

Tuesday, February 08, 2011

REQUEST NUMBER: 11-1296

**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:11-1296
Per Agreement Number:63641-001-10
Project Cost Code: MR8R032NFB00

Please analyse the enclosed samples
according to the schedule indicated:

SHIP DATE: 2/8/2011
TURNAROUND/REPORT DUE: 3/10/2011
TURNAROUND REQ'D: 30 Days

RAD SCREENING: Not Required
LAB REQUEST COMMENTS:

LANL ER SMO CONTACT:

Signature:



PRIORITY	METHOD CODE	CNTNR	SAMPLE ID	SAMPLE MATRIX	DATE SAMPLED	SPECIAL INSTRUCTIONS
	EPA:906.0	1	MD21-11-4738	GAS	2/8/2011	
		1	MD21-11-4739	GAS	2/8/2011	
		1	MD21-11-4740	GAS	2/8/2011	
		1	MD21-11-4741	GAS	2/8/2011	
		1	MD21-11-4742	GAS	2/8/2011	
		1	MD21-11-4743	GAS	2/8/2011	
		1	MD21-11-4744	GAS	2/8/2011	
		1	MD21-11-4745	GAS	2/8/2011	
	MD21-11-4746	1	MD21-11-4746	GAS	2/8/2011	

Tuesday, February 08, 2011

REQUEST NUMBER: 11-1296

PRIORITY	METHOD CODE	CNTNR	SAMPLE ID	SAMPLE MATRIX	DATE SAMPLED	SPECIAL INSTRUCTIONS
	EPA:906.0	1	MD21-11-4748	GAS	2/8/2011	

Final Page of REQUEST NUMBER 11-1296

Tuesday, February 08, 2011

LAB CHAIN OF CUSTODY DOCUMENT NUMBER: 11-1296C

LOS ALAMOS
NATIONAL LABORATORY

REQUEST NUMBER: 11-1296

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

TURNAROUND/REPORT DUE: 3/10/2011
TURNAROUND REQ'D: 30

SAMPLE ID	CTNR	CTNR DESC	ORDER	PRESERV	MATRIX
MD21-11-4742	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-4740	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-4746	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-4747	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-4741	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-4738	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-4748	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-4739	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-4743	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-4745	1	SILICA GEL TUBE	H3	None	GAS
MD21-11-4744	1	SILICA GEL TUBE	H3	None	GAS

Relinquished By: Date Time Received By: Date Time

Signature
[Handwritten Signature] 2/8/11 1400
Signature

Signature

Signature

Signature

Signature

Received for DISPOSAL By: Date Time Remarks: _____

Signature

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 3365

EVENT NAME: MDA T - CU 21-018(a)-99 - Tritium Sampling

SAMPLE ID: MD21-11-4738

WORK ORDER:

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>	<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED(MM/DD/YYYY):		2/8/11	MEDIA:	NA
TIME COLLECTED (HH:MM)		940	SUB-MEDIA:	OTHER
PRS ID:	21-018(a)-99	OK	SAMPLE TECH CODE:	YOST
LOCATION ID:	21-602052 H 4th	21-24524W	FIELD QC TYPE:	FB
LOCATION TYPE:	BH	OK	FIELD PREP:	NA
TOP DEPTH:	0	300' bag	SAMPLE USAGE:	QC
BOTTOM DEPTH:	0	305' bag	SCREEN/PORT DESC:	part 5 FB
FIELD MATRIX:	GAS	OK	EXCAVATED: YES/NO/NA	<input checked="" type="radio"/>
COMPOSITE TYPE:	NA		COMPOSITE TIME INTERVAL:	NA
BOREHOLE:	<input checked="" type="radio"/> YES / NO / NA		BOREHOLE DECLINATION:	NA
			BOREHOLE DIRECTION:	90°

#	PRIORITY	ORDER	CNTNR	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
1		H3	1 EA SILICA GEL TUBE	None	Y	NA

SAMPLE DESC: QC Sample of MD21-11-4744
 column # 12
 initial wt = 591.95g
 silica wt 150.20g
 final wt = 597.33g
 vapor wt = 5.36g

SAMPLE COMMENTS:
 weather data @ 13102/7/11 T=34°F RH=44% BP=30.06 in
 @ 930 2/8/11 T=32°F RH 87% BP=29.7 in

LOCATION DESC:

NA

FIELD SCREENING/MEASUREMENT RESULTS: multi Rae 1A
 atm O₂ 20.9%
 sub atm O₂ 20.9%
 CO₂ 580 ppm
 CO₂ 3550 ppm

COLLECTED BY (PRINT) R Onstott M Rains REVIEWED BY (PRINT) M. Rains

RELINQUISHED BY (Printed Name) <u>Megan Rains</u> (Signature)	Date/Time <u>2/8/11</u> <u>1300</u>	RECEIVED BY (Printed Name) <u>Miss Matr</u> (Signature)	Date/Time <u>2/8/11</u> <u>1300</u>
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 3365

EVENT NAME: MDA T - CU 21-018(a)-99 - Tritium Sampling

SAMPLE ID: MD21-11-4739

WORK ORDER:

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>	<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED(MM/DD/YYYY):		2/8/11	MEDIA:	NA
TIME COLLECTED (HH:MM)		940	SUB-MEDIA:	OTHER
PRS ID: 21-018(a)-99		ok	SAMPLE TECH CODE:	VOST
LOCATION ID: 21-603039		21-24524W	FIELD QC TYPE:	ED
LOCATION TYPE: BH		ok	FIELD PREP:	NA
TOP DEPTH: 0		300' ^{hgs}	SAMPLE USAGE:	QC
BOTTOM DEPTH: 0		305' ^{hgs}	SCREEN/PORT DESC:	part 5 FD
FIELD MATRIX: GAS		ok	EXCAVATED: YES/NO	<input checked="" type="radio"/> NA
COMPOSITE TYPE: NA			COMPOSITE TIME INTERVAL: MA	
BOREHOLE: <input checked="" type="radio"/> YES / NO / NA			BOREHOLE DECLINATION: NA	
			BOREHOLE DIRECTION: 90°	

#	PRIORITY	ORDER	CNTNR	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
1		H3	1 EA SILICA GEL TUBE	None	Y	MA

SAMPLE DESC: QC Sample of MD21-11-4744 initial wt = 611.16g Final wt = 621.54g
 Column # 6 ^{to 2/8/11} ~~Final~~ silica wt 156.79 vapor wt 10.38g

SAMPLE COMMENTS:
 weather data MD21-11-4744

LOCATION DESC:
 NA

FIELD SCREENING/MEASUREMENT RESULTS:
 see MD21-11-4744

COLLECTED BY (PRINT) Ronst H M Rain REVIEWED BY (PRINT) m. Rains

RELINQUISHED BY (Printed Name) <u>Megan Rains</u> (Signature)	Date/Time 2/8/11 1300	RECEIVED BY (Printed Name) <u>Melissa Montoya</u> (Signature)	Date/Time 2/8/11 1300
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 3365

EVENT NAME: MDA T - CU 21-018(a)-99 - Tritium Sampling

SAMPLE ID: MD21-11-4740

WORK ORDER:

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>	<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED(MM/DD/YYYY):		2/8/11	MEDIA:	NA
TIME COLLECTED (HH:MM)		940	SUB-MEDIA:	OTHER
PRS ID: 21-018(a)-99		OK	SAMPLE TECH CODE:	VOST
LOCATION ID: 21-24524W		OK	FIELD QC TYPE:	NA
LOCATION TYPE: BH		OK	FIELD PREP:	NA
TOP DEPTH: ± 43 ^{22/71u}		42.5' bgs	SAMPLE USAGE:	INV
BOTTOM DEPTH: 0		47.5' bgs	SCREEN/PORT DESC:	part #1
FIELD MATRIX: GAS		OK	EXCAVATED: YES/NO	NA
COMPOSITE TYPE: <u>NA</u>			COMPOSITE TIME INTERVAL: <u>NA</u>	
			WATER FLOWING: YES/NO	NA
BOREHOLE: <input checked="" type="radio"/> YES / NO / NA			BOREHOLE DECLINATION: <u>NA</u>	
			BOREHOLE DIRECTION: <u>90°</u>	

#	PRIORITY	ORDER	CNTNR	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
1		H3	1 EA SILICA GEL TUBE	None	Y	NA

SAMPLE DESC: column # 1 initial wt = 589.45g Final wt = 606.06g
 silica wt = 151.65g vapor wt = 16.61g

SAMPLE COMMENTS: weather data @ 930 2/8/11 T = 32°F RH = 87% BP = 29.71 in
@ 1320 2/7/11 T = 34°F RH = 44% BP = 30.06 in

LOCATION DESC: NA

FIELD SCREENING/MEASUREMENT RESULTS: multiRae IR
~~604/01 NA~~ atm O₂ 20.9% CO₂ 490 ppm
 Sub atm O₂ 15.9% CO₂ 1.56%

COLLECTED BY (PRINT) R. D. Smith M. Rains REVIEWED BY (PRINT) M. Rains

RELINQUISHED BY (Printed Name) <u>megan Rains</u> (Signature) <u>[Signature]</u>	Date/Time <u>2/8/11</u> <u>1300</u>	RECEIVED BY (Printed Name) <u>Miss Marty</u> (Signature) <u>[Signature]</u>	Date/Time <u>2/8/11</u> <u>1300</u>
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 3365

EVENT NAME: MDA T - CU 21-018(a)-99 - Tritium Sampling

SAMPLE ID: MD21-11-4741

WORK ORDER:

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>	<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED(MM/DD/YYYY):		2/8/11	MEDIA:	NA
TIME COLLECTED (HH:MM)		940	SUB-MEDIA:	OTHER
PRS ID: 21-018(a)-99		ok	SAMPLE TECH CODE:	VOST
LOCATION ID: 21-24524W		ok	FIELD QC TYPE:	NA
LOCATION TYPE: BH		ok	FIELD PREP:	NA
TOP DEPTH: 0-125 2/27/11		122.5' bgs	SAMPLE USAGE:	INV
BOTTOM DEPTH: 0		127.5' bgs	SCREEN/PORT DESC:	part # 2
FIELD MATRIX: GAS		ok	EXCAVATED: YES/NO	(NA)
COMPOSITE TYPE: NA			COMPOSITE TIME INTERVAL:	
			WATER FLOWING: YES/NO/NA	(NA)
BOREHOLE: YES/NO/NA			BOREHOLE DECLINATION: NA	
			BOREHOLE DIRECTION: 90°	

#	PRIORITY	ORDER	CNTNR	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
1		H3	1 EA SILICA GEL TUBE	None	Y	NA

SAMPLE DESC: column # 2
 initial wt 593.62g
 final wt = 152.75g
 silica
 final sitment 614.93g
 vapor wt 21.31g

SAMPLE COMMENTS: weather data @ 1310 2/7/11 T = 34°F RH 44% BP = 3006 in
 @ 930 2/8/11 T = 32°F RH = 87% BP = 29.71 in

LOCATION DESC: NA

FIELD SCREENING/MEASUREMENT RESULTS: multi RAE IR
 atm O₂ 20.9% CO₂ 520ppm
 sub atm O₂ 20.9% CO₂ 3150ppm

COLLECTED BY (PRINT) R Onstott M Rains REVIEWED BY (PRINT) M. Rains

RELINQUISHED BY (Printed Name) Megan Rains (Signature)	Date/Time 2/8/11 1300	RECEIVED BY (Printed Name) (Signature)	Date/Time 2/8/11 1300
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 3365

EVENT NAME: MDA T - CU 21-018(a)-99 - Tritium Sampling

SAMPLE ID: MD21-11-4742

WORK ORDER:

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED(MM/DD/YYYY):		2/8/11	MEDIA:	NA	ok
TIME COLLECTED (HH:MM)		940	SUB-MEDIA:	OTHER	
PRS ID: 21-018(a)-99		ok	SAMPLE TECH CODE:	VOST	
LOCATION ID: 21-24524W		ok	FIELD QC TYPE:	NA	
LOCATION TYPE: BH		ok	FIELD PREP:	NA	
TOP DEPTH: 175 202111		172.5' bgs	SAMPLE USAGE:	INV	
BOTTOM DEPTH: 0		177.5' bgs	SCREEN/PORT DESC:	part 3	
FIELD MATRIX: GAS		ok	EXCAVATED: YES/NO/NA	NA	
COMPOSITE TYPE: NA			COMPOSITE TIME INTERVAL: NA		
BOREHOLE: YES/NO/NA			BOREHOLE DECLINATION: NA		
			BOREHOLE DIRECTION: 90°		

#	PRIORITY	ORDER	CNTNR	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
1		H3	1 EA SILICA GEL TUBE	None		NA

SAMPLE DESC:

column #
3

initial wt = 588.53g
silica wt = 151.02g

Final wt = 607.4g
vapor wt = 18.91g

SAMPLE COMMENTS:

weather data @ 1310 2/8/11 T=34°F RH=44% BR=30.06in
@ 930 2/8/11 T=32°F RH 87% BP=29.71in

LOCATION DESC:

NA

FIELD SCREENING/MEASUREMENT RESULTS:

multi Rae
atm O₂ 20.9% CO₂ 500ppm
Sub atm O₂ = 20.6% CO₂ 4560ppm

COLLECTED BY (PRINT) R Onstott # M Rains REVIEWED BY (PRINT) M. Rains

RELINQUISHED BY (Printed Name) <i>M. Rains</i> (Signature) <i>[Signature]</i>	Date/Time 2/8/11 1300	RECEIVED BY (Printed Name) <i>Miss Monty</i> (Signature) <i>[Signature]</i>	Date/Time 2/8/11 1300
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 3365

EVENT NAME: MDA T - CU 21-018(a)-99 - Tritium Sampling

SAMPLE ID: MD21-11-4743

WORK ORDER:

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>	<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED(MM/DD/YYYY):		2/7/11 2/8/11	MEDIA:	NA
TIME COLLECTED (HH:MM)		940	SUB-MEDIA:	OTHER
PRS ID: 21-018(a)-99		OK	SAMPLE TECH CODE:	VOST
LOCATION ID: 21-24524W		OK	FIELD QC TYPE:	NA
LOCATION TYPE: BH		OK	FIELD PREP:	NA
TOP DEPTH: 0 260		257.5' bgs	SAMPLE USAGE:	INV
BOTTOM DEPTH: 0		262.5' bgs	SCREEN/PORT DESC:	part # 4
FIELD MATRIX: GAS		OK	EXCAVATED: YES/NO/NA	NA
COMPOSITE TYPE: NA			COMPOSITE TIME INTERVAL: NA	WATER FLOWING: YES/NO NA
BOREHOLE: YES/NO/NA			BOREHOLE DECLINATION: NA	BOREHOLE DIRECTION: 90°

#	PRIORITY	ORDER	CNTNR	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
1		H3	1 EA SILICA GEL TUBE	None	Y	NA

SAMPLE DESC: column # 4
 Initial wt = 594.84g Final wt = 608.65g
 Silica wt = 147.98g vapor wt = 13.81g

SAMPLE COMMENTS: weather data @ 1310 2/7/11 T=34°F RH=44% BP=30.06in
 @ 930 2/8/11 T=32°F RH 87% BP=29.71in

LOCATION DESC: NA

FIELD SCREENING/MEASUREMENT RESULTS: mult Rare IR
 atm O₂ 20.9% CO₂ 520ppm
 sub atm O₂ 20.9% CO₂ 3700ppm

COLLECTED BY (PRINT) L Onstott M Rains REVIEWED BY (PRINT) M. Rains

RELINQUISHED BY (Printed Name) Megan Rains (Signature)	Date/Time 2/8/11 1300	RECEIVED BY (Printed Name) (Signature)	Date/Time 2/8/11 1300
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 3365

EVENT NAME: MDA T - CU 21-018(a)-99 - Tritium Sampling

SAMPLE ID: MD21-11-4744

WORK ORDER:

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>	<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED(MM/DD/YYYY):		2/8/11	MEDIA:	NA
TIME COLLECTED (HH:MM)		940	SUB-MEDIA:	OTHER
PRS ID: 21-018(a)-99		ok	SAMPLE TECH CODE:	VOST
LOCATION ID: 21-24524W		ok	FIELD QC TYPE:	NA
LOCATION TYPE: BH		ok	FIELD PREP:	NA
TOP DEPTH: ± 302.5 to 2/7/11		300' bgs	SAMPLE USAGE:	INV
BOTTOM DEPTH: 0		305' bgs	SCREEN/PORT DESC:	part 5
FIELD MATRIX: GAS		ok	EXCAVATED: YES/NO/ NA	
COMPOSITE TYPE: NA	NA	COMPOSITE TIME INTERVAL: NA	NA	WATER FLOWING: YES/NO/ NA
BOREHOLE: YES /NO/NA	NA	BOREHOLE DECLINATION: NA	NA	BOREHOLE DIRECTION: 90°

#	PRIORITY	ORDER	CNTNR	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
1		H3	1 EA SILICA GEL TUBE	None	Y	NA

SAMPLE DESC:
column # 5 initial wt silica wt Final wt Vapor wt

SAMPLE COMMENTS:
 weather data @ 1310 2/7/11 T=34°F RH=44% BP=30.06 in
 @ 930 2/8/11 T=32°F RH 87% BP=29.71 in

LOCATION DESC:
 NA

FIELD SCREENING/MEASUREMENT RESULTS:
 multi Rae
 atm O₂ 20.9% CO₂ 580 ppm
 sub atm O₂ 20.9% CO₂ 3550 ppm

COLLECTED BY (PRINT) Ronsted M Rains REVIEWED BY (PRINT) M. Rains

RELINQUISHED BY (Printed Name) <u>Megan Rains</u>	Date/Time <u>2/8/11</u> <u>1300</u>	RECEIVED BY (Printed Name) <u>Whitney Montoye</u>	Date/Time <u>2/8/11</u> <u>1300</u>
RELINQUISHED BY (Printed Name)	Date/Time	RECEIVED BY (Printed Name)	Date/Time
(Signature)		(Signature)	

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 3365

EVENT NAME: MDA T - CU 21-018(a)-99 - Tritium Sampling

SAMPLE ID: MD21-11-4745

WORK ORDER:

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED(MM/DD/YYYY):		2/8/11	MEDIA:	NA	ok
TIME COLLECTED (HH:MM)		940	SUB-MEDIA:	OTHER	
PRS ID: 21-018(a)-99		ok	SAMPLE TECH CODE:	YOST	
LOCATION ID: 21-24524W		ok	FIELD QC TYPE:	NA	
LOCATION TYPE: BH		ok	FIELD PREP:	NA	
TOP DEPTH: 0 220 20 2/9/11		327.5' bgs	SAMPLE USAGE:	INV	
BOTTOM DEPTH: 0		332.5' bgs	SCREEN/PORT DESC:	part 6	
FIELD MATRIX: GAS		ok	EXCAVATED: YES/NO/NA	<input checked="" type="radio"/>	
COMPOSITE TYPE: <u>NA</u>			COMPOSITE TIME INTERVAL: <u>NA</u>		
BOREHOLE: <input checked="" type="radio"/> YES / NO / NA			BOREHOLE DECLINATION: <u>NA</u>		
			BOREHOLE DIRECTION: <u>90°</u>		

#	PRIORITY	ORDER	CNTNR	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
1		H3	1 EA SILICA GEL TUBE	None	Y	NA

SAMPLE DESC: column # 7
 Initial wt: 590.22g
 Silica wt: 158.93g
 Final wt: 610.13g
 Vapour wt = 19.91g

SAMPLE COMMENTS: weather data
 @ 1310 2/7/11 T=34°F RH 44% BP=30.06 in
 @ 930 2/8/11 T=32°F RH 87% BP 29.7 in

LOCATION DESC: NA

FIELD SCREENING/MEASUREMENT RESULTS: null to RAE
 atm O₂ 20.9% CO₂ 500ppm
 sub atm O₂ 20.9% CO₂ 3950ppm

COLLECTED BY (PRINT) R Ousalt M Rain REVIEWED BY (PRINT) M. Rainis

RELINQUISHED BY (Printed Name) <u>megan Rainis</u> (Signature)	Date/Time <u>2/8/11</u> <u>1300</u>	RECEIVED BY (Printed Name) <u>Melissa Montoya</u> (Signature)	Date/Time <u>2/8/11</u> <u>1300</u>
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 3365

EVENT NAME: MDA T - CU 21-018(a)-99 - Tritium Sampling

SAMPLE ID: MD21-11-4746

WORK ORDER:

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>	<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED(MM/DD/YYYY):		2/8/11	MEDIA:	NA
TIME COLLECTED (HH:MM)		940	SUB-MEDIA:	OTHER
PRS ID: 21-018(a)-99		ok	SAMPLE TECH CODE:	VOST
LOCATION ID: 21-24524W		ok	FIELD QC TYPE:	NA
LOCATION TYPE: BH		ok	FIELD PREP:	NA
TOP DEPTH: 0-380 21/7/11		377.5' bgs	SAMPLE USAGE:	INV
BOTTOM DEPTH: 0		382.5' bgs	SCREEN/PORT DESC:	part 7
FIELD MATRIX: GAS			EXCAVATED: YES/NO/NA	NA
COMPOSITE TYPE: NA			COMPOSITE TIME INTERVAL: NA	NA
			WATER FLOWING: YES/NO/NA	NA
BOREHOLE: <input checked="" type="radio"/> YES / NO / NA			BOREHOLE DECLINATION: NA	90°
			BOREHOLE DIRECTION:	90°

#	PRIORITY	ORDER	CNTNR	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
1		H3	1 EA SILICA GEL TUBE	None	Y	NA

SAMPLE DESC: column # 8 initial wt 611.33g Final wt 621.21g
 silica wt 150.42g Vapour wt 9.88g

SAMPLE COMMENTS: weather data @ 1310 2/7/11 T=34°F RH=44% BP=30.06in
 @ 930 2/8/11 T=32°F RH 87% BP=29.7in

LOCATION DESC: NA

FIELD SCREENING/MEASUREMENT RESULTS: multi Rae
 atm O₂ 20.9% CO₂ 530 ppm
 sub atm O₂ 20.9% CO₂ 3400 ppm

COLLECTED BY (PRINT) R. Dreyhoff M. Krins REVIEWED BY (PRINT) m. Paris

RELINQUISHED BY (Printed Name) <i>Megan Paris</i> (Signature)	Date/Time 2/8/11 1300	RECEIVED BY (Printed Name) <i>Missy Hantz</i> (Signature)	Date/Time 2/8/11 1300
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 3365

EVENT NAME: MDA T - CU 21-018(a)-99 - Tritium Sampling

SAMPLE ID: MD21-11-4747

WORK ORDER:

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>	<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED(MM/DD/YYYY):		2/8/11	MEDIA:	NA
TIME COLLECTED (HH:MM)		9:40	SUB-MEDIA:	OTHER
PRS ID: 21-018(a)-99		ok	SAMPLE TECH CODE:	VOST
LOCATION ID: 21-245245		21-245245	FIELD QC TYPE:	NA
LOCATION TYPE: BH		ok	FIELD PREP:	NA
TOP DEPTH: 0-680		677.5' bgs	SAMPLE USAGE:	INV
BOTTOM DEPTH: 0		682.5' bgs	SCREEN/PORT DESC:	part 10
FIELD MATRIX: GAS			EXCAVATED: YES/NO/NA	<input checked="" type="radio"/>
COMPOSITE TYPE: NA			COMPOSITE TIME INTERVAL: NA	
BOREHOLE: <input checked="" type="radio"/> YES <input type="radio"/> NO <input type="radio"/> NA			BOREHOLE DECLINATION: NA	
			BOREHOLE DIRECTION: 90°	

#	PRIORITY	ORDER	CNTNR	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
1		H3	1 EA SILICA GEL TUBE	None	Y	NA

SAMPLE DESC: column #9
 initial wt 591.24g
 silica wt 155.78g
 final wt 601.59g
 vapor wt 10.35g

SAMPLE COMMENTS: weather data @ 1310 2/7/11 T=34°F RH=44% BP=30.06in
 @ 930 2/8/11 T=32°F RH=87% BP=29.71in

LOCATION DESC: NA

FIELD SCREENING/MEASUREMENT RESULTS: Multi RAE
 atm O₂ 20.9% CO₂ 500 ppm
 sub atm O₂ 20.9% CO₂ 3500 ppm

COLLECTED BY (PRINT) Konstantin M Pains REVIEWED BY (PRINT) m. Pains

RELINQUISHED BY (Printed Name) m. Pains (Signature)	Date/Time 2/8/11 1300	RECEIVED BY (Printed Name) Melissa Montz (Signature)	Date/Time 2/8/11 1300
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 3365

EVENT NAME: MDA T - CU 21-018(a)-99 - Tritium Sampling

SAMPLE ID: MD21-11-4748

WORK ORDER:

<u>AS PLANNED</u>	<u>AS COLLECTED</u>	<u>AS PLANNED</u>	<u>AS COLLECTED</u>
DATE COLLECTED(MM/DD/YYYY):	2/8/11	MEDIA:	NA
TIME COLLECTED (HH:MM)	940	SUB-MEDIA:	OTHER
PRS ID: 21-018(a)-99	ok	SAMPLE TECH CODE: VOST	
LOCATION ID: 21-24524W ^{no 2/7/11}	21-245245	FIELD QC TYPE: NA	
LOCATION TYPE: BH	ok	FIELD PREP: NA	
TOP DEPTH: 0 ^{715' 2/7/11}	712.5' bgs	SAMPLE USAGE: INV	
BOTTOM DEPTH: 0	717.5' bgs	SCREEN/PORT DESC:	part 11
FIELD MATRIX: GAS	ok	EXCAVATED: YES/NO/NA	NA
COMPOSITE TYPE: <u>NA</u>	COMPOSITE TIME INTERVAL: <u>NA</u>	WATER FLOWING: YES/NO/NA	NA
BOREHOLE: <input checked="" type="radio"/> YES / NO / NA	BOREHOLE DECLINATION: <u>NA</u>	BOREHOLE DIRECTION: <u>90°</u>	

#	PRIORITY	ORDER	CNTNR	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
1		H3	1 EA SILICA GEL TUBE	None	Y	NA

SAMPLE DESC: Column # 10 initial wt 593.91g silica wt = 153.38g Final wt 607.75g vapor wt 13.84g

SAMPLE COMMENTS: weather data @ 1310 ^{2/8/11} T = 34° F RH = 44% BP = 30.06 in @ 930 ^{2/8/11} T = 32° F RH 87% BP = 29.71 in

LOCATION DESC: NA

FIELD SCREENING/MEASUREMENT RESULTS: Mult Rac
 atm O₂ 20.9% CO₂ 580 ppm
 sub atm O₂ 20.9% CO₂ 2870 ppm

COLLECTED BY (PRINT) K Onstott / M Rain REVIEWED BY (PRINT) m. Rain

RELINQUISHED BY (Printed Name) <u>Megan Rainis</u> (Signature) 	Date/Time <u>2/8/11</u> <u>1300</u>	RECEIVED BY (Printed Name) <u>Debbie Monty</u> (Signature) 	Date/Time <u>2/8/11</u> <u>1300</u>
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

DATA VALIDATION COVER SHEET

5119-1

Data Validation Cover Sheet

Records Use only



Section I.

 REQUEST NUMBER: 11-1296 VALIDATION DATE: 03/30/11 LAB CODE: ARS

 CONTRACT LABORATORY NAME: American Radiation Services, Inc.

 VALIDATOR: David Schwent ORGANIZATION: Analytical Quality Associates, Inc.

ANALYTICAL SUITE (CHECK ALL THAT APPLY):

- | | | | |
|--|--|--|---|
| <input type="checkbox"/> TPH-GRO | <input type="checkbox"/> HIGH EXPLOSIVES | <input type="checkbox"/> DIOXIN FURANS | <input type="checkbox"/> LCMSMS PERCHLORATES |
| <input type="checkbox"/> TPH-DRO | <input type="checkbox"/> METALS | <input type="checkbox"/> PCB CONGENERS | <input type="checkbox"/> ORGANOCHLORINE
PESTICIDES/POLYCHLORINA
TED BIPHENYLS |
| <input type="checkbox"/> GENERAL CHEMISTRY | <input checked="" type="checkbox"/> RADIOCHEMISTRY | <input type="checkbox"/> LCMSMS HIGH
EXPLOSIVES | |
| <input type="checkbox"/> OTHER (DESCRIBE): <u>Tritium only</u> | | | |

Section II. Completeness Check

YES	NO	N/A	(CHECK ONE)	YES	NO	N/A	(CHECK ONE)
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1. CHAIN-OF-CUSTODY FORM(S)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6. RAW/BSS DATA
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2. CASE NARRATIVE	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7. QUALITY CONTROL FORMS
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	3. SAMPLE RESULT FORMS	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8. QUANTITATION REPORTS
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	4. SAMPLE CHROMATOGRAMS	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	9. TICS FORMS
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	5. STANDARD CHROMATOGRAMS	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	10. TICS MASS SPECTRA

Comments/problems noted (include information about requests for further information submitted to the contract laboratory and agreed-upon date of resolution and contract laboratory point of contact):

1. In the MB, tritium was detected. The associated results of samples MD21-11-4742, -4747, -4741, -4748, and -4745 were detects >5X but ≤50X the MB concentration and, thus, was qualified J,R4a. The associated results of samples -4746 and -4738 were NDs and, thus, were not qualified. All other associated sample results were detects >50X the MB concentration and, thus, were not qualified, based on professional judgment.
2. It should be noted that no duplicate or MS samples were analyzed. However, an LCS and LCSD were analyzed and met acceptance criteria and, thus, no sample data were qualified.
3. It should also be noted that the LCS/LCSD RER was hand-calculated using the 2-sigma TPU values and was found to be within specifications. No sample data were qualified as a result.
4. It should also be noted that the tritium analysis for sample -4747 was not listed on the Analytical Request form associated with the COC. No sample data were qualified as a result.

DATA VALIDATION COVER SHEET

5119-1

Data Validation Cover Sheet

Records Use only



Reviewed by: Susan Ball

Level: I

Date: 03/30/11

VALIDATOR'S SIGNATURE:

David Schwant

DATE: 03/30/11

Form 5119-1, Revision 0.0

LOS ALAMOS
Environmental Restoration Project

RAD ANALYTICAL DATA VALIDATION CHECKLIST

5119-2

Rad Analytical Data Validation Checklist

Records Use only



Yes No N/A (Check One)				Assign Qualifier Listed Below If Criterion = Yes	
				Non-detected Analyte	Detected Analyte
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1. The holding time was >1 and ≤2 times the applicable holding time requirement.	UJ, R9	J-, R9
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2. The holding time was >2 times the applicable holding time requirement.	R, R9a	J-, R9a
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	3. The results for the affected analytes are considered not detected (U) because the associated sample concentration was less than or equal to the MDC.	U, R5	N/A
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	4. The analyte should be regarded as rejected because spectral interferences prevent positive identification of the analytes.	R, R5a	R, R5a
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	5. The MDC and/or TPU documentation is missing. Data may not be acceptable for use. Contact the SMO or external laboratory for information.	R, R5b	J-, R5b
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	6. 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.	U, R11	N/A
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7. The sample result is ≤5X the concentration of the related analyte in the method blank.	U, R4	N/A
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	8. The affected analytes are considered estimated and biased high because this analyte was identified in the method blank but was >5X.	N/A	J, R4a
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	9. The sample result is ≤5X the concentration of the related analyte in the trip blank, rinsate blank, or equipment blank.	U, R4d	N/A
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	10. Required method blank information is missing. Data may not be acceptable for use. Contact the SMO or external laboratory for information.	R, R4e	R, R4e
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	11. The tracer is <10%R. Follow the external laboratory limits located within the associated data package. Tracer%R is not applicable for Gamma Spectroscopy.	R, R3	R, R3

RAD ANALYTICAL DATA VALIDATION CHECKLIST

5119-2

Rad Analytical Data Validation Checklist

Records Use only



Yes No N/A (Check One)				Assign Qualifier Listed Below If Criterion = Yes	
				Non-detected Analyte	Detected Analyte
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	12. The tracer is < the Lower Acceptance Level (LAL) but $\geq 10\%R$. Follow the external laboratory limits located within the associated data package. Tracer%R is not applicable for Gamma Spectroscopy.	UJ, R3a	J-, R3a
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	13. The Tracer%R value is > the Upper Acceptance Limit (UAL). Follow the external laboratory limits located within the associated data package. Tracer%R is not applicable for Gamma Spectroscopy.	N/A	J+, R3b
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	14. Required tracer information is missing. Data may not be acceptable for use. Contact the SMO or external laboratory for information. Tracer%R is not applicable for Gamma Spectroscopy.	R, R3d	R, R3d
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	15. The LCS percent recovery was <10%. Follow the external laboratory limits located within the associated data package.	R, R12	R, R12
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	16. The LCS percent recovery was < the LAL but >10%. Follow the external laboratory limits located within the associated data package.	UJ, R12a	J-, R12a
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	17. The LCS percent recovery was > the UAL. Follow the external laboratory limits located within the associated data package.	N/A	J+, R12b
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	18. The LCS documentation is missing. Data may not be acceptable for use. Contact the SMO or external laboratory for information.	R, R12c	R, R12c
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	19. Associated duplicate sample has DER or RER > the analytical laboratory's acceptance limits.	R, R10	J, J10
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	20. The duplicate sample was not prepared and/or analyzed with the samples for unspecified reasons. The duplicate information is missing. Data may not be acceptable for use. Contact the SMO or external laboratory for information.	R, R6	R, R6

RAD ANALYTICAL DATA VALIDATION CHECKLIST

5119-2

Rad Analytical Data Validation Checklist

Records Use only



Yes No N/A (Check One)				Assign Qualifier Listed Below If Criterion = Yes	
				Non-detected Analyte	Detected Analyte
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	21. The associated matrix spike recovery was <10%. Follow the external laboratory limits. MS/MSD is not applicable to Gamma Spectroscopy.	R, R6	R, R6
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	22. The associated matrix spike recovery was <10%. Follow the external laboratory limits. MS/MSD is not applicable to Gamma Spectroscopy.	UJ, R6a	J-, R6a
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	23. The associated matrix spike recovery was above the UAL. Follow the external laboratory limits. MS/MSD is not applicable to Gamma Spectroscopy.	UJ, R6b	J+, R6b
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	24. Required matrix spike information is missing. Data may not be acceptable for use. Contact the SMO or external laboratory for information. If LCS information is present, do not Reject. Qualify data based on LCS information. MS/MSD is not applicable to Gamma Spectroscopy.	R, R6c	R, R6c
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	25. Duplicate, dilution, or reanalysis.	UJ, R88	J, R88
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	26. The LANL project chemist identified quality deficiencies in the reported data that require further qualification. This code can ONLY be used and/or under advisement by the LANL project chemist.	UJ, R, R19	J, R, R19
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	27. Quantification of data via data validation did not occur based on Quality Control requirements in this procedure. Adhere to the external laboratory qualifiers found within the Form I analytical data summary sheets generated by the external laboratory.	U, U_LAB	J, J_LAB NQ, NQ



2609 North River Road, Port Allen, Louisiana 70767

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

ARS Sample Delivery Group: ARS1-11-00256
Client Sample ID: MD21-11-4742
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-001
Date Received: 02/09/11
Report Date: 03/18/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3 J,R4a	11316.852	608.411	212.519	104.332		pCi/L	ARS-054/EPA 906.0	03/15/11 19:25	AB	NA

NOTES: Project Cost Code MR8R032NFB00

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



2609 North River Road, Port Allen, Louisiana 70767

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

ARS Sample Delivery Group: ARS1-11-00256
Client Sample ID: MD21-11-4740
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-002
Date Received: 02/09/11
Report Date: 03/18/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	30698.165	1619.537	210.569	103.374		pCi/L	ARS-054/EPA 906.0	03/15/11 22:32	AB	NA

NOTES: Project Cost Code MR8R032NFB00

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



2609 North River Road, Port Allen, Louisiana 70767

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

ARS Sample Delivery Group: ARS1-11-00256
Client Sample ID: MD21-11-4746
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-003
Date Received: 02/09/11
Report Date: 03/18/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	152.031	64.923	210.270	103.228	U	pCi/L	ARS-054/EPA 906.0	03/16/11 01:39	AB	NA

NOTES: Project Cost Code MRBR032NFB00

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



2609 North River Road, Port Allen, Louisiana 70767

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

ARS Sample Delivery Group: ARS1-11-00256
Client Sample ID: MD21-11-4747
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-004
Date Received: 02/09/11
Report Date: 03/18/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3 J,R4a	3477.138	204.807	211.390	103.778		pCi/L	ARS-054/EPA 906.0	03/16/11 04:46	AB	NA

NOTES: Project Cost Code MRBR032NFB00

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 # EB7558



2609 North River Road, Port Allen, Louisiana 70767

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

ARS Sample Delivery Group: ARS1-11-00256
Client Sample ID: MD21-11-4741
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-005
Date Received: 02/09/11
Report Date: 03/18/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3 J,R4a	9799.779	529.351	210.245	103.215		pCi/L	ARS-054/EPA 906.0	03/16/11 07:53	AB	NA

NOTES: Project Cost Code MR8R032NFB00

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



2609 North River Road, Port Allen, Louisiana 70767

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

ARS Sample Delivery Group: ARS1-11-00256
Client Sample ID: MD21-11-4738
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-006
Date Received: 02/09/11
Report Date: 03/18/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	111.103	64.033	209.542	102.870	U	pCi/L	ARS-054/EPA 906.0	03/16/11 11:00	AB	NA

NOTES: Project Cost Code MR8R032NFB00

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



2609 North River Road, Port Allen, Louisiana 70767

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

ARS Sample Delivery Group: ARS1-11-00256
Client Sample ID: MD21-11-4748
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-007
Date Received: 02/09/11
Report Date: 03/18/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3 J,R4a	2304.098	147.128	209.424	102.812		pCi/L	ARS-054/EPA 906.0	03/16/11 14:07	AB	NA

NOTES: Project Cost Code MR8R032NFB00

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



2609 North River Road, Port Allen, Louisiana 70767

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

ARS Sample Delivery Group: ARS1-11-00256
Client Sample ID: MD21-11-4739
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-008
Date Received: 02/09/11
Report Date: 03/18/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	26870.401	1419.539	209.945	103.068		pCi/L	ARS-054/EPA 906.0	03/16/11 17:14	AB	NA

NOTES: Project Cost Code MR8R032NFB00

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



2609 North River Road, Port Allen, Louisiana 70767

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

ARS Sample Delivery Group: ARS1-11-00256
Client Sample ID: MD21-11-4743
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-009
Date Received: 02/09/11
Report Date: 03/18/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	24399.350	1290.720	212.954	104.545		pCi/L	ARS-054/EPA 906.0	03/16/11 20:21	AB	NA

NOTES: Project Cost Code MR8R032NFB00

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



2609 North River Road, Port Allen, Louisiana 70767

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

ARS Sample Delivery Group: ARS1-11-00256
Client Sample ID: MD21-11-4745
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-010
Date Received: 02/09/11
Report Date: 03/18/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3 J,R4a	7396.100	405.078	212.889	104.513		pCi/L	ARS-054/EPA 906.0	03/16/11 23:28	AB	NA

NOTES: Project Cost Code MRBR032NFB00

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



2609 North River Road, Port Allen, Louisiana 70767

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

ARS Sample Delivery Group: ARS1-11-00256
Client Sample ID: MD21-11-4744
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-011
Date Received: 02/09/11
Report Date: 03/18/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	25452.475	1345.529	210.542	103.361		pCi/L	ARS-054/EPA 906.0	03/17/11 02:35	AB	NA

NOTES: Project Cost Code MR8R032NFB00

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

Tuesday, February 08, 2011

REQUEST NUMBER: 11-1296

LOS ALAMOS
NATIONAL LABORATORY

ATTN: Danny Coleman

These Samples are on:

American Radiation Services - Primary

LANL Request Number: 11-1296

1726 Wooddale Court

Per Agreement Number: 63641-001-10

Baton Rouge, LA 70806

Project Cost Code: MR8R032NFB00

Please analyse the enclosed samples according to the schedule indicated:

SHIP DATE: 2/8/2011

TURNAROUND/REPORT DUE: 3/10/2011

TURNAROUND REQ'D: 30 Days

RAD SCREENING: Not Required

LAB REQUEST COMMENTS:

LANL ER SMO CONTACT:

Signature:

PRIORITY	METHOD CODE	CNTNR	SAMPLE ID	SAMPLE MATRIX	DATE SAMPLED	SPECIAL INSTRUCTIONS
----------	-------------	-------	-----------	---------------	--------------	----------------------

EPA906.0 1 MD21-11-4738 GAS 2/8/2011

1 MD21-11-4739 GAS 2/8/2011

1 MD21-11-4740 GAS 2/8/2011

1 MD21-11-4741 GAS 2/8/2011

1 MD21-11-4742 GAS 2/8/2011

1 MD21-11-4743 GAS 2/8/2011

1 MD21-11-4744 GAS 2/8/2011

1 MD21-11-4745 GAS 2/8/2011

1 MD21-11-4746 GAS 2/8/2011

Tuesday, February 08, 2011

REQUEST NUMBER: 11-1296

PRIORITY	METHOD CODE	CNTNR	SAMPLE ID	SAMPLE MATRIX	DATE SAMPLED	SPECIAL INSTRUCTIONS
EPA:906:0		1	MD21-11-4748	GAS	2/8/2011	

Final Page of REQUEST NUMBER 11-1296



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 Number: 11-1296



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 Number: 11-1296**

Original COC

Tuesday, February 08, 2011

REQUEST NUMBER: 11-1296

LOS ALAMOS
NATIONAL LABORATORY

ATTN: Danny Coleman

These Samples are on:

American Radiation Services - Primary

LANL Request Number: 11-1296

1726 Wooddale Court

Per Agreement Number: 63641-001-10

Baton Rouge, LA 70806

Project Cost Code: MR8R032NFB00

Please analyse the enclosed samples according to the schedule indicated:

SHIP DATE: 2/8/2011

TURNAROUND/REPORT DUE: 3/10/2011

TURNAROUND REQ'D: 30 Days

RAD SCREENING: Not Required

LAB REQUEST COMMENTS:

LANL ER SMO CONTACT:

Signature:

PRIORITY	METHOD CODE	CNTNR	SAMPLE ID	SAMPLE MATRIX	DATE SAMPLED	SPECIAL INSTRUCTIONS
----------	-------------	-------	-----------	---------------	--------------	----------------------

EPA906.0 1 MD21-11-4738 GAS 2/8/2011

1 MD21-11-4739 GAS 2/8/2011

1 MD21-11-4740 GAS 2/8/2011

1 MD21-11-4741 GAS 2/8/2011

1 MD21-11-4742 GAS 2/8/2011

1 MD21-11-4743 GAS 2/8/2011

1 MD21-11-4744 GAS 2/8/2011

1 MD21-11-4745 GAS 2/8/2011

1 MD21-11-4746 GAS 2/8/2011

Tuesday, February 08, 2011

REQUEST NUMBER: 11-1296

PRIORITY	METHOD CODE	CNTNR	SAMPLE ID	SAMPLE MATRIX	DATE SAMPLED	SPECIAL INSTRUCTIONS
EPA:906:0		1	MD21-11-4748	GAS	2/8/2011	

Final Page of REQUEST NUMBER 11-1296



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 Number: 11-1296**

Case Narrative



2609 North River Road • Port Allen, Louisiana 70767

1 (800) 401-4277 • Fax (225) 381-2996

March 18, 2011

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

Request Number: 11-1296

LANL Sample ID: MD21-11-4742; MD21-11-4740; MD21-11-4746; MD21-11-4747; MD21-11-4741;
MD21-11-4738; MD21-11-4748; MD21-11-4739; MD21-11-4743; MD21-11-4745; MD21-11-4744.

Dear Mr. Greene;

On February 9, 2011, ARS International received eleven (11) Silica Gel samples to be analyzed for Tritium.

The samples were received in good condition. They were processed and 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,

A handwritten signature in black ink that reads 'Virginia Mulhegan'. The signature is written in a cursive, flowing style.

Laboratory Management
ARS International



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)
11-1296	MD21-11-4742	ARS1-11-00256-001
11-1296	MD21-11-4740	ARS1-11-00256-002
11-1296	MD21-11-4746	ARS1-11-00256-003
11-1296	MD21-11-4747	ARS1-11-00256-004
11-1296	MD21-11-4741	ARS1-11-00256-005
11-1296	MD21-11-4738	ARS1-11-00256-006
11-1296	MD21-11-4748	ARS1-11-00256-007
11-1296	MD21-11-4739	ARS1-11-00256-008
11-1296	MD21-11-4743	ARS1-11-00256-009
11-1296	MD21-11-4745	ARS1-11-00256-010
11-1296	MD21-11-4744	ARS1-11-00256-011

ANALYTICAL METHODS

Tritium analyses were performed using EPA 906.0.

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.”



2609 North River Road • Port Allen, Louisiana 70767

1 (800) 401-4277 • Fax (225) 381-2996

"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."

Deyane Mulligan
Signature

Laboratory Management, ARS International
Title

3-18-11
Date



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

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: ARS1-11-00256
Client Sample ID: MD21-11-4742
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-001
Date Received: 02/09/11
Report Date: 03/18/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	11316.852	608.411	212.519	104.332		pCi/L	ARS-054/EPA 906.0	03/15/11 19:25	AB	NA

NOTES: Project Cost Code MR8R032NFB00

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



2609 North River Road, Port Allen, Louisiana 70767

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

ARS Sample Delivery Group: ARS1-11-00256
Client Sample ID: MD21-11-4740
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-002
Date Received: 02/09/11
Report Date: 03/18/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	30698.165	1619.537	210.569	103.374		pCi/L	ARS-054/EPA 906.0	03/15/11 22:32	AB	NA

NOTES: Project Cost Code MR8R032NFB00

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



2609 North River Road, Port Allen, Louisiana 70767

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

ARS Sample Delivery Group: ARS1-11-00256
Client Sample ID: MD21-11-4746
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-003
Date Received: 02/09/11
Report Date: 03/18/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	152.031	64.923	210.270	103.228	U	pCi/L	ARS-054/EPA 906.0	03/16/11 01:39	AB	NA

NOTES: Project Cost Code MRBR032NFB00

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



2609 North River Road, Port Allen, Louisiana 70767

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

ARS Sample Delivery Group: ARS1-11-00256
 Client Sample ID: MD21-11-4747
 Sample Collection Date: 02/08/11
 Sample Matrix: Silica

Request or PO Number: 11-1296
 ARS Sample ID: ARS1-11-00256-004
 Date Received: 02/09/11
 Report Date: 03/18/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	3477.138	204.807	211.390	103.778		pCi/L	ARS-054/EPA 906.0	03/16/11 04:46	AB	NA

NOTES: Project Cost Code MRBR032NFB00

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 # EB7558



2609 North River Road, Port Allen, Louisiana 70767

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

ARS Sample Delivery Group: ARS1-11-00256
Client Sample ID: MD21-11-4741
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-005
Date Received: 02/09/11
Report Date: 03/18/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	9799.779	529.351	210.245	103.215		pCi/L	ARS-054/EPA 906.0	03/16/11 07:53	AB	NA

NOTES: Project Cost Code MR8R032NFB00

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



2609 North River Road, Port Allen, Louisiana 70767

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

ARS Sample Delivery Group: ARS1-11-00256
Client Sample ID: MD21-11-4738
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-006
Date Received: 02/09/11
Report Date: 03/18/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	111.103	64.033	209.542	102.870	U	pCi/L	ARS-054/EPA 906.0	03/16/11 11:00	AB	NA

NOTES: Project Cost Code MR8R032NFB00

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



2609 North River Road, Port Allen, Louisiana 70767

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

ARS Sample Delivery Group: ARS1-11-00256
Client Sample ID: MD21-11-4748
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-007
Date Received: 02/09/11
Report Date: 03/18/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	2304.098	147.128	209.424	102.812		pCi/L	ARS-054/EPA 906.0	03/16/11 14:07	AB	NA

NOTES: Project Cost Code MR8R032NFB00

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



2609 North River Road, Port Allen, Louisiana 70767

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

ARS Sample Delivery Group: ARS1-11-00256
Client Sample ID: MD21-11-4739
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-008
Date Received: 02/09/11
Report Date: 03/18/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	26870.401	1419.539	209.945	103.068		pCi/L	ARS-054/EPA 906.0	03/16/11 17:14	AB	NA

NOTES: Project Cost Code MR8R032NFB00

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



2609 North River Road, Port Allen, Louisiana 70767

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

ARS Sample Delivery Group: ARS1-11-00256
Client Sample ID: MD21-11-4743
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-009
Date Received: 02/09/11
Report Date: 03/18/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	24399.350	1290.720	212.954	104.545		pCi/L	ARS-054/EPA 906.0	03/16/11 20:21	AB	NA

NOTES: Project Cost Code MR8R032NFB00

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



2609 North River Road, Port Allen, Louisiana 70767

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

ARS Sample Delivery Group: ARS1-11-00256
Client Sample ID: MD21-11-4745
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-010
Date Received: 02/09/11
Report Date: 03/18/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	7396.100	405.078	212.889	104.513		pCi/L	ARS-054/EPA 906.0	03/16/11 23:28	AB	NA

NOTES: Project Cost Code MRBR032NFB00

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



2609 North River Road, Port Allen, Louisiana 70767

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

ARS Sample Delivery Group: ARS1-11-00256
Client Sample ID: MD21-11-4744
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-011
Date Received: 02/09/11
Report Date: 03/18/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
H-3	25452.475	1345.529	210.542	103.361		pCi/L	ARS-054/EPA 906.0	03/17/11 02:35	AB	NA

NOTES: Project Cost Code MR8R032NFB00

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



QC Results per Analytical Batch

Analytical Batch	ARS1-B11-00807
SDG	ARS1-11-00256
Analysis	Tritium (Aqueous)
Analysis Test Method	ARS-054/Liquid Scintillation Counter
Analysis Code	LSC-A-001
Report Units	pCi/L

Acceptable QC Performance Ranges

QC Sample Type	Performance Items and Ranges		
Laboratory Control Sample	Recovery (%):	> 80	< 120
Matrix Spike	Recovery (%):	> 75	< 125
Duplicate	Replicate Error Ratio (RER):	< 1	
	Duplicate Error Ratio (DER):	< 3	
	Relative Percent Difference (RPD %):	≤ 25	

Laboratory Control Sample				Analysis Date	03/15/11 10:04	Analysis Technician	BSTEFFENS	
Analysis Batch Sample ID	QC Type	Analyte	Results	CSU (1s)	Expected Value	LCS Rec (%)	MDC	
ARS1-B11-00807-01	LCS	H-3	2670	160	2467	108	210	

Duplicate RER/DER/RPD				Analysis Date	03/15/11 13:11	Analysis Technician	BSTEFFENS		
Analyte	Result LCS	CSU LCS (1s)	Results LCSD	CSU LCSD (1s)	RER	DER	RPD		
H-3	2670	165	2640	163	0.05	0.13	1.1		

Method Blank				Analysis Date	03/15/11 16:18	Analysis Technician	BSTEFFENS		
Analysis Batch Sample ID	QC Type	Analyte	Results	CSU (1s)	MDC	Qual			
ARS1-B11-00807-03	MBL	H-3	276	66	210				

Susan Leese

Susan Leese

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 client.

LELAP Certificate# 01949

NELAP Certificate # E87558



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

Tritium

by

Low Level Liquid Scintillation Counting

Samples



LSC Instrument Data Transfer Report

\\PAC04003170_NEW\Bouaziz\ARS\11-3-Normal.LM

LIMS		LSC		LSC		LSC		LSC		LSC		LSC		LSC		LSC		LSC		LSC		LSC			
Batch Sample ID	Ref	PTD	SA#	SPML_ID	Count Date	CPMA	RT	EIF	Count Dur	Analytical Batch	LIMS SDC	LIMS Run	Batch Sample ID	Ref	PTD	SA#	SPML_ID	Count Date	CPMA	RT	EIF	Count Dur	Analytical Batch	LIMS SDC	LIMS Run
ARS1-B11-00807 22 22 LSC 2																									
ARS1-B11-00807-01	44		1	BACKGROUND	03/15/11 06:57	5.52	410.50	35.3500	180.00	ARS1-B11-00807			ARS1-B11-00807-01	44		2	B11-00807-01	03/15/11 10:04	16.11	414.33	35.3500	180.00	ARS1-B11-00807		
ARS1-B11-00807-02	44		3	B11-00807-02	03/15/11 13:11	16.15	426.45	36.0800	180.00	ARS1-B11-00807			ARS1-B11-00807-02	44		3	B11-00807-02	03/15/11 13:11	16.15	426.45	36.0800	180.00	ARS1-B11-00807		
ARS1-B11-00807-03	44		4	B11-00807-03	03/15/11 16:18	6.63	414.68	35.3600	180.00	ARS1-B11-00807			ARS1-B11-00807-03	44		4	B11-00807-03	03/15/11 16:18	6.63	414.68	35.3600	180.00	ARS1-B11-00807		
ARS1-B11-00807-04	44		5	B11-00807-04	03/15/11 19:25	49.71	405.93	35.0200	180.00	ARS1-B11-00807			ARS1-B11-00807-04	44		5	B11-00807-04	03/15/11 19:25	49.71	405.93	35.0200	180.00	ARS1-B11-00807		
ARS1-B11-00807-05	44		6	B11-00807-05	03/15/11 22:32	126.50	410.94	35.3800	180.00	ARS1-B11-00807			ARS1-B11-00807-05	44		6	B11-00807-05	03/15/11 22:32	126.50	410.94	35.3800	180.00	ARS1-B11-00807		
ARS1-B11-00807-06	44		7	B11-00807-06	03/16/11 01:39	6.12	411.36	35.4100	180.00	ARS1-B11-00807			ARS1-B11-00807-06	44		7	B11-00807-06	03/16/11 01:39	6.12	411.36	35.4100	180.00	ARS1-B11-00807		
ARS1-B11-00807-07	44		8	B11-00807-07	03/16/11 04:46	19.17	408.76	35.2300	180.00	ARS1-B11-00807			ARS1-B11-00807-07	44		8	B11-00807-07	03/16/11 04:46	19.17	408.76	35.2300	180.00	ARS1-B11-00807		
ARS1-B11-00807-08	44		9	B11-00807-08	03/16/11 07:53	44.20	413.36	35.5000	180.00	ARS1-B11-00807			ARS1-B11-00807-08	44		9	B11-00807-08	03/16/11 07:53	44.20	413.36	35.5000	180.00	ARS1-B11-00807		
ARS1-B11-00807-09	44		10	B11-00807-09	03/16/11 11:00	5.96	413.28	35.5000	180.00	ARS1-B11-00807			ARS1-B11-00807-09	44		10	B11-00807-09	03/16/11 11:00	5.96	413.28	35.5000	180.00	ARS1-B11-00807		
ARS1-B11-00807-10	44		11	B11-00807-10	03/16/11 14:07	14.65	414.87	35.3700	180.00	ARS1-B11-00807			ARS1-B11-00807-10	44		11	B11-00807-10	03/16/11 14:07	14.65	414.87	35.3700	180.00	ARS1-B11-00807		
ARS1-B11-00807-11	44		12	B11-00807-11	03/16/11 17:14	111.73	414.53	35.3600	180.00	ARS1-B11-00807			ARS1-B11-00807-11	44		12	B11-00807-11	03/16/11 17:14	111.73	414.53	35.3600	180.00	ARS1-B11-00807		
ARS1-B11-00807-12	44		13	B11-00807-12	03/16/11 20:21	100.60	407.94	35.1700	180.00	ARS1-B11-00807			ARS1-B11-00807-12	44		13	B11-00807-12	03/16/11 20:21	100.60	407.94	35.1700	180.00	ARS1-B11-00807		
ARS1-B11-00807-13	44		14	B11-00807-13	03/16/11 23:28	34.35	405.60	35.0000	180.00	ARS1-B11-00807			ARS1-B11-00807-13	44		14	B11-00807-13	03/16/11 23:28	34.35	405.60	35.0000	180.00	ARS1-B11-00807		
ARS1-B11-00807-14	44		15	B11-00807-14	03/17/11 02:35	105.84	409.73	35.3000	180.00	ARS1-B11-00807			ARS1-B11-00807-14	44		15	B11-00807-14	03/17/11 02:35	105.84	409.73	35.3000	180.00	ARS1-B11-00807		
ARS1-B11-00807-15	44		16	B11-00807-15	03/17/11 05:42	13.00	397.32	34.4000	180.00	ARS1-B11-00807			ARS1-B11-00807-15	44		16	B11-00807-15	03/17/11 05:42	13.00	397.32	34.4000	180.00	ARS1-B11-00807		
ARS1-B11-00807-16	44		17	B11-00807-16	03/17/11 08:51	113.86	405.78	35.0100	180.00	ARS1-B11-00807			ARS1-B11-00807-16	44		17	B11-00807-16	03/17/11 08:51	113.86	405.78	35.0100	180.00	ARS1-B11-00807		
ARS1-B11-00807-17	44		18	B11-00807-17	03/17/11 11:58	11.66	402.60	34.7800	180.00	ARS1-B11-00807			ARS1-B11-00807-17	44		18	B11-00807-17	03/17/11 11:58	11.66	402.60	34.7800	180.00	ARS1-B11-00807		
ARS1-B11-00807-18	44		19	B11-00807-18	03/17/11 15:05	12.12	381.91	33.2900	180.00	ARS1-B11-00807			ARS1-B11-00807-18	44		19	B11-00807-18	03/17/11 15:05	12.12	381.91	33.2900	180.00	ARS1-B11-00807		
ARS1-B11-00807-19	44		20	B11-00807-19	03/17/11 18:15	37.63	410.47	35.3500	180.00	ARS1-B11-00807			ARS1-B11-00807-19	44		20	B11-00807-19	03/17/11 18:15	37.63	410.47	35.3500	180.00	ARS1-B11-00807		
ARS1-B11-00807-20	44		21	B11-00807-20	03/17/11 21:22	7.57	382.91	33.3600	180.00	ARS1-B11-00807			ARS1-B11-00807-20	44		21	B11-00807-20	03/17/11 21:22	7.57	382.91	33.3600	180.00	ARS1-B11-00807		
ARS1-B11-00807-21	44		22	B11-00807-21	03/18/11 00:31	13.41	405.48	34.9900	180.00	ARS1-B11-00807			ARS1-B11-00807-21	44		22	B11-00807-21	03/18/11 00:31	13.41	405.48	34.9900	180.00	ARS1-B11-00807		
ARS1-B11-00807-22	44		23	B11-00807-22	03/18/11 03:41	7.66	412.72	35.4800	180.00	ARS1-B11-00807			ARS1-B11-00807-22	44		23	B11-00807-22	03/18/11 03:41	7.66	412.72	35.4800	180.00	ARS1-B11-00807		

Procedure		Isotope			
ARS-054		H-3			
Variable	Value	Calculated Values	Excel	VBA	V/V
Gross Count Rate	16.110000	ACT	2668.751347	2668.751347	OK
Sample Count Mins	180.000000	CU	87.358297	87.358297	OK
BKG Count Rate	5.520000	TPU	164.613911	164.613911	OK
BKG Count Mins	180.000000	MDA	269.125958	269.125958	OK
Instrument Efficiency	0.355500	DL	102.665928	102.665928	OK
Sample Aliquot	5.028000	Net Count Rate	10.590000	10.590000	OK
Dilution Factor	1.000000	D t 1 (t2 - t1)	0.000000	0.000000	OK
Aliquot Conversion Factor	0.001000	DF	1.000000	1.000000	OK
		Sys Err	0.052280	0.052280	OK
Sample Collection Date (t1)	3/15/11 10:04 AM	K	0.003968	0.003968	OK
Count Date (t2)	3/15/11 10:04 AM	K MDA	0.714267	0.714267	OK
Activity Units = pCi --- UCF =	2.2200				
CF	1.0000				
Nuclide Abundance	1.000000				
Halflife Days 1 - Result Isotope	4499.800000				
TPUF_Calibration Factor	0.041330				
TPUF_Aliquoting Factor	0.020000				
TPUF_Yield Factor	0.000000				
TPUF_Decay Ingrowth Factor	0.025000				
TPUF_Analysis Factor	0.000000				
TPUF_Unassigned Factor	0.000000				
Activity Units	pCi	Batch Identifiers and Other Related Information			
Aliquot Units	L	Batch	ARS1-B11-00807		
		Batch ID	ARS1-B11-00807-01		
		Analysis Code			
		SDG	QC Sample		
		Fraction	N/A QC Sample		
		Run Number			
		Client	QC Sample		
		Client Profile			
		Client ID	N/A QC Sample		
		Instr File Name	73		
		Instr Detector	P-44-S-2		
		Instr keV			
0 Variables Intact Test	OK	Version/Date	1.0 -- 11/18/2005		

Reviewed by:

SKC

Date:

3-18-11

Procedure		Isotope			
ARS-054		H-3			
Variable	Value	Calculated Values	Excel	VBA	V/V
Gross Count Rate	6.630000	ACT	275.700832	275.700832	OK
Sample Count Min	180.000000	CT	126.480349	126.480349	OK
BKG Count Rate	5.520000	TPU	129.596967	129.596967	OK
BKG Count Min	180.000000	MDA	206.115637	206.115637	OK
Instrument Efficiency	0.355600	DL	101.188063	101.188063	OK
Sample Aliquot	5.100000	Net Count Rate	1.110000	1.110000	OK
Dilution Factor	1.000000	D t 1 (t2 - t1)	0.000000	0.000000	OK
Aliquot Conversion Factor	0.001000	DF	1.000000	1.000000	OK
Sample Collection Date (t1)	3/15/11 4:18 PM	Sys Err	0.052280	0.052280	OK
Count Date (t2)	3/15/11 4:18 PM	K	0.004026	0.004026	OK
Activity Units -- pCi -- UCF --	2.2200	K MDA	0.724699	0.724699	OK
CF	1.9600				
Nuclide Abundance	1.000000				
Half-life Days 1 - Result Isotope	4499.800000				
TPUF_Calibration Factor	0.041330				
TPUF_Allquoting Factor	0.020000				
TPUF_Yield Factor	0.000000				
TPUF_Decay Ingrowth Factor	0.025000				
TPUF_Analysis Factor	0.000000				
TPUF_Unassigned Factor	0.000000				
Activity Units	pCi	Batch Identifiers and Other Related Information			
Aliquot Units	L	Batch	ARS1-B11-00807		
		Batch ID	ARS1-B11-00807-03		
		Analysis Code			
		SDG	QC Sample		
		Fraction	N/A QC Sample		
		Run Number			
		Client	QC Sample		
		Client Profile			
		Client ID	N/A QC Sample		
		Instr File Name	73		
		Instr Detector	P-44-S-4		
		Instr keV			
		Version/Date	1.0 -- 11/18/2005		
0 Variables Intact Test	OK				

Reviewed by: SKA

Date: 3-18-11

Procedure		Isotope			
ARS-054		H-3			
Variable	Value	Calculated Values	Excel	VBA	V/V
Gross Count Rate	49.710000	ACT	11316.851816	11316.851812	OK
Sample Count Mins	180.000000	CI	141.857694	141.857694	OK
BKG Count Rate	5.520000	TPU	608.410757	608.410756	OK
BKG Count Mins	180.000000	MDA	112.518931	112.518931	OK
Instrument Efficiency	0.350200	DL	104.331587	104.331587	OK
Sample Aliquot	5.050000	Net Count Rate	44.190000	44.190000	OK
Dilution Factor	1.000000	D t 1 (t2 - t1)	35.309028	35.309028	OK
Aliquot Conversion Factor	0.061000	DF	0.994576	0.994576	OK
		Sys Err	0.052280	0.052280	OK
Sample Collection Date (t1)	2/8/11 12:00 PM	K	0.003908	0.003908	OK
Count Date (t2)	3/15/11 7:25 PM	K MDA	0.702863	0.702863	OK
Activity Units = pCi -- UCF =	2.1200				
CF	1.0000				
Nuclide Abundance	1.000000				
Halflife Days 1 - Result Isotope	4499.800000				
TPUF_Calibration Factor	0.041330				
TPUF_Aliquoting Factor	0.020000				
TPUF_Yield Factor	0.000000				
TPUF_Decay Ingrowth Factor	0.025000				
TPUF_Analysis Factor	0.000000				
TPUF_Unassigned Factor	0.000000				
Activity Units	pCi	Batch Identifiers and Other Related Information			
Aliquot Units	L	Batch	ARS1-B11-00807		
		Batch ID	ARS1-B11-00807-04		
		Analysis Code	LSC-A-001		
		SDG	ARS1-11-00256		
		Fraction	001		
		Run Number	1		
		Client	Los Alamos National Laboratory		
		Client Profile	Keith Greene		
		Client ID	MD21-11-4742		
		Instr File Name	73		
		Instr Detector	P44 S:5		
		Instr keV			
		Version/Date	1.0 -- 11/18/2005		
0 Variables Intact Test	OK				

Reviewed by: SKA

Date: 3-18-11

Procedure		Isotope			
ARS-054		H-3			
Variable	Value	Calculated Values	Excel	VBA	V/V
Gross Count Rate	126.500000	ACT	30698.165001	30698.164990	OK
Sample Count Mins	160.000000	CD	217.311389	217.311389	OK
BKG Count Rate	5.520000	TPU	1619.537173	1619.537172	OK
BKG Count Mins	160.000000	MDA	210.569893	210.569893	OK
Instrument Efficiency	0.353800	DL	103.374405	103.374405	OK
Sample Aliquot	5.045000	Net Count Rate	120.980000	120.980000	OK
Dilution Factor	1.000000	D t 1 (t2 - t1)	35.438889	35.438889	OK
Aliquot Conversion Factor	0.001000	DF	0.994556	0.994556	OK
Sample Collection Date (t1)	2/8/11 12:00 PM	Sys Err	0.052280	0.052280	OK
Count Date (t2)	3/15/11 10:32 PM	K	0.003941	0.003941	OK
Activity Units = pCi --- UCF =	2.2200	K MDA	0.709371	0.709371	OK
CF	1.0000				
Nuclide Abundance	1.000000				
Half-life Days 1 - Result Isotope	4499.800000				
TPUF_Calibration Factor	0.041330				
TPUF_Aliquoting Factor	0.020000				
TPUF_Yield Factor	0.000000				
TPUF_Decay Ingrowth Factor	0.025000				
TPUF_Analysis Factor	0.000000				
TPUF_Unassigned Factor	0.000000				
Activity Units	pCi	Batch Identifiers and Other Related Information			
Aliquot Units	L	Batch	ARS1-B11-00807		
		Batch ID	ARS1-B11-00807-05		
		Analysis Code	LSC-A-001		
		SDG	ARS1-11-00256		
		Fraction	002		
		Run Number	1		
		Client	Los Alamos National Laboratory		
		Client Profile	Keith Greene		
		Client ID	MD21-11-4740		
		Instr File Name	73		
		Instr Detector	P-44-S-6		
		Instr keV			
		Version/Date	1.0 -- 11/18/2005		
0 Variables Intact Test	OK				

Reviewed by: SPK

Date: 3-18-11

Procedure		Isotope			
ARS-054		H-3			
Variable	Value	Calculated Values	Excel	VBA	V/V
Gross Count Rate	6.120000	ACT	152.031122	152.031122	OK
Sample Count Mins	168.000000	CU	64.434947	64.434949	OK
BKG Count Rate	5.520000	TPU	64.923306	64.923306	OK
BKG Count Mins	150.000000	MDA	210.269868	210.269867	OK
Instrument Efficiency	0.354100	DL	103.227506	103.227506	OK
Sample Aliquot	5.040000	Net Count Rate	0.600000	0.600000	OK
Dilution Factor	1.000000	D t 1 (t2 - t1)	35.568750	35.568750	OK
Aliquot Conversion Factor	0.001000	DF	0.994536	0.994536	OK
		Sys Err	0.052280	0.052280	OK
Sample Collection Date (t1)	2/8/11 12:00 PM	K	0.003947	0.003947	OK
Count Date (t2)	3/16/11 1:39 AM	K MDA	0.710381	0.710381	OK
Activity Units = pCi --- UCF =	2.2200				
CF	1.0000				
Nuclide Abundance	1.000000				
Half-life Days 1 - Result Isotope	4499.800000				
TPUF_Calibration Factor	0.041330				
TPUF_Aliquoting Factor	0.020000				
TPUF_Yield Factor	0.000000				
TPUF_Decay Ingrowth Factor	0.025000				
TPUF_Analysis Factor	0.000000				
TPUF_Unassigned Factor	0.000000				
Activity Units	pCi	Batch Identifiers and Other Related Information			
Aliquot Units	L	Batch	ARS1-B11-00807		
		Batch ID	ARS1-B11-00807-06		
		Analysis Code	LSC-A-001		
		SDG	ARS1-11-00256		
		Fraction	003		
		Run Number	1		
		Client	Los Alamos National Laboratory		
		Client Profile	Keith Greene		
		Chart ID	MD21-11-4746		
		Instr File Name	73		
		Instr Detector	P-44-S-7		
		Instr keV			
		Version/Date	1.0 -- 11/18/2005		
Variables Intact Test	OK				

Reviewed by: SPH

Date: 3-18-11

Procedure		Isotope			
ARS-054		H-3			
Variable	Value	Calculated Values	Excel	VBA	V/V
Gross Count Rate	19.170000	ACT	3477.137890	3477.137889	OK
Sample Count Mins	180.000000	CU	24.343844	24.343844	OK
BKG Count Rate	5.520000	TPU	204.807485	204.807485	OK
BKG Count Mins	180.000000	MDA	211.390299	211.390299	OK
Instrument Efficiency	0.352300	DL	103.777558	103.777558	OK
Sample Aliquot	5.047000	Net Count Rate	13.650000	13.650000	OK
Dilution Factor	1.000000	D t 1 (t2 - t1)	35.698611	35.698611	OK
Aliquot Conversion Factor	0.061000	DF	0.994516	0.994516	OK
		Sys Err	0.052280	0.052280	OK
Sample Collection Date (t1)	2/8/11 12:00 PM	K	0.003926	0.003926	OK
Count Date (t2)	3/16/11 4:46 AM	K MDA	0.706616	0.706616	OK
Activity Units = pCi --- LCF =	2.2200				
CF	1.0000				
Nuclide Abundance	1.000000				
Half-life Days 1 - Result Isotope	4499.800000				
TPUF_Calibration Factor	0.041330				
TPUF_Allquoting Factor	0.020000				
TPUF_Yield Factor	0.000000				
TPUF_Decay Ingrowth Factor	0.025000				
TPUF_Analysis Factor	0.000000				
TPUF_Unassigned Factor	0.000000				
Activity Units	pCi	Batch Identifiers and Other Related Information			
Aliquot Units	L	Batch	ARS1-B11-00807		
		Batch ID	ARS1-B11-00807-07		
		Analysis Code	LSC-A-001		
		SDG	ARS1-11-00256		
		Fraction	004		
		Run Number	1		
		Client	Los Alamos National Laboratory		
		Client Profile	Keith Greene		
		Client ID	MD21-11-4747		
		Instr File Name	73		
		Instr Detector	P-44-S-8		
		Instr keV			
0 Variables Intact Test	OK	Version/Date	1.0 -- 11/18/2005		

Reviewed by: SDH

Date: 3-18-11

Procedure		Isotope			
ARS-054		H-3			
Variable	Value	Calculated Values	Excel	VBA	V/V
Gross Count Rate	5.960000	ACT	111.103467	111.103467	OK
Sample Count Mins	180.000000	CI	63.769003	63.769003	OK
BKG Count Rate	5.520000	TPU	64.032991	64.032991	OK
BKG Count Mins	180.000000	MDA	209.541827	209.541827	OK
Instrument Efficiency	0.355000	DL	102.870090	102.870090	OK
Sample Aliquot	5.053000	Net Count Rate	0.440000	0.440000	OK
Dilution Factor	1.000000	D t 1 (t2 - t1)	35.958333	35.958333	OK
Aliquot Conversion Factor	0.001000	DF	0.994475	0.994475	OK
		Sys Err	0.052280	0.052280	OK
Sample Collection Date (t1)	2/8/11 12:00 PM	K	0.003960	0.003960	OK
Count Date (t2)	3/16/11 11:00 AM	K MDA	0.712849	0.712849	OK
Activity Units = pCi --- UCF =	2.2200				
CF	1.0000				
Nuclide Abundance	1.000000				
Halflife Days 1 - Result Isotope	4499.800000				
TPUF_Calibration Factor	0.041330				
TPUF_Aliquoting Factor	0.020000				
TPUF_Yield Factor	0.000000				
TPUF_Decay Ingrowth Factor	0.025000				
TPUF_Analysis Factor	0.000000				
TPUF_Unassigned Factor	0.000000				
Activity Units	pCi	Batch Identifiers and Other Related Information			
Aliquot Units	L	Batch	ARS1-B11-00807		
		Batch ID	ARS1-B11-00807-09		
		Analysis Code	LSC-A-001		
		SDG	ARS1-11-00256		
		Fraction	006		
		Run Number	1		
		Client	Los Alamos National Laboratory		
		Client Profile	Keith Greene		
		Client ID	MD21-11-4738		
		Instr File Name	73		
		Instr Detector	P-44-S-10		
		Instr keV			
		Version/Date	1.0 -- 11/18/2005		
Variables Intact Test	OK				

Reviewed by: SOL

Date: 3-18-11

Procedure		Isotope			
ARS-054		H-3			
Variable	Value	Calculated Values	Excel	VBA	V/V
Gross Count Rate	14.650000	ACT	2304.097957	2304.097956	OK
Sample Count Mins	168.000000	CI	84.478629	84.478629	OK
BKG Count Rate	5.520000	TPU	147.128074	147.128074	OK
BKG Count Mins	168.000000	MDA	209.423768	209.423768	OK
Instrument Efficiency	0.355700	DL	102.812128	102.812128	OK
Sample Aliquot	5.046000	Net Count Rate	9.130000	9.130000	OK
Dilution Factor	1.000000	D t 1 (t2 - t1)	36.088194	36.088194	OK
Aliquot Conversion Factor	0.081000	DF	0.994456	0.994456	OK
Sample Collection Date (t1)	2/8/11 12:00 PM	Sys Err	0.052280	0.052280	OK
Count Date (t2)	3/16/11 2:07 PM	K	0.003963	0.003963	OK
Activity Units = pCi --- UCF =	2.2200	K MDA	0.713251	0.713251	OK
CF	1.0000				
Nuclide Abundance	1.000000				
Halflife Days 1 - Result Isotope	4499.800000				
TPUF_Calibration Factor	0.041330				
TPUF_Aliquoting Factor	0.020000				
TPUF_Yield Factor	0.000000				
TPUF_Decay Ingrowth Factor	0.025000				
TPUF_Analysis Factor	0.000000				
TPUF_Unassigned Factor	0.000000				
Activity Units	pCi	Batch Identifiers and Other Related Information			
Aliquot Units	L	Batch	ARS1-B11-00807		
		Batch ID	ARS1-B11-00807-10		
		Analysis Code	LSC-A-001		
		SDG	ARS1-11-00256		
		Fraction	007		
		Run Number	1		
		Client	Los Alamos National Laboratory		
		Client Profile	Keith Greene		
		Client ID	MD21-11-4748		
		Instr File Name	73		
		Instr Detector	P-44-S-11		
		Instr keV			
		Version/Date	1.0 -- 11/18/2005		
0 Variables Intact Test	OK				

Reviewed by:

SDH

Date:

3-18-11

Procedure		Isotope			
ARS-054		H-3			
Variable	Value	Calculated Values	Excel	VBA	V/V
Gross Count Rate	111.730000	ACT	26870.400637	26870.400627	OK
Sample Count Mins	180.000000	CU	204.187384	204.187384	OK
BKG Count Rate	5.520000	TPU	1419.538942	1419.538941	OK
BKG Count Mins	180.000000	MDA	209.944511	209.944511	OK
Instrument Efficiency	0.355600	DL	103.067779	103.067779	OK
Sample Aliquot	5.035000	Net Count Rate	106.210000	106.210000	OK
Dilution Factor	1.000000	D t 1 (t2 - t1)	36.218056	36.218056	OK
Aliquot Conversion Factor	0.001000	DF	0.994437	0.994437	OK
		Sys Err	0.052280	0.052280	OK
Sample Collection Date (t1)	2/8/11 12:00 PM	K	0.003953	0.003953	OK
Count Date (t2)	3/16/11 5:14 PM	K MDA	0.711482	0.711482	OK
Activity Units = pCi --- UCF =	2.2200				
CF	1.0000				
Nuclide Abundance	1.000000				
Halflife Days 1 - Result Isotope	4499.800000				
TPUF_Calibration Factor	0.041330				
TPUF_Aliquoting Factor	0.020000				
TPUF_Yield Factor	0.000000				
TPUF_Decay Ingrowth Factor	0.025000				
TPUF_Analysis Factor	0.000000				
TPUF_Unassigned Factor	0.000000				
Activity Units	pCi	Batch Identifiers and Other Related Information			
Aliquot Units	L	Batch	ARS1-B11-00807		
		Batch ID	ARS1-B11-00807-11		
		Analysis Code	LSC-A-001		
		SDG	ARS1-11-00256		
		Fraction	008		
		Run Number	1		
		Client	Los Alamos National Laboratory		
		Client Profile	Keith Greene		
		Client ID	MD21-11-4739		
		Instr File Name	73		
		Instr Detector	P-44-S-12		
		Instr keV			
		Version/Date	1.0 -- 11/18/2005		
Variables Intact Test	OK				

Reviewed by: SDH

Date: 3-18-11

Procedure		Isotope			
ARS-054		H-3			
Variable	Value	Calculated Values	Excel	VBA	V/V
Gross Count Rate	100.600000	ACT	24399.349992	24399.349983	OK
Sample Count Mins	180.000000	CU	197.038663	197.038663	OK
BKG Count Rate	5.520000	TPU	1290.719557	1290.719557	OK
BKG Count Mins	180.000000	MDA	212.053546	212.053545	OK
Instrument Efficiency	0.351700	DL	104.545001	104.545001	OK
Sample Aliquot	5.019000	Net Count Rate	95.080000	95.080000	OK
Dilution Factor	1.000000	D t 1 (t2 - t1)	36.347917	36.347917	OK
Aliquot Conversion Factor	0.001000	DF	0.994417	0.994417	OK
		Sys Err	0.052280	0.052280	OK
Sample Collection Date (t1)	2/8/11 12:00 PM	K	0.003897	0.003897	OK
Count Date (t2)	3/16/11 8:21 PM	K MDA	0.701429	0.701429	OK
Activity Units = pCi --- UCF =	2.2200				
CF	1.0000				
Nuclide Abundance	1.000000				
Half-life Days 1 - Result Isotope	4499.800000				
TPUF_Calibration Factor	0.041330				
TPUF_Aliquoting Factor	0.020000				
TPUF_yield Factor	0.000000				
TPUF_Decay Ingrowth Factor	0.025000				
TPUF_Analysis Factor	0.000000				
TPUF_Unassigned Factor	0.000000				
Activity Units	pCi	Batch Identifiers and Other Related Information			
Aliquot Units	L	Batch	ARS1-B11-00807		
		Batch ID	ARS1-B11-00807-12		
		Analysis Code	LSC-A-001		
		SDG	ARS1-11-00256		
		Fraction	009		
		Run Number	1		
		Client	Los Alamos National Laboratory		
		Client Profile	Keith Greene		
		Client ID	MD21-11-4743		
		Instr File Name	73		
		Instr Detector	P-44-S-13		
		Instr keV			
		Version/Date	1.0 -- 11/18/2005		
0 Variables Intact Test	OK				

Reviewed by: SDH Date: 3-18-11

Procedure		Isotope			
ARS-054		H-3			
Variable	Value	Calculated Values	Excel	VBA	V/V
Gross Count Rate	34.350000	ACT	7396.099799	7396.099796	OK
Sample Count Min	180.000000	CU	120.738280	120.738280	OK
BKG Count Rate	5.520000	TPU	405.078185	405.078185	OK
BKG Count Min	180.000000	MDA	111.889333	111.889333	OK
Instrument Efficiency	0.350000	DL	104.513480	104.513479	OK
Sample Aliquot	5.045000	Net Count Rate	28.830000	28.830000	OK
Dilution Factor	1.000000	D t 1 (t2 - t1)	36.477778	36.477778	OK
Aliquot Conversion Factor	0.001000	DF	0.994397	0.994397	OK
		Sys Err	0.052280	0.052280	OK
Sample Collection Date (t1)	3/8/11 12:00 PM	K	0.003898	0.003898	OK
Count Date (t2)	3/16/11 11:28 PM	K MDA	0.701640	0.701640	OK
Activity Units = pCi -- UCF =	2.2200				
CF	1.0000				
Nuclide Abundance	1.000000				
Half-life Days 1 - Result Isotope	4499.800000				
TPUF_Calibration Factor	0.041330				
TPUF_Aliquoting Factor	0.020000				
TPUF_Yield Factor	0.000000				
TPUF_Decay Ingrowth Factor	0.025000				
TPUF_Analysis Factor	0.000000				
TPUF_Unassigned Factor	0.000000				
Activity Units	pCi	Batch Identifiers and Other Related Information			
Aliquot Units	L	Batch	ARS1-B11-00807		
		Batch ID	ARS1-B11-00807-13		
		Analysis Code	LSC-A-001		
		SDG	ARS1-11-00256		
		Fraction	010		
		Run Number	1		
		Client	Los Alamos National Laboratory		
		Client Profile	Keith Greene		
		Client ID	MD21-11-4745		
		Instr File Name	73		
		Instr Detector	P-44-S-14		
		Instr keV			
0 Variables Intact Test	OK	Version/Date	1.0 -- 11/18/2005		

Reviewed by: SDH

Date: 3-18-11

Procedure		Isotope			
ARS-054		H-3			
Variable	Value	Calculated Values	Excel	VBA	V/V
Gross Count Rate	105.840000	ACT	25452.474780	25452.474771	OK
Sample Count Min	100.000000	CU	100.000000	100.000000	OK
BKG Count Rate	5.520000	TPU	1345.529019	1345.529019	OK
BKG Count Min	100.000000	MDA	210.541777	210.541777	OK
Instrument Efficiency	0.353000	DL	103.360994	103.360994	OK
Sample Aliquot	5.050000	Net Count Rate	100.320000	100.320000	OK
Dilution Factor	1.000000	D t 1 (t2 - t1)	36.607639	36.607639	OK
Aliquot Conversion Factor	0.001000	DF	0.994377	0.994377	OK
		Sys Err	0.052280	0.052280	OK
Sample Collection Date (t1)	2/8/11 12:00 PM	K	0.003941	0.003941	OK
Count Date (t2)	3/17/11 2:35 AM	K MDA	0.709463	0.709463	OK
Activity Units = pCi --- UCF =	2.2200				
CF	1.0000				
Nuclide Abundance	1.000000				
Half-life Days 1 - Result Isotope	4499.800000				
TPUF_Calibration Factor	0.041330				
TPUF_Aliquoting Factor	0.020000				
TPUF_Yield Factor	0.000000				
TPUF_Decay Ingrowth Factor	0.025000				
TPUF_Analysis Factor	0.000000				
TPUF_Unassigned Factor	0.000000				
Activity Units	pCi	Batch Identifiers and Other Related Information			
Aliquot Units	L	Batch	ARS1-B11-00807		
		Batch ID	ARS1-B11-00807-14		
		Analysis Code	LSC-A-001		
		SDG	ARS1-11-00256		
		Fraction	011		
		Run Number	1		
		Client	Los Alamos National Laboratory		
		Client Profile	Keith Greene		
		Client ID	MD21-11-4744		
		Instr File Name	73		
		Instr Detector	F-44-S-15		
		Instr keV			
		Version/Date	1.0 -- 11/18/2005		
0 Variables Intact Test	OK				

Reviewed by: SOL

Date: 3-18-11



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

Tritium

by

Low Level Liquid Scintillation Counting

Laboratory

Records

Analysis Batch Report



Analysis Batch ID **ARS1-B11-00807**

Method **ARS-054** Analysis **LSC-A-001**

Matrix **SI**

Batch Sample ID	Type	Blind 1so1	Blind 1so2	Blind 1so3	Description	Tritium (Aqueous)	SDG	FR	Run	Client ID	Isotope Group	Lab Deadline
ARS1-B11-00807-01	LCS	B-11376										
ARS1-B11-00807-02	LCS	B-11377										
ARS1-B11-00807-03	MBL											
ARS1-B11-00807-04	TRG											
ARS1-B11-00807-05	TRG											
ARS1-B11-00807-06	TRG											
ARS1-B11-00807-07	TRG											
ARS1-B11-00807-08	TRG											
ARS1-B11-00807-09	TRG											
ARS1-B11-00807-10	TRG											
ARS1-B11-00807-11	TRG											
ARS1-B11-00807-12	TRG											
ARS1-B11-00807-13	TRG											
ARS1-B11-00807-14	TRG											
ARS1-B11-00807-15	TRG											
ARS1-B11-00807-16	TRG											
ARS1-B11-00807-17	TRG											
ARS1-B11-00807-18	TRG											
ARS1-B11-00807-19	TRG											
ARS1-B11-00807-20	TRG											
ARS1-B11-00807-21	TRG											
ARS1-B11-00807-22	TRG											

81305 11-00256-001-1 WRAD
 81306 11-00256-002-1 WRAD
 81307 11-00256-003-1 WRAD
 81308 11-00256-004-1 WRAD
 81309 11-00256-005-1 WRAD
 81310 11-00256-006-1 WRAD
 81311 11-00256-007-1 WRAD
 81312 11-00256-008-1 WRAD
 81313 11-00256-009-1 WRAD

81314 11-00256-010-1 WRAD
 81315 11-00256-011-1 WRAD
 81316 11-00267-001-1 WRAD
 81317 11-00267-002-1 WRAD
 81318 11-00267-003-1 WRAD
 81319 11-00267-004-1 WRAD
 81320 11-00267-005-1 WRAD
 81321 11-00268-001-1 WRAD
 81322 11-00268-002-1 WRAD

81323 11-00268-003-1 WRAD

LCS Report
Analytical Batch: ARS1-B11-00807

BlindID	Abatch	BatchSampleID	BlindGroup	StdID	Isotope	ExpectedAddition	ExpectedValue	Empy/Wt	GrossWt	NetWt	UserID	ModDate	ExpectedValue_CT	MidPointConcIDate	KnownValue
B-11376	ARS1-B11-00807	ARS1-B11-00807-01	B-H3	S-0247	H-3	5	2.475798889	0	1	1	BSTEFFENS	2/21/2011	2.467422931	3/15/2011	2.467422931
B-11377	ARS1-B11-00807	ARS1-B11-00807-02	B-H3	S-0247	H-3	5	2.475798889	0	1	1	BSTEFFENS	2/21/2011	2.467422931	3/15/2011	2.467422931

ARS-054

ID_31001_054	ABatch	ABatchSampleID	ClientID	Aliquot1	AliquotUnits1	IC_ID1	Aliquot2	AliquotUnits2	IC_ID2	UserID	ModDate
7871	ARS1-B11-00807	ARS1-B11-00807-01					5.028 g			BSTEFFENS	03/01/2011 14:15
7872	ARS1-B11-00807	ARS1-B11-00807-02					5.028 g			BSTEFFENS	03/01/2011 14:15
7873	ARS1-B11-00807	ARS1-B11-00807-03					5.1 g			BSTEFFENS	03/01/2011 14:15
7874	ARS1-B11-00807	ARS1-B11-00807-04					5.05 g			81305 BSTEFFENS	03/01/2011 14:15
7875	ARS1-B11-00807	ARS1-B11-00807-05					5.045 g			81306 BSTEFFENS	03/01/2011 14:15
7876	ARS1-B11-00807	ARS1-B11-00807-06					5.048 g			81307 BSTEFFENS	03/01/2011 14:15
7877	ARS1-B11-00807	ARS1-B11-00807-07					5.047 g			81308 BSTEFFENS	03/01/2011 14:15
7878	ARS1-B11-00807	ARS1-B11-00807-08					5.036 g			81309 BSTEFFENS	03/01/2011 14:15
7879	ARS1-B11-00807	ARS1-B11-00807-09					5.053 g			81310 BSTEFFENS	03/01/2011 14:15
7880	ARS1-B11-00807	ARS1-B11-00807-10					5.046 g			81311 BSTEFFENS	03/01/2011 14:15
7881	ARS1-B11-00807	ARS1-B11-00807-11					5.035 g			81312 BSTEFFENS	03/01/2011 14:15
7882	ARS1-B11-00807	ARS1-B11-00807-12					5.019 g			81313 BSTEFFENS	03/01/2011 14:15
7883	ARS1-B11-00807	ARS1-B11-00807-13					5.045 g			81314 BSTEFFENS	03/01/2011 14:15
7884	ARS1-B11-00807	ARS1-B11-00807-14					5.058 g			81315 BSTEFFENS	03/01/2011 14:15
7885	ARS1-B11-00807	ARS1-B11-00807-15					5.073 g			81316 BSTEFFENS	03/01/2011 14:15
7886	ARS1-B11-00807	ARS1-B11-00807-16					5.06 g			81317 BSTEFFENS	03/01/2011 14:15
7887	ARS1-B11-00807	ARS1-B11-00807-17					5.061 g			81318 BSTEFFENS	03/01/2011 14:15
7888	ARS1-B11-00807	ARS1-B11-00807-18					5.067 g			81319 BSTEFFENS	03/01/2011 14:15
7889	ARS1-B11-00807	ARS1-B11-00807-19					5.024 g			81320 BSTEFFENS	03/01/2011 14:15
7890	ARS1-B11-00807	ARS1-B11-00807-20					5.052 g			81321 BSTEFFENS	03/01/2011 14:15
7891	ARS1-B11-00807	ARS1-B11-00807-21					5.06 g			81322 BSTEFFENS	03/01/2011 14:15
7892	ARS1-B11-00807	ARS1-B11-00807-22					5.071 g			81323 BSTEFFENS	03/01/2011 14:15

Batch Result Verification Report

AbatchSampleID	SPG	Fraction	ClientID	Run	Isotope	ACT	TPU	TPUs	TPUs2	MDA	DL	CU	CUts	CUzs	ActivityReportUnits
ARSI-B11-00807-01					1 H-3	2668.751347	164.6139114	164.6135114	322.6432664	209.1259578	102.6659282	87.3582969	87.3582969	171.2222619	PC
ARSI-B11-00807-02					1 H-3	2639.480709	318.8493788	162.6782545	318.8493788	206.0539856	101.157809	168.8630006	166.1569213	168.8630006	PC
ARSI-B11-00807-03					1 H-3	275.7008315	129.5969675	66.12090177	129.5969675	206.1156123	101.1880633	126.4803489	64.53079025	126.4803489	PC
ARSI-B11-00807-04	ARSI-11-00256	001	MD21-11-4742		1 H-3	30698.16499	608.4107563	608.4107563	1192.485082	212.5188314	104.3315871	141.8576943	141.8576943	278.0410807	PC
ARSI-B11-00807-05	ARSI-11-00256	002	MD21-11-4740		1 H-3	152.0311217	1619.537172	1619.537172	3174.292857	210.5690934	103.3744048	217.3113688	217.3113688	425.9302829	PC
ARSI-B11-00807-06	ARSI-11-00256	003	MD21-11-4746		1 H-3	3477.137889	204.8074849	204.8074849	401.4226705	211.3902993	103.7775583	94.34384118	94.34384118	184.9139782	PC
ARSI-B11-00807-07	ARSI-11-00256	004	MD21-11-4747		1 H-3	9799.779148	529.3506391	529.3506391	1037.527253	210.2449701	103.2192834	133.1555063	133.1555063	260.9847924	PC
ARSI-B11-00807-08	ARSI-11-00256	005	MD21-11-4741		1 H-3	111.1034667	64.03299065	64.03299065	125.5046617	209.5418265	102.8709001	63.76900272	63.76900272	124.9872453	PC
ARSI-B11-00807-09	ARSI-11-00256	006	MD21-11-4738		1 H-3	2304.097956	147.1280735	147.1280735	288.3710241	209.42376	102.8121278	84.47862911	84.47862911	165.5781131	PC
ARSI-B11-00807-10	ARSI-11-00256	007	MD21-11-4748		1 H-3	26870.40063	1419.538941	1419.538941	2782.286325	209.944511	103.0677794	204.1873844	204.1873844	400.2072734	PC
ARSI-B11-00807-11	ARSI-11-00256	008	MD21-11-4739		1 H-3	24399.34998	1290.719557	1290.719557	2529.810331	212.8893381	104.5134795	120.7382802	120.7382802	236.6470292	PC
ARSI-B11-00807-12	ARSI-11-00256	009	MD21-11-4743		1 H-3	7396.099796	405.0781851	405.0781851	793.9532429	212.8893381	104.5134795	120.7382802	120.7382802	236.6470292	PC
ARSI-B11-00807-13	ARSI-11-00256	010	MD21-11-4745		1 H-3	25452.47477	1345.529019	1345.529019	2637.236877	210.5417768	103.3609943	199.5587848	199.5587848	391.1352183	PC
ARSI-B11-00807-14	ARSI-11-00256	011	MD21-11-4744		1 H-3	1942.003023	131.3130009	131.3130009	257.3734818	212.2431094	104.1962273	208.2894833	208.2894833	408.2473872	PC
ARSI-B11-00807-15	ARSI-11-00267	001	MD50-11-3974		1 H-3	1585.637544	114.9056052	114.9056052	225.2149862	213.6087308	104.86665	79.57033361	79.57033361	155.9578539	PC
ARSI-B11-00807-16	ARSI-11-00267	002	MD50-11-3983		1 H-3	27709.36919	1463.535642	1463.535642	2868.529858	212.2431094	104.1962273	208.2894833	208.2894833	408.2473872	PC
ARSI-B11-00807-17	ARSI-11-00267	003	MD50-11-3975		1 H-3	1772.870635	125.146828	125.146828	245.2877829	222.9096688	109.4327461	84.09034783	84.09034783	164.8170818	PC
ARSI-B11-00807-18	ARSI-11-00267	004	MD50-11-3973		1 H-3	8192.337726	446.1381524	446.1381524	874.8907787	211.7207061	103.9397645	124.9170414	124.9170414	244.8374011	PC
ARSI-B11-00807-19	ARSI-11-00267	005	MD50-11-3973		1 H-3	551.0777254	78.00754538	78.00754538	152.8947889	223.0769961	109.5148928	72.4924148	72.4924148	142.085133	PC
ARSI-B11-00807-20	ARSI-11-00268	001	MD50-11-3979		1 H-3	2019.015954	134.2689067	134.2689067	263.1670571	212.3530676	104.2502089	82.98542106	82.98542106	162.6514253	PC
ARSI-B11-00807-21	ARSI-11-00268	002	MD50-11-3978		1 H-3	538.8929957	73.73574629	73.73574629	144.5220627	208.9702956	102.5895092	68.14126914	68.14126914	133.5568875	PC
ARSI-B11-00807-22	ARSI-11-00268	003	MD50-11-3977		1 H-3										PC

Batch Result Verification Report

Batch/SampleID	SDG	Fraction	Alliquot/ReportUnits	ChemRecovery	TracerRecovery	SampleCounts	SampleCountHms	BKG_Counts	BKG_CountHms	EFF	ALIQ	SampleCalDate	MidPointCountDate	BP_DL
ARS1-B11-00807-01		L				0.0895	180	0.030666667	180	0.3555	5.028	3/18/2011	3/15/2011	
ARS1-B11-00807-02		L				0.098722222	180	0.030666667	180	0.3608	5.028	3/18/2011	3/15/2011	
ARS1-B11-00807-03		L				0.036833333	180	0.030666667	180	0.3556	5.1	3/18/2011	3/15/2011	
ARS1-B11-00807-04	ARS1-11-00256	001	L			0.276166667	180	0.030666667	180	0.3502	5.05	2/8/2011	3/15/2011	
ARS1-B11-00807-05	ARS1-11-00256	002	L			0.702777778	180	0.030666667	180	0.3538	5.045	2/8/2011	3/15/2011	
ARS1-B11-00807-06	ARS1-11-00256	003	L			0.034	180	0.030666667	180	0.3541	5.048	2/8/2011	3/15/2011	
ARS1-B11-00807-07	ARS1-11-00256	004	L			0.1065	180	0.030666667	180	0.3523	5.047	2/8/2011	3/15/2011	
ARS1-B11-00807-08	ARS1-11-00256	005	L			0.245555556	180	0.030666667	180	0.3555	5.036	2/8/2011	3/15/2011	
ARS1-B11-00807-09	ARS1-11-00256	006	L			0.033111111	180	0.030666667	180	0.355	5.053	2/8/2011	3/15/2011	
ARS1-B11-00807-10	ARS1-11-00256	007	L			0.081388889	180	0.030666667	180	0.3557	5.046	2/8/2011	3/15/2011	
ARS1-B11-00807-11	ARS1-11-00256	008	L			0.620722222	180	0.030666667	180	0.3556	5.035	2/8/2011	3/15/2011	
ARS1-B11-00807-12	ARS1-11-00256	009	L			0.558888889	180	0.030666667	180	0.3517	5.019	2/8/2011	3/15/2011	
ARS1-B11-00807-13	ARS1-11-00256	010	L			0.190833333	180	0.030666667	180	0.35	5.045	2/8/2011	3/15/2011	
ARS1-B11-00807-14	ARS1-11-00256	011	L			0.588	180	0.030666667	180	0.344	5.073	2/8/2011	3/15/2011	
ARS1-B11-00807-15	ARS1-11-00267	001	L			0.072222222	180	0.030666667	180	0.3501	5.06	2/7/2011	3/17/2011	
ARS1-B11-00807-16	ARS1-11-00267	002	L			0.632555556	180	0.030666667	180	0.3478	5.061	2/7/2011	3/17/2011	
ARS1-B11-00807-17	ARS1-11-00267	003	L			0.064888889	180	0.030666667	180	0.3329	5.067	2/7/2011	3/17/2011	
ARS1-B11-00807-18	ARS1-11-00267	004	L			0.067333333	180	0.030666667	180	0.3336	5.052	2/7/2011	3/17/2011	
ARS1-B11-00807-19	ARS1-11-00267	005	L			0.209055556	180	0.030666667	180	0.3336	5.052	2/8/2011	3/17/2011	
ARS1-B11-00807-20	ARS1-11-00268	001	L			0.042055556	180	0.030666667	180	0.3499	5.06	2/8/2011	3/18/2011	
ARS1-B11-00807-21	ARS1-11-00268	002	L			0.0745	180	0.030666667	180	0.3548	5.071	2/8/2011	3/18/2011	
ARS1-B11-00807-22	ARS1-11-00268	003	L			0.042555556	180	0.030666667	180	0.3548	5.071	2/8/2011	3/18/2011	

Batch Result Verification Report

AsaatchSampleID	SDG	Fraction	BP_MDA	SP_Val	UCF	CF	GrossCountRate	BKGCountRate	NetCountRate	PlatingRecovery	InstFileName	DetectorID	InstrumentKey	NuclideAbd	TracerMessACT
ARSI-B11-00807-01					2.22	1	16.11	5.52	10.59	73	P-44-S-2				
ARSI-B11-00807-02					2.22	1.96	16.15	5.52	10.63	73	P-44-S-3				
ARSI-B11-00807-03					2.22	1.96	6.63	5.52	1.11	73	P-44-S-4				
ARSI-B11-00807-04	ARSI-11-00256	001			2.22	1	49.71	5.52	44.19	73	P-44-S-5				
ARSI-B11-00807-05	ARSI-11-00256	002			2.22	1	126.5	5.52	120.98	73	P-44-S-6				
ARSI-B11-00807-06	ARSI-11-00256	003			2.22	1	6.12	5.52	0.6	73	P-44-S-7				
ARSI-B11-00807-07	ARSI-11-00256	004			2.22	1	19.17	5.52	13.65	73	P-44-S-8				
ARSI-B11-00807-08	ARSI-11-00256	005			2.22	1	4.2	5.52	38.68	73	P-44-S-9				
ARSI-B11-00807-09	ARSI-11-00256	006			2.22	1	5.96	5.52	0.44	73	P-44-S-10				
ARSI-B11-00807-10	ARSI-11-00256	007			2.22	1	14.65	5.52	9.13	73	P-44-S-11				
ARSI-B11-00807-11	ARSI-11-00256	008			2.22	1	111.73	5.52	106.21	73	P-44-S-12				
ARSI-B11-00807-12	ARSI-11-00256	009			2.22	1	100.6	5.52	95.08	73	P-44-S-13				
ARSI-B11-00807-13	ARSI-11-00256	010			2.22	1	34.35	5.52	28.83	73	P-44-S-14				
ARSI-B11-00807-14	ARSI-11-00256	011			2.22	1	105.84	5.52	100.32	73	P-44-S-15				
ARSI-B11-00807-15	ARSI-11-00267	001			2.22	1	13	5.52	7.48	73	P-44-S-16				
ARSI-B11-00807-16	ARSI-11-00267	002			2.22	1	113.86	5.52	108.34	73	P-44-S-17				
ARSI-B11-00807-17	ARSI-11-00267	003			2.22	1	11.68	5.52	6.16	73	P-44-S-18				
ARSI-B11-00807-18	ARSI-11-00267	004			2.22	1	12.12	5.52	6.6	73	P-44-S-19				
ARSI-B11-00807-19	ARSI-11-00267	005			2.22	1	37.63	5.52	32.11	73	P-44-S-20				
ARSI-B11-00807-20	ARSI-11-00268	001			2.22	1	7.57	5.52	2.05	73	P-44-S-21				
ARSI-B11-00807-21	ARSI-11-00268	002			2.22	1	13.41	5.52	7.89	73	P-44-S-22				
ARSI-B11-00807-22	ARSI-11-00268	003			2.22	1	7.66	5.52	2.14	73	P-44-S-23				

AbatchSampleID	SDG	Fraction	TracerKnownACT	TracerIsotope	TracerRefDate	TracerRefACT	TracerKnown	HalfLife1	HalfLife2	HalfLife3	TPUF_1	TPUF_2	TPUF_3	TPUF_4	TPUF_5	TPUF_6	DeltaT1	DeltaT2
ARSI-B11-00807-01								4499.8			0.04133	0.02	0	0.025	0	0	0	0
ARSI-B11-00807-02								4499.8			0.04133	0.02	0	0.025	0	0	0	0
ARSI-B11-00807-03								4499.8			0.04133	0.02	0	0.025	0	0	0	0
ARSI-B11-00807-04								4499.8			0.04133	0.02	0	0.025	0	0	35.30902778	0
ARSI-B11-00807-05								4499.8			0.04133	0.02	0	0.025	0	0	35.43888899	0
ARSI-B11-00807-06								4499.8			0.04133	0.02	0	0.025	0	0	35.56875	0
ARSI-B11-00807-07								4499.8			0.04133	0.02	0	0.025	0	0	35.69861111	0
ARSI-B11-00807-08								4499.8			0.04133	0.02	0	0.025	0	0	35.82847222	0
ARSI-B11-00807-09								4499.8			0.04133	0.02	0	0.025	0	0	35.95833333	0
ARSI-B11-00807-10								4499.8			0.04133	0.02	0	0.025	0	0	36.08819444	0
ARSI-B11-00807-11								4499.8			0.04133	0.02	0	0.025	0	0	36.21805556	0
ARSI-B11-00807-12								4499.8			0.04133	0.02	0	0.025	0	0	36.34791667	0
ARSI-B11-00807-13								4499.8			0.04133	0.02	0	0.025	0	0	36.47777778	0
ARSI-B11-00807-14								4499.8			0.04133	0.02	0	0.025	0	0	36.60763889	0
ARSI-B11-00807-15								4499.8			0.04133	0.02	0	0.025	0	0	37.7375	0
ARSI-B11-00807-16								4499.8			0.04133	0.02	0	0.025	0	0	37.86944444	0
ARSI-B11-00807-17								4499.8			0.04133	0.02	0	0.025	0	0	37.99930556	0
ARSI-B11-00807-18								4499.8			0.04133	0.02	0	0.025	0	0	38.12916667	0
ARSI-B11-00807-19								4499.8			0.04133	0.02	0	0.025	0	0	38.26041667	0
ARSI-B11-00807-20								4499.8			0.04133	0.02	0	0.025	0	0	37.39027778	0
ARSI-B11-00807-21								4499.8			0.04133	0.02	0	0.025	0	0	37.52222222	0
ARSI-B11-00807-22								4499.8			0.04133	0.02	0	0.025	0	0	37.65347222	0

Batch Result Verification Report

AbatchSampleID	S06	Fraction	DeltaT3	DeltaT4	DeltaT5	DeltaT6	DF1	DF2	DF3	IF1	IF2	SysErr	K Val	K MDA	AnalysisCode	UserID	ModDate
ARSI-B11-00807-01							1					0.052279718	0.003968148	0.714266618	LSC-A-001	BSTEFFENS	3/18/2011
ARSI-B11-00807-02							1					0.052279718	0.004027307	0.724915319	LSC-A-001	BSTEFFENS	3/18/2011
ARSI-B11-00807-03							1					0.052279718	0.004026103	0.724698576	LSC-A-001	BSTEFFENS	3/18/2011
ARSI-B11-00807-04	ARSI-11-00256	001					0.994575778					0.052279718	0.003904796	0.702863317	LSC-A-001	BSTEFFENS	3/18/2011
ARSI-B11-00807-05	ARSI-11-00256	002					0.994555883					0.052279718	0.003940952	0.709371391	LSC-A-001	BSTEFFENS	3/18/2011
ARSI-B11-00807-06	ARSI-11-00256	003					0.994535988					0.052279718	0.003946556	0.710380867	LSC-A-001	BSTEFFENS	3/18/2011
ARSI-B11-00807-07	ARSI-11-00256	004					0.994516094					0.052279718	0.003925642	0.706615636	LSC-A-001	BSTEFFENS	3/18/2011
ARSI-B11-00807-08	ARSI-11-00256	005					0.9944962					0.052279718	0.003947028	0.710464991	LSC-A-001	BSTEFFENS	3/18/2011
ARSI-B11-00807-09	ARSI-11-00256	006					0.994476307					0.052279718	0.003960272	0.712849044	LSC-A-001	BSTEFFENS	3/18/2011
ARSI-B11-00807-10	ARSI-11-00256	007					0.994456414					0.052279718	0.003962505	0.713250926	LSC-A-001	BSTEFFENS	3/18/2011
ARSI-B11-00807-11	ARSI-11-00256	008					0.994436521					0.052279718	0.003952676	0.711481763	LSC-A-001	BSTEFFENS	3/18/2011
ARSI-B11-00807-12	ARSI-11-00256	009					0.994416629					0.052279718	0.003896825	0.701428522	LSC-A-001	BSTEFFENS	3/18/2011
ARSI-B11-00807-13	ARSI-11-00256	010					0.994396737					0.052279718	0.003898	0.701640073	LSC-A-001	BSTEFFENS	3/18/2011
ARSI-B11-00807-14	ARSI-11-00256	011					0.994376845					0.052279718	0.003941463	0.709463428	LSC-A-001	BSTEFFENS	3/18/2011
ARSI-B11-00807-15	ARSI-11-00267	001					0.994203796					0.052279718	0.003851693	0.693304791	LSC-A-001	BSTEFFENS	3/18/2011
ARSI-B11-00807-16	ARSI-11-00267	002					0.994183589					0.052279718	0.003909869	0.703776397	LSC-A-001	BSTEFFENS	3/18/2011
ARSI-B11-00807-17	ARSI-11-00267	003					0.994163702					0.052279718	0.003884873	0.699277085	LSC-A-001	BSTEFFENS	3/18/2011
ARSI-B11-00807-18	ARSI-11-00267	004					0.994143815					0.052279718	0.003722776	0.670099695	LSC-A-001	BSTEFFENS	3/18/2011
ARSI-B11-00807-19	ARSI-11-00267	005					0.994123716					0.052279718	0.003919516	0.705512906	LSC-A-001	BSTEFFENS	3/18/2011
ARSI-B11-00807-20	ARSI-11-00268	001					0.994256973					0.052279718	0.003719983	0.669597015	LSC-A-001	BSTEFFENS	3/18/2011
ARSI-B11-00807-21	ARSI-11-00268	002					0.994236766					0.052279718	0.003907844	0.703411975	LSC-A-001	BSTEFFENS	3/18/2011
ARSI-B11-00807-22	ARSI-11-00268	003					0.994216665					0.052279718	0.003971104	0.714798676	LSC-A-001	BSTEFFENS	3/18/2011

Assay Definition-

Assay Description:
H3 Normal Lvl

Assay Type: DPM (Single)

Report Name: Report1
Output Data Path: C:\Packard\Tricarb\Results\ARS\H-3 Normal Lvl\20110315_0652
Raw Results Path: C:\Packard\Tricarb\Results\ARS\H-3 Normal Lvl\20110315_0652\H3 Results.results
RTF File Name: C:\Packard\Tricarb\Results\ARS\H-3 Normal Lvl\20110315_0652\H3 Results.rtf
Comma-Delimited File Name: C:\Packard\Tricarb\Results\ARS\H-3 Normal Lvl\20110315_0652\H3 Results.csv
Assay File Name: C:\Packard\Tricarb\Assays\H-3 Normal Lvl.1sa

Count Conditions-

Nuclide: H-3 Normal

Quench Indicator: tSIE/AEC
External Std Terminator (sec): 0.5 2s%
Pre-Count Delay (min): 0.00

Quench Set:

Low Energy: UG STD H-3
Count Time (min): 180.00
Count Mode: Normal
Assay Count Cycles: 1
#Vials/Sample: 1
Repeat Sample Count: 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-

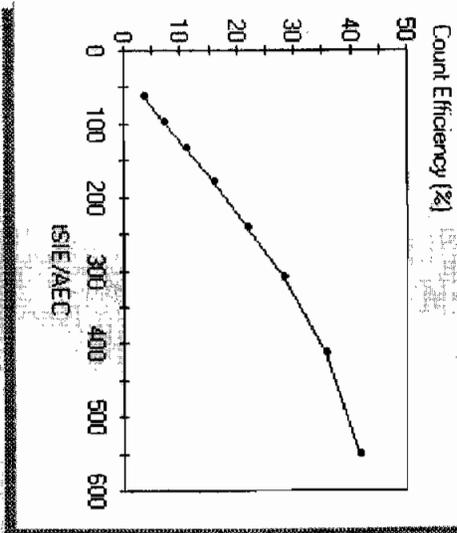
Static Controller: On
Colored Samples: Off
Coincidence Time (nsec): 18
Luminescence Correction: OFF
Heterogeneity Monitor: Off
Delay Before Burst (nsec): 75

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: 06/30/2010
Date Modified:
UG STD H-3 in A

tSIE/AEC	Count Efficiency (%)
551.03	41.58
411.38	35.42
310.08	28.09
241.32	21.90
178.11	15.75
132.72	11.03
96.52	6.92
63.58	3.36

P#	S#	SMPL_ID	CPMA	DPM1	CSIE	EFF Nucl	In A	Count	Time	DATE	TIME	MESSAGES
44	1	BACKGROUND	5.52	15.63	410.50		35.55	180.00	6:57:09 AM	3/15/2011	10:04:03 AM	
44	2	B11-00807-01	16.11	45.33	414.33		35.55	180.00	1:11:06 PM	3/15/2011	1:11:06 PM	
44	3	B11-00807-02	16.15	44.77	426.45		36.08	180.00	4:18:12 PM	3/15/2011	4:18:12 PM	
44	4	B11-00807-03	6.63	18.64	414.68		35.56	180.00	7:25:20 PM	3/15/2011	7:25:20 PM	
44	5	B11-00807-04	49.71	141.93	405.93		35.02	180.00	10:32:21 PM	3/15/2011	10:32:21 PM	
44	6	B11-00807-05	126.50	357.52	410.94		35.38	180.00	1:39:25 AM	3/16/2011	1:39:25 AM	
44	7	B11-00807-06	6.12	17.29	411.36		35.41	180.00	4:46:20 AM	3/16/2011	4:46:20 AM	
44	8	B11-00807-07	19.17	54.43	408.76		35.23	180.00	7:53:17 AM	3/16/2011	7:53:17 AM	
44	9	B11-00807-08	44.20	124.50	413.36		35.50	180.00	11:00:18 AM	3/16/2011	11:00:18 AM	
44	10	B11-00807-09	5.96	16.80	413.28		35.50	180.00	2:07:11 PM	3/16/2011	2:07:11 PM	
44	11	B11-00807-10	14.65	41.19	414.87		35.57	180.00	5:14:06 PM	3/16/2011	5:14:06 PM	
44	12	B11-00807-11	111.73	314.25	414.53		35.56	180.00	8:21:11 PM	3/16/2011	8:21:11 PM	
44	13	B11-00807-12	100.60	286.06	407.94		35.17	180.00	11:28:12 PM	3/16/2011	11:28:12 PM	
44	14	B11-00807-13	34.35	98.14	405.60		35.00	180.00	2:35:13 AM	3/17/2011	2:35:13 AM	
44	15	B11-00807-14	105.84	299.85	409.73		35.30	180.00	5:42:17 AM	3/17/2011	5:42:17 AM	
44	16	B11-00807-15	13.00	37.80	397.32		34.40	180.00	8:51:44 AM	3/17/2011	8:51:44 AM	
44	17	B11-00807-16	113.86	325.22	405.78		35.01	180.00	3:05:57 PM	3/17/2011	3:05:57 PM	
44	18	B11-00807-17	11.68	33.57	402.60		34.78	180.00	6:15:25 PM	3/17/2011	6:15:25 PM	
44	19	B11-00807-18	12.12	36.40	381.91		35.35	180.00	9:22:25 PM	3/17/2011	9:22:25 PM	
44	20	B11-00807-19	37.63	106.44	410.47		33.36	180.00	12:31:35 AM	3/18/2011	12:31:35 AM	
44	21	B11-00807-20	7.57	22.68	382.91		34.99	180.00	3:41:04 AM	3/18/2011	3:41:04 AM	
44	22	B11-00807-21	13.41	38.32	405.48		35.48	180.00				
44	23	B11-00807-22	7.66	21.60	412.72			180.00				

Beta Liquid Scintillation Counter Log Book

Date	Time	ARS Sample I.D. Number	Batch Number	Liquid Scintillation File Number	Technician Initials
2-24-11	1318	B11-00704-16	B11-00704	0250	*
↓	↓	B11-00704-17	↓	↓	
↓	↓	B11-00704-18	↓	↓	
↓	↓	B11-00704-19	↓	↓	
↓	↓	B11-00704-20	↓	↓	
2-25-11	1114	SNC 117	QA	QA	*
↓	↓	Background	B11-00826	0213	
↓	↓	B11-00826-01	↓	↓	
↓	↓	B11-00826-02	↓	↓	
↓	↓	B11-00826-03	↓	↓	
↓	↓	B11-00826-04	↓	↓	
↓	↓	B11-00826-05	↓	↓	
↓	↓	B11-00826-06	↓	↓	
↓	↓	B11-00826-07	↓	↓	
↓	↓	B11-00826-08	↓	↓	
↓	↓	B11-00826-09	↓	↓	
↓	↓	B11-00826-10	↓	↓	
↓	↓	B11-00826-11	↓	↓	
3-7-11	1446	SNC 117	QA	QA	
3-7-11	1446	Background	B11-00807	0052	*

YSW
3-1-11

5-1-11

Beta Liquid Scintillation Counter Log Book

Date	Time	ARS Sample I.D. Number	Batch Number	Liquid Scintillation File Number	Technician Initials
3-1-11	1446	B11-00807-01	B11-00807	0652	LSW
L	L	B11-00807-02	L	L	
L	L	B11-00807-03	L	L	
L	L	B11-00807-04	L	L	
L	L	B11-00807-05	L	L	
L	L	B11-00807-06	L	L	
L	L	B11-00807-07	L	L	
L	L	B11-00807-08	L	L	
L	L	B11-00807-08	L	L	
L	L	B11-00807-09	L	L	
L	L	B11-00807-10	L	L	
L	L	B11-00807-11	L	L	
L	L	B11-00807-12	L	L	
L	L	B11-00807-13	L	L	
L	L	B11-00807-14	L	L	
L	L	B11-00807-15	L	L	
L	L	B11-00807-16	L	L	
L	L	B11-00807-17	L	L	
L	L	B11-00807-18	L	L	
L	L	B11-00807-19	L	L	

Beta Liquid Scintillation Counter Log Book

Date	Time	ARS Sample I.D. Number	Batch Number	Liquid Scintillation File Number	Technician Initials
3-1-11	1446	B11-00807-20	B11-00807	0652	JDR
↓	↓	B11-00807-21	↓	↓	JDR
↓	↓	B11-00807-22	↓	↓	JDR
3-2-11	1646	Background	B11-00882	2333	JDR
↓	↓	^{JDR 3-2-11} B11-00882-04	↓	↓	JDR
↓	↓	B11-00882-05	↓	↓	JDR
↓	↓	B11-00882-06	↓	↓	JDR
↓	↓	B11-00882-07	↓	↓	JDR
↓	↓	B11-00882-08	↓	↓	JDR
↓	↓	B11-00882-09	↓	↓	JDR
↓	↓	B11-00882-10	↓	↓	JDR
↓	↓	B11-00882-11	↓	↓	JDR
↓	↓	B11-00882-12	↓	↓	JDR
↓	↓	B11-00882-13	↓	↓	JDR
↓	↓	B11-00882-14	↓	↓	JDR
↓	↓	B11-00882-15	↓	↓	JDR
↓	↓	B11-00882-16	↓	↓	JDR
↓	↓	B11-00882-17	↓	↓	JDR
↓	↓	B11-00882-18	↓	↓	JDR
↓	↓	B11-00882-19	↓	↓	JDR



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

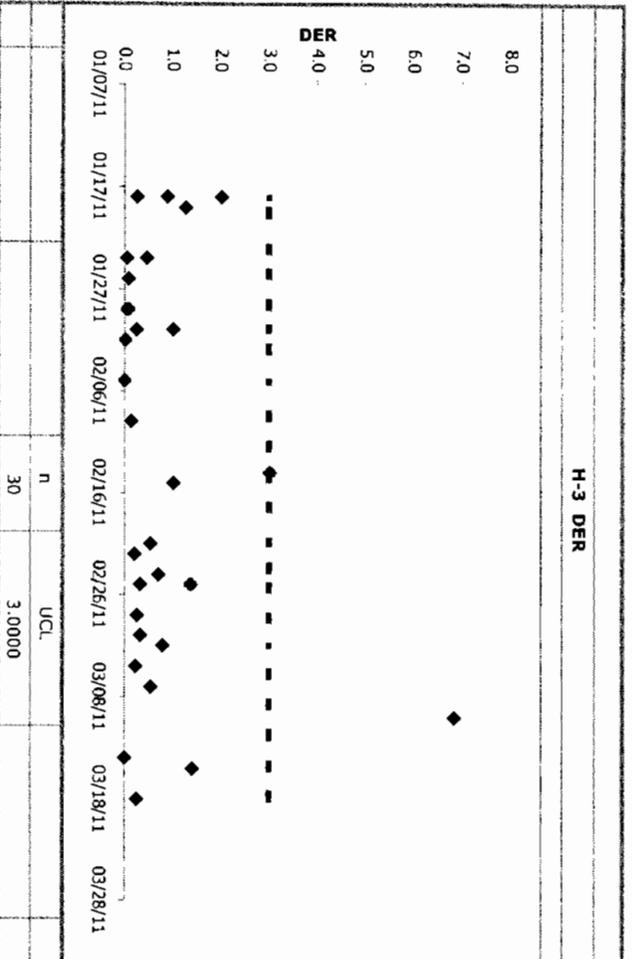
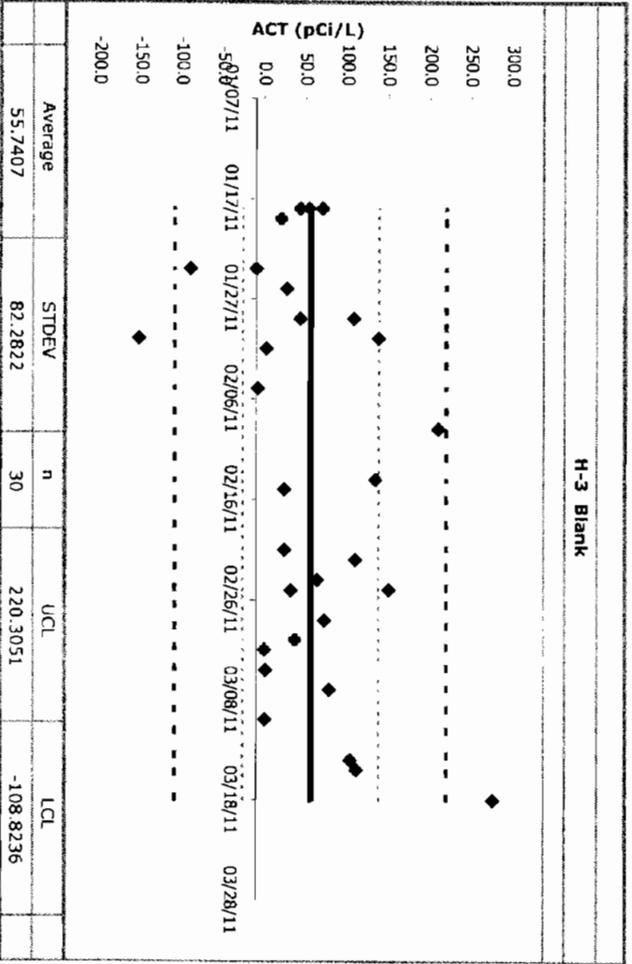
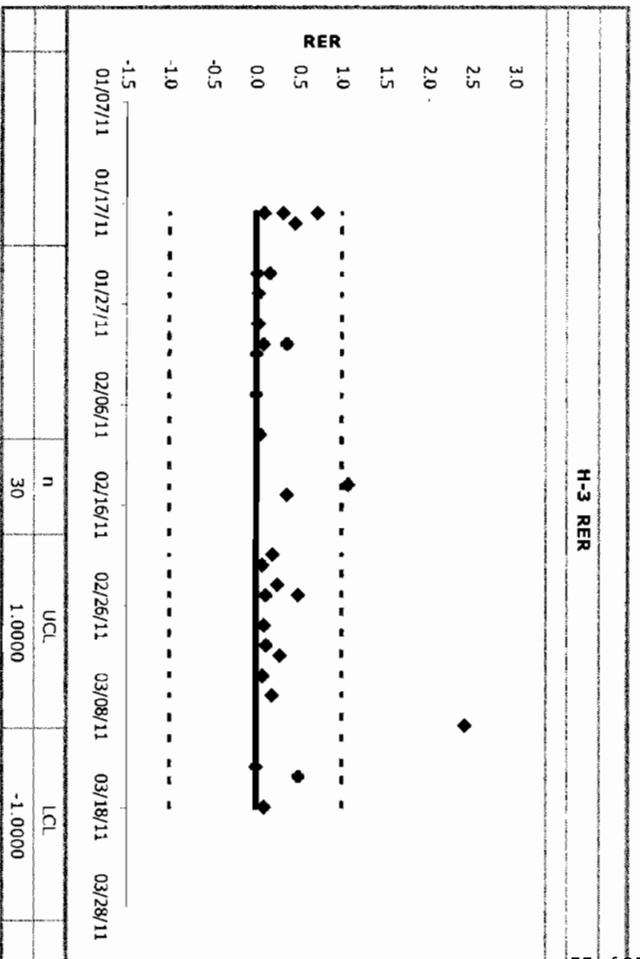
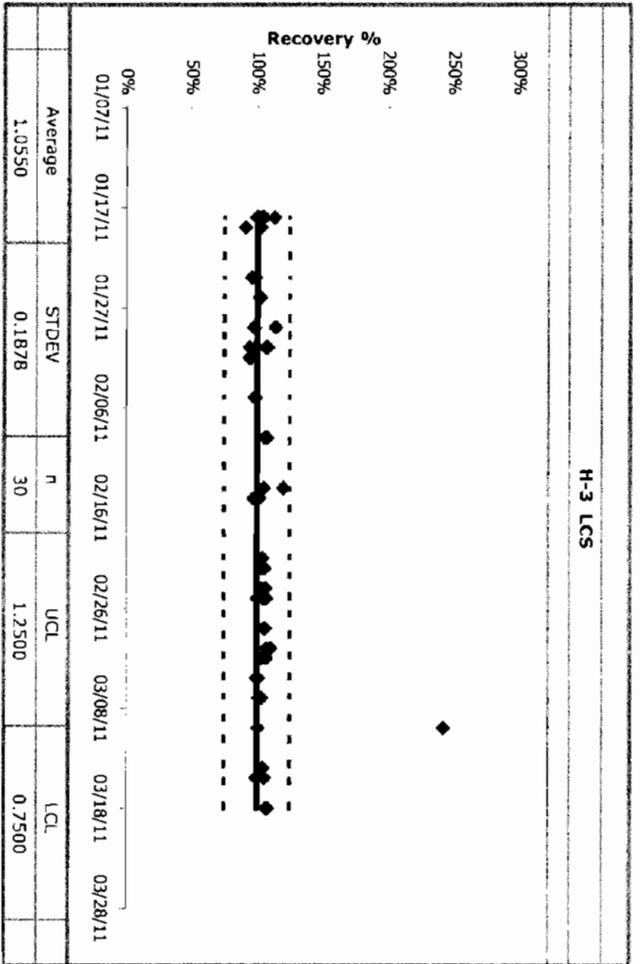
Tritium

by

Low Level Liquid Scintillation Counting

Control Charts

QC Chart



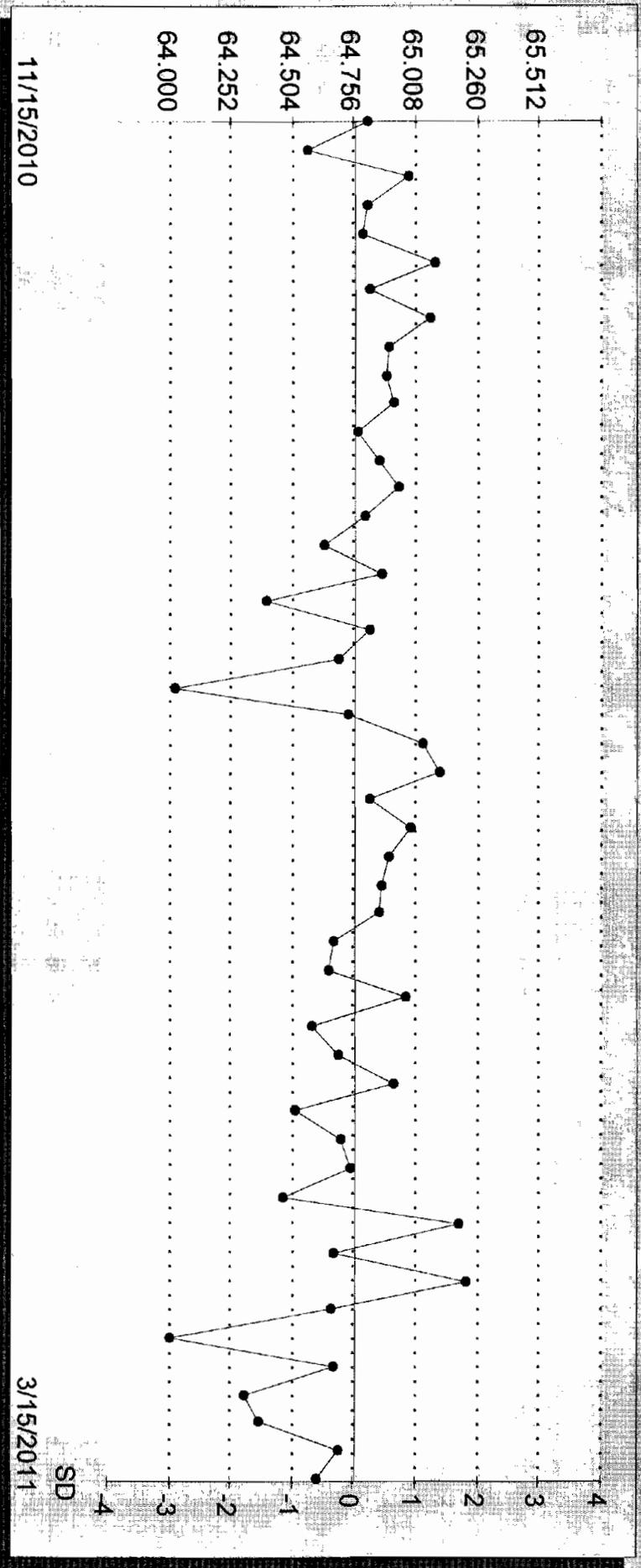
3H Efficiency : 1566
 Total # pts : 49
 Valid # pts : 64.76
 Mean : 64.76
 SD : 0.25

Date	Value	Valid Pt
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
Dec 13, 2010	64.86	X
Dec 17, 2010	64.68	X
Dec 28, 2010	64.65	X
Jan 01, 2011	64.97	X
Jan 06, 2011	64.58	X
Jan 10, 2011	64.70	X
Jan 13, 2011	64.92	X
Jan 18, 2011	64.51	X
Jan 24, 2011	64.74	X
Jan 29, 2011	64.74	X
Jan 31, 2011	64.46	X
Feb 05, 2011	65.19	X
Feb 11, 2011	64.68	X
Feb 15, 2011	65.22	X
Feb 19, 2011	64.66	X
Feb 23, 2011	64.01	X
Feb 25, 2011	64.68	X
Mar 01, 2011	64.31	X
Mar 04, 2011	64.77	X

Mar 09, 2011 64.70
Mar 15, 2011 64.61

X
X

3H Efficiency : 1566
Total # pts : 49
Valid # pts : 64.76
Mean : 64.76
SD : 0.25





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

Low Level Liquid Scintillation Counting

Calibration Information

ARS INTERNATIONAL		Add/Edit Secondary Stds	Parent Standard Data			
Planning		Parent Solution Reference #	NIST SRM 4927F			
Planning Comments	Create an H-3 LCS standard	Parent Solution #	S-0237			
Target dpm/g (on dil. date)	5.56	Parent Principal Radionuclide	H-3	Half Life (Days)	4499.6000000	
Target Final volume ml	2000	Parent Reference Date	03/22/2010 10:10			
Appx mass g of Parent Sol'n	3.274623294	Parent Certified Act	3503.682716	Certf Act/Vol Units	dpm	g
Appx vol ml of Parent Sol'n	3.280528244	Parent Cert Act Uncert 1 Sigma	0.0036			
Expected Addition for Analysis g	5	Parent Sp. Gravity G/ML	0.9982			
Standards Preparation / Dilution		Parent Supplier	NIST SRM 4927F			
Secondary Solution #	S-0247	Parent Date Recvd	01/02/00			
Dilution Date (New Ref Date)	10/11/2010 10:30	Parent Received By	Unknown			
Ampoule, Empty (g)		Parent Cert Exp Date				
Ampoule /Solution Gross (g)		Parent Matrix	H2O			
Net Wt Removed (g)		Certified dpm/g At Ref Date	3503.682716			
Transfer Container, empty (g)	1.7	Certified dpm/g on 10/11/2010 10:30	3395.81045			
Container Plus Solution (g)	4.994	Parent Comments	Intermediate level H-3 standard for creating LCS solutions and matrix spikes. Dilution performed as stated above by B Steffens. -BJS 3/22/10			
Net Wt Transferred (g)	3.294					
DPM Xferred on 10/11/2010 10:30	11165.79962					
Diluent/matrix	DI H2O					
Diluent Density Cont, empty (g)		Parent Tech	Unknown			
Test Mass of 5 ml of Diluent (g)		Is_Primary	FALSE			
Diluent Density Test - (g/mL)		Is_LCS	TRUE			
Dilution Empty Container Mass (g)	473.95	Is_Tracer	FALSE			
Dilution Full Cont g (if measured)	2467.85	Is_Calb	FALSE			
Dilution Final Volume ml (if measured)	2000					
Final Dilution Density (g/mL)	0.998945					
Final Dilution Measured Mass g	1993.89					
Comments	Stock H-3 LCS standard. Dilution performed as stated above by B Steffens. -BJS 10/11/10					
Final Dilution dpm/g	6.610038479					
Final Dil New Ref Date/Time	10/11/2010 10:30					

S-0247			
H-3	Verified	10/13/10	
SL	Expires	10/13/11	
Manufacturer	NIST SRM 4927F		
Sol Matrix	H2O		
Ref No	NIST SRM 4927F		
Tech	Unknown		
Parent ID	S-0237		
RADIOACTIVE STANDARDS -- BATON ROUGE LABORATORY			





QUALITY CONTROL PROGRAM
 AMERICAN RADIATION SERVICES
 RADIOACTIVE REFERENCE SOLUTIONS
ANNUAL ACTIVITY VERIFICATION

VERIFICATION DATE 10/13/2010 20:18 *date counted*
 STANDARD REFERENCE # S-0247

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

Radionuclide H-3 Dilution Reference Date 10/11/2010 10:30

Dilution Activity 2.53 pCi per gram ==> dpm/g 5.61
 Verif. Date Decay Corrected 2.53 pCi per gram ==> dpm/g 5.61

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-0247-V1	16.99	1	LSC	0.3440	6.86	5.017	5.87	2.64
S-0247-V2	16.76	1	LSC	0.3484	6.86	4.979	5.70	2.57
S-0247-V3	16.97	1	LSC	0.3465	6.86	4.972	5.87	2.64
S-0247-V4	16.76	1	LSC	0.3449	6.86	4.982	5.76	2.60
S-0247-V5	16.88	1	LSC	0.3433	6.86	4.980	5.86	2.64

Average	5.81	2.62
Two Sigma Uncertainty	0.15	0.07
Standard Deviation percent of known concentration	1.35%	1.35%
Target Activity	5.61	2.53
% Diff	3.66%	3.66%

10% Max **PASS** 5% Max **PASS**

Verification Expiration Date: October 13, 2011

Prepared & Counted By [Signature] Date: 10/13/2010 20:18

Verified & Approved By [Signature] Date: 10-14-10/1824

QC Approval [Signature] Date: 10-14-10/18:30

STD ID: S-0031

ARS INTERNATIONAL		Add/Edit Secondary Stds	Parent Standard Data			
Planning		Parent Solution Reference #	NIST SRM 4927F			
Planning Comments	Dilute Intermediate level solution from SRM 4927F		Parent Solution #	S-0107		
Target dpm/g (on dil. date)	167000	Parent Principal Radionuclide	H-3	Half Life (Days)	4499.6000000	
Target Final volume mL	200	Parent Reference Date	09/03/1998 11:00			
Appx mass g of Parent Sol'n	2.093763934	Parent Certified Act	38082000	Cert Act/Vol Units	dpm	g
Appx vol ml of Parent Sol'n	2.097539505	Parent Cert Act Uncert 1 Sigma	0.0036			
Expected Addition for Analysis g		Parent Sp. Gravity G/Ml	0.9982			
Standards Preparation / Dilution		Parent Supplier	NIST SRM 4927F			
Secondary Solution #	S-0031	Parent Date Recvd	01/02/00			
Dilution Date (New Ref Date)	10/19/2005 00:00	Parent Received By	Unknown			
Ampoule, Empty (g)		Parent Cert Exp Date				
Ampoule /Solution Gross (g)		Parent Matrix	H2O			
Net Wt Removed (g)		Certified dpm/g At Ref Date	38082000			
Transfer Container, empty (g)	0	Certified dpm/g on 10/18/2003 00:00	25504307.89			
Container Plus Solution (g)	4.7574	Parent Comments	Primary for S-0029 - Information entered from dilution records - 4/18/2006 RTS			
Net Wt Transferred (g)	4.7674					
DPM Xferred on 10/19/2005 00:00	121334194.3					
Diluent/matrix	H2O	Parent Tech	Unknown			
Diluent Density Cont, empty (g)		Is_Primary	FALSE			
Test Mass of 5 ml of Diluent (g)		Is_LCS	TRUE			
Diluent Density Test - (g/mL)		Is_Tracer	FALSE			
Dilution Empty Container Mass (g)	1	Is_Calib	FALSE			
Dilution Full Cont g (if measured)	200.64					
Dilution Final Volume ml (if measured)	200					
Final Dilution Density (g/mL)	0.9982					
Final Dilution Measured Mass g	199.64					
Comments	S-0031 Intermediate dilution - Information entered from dilution records - 4/19/2006 RTS					
Final Dilution dpm/g	607764.9485					
Final Dil New Ref Date/Time	10/19/2005 00:00					



Add / Edit *Primary* Standards

Solution Reference #	NIST SRM 4927F		
Solution #	S-0107		
Principal Radionuclide	H-3	Half Life (Days)	4499.8000
Reference Date	09/03/98 11:00		
Certified Act	634700.0000	Cert. Act/Vol Units	Bq g
Cert Act Uncert 1 Sigma (fractional .03=3%)	0.0036		
Sp. Gravity G/ML	0.9982		
Supplier	NIST SRM 4927F		
Date Recvd	01/02/00		
Received By	Unknown		
Cert Exp Date			
Matrix	H2O		
Certified dpm/g At Reference Date	38082000		
Certified dpm/g On 10/15/2010 15:48	19261068.03		
Comments	Primary for S-0029 - Information entered from dilution records - 4/18/2006 RTS		
Primary Tech	Unknown		
Is_Primary	TRUE		
Is_LCS	TRUE		
Is_Tracer	FALSE		
Is_Calib	FALSE		

5-0031



National Institute of Standards & Technology

Certificate

Standard Reference Material 4927F Hydrogen-3 Radioactivity Standard

This Standard Reference Material (SRM) consists of radioactive hydrogen-3, as water, in 5 mL of distilled water. The solution is contained in a flame-sealed NIST borosilicate-glass ampoule. The SRM is intended for the calibration of beta-particle counting instruments and for the monitoring of radiochemical procedures.

Radiological Hazard

The SRM ampoule contains hydrogen-3 with a total activity of approximately 3.2 MBq. Hydrogen-3 decays by beta-particle emission. None of the beta particles escape from the SRM ampoule. During the decay process no photons are emitted. Approximate unshielded dose rates at several distances (as of the reference time) are given in note [a]*. There is no detectable external radiation. The SRM should be used only by persons qualified to handle radioactive material.

Chemical Hazard

The SRM ampoule contains only distilled water. There is no chemical hazard. If the ampoule is to be opened to transfer the solution, the recommended procedure is given on page 2.

Storage and Handling

The SRM should be stored and used at a temperature between 5 and 65 °C. The solution in an unopened ampoule should remain stable and homogeneous until at least September 2008.

The ampoule (or any subsequent container) should always be clearly marked as containing radioactive material. If the ampoule is transported it should be packed, marked, labeled, and shipped in accordance with the applicable national, international, and carrier regulations. The solution in the ampoule is a dangerous good (hazardous material) because of the radioactivity.

Preparation

This Standard Reference Material was prepared in the Physics Laboratory, Ionizing Radiation Division, Radioactivity Group, L.R. Karam, Group Leader. The overall technical direction and physical measurements leading to certification were provided by L.L. Lucas and M.P. Unterwieser of the Radioactivity Group.

The support aspects involved in the preparation, certification, and issuance of this SRM were coordinated through the Standard Reference Materials Program by J.W.L. Thomas.

Bert M. Coursey, Chief
Ionizing Radiation Division

Nancy M. Trahey, Chief
Standard Reference Materials Program

Gaithersburg, Maryland 20899
June 1999
Half-life and text revised October 2000

PROPERTIES OF SRM 4927F

Certified values

Solution density	$(0.996 \pm 0.002) \text{ g} \cdot \text{mL}^{-1}$ at 20.0 °C [b]*
Radionuclide	Hydrogen-3
Reference time	1200 EST, 3 September 1998 1100 CST
Massic activity of the solution [c]	$634.7 \text{ kBq} \cdot \text{g}^{-1}$
Relative expanded uncertainty ($k=2$)	0.72% [d] [e]

Uncertified values

Physical Properties:			
Source description	Liquid in flame-sealed NIST borosilicate-glass ampoule		
Ampoule specifications	Body outside diameter	$(16.5 \pm 0.5) \text{ mm}$	
	Wall thickness	$(0.60 \pm 0.04) \text{ mm}$	
	Barium content	Less than 2.5%	
	Lead-oxide content	Less than 0.02%	
	Other heavy elements	Trace quantities	
Solution mass	Approximately 5.0 g		
Chemical Properties:			
Solution composition	Chemical Formula	Concentration ($\text{mol} \cdot \text{L}^{-1}$)	Mass Fraction ($\text{g} \cdot \text{g}^{-1}$)
	H ₂ O ³ HHO	55 6×10^{-7}	1.00 1×10^{-8}
Radiological Properties:			
Radionuclidic impurities	None detected [f]		
Half lives used	Hydrogen-3: $(4500 \pm 8) \text{ d}$ [g]		
Calibration method and measuring instrument(s)	4πβ gas counting of SRM 4927E using the NIST length-compensated internal gas proportional counters and intercomparison of SRMs 4927E/4927F using two 4πβ liquid-scintillation counting systems [h]		

NOTES

- [a] The Sievert is the SI unit for dose equivalent. See reference [1]. One μSv is equal to 0.1 mrem.
Distance from Ampoule (cm): 1 30 100
Approximate Dose Rate ($\mu\text{Sv/h}$): <0.1 (Not detectable)
- [b] The stated uncertainty is two times the standard uncertainty.
- [c] Massic activity is the preferred name for the quantity activity divided by the total mass of the sample. See reference [1].
- [d] The reported value, y , of massic activity (activity per unit mass) at the reference time was not measured directly but was derived from measurements and calculations of other quantities. This can be expressed as $y = f(x_1, x_2, x_3, \dots, x_n)$, where f is a mathematical function derived from the assumed model of the measurement process.
- The value, x_i , used for each input quantity i has a standard uncertainty, $u(x_i)$, that generates a corresponding uncertainty in y , $u(y) = |\partial y / \partial x_i| \cdot u(x_i)$, called a component of combined standard uncertainty of y .
- The combined standard uncertainty of y , $u_c(y)$, is the positive square root of the sum of the squares of the components of combined standard uncertainty.
- The combined standard uncertainty is multiplied by a coverage factor of $k = 2$ to obtain U , the expanded uncertainty of y .
- Since it can be assumed that the possible estimated values of the massic activity are approximately normally distributed with approximate standard deviation $u_c(y)$, the unknown value of the massic activity is believed to lie in the interval $y \pm U$ with a level of confidence of approximately 95 percent.
- For further information on the expression of uncertainties, see references [2] and [3].
- [e] The value of each standard uncertainty component, and hence the value of the expanded uncertainty itself, is a best estimate based upon all available information, but is only approximately known. That is to say, the "uncertainty of the uncertainty" is large and not well known. This is true for uncertainties evaluated by statistical methods (e.g., the relative standard deviation of the standard deviation of the mean for the massic response is approximately 50%) and for uncertainties evaluated by other methods (which could easily be over estimated or under estimated by substantial amounts). The unknown value of the expanded uncertainty is believed to lie in the interval $U/2$ to $2U$ (i.e., within a factor of 2 of the estimated value).
- [f] The estimated limit of detection for radionuclides impurities is $300 \text{ Bq} \cdot \text{g}^{-1}$.
- [g] The stated uncertainty is the standard uncertainty. See reference [5].
- [h] Extensive gas-counting measurements were made on the SRM 4927E solution during 1998 and 1999. The SRM 4927F solution was intercompared with the SRM 4927E solution using liquid scintillation counting.
- [i] Relative standard uncertainty of the input quantity x_i .



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

Percent Moisture



2609 North River Road, Port Allen, Louisiana 70767

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

ARS Sample Delivery Group: ARS1-11-00256
Client Sample ID: MD21-11-4742
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-001
Date Received: 02/09/11
Report Date: 03/18/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
Percent Moisture	12.240	NA	NA	NA		%	Percent Moisture	03/15/11 19:25	AB	NA

NOTES: Project Cost Code MR8R032NFB00

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



2609 North River Road, Port Allen, Louisiana 70767

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

ARS Sample Delivery Group: ARS1-11-00256
Client Sample ID: MD21-11-4740
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-002
Date Received: 02/09/11
Report Date: 03/18/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
Percent Moisture	10.069	NA	NA	NA		%	Percent Moisture	03/15/11 22:32	AB	NA

NOTES: Project Cost Code MR8R032NFB00

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



2609 North River Road, Port Allen, Louisiana 70767

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

ARS Sample Delivery Group: ARS1-11-00256
Client Sample ID: MD21-11-4746
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-003
Date Received: 02/09/11
Report Date: 03/18/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
Percent Moisture	7.796	NA	NA	NA	U	%	Percent Moisture	03/16/11 01:39	AB	NA

NOTES: Project Cost Code MR8R032NFB00

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



2609 North River Road, Port Allen, Louisiana 70767

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

ARS Sample Delivery Group: ARS1-11-00256
Client Sample ID: MD21-11-4747
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-004
Date Received: 02/09/11
Report Date: 03/18/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
Percent Moisture	7.977	NA	NA	NA		%	Percent Moisture	03/16/11 04:46	AB	NA

NOTES: Project Cost Code MR8R032NFB00

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



2609 North River Road, Port Allen, Louisiana 70767

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

ARS Sample Delivery Group: ARS1-11-00256
Client Sample ID: MD21-11-4741
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-005
Date Received: 02/09/11
Report Date: 03/18/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
Percent Moisture	12.709	NA	NA	NA		%	Percent Moisture	03/16/11 07:53	AB	NA

NOTES: Project Cost Code MR8R032NFB00

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



2609 North River Road, Port Allen, Louisiana 70767

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

ARS Sample Delivery Group: ARS1-11-00256
Client Sample ID: MD21-11-4738
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-006
Date Received: 02/09/11
Report Date: 03/18/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
Percent Moisture	4.937	NA	NA	NA	U	%	Percent Moisture	03/16/11 11:00	AB	NA

NOTES: Project Cost Code MRBR032NFB00

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



2609 North River Road, Port Allen, Louisiana 70767

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

ARS Sample Delivery Group: ARS1-11-00256
Client Sample ID: MD21-11-4748
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-007
Date Received: 02/09/11
Report Date: 03/18/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
Percent Moisture	9.360	NA	NA	NA		%	Percent Moisture	03/16/11 14:07	AB	NA

NOTES: Project Cost Code MR8R032NFB00

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



2609 North River Road, Port Allen, Louisiana 70767

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

ARS Sample Delivery Group: ARS1-11-00256
Client Sample ID: MD21-11-4739
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-008
Date Received: 02/09/11
Report Date: 03/18/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
Percent Moisture	7.465	NA	NA	NA		%	Percent Moisture	03/16/11 17:14	AB	NA

NOTES: Project Cost Code MR8R032NFB00

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



2609 North River Road, Port Allen, Louisiana 70767

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

ARS Sample Delivery Group: ARS1-11-00256
Client Sample ID: MD21-11-4743
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-009
Date Received: 02/09/11
Report Date: 03/18/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
Percent Moisture	10.253	NA	NA	NA		%	Percent Moisture	03/16/11 20:21	AB	NA

NOTES: Project Cost Code MR8R032NFB00

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



2609 North River Road, Port Allen, Louisiana 70767

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

ARS Sample Delivery Group: ARS1-11-00256
Client Sample ID: MD21-11-4745
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-010
Date Received: 02/09/11
Report Date: 03/18/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
Percent Moisture	12.163	NA	NA	NA		%	Percent Moisture	03/16/11 23:28	AB	NA

NOTES: Project Cost Code MR8R032NFB00

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



2609 North River Road, Port Allen, Louisiana 70767

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

ARS Sample Delivery Group: ARS1-11-00256
Client Sample ID: MD21-11-4744
Sample Collection Date: 02/08/11
Sample Matrix: Silica

Request or PO Number: 11-1296
ARS Sample ID: ARS1-11-00256-011
Date Received: 02/09/11
Report Date: 03/18/11

Analysis Description	Analysis Results	Analysis Error +/- 1 s	MDC	DLC	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
Percent Moisture	8.158	NA	NA	NA		%	Percent Moisture	03/17/11 02:35	AB	NA

NOTES: Project Cost Code MR8R032NFB00

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



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

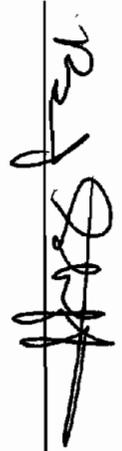
Percent Moisture Laboratory Records

AMERICAN RADIATION SERVICES
Port Allen, LA
PERCENT MOISTURE DETERMINATION IN SOILS

SDG Number ARS1-11-00256, 00267, 00268
 Client LANL

LANL ID	ARS ID	weight of cylinder with gel (g)	weight of empty cylinder (g)	Weight of gel (g)	amount of liquid collected (ml)	amount of liquid tested (ml)	% moisture
MD21-11-4742	ARS1-11-00256-001	609	439	170	20.808	5.05	12.24
MD21-11-4740	ARS1-11-00256-002	607	439	167	16.816	5.045	10.0694611
MD21-11-4746	ARS1-11-00256-003	603	437	166	12.941	5.048	7.79578313
MD21-11-4747	ARS1-11-00256-004	622	463	160	12.763	5.047	7.976875
MD21-11-4741	ARS1-11-00256-005	617	442	174	22.113	5.036	12.7086207
MD21-11-4738	ARS1-11-00256-006	599	443	155	7.653	5.053	4.93741935
MD21-11-4748	ARS1-11-00256-007	609	442	167	15.631	5.046	9.35988024
MD21-11-4739	ARS1-11-00256-008	623	456	167	12.466	5.035	7.46467066
MD21-11-4743	ARS1-11-00256-009	610	448	161	16.507	5.019	10.252795
MD21-11-4745	ARS1-11-00256-010	611	433	179	21.771	5.045	12.1625698
MD21-11-4744	ARS1-11-00256-011	599	439	159	12.971	5.058	8.15786164
MD50-11-3974	ARS1-11-00267-001	593	437	156	6.055	5.073	3.88141026
MD50-11-3983	ARS1-11-00267-002	604	441	163	14.801	5.06	9.0803681
MD50-11-3975	ARS1-11-00267-003	603	441	162	10.615	5.061	6.55246914
MD50-11-3973	ARS1-11-00267-004	596	439	155	6.568	5.067	4.23741935

MD50-11-4164	ARS1-11-00267-005	619	437	181	31.773	5.024	17.5541436
MD50-11-3979	ARS1-11-00268-001	611	443	168	15.132	5.052	9.00714286
MD50-11-3978	ARS1-11-00268-002	608	441	167	18.422	5.06	11.0311377
MD50-11-3977	ARS1-11-00268-003	602	438	162	12.006	5.071	7.411111111
Balance ID:	0102/H1331122173560P						
Pipettor ID:	FJ40469						

Signature  Date 3-17-11

AMERICAN RADIATION SERVICES
 Port Allen, LA
 PERCENT MOISTURE DETERMINATION IN SOILS

SDG Number ARS1-11-00256, 00267, 00268
 Client LANL

LANL ID	ARS ID	weight of cylinder with gel (g)	weight of empty cylinder (g)	Weight of gel (g)	amount of liquid collected (ml)	amount of liquid tested (ml)	% moisture
MD21-11-4742	ARS1-11-00256-001	609	439	170	20.808	5.050	#DIV/0!
MD21-11-4740	ARS1-11-00256-002	607	439	167	16.816	5.045	#DIV/0!
MD21-11-4746	ARS1-11-00256-003	603	437	166	12.941	5.048	#DIV/0!
MD21-11-4747	ARS1-11-00256-004	622	463	160	12.763	5.047	#DIV/0!
MD21-11-4741	ARS1-11-00256-005	617	442	174	22.113	5.036	#DIV/0!
MD21-11-4738	ARS1-11-00256-006	599	443	155	7.653	5.053	#DIV/0!
MD21-11-4748	ARS1-11-00256-007	609	442	167	15.631	5.046	#DIV/0!
MD21-11-4739	ARS1-11-00256-008	623	456	167	12.466	5.035	#DIV/0!
MD21-11-4743	ARS1-11-00256-009	610	448	161	16.507	5.019	#DIV/0!
MD21-11-4745	ARS1-11-00256-010	611	433	179	21.771	5.046	#DIV/0!
MD21-11-4744	ARS1-11-00256-011	599	439	159	12.971	5.058	#DIV/0!
MD50-11-3974	ARS1-11-00267-001	593	437	156	6.055	5.073	#DIV/0!
MD50-11-3983	ARS1-11-00267-002	604	441	163	14.801	5.066	#DIV/0!
MD50-11-3975	ARS1-11-00267-003	603	441	162	10.615	5.061	#DIV/0!
MD50-11-3973	ARS1-11-00267-004	596	439	155	6.568	5.067	#DIV/0!

LC5-5.028
 LCSD-5.028
 BIK-5.100

MD50-11-4164	AR51-11-00267-005	619	437	181	31,778	5,024	#DIV/0!
MD50-11-3979	AR51-11-00268-001	611	443	168	15,132	5,052	#DIV/0!
MD50-11-3978	AR51-11-00268-002	608	441	167	18,422	5,060	#DIV/0!
MD50-11-3977	AR51-11-00268-003	602	438	162	12,006	5,071	#DIV/0!

Balance ID: 0102/H1331122173560P
Pipettor ID: FJ40489

Signature



Date

3-1-11



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

Folder Duplicate



Report Compilation Checklist

ARS SDG:	<u>11-00256</u>	Client Name:	<u>LANL</u>	Sample Matrix:	<u>SI</u>
----------	-----------------	--------------	-------------	----------------	-----------

LEVEL 1 COMPONENTS

	1st Reviewer			
1) Cover Page Complete and Accurate (see ARS-059)?	<input checked="" type="checkbox"/> Yes	No	N/A	
2) Technical Review Checklist(s) Complete and Accurate?	<input checked="" type="checkbox"/> Yes	No	N/A	
3) Case Narrative Complete and Accurate (see ARS-059)?	<input checked="" type="checkbox"/> Yes	No	N/A	
4) Form 1s Present for all Samples and Tests?	<input checked="" type="checkbox"/> Yes	No	N/A	
5) Client Specific Components are Present and Complete?	<input checked="" type="checkbox"/> Yes	No	N/A	

LEVEL 2 COMPONENTS

	1st Reviewer			
6) Batch Quality Control Report is Present and Accurate?	<input checked="" type="checkbox"/> Yes	No	N/A	
7) DQO Report is Present and Accurate?	<input checked="" type="checkbox"/> Yes	No	N/A	
8) Client Specific Batch QC Components are Present and Complete?	<input checked="" type="checkbox"/> Yes	No	N/A	

LEVEL 3 COMPONENTS

	1st Reviewer			
9) Efficiencies are Present?	<input checked="" type="checkbox"/> Yes	No	N/A	
10) Calibrations are Present?	<input checked="" type="checkbox"/> Yes	No	N/A	
11) Backgrounds are Present?	<input checked="" type="checkbox"/> Yes	No	N/A	
12) Spectrum Analysis is Present?	<input checked="" type="checkbox"/> Yes	No	N/A	
13) Spectral Plots are Present?	<input checked="" type="checkbox"/> Yes	No	N/A	
14) Plateaus are Present?	<input checked="" type="checkbox"/> Yes	No	N/A	
15) Control Charts are Present?	<input checked="" type="checkbox"/> Yes	No	N/A	
16) Other:	Yes	No	<input checked="" type="checkbox"/> N/A	

LEVEL 4 COMPONENTS

	1st Reviewer			
17) Preparation Raw Data Present, Signed and Complete?	<input checked="" type="checkbox"/> Yes	No	N/A	
18) Instrument Raw Data Present and Complete?	<input checked="" type="checkbox"/> Yes	No	N/A	
19) Calibration Certificates Present?	<input checked="" type="checkbox"/> Yes	No	N/A	
20) Copies of Log Book Pages Present?	<input checked="" type="checkbox"/> Yes	No	N/A	
21) Sample Receiving Documentation Present?	<input checked="" type="checkbox"/> Yes	No	N/A	
22) LIMS Reports Present?	<input checked="" type="checkbox"/> Yes	No	N/A	
23) Applicable Correspondence Present?	Yes	No	<input checked="" type="checkbox"/> N/A	
24) Other:	Yes	No	N/A	

Jurana Keese 3-18-11
 Report Generator Signature Date

WJM 3-18-11
 Management Review Signature Date

Analysis Code	Group	Isotope	Activity Units	Aliquot Units	Procedure No.	RDL	ICS_LL	ICS_UL	MS_LL	MS_UL	RadY_LL	RadY_UL	GravY_LL	GravY_UL	RER	RPRD	DilutionReq	RoughPrepReq	BlankCorrectionMDA	BlankCorrectionAL	CountTimeReq	AliquotReq
LSC-A-001	STC	H-3	PC1	L	ARS-054	2.50E-02	80	120	75	125	30	110	40	110	1.00	25	FALSE	FALSE	FALSE	FALSE		

SDG Report - Samples and Containers

SDG Specific Data		TAT Days		Project Type	
Sample Count	ARS1-11-00256	Date Received	30	COC Number	Environmental
Client	Los Alamos National Laboratory	Client Deadline	2/9/2011	PC Number	11-1296
Client Code	114	Internal Deadline	3/11/2011	Job Number	63641-001-10
Profile Number	PN-00094	Lab Deadline	3/10/2011	Job Location	MRBR032NFB00
Comments					

FR	ClientID	Matrix	SampleStartDate	SampleEndDate	Disp	Hold	Arch	Storage	X	Units	Y	Units	Z	Units	Comments
→	001	MD21-11-4742	SI	02/08/11 12:00 PM	02/08/11 12:00 PM	H	90	5	Q6						
		IC ID	Vol	Volume mL	pH Orig	pH Final	CPM	UR LR	Storage	VOA	Head Sp	AF Units	AF Rate	AF Min	AF Total Vol
		79865	1				30	13		N	N/A				
→	002	MD21-11-4740	SI	02/08/11 12:00 PM	02/08/11 12:00 PM	H	90	5	Q6						
		IC ID	Vol	Volume mL	pH Orig	pH Final	CPM	UR LR	Storage	VOA	Head Sp	AF Units	AF Rate	AF Min	AF Total Vol
		79866	1				30	12		N	N/A				
→	003	MD21-11-4746	SI	02/08/11 12:00 PM	02/08/11 12:00 PM	H	90	5	Q6						
		IC ID	Vol	Volume mL	pH Orig	pH Final	CPM	UR LR	Storage	VOA	Head Sp	AF Units	AF Rate	AF Min	AF Total Vol
		79867	1				30	12		N	N/A				
→	004	MD21-11-4747	SI	02/08/11 12:00 PM	02/08/11 12:00 PM	H	90	5	Q6						
		IC ID	Vol	Volume mL	pH Orig	pH Final	CPM	UR LR	Storage	VOA	Head Sp	AF Units	AF Rate	AF Min	AF Total Vol
		79868	1				35	13		N	N/A				
→	005	MD21-11-4741	SI	02/08/11 12:00 PM	02/08/11 12:00 PM	H	90	5	Q6						
		IC ID	Vol	Volume mL	pH Orig	pH Final	CPM	UR LR	Storage	VOA	Head Sp	AF Units	AF Rate	AF Min	AF Total Vol
		79869	1				25	12		N	N/A				
→	006	MD21-11-4738	SI	02/08/11 12:00 PM	02/08/11 12:00 PM	H	90	5	Q6						
		IC ID	Vol	Volume mL	pH Orig	pH Final	CPM	UR LR	Storage	VOA	Head Sp	AF Units	AF Rate	AF Min	AF Total Vol
		79870	1				30	12		N	N/A				
→	007	MD21-11-4748	SI	02/08/11 12:00 PM	02/08/11 12:00 PM	H	90	5	Q6						
		IC ID	Vol	Volume mL	pH Orig	pH Final	CPM	UR LR	Storage	VOA	Head Sp	AF Units	AF Rate	AF Min	AF Total Vol
		79871	1				25	12		N	N/A				
→	008	MD21-11-4739	SI	02/08/11 12:00 PM	02/08/11 12:00 PM	H	90	5	Q6						
		IC ID	Vol	Volume mL	pH Orig	pH Final	CPM	UR LR	Storage	VOA	Head Sp	AF Units	AF Rate	AF Min	AF Total Vol
		79872	1				35	13		N	N/A				
→	009	MD21-11-4743	SI	02/08/11 12:00 PM	02/08/11 12:00 PM	H	90	5	Q6						
		IC ID	Vol	Volume mL	pH Orig	pH Final	CPM	UR LR	Storage	VOA	Head Sp	AF Units	AF Rate	AF Min	AF Total Vol
		79873	1				30	12		N	N/A				
→	010	MD21-11-4745	SI	02/08/11 12:00 PM	02/08/11 12:00 PM	H	90	5	Q6						
		IC ID	Vol	Volume mL	pH Orig	pH Final	CPM	UR LR	Storage	VOA	Head Sp	AF Units	AF Rate	AF Min	AF Total Vol
		79874	1				30	12		N	N/A				
→	011	MD21-11-4744	SI	02/08/11 12:00 PM	02/08/11 12:00 PM	H	90	5	Q6						
		IC ID	Vol	Volume mL	pH Orig	pH Final	CPM	UR LR	Storage	VOA	Head Sp	AF Units	AF Rate	AF Min	AF Total Vol
		79875	1				30	12		N	N/A				

SDG Report - Analysis Assignments

Temp SDG	ARS1-11-00256	Sample Count
Client	Los Alamos National Laboratory	Analysis Count 1-11

Samples Count Totals per Analysis		
Analysis Code	Analysis Description	Samples Count
LSC-A-001	Tritium in (Water [Aqueous, AQ, SI])	11

Analyses Assigned Per Fraction		
Fraction	Analysis Code	X = Assigned
001	LSC-A-001	X
002	LSC-A-001	X
003	LSC-A-001	X
004	LSC-A-001	X
005	LSC-A-001	X
006	LSC-A-001	X
007	LSC-A-001	X
008	LSC-A-001	X
009	LSC-A-001	X
010	LSC-A-001	X
011	LSC-A-001	X

ARS FILE TRACKING SHEET

SDG: ARS1-11-00256

Task	Date / Time	Initials
Date & Time Samples Received	02-09-11/09:58	CWB
ICOC Initiated / Storage Location: <u>Q6</u>	02-09-11/11:56	CWB
Technical Checks Performed	<i>See Batch</i>	_____
Report Written / EDD Generated: <u>3-18-11/1120</u>	Date/Time Initials	
	<i>3-18-11/1115</i>	<i>SDH</i>
Quality Assurance Checks Performed on Report	<i>3-18-11</i>	<i>THM</i>
Management Check Performed on Report	<i>1347</i>	_____
<i>Preliminary Report Sent</i>		
Report E-mailed		
Report Faxed		
Report Reviewed		
Report Mailed		
Invoice Completed Invoice #: _____		
Report Imaged		

SPECIAL REQUIREMENTS

Requirement	Yes	No
3 Hour Rush	<input type="checkbox"/>	<input checked="" type="checkbox"/>
24 Hour Rush	<input type="checkbox"/>	<input checked="" type="checkbox"/>
48 Hour Rush	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Special Invoicing ^{<i>see notes</i>} Mgmt. Approval: _____	<input type="checkbox"/>	<input checked="" type="checkbox"/>

NOTES:

COMPANY NAME: Los Alamos National Lab

SDG: ARSMI-00256

External and Internal Surveys

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 11
- Matrix [AF , AQ , BI , FE , LT , (SI) , SO , UR , VG]

Exposure Rate Meter: <u>M3 242861</u>	Serial No.: <u>M44-2 PR264266</u>	Calibration Due Date: <u>4-9-11</u>
Count Rate Meter: <u>M2 154859</u>	Serial No.: <u>M44-9 PR184559</u>	Calibration Due Date: <u>4-6-11</u>
Background Exposure Rate ($\mu\text{R/hr}$): <u>22</u>	Max. Exposure Rate on Shipping Containers Externals (Plus Bkgd): <u>13</u> $\mu\text{R/hr}$	
Background Count Rate (cpm): <u>60</u>	Max. Removable Count Rate on Shipping Containers Externals (Plus Bkgd): <u>30</u> cpm	
	Max. Removable Count Rate on Shipping Containers Internals (Plus Bkgd): <u>30</u> cpm	

pH \leq 2 is Acceptable	Acceptance Limits	
	$< 500 \mu\text{R/hr}$	$< 100 \text{cpm/cm}^2$

Sample Label/Comments/Notes	pH \leq 2 is Acceptable		Mark if Preserve	Acid Lot #	Weight(g) / Volume(ml)	Acceptance Limits	
	pH Orig	pH Final				$\mu\text{R/hr}$	cpm
M021-11-4742	<div style="font-size: 4em; transform: rotate(-45deg); opacity: 0.5;"> Capped 2-9-11 </div>				1 sample	13	30
↓ - 4740					↓	12	30
↓ - 4746					↓	12	30
↓ - 4747					↓	13	35
↓ - 4741					↓	12	25
↓ - 4738					↓	12	30
↓ - 4748					↓	12	25
↓ - 4739					↓	13	35
↓ - 4743					↓	12	30
↓ - 4745					↓	12	30
↓ - 4744					↓	12	30

Surveyors' Name: [Signature]

Date/Time Surveyed: 2-9-11/10:42