Quarterly Report

Calendar Year 2025 – Fourth Quarter, October 1 – December 31, 2025

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

January 2026

Field Programs - Radiation Safety Group

WIPP Underground Effluent Monitoring (Station F)

From October 1st to December 31st, a total of 117 filters were collected from the primary skid at Station F, (96 sample filters, 10 trip blanks and 11 filter blanks).

All 117 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 October 1st to December 31st, a total of 113 filters were collected from the secondary skid at Station F, (92 sample filters, 10 trip blanks and 11 filter blanks).

All 113 filters from the secondary 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 October 1st to December 31st, a total of 114 filters were collected from the primary skid at Station G, (93 sample filters, 10 trip blanks and 11 filter blanks).

All 114 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 October 1st to December 31st, a total of 112 filters were collected from the secondary skid at Station G, (91 sample filters, 10 trip blanks and 11 filter blanks).

All 112 filters from the secondary 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 October 1st to December 31st, 6 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 October 1st to December 31st, 2 Whatman-41 filters and 1 trip blank filter 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 October 1st to December 31st**,** 33 soil samples were collected. Thirty-six soil samples were processed. Sixty-six soil samples were transferred to the RC group.

Vegetation sampling

No activity to report this quarter.

Surface Water Monitoring

From October 1st to December 31st, 4 surface water samples were collected. All samples were processed and transferred to both the EC and RC groups.

Drinking Water Monitoring

No activity to report this quarter.

Sediment Monitoring

From October 1st to December 31st, 2 sediment samples were collected. Four samples are currently undergoing processing.

Groundwater Monitoring

No activity to report this quarter.

Nuclear Materials Management and Safeguards

From October 1st to December 31st, 2025, the Radiation Safety group (RS) collected and bulked radioactive waste from NMSU, LANL, and the WIPP 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. The date of the last inspection was December 10, 2025. Ludlum 30/30 instruments with expiring calibrations were replaced with calibrated instruments in laboratories on November 5, 2025. All hazardous acid waste was removed from CEMRC and WIPP Labs and was sent for proper waste disposal via Clean Harbors on December 15. Floor mats near doors were changed weekly; eye wash stations, and showers were inspected to function properly; last inspection was performed on December 9.

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 December 2025 were submitted to CBFO on January 14, 2026.

The draft 2024 Annual Report was completed and submitted to DOE CBFO. In addition:

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

- Eight groundwater samples
- Eight surface water samples
- Nine FAS samples
- Five soil samples
- Five HiVol samples

Actinide activity concentrations were analyzed in:

- Twelve FAS samples
- Six HiVol samples

Characteristic results are included in the following pages.

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*************************************************************************
*                      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)
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UD = User Driven N-Sigma Test (In = Investigate, Ac = Action)
BS = 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	MDC
K-40	1460.81	0.725	0.009	10.6700	0.1100	4.66412E+11	2.92192E+09	-2.74954E-02	1.25452E-01	4.35655E-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	5.55037E-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	3.40890E-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	3.32345E-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	4.36082E-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	4.38912E-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	1.15241E-01
CS-134	604.69	1.672	0.025	97.6000	0.0000	7.53125E+02	0.00000E+00	-2.02530E-02	2.51181E-02	8.42246E-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	5.57077E-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	5.33668E-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	7.68320E-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	1.77381E-01
AM-241	59.54	4.746	0.000	36.3000	0.0000	1.58153E+05	0.00000E+00	-1.79901E-02	1.93242E-02	0.00000E+00

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: 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

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*****************************************************************************
*                      New Mexico State University                          *
*                       Quality Assurance Report                            *
*****************************************************************************


Report Date          : 12/22/25  4:25:33 PM
QA File              : C:\Genie2k\CAMFILES\New_CalVer3.QAF
Analyst              :
Sample ID            : D3E251222
Sample Quantity      :      1.00
Sample Date          : 8/1/94   12:00:00 PM
Measurement Date     : 12/22/25  4:19:28 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	1.2179E+02	< >
LU	779 Pk Energy	7.7789E+02	7.7989E+02	7.7884E+02	< >
LU	1408 Pk Energy	1.4069E+03	1.4089E+03	1.4084E+03	< >
LU	121 FWHM	7.0000E-01	2.1000E+00	1.8881E+00	< >
LU	779 FWHM	1.4000E+00	3.1000E+00	2.6621E+00	< >
LU	1408 FWHM	1.9000E+00	4.5000E+00	2.6208E+00	< >
LU	121 DCA	1.0000E+00	1.2000E+00	1.1317E+00	< >
LU	779 DCA	1.0000E+00	1.2000E+00	1.0948E+00	< >
LU	1408 DCA	1.0000E+00	1.2500E+00	1.0942E+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)
BS = Measurement Bias Test (In = Investigate, Ac = Action)

Reviewed by: _____

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* 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.                                              *
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*  IS ACCEPTABLE IF IT LIES BETWEEN +/- 25% OF THE TRUE SOURCE                *
*  ACTIVITY.                                                                  *
*******************************************************************************
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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	:	HiVol53379R
Sample Description	:	HiVol53379R
	:	
Calibration ID	:	
Background ID	:	
Sample Collection Date	:	7/18/2025 12:00:00 PM
Count Start Date	:	12/22/2025 4:32:33 PM
Sample Aliquot	:	1.00000E+00
Aliquot Unc.	:	0.00000E+00
Aliquot Unit	:	
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	MDC
K-40	1460.81	0.725	0.009	10.6700	0.1100	4.66412E+11	2.92192E+09	8.92272E-01	1.78316E-01	5.39492E-01
MN-54	834.82	1.233	0.013	99.9750	0.0000	3.12700E+02	0.00000E+00	-3.90265E-02	1.85966E-02	6.52327E-02
CO-57	122.06	5.229	0.069	85.5100	0.1800	2.70900E+02	6.00000E-01	-2.85828E-03	1.34531E-02	4.48533E-02
CO-57	136.47	5.087	0.072	10.6000	0.1800	2.70900E+02	6.00000E-01	3.30576E-01	1.47645E-01	4.83543E-01
CO-60	1173.22	0.896	0.010	100.0000	0.0000	1.92518E+03	3.65240E-01	1.20849E-02	1.27452E-02	4.26988E-02
CO-60	1332.49	0.794	0.009	100.0000	0.0000	1.92518E+03	3.65240E-01	-1.38216E-02	1.36165E-02	4.81535E-02
ZN-65	1115.52	0.940	0.010	50.7500	0.0000	2.44400E+02	0.00000E+00	3.29422E-02	3.87752E-02	1.30024E-01
CS-134	604.69	1.672	0.025	97.6000	0.0000	7.53125E+02	0.00000E+00	-2.72691E-02	1.62535E-02	5.56849E-02
CS-134	795.84	1.289	0.014	85.4000	0.0000	7.53125E+02	0.00000E+00	8.74409E-03	1.36318E-02	4.58456E-02
CS-137	661.65	1.535	0.021	85.1200	0.2300	1.10193E+04	1.09572E+01	4.71487E-02	1.68711E-02	5.45761E-02
RA-226	186.21	4.451	0.076	3.2800	0.0000	5.84384E+05	1.82620E+02	-7.61711E-02	2.86466E-01	9.54925E-01
RA-228	911.07	1.136	0.011	27.7000	1.0000	2.10013E+03	0.00000E+00	1.38925E-01	4.98946E-02	1.59322E-01
AM-241	59.54	4.746	0.000	36.3000	0.0000	1.58153E+05	0.00000E+00	2.98124E-02	1.92275E-02	0.00000E+00

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: HiVol53379R
Peak Analysis Performed on: 12/24/2025 4:32:55 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	0.36	8.869E+01	114.37	1.708E+03
2	490-	507	501.75	122.06	0.60	-1.473E+01	138.69	2.107E+03
3	552-	575	560.86	136.47	0.96	2.055E+02	183.34	3.016E+03
4	758-	776	764.90	186.21	0.27	-1.921E+01	144.51	2.390E+03
5	2474-	2489	2481.60	604.69	0.24	-6.655E+01	79.31	8.626E+02
6	2704-	2726	2715.26	661.65	2.91	1.054E+02	75.39	5.766E+02
7	3258-	3273	3265.74	795.84	0.68	1.440E+01	44.89	2.576E+02
8	3418-	3435	3425.65	834.82	0.24	-5.853E+01	55.77	4.125E+02
9	3729-	3748	3738.44	911.07	0.27	7.171E+01	51.23	2.763E+02
10	4570-	4585	4577.14	1115.52	0.36	1.734E+01	40.81	2.187E+02
11	4806-	4822	4813.82	1173.22	0.24	1.768E+01	37.30	1.763E+02
12	5459-	5476	5467.18	1332.49	0.24	-1.791E+01	35.29	1.729E+02
13	5981-	6006	5993.59	1460.81	0.69	1.193E+02	47.54	1.937E+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 : 12/20/25 12:07:31 PM
QA File : C:\Genie2k\CAMFILES\New_CalVer3.QAF
Analyst :
Sample ID : D3E12202025
Sample Quantity : 1.00
Sample Date : 8/1/94 12:00:00 PM
Measurement Date : 12/20/25 12:01:26 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	1.2182E+02	< >
LU	779 Pk Energy	7.7789E+02	7.7989E+02	7.7890E+02	< >
LU	1408 Pk Energy	1.4069E+03	1.4089E+03	1.4085E+03	< >
LU	121 FWHM	7.0000E-01	2.1000E+00	1.9234E+00	< >
LU	779 FWHM	1.4000E+00	3.1000E+00	2.4039E+00	< >
LU	1408 FWHM	1.9000E+00	4.5000E+00	2.5330E+00	< >
LU	121 DCA	1.0000E+00	1.2000E+00	1.1444E+00	< >
LU	779 DCA	1.0000E+00	1.2000E+00	1.0597E+00	< >
LU	1408 DCA	1.0000E+00	1.2500E+00	1.1024E+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)
BS = 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.                                                             *
**************************************************************************
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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	Soil57567
Sample Description	Soil57567
Calibration ID	
Background ID	
Sample Collection Date	4/29/2025 12:00:00 PM
Count Start Date	12/20/2025 12:08:54 PM
Sample Aliquot	1.00000E+00
Aliquot Unc.	0.00000E+00
Aliquot Unit	
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	MDC
K-40	1460.81	0.432	0.009	10.6700	0.1100	4.66412E+11	2.92192E+09	1.13180E+02	2.87277E+00	2.18419E+00
MN-54	834.82	0.700	0.010	99.9750	0.0000	3.12700E+02	0.00000E+00	6.90089E-02	5.18761E-02	1.71335E-01
CO-57	122.06	2.551	0.064	85.5100	0.1800	2.70900E+02	6.00000E-01	-3.96221E-02	5.22826E-02	1.73895E-01
CO-57	136.47	2.566	0.061	10.6000	0.1800	2.70900E+02	6.00000E-01	-2.24558E-01	6.30382E-01	2.08666E+00
CO-60	1173.22	0.524	0.008	100.0000	0.0000	1.92518E+03	3.65240E-01	-6.09583E-03	3.57835E-02	1.21313E-01
CO-60	1332.49	0.469	0.008	100.0000	0.0000	1.92518E+03	3.65240E-01	2.89067E-02	3.66174E-02	1.22336E-01
ZN-65	1115.52	0.548	0.008	50.7500	0.0000	2.44400E+02	0.00000E+00	-8.29200E-01	2.50183E-01	8.55077E-01
CS-134	604.69	0.919	0.014	97.6000	0.0000	7.53125E+02	0.00000E+00	-5.04882E-01	8.07133E-02	2.74727E-01
CS-134	795.84	0.728	0.011	85.4000	0.0000	7.53125E+02	0.00000E+00	3.03531E-01	6.25747E-02	1.99022E-01
CS-137	661.65	0.851	0.013	85.1200	0.2300	1.10193E+04	1.09572E+01	3.41316E-01	5.13093E-02	1.61002E-01
RA-226	186.21	2.351	0.060	3.2800	0.0000	5.84384E+05	1.82620E+02	9.81252E+00	1.02218E+00	3.15579E+00
RA-228	911.07	0.650	0.009	27.7000	1.0000	2.10013E+03	0.00000E+00	5.55594E+00	3.27462E-01	6.78383E-01
AM-241	59.54	1.575	0.000	36.3000	0.0000	1.58153E+05	0.00000E+00	-4.05830E-02	1.61372E-01	0.00000E+00

13 nuclide lines identified

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

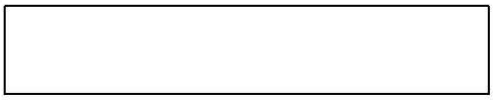
Detector Name: DET03
Sample Title: Soil57567
Peak Analysis Performed on: 12/22/2025 12:09:21 PM

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	232-	252	245.28	59.54	0.52	-4.006E+01	159.29	1.014E+04
2	494-	510	501.75	122.06	0.24	-8.164E+01	107.71	5.252E+03
3	548-	575	560.86	136.47	0.42	-5.769E+01	161.94	8.761E+03
4	753-	777	764.90	186.21	1.90	1.307E+03	131.98	6.277E+03
5	2474-	2499	2481.60	604.69	0.24	-6.306E+02	100.38	4.111E+03
6	2702-	2727	2715.26	661.65	2.32	4.211E+02	62.99	1.448E+03
7	3247-	3273	3265.74	795.84	2.68	2.627E+02	54.03	1.062E+03
8	3418-	3433	3425.65	834.82	1.14	4.942E+01	37.15	6.986E+02
9	3722-	3755	3738.44	911.07	2.20	1.600E+03	70.90	1.185E+03
10	4566-	4596	4577.14	1115.52	0.24	-2.039E+02	61.45	1.481E+03
11	4806-	4821	4813.82	1173.22	0.24	-5.076E+00	29.80	4.941E+02
12	5459-	5478	5467.18	1332.49	0.24	2.154E+01	27.28	3.595E+02
13	5972-	6014	5993.59	1460.81	2.80	9.017E+03	108.29	8.434E+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\0000067713.Cnf
Batch Identification: 2025_FAS_F_July0
Sample Identification: Oct-04_Pu
Procedure Description: Pu - 3 Days

Detector Name: 4-12
Env. Background: System Bkgd 74161

Sample Size: 5.0042E-01 +/- 0.0000E+00 unit
Sample Date/Time: 12/16/2025 5:15:22 PM
Acquisition Date/Time: 12/16/2025 5:15:22 PM
Acquisition Live Time: 4320.0 minutes
Acquisition Real Time: 4320.0 minutes

Tracer Certificate: 450_Pu-242_T
Tracer Quantity: 0.101 mL
Counting Efficiency: 0.3296 +/- 0.0037 on 8/1/2025 12:34:05 PM
Chem. Rec. Factor (%): 91.08 +/- 2.2183

PEAK AREA REPORT

Nuclide		Energy (MeV)	Net Pk Area	Pk Area Error %	Ambient Backgnd	FWHM (keV)
PU-238		5.472	235.67	13.76	2.00	15.5
PU-239		5.126	86.17	37.18	1.00	4.7
PU-242	T	4.869	2204.00	4.26	2.00	33.7

T = Tracer Peak used for Effective Efficiency

NUCLIDE ANALYSIS RESULTS

Nuclide	Energy (keV)	Activity (Bq /unit)	MDA (Bq /unit)
PU-238	5487.10*	6.058E-03 +/- 8.741E-04	6.954E-04 +/- 3.007E-05
PU-239	5147.70*	2.215E-03 +/- 8.292E-04	1.630E-03 +/- 7.051E-05
PU-242	4890.70*	5.637E-02 +/- 2.438E-03	3.072E-04 +/- 1.328E-05

[PS 0

Sample Description:
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000067697.Cnf
Batch Identification: 2025_FAS_F_July_
Sample Identification: Aug02_Am
Procedure Description: Am - 3 Days

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

Sample Size: 4.9940E-01 +/- 0.0000E+00 unit
Sample Date/Time: 12/16/2025 5:06:32 PM
Acquisition Date/Time: 12/16/2025 5:06:32 PM
Acquisition Live Time: 4320.0 minutes
Acquisition Real Time: 4320.0 minutes

Tracer Certificate: 1322_Am-243-4_T
Tracer Quantity: 0.100 mL
Counting Efficiency: 0.3287 +/- 0.0037 on 7/29/2025 11:05:28 AM
Chem. Rec. Factor (%): 92.40 +/- 2.0791

PEAK AREA REPORT

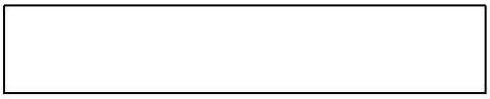
Nuclide		Energy (MeV)	Net Pk Area	Pk Area Error %	Ambient Backgnd	FWHM (keV)
AM-241		5.474	6.00	115.47	3.00	3.0
AM-243	T	5.236	2817.00	3.77	2.00	62.3

T = Tracer Peak used for Effective Efficiency

NUCLIDE ANALYSIS RESULTS

Nuclide	Energy (keV)	Activity (Bq /unit)	MDA (Bq /unit)
AM-241	5479.10*	1.527E-04 +/- 1.764E-04	3.589E-04 +/- 1.400E-05
AM-243	5270.00*	7.193E-02 +/- 2.806E-03	3.066E-04 +/- 1.196E-05

[PS 0



Sample Description:
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000067720.Cnf
Batch Identification: 2025_FAS_F_July0
Sample Identification: Nov-02U
Procedure Description: U - 3 Days (Blank Corrected)

Detector Name: 6-04
Env. Background: System Bkgd 74257

Sample Size: 4.9901E-01 +/- 0.0000E+00 unit
Sample Date/Time: 12/16/2025 5:22:15 PM
Acquisition Date/Time: 12/16/2025 5:22:15 PM
Acquisition Live Time: 4320.0 minutes
Acquisition Real Time: 4320.0 minutes

Tracer Certificate: 1320_U232_2
Tracer Quantity: 0.106 mL
Counting Efficiency: 0.3199 +/- 0.0035 on 8/8/2025 12:10:36 PM
Chem. Rec. Factor (%): 88.90 +/- 4.8121

PEAK AREA REPORT

Nuclide		Energy (MeV)	Net Pk Area	Pk Area Error %	Ambient Backgnd	FWHM (keV)
U-232	T	5.279	3265.00	3.50	4.00	44.6
U-234		4.722	-19.55	123.03	1.00	7.3
U-235		4.350	-6.79	134.05	1.00	2.9
U-238		4.157	-4.37	467.56	0.00	3.7

T = Tracer Peak used for Effective Efficiency

NUCLIDE ANALYSIS RESULTS

Nuclide	Energy (keV)	Activity (Bq /unit)	MDA (Bq /unit)
U-232	5302.50*	8.894E-02 +/- 9.424E-03	4.321E-04 +/- 4.579E-05
U-234	4761.50*	-5.326E-04 +/- 6.576E-04	1.697E-03 +/- 1.798E-04
U-235	4385.50*	-2.282E-04 +/- 3.069E-04	9.108E-04 +/- 9.651E-05
U-238	4184.40*	-1.186E-04 +/- 5.545E-04	1.389E-03 +/- 1.472E-04

[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

[PS 0

Sample Description:
Spectrum File: C:\Canberra\ApexAlpha\Root\Data\0000067686.Cnf
Batch Identification: 2025_HiVol_Nov11
Sample Identification: 56478_U
Procedure Description: U - 3 Days (Blank Corrected)

Detector Name: 2-08
Env. Background: System Bkgd 74009

Sample Size: 5.0003E-01 +/- 0.0000E+00 unit
Sample Date/Time: 12/16/2025 1:43:05 PM
Acquisition Date/Time: 12/16/2025 1:43:05 PM
Acquisition Live Time: 4320.0 minutes
Acquisition Real Time: 4320.1 minutes

Tracer Certificate: 1320_U232_2
Tracer Quantity: 0.076 mL
Counting Efficiency: 0.3294 +/- 0.0037 on 7/22/2025 11:52:11 AM
Chem. Rec. Factor (%): 107.93 +/- 5.8815

PEAK AREA REPORT

Nuclide		Energy (MeV)	Net Pk Area	Pk Area Error %	Ambient Backgnd	FWHM (keV)
U-232	T	5.269	2918.00	3.71	5.00	68.9
U-234		4.720	2190.36	6.36	3.00	76.3
U-235		4.354	129.81	25.29	3.00	5.4
U-238		4.143	2023.83	6.62	1.00	59.4

T = Tracer Peak used for Effective Efficiency

NUCLIDE ANALYSIS RESULTS

Nuclide	Energy (keV)	Activity (Bq /unit)	MDA (Bq /unit)
U-232	5302.50*	6.346E-02 +/- 6.769E-03	3.787E-04 +/- 4.039E-05
U-234	4761.50*	4.764E-02 +/- 5.916E-03	5.278E-03 +/- 5.630E-04
U-235	4385.50*	3.483E-03 +/- 9.560E-04	1.547E-03 +/- 1.650E-04
U-238	4184.40*	4.383E-02 +/- 5.501E-03	5.052E-03 +/- 5.388E-04

Environmental Chemistry Group

From October 1st to December 31st, 2025, the Environmental Chemistry (EC) group conducted analyses for samples collected in the 3rd and 4th Quarters of 2025. Anion, cation, and metal analyses were performed for FAS filters from Station F (July weeks 3 and 4 and month of August). Anion and cation analyses were performed for Whatman filters of the 1st and 2nd quarters. Trace metal analyses were performed for groundwater samples. Anion, cation, pH, conductivity, specific gravity, and mercury analyses were performed for surface water sets #4 and #5.

The following tables and figures represent characteristics results.

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

Whatman Filters

Sample Type: Near Field (107), ambient air
Year: 2025
Analysis Performed: Anions

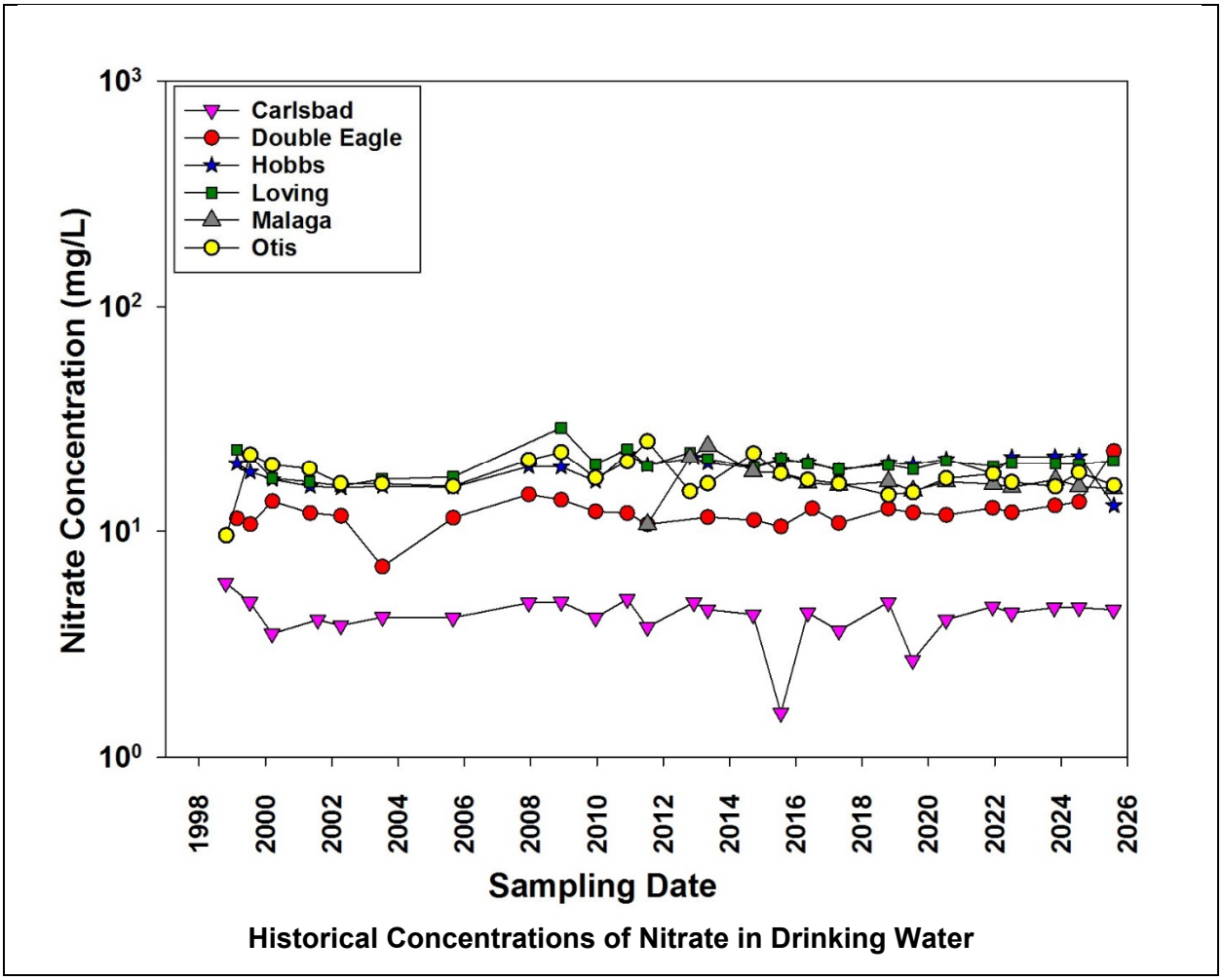
Start Date	Chloride µg/m³	Nitrate µg/m³	Phosphate µg/m³	Sulfate µg/m³
01/08/2025	9.20E-01	3.31E+00	2.73E-03	1.61E+00
01/29/2025	1.19E+00	3.77E+00	3.52E-03	5.16E+00
03/05/2025	7.49E-01	2.33E+00	3.15E-03	3.46E+00
03/21/2025	6.57E-01	3.83E+00	<MDL	3.38E+00
04/09/2025	4.48E-01	3.48E+00	3.67E-03	3.49E+00
04/25/2025	6.32E-01	4.35E+00	<MDL	4.34E+00
05/16/2025	2.00E-01	2.43E+00	<MDL	2.38E+00
06/11/2025	1.88E-01	2.06E+00	3.01E-03	2.40E+00

Sample Type: Cactus Flats (108), ambient air
Year: 2025
Analysis Performed: Anions

Start Date	Chloride µg/m³	Nitrate µg/m³	Phosphate µg/m³	Sulfate µg/m³
01/08/2025	3.24E-01	2.56E+00	1.94E-03	1.57E+00
01/29/2025	5.94E-01	3.23E+00	4.08E-03	4.07E+00
03/05/2025	5.29E-01	2.11E+00	<MDL	3.08E+00
03/21/2025	4.99E-01	2.52E+00	<MDL	2.51E+00
04/09/2025	4.20E-01	2.81E+00	<MDL	3.14E+00
04/25/2025	6.02E-01	3.81E+00	<MDL	4.12E+00
05/16/2025	1.82E-01	2.76E+00	<MDL	2.98E+00
06/11/2025	1.73E-01	1.73E+00	6.34E-03	2.27E+00

Drinking Water

Sample Type: Drinking Water
Year: 2025



Historical Concentrations of Nitrate in Drinking Water

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

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)		
Lake Carlsbad (Deep)		
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)		
Red Bluff (Deep)		

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

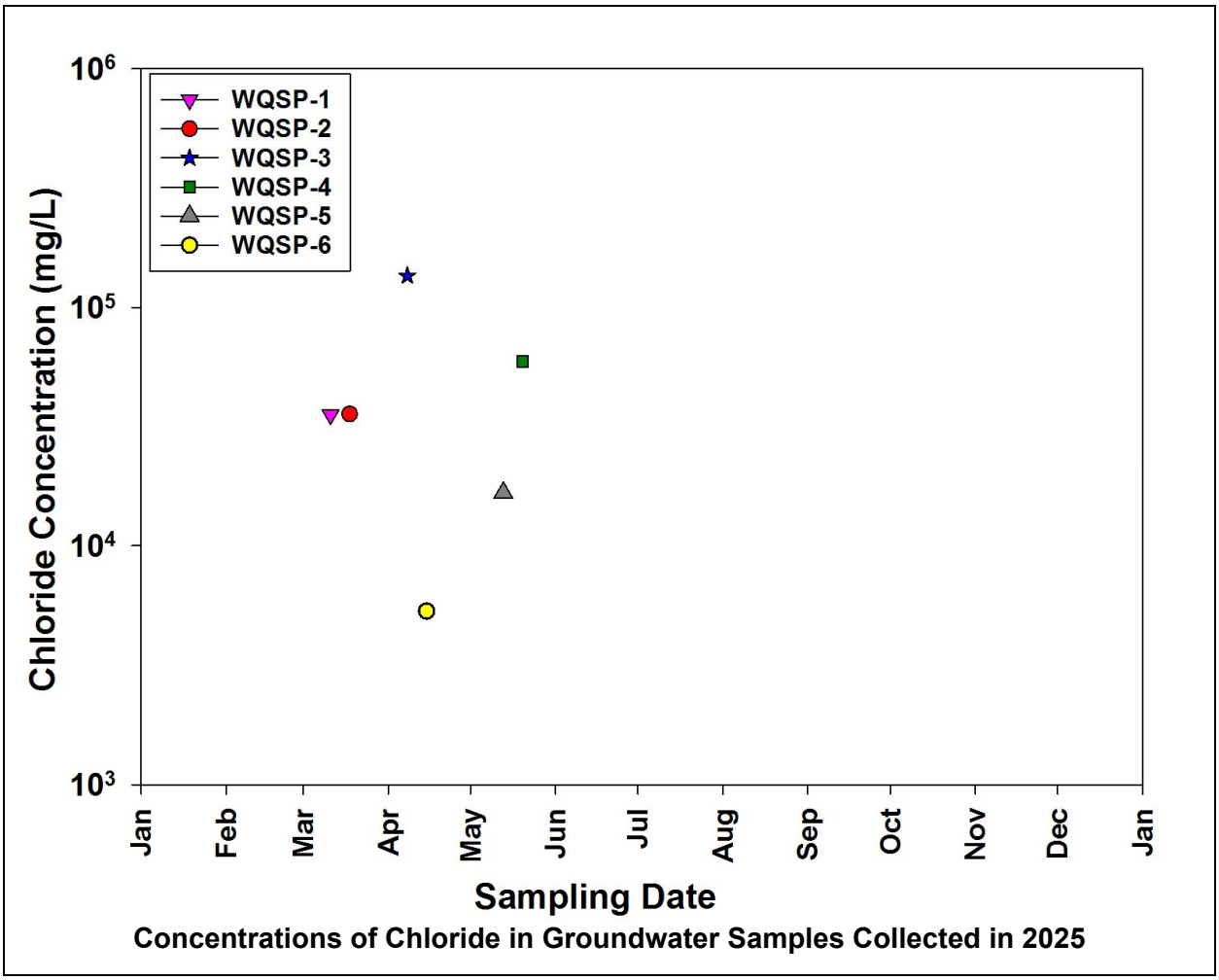
Th	1.60E-01	2.10E-01	<MDC
Tl	3.34E-02	4.14E-02	<MDC
U	2.33E-01	2.06E-01	6.07E+00
V	1.64E+01	1.92E+01	8.11E+00
Zn	<MDC	<MDC	<MDC

	Brantley Lake		Lake Carlsbad		Red Bluff		Brantley Lake	Lake Carlsbad	Pecos River
Metal	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	<MDC
Al	5.01E+01	1.53E+02					1.95E+02	1.71E+02	1.88E+04
As	<MDC	<MDC					<MDC	<MDC	7.17E+00
Ba	9.29E+01	1.14E+02					9.10E+01	2.14E+01	1.53E+02
Be	<MDC	<MDC					<MDC	<MDC	1.93E+00
Ca	3.74E+05	3.76E+05					4.60E+05	3.48E+05	4.73E+05
Cd	<MDC	<MDC					<MDC	<MDC	4.16E-01
Ce	<MDC	2.14E-01					3.09E-01	3.09E-01	4.13E+01
Co	5.76E-01	7.03E-01					9.79E-01	7.04E-01	1.18E+01
Cr	<MDC	<MDC					<MDC	<MDC	1.19E+01
Cu	<MDC	<MDC					<MDC	<MDC	<MDC
Dy	<MDC	<MDC					<MDC	<MDC	4.05E+00
Er	<MDC	<MDC					<MDC	<MDC	1.80E+00
Eu	<MDC	<MDC					<MDC	<MDC	1.39E+00
Fe	1.16E+03	1.59E+03					1.39E+03	1.40E+03	1.38E+04
Gd	<MDC	<MDC					<MDC	<MDC	6.03E+00
Hg	<MDC	<MDC	<MDL	<MDL	<MDC	<MDC	<MDC	<MDC	<MDC
K	8.67E+03	8.78E+03					9.44E+03	5.21E+03	8.08E+03
La	<MDC	1.01E-01					1.42E-01	1.55E-01	1.77E+01
Li	4.07E+01	4.24E+01					5.53E+01	4.60E+01	6.58E+01
Mg	1.04E+05	1.05E+05					1.42E+05	1.16E+05	1.06E+05
Mn	4.05E+01	1.33E+02					3.71E+01	9.89E+00	1.76E+03
Mo	4.64E+00	3.59E+00					3.82E+00	2.91E+00	2.20E+00
Na	5.74E+05	5.86E+05					7.81E+05	4.12E+05	3.72E+05
Nd	<MDC	<MDC					<MDC	<MDC	2.42E+01
Ni	1.35E+01	1.48E+01					1.56E+01	1.31E+01	3.71E+01
P	<MDC	<MDC					<MDC	<MDC	8.84E+02
Pb	<MDC	<MDC					<MDC	<MDC	<MDC
Pr	3.22E-02	2.65E-02					3.76E-02	3.68E-02	5.41E+00
Sb	2.32E-01	1.46E-01					2.06E-01	9.32E-02	1.80E-01
Sc	1.05E+00	1.45E+00					1.19E+00	1.63E+00	8.19E+00
Se	<MDC	<MDC					<MDC	<MDC	<MDC
Si	5.86E+03	6.14E+03					4.53E+03	5.79E+03	4.07E+04
Sr	5.84E+03	5.77E+03					7.34E+03	5.10E+03	6.32E+03
Th	<MDC	<MDC					<MDC	<MDC	2.54E+00
Tl	<MDC	<MDC					<MDC	<MDC	7.39E-02
U	3.69E+00	3.71E+00					4.51E+00	3.42E+00	6.12E+00
V	5.44E+00	6.00E+00					4.01E+00	5.86E+00	4.44E+01
Zn	<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



Concentrations of Chloride in Groundwater Samples Collected in 2025

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

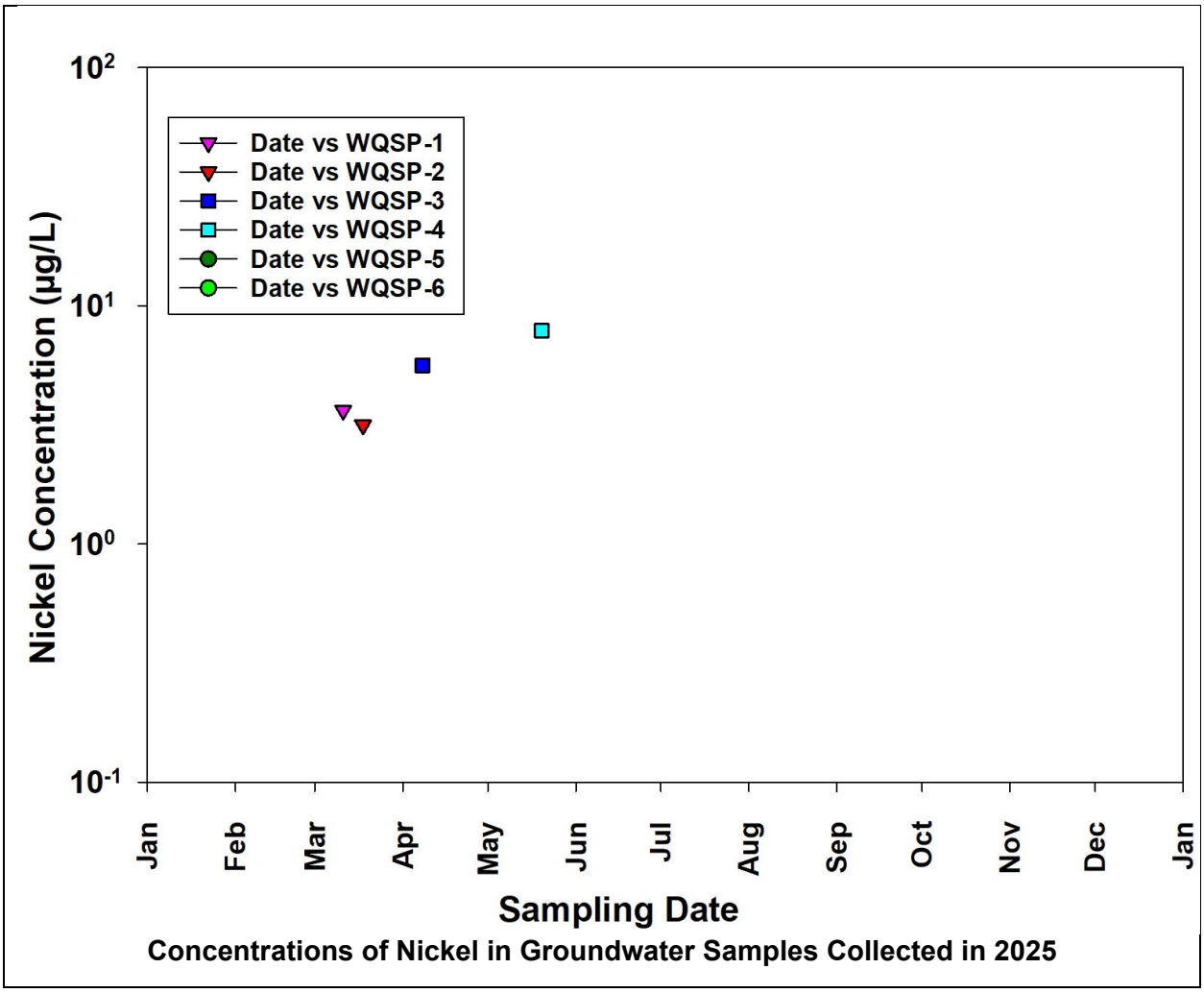
Sample Type: Ground Water
Year: 2025
Analysis Performed: TDS/TSS

Sample	TDS	TSS

Location	mg/L	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



Concentrations of Nickel in Groundwater Samples Collected in 2025

Internal Dosimetry Group and Public Outreach

In vivo radiobioassay measurements performed during the reporting period

None for WIPP (no active contract in place), 8 for the contract radiological personnel and those working in the laboratories located at CEMRC, 7 for public participants.

DOELAP assessment

Following the DOELAP onsite assessment of the ID Laboratory at CEMRC that was conducted on August 26 and 27, 2025, to assure routine practices of the direct radiobioassay program comply with DOELAP criteria and the response to the visiting committee's questions, CEMRC received confirmation of approval to provide in-vivo radiobioassay services through 31 December 2028. The confirmation letter and conditions of accreditation follow this section.

Outreach activities

CEMRC and the Internal Dosimetry group continue to interact with the public to explain CEMRC's function and 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. The following were outreach activities during the reporting period:

- 10/11/2025: Inspired by Science STEM Experience at National Cave and Karst Research Institute from 5 to 7 pm. Explained CEMRC's roles and laboratory activities, handed out LDBC brochures, and demonstrated simple science experiments to local families with young children; the number of families visited estimated to be between 80 and 100 (typically between 2 and 5 members per family).

- 10/23/2025: Provided a detailed tour of CEMRC including introduction to the ID laboratory and whole-body counting chamber and handing out an LDBC pen and brochure to a public visitor from Iowa.

- 11/4/2025: Provided a quick tour including introduction to the ID laboratory, demonstration of the lung and whole-body counting chamber and radiobioassay measurement and handing out LDBC brochures to top-level administrators from NMSU, as well as city, county, and state representatives.

Department of Energy
Washington, DC 20585

December 2, 2025

Lambis Papelis
Director
Carlsbad Environmental Monitoring and
Research Center
1400 University Drive
Carlsbad, NM 88220

Mr. Papelis,

Congratulations! Carlsbad Environmental Monitoring and Research Center (CEMRC) has successfully demonstrated it can provide direct (in vivo) radiobioassay services that meet the requirements of the Department of Energy Laboratory Accreditation Program, through performance testing and an on-site assessment in accordance with DOE-STD-1112, *Department of Energy Laboratory Accreditation Program for Radiobioassay.* This vendor qualification period is valid through 31 December 2028.

Please contact me at (301) 903-7339 or via e-mail at david.pugh1@hq.doe.gov if you have any questions.

Attachment
Conditions of Vendor Qualification

Sincerely,

David L. Pugh, CHP, RRPT
DOELAP Administrator
Office of Environmental Compliance and
Radiation Protection

cc: Josh Silverman, EHSS-10
Jessica Kratchman, EHSS-10
Kristoffer Hewitt, EHSS-11
Tom Carver, EHSS-11
George Chiu, EHSS-11
Guy Backstrom, NE-ID
Steve Bohrer, NE-ID
Nhat Nguyen, CEMRC

DEPARTMENT OF ENERGY LABORATORY ACCREDITATION PROGRAM
CONDITIONS OF VENDOR QUALIFICATION

Carlsbad Environmental Monitoring and Research Center

Valid To: December 31, 2028

In recognition of the successful completion of the Department of Energy Laboratory Accreditation Program evaluation process for radiobioassay, vendor qualification is granted for the direct (in vivo) radiobioassay systems described below.

Table 1. Direct Radiobioassay DOELAP Categories

	Measurement Category	Type	Radionuclide	BEGe lung System	CEMRC ID 4D-WB System	CEMRC ID 3D-WB System
I	Transuranium elements via L x-rays	Lung	^{238}Pu	X		
II	Americium-241	Lung	^{241}Am	X		
III	Thorium-234 (Equilibrium w/ U-238)	Lung	^{234}Th	X		
IV	Uranium-235	Lung	^{235}U	X		
V	Fission & activation products	Lung	^{54}Mn ^{60}Co ^{144}Ce or ^{57}Co	X X X		
VII	Fission & activation products	Total Body	^{134}Cs ^{137}Cs ^{60}Co		X X X	X X X

Conditions:

Vendor qualification is for these radiobioassay systems only and is contingent upon maintaining a radiobioassay program that is consistent with the application(s) submitted and in compliance with DOE-STD-1112, *Department of Energy Laboratory Accreditation Program for Radiobioassay.*

Low Background Radiation Experiment (LBRE)

As described in our previous quarterly report, a *Drosophila* development experiment was deployed at WIPP in the summer utilizing more than 360 individual flies. In October, we discussed quality control issues of our samples with the company that sequences our RNA for LBRE gene expression studies and they stated that they would be able to sequence samples if they had 100 ng or more. This was good news given that on their website it was stated that the minimum quantity was 500 ng. We remeasured our RNA concentrations and found that all but 3 samples can be RNA-Seq analyzed (Table 1). We are currently waiting for additional funding to complete these analyses.

Table 1. Quantitative RNA analysis revealed three samples** that cannot be sequenced.

Sample Date	**Flagged Samples	Surface	ng/uL	ng/uL Avg	ng in 25 uL	Underground	ng/uL	ng/uL Avg	ng in 25 uL
5-Aug		S1	40.8	41.1	1026.3	U1	16.9	17.1	426.3
5-Aug			41.3				17.2		
		S2	8	8.2	205.0	U2	14.2	14.4	358.8
			8.4				14.5		
		S3	4.2	4.1	102.5	U3	27.2	27.5	687.5
	**Too little		4				27.8		
	don't send	S4	1.3	1.5	**37.5	U4	53.9	54.6	1365.0
			1.7				55.3		
8-Aug		S5	16.4	17.2	428.8	U5	3.6	3.8	**95.0
			17.9				4		
		S6	2.9	2.8	**68.8	U6	7.4	7.5	186.3
			2.6				7.5		
9-Aug		S7	259.9	264.0	6598.8	U7	94.3	95.7	2392.5
			268				97.1		
		S8	14.9	15.3	382.5	U8	337.9	342.2	8555.0
			15.7				346.5		
		S9	143.2	145.7	3641.3	U9	323.2	318.0	7948.8
			148.1				312.7		
Aug.12		S10	312.9	321.4	8033.8	U10	328.2	327.4	8183.8
			329.8				326.5		
		S11	9.8	9.9	246.3	U11	19.9	19.7	491.3
			9.9				19.4		
						U12	241.1	239.9	5996.3
							238.6		

On the WIPP halite biomarker project, over the months of October through mid-December, we solved the WIPP halite sample preparation problems we had by utilizing small-volume Swinnex filters to rinse the samples of the excess salt. This process showed the preservation of *Bacillus atrophaeus* on the filter (Positive Control, **Figure 1**) and the reduction of interfering halite salt crystals (Negative Control, **Figure 1**).

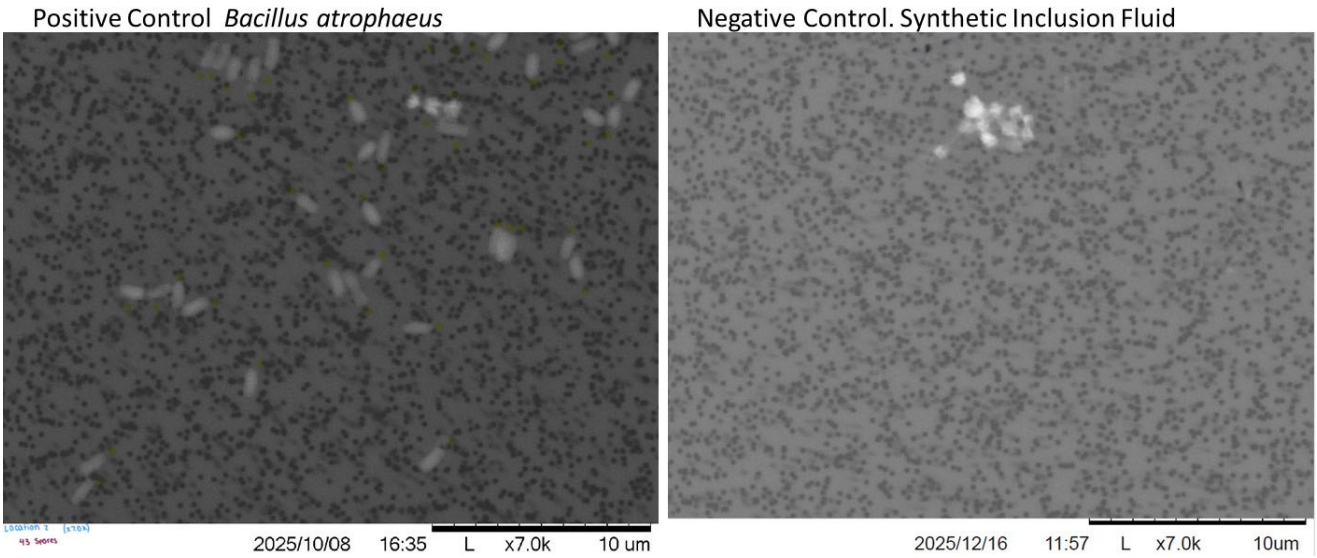


Figure 1. Scanning Electron Microscope (SEM) images of the type of spores expected to survive 250 million years (B. atrophaeus) in WIPP inclusion fluid and a sample of synthetic inclusion fluid (based on the Reed/Swanson salt weep analyses).