

Quarterly Report

Calendar Year 2026 – First Quarter, January 1 – March 31, 2026

Prepared by:

**Carlsbad Environmental Monitoring & Research Center
under a financial assistance grant from
U.S. Department of Energy
Carlsbad Field Office (CBFO)
Award No. DE-EM0005195**

Submitted to:

**U.S. Department of Energy
Carlsbad Field Office**

April 2026

Field Programs - Radiation Safety Group

WIPP Underground Effluent Monitoring (Station F)

From January 1st to March 31st, a total of 129 filters were collected from the primary skid at Station F (105 sample filters, 12 trip blanks and 12 filter blanks).

All 129 filters from the primary skid at Station F have been processed (gravimetrics, sample flow volume, and mass concentration have been calculated in the Field Programs (FP) data package) and transferred to the Radiochemistry group (RC).

From January 1st to March 31st, a total of 120 filters were collected from the secondary skid at Station F (96 sample filters, 12 trip blanks and 12 filter blanks).

All 120 filters from the primary skid at Station F have been processed (gravimetrics, sample flow volume, and mass concentration have been calculated in the Field Programs (FP) data package) and transferred to the Environmental Chemistry group (EC).

WIPP Underground Effluent Monitoring (Station G)

From January 1st to March 31st, a total of 112 filters were collected from the primary skid at Station G, (88 sample filters, 12 trip blanks and 12 filter blanks).

All 112 filters from the primary skid at Station G have been processed (gravimetrics, sample flow volume, and mass concentration have been calculated in the Field Programs (FP) data package) and transferred to the Radiochemistry group (RC).

From January 1st to March 31st, a total of 111 filters were collected from the secondary skid at Station G, (87 sample filters, 12 trip blanks and 12 filter blanks).

All 111 filters from the primary skid at Station G have been processed (gravimetrics, sample flow volume, and mass concentration have been calculated in the Field Programs (FP) data package) and transferred to the Environmental Chemistry group (EC).

Ambient Air Sampling

From January 1st to March 31st, 12 ambient air particulate filters were collected from the six perimeter and regional continuous sampling stations (On-Site, Near Field, Cactus Flats, WIPP East, Carlsbad, and Loving) using a high-volume sampler (HiVol). All filters have been processed (gravimetrics, total air flow values, and notes of any irregularities) by FP and transferred to RC.

Subtask - Non-Radiological analyses

From January 1st to March 31st, 4 Whatman-41 filters and 2 trip blank filters were collected, from the 2 sampling sites (Near Field and Cactus Flats) using a high-volume sampler. All filters have been processed (recorded total airflow values and any irregularities) by FP and transferred to EC.

Soils sampling

From January January 1st to March 31st, 54 soil samples were collected and are awaiting processing.

Vegetation sampling

From January 1st to March 31st, 6 samples were processed and transferred to the RC group.

Surface Water Monitoring

No activity to report this quarter.

Drinking Water Monitoring

No activity to report this quarter.

Sediment Monitoring

From January 1st to March 31st, 4 samples were processed and transferred to the RC group.

Groundwater Monitoring

From January 1st to March 31st, 5 samples were collected and transferred to the EC group.

Nuclear Materials Management and Safeguards

From January 1st to March 31st, 2026, the Radiation Safety group (RS) collected and bulked radioactive waste from NMSU and LANL Labs groups working in the CEMRC facility. Radiation Safety (RS) has performed monthly surveys of all laboratories where radioactive materials are present, including smears, and dose rate measurements. All fume hoods are face-velocity checked quarterly and had new belts installed January 14. The date of the last inspection was March 24, 2026. All Hazardous acid waste was removed from CEMRC, LANL laboratories, and was stored for proper waste disposal. Combustible waste barrels were moved and properly stored in secondary storage. Continuous Air Monitoring (CAM) filters in LANL laboratories were changed for clean filters. Hand and foot monitors were calibrated in LANL laboratories. MAPEP and Radiological sources were smeared and relinquished to proper personnel. Floor mats near doors were changed weekly; eye wash stations, and showers were inspected to function properly. The last inspection was conducted on March 24.

Radiochemistry Group

WIPP Underground Effluent Monitoring (Stations F and G)

Gross alpha and beta activities on individual filters collected from station F, taken before any high-efficiency particulate air (HEPA) filtration, and Station G, taken after HEPA filtration, were counted using a low-background gas proportional counter (Protean Instruments) for 1200 minutes (20 hours). The complete results for gross alpha and gross beta counts on FAS filters from both stations through March 2026 were submitted to CBFO on April 14, 2026.

Gamma-radiation-emitting isotope activity concentrations were analyzed in:

- Thirteen surface water samples
- Seven drinking water samples
- Seven groundwater samples
- Six HiVol samples
- Eight FAS samples
- Five soil samples

Actinide activity concentrations were analyzed in:

- Thirteen surface water samples
- Seven drinking water samples
- Five groundwater samples
- Six HiVol samples
- Twenty-two FAS samples
- Twelve soil samples

Characteristic results are included in the following pages.

[PS 0



Sample Description:
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000068591.Cnf
Batch Identification: 2025_FASF_1_Am
Sample Identification: 56588Am
Procedure Description: Am - 3 Days

Detector Name: 3-03
Env. Background: System Bkgd 74114

Sample Size: 6.0100E-01 +/- 0.0000E+00 unit
Sample Date/Time: 3/13/2026 2:16:38 PM
Acquisition Date/Time: 3/13/2026 2:16:38 PM
Acquisition Live Time: 4320.0 minutes
Acquisition Real Time: 4320.0 minutes

Tracer Certificate: 1322_Am-243-4_T
Tracer Quantity: 0.205 mL
Counting Efficiency: 0.3231 +/- 0.0036 on 7/29/2025 11:05:27 AM
Chem. Rec. Factor (%): 45.99 +/- 1.0302

----- PEAK AREA REPORT -----

Nuclide	Energy (MeV)	Net Pk Area	Pk Area Error %	Ambient Backgnd	FWHM (keV)
AM-241	5.476	23.00	43.48	1.00	3.7
AM-243 T	5.250	2827.00	3.76	2.00	46.0

T = Tracer Peak used for Effective Efficiency

----- NUCLIDE ANALYSIS RESULTS -----

Nuclide	Energy (keV)	Activity (Bq /unit)	MDA (Bq /unit)
AM-241	5479.10*	9.943E-04 +/- 4.341E-04	4.015E-04 +/- 1.564E-05
AM-243	5270.00*	1.226E-01 +/- 4.775E-03	5.209E-04 +/- 2.029E-05

 * New Mexico State University *
 * Quality Assurance Report *

Report Date : 12/11/25 2:32:12 PM
 QA File : C:\Genie2k\CAMFILES\New_CalVer3.QAF
 Analyst :
 Sample ID : D3E251211
 Sample Quantity : 1.00
 Sample Date : 8/1/94 12:00:00 PM
 Measurement Date : 12/11/25 2:26:06 PM
 Elapsed Live Time : 360 seconds
 Elapsed Real Time : 363 seconds

Test	Parameter	Low Limit	High Limit	New Value	Flag
LU	121 Pk Energy	1.2078E+02	1.2278E+02	1.2181E+02	< >
LU	779 Pk Energy	7.7789E+02	7.7989E+02	7.7892E+02	< >
LU	1408 Pk Energy	1.4069E+03	1.4089E+03	1.4085E+03	< >
LU	121 FWHM	7.0000E-01	2.1000E+00	1.9358E+00	< >
LU	779 FWHM	1.4000E+00	3.1000E+00	2.5352E+00	< >
LU	1408 FWHM	1.9000E+00	4.5000E+00	2.8935E+00	< >
LU	121 DCA	1.0000E+00	1.2000E+00	1.1384E+00	< >
LU	779 DCA	1.0000E+00	1.2000E+00	1.1054E+00	< >
LU	1408 DCA	1.0000E+00	1.2500E+00	1.0988E+00	< >

Flags Key: LU = Boundary Test (Ab = Above , Be = Below)
 SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)

UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
ES = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: _____

* NOTE: DAILY QUALITY CONTROL SAMPLES (QC) ARE GIVEN A USER DRIVEN *
* N-SIGMA TEST. INVESTIGATE MEANS THE MEASUREMENT IS BETWEEN *
* 10% AND 15% OF THE BASELINE. ACTION MEANS THAT THE MEASUREMENT *
* IS ABOVE 15% OF THE BASELINE. *
* LABORATORY CONTROL SAMPLES ARE GIVEN A BOUNDARY TEST. THE RESULT *
* IS ACCEPTABLE IF IT LIES BETWEEN +/- 25% OF THE TRUE SOURCE *
* ACTIVITY. *

C E M R C G A M M A S P E C T R U M A N A L Y S I S

Sample ID : 25FASF0803
Sample Description : 25FASF0803
 :
Calibration ID :
Background ID :

Sample Collection Date : 8/15/2025 12:00:00 PM
Count Start Date : 12/11/2025 2:33:45 PM

Sample Aliquot : 1.00000E+00
Aliquot Unc. : 0.00000E+00
Aliquot Unit :

Live Time (sec) : 172800
Real Time (sec) : 172814

Energy Calibration Used Done On : 10/1/2024
Efficiency Calibration Used Done On : 11/16/2023
Efficiency ID : DET03_70mlEff_23

%Random Unc. : 0.0
%Systematic Unc. : 0.0

Nuclide	Energy	Eff%	UncEff%	Abun%	UncAbn%	HL(d)	UncHL(d)	Conc(Bq/unit)	Unc2sigma
K-40	1460.81	0.725	0.009	10.6700	0.1100	4.66412E+11	2.92192E+09	-2.74954E-02	1.25452E-01
MN-54	834.82	1.233	0.013	99.9750	0.0000	3.12700E+02	0.00000E+00	2.01362E-02	1.67407E-02
CO-57	122.06	5.229	0.069	85.5100	0.1800	2.70900E+02	6.00000E-01	-1.00088E-02	1.01315E-02
CO-57	136.47	5.087	0.072	10.6000	0.1800	2.70900E+02	6.00000E-01	2.59564E-01	1.01856E-01
CO-60	1173.22	0.896	0.010	100.0000	0.0000	1.92518E+03	3.65240E-01	1.24962E-02	1.30285E-02
CO-60	1332.49	0.794	0.009	100.0000	0.0000	1.92518E+03	3.65240E-01	3.81732E-03	1.28288E-02
ZN-65	1115.52	0.940	0.010	50.7500	0.0000	2.44400E+02	0.00000E+00	-3.19664E-03	3.35477E-02
CS-134	604.69	1.672	0.025	97.6000	0.0000	7.53125E+02	0.00000E+00	-2.02530E-02	2.51181E-02
CS-134	795.84	1.289	0.014	85.4000	0.0000	7.53125E+02	0.00000E+00	-7.45581E-04	1.64373E-02
CS-137	661.65	1.535	0.021	85.1200	0.2300	1.10193E+04	1.09572E+01	5.08878E-02	1.65699E-02
RA-226	186.21	4.451	0.076	3.2800	0.0000	5.84384E+05	1.82620E+02	1.13994E-01	2.31258E-01
RA-228	911.07	1.136	0.011	27.7000	1.0000	2.10013E+03	0.00000E+00	4.67350E-02	5.32180E-02
AM-241	59.54	4.746	0.000	36.3000	0.0000	1.58153E+05	0.00000E+00	-1.79901E-02	1.93242E-02

13 nuclide lines identified

 ***** P E A K A N A L Y S I S R E P O R T *****

Detector Name: DET03
 Sample Title: 25FASF0803
 Peak Analysis Performed on: 12/13/2025 2:34:04 PM

Peak Analysis From Channel: 50
Peak Analysis To Channel: 8190

Peak No.	ROI start	ROI end	Peak centroid	Energy (keV)	FWHM (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
1	238-	252	245.28	59.54	0.24	-5.353E+01	114.98	1.613E+03
2	496-	513	501.75	122.06	0.24	-5.702E+01	115.42	1.479E+03
3	555-	575	560.86	136.47	0.63	1.783E+02	139.73	1.877E+03
4	753-	771	764.90	186.21	0.40	2.875E+01	116.66	1.540E+03
5	2463-	2491	2481.60	604.69	0.33	-5.124E+01	127.09	1.562E+03
6	2707-	2728	2715.26	661.65	0.43	1.141E+02	74.21	5.669E+02
7	3253-	3273	3265.74	795.84	0.24	-1.273E+00	56.11	3.633E+02
8	3418-	3434	3425.65	834.82	0.24	3.293E+01	54.76	3.641E+02
9	3725-	3746	3738.44	911.07	0.44	2.444E+01	55.62	3.366E+02
10	4570-	4585	4577.14	1115.52	0.24	-1.879E+00	39.45	2.149E+02
11	4806-	4824	4813.82	1173.22	0.24	1.854E+01	38.67	1.815E+02
12	5459-	5476	5467.18	1332.49	0.46	5.017E+00	33.72	1.460E+02
13	5985-	6002	5993.59	1460.81	0.24	-3.677E+00	33.56	1.497E+02

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet

[PS 0



Sample Description:
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000067682.Cnf
Batch Identification: 2025_HiVol_Nov11
Sample Identification: 56474_Pu
Procedure Description: Pu - 3 Days

Detector Name: 1-09
Env. Background: System Bkgd 73637

Sample Size: 4.9941E-01 +/- 0.0000E+00 unit
Sample Date/Time: 12/16/2025 1:39:26 PM
Acquisition Date/Time: 12/16/2025 1:39:26 PM
Acquisition Live Time: 4320.0 minutes
Acquisition Real Time: 4320.0 minutes

Tracer Certificate: 450_Pu-242_T
Tracer Quantity: 0.098 mL
Counting Efficiency: 0.3568 +/- 0.0039 on 7/24/2025 5:10:24 PM
Chem. Rec. Factor (%): 83.67 +/- 2.0561

----- ----- PEAK AREA REPORT ----- -----					
Nuclide	Energy (MeV)	Net Pk Area	Pk Area Error %	Ambient Backgnd	FWHM (keV)
PU-238	5.448	-0.30	4218.6	5.00	2.9
PU-239	5.125	-423.35	19.84	1.00	21.5
PU-242 T	4.864	2118.00	4.35	0.00	42.3

T = Tracer Peak used for Effective Efficiency

----- ----- NUCLIDE ANALYSIS RESULTS ----- -----					
Nuclide	Energy (keV)	Activity (Bq /unit)	MDA (Bq /unit)		
PU-238	5487.10*	-7.727E-06 +/- 3.260E-04	8.310E-04 +/- 3.661E-05		
PU-239	5147.70*	-1.097E-02 +/- 2.229E-03	5.704E-03 +/- 2.513E-04		
PU-242	4890.70*	5.459E-02 +/- 2.405E-03	1.897E-04 +/- 8.358E-06		

 * New Mexico State University *
 * Quality Assurance Report *

Report Date : 12/4/25 2:40:55 PM
 QA File : C:\Genie2k\CAMFILES\New_CalVer3.QAF
 Analyst :
 Sample ID : Eu152
 Sample Quantity : 1.00 g
 Sample Date : 8/1/94 12:00:00 PM
 Measurement Date : 12/4/25 2:34:50 PM
 Elapsed Live Time : 360 seconds
 Elapsed Real Time : 363 seconds

Test	Parameter	Low Limit	High Limit	New Value	Flag
LU	121 Pk Energy	1.2078E+02	1.2278E+02	1.2181E+02	< >
LU	779 Pk Energy	7.7789E+02	7.7989E+02	7.7898E+02	< >
LU	1408 Pk Energy	1.4069E+03	1.4089E+03	1.4087E+03	< >
LU	121 FWHM	7.0000E-01	2.1000E+00	1.8846E+00	< >
LU	779 FWHM	1.4000E+00	3.1000E+00	2.4305E+00	< >
LU	1408 FWHM	1.9000E+00	4.5000E+00	2.1959E+00	< >
LU	121 DCA	1.0000E+00	1.2000E+00	1.1418E+00	< >
LU	779 DCA	1.0000E+00	1.2000E+00	1.0519E+00	< >
LU	1408 DCA	1.0000E+00	1.2500E+00	1.0915E+00	< >

Flags Key: LU = Boundary Test (Ab = Above , Be = Below)
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UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
ES = Measurement Bias Test (In = Investigate, Ac = Action)

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C E M R C G A M M A S P E C T R U M A N A L Y S I S

Sample ID : HiVol156476
Sample Description : HiVol156476
 :
Calibration ID :
Background ID :

Sample Collection Date : 7/18/2025 12:00:00 PM
Count Start Date : 12/4/2025 2:53:19 PM

Sample Aliquot : 1.00000E+00
Aliquot Unc. : 0.00000E+00
Aliquot Unit : g

Live Time (sec) : 172800
Real Time (sec) : 172815

Energy Calibration Used Done On : 10/1/2024
Efficiency Calibration Used Done On : 11/16/2023
Efficiency ID : DET03_70mlEff_23

%Random Unc. : 0.0
%Systematic Unc. : 0.0

Nuclide	Energy	Eff%	UncEff%	Abun%	UncAbn%	HL(d)	UncHL(d)	Conc(Bq/unit)	Unc2sigma
K-40	1460.81	0.725	0.009	10.6700	0.1100	4.66412E+11	2.92192E+09	6.29942E-01	1.51876E-01
MN-54	834.82	1.233	0.013	99.9750	0.0000	3.12700E+02	0.00000E+00	-1.23796E-02	1.69569E-02
CO-57	122.06	5.229	0.069	85.5100	0.1800	2.70900E+02	6.00000E-01	-2.44613E-03	1.52428E-02
CO-57	136.47	5.087	0.072	10.6000	0.1800	2.70900E+02	6.00000E-01	-3.88315E-01	1.35784E-01
CO-60	1173.22	0.896	0.010	100.0000	0.0000	1.92518E+03	3.65240E-01	1.11425E-02	1.23888E-02
CO-60	1332.49	0.794	0.009	100.0000	0.0000	1.92518E+03	3.65240E-01	-1.54439E-02	1.26132E-02
ZN-65	1115.52	0.940	0.010	50.7500	0.0000	2.44400E+02	0.00000E+00	8.27887E-02	3.47745E-02
CS-134	604.69	1.672	0.025	97.6000	0.0000	7.53125E+02	0.00000E+00	5.26273E-03	2.30318E-02
CS-134	795.84	1.289	0.014	85.4000	0.0000	7.53125E+02	0.00000E+00	-8.66070E-03	1.42884E-02
CS-137	661.65	1.535	0.021	85.1200	0.2300	1.10193E+04	1.09572E+01	5.04643E-02	1.53416E-02
RA-226	186.21	4.451	0.076	3.2800	0.0000	5.84384E+05	1.82620E+02	1.95514E-01	2.97176E-01
RA-228	911.07	1.136	0.011	27.7000	1.0000	2.10013E+03	0.00000E+00	4.52537E-02	4.40639E-02
AM-241	59.54	4.746	0.000	36.3000	0.0000	1.58153E+05	0.00000E+00	4.58139E-02	2.04065E-02

13 nuclide lines identified

 ***** P E A K A N A L Y S I S R E P O R T *****

Detector Name: DET03
 Sample Title: HiVol56476
 Peak Analysis Performed on: 12/6/2025 2:53:44 PM

Peak Analysis From Channel: 50
Peak Analysis To Channel: 8190

Peak No.	ROI start	ROI end	Peak centroid	Energy (keV)	FWHM (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
1	240-	251	245.28	59.54	0.63	1.363E+02	121.35	1.905E+03
2	495-	514	501.75	122.06	0.24	-1.321E+01	164.57	2.791E+03
3	546-	566	560.86	136.47	0.24	-2.528E+02	176.46	3.183E+03
4	758-	775	764.90	186.21	0.24	4.931E+01	149.90	2.617E+03
5	2465-	2489	2481.60	604.69	0.24	1.306E+01	114.31	1.360E+03
6	2708-	2727	2715.26	661.65	0.60	1.130E+02	68.61	5.020E+02
7	3258-	3273	3265.74	795.84	0.24	-1.450E+01	47.84	3.085E+02
8	3417-	3433	3425.65	834.82	0.24	-1.933E+01	52.94	3.633E+02
9	3731-	3746	3738.44	911.07	0.29	2.350E+01	45.73	2.635E+02
10	4570-	4585	4577.14	1115.52	0.35	4.586E+01	38.51	1.801E+02
11	4806-	4821	4813.82	1173.22	0.25	1.641E+01	36.49	1.756E+02
12	5459-	5476	5467.18	1332.49	0.24	-2.015E+01	32.90	1.521E+02
13	5985-	6002	5993.59	1460.81	0.29	8.425E+01	40.53	1.717E+02

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet

 * New Mexico State University *
 * Quality Assurance Report *

Report Date : 12/8/25 9:04:38 PM
 QA File : C:\Genie2k\CAMFILES\New_CalVer3.QAF
 Analyst :
 Sample ID : D3E251208
 Sample Quantity : 1.00 g
 Sample Date : 8/1/94 12:00:00 PM
 Measurement Date : 12/8/25 8:58:33 PM
 Elapsed Live Time : 360 seconds
 Elapsed Real Time : 363 seconds

Test	Parameter	Low Limit	High Limit	New Value	Flag
LU	121 Pk Energy	1.2078E+02	1.2278E+02	1.2180E+02	< >
LU	779 Pk Energy	7.7789E+02	7.7989E+02	7.7896E+02	< >
LU	1408 Pk Energy	1.4069E+03	1.4089E+03	1.4087E+03	< >
LU	121 FWHM	7.0000E-01	2.1000E+00	1.8361E+00	< >
LU	779 FWHM	1.4000E+00	3.1000E+00	2.2862E+00	< >
LU	1408 FWHM	1.9000E+00	4.5000E+00	2.5507E+00	< >
LU	121 DCA	1.0000E+00	1.2000E+00	1.1443E+00	< >
LU	779 DCA	1.0000E+00	1.2000E+00	1.0760E+00	< >
LU	1408 DCA	1.0000E+00	1.2500E+00	1.1064E+00	< >

Flags Key: LU = Boundary Test (Ab = Above , Be = Below)
 SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)

UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
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* ACTIVITY. *

C E M R C G A M M A S P E C T R U M A N A L Y S I S

Sample ID : Soil57612
Sample Description : Soil57612
 :
Calibration ID :
Background ID :

Sample Collection Date : 4/30/2025 12:00:00 PM
Count Start Date : 12/8/2025 9:08:17 PM

Sample Aliquot : 4.50500E+02
Aliquot Unc. : 0.00000E+00
Aliquot Unit : gram

Live Time (sec) : 172800
Real Time (sec) : 172819

Energy Calibration Used Done On : 10/1/2024
Efficiency Calibration Used Done On : 7/16/2024
Efficiency ID : DET03_soilEff_24

%Random Unc. : 0.0
%Systematic Unc. : 0.0

Nuclide	Energy	Eff%	UncEff%	Abun%	UncAbn%	HL(d)	UncHL(d)	Conc(Bq/unit)	Unc2sigma
K-40	1460.81	0.432	0.009	10.6700	0.1100	4.66412E+11	2.92192E+09	2.34325E-01	5.99542E-03
MN-54	834.82	0.700	0.010	99.9750	0.0000	3.12700E+02	0.00000E+00	-4.59527E-05	1.20724E-04
CO-57	122.06	2.551	0.064	85.5100	0.1800	2.70900E+02	6.00000E-01	1.04254E-04	1.37642E-04
CO-57	136.47	2.566	0.061	10.6000	0.1800	2.70900E+02	6.00000E-01	-1.54513E-04	1.02176E-03
CO-60	1173.22	0.524	0.008	100.0000	0.0000	1.92518E+03	3.65240E-01	9.51984E-05	9.68598E-05
CO-60	1332.49	0.469	0.008	100.0000	0.0000	1.92518E+03	3.65240E-01	-3.08567E-05	7.48026E-05
ZN-65	1115.52	0.548	0.008	50.7500	0.0000	2.44400E+02	0.00000E+00	-6.97080E-04	3.16860E-04
CS-134	604.69	0.919	0.014	97.6000	0.0000	7.53125E+02	0.00000E+00	-1.46148E-03	1.74492E-04
CS-134	795.84	0.728	0.011	85.4000	0.0000	7.53125E+02	0.00000E+00	6.00814E-04	1.30908E-04
CS-137	661.65	0.851	0.013	85.1200	0.2300	1.10193E+04	1.09572E+01	1.14871E-04	9.12578E-05
RA-226	186.21	2.351	0.060	3.2800	0.0000	5.84384E+05	1.82620E+02	2.06232E-02	2.27756E-03
RA-228	911.07	0.650	0.009	27.7000	1.0000	2.10013E+03	0.00000E+00	1.02671E-02	6.59255E-04
AM-241	59.54	1.575	0.000	36.3000	0.0000	1.58153E+05	0.00000E+00	1.85722E-04	3.02865E-04

13 nuclide lines identified

 ***** P E A K A N A L Y S I S R E P O R T *****

Detector Name: DET03
 Sample Title: Soil57612
 Peak Analysis Performed on: 12/10/2025 9:08:44 PM

Peak Analysis From Channel: 50
Peak Analysis To Channel: 8190

Peak No.	ROI start	ROI end	Peak centroid	Energy (keV)	FWHM (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
1	234-	251	245.28	59.54	0.50	8.260E+01	134.66	7.874E+03
2	494-	516	501.75	122.06	0.35	9.995E+01	131.94	6.543E+03
3	546-	566	560.86	136.47	0.24	-1.847E+01	122.14	5.956E+03
4	752-	777	764.90	186.21	2.13	1.237E+03	132.95	6.257E+03
5	2474-	2499	2481.60	604.69	0.24	-8.319E+02	98.57	4.007E+03
6	2703-	2724	2715.26	661.65	0.24	6.390E+01	50.75	1.130E+03
7	3247-	3273	3265.74	795.84	1.51	2.370E+02	51.53	9.670E+02
8	3418-	3435	3425.65	834.82	0.24	-1.525E+01	40.06	8.052E+02
9	3722-	3755	3738.44	911.07	2.55	1.337E+03	68.36	1.155E+03
10	4567-	4585	4577.14	1115.52	0.24	-8.004E+01	36.36	6.920E+02
11	4800-	4821	4813.82	1173.22	0.40	3.588E+01	36.50	6.161E+02
12	5459-	5476	5467.18	1332.49	0.24	-1.040E+01	25.22	3.374E+02
13	5972-	6014	5993.59	1460.81	2.73	8.410E+03	104.58	7.812E+02

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet

[PS 0



Sample Description:
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000068699.Cnf
Batch Identification: 2025_DW_1_Pu
Sample Identification: Pu56568
Procedure Description: Pu - 3 Days

Detector Name: 5-03
Env. Background: System Bkgd 74221

Sample Size: 1.0000E+00 +/- 0.0000E+00 L
Sample Date/Time: 3/18/2026 8:15:11 AM
Acquisition Date/Time: 3/18/2026 8:15:11 AM
Acquisition Live Time: 4320.0 minutes
Acquisition Real Time: 4320.0 minutes

Tracer Certificate: 450_Pu-242_T
Tracer Quantity: 0.129 mL
Counting Efficiency: 0.3259 +/- 0.0036 on 8/4/2025 6:57:46 PM
Chem. Rec. Factor (%): 79.92 +/- 1.8678

----- PEAK AREA REPORT -----

Nuclide	Energy (MeV)	Net Pk Area	Pk Area Error %	Ambient Backgnd	FWHM (keV)
PU-238	5.465	4.43	333.30	0.00	3.7
PU-239	5.125	64.45	102.11	1.00	30.5
PU-242 T	4.867	2435.00	4.05	1.00	42.7

T = Tracer Peak used for Effective Efficiency

----- NUCLIDE ANALYSIS RESULTS -----

Nuclide	Energy (keV)	Activity (Bq /L)	MDA (Bq /L)
PU-238	5487.10*	6.569E-05 +/- 2.190E-04	5.281E-04 +/- 2.175E-05
PU-239	5147.70*	9.557E-04 +/- 9.766E-04	2.240E-03 +/- 9.226E-05
PU-242	4890.70*	3.593E-02 +/- 1.479E-03	1.370E-04 +/- 5.642E-06

[PS 0



Sample Description:
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000068684.Cnf
Batch Identification: 2025_DW_1_U
Sample Identification: U56567
Procedure Description: U - 3 Days (Blank Corrected)

Detector Name: 3-04
Env. Background: System Bkgd 74115

Sample Size: 1.0000E+00 +/- 0.0000E+00 L
Sample Date/Time: 3/18/2026 8:10:22 AM
Acquisition Date/Time: 3/18/2026 8:10:22 AM
Acquisition Live Time: 4320.0 minutes
Acquisition Real Time: 4320.1 minutes

Tracer Certificate: 1320_U232_2
Tracer Quantity: 0.130 mL
Counting Efficiency: 0.3287 +/- 0.0037 on 7/29/2025 11:05:28 AM
Chem. Rec. Factor (%): 85.54 +/- 4.5895

----- PEAK AREA REPORT -----

Nuclide	Energy (MeV)	Net Pk Area	Pk Area Error %	Ambient Backgnd	FWHM (keV)
U-232	T 5.277	3959.00	3.18	2.00	46.8
U-234	4.726	13873.07	1.72	2.00	75.9
U-235	4.362	384.86	10.54	1.00	22.9
U-238	4.147	5217.02	2.82	7.00	67.4

T = Tracer Peak used for Effective Efficiency

----- NUCLIDE ANALYSIS RESULTS -----

Nuclide	Energy (keV)	Activity (Bq /L)	MDA (Bq /L)
U-232	5302.50*	5.443E-02 +/- 5.712E-03	1.651E-04 +/- 1.733E-05
U-234	4761.50*	1.907E-01 +/- 2.028E-02	1.128E-03 +/- 1.184E-04
U-235	4385.50*	6.527E-03 +/- 9.706E-04	4.493E-04 +/- 4.715E-05
U-238	4184.40*	7.142E-02 +/- 7.759E-03	8.859E-04 +/- 9.296E-05

 * New Mexico State University *
 * Quality Assurance Report *

Report Date : 9/17/25 11:07:46 AM
 QA File : C:\Genie2k\CAMFILES\Calver1_2019.QAF
 Analyst :
 Sample ID : D1E250916
 Sample Quantity : 1.00 unit
 Sample Date : 8/1/94 1:00:00 PM
 Measurement Date : 9/16/25 9:41:31 AM
 Elapsed Live Time : 300 seconds
 Elapsed Real Time : 305 seconds

Test	Parameter	Low Limit	High Limit	New Value	Flag
LU	121 Pk Energy	1.2078E+02	1.2278E+02	1.2179E+02	< >
LU	779 Pk Energy	7.7789E+02	7.7989E+02	7.7885E+02	< >
LU	1408 Pk Energy	1.4069E+03	1.4089E+03	1.4087E+03	< >
LU	121 FWHM	7.0000E-01	2.1000E+00	1.4099E+00	< >
LU	779 FWHM	1.4000E+00	3.1000E+00	2.6984E+00	< >
LU	1408 FWHM	1.9000E+00	4.5000E+00	4.2877E+00	< >
LU	121 DCA	1.0000E+00	1.2000E+00	1.1050E+00	< >
LU	779 DCA	1.0000E+00	1.2000E+00	1.0840E+00	< >
LU	1408 DCA	1.0000E+00	1.2500E+00	1.1703E+00	< >

Flags Key: LU = Boundary Test (Ab = Above , Be = Below)
 SD = Sample Driven N-Sigma Test (In = Investigate, Ac = Action)

UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
ES = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: _____

* NOTE: DAILY QUALITY CONTROL SAMPLES (QC) ARE GIVEN A USER DRIVEN *
* N-SIGMA TEST. INVESTIGATE MEANS THE MEASUREMENT IS BETWEEN *
* 10% AND 15% OF THE BASELINE. ACTION MEANS THAT THE MEASUREMENT *
* IS ABOVE 15% OF THE BASELINE. *
* LABORATORY CONTROL SAMPLES ARE GIVEN A BOUNDARY TEST. THE RESULT *
* IS ACCEPTABLE IF IT LIES BETWEEN +/- 25% OF THE TRUE SOURCE *
* ACTIVITY. *

 C E M R C G A M M A S P E C T R U M A N A L Y S I S

Sample ID : DW56572
 Sample Description : DW56572
 :
 Calibration ID :
 Background ID :
 Sample Collection Date : 8/5/2025 7:06:00 AM
 Count Start Date : 8/26/2025 10:24:13 AM
 Sample Aliquot : 1.50000E+00
 Aliquot Unc. : 0.00000E+00
 Aliquot Unit : liters
 Live Time (sec) : 172800
 Real Time (sec) : 172829
 Energy Calibration Used Done On : 7/16/2024
 Efficiency Calibration Used Done On : 7/17/2024
 Efficiency ID : DET01_WMarEff_24
 %Random Unc. : 0.0
 %Systematic Unc. : 0.0

Nuclide	Energy	Eff%	UncEff%	Abun%	UncAbn%	HL(d)	UncHL(d)	Conc(Bq/unit)	Unc2sigma
MDC									
K-40	1460.81	0.819	0.036	10.6700	0.1100	4.66412E+11	2.92192E+09	8.29748E-02	1.14102E-01
	3.81821E-01								
MN-54	834.82	1.280	0.043	99.9750	0.0000	3.12700E+02	0.00000E+00	-1.19866E-02	1.25909E-02
	4.27534E-02								
CO-57	122.06	2.825	0.102	85.5100	0.1800	2.70900E+02	6.00000E-01	4.62201E-03	1.55800E-02
	5.16300E-02								
CO-57	136.47	2.985	0.147	10.6000	0.1800	2.70900E+02	6.00000E-01	-1.96117E+00	1.73222E-01
	4.92587E-01								
CO-60	1173.22	0.989	0.025	100.0000	0.0000	1.92518E+03	3.65240E-01	-3.81736E-03	9.91213E-03

```

3.39216E-02
CO-60 1332.49 0.889 0.029 100.0000 0.0000 1.92518E+03 3.65240E-01 -7.79283E-03 1.08147E-02
3.72694E-02
ZN-65 1115.52 1.029 0.025 50.7500 0.0000 2.44400E+02 0.00000E+00 -4.59910E-03 2.10972E-02
7.18178E-02
CS-134 604.69 1.599 0.067 97.6000 0.0000 7.53125E+02 0.00000E+00 -2.54471E-02 1.55818E-02
5.24995E-02
CS-134 795.84 1.324 0.047 85.4000 0.0000 7.53125E+02 0.00000E+00 2.75772E-03 1.18375E-02
3.97521E-02
CS-137 661.65 1.504 0.060 85.1200 0.2300 1.10193E+04 1.09572E+01 -9.38284E-03 9.42547E-03
3.22920E-02
RA-226 186.21 3.026 0.234 3.2800 0.0000 5.84384E+05 1.82620E+02 7.71424E-01 2.52280E-01
7.96658E-01
RA-228 911.07 1.201 0.037 27.7000 1.0000 2.10013E+03 0.00000E+00 8.83911E-02 4.01680E-02
1.30275E-01
AM-241 59.54 0.525 0.000 36.3000 0.0000 1.58153E+05 0.00000E+00 -4.73199E-02 1.30301E-01
0.00000E+00

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13 nuclide lines identified

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*****
**** P E A K A N A L Y S I S R E P O R T ****
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Detector Name: DET01
Sample Title: DW56572
Peak Analysis Performed on: 9/5/2025 1:30:43 PM
Peak Analysis From Channel: 50
Peak Analysis To Channel: 8190

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Peak No.	ROI start	ROI end	Peak centroid	Energy (keV)	FWHM (keV)	Net Peak Area	Net Area Uncert.	Continuum Counts
1	238-	248	243.20	59.54	0.24	-2.335E+01	128.59	1.741E+03
2	489-	508	499.39	122.06	0.36	2.735E+01	184.35	2.818E+03
3	550-	568	558.44	136.47	2.33	-1.520E+03	216.83	4.272E+03
4	756-	767	762.26	186.21	0.44	1.984E+02	126.12	1.712E+03
5	2461-	2484	2477.10	604.69	0.24	-1.009E+02	123.30	1.557E+03
6	2704-	2717	2710.51	661.65	0.24	-3.110E+01	62.44	5.641E+02
7	3249-	3268	3260.39	795.84	0.24	7.926E+00	68.04	5.431E+02
8	3413-	3434	3420.13	834.82	0.28	-3.785E+01	79.47	7.248E+02
9	3724-	3745	3732.58	911.07	0.34	7.570E+01	68.43	5.213E+02

10	4562-	4579	4570.37	1115.52	0.24	-5.849E+00	53.66	3.978E+02
11	4798-	4816	4806.80	1173.22	0.24	-9.708E+00	50.41	3.457E+02
12	5450-	5469	5459.45	1332.49	0.24	-1.781E+01	49.43	3.278E+02
13	5976-	5995	5985.30	1460.81	0.25	1.879E+01	51.66	3.432E+02

M = First peak in a multiplet region
m = Other peak in a multiplet region
F = Fitted singlet

[PS 0



Sample Description:
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000068409.Cnf
Batch Identification: 2025_GW_1_R_Am
Sample Identification: 56541Am
Procedure Description: Am - 3 Days

Detector Name: 3-12
Env. Background: System Bkgd 74180

Sample Size: 5.0000E-01 +/- 0.0000E+00 L
Sample Date/Time: 2/27/2026 2:51:49 PM
Acquisition Date/Time: 2/27/2026 2:51:49 PM
Acquisition Live Time: 4320.0 minutes
Acquisition Real Time: 4320.0 minutes

Tracer Certificate: 1322_Am-243-4_T
Tracer Quantity: 0.130 mL
Counting Efficiency: 0.3363 +/- 0.0038 on 7/30/2025 11:08:01 AM
Chem. Rec. Factor (%): 88.08 +/- 1.8242

----- PEAK AREA REPORT -----

Nuclide	Energy (MeV)	Net Pk Area	Pk Area Error %	Ambient Backgnd	FWHM (keV)
AM-241	5.463	34.00	39.02	5.00	6.6
AM-243 T	5.240	3592.00	3.34	4.00	68.6

T = Tracer Peak used for Effective Efficiency

----- NUCLIDE ANALYSIS RESULTS -----

Nuclide	Energy (keV)	Activity (Bq /L)	MDA (Bq /L)
AM-241	5479.10*	8.863E-04 +/- 3.472E-04	4.539E-04 +/- 1.583E-05
AM-243	5270.00*	9.393E-02 +/- 3.276E-03	4.148E-04 +/- 1.447E-05

Environmental Chemistry Group

From January 1st to March 31st, 2026, the Environmental Chemistry (EC) group processed the trace metal, total suspended solids and total dissolved solid analyses for the surface water samples collected in 2025. In addition, the EC group conducted the analyses for 2026 proficiency tests (hardness), groundwater samples (including the anions, specific gravity, and TDS/TSS) collected in March 2026.

The following tables and figures represent characteristics results.

FAS Filters – Station F

Sample Type: FAS, Station F
Year: 2025
Analysis Performed: Anions in weekly composites

Week	Chloride ng/m ³	Nitrate ng/m ³	Phosphate ng/m ³	Sulfate ng/m ³
01/01/25				
01/08/25				
01/15/25				
01/22/25				
02/01/25				
02/08/25				
02/15/25				
02/22/25				
03/01/25				
03/08/25				
03/15/25				
03/22/25				
04/01/25				
04/08/25				
04/15/25				
04/22/25				
05/01/25				
05/08/25				
05/15/25				
05/22/25				
06/01/25				
06/08/25				
06/15/25				
06/22/25				
07/01/25				
07/08/25				
07/15/25	2.54E+03	<MDL	<MDL	2.92E+03
07/22/25	2.88E+03	<MDL	<MDL	2.00E+03
08/01/25	1.89E+03	<MDL	<MDL	1.66E+03
08/08/25	1.98E+03	<MDL	<MDL	1.92E+03
08/15/25	3.15E+03	6.97E+01	<MDL	1.61E+03
08/22/25	1.37E+04	<MDL	<MDL	2.50E+03
09/01/25				
09/08/25				
09/15/25				
09/22/25				
10/01/25				
10/08/25				
10/15/25				
10/22/25				
11/01/25				
11/08/25				
11/15/25				

11/22/25				
12/01/25				
12/08/25				
12/15/25				
12/22/25				

NOTE: Filters were not received for the following time frames: January, February, March, April, May, June, July 1st and 2nd week

Sample Type: FAS, Station F
Year: 2025
Analysis Performed: Cations in weekly composites

Week	Sodium ng/m ³	Ammonium ng/m ³	Magnesium ng/m ³	Potassium ng/m ³	Calcium ng/m ³
01/01/25					
01/08/25					
01/15/25					
01/22/25					
02/01/25					
02/08/25					
02/15/25					
02/22/25					
03/01/25					
03/08/25					
03/15/25					
03/22/25					
04/01/25					
04/08/25					
04/15/25					
04/22/25					
05/01/25					
05/08/25					
05/15/25					
05/22/25					
06/01/25					
06/08/25					
06/15/25					
06/22/25					
07/01/25					
07/08/25					
07/15/25	1.27E+03	3.87E+02	<MDL	3.73E+02	2.37E+02
07/22/25	1.69E+03	2.32E+02	<MDL	4.38E+02	2.16E+02
08/01/25	8.26E+02	1.86E+02	<MDL	1.84E+02	2.84E+02
08/08/25	1.00E+03	1.57E+02	<MDL	2.24E+02	4.00E+02
08/15/25	1.73E+03	2.03E+02	<MDL	3.03E+02	1.50E+02
08/22/25	1.00E+04	1.20E+02	<MDL	2.72E+02	5.36E+02
09/01/25					
09/08/25					
09/15/25					
09/22/25					
10/01/25					
10/08/25					
10/21/25					
10/22/25					
11/01/25					
11/08/25					
11/15/25					
11/22/25					
12/01/25					
12/08/25					
12/15/25					
12/22/25					

NOTE: Filters were not received for the following time frames: January, February, March, April, May, June, July 1st and 2nd week

Drinking Water

Sample Type: Drinking Water

Year: 2025

Analysis Performed: Anions

Sample Location	Chloride mg/L	Nitrate mg/L	Phosphate mg/L	Sulfate mg/L
Carlsbad (Sheep draw)	3.72E+01	4.49E+00	<MDL	8.96E+01
Hobbs	1.27E+02	2.29E+01	<MDL	1.55E+02
Double Eagle PRV4	3.00E+01	1.30E+01	<MDL	3.97E+01
Loving	3.14E+01	2.06E+01	<MDL	1.16E+02
Otis	2.83E+02	1.60E+01	<MDL	6.32E+02
Malaga	6.50E+02	1.54E+01	<MDL	1.01E+03

Sample Type: Drinking Water

Year: 2025

Analysis Performed: Cations

Sample Location	Sodium mg/L	Magnesium mg/L	Potassium mg/L	Calcium mg/L
Carlsbad (Sheep draw)	2.82E+01	3.25E+01	<MDL	7.25E+01
Hobbs	6.14E+01	2.56E+01	<MDL	1.14E+02
Double Eagle PRV4	3.18E+01	1.02E+01	<MDL	5.03E+01
Loving	2.24E+01	3.64E+01	<MDL	8.65E+01
Otis	9.93E+01	7.65E+01	<MDL	2.81E+02
Malaga	2.14E+02	1.29E+02	<MDL	4.54E+02

Sample Type: Drinking Water

Year: 2025

Analysis Performed: pH

Sample Location	pH @ 26.77°C
Carlsbad (Sheep draw)	8.34
Hobbs	8.16
Double Eagle PRV4	8.19
Loving	8.11
Otis	7.84
Malaga	7.59

Sample Type: Drinking Water

Year: 2025

Analysis Performed: Total Organic Carbon

Sample Location	TOC mg/L
Carlsbad (Sheep draw)	
Hobbs	
Double Eagle PRV-4	
Loving	
Otis	
Malaga	

Sample Type: Drinking Water
Year: 2025
Analysis Performed: Conductivity

Sample Location	Conductivity mS/cm	Temperature °C
Carlsbad (Sheep draw)	0.729	27.9
Loving	0.792	27.8
Otis	2.24	28.1
Malaga	3.65	27.8
Hobbs	1.073	27.7
PRV4 (Double Eagle)	0.500	27.6

Sample Type: Drinking Water
Year: 2025
Analysis Performed: Specific gravity

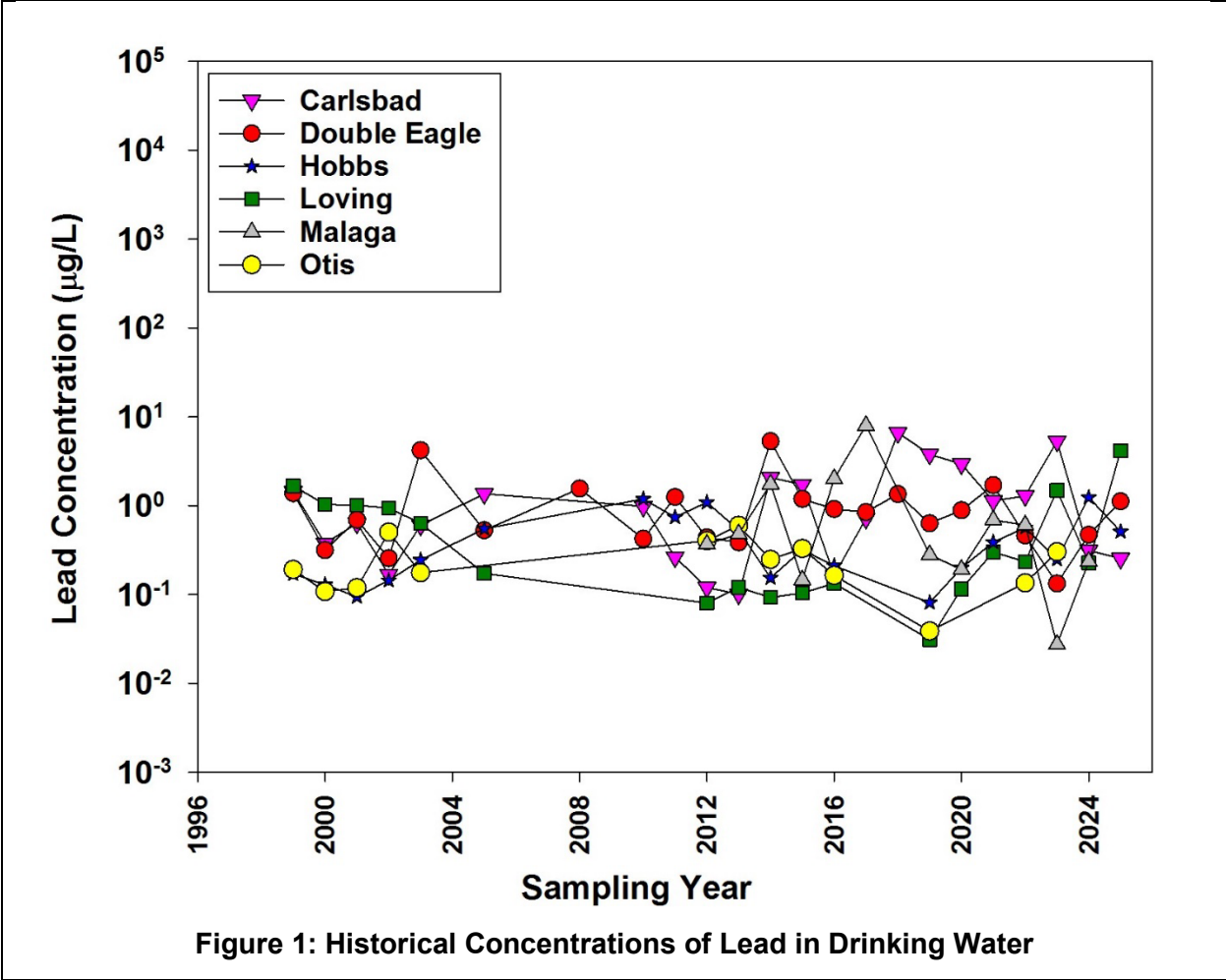
Sample Location	Specific Gravity
Carlsbad (Sheep draw)	0.991
Loving	0.990
Otis	0.993
Malaga	0.995
Hobbs	0.992
PRV4 (Double Eagle)	0.992

Sample Type: Drinking Water
Year: 2025
Analysis Performed: TDS/TSS

Sample Location	TDS mg/L	TSS mg/L
Carlsbad (Sheep draw)	440.0	N.D.
Loving	560.0	20.0
Otis	1820.0	N.D.
Malaga	3260.0	N.D.
Hobbs	720.0	20.0
PRV4 (Double Eagle)	260.0	N.D.
N.D. = non-detect.		

Sample Type: Drinking Water
 Year: 2025
 Analysis Performed: Metals

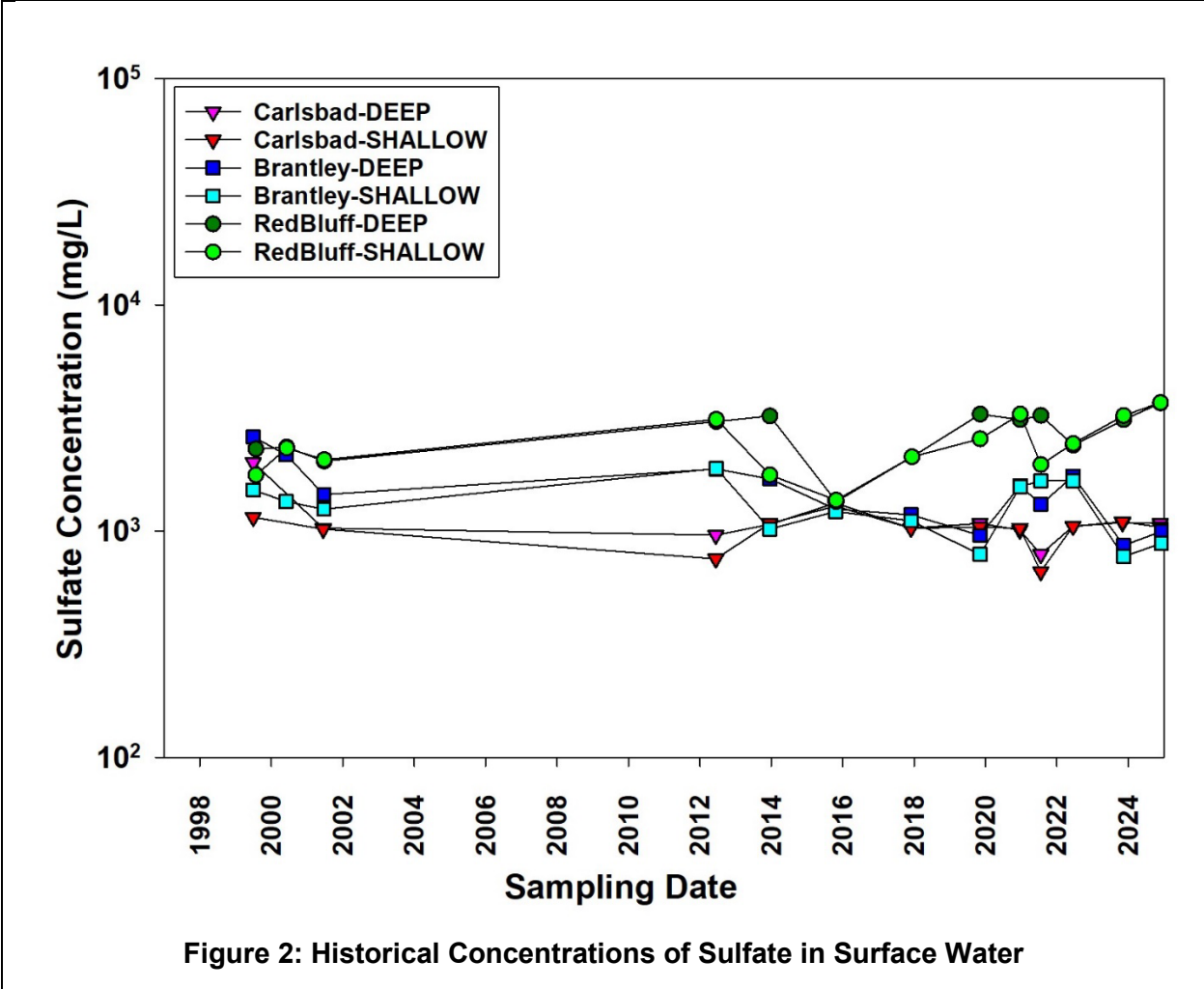
Metal	Carlsbad Conc µg/L	Loving Conc µg/L	Otis Conc µg/L	Malaga Conc µg/L	Hobbs Conc µg/L	Double Eagle (PRV4) Conc µg/L
Ag	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC
Al	3.02E+00	4.54E+00	3.00E+01	9.67E+00	4.31E+00	6.98E+00
As	7.13E-01	1.77E+00	1.88E+00	2.03E+00	6.54E+00	7.34E+00
Ba	7.05E+01	3.29E+01	1.33E+01	1.20E+01	5.50E+01	8.79E+01
Be	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC
Ca	7.23E+04	8.52E+04	2.64E+05	4.31E+05	1.12E+05	5.01E+04
Cd	4.51E-03	4.98E-02	<MDC	<MDC	7.41E-03	<MDC
Ce	<MDC	<MDC	4.35E-02	<MDC	<MDC	<MDC
Co	8.90E-02	1.01E-01	3.56E-01	5.19E-01	1.51E-01	6.10E-02
Cr	2.00E+00	2.63E+00	2.92E+00	2.77E+00	2.32E+00	1.80E+00
Cu	4.10E+00	5.40E+00	<MDC	<MDC	8.94E+00	<MDC
Dy	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC
Er	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC
Eu	1.30E-02	5.95E-03	<MDC	<MDC	8.91E-03	1.54E-02
Fe	2.26E+02	2.69E+02	1.02E+03	1.45E+03	3.56E+02	2.34E+02
Gd	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC
Hg	<MDL	<MDL	0.167	<MDL	<MDL	<MDL
K	1.27E+03	1.80E+03	2.71E+03	3.83E+03	2.61E+03	2.46E+03
La	<MDC	<MDC	2.05E-02	<MDC	<MDC	<MDC
Li	7.16E+00	1.92E+01	4.41E+01	6.05E+01	3.72E+01	1.82E+01
Mg	3.35E+04	3.64E+04	8.01E+04	1.32E+05	2.66E+04	9.83E+03
Mn	4.35E-01	5.67E-01	1.02E+00	<MDC	1.27E+00	3.49E+00
Mo	1.36E+00	1.67E+00	3.93E+00	4.06E+00	2.70E+00	1.77E+00
Na	2.62E+04	2.06E+04	9.35E+04	2.01E+05	5.54E+04	2.94E+04
Nd	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC
Ni	2.69E+00	2.95E+00	1.93E+01	1.37E+01	3.96E+00	1.72E+00
P	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC
Pb	2.55E-01	4.16E+00	<MDC	<MDC	5.10E-01	1.12E+00
Pr	<MDC	<MDC	5.47E-03	<MDC	<MDC	<MDC
Sb	3.05E-02	4.28E-02	3.51E-02	3.79E-02	6.08E-02	2.66E-02
Sc	1.37E+00	2.19E+00	2.40E+00	2.52E+00	5.41E+00	3.39E+00
Se	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC
Si	6.10E+03	9.49E+03	9.66E+03	9.97E+03	2.55E+04	1.52E+04
Sr	3.08E+02	7.08E+02	2.87E+03	5.11E+03	1.13E+03	4.70E+02
Th	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC
Tl	7.50E-02	3.53E-03	<MDC	<MDC	<MDC	<MDC
U	8.12E-01	1.92E+00	4.07E+00	5.69E+00	3.80E+00	1.41E+00
V	3.96E+00	1.22E+01	9.40E+00	8.05E+00	3.04E+01	2.81E+01
Zn	5.60E+00	2.51E+02	2.29E+01	<MDC	1.10E+01	8.76E+00



Surface Water

Sample Type: Surface Water
 Year: 2025
 Analysis Performed: Anions

Sample Location	Chloride mg/L	Nitrate mg/L	Phosphate mg/L	Sulfate mg/L
Hill Tank	2.73E+00	1.03E+00	4.66E-01	7.63E+00
Noya Tank	1.09E+00	1.71E+00	6.77E-01	1.82E+00
Pierce Canyon	1.41E+03	3.14E+00	<MDL	1.47E+03
Lake Carlsbad (Shore)	7.04E+02	1.48E+00	<MDL	1.16E+03
Lake Carlsbad (Shallow)	7.10E+02	4.03E+00	<MDL	1.13E+03
Lake Carlsbad (Deep)	7.97E+02	4.60E+00	<MDL	1.24E+03
Brantley Lake (shore)	1.33E+03	<MDL	<MDL	1.42E+03
Brantley Lake (shallow)	9.98E+02	<MDL	<MDL	1.15E+03
Brantley Lake (deep)	1.01E+03	<MDL	<MDL	1.15E+03
Pecos River (Shore)	4.94E+02	2.33E+00	<MDL	1.11E+03
Red Bluff (Shallow)	3.16E+03	<MDL	<MDL	3.27E+03
Red Bluff (Deep)	3.19E+03	<MDL	<MDL	3.29E+03



Sample Type: Surface Water
 Year: 2025
 Analysis Performed: Cations

Sample Location	Sodium mg/L	Magnesium mg/L	Potassium mg/L	Calcium mg/L
Hill Tank	1.38E+00	3.61E+00	7.59E+00	4.93E+01
Noya Tank	3.40E-01	2.05E+00	5.38E+00	4.26E+01
Pierce Canyon	8.30E+02	1.86E+02	3.91E+01	4.98E+02
Lake Carlsbad (Shore)	4.47E+02	1.19E+02	9.52E+00	3.88E+02
Lake Carlsbad (Shallow)	4.83E+02	1.46E+02	<MDL	4.09E+02
Lake Carlsbad (Deep)	5.00E+02	1.54E+02	<MDL	4.19E+02
Brantley Lake (Shore)	8.42E+02	1.47E+02	1.50E+01	4.96E+02
Brantley Lake (shallow)	6.47E+02	1.07E+02	1.30E+01	4.01E+02
Brantley Lake (deep)	6.54E+02	1.01E+02	<MDL	4.03E+02
Pecos River (Shore)	4.07E+02	9.58E+01	8.08E+00	4.95E+02
Red Bluff (Shallow)	1.97E+03	4.38E+02	7.42E+01	9.83E+02
Red Bluff (Deep)	1.97E+03	4.40E+02	8.50E+01	9.77E+02

Sample Type: Surface Water
Year: 2025
Analysis Performed: pH

Sample Location	pH @ 25°C
Hill Tank	8.33
Noya Tank	8.41
Pierce Canyon	8.07
Lake Carlsbad (Shore)	8.21
Lake Carlsbad (Shallow)	8.13
Lake Carlsbad (Deep)	8.44
Brantley Lake (Shore)	8.29
Brantley Lake (shallow)	8.12
Brantley Lake (deep)	7.95
Pecos River (Shore)	7.58
Red Bluff (Shallow)	8.22
Red Bluff (Deep)	8.32

Sample Type: Surface Water
Year: 2025
Analysis Performed: Conductivity

Sample Location	Conductivity mS/cm	Temperature °C
Hill Tank	0.1764	19.8
Noya Tank	0.1537	19.8
Pierce Canyon	6.49	19.6
Lake Carlsbad (Shore)	4.26	19.6
Lake Carlsbad (Shallow)	4.27	19.6
Lake Carlsbad (Deep)	4.37	19.6
Brantley Lake (Shore)	6.44	19.4
Brantley Lake (shallow)	4.92	21.1
Brantley Lake (deep)	4.98	21.1
Pecos River (Shore)	3.91	19.9
Red Bluff (Shallow)	12.48	19.6
Red Bluff (Deep)	12.43	19.6

Sample Type: Surface Water
Year: 2025
Analysis Performed: Specific gravity

Sample Location	SG _{T/4°C}
Hill Tank	0.995
Noya Tank	0.996
Pierce Canyon	1.001
Lake Carlsbad (Shore)	0.999
Lake Carlsbad (Shallow)	0.993
Lake Carlsbad (Deep)	0.995
Brantley Lake (Shore)	1.000
Brantley Lake (Shallow)	0.993
Brantley Lake (Deep)	0.997
Pecos River (Shore)	1.000
Red Bluff (Shallow)	0.998
Red Bluff (Deep)	0.998

Sample Type: Surface Water
Year: 2025
Analysis Performed: TOC

Sample Location	TOC mg/L
Hill Tank	16.01
Noya Tank	16.10
Pierce Canyon	17.91
Lake Carlsbad (Shore)	17.73
Brantley Lake (Shore)	18.33
Pecos River (Shore)	12.11

Sample Type: Surface Water
Year: 2025
Analysis Performed: TDS/TSS

Sample Location	TDS mg/L	TSS mg/L
Hill Tank	160.00	N.D.
Noya Tank	200.00	N.D.
Pierce Canyon	4760.00	N.D.
Lake Carlsbad (Shore)	2960.00	N.D.
Lake Carlsbad (Shallow)	3210.00	80.00
Lake Carlsbad (Deep)	3200.00	80.00
Brantley Lake (Shore)	4680.00	N.D.
Brantley Lake (Shallow)	3800.00	40.00
Brantley Lake (Deep)	3680.00	N.D.
Pecos River (Shore)	2720.00	2120.00
Red Bluff (Shallow)	10520.00	160.00
Red Bluff (Deep)	10320.00	N.D.

Sample Type: Surface Water
Year: 2025
Analysis Performed: Metals

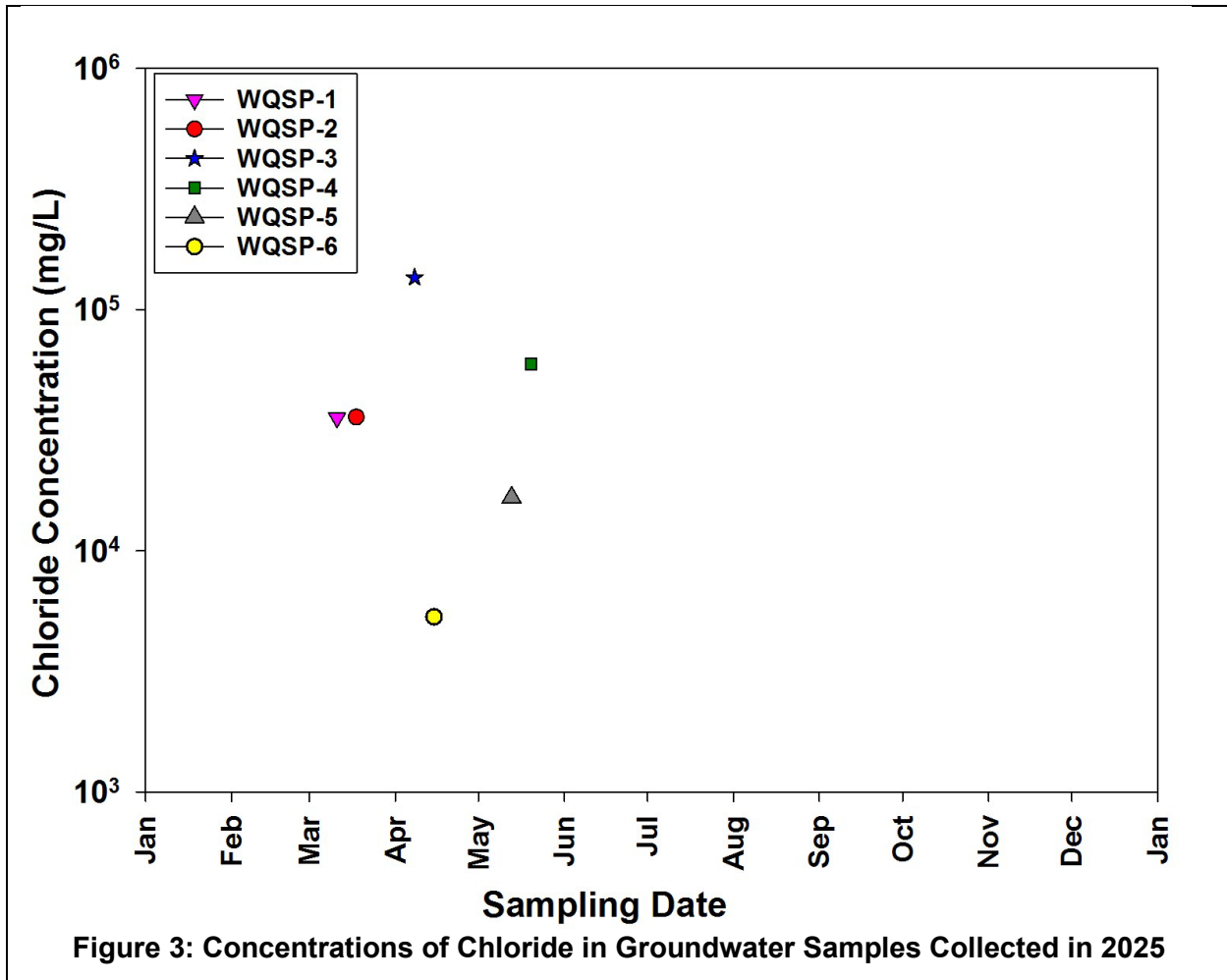
Metal	Hill Tank Conc µg/L	Noya Tank Conc µg/L	Pierce Canyon Conc µg/L
Ag	<MDC	<MDC	<MDC
Al	6.54E+03	7.12E+03	1.78E+03
As	2.68E+00	2.60E+00	<MDC
Ba	2.60E+02	2.55E+02	1.37E+02
Be	4.83E-01	5.26E-01	<MDC
Ca	4.51E+04	3.96E+04	4.16E+05
Cd	1.14E-01	1.16E-01	<MDC
Ce	1.27E+01	1.37E+01	2.58E+00
Co	4.22E+00	4.59E+00	2.17E+00
Cr	4.51E+00	4.23E+00	<MDC
Cu	<MDC	1.89E+01	<MDC
Dy	9.61E-01	1.08E+00	2.22E-01
Er	4.42E-01	4.95E-01	1.01E-01
Eu	3.70E-01	4.21E-01	9.55E-02
Fe	3.28E+03	3.49E+03	2.33E+03
Gd	1.50E+00	1.69E+00	3.28E-01
Hg	<MDL	<MDL	<MDC
K	7.03E+03	6.94E+03	1.53E+04
La	5.53E+00	5.96E+00	1.07E+00
Li	7.55E+00	9.43E+00	7.70E+01
Mg	7.34E+03	7.60E+03	1.80E+05
Mn	1.71E+02	1.93E+02	1.69E+02
Mo	1.39E-01	3.00E-01	2.91E+00
Na	1.56E+03	7.99E+02	7.10E+05
Nd	6.68E+00	7.06E+00	1.40E+00
Ni	8.94E+00	8.94E+00	1.81E+01
P	4.48E+02	5.71E+02	1.15E+02
Pb	6.48E+00	8.88E+00	<MDC
Pr	1.55E+00	1.64E+00	3.20E-01
Sb	1.11E-01	1.30E-01	2.07E-01
Sc	2.94E+00	3.30E+00	2.12E+00
Se	<MDC	<MDC	<MDC
Si	1.56E+04	1.74E+04	7.44E+03
Sr	1.39E+02	1.16E+02	6.87E+03
Th	1.60E-01	2.10E-01	<MDC
Ti	3.34E-02	4.14E-02	<MDC
U	2.33E-01	2.06E-01	6.07E+00
V	1.64E+01	1.92E+01	8.11E+00
Zn	<MDC	<MDC	<MDC

Metal	Brantley Lake		Lake Carlsbad		Red Bluff		Brantley Lake	Lake Carlsbad	Pecos River
	Shallow Conc µg/L	Deep Conc µg/L	Shallow Conc µg/L	Deep Conc µg/L	Shallow Conc µg/L	Deep Conc µg/L	Shore Conc µg/L	Shore Conc µg/L	Shore Conc µg/L
Ag	<MDC	<MDC	<MDC	<MDC	1.16E+01	<MDC	<MDC	<MDC	<MDC
Al	5.01E+01	1.53E+02	<MDC	4.15E+01	<MDC	<MDC	1.95E+02	1.71E+02	1.88E+04
As	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC	7.17E+00
Ba	9.29E+01	1.14E+02	1.51E+01	1.54E+01	8.65E+01	8.87E+01	9.10E+01	2.14E+01	1.53E+02
Be	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC	1.93E+00
Ca	3.74E+05	3.76E+05	3.98E+05	4.01E+05	9.26E+05	9.50E+05	4.60E+05	3.48E+05	4.73E+05
Cd	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC	4.16E-01
Ce	<MDC	2.14E-01	<MDC	<MDC	<MDC	<MDC	3.09E-01	3.09E-01	4.13E+01
Co	5.76E-01	7.03E-01	1.05E+00	1.11E+00	1.56E+00	1.69E+00	9.79E-01	7.04E-01	1.18E+01
Cr	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC	1.19E+01
Cu	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC
Dy	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC	4.05E+00
Er	<MDC	<MDC	<MDC	<MDC	2.37E-01	<MDC	<MDC	<MDC	1.80E+00
Eu	<MDC	<MDC	<MDC	<MDC	3.16E-01	<MDC	<MDC	<MDC	1.39E+00
Fe	1.16E+03	1.59E+03	1.26E+03	1.83E+03	3.86E+03	5.20E+03	1.39E+03	1.40E+03	1.38E+04
Gd	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC	6.03E+00
Hg	<MDC	<MDC	<MDL	<MDL	<MDC	<MDC	<MDC	<MDC	<MDC
K	8.67E+03	8.78E+03	6.14E+03	6.85E+03	3.79E+04	3.89E+04	9.44E+03	5.21E+03	8.08E+03
La	<MDC	1.01E-01	<MDC	<MDC	<MDC	<MDC	1.42E-01	1.55E-01	1.77E+01
Li	4.07E+01	4.24E+01	4.81E+01	5.49E+01	1.60E+02	1.61E+02	5.53E+01	4.60E+01	6.58E+01
Mg	1.04E+05	1.05E+05	1.23E+05	1.34E+05	3.90E+05	3.96E+05	1.42E+05	1.16E+05	1.06E+05
Mn	4.05E+01	1.33E+02	4.12E+00	4.84E+00	8.10E+01	8.52E+01	3.71E+01	9.89E+00	1.76E+03
Mo	4.64E+00	3.59E+00	2.89E+00	2.67E+00	9.18E+00	<MDC	3.82E+00	2.91E+00	2.20E+00
Na	5.74E+05	5.86E+05	4.33E+05	4.48E+05	2.00E+06	2.04E+06	7.81E+05	4.12E+05	3.72E+05
Nd	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC	2.42E+01
Ni	1.35E+01	1.48E+01	1.54E+01	1.64E+01	3.19E+01	3.68E+01	1.56E+01	1.31E+01	3.71E+01
P	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC	8.84E+02
Pb	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC
Pr	3.22E-02	2.65E-02	<MDC	<MDC	2.61E-01	<MDC	3.76E-02	3.68E-02	5.41E+00
Sb	2.32E-01	1.46E-01	<MDC	<MDC	8.55E-01	7.39E-01	2.06E-01	9.32E-02	1.80E-01
Sc	1.05E+00	1.45E+00	1.56E+00	2.13E+00	1.91E+00	1.76E+00	1.19E+00	1.63E+00	8.19E+00
Se	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC
Si	5.86E+03	6.14E+03	7.68E+03	7.86E+03	5.05E+03	4.44E+03	4.53E+03	5.79E+03	4.07E+04
Sr	5.84E+03	5.77E+03	4.92E+03	5.02E+03	1.26E+04	1.33E+04	7.34E+03	5.10E+03	6.32E+03
Th	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC	2.54E+00
Tl	<MDC	<MDC	1.23E-01	1.27E-01	<MDC	<MDC	<MDC	<MDC	7.39E-02
U	3.69E+00	3.71E+00	4.12E+00	4.68E+00	1.01E+01	1.00E+01	4.51E+00	3.42E+00	6.12E+00
V	5.44E+00	6.00E+00	6.96E+00	8.39E+00	1.51E+01	1.60E+01	4.01E+00	5.86E+00	4.44E+01
Zn	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC

Groundwater

Sample Type: Ground Water
Year: 2025
Analysis Performed: Anions

Sample Location	Chloride mg/L	Nitrate mg/L	Phosphate mg/L	Sulfate mg/L
WQSP-1	3.56E+04	<MDL	<MDL	4.85E+03
WQSP-2	3.59E+04	<MDL	<MDL	5.28E+03
WQSP-3	1.36E+05	<MDL	<MDL	7.95E+03
WQSP-4	5.94E+04	<MDL	<MDL	6.75E+03
WQSP-5	1.66E+04	<MDL	<MDL	4.88E+03
WQSP-6	5.32E+03	<MDL	<MDL	4.51E+03



Sample Type: Ground Water
 Year: 2025
 Analysis Performed: Cations

Sample Location	Sodium mg/L	Magnesium mg/L	Potassium mg/L	Calcium mg/L
WQSP-1	2.31E+04	1.01E+03	4.12E+02	1.79E+03
WQSP-2	2.16E+04	9.74E+02	4.36E+02	1.58E+03
WQSP-3	8.39E+04	2.29E+03	1.47E+03	1.44E+03
WQSP-4	4.02E+04	1.24E+03	9.81E+02	1.80E+03
WQSP-5	1.13E+04	5.95E+02	3.76E+02	1.12E+03
WQSP-6	4.69E+03	2.01E+02	1.63E+02	7.14E+02

Sample Type: Ground Water
 Year: 2025
 Analysis Performed: pH

Sample Location	pH @ 23°C
WQSP-1	6.86
WQSP-2	7.05
WQSP-3	7.32
WQSP-4	7.42
WQSP-5	7.62
WQSP-6	8.02

Sample Type: Ground Water

Year: 2025
Analysis Performed: Conductivity

Sample Location	Conductivity mS/cm	Temperature °C
WQSP-1	85.4	21.7
WQSP-2	83.6	21.7
WQSP-3	198.8	18.6
WQSP-4	128.9	20.4
WQSP-5	46.8	22.6
WQSP-6	21.0	18.6

Sample Type: Ground Water
Year: 2025
Analysis Performed: Specific gravity

Sample Location	SG T/4°C
WQSP-1	1.041
WQSP-2	1.044
WQSP-3	1.129
WQSP-4	1.069
WQSP-5	1.024
WQSP-6	1.007

Sample Type: Ground Water
Year: 2025
Analysis Performed: TOC

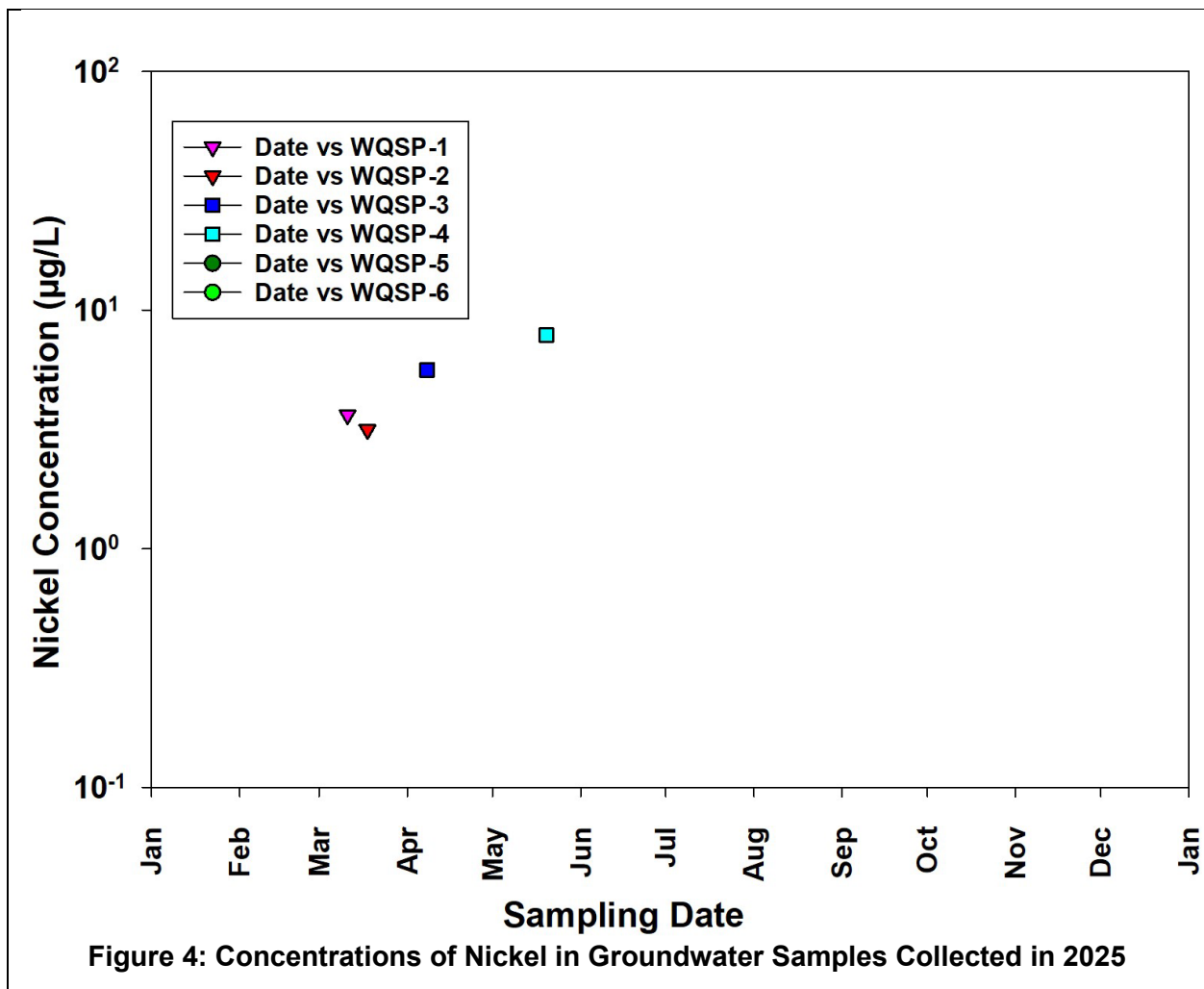
Sample Location	TOC mg/L
WQSP-1	1.440
WQSP-2	1.322
WQSP-3	0.969
WQSP-4	3.497
WQSP-5	4.130
WQSP-6	1.384

Sample Type: Ground Water
Year: 2025
Analysis Performed: TDS/TSS

Sample Location	TDS mg/L	TSS mg/L
WQSP-1	66480.00	N.D.
WQSP-2	66440.00	N.D.
WQSP-3	229580.00	60.00
WQSP-4	111260.00	20.00
WQSP-5	35020.00	40.00
WQSP-6	15440.00	180.00

Sample Type: Ground Water
 Year: 2025
 Analysis Performed: Metals

Metals	WQSP-1 µg/L	WQSP-2 µg/L	WQSP-3 µg/L	WQSP-4 µg/L	WQSP-5 µg/L	WQSP-6 µg/L
Cd	0.1601	<MDC	<MDC	<MDC	<MDC	2.26575
Co	0.6465	<MDC	<MDC	<MDC	<MDC	1.5122
Cr	<MDC	<MDC	15.8467	<MDC	3.26515	2.41995
Cu	<MDC	<MDC			<MDC	<MDC
Eu	0.3206	<MDC	<MDC	<MDC	<MDC	<MDC
La	0.553	<MDC	<MDC	<MDC	<MDC	5.71325
Ni	3.6407	3.1548	5.6259	7.8804	<MDC	<MDC
Pb	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC
Th	<MDC	<MDC	<MDC	<MDC	<MDC	<MDC
U	11.0011	9.3027	<MDC	5.1374	3.89445	3.48635
Zn		<MDC			<MDC	<MDC



Proficiency Test Results

Sample Type: Proficiency Test
Year: 2026
Analysis Performed: Cations (Hardness)



A Waters Company

WS-354 Final Evaluation Report

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EPA ID:
ERA Customer Number:
Report Issued:
Study Dates:

Not Reported
N215603
03/02/2026
01/12/2026 - 02/26/2026

TNI Analyte Code	Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Performance Evaluation	Method Description	Analysis Date	Z Score	Study Mean	Study Standard Deviation	Analyst Name
WS Hardness (cat# 555, lot# S354-693)												
1035	Calcium	mg/L	45.7	42.9	36.5 - 49.3	Acceptable	ASTM D6919-09 2009	2/17/2026	1.03	43.6	2.02	
1085	Magnesium	mg/L	19.0	19.3	16.4 - 22.2	Acceptable	ASTM D6919-09 2009	2/17/2026	-0.555	19.5	0.881	
1155	Sodium	mg/L	48.7	43.7	37.1 - 50.3	Acceptable	ASTM D6919-09 2009	2/17/2026	2.29	43.8	2.15	
1550	Calcium Hardness as CaCO3	mg/L	114.4	107	91.0 - 123	Acceptable	ASTM D6919-09 2009	2/17/2026	1.15	109	4.46	
1755	Total Hardness as CaCO3	mg/L	192.4	187	159 - 215	Acceptable	ASTM D6919-09 2009	2/17/2026	0.446	189	6.77	

Sample Type: Proficiency Test
Year: 2026
Analysis Performed: Mercury

Drinking Water

Sample Type: Drinking Water

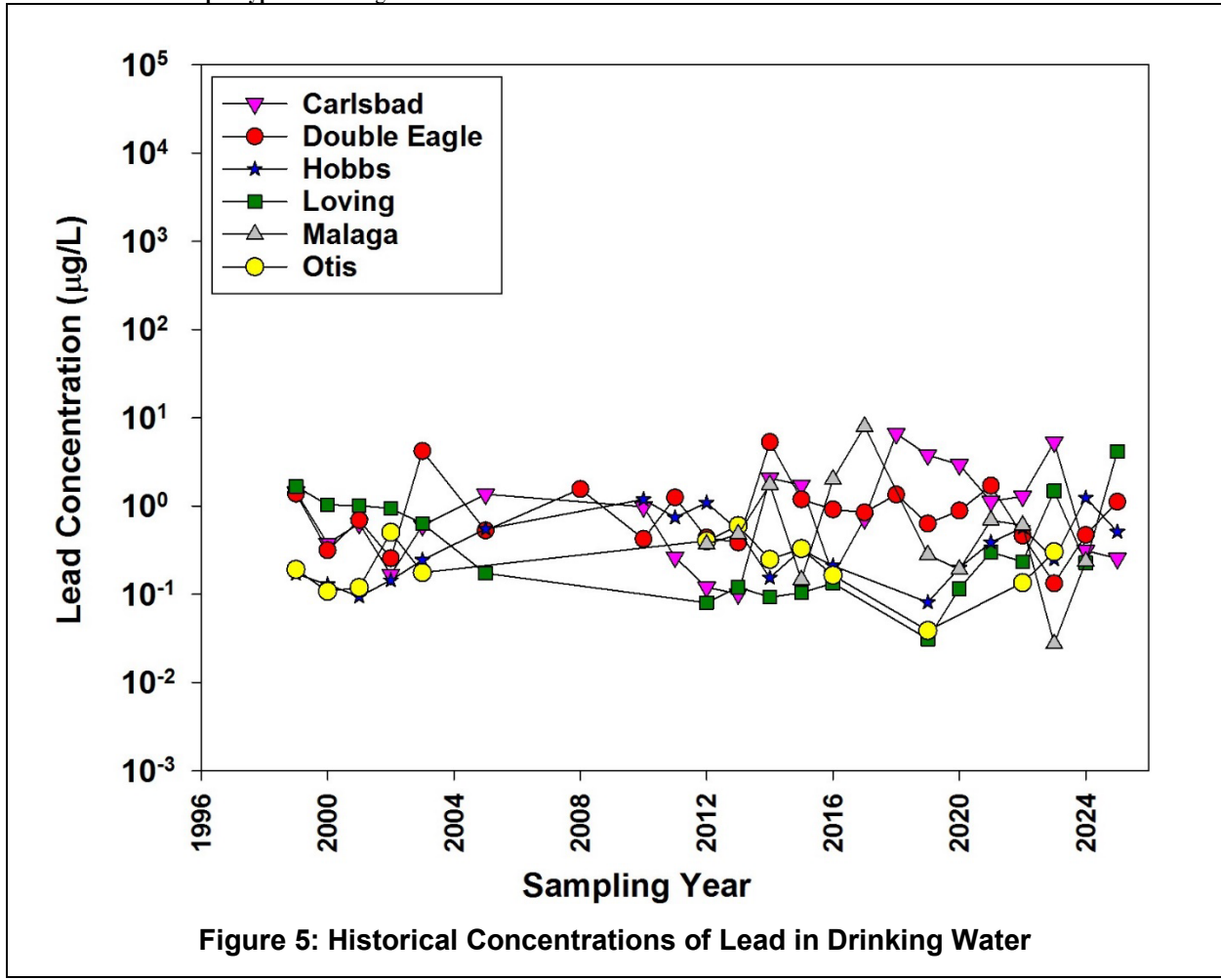
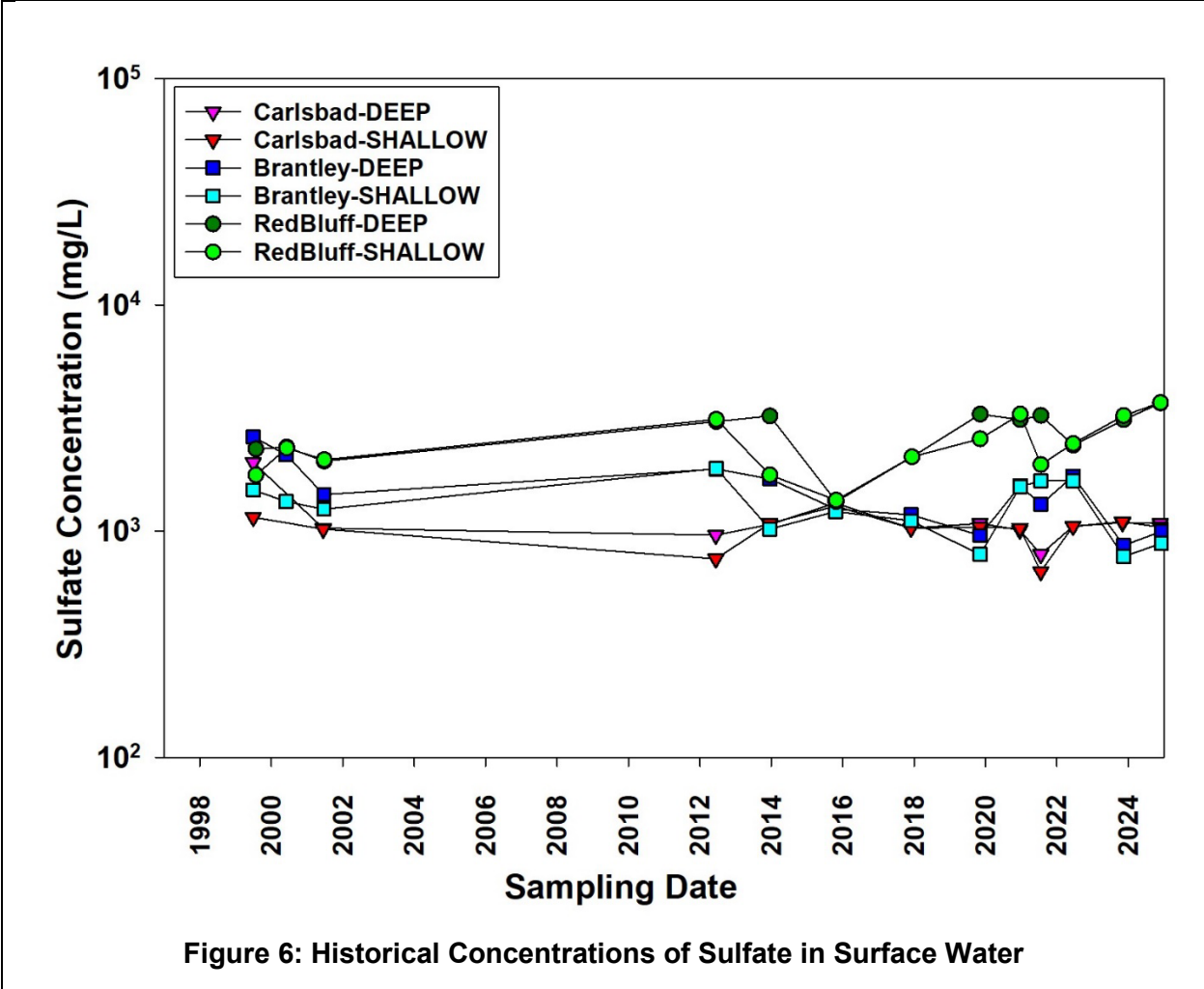


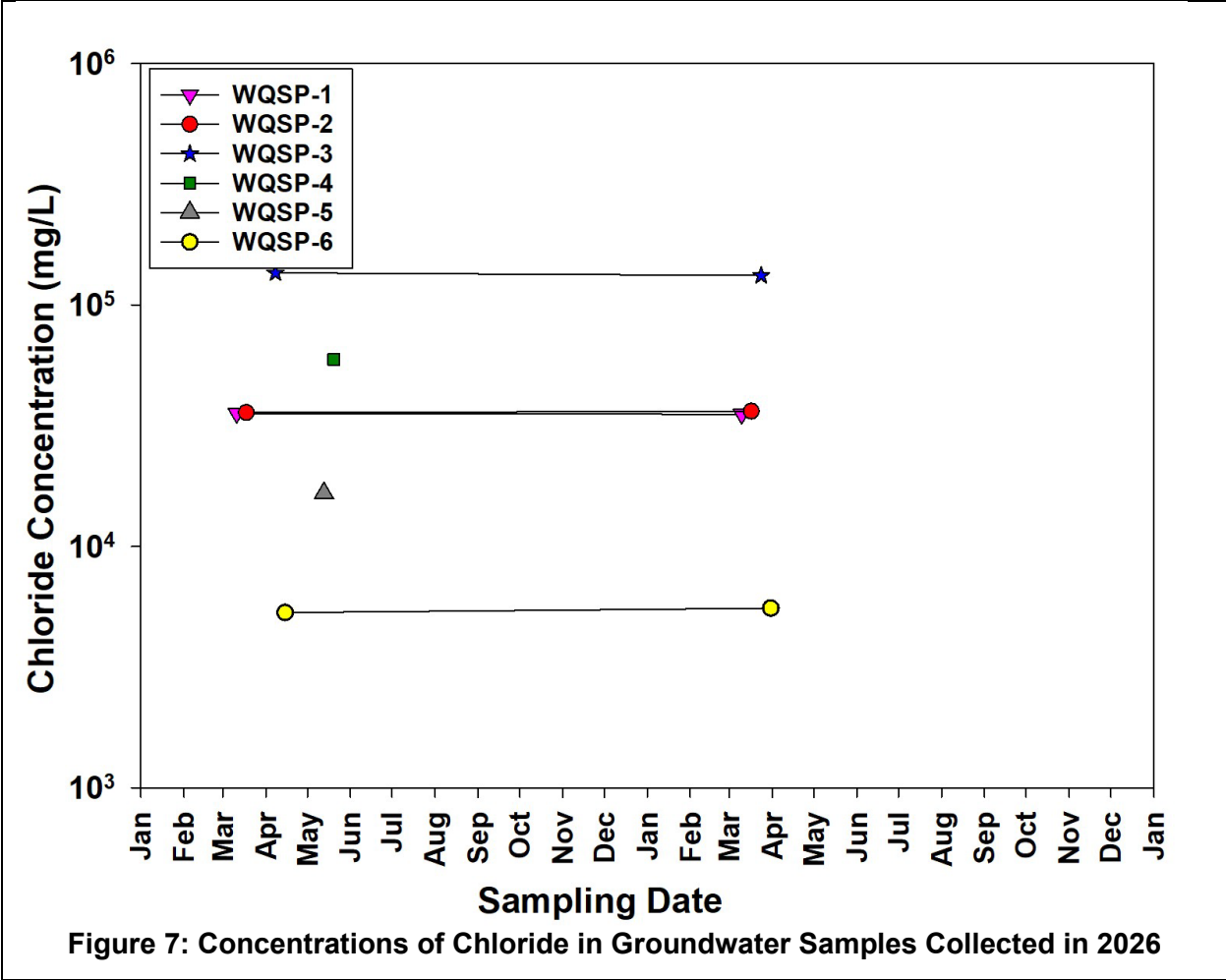
Figure 5: Historical Concentrations of Lead in Drinking Water



Groundwater

Sample Type: Ground Water
 Year: 2026
 Analysis Performed: Anions

Sample Location	Chloride mg/L	Nitrate mg/L	Phosphate mg/L	Sulfate mg/L
WQSP-1	3.53E+04	<MDL	<MDL	4.50E+03
WQSP-2	3.64E+04	<MDL	<MDL	5.50E+03
WQSP-3	1.33E+05	<MDL	<MDL	7.64E+03
WQSP-4				
WQSP-5				
WQSP-6	5.55E+03	<MDL	<MDL	4.61E+03



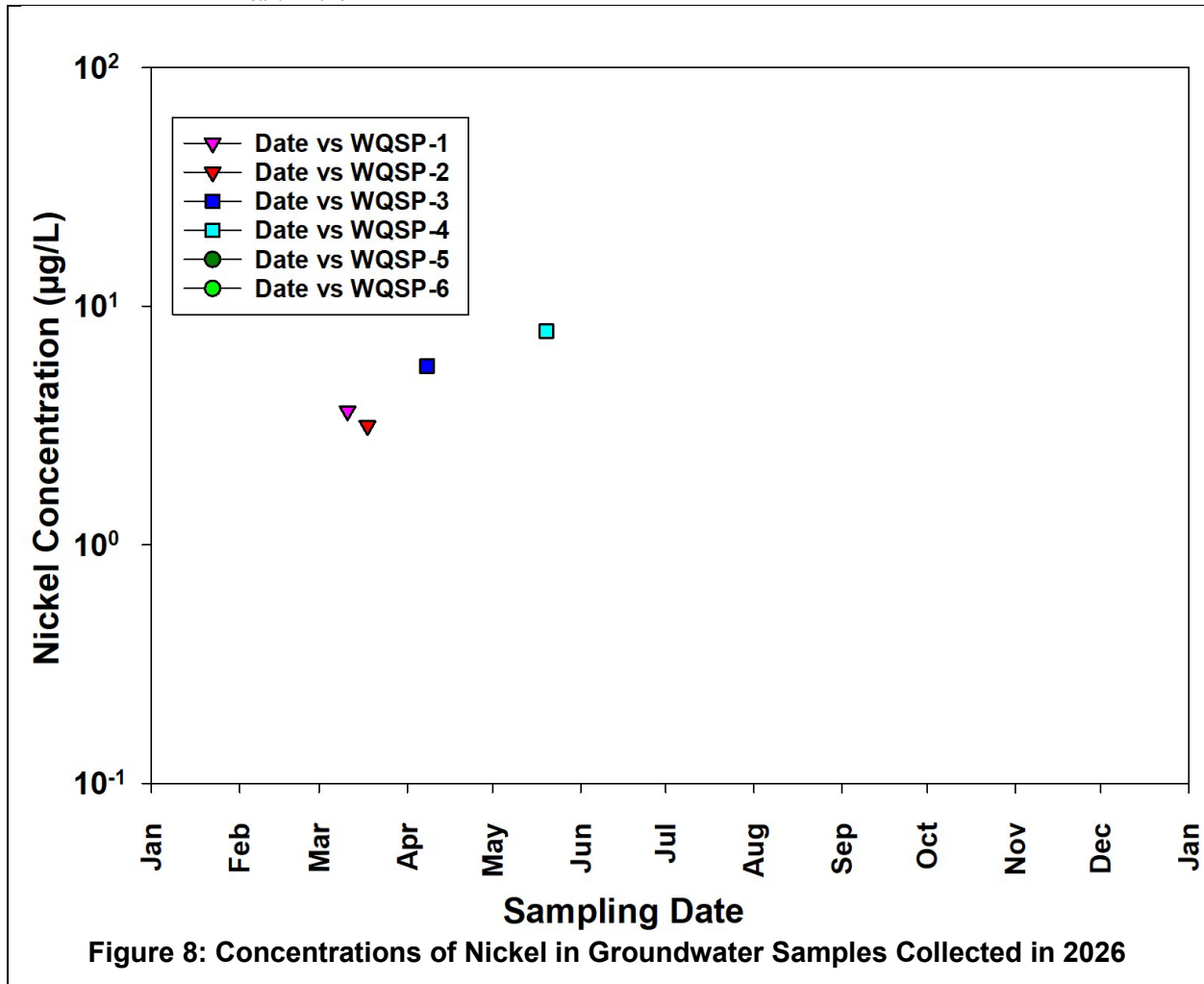
Sample Type: Ground Water
Year: 2026
Sample Type: Ground Water
Year: 2026
Analysis Performed: Specific gravity

Sample Location	SG _{T/4°C}
WQSP-1	1.043
WQSP-2	1.047
WQSP-3	1.134
WQSP-4	
WQSP-5	
WQSP-6	1.011

Sample Type: Ground Water
Year: 2026
Analysis Performed: TOC
Sample Type: Ground Water
Year: 2026
Analysis Performed: TDS/TSS

Sample Location	TDS mg/L	TSS mg/L
WQSP-1	66460.00	40.00
WQSP-2	66160.00	20.00
WQSP-3	220540.00	60.00
WQSP-4		
WQSP-5		
WQSP-6		

Sample Type: Ground Water
Year: 2026



Internal Dosimetry Group and Public Outreach

***In vivo* radiobioassay measurements performed during the reporting period**

The total number of radiobioassay measurements performed during this reporting period was 47. None for WIPP personnel, 44 for the contract radiological personnel and those working in the laboratories located at CEMRC, and 3 for public participants.

CEMRC Lung and Whole-Body APEX In-Vivo radiobioassay system annual energy and efficiency calibrations for 2026-2027 period

Successfully performed the annual energy and efficiency calibrations of CEMRC Lung and Whole-Body APEX In-vivo radiobioassay measurement system during January-March 2026.

Waste Isolation Pilot Plant (WIPP) annual quality assurance (QA) audit

The WIPP annual onsite audit was conducted between February 9 and 12, 2026 at CEMRC for the In-Vivo Radiobioassay (Lung and Whole Body) system to evaluate CEMRC's QA program. Based on the audit team's review of objective evidence and discussions with CEMRC staff, it was determined that CEMRC has maintained their QA program and was recommended to remain on the WIPP Qualified Suppliers List (QSL) for the current scope.

Outreach activities:

The Internal Dosimetry group continues to interact with the public to encourage the Lie Down and Be Counted (LDBC) project's lung and whole body in-vivo radiobioassay measurements at CEMRC. CEMRC also promotes awareness of environmental monitoring and research, to the public.

During this reporting period:

- 02/07/2026 – Southeast New Mexico Regional Science Bowl 2026 at Southeast New Mexico College from 7 AM to 2 pm. Explained CEMRC's roles and laboratory activities, handed out LDBC brochures, and demonstrated simple science experiments to participants and visitors.

Low Background Radiation Experiment (LBRE)

With an influx of funding in February 2026, we were able to send off 41 samples of RNA purified from a *Drosophila* development experiment run in August 2025 out at WIPP. The RNA was sent off in two shipments to Azenta, the RNA-Seq company that has performed the sequencing for the last number of WIPP publications (e.g., Thawng and Smith, 2022 and 2023). In August 2025, Smith and Jacob Angel (the NMSU undergraduate student who was supported on LBRE funds) ran a 14 consecutive-day experiment at WIPP, collecting and purifying an unprecedented number (41) of WIPP RNA samples.

The experiment entailed the use of seven separate controls: 1. *Drosophila* reared at NMSU to represent 2 and 3-day old larvae (2 controls). 2. These growth stages were replicated at the WIPP control surface laboratory, and a 5- day control was added to provide a reference for parallel larval stages grown in the WIPP underground (3 controls). 3. Adult males and females were grown at the surface to function as controls for the parallel adults that were grown in the underground (2 controls). In RNA transcriptome analyses, these controls must be compared one at a time with their respective treatments, and so there are a total of 15 pair-wise comparisons needed to parse out single variable treatment effects (Table 1). With no graduate students or postdoctoral scholars currently working on the LBRE project, Molecular Research has been contracted to help analyze these data before the retirement of PI G. Smith on July 1, 2026.

Table 1. Pair-wise RNA-Seq comparisons that have been carried out by Azenta, with follow-up analyses currently being carried out by Molecular Research.

▼	Control_Group	▼	Treatment_Group
1	<i>SURFACE 3D</i>		<i>UNDER 3D</i>
2	<i>2D NMSU</i>		<i>SURFACE 3D</i>
3	<i>2D NMSU</i>		<i>UNDER 3D</i>
4	<i>SURFACE 5D</i>		<i>UNDER 5D</i>
5	<i>3D NMSU</i>		<i>SURFACE 5D</i>
6	<i>3D NMSU</i>		<i>UNDER 5D</i>
7	<i>2D NMSU</i>		<i>MOLD</i>
8	<i>SURFACE M</i>		<i>UNDER M</i>
9	<i>SURFACE F</i>		<i>UNDER F</i>
10	<i>SURFACE M + SURFACE F</i>		<i>UNDER M + UNDER F</i>
11	<i>SURFACE M</i>		<i>SURFACE F</i>
12	<i>UNDER M</i>		<i>UNDER F</i>
13	<i>SURFACE 3D</i>		<i>SURFACE 5D</i>
14	<i>UNDER 3D</i>		<i>UNDER 5D</i>
15	<i>2D NMSU</i>		<i>3D NMSU</i>

The following are preliminary analyses performed in collaboration with Dr. Scot Dowd at Molecular Research. First, it appears that the NMSU controls and the WIPP surface controls behaved similarly, consistent with the background radiation fluxes (50-100 nGy/hr) that the *Drosophila* larvae experienced at both locations. Secondly, the strongest transcriptional differences are observed when comparing surface and underground conditions within the same developmental stage. This supports the interpretation that the radiation-deprived underground environment is driving the primary biological signal and that geographical factors are not contributing to the biological response.

Lastly, larvae grown in the underground conditions showed coordinated suppression of protein translational pathways, which is consistent with previous results we have reported before (Castillo et al. 2018). In the preliminary results we are reporting here, these patterns were consistent across developmental stages, indicating a reproducible and system-level transcriptional response to reduced background radiation.

References.

Castillo, H. X. Li, F. Shilkey and G.B. Smith. (2018). Transcriptome analysis reveals a stress response of *Shewanella oneidensis* deprived of background radiation levels of ionizing radiation. PLoS ONE May 16, 2018 1-22

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0196472#:~:text=oneidensis%20shows%20a%20growth%20phase,on%20it%20to%20maintain%20homeostasis.>

Thawng, C., Smith, G. (2022). A transcriptome software comparison for the analyses of treatments expected to give subtle gene expression responses.. *BMC Genomics / BioMed Central*, 23, 452. <https://bmcbgenomics.biomedcentral.com/articles/10.1186/s12864-022-08673-8#Sec8>

Thawng, C.N. and G.B. Smith. (2023). Transcriptome software results show significant variation among different commercial pipelines BMC (BioMedCentral) Genomics 24, 662.

<https://bmcbgenomics.biomedcentral.com/articles/10.1186/s12864-023-09683-w#citeas>