



2609 North River Road, Port Allen, Louisiana 70767

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

## American Radiation Services, Inc.

### Laboratory Analysis Preliminary Report

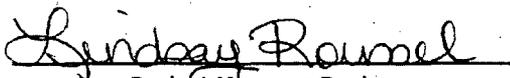
ARS1-08-01562

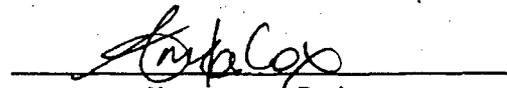
*Prepared for:*

### Nuclear Regulatory Commission (NRC)

James Noggle  
USNRC Region 1  
475 Allendale Road  
King of Prussia, PA 19406  
James.Noggle@nrc.gov

Phone: 610.337.5063

  
Project Manager Review

  
Management 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.

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

Project Manager:

ProjectManagers@amrad.com

Phone: 225.381.2991  
Fax: 225.381.2996

LELAP Cert# 30658

NELAP Cert# E87558



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August 22, 2008

Nuclear Regulatory Commission  
James Noggle  
475 Allendale Road  
King of Prussia, PA 19406

Client Sample: LAF-002-(009)  
ARS SGD: ARS1-08-01562-001

Dear Mr. Noggle,

On August 12, 2008, American Radiation Services (ARS) received 1 Ground Water Samples to be analyzed for Gamma Spectroscopy, Tritium, Strontium-90, and Nickel-63.

The samples 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 samples and QA/QC's were counted with a count time sufficient to meet a statistical sound detection limits.

Counting equipment Quality Assurance was within acceptance criteria when the above referenced samples were processed.

If you have any questions please do not hesitate to call at 225-381-2991.

Sincerely,

A handwritten signature in black ink, appearing to be 'A. Steyer', is written over the typed name.

Quality Assurance Officer  
American Radiation Services



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### COVER PAGE

Statement of Work for Analytical Laboratories

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

CLIENT SAMPLE	American Radiation Services SAMPLE ID NUMBER(S)
LAF-002-(009)	ARS1-08-01562-001

### SAMPLE RECEIPT

The samples were received in good condition. The samples were screened for radioactive contamination as per procedure ARS-062 "Sample Receiving".

### ANALYTICAL METHODS

The Gamma Spectroscopy determinations were performed using American Radiation Services procedure ARS-007/EPA 901.1, "Gamma Emitting Radionuclides in Water." The tritium analyses were performed using American Radiation Services procedure ARS-054, "Tritium In Water".

### ANALYTICAL RESULTS

The result data that are flagged with "U" indicates that the activity is below the MDC.



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**American Radiation Services Project Manager/Laboratory Manager's Comments:**

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

*"I certify that this electronic image, and all hardcopies produced from this image, accurately represents the data and is in compliance with the 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

Quality Assurance Officer, American Radiation Services  
Title

8-22-08  
Date



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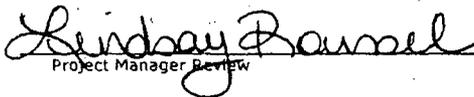
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ARS Sample Delivery Group: ARS1-08-01562  
Client Sample ID: LAF-002-(009)04-10/1048  
Sample Collection Date: 04/10/08 10:48  
Sample Matrix: Aqueous

Request or PO Number: N/A  
ARS Sample ID: ARS1-08-01562-001  
Date Received: 8/12/2008  
Report Date: 08/22/08 08:27

Analysis Description	Analysis Results	Analysis Error +/- 2 s	MDC	DLC	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Tracer/Chem Recovery
MN-54	-0.945	1.622	2.230	1.115	pCi/L	ARS-007/EPA 901.1	8/19/08 16:11	JLA	N/A
FE-59	-1.358	1.338	4.470	2.235	pCi/L	ARS-007/EPA 901.1	8/19/08 16:11	JLA	N/A
CO-58	-0.531	2.534	2.250	1.125	pCi/L	ARS-007/EPA 901.1	8/19/08 16:11	JLA	N/A
CO-60	-1.406	2.454	2.790	1.395	pCi/L	ARS-007/EPA 901.1	8/19/08 16:11	JLA	N/A
ZN-65	-1.583	1.580	5.280	2.640	pCi/L	ARS-007/EPA 901.1	8/19/08 16:11	JLA	N/A
ZR-95	0.829	1.001	3.370	1.685	pCi/L	ARS-007/EPA 901.1	8/19/08 16:11	JLA	N/A
NB-95	-0.093	0.526	1.800	0.900	pCi/L	ARS-007/EPA 901.1	8/19/08 16:11	JLA	N/A
CS-134	-20.159	706.380	25.100	12.550	pCi/L	ARS-007/EPA 901.1	8/19/08 16:11	JLA	N/A
CS-137	-0.084	0.698	2.370	1.185	pCi/L	ARS-007/EPA 901.1	8/19/08 16:11	JLA	N/A
BA-140	-4.426	27.062	7.990	3.995	pCi/L	ARS-007/EPA 901.1	8/19/08 16:11	JLA	N/A
LA-140	-1.536	3.584	3.170	1.585	pCi/L	ARS-007/EPA 901.1	8/19/08 16:11	JLA	N/A
SR-90	0.248	0.083	0.253	0.121	pCi/L	ARS-032/Eichrom SRW-01	8/21/08 14:48	BJS	108.00%

NOTES: Preliminary Report / Shipment# 08-152 / NRC-03-08-072

  
Project Manager Review

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## QC Results Report

Sample Delivery Group: ARS1-08-01562

Date Received: 08/12/08

### Laboratory Control Sample Evaluation

Analysis Batch	QC Type	Analyte	Analysis Results	CSU 1 (1 s)	MDC	Expected Value	Qual	Report Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	Percent Recovery (%)	LCS Acceptance Range
ARS1-B08-02213	LCS	Sr-90	15.91	1.2	0.295	20.80		pCi/L	ARS-032/EPA 905.0	8/21/08 14:48	BJS	77	75%-125%

### Blank Evaluation

Analysis Batch	QC Type	Analyte	Analysis Results	CSU 1 (1 s)	MDC	Expected Value	Qual	Report Units	Analysis Test Method	Analysis Date/Time	Analysis Technician
ARS1-B08-02213	MBL	Sr-90	-0.099	0.083	0.253	NA	U	pCi/L	ARS-032/EPA 905.0	8/21/08 14:48	BJS

### RER Duplicate Evaluation

Analysis Batch	QC Type	Analysis Description	Result 1	CSU 1 (1 s)	Result 2	CSU 2 (1s)	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	RER	RER Acceptance Range
ARS1-B08-02213	LCS	Sr-90	15.91	1.2	13.13	1.0		pCi/L	ARS-032/EPA 905.0	8/21/08 14:48	BJS	1.24	< 1

### DER Duplicate Evaluation

Analysis Batch	QC Type	Analysis Description	Result 1	CSU 1 (1 s)	Result 2	CSU 2 (1s)	Qual	Analysis Units	Analysis Test Method	Analysis Date/Time	Analysis Technician	DER	DER Acceptance Range
ARS1-B08-02213	LCS	Sr-90	15.91	1.2	13.1	1.0		pCi/L	ARS-032/EPA 905.0	8/21/08 14:48	BJS	3.49	< 3

*Lindsay Parnell*  
Project Manager Review

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## QC Results Report

Sample Delivery Group: ARS1-08-01562

Date Received: 08/12/08

### Laboratory Control Sample Evaluation

Analysis Batch	QC Type	Analyte	Analysis Results	CSU 1 (1 s)	MDC	Expected Value	Qual	Report Units	Analysis Test Method	Analysis Date	Analysis Technician	Percent Recovery (%)	LCS Acceptance Range
ARS1-B08-02204	LCS	CO-60	24779.00	495.75	200.80	25315.22		pCi/g	EPA 901.1	08/18/08	JLA	98	75%-125%
ARS1-B08-02204	LCS	CS-137	15083.00	359.87	137.80	15285.98		pCi/g	EPA 901.1	08/18/08	JLA	99	75%-125%
ARS1-B08-02204	LCS	AM-241	34007.00	1235.00	277.10	34794.33		pCi/g	EPA 901.1	08/18/08	JLA	98	75%-125%

### Blank Evaluation

Analysis Batch	QC Type	Analyte	Analysis Results	CSU 1 (1 s)	MDC	Expected Value	Qual	Report Units	Analysis Test Method	Analysis Date	Analysis Technician
ARS1-B08-02204	MBL	CO-60	-0.001	0.005	0.005	NA	U	pCi/g	EPA 901.1	08/18/08	JLA
ARS1-B08-02204	MBL	CS-137	-0.001	0.001	0.004	NA	U	pCi/g	EPA 901.1	08/18/08	JLA
ARS1-B08-02204	MBL	AM-241	-0.001	0.014	0.006	NA	U	pCi/g	EPA 901.1	08/18/08	JLA

### RER Duplicate Evaluation

Analysis Batch	QC Type	Analysis Description	Result 1	CSU 1 (1 s)	Result 2	CSU 2 (1s)	Qual	Analysis Units	Analysis Test Method	Analysis Date	Analysis Technician	RER	RER Acceptance Range
ARS1-B08-02204	LCS	CO-60	24779.00	495.75	25129.00	492.32		pCi/g	EPA 901.1	08/18/08	JLA	0.35	< 1
ARS1-B08-02204	LCS	CS-137	15083.00	359.87	15425.00	341.69		pCi/g	EPA 901.1	08/18/08	JLA	0.49	< 1
ARS1-B08-02204	LCS	AM-241	34007.00	1235.00	34050.00	1247.60		pCi/g	EPA 901.1	08/18/08	JLA	0.02	< 1

### DER Duplicate Evaluation

Analysis Batch	QC Type	Analysis Description	Result 1	CSU 1 (1 s)	Result 2	CSU 2 (1s)	Qual	Analysis Units	Analysis Test Method	Analysis Date	Analysis Technician	DER	DER Acceptance Range
ARS1-B08-02204	LCS	CO-60	24779.00	495.75	25129.00	492.32		pCi/g	EPA 901.1	08/18/08	JLA	1.00	< 3
ARS1-B08-02204	LCS	CS-137	15083.00	359.87	15425.00	341.69		pCi/g	EPA 901.1	08/18/08	JLA	1.38	< 3
ARS1-B08-02204	LCS	AM-241	34007.00	1235.00	34050.00	1247.60		pCi/g	EPA 901.1	08/18/08	JLA	0.05	< 3

*Sunday Ransel*  
Quality Assurance Review

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## Notes:

### Comments:

- 1.0) Soil and Sludge analysis are reported on a wet basis or an as received basis unless otherwise indicated.
- 2.0) The data in this report are within the limits of uncertainty specified in the reference method unless specified.
- 3.0) 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.
- 4.0) Derived Air Concentrations and Effluent Release Concentrations are obtained from 10 CFR 20 Appendix B.
- 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.

### 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 Examination of Water and Waste Water, 18<sup>th</sup>, 1992.
- 3.0) EPA SW-846, Test Methods for Evaluating Solid Waste, Third Edition, (9/86). (Updated through 1995).
- 4.0) EPA 600/4/79-020, Methods for Chemical Analysis of Water and Waste, March 1983.
- 5.0) HASL 300

### Definitions:

- |       |                 |  |
|-------|-----------------|--|
| 1.0)  | BDL             | Analyte not detected because the value was below the detection limit.                  |
| 2.0)  | ND              | Not detected above the detection limit.  |
| 3.0)  | Detection Limit | The minimum amount of the analyte that ARS can detect utilizing the specific analysis. |
| 4.0)  | B               | Method Blank   |
| 5.0)  | D               | Method Duplicate   |
| 6.0)  | MS              | Matrix Spike   |
| 7.0)  | S               | Spike  |
| 8.0)  | RS              | Reference Spike  |
| 9.0)  | *SC             | Subcontracted out to another qualified laboratory                                      |
| 10.0) | NR              | Not Referenced   |
| 11.0) | N/A             | Not Applicable   |
| 12.0) | *               | Reported as a calculated value   |
| 13.0) | **              | False Positive due to interference from <u>Bi-214</u>                                  |

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SHIPMENT # 08-152

NRC FORM 303 (4-2004)				U.S. NUCLEAR REGULATORY COMMISSION				LABORATORY USE ONLY					
REQUEST FOR ANALYSIS AND CHAIN OF CUSTODY								CONTROL NUMBER					
								LABORATORY: _____					
SAMPLE LOCATION (LICENSEE) INDIAN POINT ENERGY CENTER								LICENSEE NUMBER		DOCKET NO.			
SAMPLE SUBMITTED								DATE SAMPLES SUBMITTED		PRIORITY <input type="checkbox"/> ROUTINE <input type="checkbox"/> URGENT			
# TOTAL	TYPE	VOLUME	WEIGHT	SAMPLE COLLECTION INTERVAL				START		MONTH	DAY	YEAR	TIME
1	GROUND WATER	2000 ML	~ 2 Kg							STOP			
INSPECTOR RESPONSIBLE Jim Noggle (USNRC)								TELEPHONE NUMBER (610) 337-5063					
ANALYSIS TO BE PERFORMED				LIST DESIRED LLD (Optional)		OTHER TYPE OF ANALYSIS (Specify)				LIST DESIRED LLD (Optional)			
<input type="checkbox"/> GROSS ALPHA (GA)						<input checked="" type="checkbox"/> STRONTIUM-90 (Sr90)							
<input type="checkbox"/> GROSS BETA (GB)						<input checked="" type="checkbox"/> NICKEL-63 (Ni63)							
<input checked="" type="checkbox"/> GAMMA SPEC (GS)						<input type="checkbox"/>							
<input checked="" type="checkbox"/> TRITIUM (H3)						<input type="checkbox"/>							
<input type="checkbox"/> CARBON-14 (C14)						<input type="checkbox"/>							
<input type="checkbox"/> IODINE-125 (I125)						<input type="checkbox"/>							
RELENGISHED BY	RECEIVED BY	DATE	TIME	REASON FOR CHANGE OF CUSTODY									
Paul Goodell	Jim Noggle	4/10/08	10 52 am	Sample receipt									
J. Hoff	Donahue	04/10/08	1052	Sample storage; awaiting shipping									
Donahue	SECURE STORAGE	4/20/08	1205	Sample Storage									
STORAGE	W. Setz	8-7-2008	1100	PREP FOR SHIPMENT									
W. Setz	FED/EX	8-7-2008	1600	SHIPMENT									
		8-12-08	09:56										
FEE RECOVERABLE <input type="checkbox"/> NO <input checked="" type="checkbox"/> YES				TAC NUMBER _____									
REMARKS:  Inspection Report: 1007005													
NOTE: SAMPLES WILL BE DISCARDED AFTER ANALYSIS UNLESS REASON ARE NOTED IN REMARKS ABOVE.													

