



ANALYTICAL SUMMARY REPORT

OST - 002

August 03, 2015

Defenders of the Black Hills
PO Box 2003
Rapid City, SD 57709

Work Order: G15070220

Project Name: PSMSD & CCHPSD

Energy Laboratories Inc. Gillette WY received the following 2 samples for Defenders of the Black Hills on 7/9/2015 for analysis.

Lab ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
G15070220-001	PSMSD	07/07/15 15:37	07/09/15	Drinking Water	Metals, Drinking Water Metals Digestion by EPA 200.2 Gross Alpha, Gross Beta Gross Gamma Radium 226 + Radium 228 Radium 226, Total Radium 228, Total
G15070220-002	CCHPSD	07/07/15 16:15	07/09/15	Drinking Water	Same As Above

The analyses presented in this report were performed by Energy Laboratories, Inc., 400 W. Boxelder Rd., Gillette, WY 82718, unless otherwise noted.

As appropriate, any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

The results as reported relate only to the item(s) submitted for testing.

If you have any questions regarding these tests results, please call.

Report Approved By:


Project Manager

Digitally signed by
Tracey Archer
Date: 2015.08.03 11:11:52 -06:00



CLIENT: Defenders of the Black Hills
Project: PSMSD & CCHPSD
Work Order: G15070220

Report Date: 08/03/15

CASE NARRATIVE

Tests associated with analyst identified as ELI-CA were subcontracted to Energy Laboratories, 2393 Salt Creek Hwy., Casper, WY, EPA Number WY00002 and WY00937.

COMBINED RA226+RA228 CALCULATION

The result for the combined Ra226/228 calculation is performed by adding the Ra226 activity to the Ra228 activity. If one or both of these activities is negative or less than the 40CFR_DL, one half the 40CFR_DL is substituted for the respective value below the 40CFR_DL. This may produce a value for the combined radium activities larger than the sum of the two original activities. This method of calculating the sum of the activities for these two radionuclides is in accordance with the guidance in 40CFR141.26(a)(4).

Note:

There was not enough sample to analyze the Uranium Isotopes. The Defenders of the Black Hills re-collected for the Isotopes on 07/29/2015 and the results will be reported as soon as possible.
Tracey L. Archer



LABORATORY ANALYTICAL REPORT

Prepared by Gillette, WY Branch

Client: Defenders of the Black Hills
Project: PSMSD & CCHPSD
Lab ID: G15070220-001
Client Sample ID: PSMSD

Report Date: 08/03/15
Collection Date: 07/07/15 15:37
Date Received: 07/09/15
Matrix: Drinking Water

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - TOTAL							
Gross Alpha	14.3	pCi/L			15	E900.0	07/21/15 00:42 / eli-ca
Gross Alpha precision (±)	2.7	pCi/L				E900.0	07/21/15 00:42 / eli-ca
Gross Alpha MDC	0.9	pCi/L				E900.0	07/21/15 00:42 / eli-ca
Gross Beta	12.7	pCi/L			50	E900.0	07/21/15 00:42 / eli-ca
Gross Beta precision (±)	2.2	pCi/L				E900.0	07/21/15 00:42 / eli-ca
Gross Beta MDC	1.6	pCi/L				E900.0	07/21/15 00:42 / eli-ca
Radium 226	0.08	pCi/L			5	E903.0	07/28/15 15:45 / eli-ca
Radium 226 precision (±)	0.08	pCi/L				E903.0	07/28/15 15:45 / eli-ca
Radium 226 MDC	0.08	pCi/L				E903.0	07/28/15 15:45 / eli-ca
Radium 228	0.4	pCi/L	U		5	RA-05	07/28/15 10:34 / eli-ca
Radium 228 precision (±)	0.6	pCi/L				RA-05	07/28/15 10:34 / eli-ca
Radium 228 MDC	0.6	pCi/L				RA-05	07/28/15 10:34 / eli-ca
Radium 226 + Radium 228	0.4	pCi/L	U		5	A7500-RA	07/29/15 16:39 / eli-ca
Radium 226 + Radium 228 precision (±)	0.6	pCi/L				A7500-RA	07/29/15 16:39 / eli-ca
Radium 226 + Radium 228 MDC	0.6	pCi/L				A7500-RA	07/29/15 16:39 / eli-ca
Uranium	25	ug/L		1	30	E200.8	07/22/15 23:39 / eli-ca
Uranium, Activity	16.7	pCi/L		0.7	20	E200.8	07/22/15 23:39 / eli-ca
- See case narrative regarding combined Ra226+Ra228 calculation.							
RADIONUCLIDES - GAMMA							
Thorium 234	-0.0900	pCi/L	U			E901.1	07/23/15 07:40 / eli-ca
Thorium 234 precision (±)	0.0700	pCi/L				E901.1	07/23/15 07:40 / eli-ca
Thorium 234 MDC	0.280	pCi/L				E901.1	07/23/15 07:40 / eli-ca
Gross Gamma	-0.0600	pCi/L	U			E901.1	07/23/15 07:40 / eli-ca
Gross Gamma precision (±)	0.120	pCi/L				E901.1	07/23/15 07:40 / eli-ca
Gross Gamma MDC	0.360	pCi/L				E901.1	07/23/15 07:40 / eli-ca

Report Definitions:
 RL - Analyte reporting limit.
 QCL - Quality control limit.
 MDC - Minimum detectable concentration

MCL - Maximum contaminant level.
 ND - Not detected at the reporting limit.
 U - Not detected at minimum detectable concentration



LABORATORY ANALYTICAL REPORT

Prepared by Gillette, WY Branch

Client: Defenders of the Black Hills
Project: PSMSD & CCHPSD
Lab ID: G15070220-002
Client Sample ID: CCHPSD

Report Date: 08/03/15
Collection Date: 07/07/15 16:15
Date Received: 07/09/15
Matrix: Drinking Water

Analyses	Result	Units	Qualifiers	RL	MCL/ QCL	Method	Analysis Date / By
RADIONUCLIDES - TOTAL							
Gross Alpha	10.5	pCi/L			15	E900.0	07/21/15 00:42 / eli-ca
Gross Alpha precision (±)	2.3	pCi/L				E900.0	07/21/15 00:42 / eli-ca
Gross Alpha MDC	1.0	pCi/L				E900.0	07/21/15 00:42 / eli-ca
Gross Beta	7.8	pCi/L			50	E900.0	07/21/15 00:42 / eli-ca
Gross Beta precision (±)	1.8	pCi/L				E900.0	07/21/15 00:42 / eli-ca
Gross Beta MDC	1.5	pCi/L				E900.0	07/21/15 00:42 / eli-ca
Radium 226	0.09	pCi/L			5	E903.0	07/28/15 15:45 / eli-ca
Radium 226 precision (±)	0.07	pCi/L				E903.0	07/28/15 15:45 / eli-ca
Radium 226 MDC	0.07	pCi/L				E903.0	07/28/15 15:45 / eli-ca
Radium 228	0.06	pCi/L	U		5	RA-05	07/28/15 10:34 / eli-ca
Radium 228 precision (±)	0.5	pCi/L				RA-05	07/28/15 10:34 / eli-ca
Radium 228 MDC	0.5	pCi/L				RA-05	07/28/15 10:34 / eli-ca
Radium 226 + Radium 228	0.4	pCi/L	U		5	A7500-RA	07/29/15 16:39 / eli-ca
Radium 226 + Radium 228 precision (±)	0.5	pCi/L				A7500-RA	07/29/15 16:39 / eli-ca
Radium 226 + Radium 228 MDC	0.5	pCi/L				A7500-RA	07/29/15 16:39 / eli-ca
Uranium	0.014	mg/L		0.001	0.03	E200.8	07/22/15 23:55 / eli-ca
Uranium, Activity	9.5	pCi/L		0.7	20	E200.8	07/22/15 23:55 / eli-ca
- See case narrative regarding combined Ra226+Ra228 calculation.							
RADIONUCLIDES - GAMMA							
Thorium 234	-0.140	pCi/L	U			E901.1	07/23/15 07:40 / eli-ca
Thorium 234 precision (±)	0.120	pCi/L				E901.1	07/23/15 07:40 / eli-ca
Thorium 234 MDC	0.280	pCi/L				E901.1	07/23/15 07:40 / eli-ca
Gross Gamma	-0.120	pCi/L	U			E901.1	07/23/15 07:40 / eli-ca
Gross Gamma precision (±)	0.140	pCi/L				E901.1	07/23/15 07:40 / eli-ca
Gross Gamma MDC	0.360	pCi/L				E901.1	07/23/15 07:40 / eli-ca

Report Definitions:
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QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Defenders of the Black Hills
Project: PSMDS & CCHPSD

Report Date: 08/03/15
Work Order: G15070220

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E900.0							Batch: GrDW-0723		
Lab ID: Th230-GrDW-0723	Laboratory Control Sample				Run: TENNELEC-3_150716A		07/21/15 00:41		
Gross Alpha	110	pCi/L		105	80	120			
Lab ID: Sr90-GrDW-0723	Laboratory Control Sample				Run: TENNELEC-3_150716A		07/21/15 00:41		
Gross Beta	190	pCi/L		97	80	120			
Lab ID: MB-GrDW-0723	Method Blank				Run: TENNELEC-3_150716A		07/21/15 00:41		
Gross Alpha	1	pCi/L							
Gross Alpha precision (±)	0.8	pCi/L							
Gross Alpha MDC	0.6	pCi/L							
Gross Beta	-0.4	pCi/L							U
Gross Beta precision (±)	1	pCi/L							
Gross Beta MDC	1	pCi/L							
Lab ID: G15070220-001ADUP	Sample Duplicate				Run: TENNELEC-3_150716A		07/21/15 00:42		
Gross Alpha	14	pCi/L					1.0	20	
Gross Alpha precision (±)	2.7	pCi/L							
Gross Alpha MDC	0.92	pCi/L							
Gross Beta	14	pCi/L					13	20	
Gross Beta precision (±)	2.3	pCi/L							
Gross Beta MDC	1.6	pCi/L							
Lab ID: G15070220-002AMS	Sample Matrix Spike				Run: TENNELEC-3_150716A		07/21/15 00:42		
Gross Alpha	95	pCi/L		85	70	130			
Lab ID: G15070220-002AMS	Sample Matrix Spike				Run: TENNELEC-3_150716A		07/21/15 00:41		
Gross Beta	230	pCi/L		114	70	130			

Qualifiers:

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MDC - Minimum detectable concentration

ND - Not detected at the reporting limit.
U - Not detected at minimum detectable concentration



QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Defenders of the Black Hills
Project: PSMDS & CCHPSD

Report Date: 08/03/15
Work Order: G15070220

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E901.1							Batch: R201903		
Lab ID: MB-R201903	Method Blank		Run: GAM-HPGE_150723A			07/23/15 07:40			
Thorium 234	-0.2	pCi/L							U
Thorium 234 precision (±)	0.1	pCi/L							
Thorium 234 MDC	0.3	pCi/L							
Gross Gamma	-0.1	pCi/L							U
Gross Gamma precision (±)	0.2	pCi/L							
Gross Gamma MDC	0.3	pCi/L							
Lab ID: LCS-R201903	Laboratory Control Sample		Run: GAM-HPGE_150723A			07/23/15 07:40			
Cadmium 109	430	pCi/L	142		90	110			S
Cesium 137	380	pCi/L	99		90	110			
Cobalt 60	270	pCi/L	90		90	110			
- LCS response is outside of the acceptance range for Cd109.									
Lab ID: G15070220-002ADUP	Sample Duplicate		Run: GAM-HPGE_150723A			07/23/15 07:40			
Thorium 234	-0.16	pCi/L					13	20	U
Thorium 234 precision (±)	0.14	pCi/L							
Thorium 234 MDC	0.28	pCi/L							
Gross Gamma	-0.11	pCi/L					8.7	20	U
Gross Gamma precision (±)	0.18	pCi/L							
Gross Gamma MDC	0.35	pCi/L							

Qualifiers:

RL - Analyte reporting limit.

MDC - Minimum detectable concentration

U - Not detected at minimum detectable concentration

ND - Not detected at the reporting limit.

S - Spike recovery outside of advisory limits.



QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Defenders of the Black Hills
Project: PSMDS & CCHPSD

Report Date: 08/03/15
Work Order: G15070220

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E903.0							Batch: RA226DW-0338		
Lab ID: LCS-RA226DW-0338 Radium 226	Laboratory Control Sample 9.5	pCi/L		91	90	110			07/28/15 15:45
Lab ID: MB-RA226DW-0338 Radium 226	Method Blank 0.07	pCi/L							07/28/15 15:45 U
Radium 226 precision (±)	0.08	pCi/L							
Radium 226 MDC	0.07	pCi/L							
Lab ID: C15070147-001AMS Radium 226	Sample Matrix Spike 18	pCi/L		87	80	120			07/28/15 15:45
Lab ID: C15070147-001AMSD Radium 226	Sample Matrix Spike Duplicate 18	pCi/L		85	80	120	2.9	20	07/28/15 15:45
Lab ID: C15070593-001BMS Radium 226	Sample Matrix Spike 15	pCi/L		74	80	120			07/28/15 15:45 S
The Matrix Spike (MS) for the batch with these samples is outside of prescribed acceptance limits. This may indicate a possible low bias for this sample due to matrix effect									
Lab ID: C15070593-001BMDS Radium 226	Sample Matrix Spike Duplicate 18	pCi/L		85	80	120	13	20	07/28/15 15:45

Qualifiers:

RL - Analyte reporting limit.

MDC - Minimum detectable concentration

U - Not detected at minimum detectable concentration

ND - Not detected at the reporting limit.

S - Spike recovery outside of advisory limits.



QA/QC Summary Report

Prepared by Casper, WY Branch

Client: Defenders of the Black Hills
Project: PSMDS & CCHPSD

Report Date: 08/03/15
Work Order: G15070220

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: RA-05							Batch: RA228DW-0325		
Lab ID: LCS-228-RA228DW-0325	Laboratory Control Sample				Run: TENNELEC-3_150714D		07/28/15 10:34		
Radium 228	6.4	pCi/L	101		80	120			
Lab ID: MB-228-RA228DW-0325	Method Blank				Run: TENNELEC-3_150714D		07/28/15 10:34		
Radium 228	0.2	pCi/L							U
Radium 228 precision (±)	0.4	pCi/L							
Radium 228 MDC	0.5	pCi/L							
Lab ID: C15070405-001BMS	Sample Matrix Spike				Run: TENNELEC-3_150714D		07/28/15 10:34		
Radium 228	10.0	pCi/L	82		70	130			
Lab ID: C15070405-001BMSD	Sample Matrix Spike Duplicate				Run: TENNELEC-3_150714D		07/28/15 10:34		
Radium 228	13	pCi/L	104		70	130	24	20	R

The RPD for the MS/MSD pair is outside the control limits indicating a possible low precision for the batch. The individual spike recoveries are acceptable, the MB is acceptable, and the LCS is acceptable. Sample non-homogeneity or matrix effects may be responsible for the MS/MSD performance. All other QC parameters for the batch and the instrument are in control therefore the batch is approved.

Qualifiers:

RL - Analyte reporting limit.

MDC - Minimum detectable concentration

U - Not detected at minimum detectable concentration

ND - Not detected at the reporting limit.

R - RPD exceeds advisory limit.



Work Order Receipt Checklist

Defenders of the Black Hills

G15070220

Login completed by: Misty Voegele

Date Received: 7/9/2015

Reviewed by: BL2000\kscottruff

Received by: mav

Reviewed Date: 7/10/2015

Carrier name: UPS

- Shipping container/cooler in good condition? Yes No Not Present
- Custody seals intact on all shipping container(s)/cooler(s)? Yes No Not Present
- Custody seals intact on all sample bottles? Yes No Not Present
- Chain of custody present? Yes No
- Chain of custody signed when relinquished and received? Yes No
- Chain of custody agrees with sample labels? Yes No
- Samples in proper container/bottle? Yes No
- Sample containers intact? Yes No
- Sufficient sample volume for indicated test? Yes No
- All samples received within holding time?
(Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.) Yes No
- Temp Blank received in all shipping container(s)/cooler(s)? Yes No Not Applicable
- Container/Temp Blank temperature: 20.2°C No Ice
- Water - VOA vials have zero headspace? Yes No No VOA vials submitted
- Water - pH acceptable upon receipt? Yes No Not Applicable

Standard Reporting Procedures:

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

Contact and Corrective Action Comments:

None

Chain of Custody and Analytical Request Record

Company Name: **Defenders of the Black Hills**

Report Mail Address (Required):
**PO Box 2003
Rapid City SD 57709**

Invoice Address (Required):
**PO Box 2003
Rapid City SD 57709**

Project Name, PWS, Permit, Etc.:
PSMSD & CCHPSD

Contact Name: **Charmaine**
Phone/Fax: **605-342-1626**
Cell: **None**

Sample Origin: **SD**
EPA/State Compliance: Yes No
Sampler: (Please Print)

Special Report/Formats:
 DW
 POT/WW/WTP
 State:
 Other:

Format:
 EDD/EDT (Electronic Data)
 LEVEL IV
 NELAC

Number of Containers
Sample Type: AWS V B O DW
Air Water Soils/Solids
Vegetation Bioassay Other
DW - Drinking Water

ANALYSIS REQUESTED
**Uranium & Isotopes
Radionuclides incl
Thorium**

Standard Turnaround (TAT)
RUSH

Comments:
Contact ELL prior to RUSH sample submittal for charges and scheduling - See Instruction Page

Shipped by: **SPS**
Cooler Id#:
Receipt Temp: **20.8°C**
On Ice: **Y**
Custody Seal: **Y**
On Bottle: **N**
On Cooler: **N**
Intact: **N**
Signature Match: **N**

SAMPLE IDENTIFICATION (Name, Location, Interval, etc.)	Collection Date	Collection Time	MATRIX	ANALYSIS REQUESTED	Standard Turnaround (TAT)	Comments	Signature
1 PSMSD	7/7/15	3:37pm	DW				
2 CCHPSD	7/7/15	4:15 pm	DW				
3							
4							
5							
6							
7							
8							
9							
10							

Relinquished by (print): **White Face** Date/Time: **7/8/15 9:45am**
Signature: **White Face**

Received by (print): **AD** Date/Time: **7/9/15**
Signature: **AD**

MUST be Signed: **White Face** Date/Time: **7/8/15 9:45am** Signature: **White Face**

Sample Disposal: Return to Client: Lab Disposal: **LABORATORY USE ONLY**
Received by Laboratory: **AD** Date/Time: **7/9/15** Signature: **AD**