Gamma spectroscopy result should be regarded as an uncertain identificatio
UJ		(UJ) (Organic) Legacy CST lab code should not be used
		UL (all suites) Not detected legacy - This lab qual code is applied by WQ personnel for CST data and other legacy data that was reported as not detected using the less th
UL		symbol without the laboratory assigning a U lab code.
		(U) (Organic/Inorganic) - The result for this analyte was not detected at the specified reporting limit. (N) (Organic) - The reported analyte is a tentitively identified compos
UN		(TIC). (N) (Inorganic) - The result for this anlayte in the matrix spike sample was outside acceptance criteria.
		(U) (Organic/Inorganic) - The result for this analyte was not detected at the specified reporting limit. (N) (Organic) - The reported analyte is a tentitively identified compos
		(TIC). (N) (Inorganic) - The result for this anlayte in the matrix spike sample was outside acceptance criteria. * (Inorganic) - The result for this analyte in the Laboratory
UN*		Replicate analysis was outside acceptance criteria.
UUI		(UUI) (Rad) - Gamma spectroscopy result should be regarded as an uncertain identification and the lab assigned these gamma spectroscopy results as not detected.
		(U) (Organic/Inorganic) - The result for this analyte was not detected at the specified reporting limit. (W) (Inorganic GFAA CLP) - The result for this analyte in the post-digest
UW		spike sample was outside acceptance criteria.
UY2		(UY2) (Rad) - Result should be regarded as an uncertain identification due to spectral interferenc
W		(W) (Inorganic GFAA CLP) - The result for this analyte in the post-digestion spike sample was outside acceptance criteri
X		(X) (Organic/Inorganic) - The result for this analyte should be regarded as not detecte
		(X) (Organic/Inorganic) - The result for this analyte should be regarded as not detected. (B) (Organic) - This analyte was detected in the associated Laboratory Method Blank
XB		and the sample. (B) (Inorganic) - The result for this analyte was greater than the Instrument Detection Limit but less than the Contract Required Detection Limit.