

The order of this data package is as follows:

1. Chain-of-Custody/Lab Request
2. Copies of field COCs
3. Validation Report
4. Laboratory analysis

Comments:

American Radiation

Baton Rouge LA

Chain of Custody/Analysis Request

COC/Lab Request #:

2017-2042

Page 1 of 1

Client Contact:

Lab Agreement #:

Site Name:

Los Alamos National Laboratory

Project Number:

Analysis Turnaround Time:

24 Hour - ☐ Other - ☐7 Days - ☐14 Days - ☐21 Days - ☐28 Days - ☒

Rad Screening Info:

Yes, Below
Background

Lab Reporting Limit Type:

Sample Quantitation
Limit

Field Sample ID

Sample
DateSample
TimeSample
Matrix

WSP-LL-H-3

CAPA-17-139143

Jul 14 2017

12:06

W

1

CAMO-17-139132

Jul 13 2017

13:38

W

1

CAMO-17-139133

Jul 17 2017

11:28

W

1

CAPA-17-139144

Jul 18 2017

10:44

W

1

CAPA-17-139145

Jul 17 2017

13:05

W

1

CAPA-17-139146

Jul 17 2017

13:14

W

1

CAPA-17-139147

Jul 14 2017

12:13

W

1

CAPA-17-141868

Jul 14 2017

09:15

W

1

CAMO-17-139134

Jul 13 2017

12:09

W

1

CAPA-17-139150

Jul 18 2017

10:40

W

1

Special Instructions:

Relinquished by:

Print Name:

Date/Time:

Received by:

Print Name:

Date/Time:

Relinquished by:

Print Name:

Date/Time:

Received by:

Print Name:

Date/Time:

Relinquished by:

Print Name:

Date/Time:

Received by:

Print Name:

Date/Time:

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11313

EVENT NAME: Pajarito (TA-54) MY2017 Q4

SAMPLE ID: CAMO-17-139132

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	7/13/2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1338		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-37 S2		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	REG	
TOP DEPTH:	↓	↓	SAMPLE USAGE:	INV	↓
BOTTOM DEPTH:	↓	↓	EXCAVATED:		YES / <u>NO</u> / NA

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-8260B-VOA	40 ML SEPTUM AMBER GLASS	2	HCL	Y	NA
↓	WSP-LL-H-3	1 LITER POLY	1	NONE	↓	↓

SAMPLE COMMENTS: Sampled 30 ft from running diesel generator

LOCATION COMMENTS: None

FIELD PARAMETERS:

Sample Time	1338	HH:MM	Dissolved Oxygen	6.47	Flow (in gpm)	10.34
Oxidation-Reduction Potential	156.9		pH	8.26	Specific Conductance	134.7
Temperature	22.0		Turbidity	1.82		

COLLECTED BY (PRINT): D. Jaramillo & T. Vander Vis

RELINQUISHED BY (Printed Name) Tanya Vander Vis (Signature) Tanya Vander Vis	Date/Time 7/13/17 2:35	RECEIVED BY (Printed Name) M. Matz (Signature) M. Matz	Date/Time 7/13/17 2:35
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 07/06/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11313

EVENT NAME: Pajarito (TA-54) MY2017 Q4

SAMPLE ID: CAMO-17-139133

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	7/17/17	ok	FIELD MATRIX:	WG	ok
TIME COLLECTED (HH:MM):	1128		MEDIA:	UA	
PRS ID:	OK		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-38		FIELD PREP:	UF	
LOCATION TYPE:	OK		FIELD QC TYPE:	REG	
TOP DEPTH:	↓		SAMPLE USAGE:	INV	↓
BOTTOM DEPTH:	↓	↓	EXCAVATED:		YES / NO / <u>NA</u>

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-8260B-VOA	40 ML SEPTUM AMBER GLASS	2	HCL	Y	NA
↓	WSP-LL-H-3	1 LITER POLY	1	NONE	↓	↓

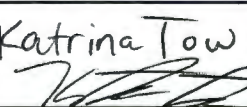
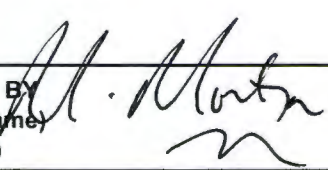
SAMPLE COMMENTS: Slight breeze while sampling

LOCATION COMMENTS: None

FIELD PARAMETERS:

Sample Time	1128	HH:MM	Dissolved Oxygen	6.48	Flow (in gpm)	2.81
Oxidation-Reduction Potential	134.0		pH	7.12	Specific Conductance	133.5
Temperature	19.2		Turbidity	0.2		

COLLECTED BY (PRINT): K. Tow

RELINQUISHED BY (Printed Name) (Signature)	Katrina Tow 	Date/Time 7/17/17 1345	RECEIVED BY (Printed Name) (Signature)	 M. Montoya	Date/Time 7/17/17 1345
RELINQUISHED BY (Printed Name) (Signature)		Date/Time	RECEIVED BY (Printed Name) (Signature)		Date/Time

Report Date: 07/06/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11313

EVENT NAME: Pajarito (TA-54) MY2017 Q4

SAMPLE ID: CAMO-17-139134

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	7/13/2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1209		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-55 S1		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	REG	
TOP DEPTH:	↓		SAMPLE USAGE:	INV	↓
BOTTOM DEPTH:	↓	↓	EXCAVATED:		YES / <u>(NO)</u> / NA

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-8260B-VOA	40 ML SEPTUM AMBER GLASS	2	HCL	Y	NA
↓	WSP-LL-H-3	1 LITER POLY	1	NONE	↓	↓

SAMPLE COMMENTS: sampled 30 ft from running diesel generator

LOCATION COMMENTS: None

FIELD PARAMETERS:

Sample Time	1209	HH:MM	Dissolved Oxygen	6.47	6.31	Flow (in gpm)	10.34	2.94
Oxidation-Reduction Potential	156.9	185.6	pH	8.26	8.16	Specific Conductance	134.7	174.5
Temperature	22.9		Turbidity	1.82	0.21			

COLLECTED BY (PRINT): D. Jaramillo + T. Vander Vis

RELINQUISHED BY (Printed Name) Tanya Vander Vis (Signature) <i>Tanya Vander Vis</i>	Date/Time 7/13/17 2:30	RECEIVED BY (Printed Name) <i>M. Martin</i> (Signature) <i>M. Martin</i>	Date/Time 7/13/17 2:30
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 07/06/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11313

EVENT NAME: Pajarito (TA-54) MY2017 Q4

SAMPLE ID: CAPA-17-139143

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	07/14/2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1206		MEDIA:	UA	
PRS ID:	OK		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-32 S1		FIELD PREP:	UF	
LOCATION TYPE:	OK		FIELD QC TYPE:	REG	
TOP DEPTH:			SAMPLE USAGE:	INV	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / NA

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
MA	WSP-8260B-VOA	40 ML SEPTUM AMBER GLASS	2	HCL	Y	MA
↓	WSP-LL-H-3	1 LITER POLY	1	NONE	↓	

SAMPLE COMMENTS: Sampled Soft. from running diesel generator

LOCATION COMMENTS: Breezy while sampling

FIELD PARAMETERS:

Sample Time	1206	HH:MM	Dissolved Oxygen	4.44	Flow (in gpm)	2.38
Oxidation-Reduction Potential	69.1		pH	6.89	Specific Conductance	165.2
Temperature	19.5		Turbidity	1.1		

COLLECTED BY (PRINT): K. Tow

RELINQUISHED BY (Printed Name) (Signature)	Katrina Tow <i>[Signature]</i>	Date/Time 07/14/2017 1250	RECEIVED BY (Printed Name) (Signature)	K. Green <i>[Signature]</i>	Date/Time 7/14/17 12:58
RELINQUISHED BY (Printed Name) (Signature)		Date/Time	RECEIVED BY (Printed Name) (Signature)		Date/Time

Report Date: 07/06/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11313

EVENT NAME: Pajarito (TA-54) MY2017 Q4

SAMPLE ID: CAPA-17-139144

WORK ORDER:

AS
PLANNED

AS COLLECTED

AS
PLANNED

AS COLLECTED

Date Collected

(MM/DD/YYYY):

07/18/17

OK

FIELD MATRIX:

WG

OK

TIME COLLECTED
(HH:MM):

1044

0944 TV
7/18/17

MEDIA:

UA

PRS ID:

NA

SAMPLE TECH
CODE:

GSP

LOCATION ID:

R-39

FIELD PREP:

UF

LOCATION TYPE:

NA

FIELD QC TYPE:

REG

TOP DEPTH:

SAMPLE USAGE:

INV

BOTTOM DEPTH:

EXCAVATED:

YES / NO / NA

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-8260B-VOA	40 ML SEPTUM AMBER GLASS	2	HCL	Y	NA
↓	WSP-LL-H-3	1 LITER POLY	1	NONE	↓	↓

SAMPLE COMMENTS:

None sampled soft from running diesel generator.
TV 7/18/17

LOCATION COMMENTS:

none

FIELD PARAMETERS:

Sample Time	1044	HH:MM	Dissolved Oxygen	5.74 mg/l	Flow (in gpm)	2.23 gpm
Oxidation-Reduction Potential	146.7 mV		pH	6.26 STU	Specific Conductance	139.4 μ S/cm
Temperature	20.5°C		Turbidity	1.42 NTU		

COLLECTED BY (PRINT): D. Jaramillo

RELINQUISHED BY (Printed Name) Daniel Jaramillo (Signature)	Date/Time 7/18/17 11:30	RECEIVED BY (Printed Name) S. Sherwood (Signature)	Date/Time 7/18/17 11:30
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 07/06/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11313

EVENT NAME: Pajarito (TA-54) MY2017 Q4

SAMPLE ID: CAPA-17-139145

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	7/17/17	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1305		MEDIA:	UA	
PRS ID:	OK		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-41 S2		FIELD PREP:	UF	
LOCATION TYPE:	OK		FIELD QC TYPE:	REG	
TOP DEPTH:	↓		SAMPLE USAGE:	INV	↓
BOTTOM DEPTH:	↓	↓	EXCAVATED:		YES / NO / <u>NA</u>

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-8260B- VOA	40 ML SEPTUM AMBER GLASS	2	HCL	Y	NA
↓	WSP-LL-H-3	1 LITER POLY	1	NONE	↓	↓

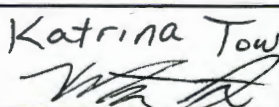
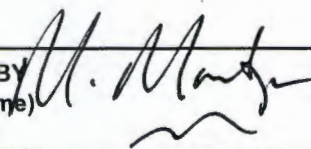
SAMPLE COMMENTS: Windy while sampling

LOCATION COMMENTS: None

FIELD PARAMETERS:

Sample Time	1305	HH:MM	Dissolved Oxygen	6.11	Flow (in gpm)	2.86
Oxidation-Reduction Potential	122.4		pH	8.36	Specific Conductance	159.4
Temperature	22.6		Turbidity	1.2		

COLLECTED BY (PRINT): K. Tow

RELINQUISHED BY (Printed Name) (Signature)	Katrina Tow 	Date/Time 7/17/17 1345	RECEIVED BY (Printed Name) (Signature)	 U. Mandy	Date/Time 7/17/17 1345
RELINQUISHED BY (Printed Name) (Signature)		Date/Time	RECEIVED BY (Printed Name) (Signature)		Date/Time

Report Date: 07/06/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11313

EVENT NAME: Pajarito (TA-54) MY2017 Q4

SAMPLE ID: CAPA-17-139146

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	07/17/2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1314		MEDIA:	UA	
PRS ID:	OK		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-49 S1		FIELD PREP:	UF	
LOCATION TYPE:	OK		FIELD QC TYPE:	REG	
TOP DEPTH:			SAMPLE USAGE:	INV	
BOTTOM DEPTH:			EXCAVATED:		YES / <u>NO</u> / NA

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-8260B-VOA	40 ML SEPTUM AMBER GLASS	2	HCL	Y	NA
↓	WSP-LL-H-3	1 LITER POLY	1	NONE	↓	↓

SAMPLE COMMENTS: Sampled 50 ft. from running diesel generator

LOCATION COMMENTS: Breezy while sampling

FIELD PARAMETERS:

Sample Time	1314	HH:MM	Dissolved Oxygen	3.77	Flow (in gpm)	1.52
Oxidation-Reduction Potential	161.0		pH	7.83	Specific Conductance	150.9
Temperature	22.9		Turbidity	9.17		

COLLECTED BY (PRINT): M. Shardo

RELINQUISHED BY (Printed Name) <i>Maurice Shardo</i> (Signature) <i>[Signature]</i>	Date/Time 07/17/2017 1350	RECEIVED BY (Printed Name) <i>M. Shardo</i> (Signature) <i>[Signature]</i>	Date/Time 07/17/2017 1358
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 07/06/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11313

EVENT NAME: Pajarito (TA-54) MY2017 Q4

SAMPLE ID: CAPA-17-139147

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	07/14/2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	12:13		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-51 S1		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	REG	
TOP DEPTH:			SAMPLE USAGE:	INV	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / (NA)

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-8260B-VOA	40 ML SEPTUM AMBER GLASS	2	HCL	Y	NA
↓	WSP-LL-H-3	1 LITER POLY	1	NONE	↓	↓

SAMPLE COMMENTS:

gusty wind while sampling
sampled 50 ft from generator

LOCATION COMMENTS:

None

FIELD PARAMETERS:

Sample Time	12:13	HH:MM	Dissolved Oxygen	7.45 mg/L	Flow (in gpm)	3.75
Oxidation-Reduction Potential	248.2 mV		pH	7.86 su	Specific Conductance	117.9 $\mu S/cm$
Temperature	21.1 °C		Turbidity	1.09 NTU		

COLLECTED BY (PRINT): D. Hughes

RELINQUISHED BY (Printed Name) (Signature)	Date/Time 07/14/2017 13:30	RECEIVED BY (Printed Name) (Signature)	Date/Time 7/14/17 13:30
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 07/06/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11313

EVENT NAME: Pajarito (TA-54) MY2017 Q4

SAMPLE ID: CAPA-17-139150

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	07/18/2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	1040		MEDIA:	UA	
PRS ID:	OK		SAMPLE TECH CODE:	GSP	
LOCATION ID:	R-56 S1		FIELD PREP:	UF	
LOCATION TYPE:	OK		FIELD QC TYPE:	REG	
TOP DEPTH:			SAMPLE USAGE:	INV	
BOTTOM DEPTH:			EXCAVATED:		YES / <u>NO</u> / NA

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-8260B- VOA	40 ML SEPTUM AMBER GLASS	2	HCL	Y	NA
↓	WSP-LL-H-3	1 LITER POLY	1	NONE	↓	↓

SAMPLE COMMENTS: Sampled 50 ft. from running diesel generator

LOCATION COMMENTS: Breezy white sampling

FIELD PARAMETERS:

Sample Time	1040	HH:MM	Dissolved Oxygen	6.60	Flow (in gpm)	4.17
Oxidation-Reduction Potential	182.6		pH	8.09	Specific Conductance	149.6
Temperature	21.7		Turbidity	0.59		

COLLECTED BY (PRINT): A. Stanfield

RELINQUISHED BY (Printed Name) (Signature)	Date/Time 07/18/2017 1150	RECEIVED BY (Printed Name) (Signature)	Date/Time 7/18/17 1150
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 07/06/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11313

EVENT NAME: Pajarito (TA-54) MY2017 Q4

SAMPLE ID: CAPA-17-141868

WORK ORDER:

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
Date Collected (MM/DD/YYYY):	07-14-2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	09:15 09:40 DJH 07/17		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	PC	
LOCATION ID:	R-51 S1		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	PEB	
TOP DEPTH:			SAMPLE USAGE:	QC	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / <u>NA</u>

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	WSP-8260B-VOA	40 ML SEPTUM AMBER GLASS	2	HCL	Y	NA
	WSP-8270C-SVOA	1 LITER AMBER GLASS	2	ICE		
	WSP-8321A-NMED HEXMOD	1 LITER AMBER GLASS	2 2 11/14/17	ICE		
	WSP-All Metals	1 LITER POLY	1	HNO3 ICE		
	WSP-CN(T)	250 ML POLY	1	NAOH		
	WSP-GENINORG+PerChlorate	1 LITER POLY	1	ICE		
	WSP-LL-H-3	1 LITER POLY	1	NONE		
	WSP-NH3+NO3/NO2	500 ML AMBER GLASS	1	H2SO4		
X	WSP-TKN+TOC	500 ML AMBER GLASS	1	H2SO4	X	

SAMPLE COMMENTS:

None
LOCATION COMMENTS:None
FIELD PARAMETERS:

Sample Time _____ HH:MM _____ Dissolved Oxygen DAI _____ Flow (in gpm) _____
 Oxidation-Reduction Potential _____ pH 07/14/17 _____ Specific Conductance _____

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY**EVENT ID:** 11313**EVENT NAME:** Pajarito (TA-54) MY2017 Q4**SAMPLE ID:** CAPA-17-141868**WORK ORDER:**

Temperature

Turbidity

COLLECTED BY (PRINT):T. Vander Vliet, D. Hughes
07-14-17**RELINQUISHED BY**

(Printed Name)

(Signature)

Damon Hughes
CH**Date/Time**

07-14-2017

13:30

RECEIVED BY

(Printed Name)

(Signature)

J. Sheppard
J. Sheppard**Date/Time**

7/14/17

13:30

RELINQUISHED BY

(Printed Name)

(Signature)

Date/Time**RECEIVED BY**

(Printed Name)

(Signature)

Date/Time

Report Date: 07/06/2017

DATA VALIDATION REPORT

Chain Of Custody No. 2017-2042

1. Distribution Of Samples In EDD.

SDG	Analytical Method	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks
ARS1-17-02200	Generic:Low_Level_Tritium	2				
ARS1-17-02200	Generic:Low_Level_Tritium	2				
ARS1-17-02200	Generic:Low_Level_Tritium	3				
ARS1-17-02200	Generic:Low_Level_Tritium	2				

SDG	Analytical Method	Analysis Lot ID	Prep Lot ID	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks	Method Blanks	Matrix Spikes	Matrix Spike Dups	Analytical Spikes	Post-Digestion Spikes	Lab Control Samples	Lab Control Sample Dups	Blank Spike	Blank Spike Dups	Lab Duplicates	Storage Blanks	Preparation Blanks	Reagent Blanks
ARS1-17-02200	Generic:Low_Level_Tritium	ARS1-B17-	ARS1-B17-	9					1					1	1						

2. Distribution Of Analytes In EDD.

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
Generic:Low_Level_Tritium	RAD	CAMO-17-139132	ARS1-B17-01664-06	REG	1	0	0	0
Generic:Low_Level_Tritium	RAD	CAMO-17-139133	ARS1-B17-01664-07	REG	1	0	0	0
Generic:Low_Level_Tritium	RAD	CAMO-17-139134	ARS1-B17-01664-13	REG	1	0	0	0
Generic:Low_Level_Tritium	RAD	CAPA-17-139143	ARS1-B17-01664-05	REG	1	0	0	0
Generic:Low_Level_Tritium	RAD	CAPA-17-139144	ARS1-B17-01664-08	REG	1	0	0	0
Generic:Low_Level_Tritium	RAD	CAPA-17-139145	ARS1-B17-01664-09	REG	1	0	0	0
Generic:Low_Level_Tritium	RAD	CAPA-17-139146	ARS1-B17-01664-10	REG	1	0	0	0
Generic:Low_Level_Tritium	RAD	CAPA-17-139147	ARS1-B17-01664-11	REG	1	0	0	0
Generic:Low_Level_Tritium	RAD	CAPA-17-139150	ARS1-B17-01664-14	REG	1	0	0	0
Generic:Low_Level_Tritium	RAD	CAPA-17-141868	ARS1-B17-01664-12	PEB	1	0	0	0
Generic:Low_Level_Tritium	RAD	LCS	ARS1-B17-01664-01	LCS	0	0	1	0
Generic:Low_Level_Tritium	RAD	LCSD	ARS1-B17-01664-02	LCSD	0	0	1	0
Generic:Low_Level_Tritium	RAD	MB	ARS1-B17-01664-03	MB	1	0	0	0

3. Are any analytes missing?

No.

DATA VALIDATION REPORT

4. Were any holding times exceeded?

No.

5. Any contaminants in blanks?

No.

6. Any surrogate recoveries outside the control limits?

No.

7. Any MS/MSD recoveries or RPDs outside the control limits?

No.

8. Any LCS/LCSD or BS/BSD recoveries or RPDs outside the control limits?

LCS Lab Sample	LCSD Lab	Analytical Method	Parameter Name	Lab Lot ID	Analysis	Sample Matrix	LCS Spike Recovery	LCSD Spike Recovery	Upper Limit	Lower Limit	Upper Rejection Limit	Lower Rejection Limit	RPD	RPD Limit
ARS1-B17-01664-01	ARS1-B17-01664-02	Generic:Low_Level_Tritium	Tritium	ARS1-B17-01664	09-14-2017	W	79.000	91.000	120.00	80.000		10	16.274	

9. Any Field Duplicate RPDs outside the desired limits?

No.

10. Any Lab Duplicate RPDs outside the desired limits?

DATA VALIDATION REPORT

No.

11. Any required reporting limits exceeded?

No.

12. Additional Validator's Comments.

13. Display Flagged Data.

Location ID	COC Number	Field Sample ID	Sample Purpose	Analysis Type Code	Analytical Suite	Analytical Method	Parameter Name	Lab Qualifier	Validation Qualifier	Validation Reason Codes	Detect Flag	Lab Result	Lab Units	Report Result	Report Units	Report MDA	Report Uncertainty	Lab Matrix	Sample Date	Percent	Analysis Lot ID	Validation Status Code	Use Flag
R-37 S2	2017-2042	CAMO-17-139132	REG	INIT	RAD	Generic:Low_Level_Tritium	Tritium	U	U	R5	N	-0.972	pCi/L	-0.972	pCi/L	2.798	0.821	W	07/13/2017		ARS1-B17-01664	VAL	Y
R-38	2017-2042	CAMO-17-139133	REG	INIT	RAD	Generic:Low_Level_Tritium	Tritium	U	U	R5	N	-2.463	pCi/L	-2.463	pCi/L	3.039	0.928	W	07/17/2017		ARS1-B17-01664	VAL	Y
R-55 S1	2017-2042	CAMO-17-139134	REG	INIT	RAD	Generic:Low_Level_Tritium	Tritium	U	U	R5	N	-0.256	pCi/L	-0.256	pCi/L	2.604	0.765	W	07/13/2017		ARS1-B17-01664	VAL	Y
R-32 S1	2017-2042	CAPA-17-139143	REG	INIT	RAD	Generic:Low_Level_Tritium	Tritium	U	U	R5	N	-0.891	pCi/L	-0.891	pCi/L	2.886	0.846	W	07/14/2017		ARS1-B17-01664	VAL	Y
R-39	2017-2042	CAPA-17-139144	REG	INIT	RAD	Generic:Low_Level_Tritium	Tritium	U	U	R5	N	-1.957	pCi/L	-1.957	pCi/L	3.282	0.978	W	07/18/2017		ARS1-B17-01664	VAL	Y
R-41 S2	2017-2042	CAPA-17-139145	REG	INIT	RAD	Generic:Low_Level_Tritium	Tritium	U	U	R5	N	-0.203	pCi/L	-0.203	pCi/L	2.514	0.739	W	07/17/2017		ARS1-B17-01664	VAL	Y
R-49 S1	2017-2042	CAPA-17-139146	REG	INIT	RAD	Generic:Low_Level_Tritium	Tritium	U	U	R5	N	-0.295	pCi/L	-0.295	pCi/L	2.801	0.823	W	07/17/2017		ARS1-B17-01664	VAL	Y
R-51 S1	2017-2042	CAPA-17-139147	REG	INIT	RAD	Generic:Low_Level_Tritium	Tritium	U	U	R5	N	-1.763	pCi/L	-1.763	pCi/L	3.064	0.911	W	07/14/2017		ARS1-B17-01664	VAL	Y
R-56 S1	2017-2042	CAPA-17-139150	REG	INIT	RAD	Generic:Low_Level_Tritium	Tritium	U	U	R5	N	0.990	pCi/L	0.990	pCi/L	2.497	0.769	W	07/18/2017		ARS1-B17-01664	VAL	Y
R-51 S1	2017-2042	CAPA-17-141868	PEB	INIT	RAD	Generic:Low_Level_Tritium	Tritium	U	U	R5	N	0.348	pCi/L	0.348	pCi/L	2.837	0.845	W	07/14/2017		ARS1-B17-01664	VAL	Y

Reason Code

Description

R5 Analyte is not detected because the amount reported is less than the MDC.

14. Usable Result Count.

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAMO-17-139132	R-37 S2	REG	Generic:Low_Level_Tritium	0	1
CAMO-17-139133	R-38	REG	Generic:Low_Level_Tritium	0	1
CAMO-17-139134	R-55 S1	REG	Generic:Low_Level_Tritium	0	1
CAPA-17-139143	R-32 S1	REG	Generic:Low_Level_Tritium	0	1

DATA VALIDATION REPORT

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAPA-17-139144	R-39	REG	Generic:Low_Level_Tritium	0	1
CAPA-17-139145	R-41 S2	REG	Generic:Low_Level_Tritium	0	1
CAPA-17-139146	R-49 S1	REG	Generic:Low_Level_Tritium	0	1
CAPA-17-139147	R-51 S1	REG	Generic:Low_Level_Tritium	0	1
CAPA-17-139150	R-56 S1	REG	Generic:Low_Level_Tritium	0	1
CAPA-17-141868	R-51 S1	PEB	Generic:Low_Level_Tritium	0	1



ARS International, LLC

Laboratory Analysis Report

ARS1-17-02200

Prepared for:

Los Alamos National Laboratory

**Nita Patel
P.O. Box 1663
MS M992
Los Alamos, NM 87545**

**npatel@lanl.gov
sherwoods@lanl.gov**

**Phone: 505-665-9273
Fax: 505-665-9972**

Project Manager Review

Management Review

Notes: ARS International, LLC assumes no liability for the use or the 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.

Contact Person: Questions regarding this analytical report should be addressed to:

**Project Manager
ProjectManagers@amrad.com**

**Phone: 225.381.2991
Fax: 225.381.2996**





September 20, 2017

Nita Patel
Sherri Sherwood
Los Alamos National Laboratory
505-665-9273
npatel@lanl.gov

ARS SDG: **ARS1-17-02200**
Request #: **2017-2042**
Charge Code: **ADEP**

Dear Nita Patel,

On July 24, 2017, ARS International received ten (10) samples to be analyzed for Enriched H-3.

The samples were processed and counted using the appropriate equipment and techniques for these types of analyses. Results of all the analyses 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. Exceptions are detailed in the "Analytical Results" section of the narrative.

If you have any questions, please do not hesitate to call at 255.381.2991 or email ProjectManagers@amrad.com.

Sincerely,

Susan Leese
Project Management
ARS International



**PROJECT SAMPLE IDENTIFICATION
CROSS-REFERENCE
TO ARS SAMPLE LABORATORY IDs**

Client Sample ID NUMBER	American Radiation Services SAMPLE ID NUMBER(S)
CAPA-17-139143	ARS1-17-02200-001
CAMO-17-139132	ARS1-17-02200-002
CAMO-17-139133	ARS1-17-02200-003
CAPA-17-139144	ARS1-17-02200-004
CAPA-17-139145	ARS1-17-02200-005
CAPA-17-139146	ARS1-17-02200-006
CAPA-17-139147	ARS1-17-02200-007
CAPA-17-141868	ARS1-17-02200-008
CAMO-17-139134	ARS1-17-02200-009
CAPA-17-139150	ARS1-17-02200-010

SAMPLE RECEIPT/PREP

The samples arrived in good condition. The samples were screened for radioactive contamination as per procedure ARS-062 "Sample Receiving". Turnaround time was set at 40 calendar days.

ANALYTICAL METHODS

Screening analysis was performed using ARS-054, "Tritium in Water (EPA 906.0)".

The Enriched H-3 analysis was performed using ARS-040, "Tritium Assay in Water Samples Using Electrolytic Enrichment".

ANALYTICAL RESULTS

MDC for Fraction -004 was marginally elevated at 3.282 pCi/L.
All other QC criteria were met.

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."



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

Signature

Laboratory Management, ARS International

Title

9-21-17

Date



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

ARS Sample Delivery Group: ARS1-17-02200

Client Sample ID: CAPA-17-139143

Sample Collection Date: 07/14/17

Sample Matrix: Aqueous

Percent Solids: N/A

Request or PO Number: 2017-2042

ARS Sample ID: ARS1-17-02200-001

Date Received: 07/24/17

Report Date: 09/18/17

Radiochemistry

Analysis Description	Analysis Results	CSU +/-1s	MDC	DLC	CRDL	Qual	Analysis Units	Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
Enriched H-3	-0.891	0.846	2.886	1.401	3.221	U	pCi/L	ARS-040/	09/15/17 8:00	bsteffens	N/A

Project Manager Review

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ARS Sample Delivery Group: ARS1-17-02200

Client Sample ID: CAMO-17-139132

Sample Collection Date: 07/13/17

Sample Matrix: Aqueous

Percent Solids: N/A

Request or PO Number: 2017-2042

ARS Sample ID: ARS1-17-02200-002

Date Received: 07/24/17

Report Date: 09/18/17

Radiochemistry

Analysis Description	Analysis Results	CSU +/-1s	MDC	DLC	CRDL	Qual	Analysis Units	Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
Enriched H-3	-0.972	0.821	2.798	1.358	3.221	U	pCi/L	ARS-040/	09/15/17 13:41	bsteffens	N/A

Project Manager Review

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ARS Sample Delivery Group: ARS1-17-02200

Client Sample ID: CAMO-17-139133

Sample Collection Date: 07/17/17

Sample Matrix: Aqueous

Percent Solids: N/A

Request or PO Number: 2017-2042

ARS Sample ID: ARS1-17-02200-003

Date Received: 07/24/17

Report Date: 09/18/17

Radiochemistry

Analysis Description	Analysis Results	CSU +/-1s	MDC	DLC	CRDL	Qual	Analysis Units	Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
Enriched H-3	-2.463	0.928	3.039	1.476	3.221	U	pCi/L	ARS-040/	09/15/17 19:23	bsteffens	N/A

Project Manager Review

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ARS Sample Delivery Group: ARS1-17-02200

Client Sample ID: CAPA-17-139144

Sample Collection Date: 07/18/17

Sample Matrix: Aqueous

Percent Solids: N/A

Request or PO Number: 2017-2042

ARS Sample ID: ARS1-17-02200-004

Date Received: 07/24/17

Report Date: 09/18/17

Radiochemistry

Analysis Description	Analysis Results	CSU +/-1s	MDC	DLC	CRDL	Qual	Analysis Units	Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
Enriched H-3	-1.957	0.978	3.282	1.594	3.221	U	pCi/L	ARS-040/	09/16/17 1:04	bsteffens	N/A

Project Manager Review

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ARS Sample Delivery Group: ARS1-17-02200

Client Sample ID: CAPA-17-139145

Sample Collection Date: 07/17/17

Sample Matrix: Aqueous

Percent Solids: N/A

Request or PO Number: 2017-2042

ARS Sample ID: ARS1-17-02200-005

Date Received: 07/24/17

Report Date: 09/18/17

Radiochemistry

Analysis Description	Analysis Results	CSU +/-1s	MDC	DLC	CRDL	Qual	Analysis Units	Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
Enriched H-3	-0.203	0.739	2.514	1.221	3.221	U	pCi/L	ARS-040/	09/16/17 6:46	bsteffens	N/A

Project Manager Review

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ARS Sample Delivery Group: ARS1-17-02200

Client Sample ID: CAPA-17-139146

Sample Collection Date: 07/17/17

Sample Matrix: Aqueous

Percent Solids: N/A

Request or PO Number: 2017-2042

ARS Sample ID: ARS1-17-02200-006

Date Received: 07/24/17

Report Date: 09/18/17

Radiochemistry

Analysis Description	Analysis Results	CSU +/-1s	MDC	DLC	CRDL	Qual	Analysis Units	Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
Enriched H-3	-0.295	0.823	2.801	1.360	3.221	U	pCi/L	ARS-040/	09/16/17 12:28	bsteffens	N/A

Project Manager Review

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

ARS Sample Delivery Group: ARS1-17-02200

Client Sample ID: CAPA-17-139147

Sample Collection Date: 07/14/17

Sample Matrix: Aqueous

Percent Solids: N/A

Request or PO Number: 2017-2042

ARS Sample ID: ARS1-17-02200-007

Date Received: 07/24/17

Report Date: 09/18/17

Radiochemistry

Analysis Description	Analysis Results	CSU +/-1s	MDC	DLC	CRDL	Qual	Analysis Units	Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
Enriched H-3	-1.763	0.911	3.064	1.488	3.221	U	pCi/L	ARS-040/	09/16/17 18:10	bsteffens	N/A

Project Manager Review

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

ARS Sample Delivery Group: ARS1-17-02200

Client Sample ID: CAPA-17-141868

Sample Collection Date: 07/14/17

Sample Matrix: Aqueous

Percent Solids: N/A

Request or PO Number: 2017-2042

ARS Sample ID: ARS1-17-02200-008

Date Received: 07/24/17

Report Date: 09/18/17

Radiochemistry

Analysis Description	Analysis Results	CSU +/-1s	MDC	DLC	CRDL	Qual	Analysis Units	Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
Enriched H-3	0.348	0.845	2.837	1.377	3.221	U	pCi/L	ARS-040/	09/16/17 23:51	bsteffens	N/A

Project Manager Review

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

ARS Sample Delivery Group: ARS1-17-02200

Client Sample ID: CAMO-17-139134

Sample Collection Date: 07/13/17

Sample Matrix: Aqueous

Percent Solids: N/A

Request or PO Number: 2017-2042

ARS Sample ID: ARS1-17-02200-009

Date Received: 07/24/17

Report Date: 09/18/17

Radiochemistry

Analysis Description	Analysis Results	CSU +/-1s	MDC	DLC	CRDL	Qual	Analysis Units	Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
Enriched H-3	-0.256	0.765	2.604	1.265	3.221	U	pCi/L	ARS-040/	09/17/17 5:33	bsteffens	N/A

Project Manager Review

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

ARS Sample Delivery Group: ARS1-17-02200

Client Sample ID: CAPA-17-139150

Sample Collection Date: 07/18/17

Sample Matrix: Aqueous

Percent Solids: N/A

Request or PO Number: 2017-2042

ARS Sample ID: ARS1-17-02200-010

Date Received: 07/24/17

Report Date: 09/18/17

Radiochemistry

Analysis Description	Analysis Results	CSU +/-1s	MDC	DLC	CRDL	Qual	Analysis Units	Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
Enriched H-3	0.990	0.769	2.497	1.213	3.221	U	pCi/L	ARS-040/	09/17/17 11:15	bsteffens	N/A

Project Manager Review

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QC Results per Analytical Batch

Analytical Batch	ARS1-B17-01664
SDG	ARS1-17-02200
Analysis	Low Level Tritium by Electrolytic Enrichment
Analysis Test Method	ARS-040/
Analysis Code	LSC-A-022
Report Units	pCi/L

Acceptable QC Performance Ranges

QC Sample Type	Performance Items and Ranges		
Laboratory Control Sample	Recovery (%):	> 80	< 120
Matrix Spike	Recovery (%):	> 60	< 140
Duplicate	Replicate Error Ratio (RER):	< 1	
	Duplicate Error Ratio (DER):	< 3	
	Relative Percent Difference (RPD %):	≤ 25	

Laboratory Control Sample			Analysis Date	09/17/17 16:56	Analysis Technician		
Analysis Batch Sample ID	QC Type	Analyte	Results	CSU (1s)	Expected Value	LCS Rec (%)	MDC
ARS1-B17-01664-02	LCSD	ENRICHED H-3	30.571	4.735	33.338	91.7	2.548

Duplicate RER/DER/RPD			Analysis Date	09/17/17 16:56	Analysis Technician		
Analyte	Results LCS	CSU LCS (1s)	Results LCSD	CSU LCSD (1s)	RER	DER	RPD
ENRICHED H-3	25.970	4.065	30.571	4.735	0.523	0.737	16.3

Method Blank			Analysis Date	09/14/17 20:37	Analysis Technician		
Analysis Batch Sample ID	QC Type	Analyte	Results	CSU (1s)	MDC	Qual	
ARS1-B17-01664-03	MBL	ENRICHED H-3	-2.465	0.870	2.822	U	

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 client.

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Notes (Case Narrative):

Comments:

- 1.0) All MDA/MDC values are calculated on a sample specific basis.
- 2.0) Soil and Sludge analysis are reported on a wet basis or an as received basis unless otherwise indicated.
- 3.0) Data in this report are within the limits of uncertainty specified in the reference method unless otherwise specified.
- 4.0) Modified analysis procedures are procedures that are modified to meet the certain specifications. An example may be the use of a water method to analyze a solid matrix due to the lack of an officially recognized procedure for the analysis of the solid matrix. Modified analyses are indicated by the subsequent addition of "m" to the procedure number (i.e. 900.0M).
- 5.0) Total activity is actually total gamma activity and is determined utilizing the prominent gamma emitters from the naturally occurring radioactive decay chains and other prominent radioactive nuclides. Total activity may be lower than the actual total activity due to the extent of secular equilibrium achieved in the various decay chains at the time of analysis. The total activity is not representative of nuclides that emit solely alpha or beta particles.
- 6.0) Ra-228 is determined via secular equilibrium with its daughter, Actinium 228 (Gamma Spectroscopy only).
- 7.0) U-238 is determined via secular equilibrium with its daughter, Thorium 234 (Gamma Spectroscopy only).
- 8.0) All gamma spectroscopy was performed utilizing high purity germanium detectors (HPGe).
- 9.0) ARS makes every attempt to match sample density to calibrated density; however, in some cases, it is not practical or possible to do so and data results may be affected (Gamma Spectroscopy only).
- 10.0) Gamma spectroscopy results are calculated values based on the ORTEC® GammaVision ENV32 Analysis Engine.
- 11.0) ACLASS DOD and ISO 17025 certification applies only to the following analytes and methods: Gross Alpha and Gross Beta (EPA 900, SM7110B&C, SW846 9310); Radium 226 (EPA 903, EPA 903.1, SM 7500 Ra-B, SW846 9315); Radium 228 (EPA 904, SM 7500 Ra-B SW846 9320); Iodine-131(EPA 901.1); Uranium by ICPMS (EPA 200.8); Strontium 89/90 (EPA 905, Eichrom SRW01, HASL 300 Sr-03-RC); Tritium (EPA 906, EPA 906M); Gamma Emitters (EPA 901.1, SM7120B, HASL 300 Ga-01-R); Americium-241, Curium 242/244, Plutonium 239/240 and 241, Thorium 228/230/232, Uranium 234/233 and 238 (Eichrom ACW03 VBS); Lead 210 (HASL 300 Pb-01-RC, Eichrom OTW01); Polonium 210 (HASL 300 Po-01-RC, HASL 300 Po-02-RC); Technetium-99 (Eichrom TCW02, Eichrom TCS01M).

Method References:

- 1.0) EPA 600/4-80-032; Prescribed Procedures for the Measurements of Radioactivity in Drinking Water, August 1980.
- 2.0) Standard Methods for the Examination of Water and Wastewater (On-Line Edition)
- 3.0) EPA SW-846; Test Methods for Evaluating Solid Waste, (On-Line edition)
- 4.0) EPA 600/4/79-020; Methods for Chemical Analysis of Water and Waste, March 1983.
- 5.0) HASL 300; The Procedures Manual of the Environmental Measurements Laboratory, Volume I, 28th Edition February, 1997.

Definitions:

CRDL	Contract Required Detection Limit
CSU	Combined Standard Uncertainty
DLC	Decision Level Concentration (ANSI N42.23) or critical level
DO	Duplicate Original
DUP	Method Duplicate
LCS/LCSD	Laboratory Control Sample/Laboratory Control Sample Duplicate
MDA	Minimum Detectable Activity
MDC	(Minimum Detectable Concentration) minimum concentration of the analyte that ARS can detect utilizing the specific analysis
MBL	Method Blank
MS/MSD	Matrix Spike/Matrix Spike Duplicate
N/A	Not Applicable
NP	Not Provided
NR	Not Referenced
LOD	Limit of Detection
LOQ	Limit of Quantitation

Data Qualifiers:

B	The analyte is found in both the associated method blank and the sample. This flag indicates probable blank contamination.
D	Sample analysis accomplished through dilution.
J	The reported result is an estimated value above the limit of detection but outside of quantitation range (e.g., matrix interference was observed).
Q	One or more quality control criteria failed (e.g., LCS recovery, surrogate spike recovery, or CCV recovery).
U	Activity is below the MDC, MDA, MDL, or LOD
N	The analyte is a tentatively identified compound using mass spectrometry or any non-customer requested compounds that are tentatively identified.
*	LCS/LCSD or MS/MSD fails RPD criteria.
S	Spike
SC	Subcontracted out to another qualified laboratory
H	Holding time exceeded

LELAP Cert# 01949

NELAP Cert# E87558

ARS-059-010
Revision: 9.1
Revision Date: 03-14-2017

[illegible]