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INL Oversight Program

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QUARTERLY DATA REPORT

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Table of Acronyms and Abbreviations

ATR	-	Advanced Test Reactor Complex
BEA	-	Battelle Energy Alliance, LLC
BLR	-	Big Lost River
CFA	-	Central Facilities Area
CFR	-	Code of Federal Regulations
CITRC	-	Critical Infrastructure Test Range Complex
CMS	-	Community Monitoring Station
DCS	-	DOE Derived Concentration Standard
DEQ-INL OP	-	The State of Idaho, Department of Environmental Quality, Idaho National Laboratory Oversight Program
DOE	-	U.S. Department of Energy
EBR I & II	-	Experimental Breeder Reactors I & II
EFS	-	Experimental Field Station
EIC	-	electret ionization chamber
EML	-	Environmental Monitoring Laboratory
EPA	-	Environmental Protection Agency
ESER	-	Environmental Surveillance, Education and Research Program
ESP	-	Environmental Surveillance Program
ESRP	-	Eastern Snake River Plain
ft bls	-	feet below land surface
HPIC	-	high-pressure ion chamber
IBL	-	Idaho Bureau of Laboratories
IBL Sub	-	Subcontract laboratory to IBL
ICPP	-	Idaho Chemical Processing Plant
IDAPA	-	Idaho Administrative Procedures Act
IEC	-	Idaho Environmental Coalition
IF	-	Idaho Falls, Idaho
INL	-	Idaho National Laboratory
INTEC	-	Idaho Nuclear Technology and Engineering Center
ISB	-	In-situ bioremediation
ISU	-	Idaho State University
ISU Sub	-	Subcontract laboratory to ISU-EML
IWP	-	MFC Industrial Waste Pipeline
MCL	-	maximum contaminant level
MDC	-	minimum detectable concentration
MDL	-	IBL method detection limit
MFC	-	Materials and Fuels Complex
µg/L	-	micrograms per liter
mg/L	-	milligrams per liter
mm	-	millimeter
MP	-	milepost
mR	-	milliRoentgen
mrem	-	millirem or 1/1000th of a rem
µR/hr	-	microRoentgen per hour
µR/yr	-	microRoentgen per year
MV	-	Magic Valley
NCRP	-	National Council on Radiation Protection and Measurements
NRF	-	Naval Reactors Facility
PBF	-	Power Burst Facility
pCi/g	-	picoCuries per gram
pCi/L	-	picoCuries per liter
pCi/m^3	-	picoCuries per cubic meter
PCS	-	Idaho Primary Constituent Standard
PT Program	-	Laboratory Proficiency Testing Program
PW	-	Perched water well designation
QA/QC	-	Quality Assurance/Quality Control
rad	-	unit of absorbed radiation dose
RadNet	-	EPA network of radiation monitoring stations
RDL	-	IBL reporting detection limit
RPD	-	relative percent difference
R/rad	-	Roentgen/rad
RWMC	-	Radioactive Waste Management Complex
SD	-	Sample standard deviation
SMC	-	Specific Manufacturing Capability
SMCL	-	secondary maximum contaminant level
TAN	-	Test Area North
TRA	-	Test Reactor Area
TSP	-	total suspended particulate
USGS	-	U.S. Geological Survey
VOC	-	volatile organic compound

Introduction

The State of Idaho, Department of Environmental Quality, Idaho National Laboratory Oversight Program (DEQ-INL OP) conducts an Environmental Surveillance Program (ESP) at locations on the INL, near the boundaries of the INL, and at distant locations to the INL in accordance with accepted monitoring procedures and management practices. This program is designed to provide the people of the state of Idaho with independently evaluated information about the impacts of the Department of Energy's (DOE) activities in Idaho.

The primary objective for DEQ-INL OP's ESP is to maintain an independent environmental monitoring and verification program designed to verify and supplement DOE's environmental data and programs. This program also provides the citizens of Idaho with information on current and proposed DOE programs that have been independently evaluated to enable them to reach informed conclusions about DOE activities in Idaho and potential impacts to public health and the environment.

Results of the ESP are published using two distinct reporting formats: quarterly data reports and an annual ESP report. The annual ESP report is designed for a broad audience and summarizes the results of the ESP for the previous four quarters. The annual report's primary emphasis is to focus on trends, ascertain the impacts of DOE operations on the environment, and confirm the validity of DOE monitoring programs. This quarterly report is designed to document the results of the ESP on a quarterly basis and provide detailed data. It is organized according to the media sampled and also provides a quality assurance assessment.

Changes to Qualification and Reporting of Sample Results

Starting in the first quarter of 2024, DEQ-INL OP has changed the methods used for qualifying and reporting sample results. These changes apply primarily to low-level results. The changes listed below bring DEQ-INL OP's qualification and reporting conventions more closely in line with the INL contractors' methods.

For radiological results, the minimum detectable concentration (MDC) is no longer used as the criterion above which the result is considered a positive detection. The following criteria are used instead[1,2,3]:

1. Results greater or equal to 3 SD are reported as positive detections, where SD is the sample standard deviation.
2. Results less than 3 SD are reported as non-detections (U qualifier).
3. Field sample results are reported together with the 1-SD value.

For non-radiological results, the qualification and reporting conventions followed by the sample analysis contractor, Idaho Bureau of Laboratories (IBL), are used. With each result, the IBL reports both the Method Detection Limit[4] (MDL) and the higher Reporting Detection Limit[5] (RDL).

[1] Idaho National Laboratory Site Environmental Surveillance Program Report, Fourth Quarter 2023, INL/RPT-24-77413, p.
[2] HANDBOOK FOR THE DEPARTMENT OF ENERGY'S MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM (MAPEP), MAPEP-HB-1, July 6,2022, p.30.
[3] An Update of Hydrologic Conditions and Distribution of Selected Constituents in Water, Eastern Snake River Aquifer and Perched Groundwater Zones, Idaho National Laboratory, Idaho, Emphasis 2019–21, U. S. Geological Survey, DOE/ID-22261, p. 29.
[4] The MDL is defined as the minimum concentration of substance that can be measured and reported with 99% confidence that an analyte concentration is greater than zero and is determined from an analysis of a sample in a given matrix containing the analyte.
[5] IBL utilizes the Practical Quantitation Limit (PQL) as the Reporting Detection Limit (RDL) for final data reports. PQL represents a practical and routinely achievable quantitation limit with a high degree of certainty (> 99.9% confidence) that the result is a positive detection.

1. Results greater than MDL and greater than RDL are reported as positive detections.
2. Results greater than MDL but less than RDL are reported as detected estimates (J qualifier) with greater associated uncertainty.
3. Results less than MDL are non-detections and reported as less than (RDL value).

Appendix C is a summary of the analyzing laboratories' MDCs for radiological analytes and RDLs for non-radiological analytes, together with the EPA Maximum Contaminant Levels (MCLs) and DOE Derived Concentration Standards (DCSs) for comparison. MDCs are a measure of method/instrument performance. They are not a criterion above which a result is considered a detection. DCSs and MCLs are listed only as reference values for comparison to typical MDC or RDL ranges. The MCLs are the most restrictive and do not necessarily apply to the environmental media sampled.

Air and Precipitation Monitoring Results

The ESP operated nine air monitoring stations on and near the INL as well as two monitoring stations distant from the INL during the fourth quarter, 2025 (**Figure 1**). These stations employed instrumentation for collecting airborne particulate matter, gaseous radioiodine, precipitation, and water vapor for tritium analysis (**Table 1**). The Shoshone-Bannock Tribes operated an air monitoring station located at Fort Hall. The Fort Hall station uses identical instrumentation and sampling protocol as the eleven stations operated by the ESP. The DEQ-INL OP reports the Fort Hall station data as an additional distant site.

Airborne particulate matter was sampled using both high-volume (8x10-inch filter) and low-volume (47-mm filter) total suspended particulate (TSP) air samplers. Weekly gross alpha and gross beta particulate radioactivity results for 47-mm filters from the low-volume TSP samplers are presented in **Appendix A** and summarized as a range of results in **Table 2**. Results are within the expected historical range.

Composites of 47-mm filters collected from low-volume TSP samplers during a calendar quarter are analyzed using gamma spectrometry. Composites of 8x10-inch filters collected from high-volume TSP samplers during each calendar month are also analyzed using gamma spectrometry. Typically, gamma spectrometry results are only reported by ISU-EML when exceeding their minimum detectable concentration (MDC). Gamma spectrometry results for the fourth quarter of 2025 for 47-mm and 8x10-inch TSP filters are presented in **Tables 3** and **4**. For the 47-mm filter composites, there were zero reported man-made gamma-emitting radionuclide concentrations greater than 3 SD. For all site locations, beryllium-7 (Be-7), a naturally occurring, cosmogenic radionuclide was reported. For the 8x10-inch filter composites, there were three cesium-137 (Cs-137) results greater than or equal to 3 SD at Sand Dunes, Fort Hall and Idaho Falls locations. There were two cesium-134 (Cs-134) results greater than or equal to 3 SD at Experimental Field Station and Sand Dunes locations. The concentrations and 1 SD values for cesium-137 (Cs-137) are reported for all locations since Cs-137 is the most likely of the man-made gamma emitting radionuclides to be detected unless otherwise noted. Beryllium-7 results were greater than 3 SD at all site locations.

Quarterly composites of high-volume 8x10-inch TSP filters are analyzed using radiochemical separation techniques. Results from these composite filter analyses are typically presented in the following quarter's report. The samples are analyzed for Strontium-90, Plutonium-238, Plutonium-239/240, and Americium-241. Measurable quantities of these radionuclides are expected in the environment due to historic above ground testing of nuclear weapons, and possibly from INL programs. DEQ-INL OP's action levels of 19 for Americium-241 (Am-241), 190 for Strontium-90 (Sr-90), 21 for Plutonium-238 (Pu-238), and 20 for Plutonium-239/240 (Pu-239/240) (in 1×10^{-5} pCi/m^3) are 10 percent of the compliance

values listed for the specific radionuclides in 40 CFR 61, Appendix E, Table 2. Field sample concentrations which exceed these levels require further investigation.

Radiochemical separation analysis results for 8x10-inch TSP particulate filter composites collected during fourth quarter 2025 are presented in **Table 5.** Positive Sr-90 detections were observed at all locations. There was one positive detection of Pu-239/240 at the Van Buren Avenue location. The detection had a result equal to three times the sample standard deviation. The detection was also well below DEQ-INL OP action levels.

Radioactive iodine samples are collected weekly. Samples are collected by drawing air through a canister filled with activated charcoal using a low-volume air pump. The activated charcoal contained in the canister traps the radioiodine by adsorption onto its porous surface. Each week, canisters are collected from all twelve air monitoring stations and analyzed together as a composite using gamma spectrometry (**Table 6**). If Iodine-131 is detected in this grouping, the canisters are individually analyzed. No radioactive isotopes of iodine, specifically Iodine-131, were detected on the weekly charcoal cartridges used to collect this nuclide during the fourth quarter of 2025.

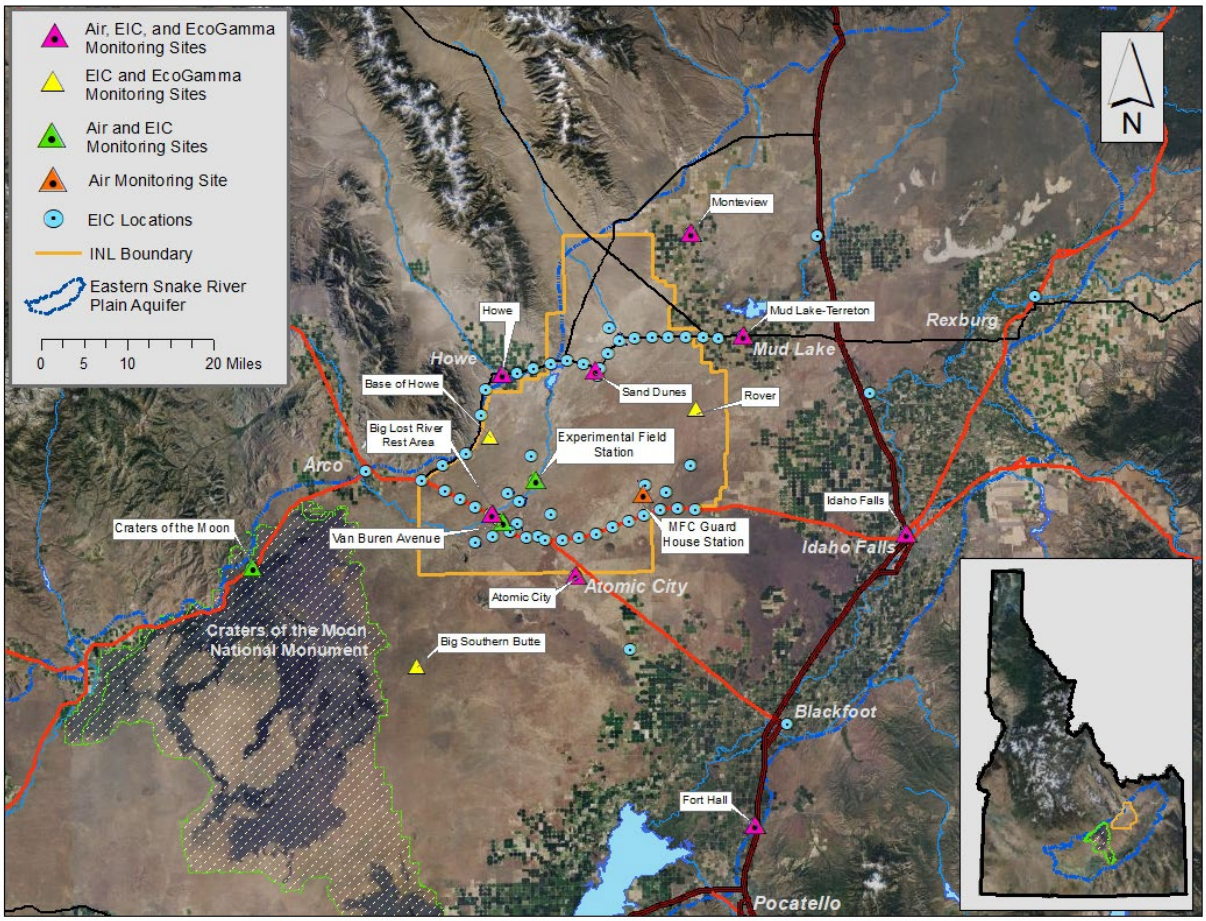


Figure 1. Air and radiation monitoring sites.

Table 1. Sampling locations and sample type.

Station Locations	Sample type[1]			
	TSP	Radioiodine	Water Vapor	Precipitation
On-site Locations				
Big Lost River Rest Area	□	□	■	■
Experimental Field Station	□	□	■	
MFC Guard House	□	□	■	
Sand Dunes Tower	□	□	■	
Van Buren Avenue	□	□	■	
Boundary Locations				
Atomic City	□	□	■	■
Howe	□	□	■	■
Monteview	□	□	■	■
Mud Lake	□	□	■	■
Distant Locations				
Craters of the Moon	□	□	■	
Fort Hall[2]	□	□	■	
Idaho Falls	□	□	■	■

[1] □Samples collected weekly; ■ Samples collected quarterly, or more frequently if sample containers reach capacity.
[2]TSP and radioiodine samples collected by Shoshone-Bannock Tribes.
.

Table 2. Range of gross alpha and gross beta concentrations for 47-mm TSP filters, fourth quarter, 2025.

Station Location	Concentration					
	Gross Alpha			Gross Beta		
On-Site Locations						
Big Lost River Rest Area	0.2	-	**1.2 J[2]**	**11.0[3]**	-	**39.9 J[2,4]**
Experimental Field Station	0.1[3]	-	**2.1**	**10.7[3]**	-	**38.9 J[2,4]**
MFC Guard House[3]	0.3	-	**1.3**	**10.1[3]**	-	**37.5[4]**
Sand Dunes Tower	0.3[3]	-	**1.3[5]**	**10.9[3]**	-	**42.5**
Van Buren Avenue	0.4 J[2,3]	-	**1.8 J[2]**	**10.9 J[2,3]**	-	**41.3 J[2,4]**
Boundary Locations						
Atomic City	**0.6 J[2]**	-	**2.3 J[2]**	**11.7 J[2,3]**	-	**39.1 J[2,4]**
Howe	**0.5[4]**	-	**1.3 J[6]**	**9.5[3]**	-	**39.3 J[6]**
Monteview	0.3	-	**1.4**	**8.3**	-	**39.0[5]**
Mud Lake	0.2[3]	-	**1.2[4]**	**10.1[3]**	-	**40.3**
Distant Locations						
Craters of the Moon	0.1[3]	-	**1.8[5]**	**7.8[3]**	-	**31.4[4]**
Fort Hall[1]	**0.6[4]**	-	**1.3**	**11.0**	-	**34.2[4]**
Idaho Falls	0.3[3]	-	**1.9**	**11.9**	-	**37.8[4]**

Concentrations are expressed in 1 x 10^{-3} pCi/m^3. **Bold** concentrations are positive detections, greater than or equal to 3 SD.
[1]Operated by Shoshone-Bannock Tribes.
[2]Volume is an estimate due to mechanical issues. Results are considered to be a usable estimate (J).
[3]Sample was collected 2 days early.
[4]Sample was collected 1 day later.
[5]Sample was collected 1 day early.
[6]Volume is lower than expected due to a power outage. Results are considered to be a usable estimate (J)

Table 3. Gamma spectroscopy analysis data for 47-mm TSP filters, composite samples, fourth quarter, 2025.

Station Location	Naturally Occurring Radionuclide Beryllium-7			Man-Made Gamma Emitting Radionuclides		
	Concentration		1 SD	Concentration[2]		1 SD[2]
On-site Locations						
Big Lost River Rest Area	**64.6**	J[3]	2.2	-0.02	UJ[3]	0.03
Experimental Field Station	**64.5**	J[4,5]	2.2	-0.02	UJ[4,5]	0.03
MFC Guard House	**64.1**	J[5]	2.6	0.02	UJ[5]	0.03
Sand Dunes Tower	**64.0**	-	2.2	0.02	U	0.04
Van Buren Avenue	**64.5**	J[8]	2.2	0.01	UJ[8]	0.03
Boundary Locations						
Atomic City	**66.2**	J[6,7]	2.2	0.01	UJ[6,7]	0.04
Howe	**62.8**	J[5]	2.1	-0.03	UJ[5]	0.03
Monteview	**66.9**	-	2.8	0.03	U	0.03
Mud Lake	**59.6**	-	2.0	-0.05	U	0.03
Distant Locations						
Craters of the Moon	**61.5**	-	2.5	0.05	U	0.03
Fort Hall[1]	**67.4**	-	2.8	0.07	U	0.03
Idaho Falls	**61.9**	-	2.1	0.01	U	0.04

Concentrations are reported in 1 x 10^{-3} pCi/m^3 with associated uncertainty (1 SD). **Bold** concentrations are positive detections, greater than or equal to 3 SD.

Data qualifiers: U = undetected, J = estimate, R = rejected, "+" or "-" after a J means that the estimated result is biased high or low, respectively.

[1]Operated by Shoshone-Bannock Tribes.

[2]Concentration and uncertainty (1 SD) values are for Cs-137 unless otherwise noted.

[3]Volume is an estimate for ten weeks due to mechanical issues. Results are considered a usable estimate (J).

[4]Volume is an estimate for one week due to mechanical issues. Results are considered a usable estimate (J).

[5]Volume is less than expected for one week due to power outage. Results are considered a usable estimate (J).

[6]Volume is an estimate for thirteen weeks due to mechanical issues. Results are considered a usable estimate (J).

[7]No sample for one week due to mechanical failure.

[8]Volume is an estimate for fourteen weeks due to mechanical issues. Results are considered a usable estimate (J).

Table 4. Gamma spectrometry analysis data for 8x10-inch TSP filters, monthly composite samples, fourth quarter, 2025.

Station Location	Month[3]	Naturally Occurring Radionuclide Beryllium-7			Man-Made Gamma Emitting Radionuclides		
		Concentration		1 SD	Concentration[2]		1 SD[2]
On-site Locations							
Big Lost River Rest Area	Oct	**109.9**	-	3.4	0.00	U	0.01
	Nov	**93.3**	-	1.9	0.02	U	0.02
	Dec	**83.5**	-	2.6	0.00	U	0.01
Experimental Field Station	Oct	**101.7**	-	3.1	0.01	U	0.01
	Nov	**91.5**	J[4]	2.9	0.00	UJ[4]	0.01
	Dec	**77.1**	-	1.5	**0.03**	Cs-134	0.01
MFC Guard House	Oct	**113.2**	J[4]	3.6	-0.01	UJ[4]	0.01
	Nov	**99.0**	-	3.1	-0.01	U	0.01
	Dec	**76.0**	-	1.5	0.00	U	0.01
Sand Dunes Tower	Oct	**112.6**	-	3.5	**0.03**	Cs-134	0.01
	Nov	**97.5**	-	1.9	0.02	U	0.02
	Dec	**77.1**	-	1.5	**0.03**	-	0.01
Van Buren Avenue	Oct	**107.9**	-	2.1	0.01	U	0.01
	Nov	**96.7**	-	3.0	0.00	U	0.01
	Dec	**79.1**	-	2.5	0.00	U	0.01
Boundary Locations							
Atomic City	Oct	**110.4**	-	3.4	-0.01	U	0.01
	Nov	**100.1**	-	3.1	0.00	U	0.01
	Dec	**81.0**	-	1.5	0.00	U	0.01
Howe	Oct	**113.2**	-	3.5	0.00	U	0.01
	Nov	**112.9**	-	3.5	0.01	U	0.02
	Dec	**79.1**	J[4]	2.5	-0.01	UJ[4]	0.01
Monteview	Oct	**108.2**	-	3.3	0.01	U	0.01
	Nov	**101.9**	-	3.2	0.02	U	0.02
	Dec	**79.5**	-	2.5	0.00	U	0.01
Mud Lake	Oct	**116.6**	-	3.6	-0.01	U	0.01
	Nov	**98.1**	-	3.1	0.02	U	0.01
	Dec	**79.5**	-	2.5	0.00	U	0.01
Distant Locations							
Craters of the Moon	Oct	**112.4**	-	3.4	0.00	U	0.01
	Nov	**93.2**	-	2.9	0.00	U	0.01
	Dec	**73.5**	-	2.3	0.00	U	0.01
Fort Hall[1]	Oct	**79.7**	-	1.6	**0.05**	-	0.01
	Nov	**71.0**	-	1.4	0.04	U	0.02
	Dec	**59.1**	-	1.8	0.01	U	0.01
Idaho Falls	Oct	**116.3**	-	2.2	**0.03**	-	0.01
	Nov	**103.2**	-	3.2	0.00	U	0.01
	Dec	**85.5**	-	2.6	0.00	U	0.01

Concentrations are reported in 1 x 10^{-3} pCi/m^3 with associated uncertainty (1 SD). **Bold** concentrations are positive detections, greater than or equal to 3 SD.

Data qualifiers: U = undetected, J = estimate, R = rejected, "+" or "-" after a J means that the estimated result is biased high or low, respectively.

[1] Operated by Shoshone-Bannock Tribes.

[2] Concentration and SD values are for Cs-137 unless otherwise noted.

[3] Four filters/composite for November, five filters/composite for October and December unless otherwise noted.

[4] Volume is an estimate due to power outage during one of the weeks. Results are considered a usable estimate.

Table 5. Radiochemical separation analysis results for 8x10-inch TSP particulate filter composites collected during third quarter 2025.

Station Location	^{90}Sr			^{238}Pu			$^{239/240}Pu$			^{241}Am		
	Value[1]		1 SD	Value[1]		1 SD	Value[1]		1 SD	Value[1]		1 SD
On-Site Locations												
BLR[4] Rest Area	**7.03**	-	0.49	0.03	U	0.02	0.04	U	0.02	0.02	U	0.05
EFS[3]	**7.20**	-	0.58	0.00	U	0.03	0.10	U	0.04	-0.05	U	0.05
MFC Guard House	**8.76**	-	0.67	0.02	U	0.02	0.05	U	0.03	0.07	U	0.06
Sand Dunes Tower	**5.55**	-	0.42	-0.01	U	0.01	0.11	U	0.04	0.07	U	0.04
Van Buren Avenue	**9.45**	-	0.68	0.04	U	0.04	**0.09**	-	0.03	0.04	U	0.06
Boundary Locations												
Atomic City	**5.89**	-	0.49	0.03	U	0.04	0.04	U	0.02	0.01	U	0.02
Howe	**5.80**	-	0.51	0.06	U	0.03	0.05	U	0.03	0.05	U	0.05
Monteview	**4.97**	-	0.39	-0.01	U	0.01	0.06	U	0.03	-0.05	U	0.05
Mud Lake	**5.69**	-	0.47	0.03	U	0.02	0.06	U	0.03	0.00	U	0.05
Distant Locations												
Craters of the Moon	**6.10**	-	0.49	0.01	U	0.04	0.04	U	0.02	0.01	U	0.04
Fort Hall[2]	**1.62**	-	0.24	0.03	U	0.02	0.07	U	0.03	0.07	U	0.06
Idaho Falls	**6.95**	-	0.55	0.04	U	0.03	0.03	U	0.02	-0.03	U	0.04

Note: Concentrations are reported in 1 x 10^{-5} pCi/m^3 with associated uncertainty (1 SD) and correspond to filter composites collected during the calendar quarter.
Bold concentrations are positive detections, greater than or equal to 3 SD.
Data qualifiers: U = undetected, J = estimate, R = rejected, "+" or "-" after a J means that the estimated result is biased high or low, respectively.
[1] Measurable quantities of these radionuclides are expected in the environment due to historic above-ground testing of nuclear weapons, and possibly from INL programs. DEQ-INL OP's action levels of 19 for americium-241, 190 for strontium-90, 21 for plutonium-238, and 20 for plutonium-239/240 (in 1 x 10^{-5} pCi/m^3) are 10 percent of the compliance values listed for the specific radionuclide in 40 CFR 61, Appendix E, Table 2.
[2] Operated by Shoshone-Bannock Tribes.
[3] EFS - Experimental Field Station.
[4] BLR – Big Lost River.

Table 6. Iodine-131 activity in weekly charcoal filter composites, fourth quarter, 2025.

Start Date	Collection Date	Iodine-131 activity (pCi/composite)		
		Activity		1 SD
09/25/25	10/02/25	-1.33	U	1.04
10/02/25	10/09/25	0.14	U	1.07
10/09/25	10/16/25	-0.71	U	0.90
10/16/25	10/23/25	1.17	U	1.53
10/23/25	10/30/25	-0.87	U	1.69
10/30/25	11/06/25	-1.93	U	1.40
11/06/25	11/13/25	-0.36	U	1.11
11/13/25	11/20/25	0.31	U	1.14
11/20/25	11/26/25	-0.70	U	1.04
11/26/25	12/04/25	-0.17	U	1.27
12/04/25	12/11/25	-0.02	U	0.90
12/11/25	12/18/25	1.27	U	1.16
12/18/25	12/23/25	0.24	U	0.96
12/23/25	12/31/25	-1.28	U	1.27

Activities are reported in pCi/composite with associated uncertainty (1 SD). **Bold activities** are positive detections, greater than or equal to 3 SD.
Data qualifiers: U = undetected, J = estimate, R = rejected, "+" or "-" after a J means that the estimated result is biased high or low, respectively.

Atmospheric moisture was collected by drawing air through hygroscopic media at each of the twelve monitoring stations. The moisture was stripped from the hygroscopic media and analyzed to calculate atmospheric tritium (H-3) concentration. Note that INL OP's airborne tritium measurement methods cannot detect T_2 or HT gas emissions from INL facilities. However, these forms are assumed to rapidly oxidize to tritiated water (HTO) upon exposure to air and moisture. Sequential atmospheric tritium concentrations are presented in **Table 7**. Those equal to or exceeding three standard deviations of uncertainty were considered positive detections. There were 3 detections at on-site locations, 2 at boundary locations, and 3 at distant locations (**Table 7**). The ratios of detections to stations for on-site, boundary, and distant locations were 3 to 5 (0.6), 2 to 4 (0.5), and 3 to 3 (1.0) respectively. This quarter all airborne tritium measurements were far below our public health and safety criterion of 150 pCi/m^3 or greater (which is 10% of DOE-INL's compliance standard set forth in 40 CFR 61, Appendix E, Table 2).

Precipitation was collected at one on-site monitoring location (Big Lost River Rest Area), four boundary locations (Atomic City, Howe, Mud Lake, and Monteview) and one distant location (Idaho Falls) during the fourth quarter of 2025. Samples were then analyzed for tritium and man-made gamma emitting radionuclides. INL OP detected tritium at Atomic City during sampling there from 10/30/2025 to 12/31/2025. Precipitation analysis results for tritium and Cesium-137 are presented in **Table 8.**

Table 7. Tritium concentrations in air from atmospheric moisture, fourth quarter, 2025.

Station Location	Start Date	Collection Date	Tritium		
			Concentration		1 SD
On-site Locations					
Big Lost River Rest Area	09/25/2025	10/23/2025	**0.52**	-	0.17
Big Lost River Rest Area	10/23/2025	12/04/2025	0.04	U	0.08
Big Lost River Rest Area	12/04/2025	12/31/2025	0.08	U	0.08
Experimental Field Station	09/25/2025	10/16/2025	0.24	U	0.12
Experimental Field Station	10/16/2025	11/20/2025	**0.33**	-	0.08
Experimental Field Station	11/20/2025	12/31/2025	-0.04	U	0.08
MFC[1] Entrance	09/25/2025	10/23/2025	0.17	U	0.17
MFC Entrance	10/23/2025	11/26/2025	0.21	U	0.12
MFC Entrance	11/26/2025	12/31/2025	0.04	U	0.08
Sand Dunes Tower	09/25/2025	10/16/2025	0.24	U	0.12
Sand Dunes Tower	10/16/2025	11/20/2025	0.21	U	0.08
Sand Dunes Tower	11/20/2025	12/31/2025	-0.03	U	0.07
Van Buren Avenue	09/25/2025	10/23/2025	0.06	U	0.18
Van Buren Avenue	10/23/2025	12/04/2025	0.15	U	0.08
Van Buren Avenue	12/04/2025	12/31/2025	**0.29**	-	0.08
Boundary Locations					
Atomic City	09/25/2025	10/23/2025	0.06	U	0.17
Atomic City	10/23/2025	11/26/2025	0.13	U	0.09
Atomic City	11/26/2025	12/31/2025	**0.27**	-	0.08
Howe	09/25/2025	10/16/2025	0.18	U	0.18
Howe	10/16/2025	11/20/2025	0.20	U	0.08
Howe	11/20/2025	12/31/2025	-0.07	U	0.07
Mud Lake	09/25/2025	10/16/2025	0.19	U	0.13
Mud Lake	10/16/2025	11/20/2025	0.04	U	0.09
Mud Lake	11/20/2025	12/31/2025	0.11	U	0.07
Monteview	09/25/2025	10/16/2025	**0.50**	-	0.12
Monteview	10/16/2025	11/13/2025	0.16	U	0.08
Monteview	11/13/2025	12/11/2025	0.04	U	0.08
Monteview	12/11/2025	12/31/2025	0.04	U	0.08
Distant Locations					
Craters of the Moon	09/25/2025	10/16/2025	0.45	U	0.17
Craters of the Moon	10/16/2025	11/20/2025	0.04	U	0.08
Craters of the Moon	11/20/2025	12/31/2025	**0.29**	-	0.07
Fort Hall[2]	09/25/2025	10/16/2025	**0.47**	-	0.13
Fort Hall	10/16/2025	11/13/2025	0.27	U	0.14
Fort Hall	11/13/2025	12/11/2025	0.05	U	0.09
Fort Hall	12/11/2025	12/31/2025	0.09	U	0.09
Idaho Falls	09/25/2025	10/09/2025	-0.06	U	0.13
Idaho Falls	10/09/2025	10/30/2025	**0.47**	-	0.10
Idaho Falls	10/30/2025	12/04/2025	0.04	U	0.08
Idaho Falls	12/04/2025	12/31/2025	0.12	U	0.08

Note: Concentrations are reported in pCi/m^3 with associated uncertainty (1 SD). **Bold** concentrations are positive detections, greater than or equal to 3 standard deviations.
Data qualifiers: J = estimate, R = rejected, U=undetected.
[1] Materials and Fuels Complex.
[2] Station operated by Shoshone-Bannock Tribes.

Table 8. Tritium and Cesium-137 concentrations in precipitation, fourth quarter 2025.

Station Location	Start Date	Stop Date	Tritium[1]			Cs-137[2]		
			Concentration		1 SD	Concentration		1 SD
On-site Locations								
Big Lost River Rest Area	09/25/2025	10/30/2025	50	U	30	-0.6	U	0.6
Big Lost River Rest Area	10/30/2025	12/31/2025	50	U	30	-0.1	U	0.6
Boundary Locations								
Atomic City	09/25/2025	10/30/2025	0	U	30	0.6	U	0.6
Atomic City	10/30/2025	12/31/2025	**70**	-	20	0.1	U	0.6
Howe	09/25/2025	11/06/2025	0	U	30	0.7	U	0.8
Howe	11/06/2025	12/31/2025	30	U	30	-0.2	U	0.6
Mud Lake	09/25/2025	11/06/2025	50	U	30	0.8	U	0.5
Mud Lake	11/06/2025	12/31/2025	50	U	30	-0.1	U	0.6
Monteview	09/25/2025	11/06/2025	50	U	30	0.7	U	0.6
Monteview	11/06/2025	12/31/2025	50	U	30	0.7	U	0.6
Distant Locations								
Idaho Falls	09/25/2025	10/30/2025	60	U	30	0.6	U	0.6
Idaho Falls	10/30/2025	12/31/2025	70	U	30	0.0	U	0.5

Concentrations are reported in pCi/L with associated uncertainty (1 SD). **Bold** concentrations are positive detections, greater than or equal to 3 SD.
Data qualifiers: J = estimate, R = rejected, U=undetected.
[1] For comparison, the International Atomic Energy Agency - which collects precipitation worldwide and analyzes it for tritium content – reports stable measurements in the northern and southern hemispheres that vary from 14-54 pCi/L and less than 5 pCi/L respectively. Source: IAEA Technical Reports Series No. 495: *Tritium in the Environment*, 2025, page 78.
[2] USEPA maintains a RADNET station in Idaho Falls and determined that Cs-137 concentrations in precipitation collected there from 1978-2025 varied from -16 to 15 pCi/L with an average of 0.08 pCi/L (total 453 measurements). Source: https://enviro.epa.gov/envirofacts/radnet/search.

Environmental Radiation Monitoring Results

The DEQ-INL OP operated 11 real-time environmental radiation monitoring stations during the fourth quarter of 2025 (**Figure 1**). To detect gamma radiation, each station is equipped with an EcoGamma gamma radiation monitor featuring both low- and high-range Geiger–Müller detectors, along with triplicate electret ionization chambers (EICs). (**Table 9**).

The Shoshone-Bannock Tribes operate an air monitoring station at Fort Hall, which is also equipped with an EcoGamma and EICs—both owned and operated by the DEQ-INL OP. The DEQ-INL OP reports these results as a distant site.

The EcoGammas provide real-time measurements and are sensitive enough to detect small changes in gamma radiation levels. The EcoGamma data from each location are transmitted to the DEQ-INL OP and are presented graphically on the DEQ website: https://www.deq.idaho.gov/idaho-national-laboratory-oversight/inl-oversight-program/gamma-radiation-measurements. Historically, DEQ-INL OP used high-pressure ion chambers (HPICs) for real-time gamma radiation monitoring. The transition from HPICs to EcoGammas at all monitoring stations was completed in the first quarter of 2022. Slight differences between EcoGamma and historical HPIC data are expected.

EICs are passive-integrating devices that provide cumulative measurements of environmental gamma radiation exposure. They are deployed, collected, and analyzed quarterly. EICs offer an economical method for monitoring gamma radiation across wide areas, particularly in regions without a power supply. They can also deliver critical gamma radiation data during emergencies. For these reasons, DEQ-INL OP has deployed EICs at 68 locations in a broad network around the INL to measure external radiation. During the third quarter of 2025, a new EIC monitoring location was added at the MFC Guard House. These data are presented in **Appendix B.**

DEQ-INL OP uses both EcoGammas and EICs to monitor external gamma radiation for a variety of radiological objectives. **Table 10** presents the average, median, and range of radiation exposure rates measured by EcoGammas during the fourth quarter of 2025. **Table 11** presents the EIC monitoring results for the same period. Overall, exposure rates remained within the historical background radiation range observed by DEQ-INL OP.

Table 9. Summary of radiation detection instruments at EcoGamma (real-time radiation monitoring) stations and air monitoring stations. Air monitoring stations are underlined.

Station Location	Instrument Type	
	EcoGamma	EIC
On-site Locations		
Base of Howe	■	■
Big Lost River Rest Area	■	■
Experimental Field Station		■
MFC Guard House[1]		■
Rover	■	■
Sand Dunes Tower	■	■
Van Buren Avenue		■
Boundary Locations		
Atomic City	■	■
Howe Met Tower	■	■
Monteview	■	■
Mud Lake/Terreton	■	■
Distant Locations		
Big Southern Butte	■	■
Craters of the Moon		■
Fort Hall	■	■
Idaho Falls	■	■

[1]MFC – Materials and Fuels Complex. MFC Guard House is a new monitoring location. Air monitoring data collection began here during the week of 5/16 - 5/23/24. EIC data collection began during the third quarter of 2025.

Table 10. Average, median, and range of gamma exposure rates, fourth quarter 2025, from EcoGamma measurements.

Station Location	Exposure Rate (µR/hr)			
	Quarterly Average*	1 SD	Median	Range**
On-site Locations				
Base of Howe	13.7	0.8	13.7	10.0 – 21.0
Big Lost River Rest Area	14.4	0.8	14.4	8.6 – 28.5
Rover[1]	14.7	0.7	14.6	10.8 – 19.2
Sand Dunes Tower	14.1	0.7	14.0	8.0 – 20.1
Boundary Locations				
Atomic City	13.5	0.8	13.4	9.0 – 21.8
Howe Met. Tower	13.1	0.7	13.1	8.1 – 18.3
Monteview	13.2	0.7	13.1	9.7 – 21.2
Mud Lake / Terreton	13.0	0.7	13.0	9.2 – 19.0
Distant Locations				
Big Southern Butte	14.4	0.8	14.4	10.6 – 21.7
Fort Hall	14.5	1.0	14.4	8.2 – 30.3
Idaho Falls	11.7	0.6	11.6	8.8 – 17.2

*EcoGammas are sensitive electronic devices that can experience intermittent malfunctions and/or interference; this typically results in characteristic positive and/or negative data spikes. These aberrations are removed from the data set based on the judgement of the data analyst.

**The range of background exposure rates from EcoGamma data collected to date is approximately 7 – 34 µR/hr.

[1]There were 9 recurring intermittent outages throughout October and November exceeding 24 hours at Rover, with the longest being a 5-day outage from October 7–12 (122 hours). No valid data was recorded at those times.

Table 11. Electret ionization chamber (EIC) cumulative average exposure rates at EcoGamma (real-time radiation monitoring) stations and air monitoring stations, fourth quarter, 2025.

Station Location	Exposure Rate (µR/hr)	
	Quarterly Average[1]	1 SD
On-Site Locations		
Base of Howe	14.4	1.5
Big Lost River Rest Area	13.3	1.2
Experimental Field Station	17.6, 20.6	-
MFC Guard House[2]	13.4	1.1
Rover	11.9	1.3
Sand Dunes Tower	13.0	1.3
Van Buren Avenue	13.9	1.7
Boundary Locations		
Atomic City	12.9	1.9
Howe Met. Tower	12.2	0.5
Monteview	10.2	0.4
Mud Lake/ Terreton	11.8	0.8
Distant Locations		
Big Southern Butte	11.5	1.2
Craters of the Moon	15.4	0.7
Fort Hall	9.7	0.9
Idaho Falls	11.6	1.2

[1]Results are the average of triplicate exposure rate measurements with the associated sample variability (±1 SD), or the 2 measured exposure rates remaining after removal of an outlying value. One of the triplicate measurements is rejected if it is outside the average of the triplicate measurements ±2 SD of the historical population variability. Typically, the two most consistent measurements are reported, based on judgment of the data analyst.

[2]MFC – Materials and Fuels Complex. MFC Guard House is a new monitoring location. Air monitoring data collection began here during the week of 5/16 - 5/23/24. EIC data collection began during the third quarter of 2025.

Water Monitoring Results

DEQ-INL OP collects groundwater samples from wells and springs located within, upgradient of, and downgradient of the INL to evaluate the effects of INL contaminants on water quality in the eastern Snake River Plain (ESRP) aquifer and verify the results of DOE and USGS monitoring. Each year, DEQ-INL OP samples approximately 85-90 locations concurrently with a DOE contractor or the USGS and 15-20 locations independently. Co-sampled locations are primarily on or near the INL Site and are usually sampled during the second and fourth calendar quarters. DEQ-INL OP publishes a comparison of its own analytical results with those obtained by co-samplers in the DEQ-INL Oversight Program Annual Report. Locations sampled independently by DEQ-INL OP are mostly in the Magic Valley and are typically sampled during the third calendar quarter.

Most water samples are collected from wells drilled into the aquifer or springs formed by the intersection of the aquifer water table with the surface. Each aquifer well or spring is categorized as upgradient, facility, boundary, or distant based on its location (**Figure 2** and **Figure 3**):

- *Upgradient* sites are situated north or northeast of INL facilities in areas that have not been affected by INL operations. They are used to monitor background concentrations in the aquifer.

- *Facility* sites are located near facility complexes within the INL, including the Advanced Test Reactor complex (ATR), the Central Facilities Area (CFA), the Idaho Nuclear Technology and

Engineering Center (INTEC), the Materials and Fuels Complex (MFC), the Naval Reactors Facility (NRF), the Radioactive Waste Management Complex (RWMC), and Test Area North (TAN). Facility sites are located within or immediately downgradient of known areas of contamination and are sampled to monitor the concentrations and migration of specific contaminants.

- *Boundary* sites are located near the southern boundary of the INL, downgradient of potential sources of INL contamination. These include several wells equipped with Westbay Multilevel Groundwater Monitoring Systems ("Westbay wells"), which offer a look at the vertical distribution of constituents in the aquifer.

- *Distant* sites are located farther downgradient of the INL, primarily in the Magic Valley, and include wells and springs used for agricultural, municipal, domestic, and industrial purposes.

A small number of samples are also collected each year from streams, waste-pond effluent, and wells drilled into perched groundwater (groundwater that sits above the aquifer).

Samples collected from water-monitoring sites are analyzed for radiological and non-radiological constituents, many of which are present in the aquifer both naturally and as a result of INL operations. All locations are sampled for gross alpha and gross beta radioactivity, manmade gamma-emitting nuclides, tritium, chloride, sulfate, alkalinity, chromium, and nitrate-plus-nitrite.[6] Samples from locations at which tritium concentrations are too low to be detected by the standard method are re-analyzed for tritium using an electrolytic enrichment method (referred to as the low-level method), which has a minimum detectable concentration (MDC) about ten times lower than the standard method. Selected sites are also sampled for specific radionuclides—including uranium isotopes (^{234}U, ^{235}U, and ^{238}U), plutonium isotopes (^{238}Pu, $^{239/240}$Pu), americium-241 (^{241}Am), strontium-90 (^{90}Sr), iodine-129 (^{129}I) and technetium-99 (^{99}Tc)—selected trace metals, common ions, total phosphorus, and/or volatile organic compounds (VOCs) based on past and present INL operations or a history of elevated concentrations. If unexpected levels of radioactivity are detected in gross measurements, additional samples will be collected and analyzed for specific radionuclides.

During the fourth quarter of 2025, DEQ-INL OP sampled groundwater from the aquifer at 10 facility locations, three boundary locations, five distant locations, and one upgradient location. DEQ-INL OP also sampled water from four perched water locations, two surface water locations, and two wastewater locations. **Table 12** lists the sample date, co-sampler, well depth, and analyses requested for the locations sampled this quarter. Analytical results are reported in **Tables 14** through **24** and summarized below. The results of low-level tritium analyses are reported in **Table 16** and discussed below. A backlog of seven low-level tritium analyses remain.

Table 13 shows the range of background concentrations for each constituent in the ESRP aquifer and the EPA drinking water maximum contaminant level (MCL) or secondary maximum contaminant level (SMCL). Background concentrations depend on local geology, and the concentrations of constituents at sites not influenced by INL activities may on occasion be higher than the given background ranges due to local factors and natural variability.

[6] Distant locations Alpheus Spring, Bill Jones Hatchery, Clear Spring, Minidoka Water Supply, and Shoshone Water Supply and upgradient location Mud Lake Water Supply are sampled for gross alpha and gross beta radioactivity, gamma-emitting radionuclides, and tritium during the second quarter. In the fourth quarter, common ions, metals, nitrate-plus-nitrate, and other constituents are collected along with gross alpha and gross beta radioactivity, gamma-emitting radionuclides, and tritium.

Gross alpha and gross beta radioactivity

Gross alpha and gross beta analyses are used to screen for unexpectedly high levels of radioactivity in samples. DEQ-INL OP has determined from past sampling that background concentration ranges for gross alpha and gross beta radioactivity in the ESRP aquifer are approximately 0-5.6 pCi/L and 0-8.6 pCi/L, respectively. Occasional measurements of concentrations above these background ranges in uncontaminated samples are statistically probable due to uncertainties inherent in measuring low levels of radioactivity. Additionally, some samples will have levels of radioactivity slightly higher than background ranges due to higher-than-average concentrations of naturally occurring uranium, thorium, or potassium-40.

Gross alpha and beta radioactivity were detected at low levels in most samples (**Table 14**). Gross alpha radioactivity was measured within background ranges at all locations. TRA-07, an aquifer well located at the ATR facility, had the greatest gross alpha activity; measured at a concentration of 2.7 ± 0.5 pCi/L.

Gross beta activity was measured above background at TAN and ATR. TAN-37 exhibited the maximum gross beta activity this quarter at 723.9 ± 26.9 pCi/L. Bioremediation efforts are ongoing at the TAN facility, and it is hypothesized that these remediation efforts are mobilizing known ^{90}Sr contamination (a beta emitter) in the aquifer. TAN-37 also had the highest ^{90}Sr concentration this quarter. PW-12 displayed the highest gross beta concentration at the ATR facility at 83.6 ± 1.5 pCi/L. This location has known ^{90}Sr contamination and the gross beta concentration detected at this well is within the historical range. All other locations sampled this quarter had concentrations within background ranges.

Manmade gamma-emitting radionuclides

No manmade gamma-emitting radionuclides were detected at any location sampled this quarter. Results for ^{137}Cs, the manmade gamma-emitter most likely to be detected in groundwater, are reported in **Table 14**.

Tritium

Tritium was analyzed at all locations sampled this quarter (**Table 15**). Detected tritium concentrations at the facility wells ranged from 2222 ± 60 pCi/L at TRA-07 to 228 ± 40 pCi/L at TAN-37. The perched water at the ATR facility noted a marked increase in tritium concentrations including: 1072 ± 50 pCi/L at USGS-073. Perched water levels have been decreasing at the ATR facility.

Low-level tritium analysis was performed on one upgradient and five distant locations in the fourth quarter and three distant locations in the third quarter (**Table 16)**. Detections occurred at Alpheus Spring (11 ± 2 pCi/L), Shoshone Water Supply (7 ± 2 pCi/L), and two private wells; MV-13 (15 ± 2 pCi/L) and MV-63 (11 ± 2 pCi/L). All locations were below background concentrations and within historical ranges. Several low-level tritium samples from this quarter are backlogged and will be included in the first quarter 2026 report.

All tritium concentrations were within historical ranges and well below the drinking water MCL of 20,000 pCi/L.

Strontium-90

One facility and three perched water well locations were sampled for ^{90}Sr this quarter (**Table 17**). Detectable concentrations were found in three samples at TAN and ATR with a maximum concentration

of 383 ± 17 pCi/L at TAN-37. ATR perched water well PW-12 had a concentration of 56.8 ± 2.8 pCi/L. This is the highest concentration of ^{90}Sr recorded at this location and is 71% greater than the previous maximum concentration in 2023 (34.1 ± 3.1 pCi/L). Similarly, ATR perched water well PW-11 saw a 118% increase in concentration from the maximum concentration in 2024 (0.802 ± 0.2 pCi/L).

Technetium-99

One facility location was sampled for ^{99}Tc this quarter (**Table 18**). Well CFA-2 had a concentration of 1.84 ± 0.29 pCi/L. This concentration is within the historical range.

Plutonium Isotopes

Two facility wells were sampled for plutonium isotopes (^{238}Pu and $^{239/240}Pu$) this quarter, resulting in non-detections for ^{238}Pu and $^{239/240}Pu$ (**Table 19**).

Americium-241

Three facility locations at RWMC and ATR were sampled for Americium-241(^{241}Am) this quarter. All sample results were non-detections (**Table 19**).

Uranium Isotopes

Three facility wells from INTEC and RWMC were sampled for uranium isotopes this quarter (**Table 20**). All three wells yielded detectable results for ^{234}U. The highest concentration this quarter was from TAN-37 at 3.14 ± 0.54 pCi/L. Detectable concentrations of ^{235}U were found at RWMC Production Well at 0.0615 ± 0.018 pCi/L. All three wells had detections of ^{238}U this quarter, with the greatest concentration of 1.07 ± 0.30 pCi/L at TAN-37, which is a historical high for ^{238}U at this well. No wells exceed the total uranium MCL of 30 µg/L.

Common ions, trace metals, and nutrients

Select locations were sampled for common ions (calcium, magnesium, sodium, potassium, chloride, sulfate, and alkalinity), trace metals, (arsenic, barium, chromium, iron, lead, and manganese.) and dissolved nutrients (nitrate-plus-nitrite, phosphorus) (**Tables 21, 22, and 23**).

Chloride levels above background concentrations were measured at ATR and CFA. USGS-073, a perched water well at the ATR facility, had the highest overall concentration this quarter at 288 mg/L, which exceeds the EPA's secondary drinking water MCL of 250 mg/L. ATR perched water well PW-11 had the highest sulfate concentration at 116 mg/L, followed by ATR aquifer well TRA-07 at 114 mg/L.

Concentrations of barium, iron, magnesium, calcium, manganese, sodium, alkalinity, potassium, and phosphorus in samples from TAN-37, were elevated above background likely due to in-situ bioremediation (ISB) conditions, necessitating sample dilution to prevent instrument fouling.

TAN-37 displayed the locations highest recorded chromium concentration at 240 µg/L. The elevated result is likely the remobilization of chromium due to bioremediation injections. TRA-07 displayed a chromium concentration equal to the MCL at 100 µg/L, which is the highest value since 2011 (120 µg/L). Chromium concentrations in this location have increased since 2020 and will continue to be monitored annually. The highest chromium value for perched groundwater wells was 31 µg/L at PW-11 located near the ATR facility. This is the maximum recorded concentration at this location.

The highest arsenic detection was observed at MFC-IWP (2.3 µg/L) this quarter. This concentration is below the MCL and consistent with historical results at this location. All other concentrations are within natural background ranges.

The highest nitrate + nitrite concentration was 32 mg/L at perched water well USGS-073 (ATR), which is consistent with historical data. One sample at TAN-37 had elevated levels of phosphorus at 31 mg/L, which is likely a direct result of bioremediation activity. All other concentrations were consistent with past observations and trends, with most within natural background ranges.

Volatile organic compounds (VOCs)

VOCs were measured at three locations this quarter (**Table 24**). Two RWMC locations had detectable concentrations of at least one VOC. Carbon tetrachloride was detected slightly above the MCL at RWMC Production Well at 5.86 µg/L, which is within the historical range for this location. All other VOC detections were consistent with historical data and were measured in areas of known contamination.

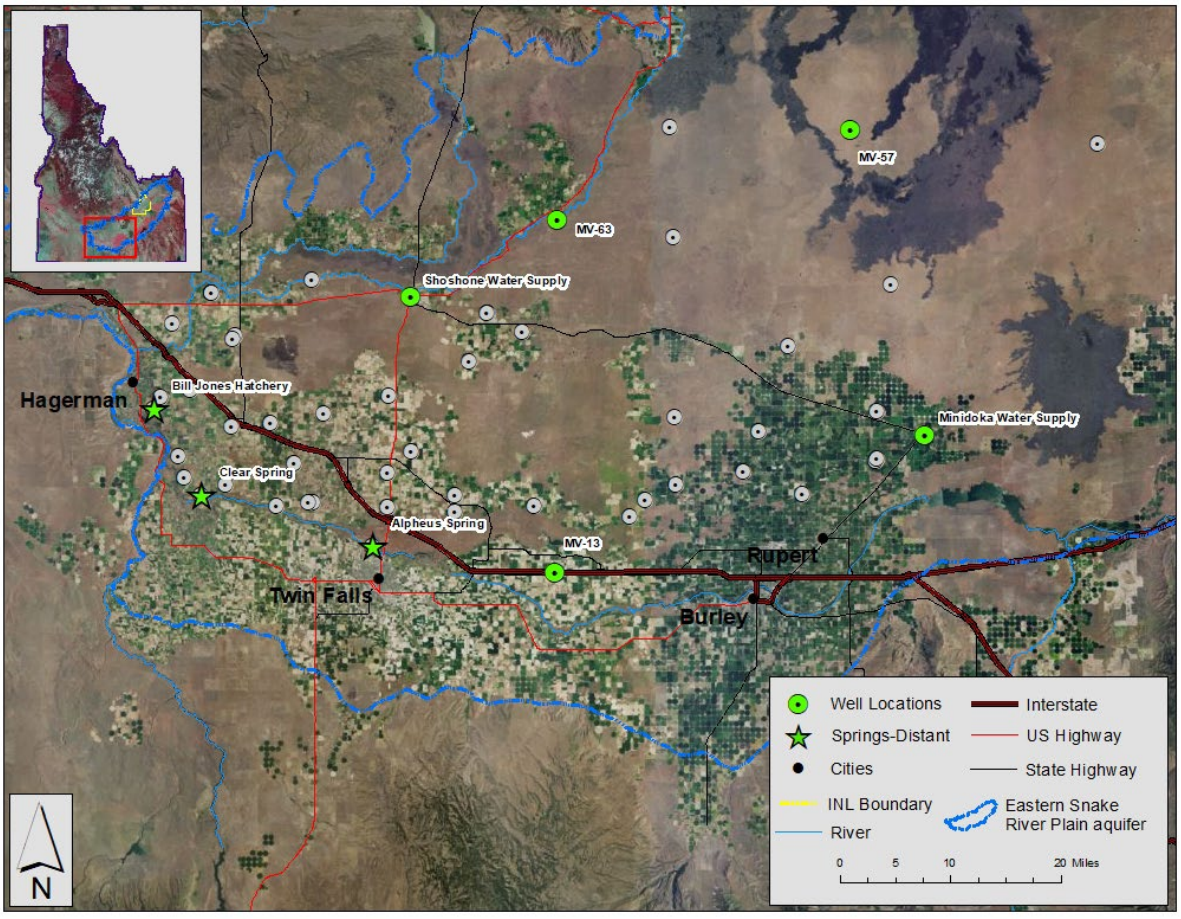


Figure 2. Distant water monitoring locations.

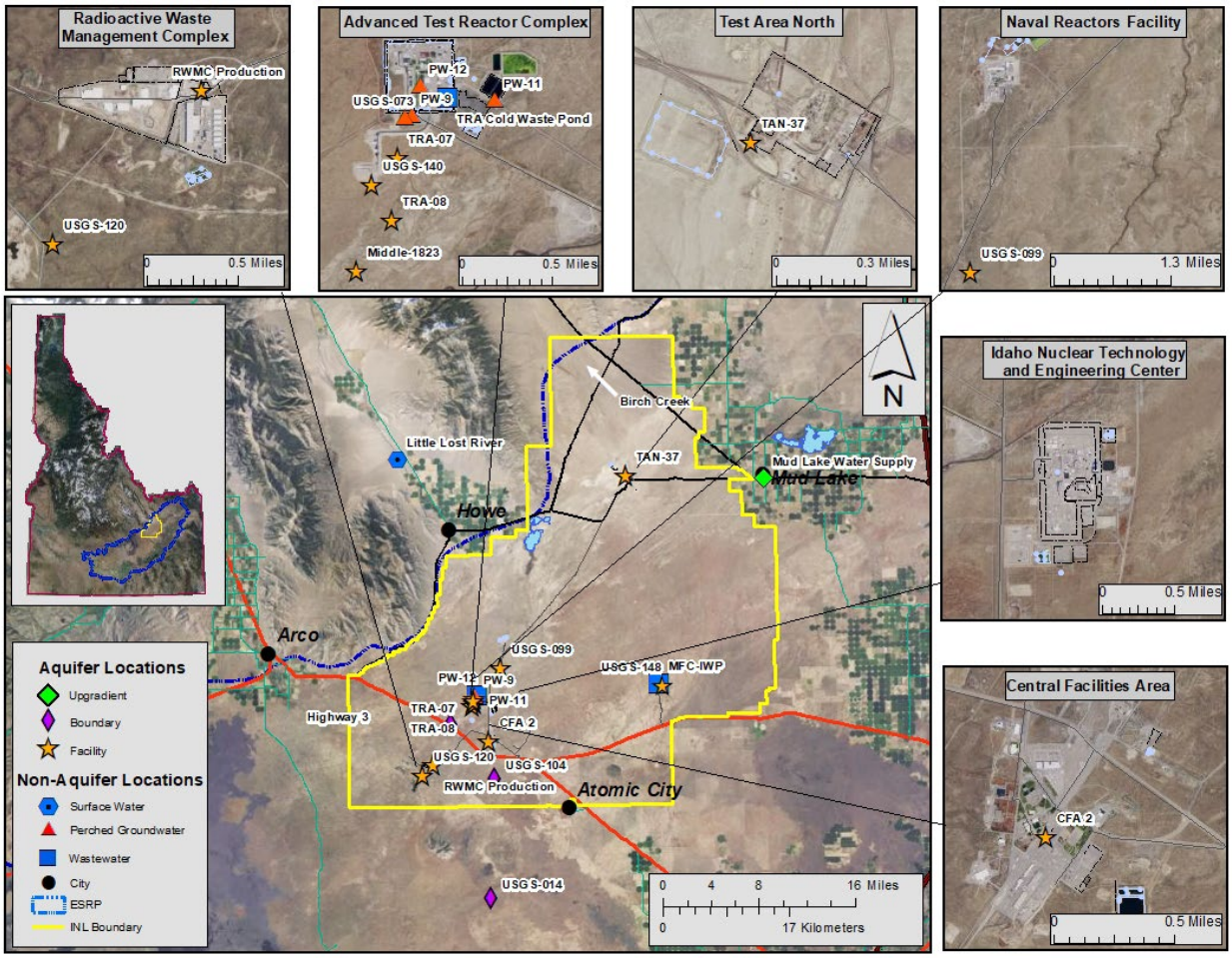


Figure 3. Upgradient, facility, boundary, perched groundwater (GW), surface water and wastewater monitoring locations.

Table 12. Locations sampled for water, fourth quarter, 2025.

Sample Location	Date Sampled	Co Sampler	Well Depth (ft bgs)	Analyses*
Aquifer Samples				
Boundary				
USGS-014	11/17/25	USGS	752	Cl^-, SO_4^{2-}, alkalinity, Cr, NO_3+NO_2, α, β, γ, ^3H
USGS-104	11/17/25	USGS	700	Cl^-, SO_4^{2-}, alkalinity, Cr, NO_3+NO_2, α, β, γ, ^3H
Highway 3	11/20/25	USGS	750	Cl^-, SO_4^{2-}, alkalinity, Cr, NO_3+NO_2, α, β, γ, ^3H
Distant				
Alpheus Spring	11/04/25	BEA	-	NO_3^- + NO_2^-, com. ions, Cr, α, β, γ, ^3H
Clear Spring	11/04/25	BEA	-	NO_3^- + NO_2^-, com. ions, Cr, α, β, γ, ^3H
Bill Jones Hatchery	11/04/25	BEA	-	NO_3^- + NO_2^-, com. ions, Cr, α, β, γ, ^3H
Shoshone Water Supply	11/04/25	BEA	-	NO_3^- + NO_2^-, com. ions, Cr, α, β, γ, ^3H
Minidoka Water Supply	11/04/25	BEA	-	NO_3^- + NO_2^-, com. ions, Cr, α, β, γ, ^3H
Facility				
Advanced Test Reactor Complex				
Middle-1823	10/06/25	IEC	705	Cl^-, SO_4^{2-}, alkalinity, Cr, NO_3+NO_2, α, β, γ, ^3H
TRA-08	10/06/25	IEC	522	Cl^-, SO_4^{2-}, alkalinity, Cr, NO_3+NO_2, α, β, γ, ^3H
TRA-07	10/06/25	IEC	490	Cl^-, SO_4^{2-}, alkalinity, Cr, NO_3+NO_2, α, β, γ, ^{241}Am., ^3H
USGS-140	11/13/25	USGS	546	Cl^-, SO_4^{2-}, alkalinity, Cr, NO_3+NO_2, α, β, γ, ^3H
Central Facilities Area				
CFA 2	11/17/25	USGS	681	Cl^-, SO_4^{2-}, alkalinity, Cr, NO_3+NO_2, α, β, γ, ^{99}Tc, ^3H
Materials and Fuels Complex				
USGS-148	11/17/25	USGS	759	Cl^-, SO_4^{2-}, alkalinity, Cr, NO_3+NO_2, α, β, γ, ^3H
Naval Reactors Facility				
USGS-099	11/17/25	USGS	440	Cl^-, SO_4^{2-}, alkalinity, Cr, NO_3+NO_2, α, β, γ, ^3H
Radioactive Waste Management Complex				
RWMC Production	11/24/25	USGS	685	Cl^-, SO_4^{2-}, alkalinity, Cr, NO_3+NO_2, VOCs, α, β, γ, U iso., Pu iso.,^{241}Am, ^3H
USGS-120	11/24/25	USGS	705	Cl^-, SO_4^{2-}, alkalinity, Cr, NO_3+NO_2, VOCs, α, β, γ, U iso., Pu iso.,^{241}Am, ^3H
Test Area North				
TAN-37	10/22/25	IEC	240	NO_3^- + NO_2^-, P, com. ions, trace metals, VOCs, α, β, γ, ^{90}Sr, U iso, ^3H
Upgradient				
Mud Lake Water Supply	11/05/25	BEA	-	NO_3^- + NO_2^-, com. ions, Cr, α, β, γ, ^3H
Other Samples				
Perched Groundwater				
Advanced Test Reactor Complex				
PW-11	10/06/25	IEC	120	NO_3^- + NO_2^-, Cl, SO_4^{2-}, alkalinity, Cr, α, β, γ, ^{90}Sr, ^3H
PW-12	10/08/25	IEC	128	NO_3^- + NO_2^-, Cl, SO_4^{2-}, alkalinity, Cr, α, β, γ, ^{90}Sr, ^3H
USGS-073	11/13/25	USGS	127	NO_3^- + NO_2^-, Cl, SO_4^{2-}, alkalinity, Cr, α, β, γ, ^{90}Sr, ^3H
PW-9	11/13/25	USGS	200	NO_3^- + NO_2^-, Cl, SO_4^{2-}, alkalinity, Cr, α, β, γ, ^3H
Surface Water				

Sample Location	Date Sampled	Co Sampler	Well Depth (ft bgs)	Analyses*
Little Lost River	11/20/25	USGS	-	NO_3^- + NO_2^-, Cl, SO_4^{2-}, alkalinity, Cr, α, β, γ, ^3H
Birch Creek	11/20/25	USGS	-	NO_3^- + NO_2^-, Cl, SO_4^{2-}, alkalinity, Cr, α, β, γ, ^3H
Waste Water				
MFC-IWP	10/06/25	BEA	-	α, β, γ, ^3H, Cl, SO_4^{2-}, alkalinity, NO_3^- + NO_2^-, P, trace metals
TRA Cold Waste Pond	10/14/25	BEA	-	NO_3^- + NO_2^-, P, Cl, SO_4^{2-}, alkalinity, trace metals, α, β, γ, ^3H

ft bgs = feet below ground surface.

*α = gross alpha radioactivity; β = gross beta radioactivity; γ = manmade gamma-emitting radionuclides; ^3H = tritium; ^{90}Sr = Strontium-90; ^{99}Tc = Technetium-99; ^{241}Am = Americium-241; P iso. = ^{238}Pu, $^{239/240}Pu$; ^{129}I = Iodine-129; U iso. = ^{234}U, ^{235}U, ^{238}U; Cl^- = chloride; Cr = chromium; com. ions = calcium (Ca^{2+}), magnesium (Mg^{2+}), sodium (Na^+), potassium (K^+), chloride (Cl^-), sulfate (SO_4^{2-}), alkalinity; trace metals = arsenic (As), barium (Ba), chromium (Cr), iron (Fe), manganese (Mn), lead (Pb); selenium (Se); NO_3+NO_2 = nitrate plus nitrite; P = phosphorus, and VOCs = volatile organic compounds

Table 13. Constituent background concentration ranges and EPA drinking water standards.

Constituent	Background[1]	MCL or SMCL[2]
Radiological Constituents (pCi/L)		
Gross alpha	0-5.6[a]	15
Gross beta	0-8.6[a]	4 mrem/yr
Cesium-137	0	200
Tritium	0-33[a]	20,000
Strontium-90	0	8
Technetium-99	0	900
Iodine-129	0.0000054[e]	1
Uranium-234	0.043-1.9[b]	30 µg/L (total U)
Uranium-235	0-0.048[b]	
Uranium-238	0.021-0.719[b]	
Plutonium-238	0	15[g]
Plutonium-239/240	0	15[g]
Americium-241	0	15[g]
Non-radiological Constituents		
Common Ions (mg/L)		
Alkalinity (as $CaCO_3$)	91-261[a]	---
Calcium	23 – 71[a]	---
Chloride	4.9 – 66.6[a]	250*
Fluoride	0.1 – 1.50[a]	4
Magnesium	10.1 – 27.4[a]	---
Potassium	1.2 – 5.8[a]	---
Sodium	2.6 – 27.0[a]	---
Sulfate	9.6 – 40.4[a]	250*
Trace Metals (µg/L)		
Arsenic	2 – 3[c]	10
Barium	50 – 70[c]	2000
Chromium	<1.0 – 5.2[a]	100
Iron	4 – 16[d]	300*
Lead	<5[c]	15
Manganese	<1 – 4[a]	50*
Selenium	<1[c]	50
Zinc	<3 – 10.5[d]	5000*
Nutrients (mg/L)		
Nitrate plus nitrite	<0.04 – 3.59[b]	10 for NO_3^-, 1 for NO_2^-
Phosphorus	<0.01 – 0.02[d]	---
Volatile Organic Compounds (µg/L)		
Tetrachloroethene (PCE)	0	5
Trichloroethene (TCE)	0	5
1,1-Dichloroethene	0	7
cis-1,2-dichloroethene	0	70
trans-1,2-dichloroethene	0	100
Vinyl chloride	0	2
Carbon tetrachloride	0	5
Chloroform	0	80[f]
Chloromethane	0	---
Methylene Chloride	0	5
Methyl Ethyl Ketone	0	---
1,1-Dichloroethane	0	---

[1] Sources for background ranges are: [a] DEQ data compiled from distant, boundary, and surface water sites from 1993-2018; [b] Bartholomay and Hall, 2016 (DOE/ID-22237); [c] Knobel and others, 1992; [d] Knobel and others, 1999 (DOE/ID-22164). [e] The actual background of I-129 in the aquifer from atmospheric deposition and rock weathering is 0.0000054 pCi/L per Cecil and others, 2003 (DOE/ID-22186); [f] MCL is for total trihalomethanes. [g] There are no specific MCLs for these nuclides. Listed MCLs are the gross alpha activity MCL. [2] Maximum Contaminant Levels (MCLs) are the highest levels of contaminants legally allowed in public drinking water systems in Idaho. Most wells sampled by DEQ-INL OP are not used for drinking water. A * designates a Secondary MCL (SMCL), which is a guideline recommended by the EPA for constituents that may affect the taste, color, or odor of drinking water.

Table 14. Gross alpha, gross beta, and man-made gamma-emitting radionuclide concentrations (pCi/L) in water samples, fourth quarter, 2025.

Sample Location	Sample Date	Gross Alpha			Gross Beta			Cesium-137*		
		Result		1 SD	Result		1 SD	Result		1 SD
Aquifer Samples										
Boundary										
USGS-014	11/17/25	**2.1**	-	0.4	**3.2**	-	0.4	1.2	U	0.6
USGS-104	11/17/25	**1.7**	-	0.4	**3.5**	-	0.4	0.4	U	0.6
Highway 3	11/20/25	**1.5**	-	0.4	**2.4**	-	0.4	1.9	U	0.7
Distant										
Alpheus Spring	11/04/25	1.2	U	0.6	**7.3**	-	0.5	0.2	U	1.0
Clear Spring	11/04/25	**1.3**	-	0.4	**3.1**	-	0.4	-0.2	U	0.5
Bill Jones Hatchery	11/04/25	0.6	U	0.3	**3.0**	-	0.4	0.2	U	0.7
Shoshone Water Supply	11/04/25	**1.4**	-	0.4	**1.7**	-	0.4	0.7	U	0.6
Minidoka Water Supply	11/04/25	1.0	U	0.4	**2.6**	-	0.4	0.7	U	0.6
Facility										
Advanced Test Reactor Complex										
Middle-1823	10/06/25	**1.8**	-	0.5	1.0	U	0.4	0.1	U	0.6
TRA-08	10/06/25	**1.5**	-	0.4	1.0	U	0.4	0.4	U	0.6
TRA-07	10/06/25	**2.7**	-	0.5	**5.7**	-	0.5	0.8	U	0.6
USGS-140	11/13/25	0.5	U	0.3	**2.3**	-	0.4	1.2	U	0.7
Central Facilities Area										
CFA 2	11/17/25	**2.2**	-	0.4	**4.6**	-	0.5	1.0	U	0.6
Materials and Fuels Complex										
USGS-148	11/17/25	**1.0**	-	0.3	**2.7**	-	0.4	-0.2	U	0.6
Naval Reactors Facility										
USGS-099	11/17/25	**1.3**	-	0.4	**1.4**	-	0.4	0.3	U	0.6
Radioactive Waste Management Complex										
RWMC Production	11/24/25	**1.5**	-	0.4	**2.8**	-	0.4	-0.5	U	0.6
USGS-120	11/24/25	0.5	U	0.4	**1.7**	-	0.4	1.4	U	0.7
Test Area North										
TAN-37	10/22/25	-34[1]	UJ	14	**724**	-	27	0.7	U	0.8
Upgradient										
Mud Lake Water Supply	11/05/25	0.4	U	0.2	**4.3**	-	0.4	-0.2	U	0.6
Other Samples										
Perched Water										
Advanced Test Reactor Complex										
PW-11	10/06/25	**1.4**	-	0.4	**3.2**	-	0.4	0.2	U	0.6
PW-12	10/08/25	0.7	U	0.6	**83.6**	-	1.5	0.7	U	0.6
USGS-073	11/13/25	1.1	U	0.9	**5.7**	-	1.0	-0.7	U	0.7
PW-9	11/13/25	1.3	U	0.6	**4.5**	-	0.5	-0.4	U	0.7
Surface water										
Little Lost River	11/20/25	**1.5**	-	0.4	0.1	U	0.4	0.3	U	0.6
Birch Creek	11/20/25	**2.3**	-	0.4	0.7	U	0.4	0.0	U	0.6

Sample Location	Sample Date	Gross Alpha			Gross Beta			Cesium-137*		
		Result		1 SD	Result		1 SD	Result		1 SD
Waste water										
MFC-IWP	10/06/25	1.9	U	0.7	**7.2**	-	0.7	0.9	U	0.6
TRA Cold Waste Pond	10/14/25	0.6	U	0.4	0.9	U	0.4	0.2	U	0.6

Data qualifiers: U = undetected, J = estimate, R = rejected, "+" or "-" after a J means that the estimated result is biased high or low, respectively.
*ISU-EML analyzes water samples for all common manmade gamma-emitting radionuclides. If none are detected, only the results for ^{137}Cs, the manmade gamma-emitter most likely to be detected in groundwater, are reported in this table.
ft bgs = feet below ground surface.
Bold concentrations are positive detections, greater than or equal to 3 SD.
[1]ISU-EML reported that the elevated 1 SD is attributable to the low aliquant of sample (0.010 L) that was required to keep the residual mass within the maximum value of 200 mg for which their mass correction formula is valid.

Table 15. Tritium concentrations (pCi/L) in water samples, fourth quarter, 2025.

Sample Location	Sample Date	Tritium		
		Result		1 SD
Aquifer Samples				
Boundary				
USGS-014	11/17/25	-20	U	30
USGS-104	11/17/25	**375**	-	40
Highway 3	11/20/25	27	U	30
Distant				
Alpheus Spring	11/04/25	-7	U	30
Clear Spring	11/04/25	-37	U	30
Bill Jones Hatchery	11/04/25	61	U	30
Shoshone Water Supply	11/04/25	17	U	30
Minidoka Water Supply	11/04/25	41	U	30
Facility				
Advanced Test Reactor Complex				
Middle-1823	10/06/25	**268**	-	40
TRA-08	10/06/25	**513**	-	40
TRA-07	10/06/25	**2222**	-	60
USGS-140	11/13/25	**654**	-	40
Central Facilities Area				
CFA 2	11/17/25	**1904**	-	60
Materials and Fuels Complex				
USGS-148	11/17/25	-17	U	30
Naval Reactors Facility				
USGS-099	11/17/25	-108	U	30
Radioactive Waste Management Complex				
RWMC Production	11/24/25	**310**	-	40
USGS-120	11/24/25	91	U	30
Test Area North				
TAN-37	10/22/25	**228**	-	40
Upgradient				

Sample Location	Sample Date	Tritium		
		Result		1 SD
Mud Lake Water Supply	11/05/25	-24	U	30
Other Samples				
Perched Water				
Advanced Test Reactor Complex				
PW-11	10/06/25	**231**	-	40
PW-12	10/08/25	**1129**	-	50
USGS-073	11/13/25	**1072**	-	50
PW-9	11/13/25	**706**	-	40
Surface water				
Little Lost River	11/20/25	10	U	30
Birch Creek	11/20/25	24	U	30
Waste water				
MFC-IWP	10/06/25	13	U	30
TRA Cold Waste Pond	10/14/25	27	U	30

Data qualifiers: U = undetected, J = estimate, R = rejected, "+" or "-" after a J means that the estimated result is biased high or low, respectively.
Bold concentrations are positive detections, greater than or equal to 3 SD.

Table 16. Low-level tritium concentrations (pCi/L) in water samples collected during third and fourth quarter 2025 and analyzed using the electrolytic enrichment method.

Sample Location	Sample Date	Tritium		
		Result		1 SD
Aquifer Samples				
Distant				
MV-13	7/14/2025	**15**	-	2
MV-57	7/29/2025	4	U	2
MV-63	8/27/2025	**11**	-	2
Alpheus Spring	11/04/25	**11**	-	2
Clear Spring	11/04/25	2	U	2
Bill Jones Hatchery	11/04/25	1	U	2
Shoshone Water Supply	11/04/25	**7**	-	2
Minidoka Water Supply	11/04/25	5	U	2
Upgradient				
Mud Lake Water Supply	11/05/25	0	U	2

Data qualifiers: U = undetected, J = estimate, R = rejected, "+" or "-" after a J means that the estimated result is biased high or low, respectively.
Bold concentrations are positive detections, greater than or equal to 3 SD.

Table 17. Strontium-90 concentrations (pCi/L) in water samples, fourth quarter, 2025.

Sample Location	Sample Date	Strontium		
		Result		1 SD
Aquifer Samples				
Facility				
Test Area North				
TAN-37	10/22/25	**383**	-	17
Other Samples				
Perched				
Advanced Test Reactor Complex				
PW-11	10/06/25	**1.75**	-	0.36
PW-12	10/08/25	**56.8**	-	2.8
USGS-073	11/13/25	0.74	U	0.74

Data qualifiers: U = undetected, J = estimate, R = rejected, "+" or "-" after a J means that the estimated result is biased high or low, respectively.
Bold concentrations are positive detections, greater than or equal to 3 SD.

Table 18. Technetium-99 concentrations (pCi/L) in water samples, fourth quarter, 2025.

Sample Location	Sample Date	Technetium-99		
		Result		1 SD
Aquifer Samples				
Facility				
Central Facilities Area				
CFA 2	11/17/25	**1.84**	-	0.29

Data qualifiers: U = undetected, J = estimate, R = rejected, "+" or "-" after a J means that the estimated result is biased high or low, respectively.
Bold concentrations are positive detections, greater than or equal to 3 SD.

Table 19. Plutonium and Americium isotope concentrations (pCi/L) in water samples, fourth quarter, 2025.

Sample Location	Sample Date	Plutonium-238			Plutonium-239/40			Americium-241		
		Result		1 SD	Result		1 SD	Result		1 SD
Aquifer Samples										
Facility										
Advanced Test Reactor Complex										
TRA-07	10/06/25	-	-	-	-	-	-	0.0143	U	0.0076
Radioactive Waste Management Complex										
RWMC Production	11/24/25	0.00206	U	0.00619	0.000	U	0.00206	0.0106	U	0.0071
USGS-120	11/24/25	-0.00869	U	0.00436	0.00217	U	0.00218	0.0076	U	0.0044

Data qualifiers: U = undetected, J = estimate, R = rejected, "+" or "-" after a J means that the estimated result is biased high or low, respectively.
Bold concentrations are positive detections, greater than or equal to 3 SD.

Table 20. Uranium isotope concentrations (pCi/L) in water samples, fourth quarter, 2025.

Sample Location	Sample Date	Uranium-234			Uranium-235			Uranium-238		
		Result		1 SD	Result		1 SD	Result		1 SD
Aquifer Samples										
Facility										
Radioactive Waste Management Complex										
RWMC Production	11/24/25	**1.49**	-	0.10	**0.0615**	-	0.0180	**0.749**	-	0.064
USGS-120	11/24/25	**1.85**	-	0.15	0.0517	U	0.0232	**0.796**	-	0.088
Test Area North										
TAN-37	10/22/25	**3.14**	-	0.54	0.103	U	0.103	**1.07**	-	0.30

Table 21. Common ion concentrations (mg/L) in water samples, fourth quarter, 2025.

Sample Location	Sample Date	Calcium*		Magnesium*		Sodium*		Potassium*		Chloride		Sulfate		Alkalinity†	
Aquifer Samples															
Boundary															
USGS-014	11/17/25	-	-	-	-	-	-	-	-	20.4	-	21.2	-	140	-
USGS-104	11/17/25	-	-	-	-	-	-	-	-	15.3	-	21.1	-	127	-
Highway 3	11/20/25	-	-	-	-	-	-	-	-	6.15	-	20.8	-	144	-
Distant															
Alpheus Spring	11/04/25	54	-	19	-	32	-	6.2	-	40.6[1]	-	56.6	-	182	-
Clear Spring	11/04/25	47	-	20	-	27	-	4.2	-	36.7[1]	-	51.2	-	156	-
Bill Jones Hatchery	11/04/25	31	-	16	-	17	-	3.5	-	12.9	-	28.9	-	134	-
Shoshone Water Supply	11/04/25	45	-	15	-	15	-	2.9	-	8.04	-	19.0	-	174	-
Minidoka Water Supply	11/04/25	50	-	18	-	22	-	3.7	-	38.3[1]	-	48.4	-	142	-
Facility															
Advanced Test Reactor Complex															
Middle-1823	10/06/25	-	-	-	-	-	-	-	-	11.2	-	31.0	-	166	-
TRA-08	10/06/25	-	-	-	-	-	-	-	-	11.7	-	41.6	-	152	-
TRA-07	10/06/25	-	-	-	-	-	-	-	-	20.0	-	114[2]	-	106	-
USGS-140	11/13/25	-	-	-	-	-	-	-	-	15.0	-	31.5	-	163	-
Central Facilities Area															
CFA 2	11/17/25	-	-	-	-	-	-	-	-	150[3]	-	48.1	-	144	-
Materials and Fuels Complex															
USGS-148	11/17/25	-	-	-	-	-	-	-	-	15.4	-	18.1	-	134	-
Naval Reactors Facility															
USGS-099	11/17/25	-	-	-	-	-	-	-	-	20.2	-	27.2	-	190	-
Radioactive Waste Management Complex															
RWMC Production	11/24/25	-	-	-	-	-	-	-	-	26.4	-	29.7	-	141	-
USGS-120	11/24/25	-	-	-	-	-	-	-	-	17.6	-	32.7	-	145	-
Test Area North															
TAN-37	10/22/25	72[2]	-	170[2]	-	4800[2]	-	48[2]	-	53.3[4]	-	9.22[4]	J	9420	-
Upgradient															
Mud Lake Water Supply	11/05/25	8.8	-	2.7	-	30	-	4.8	-	4.96	-	8.60	-	91.8	-
Other Samples															
Perched Water															
Advanced Test Reactor Complex															
PW-11	10/06/25	-	-	-	-	-	-	-	-	17.0	-	116[2]	-	150	-
PW-12	10/08/25	-	-	-	-	-	-	-	-	110[2]	-	27.6	-	192	-
USGS-073	11/13/25	-	-	-	-	-	-	-	-	288[4]	-	43.4	-	155	-
PW-9	11/13/25	-	-	-	-	-	-	-	-	92.2[2]	-	48.8	-	78.5	-

Sample Location	Sample Date	Calcium*		Magnesium*		Sodium*		Potassium*		Chloride		Sulfate		Alkalinity†	
Surface Water															
Little Lost River	11/20/25	-	-	-	-	-	-	-	-	6.94	-	20.5	-	156	-
Birch Creek	11/20/25	-	-	-	-	-	-	-	-	4.65	-	25.0	-	146	-
Waste Water															
MFC-IWP	10/07/25	41	-	13	-	23	-	3.6	-	23.7	-	21.5	-	149	-
TRA Cold Waste Pond	10/14/25	51	-	18	-	10	-	1.8	-	11.7	-	47.6	-	163	-

Data qualifiers: U = undetected, J = estimate, R = rejected, "<" = less than detection limit, "+" or "-" after a J means that the estimated result is biased high or low, respectively.

† As $CaCO_3$.

"-" = not analyzed.

Bgs = below ground surface.

Note 1. Lab indicated that a 2:1 dilution of this sample was required for this analyte. Note 2. Lab indicated that a 5:1 dilution of this sample was required for this analyte. Note 3. Lab indicated that a 10:1 dilution of this sample was required for this analyte. Note 4. Lab indicated that a 20:1 dilution of this sample was required for this analyte.

Table 22. Dissolved metals concentrations (µg/L) in water samples, fourth quarter, 2025.

Sample Location	Sample Date	Arsenic		Barium		Chromium		Iron		Lead		Manganese		Selenium	
Aquifer Samples															
Boundary															
USGS-014	11/17/25	-	-	-	-	3.5	-	-	-	-	-	-	-	-	-
USGS-104	11/17/25	-	-	-	-	7.8	-	-	-	-	-	-	-	-	-
Highway 3	11/20/25	-	-	-	-	2.2	-	-	-	-	-	-	-	-	-
Distant															
Alpheus Spring	11/04/25	-	-	-	-	1.3	-	-	-	-	-	-	-	-	-
Clear Spring	11/04/25	-	-	-	-	2.4	-	-	-	-	-	-	-	-	-
Bill Jones Hatchery	11/04/25	-	-	-	-	3.6	-	-	-	-	-	-	-	-	-
Shoshone Water Supply	11/04/25	-	-	-	-	2.1	-	-	-	-	-	-	-	-	-
Minidoka Water Supply	11/04/25	-	-	-	-	2.0	-	-	-	-	-	-	-	-	-
Facility															
Advanced Test Reactor Complex															
Middle-1823	10/06/25	-	-	-	-	10	-	-	-	-	-	-	-	-	-
TRA-08	10/06/25	-	-	-	-	18	-	-	-	-	-	-	-	-	-
TRA-07	10/06/25	-	-	-	-	100	-	-	-	-	-	-	-	-	-
USGS-140	11/13/25	-	-	-	-	16	-	-	-	-	-	-	-	-	-
Central Facilities Area															
CFA 2	11/17/25	-	-	-	-	9.7	-	-	-	-	-	-	-	-	-
Materials and Fuels Complex															
USGS-148	11/17/25	-	-	-		1.8	-	-	-	-	-	-	-	-	-
Naval Reactors Facility															
USGS-099	11/17/25	-	-	-	-	6.3	-	-	-	-	-	-	-	-	-
Radioactive Waste Management Complex															
RWMC Production	11/24/25	-	-	-	-	11	-	-	-	-	-	-	-	-	-
USGS-120	11/24/25	-	-	-	-	9.0	-	-	-	-	-	-	-	-	-
Test Area North															
TAN-37	10/22/25	24[1]	J	2400[1]	-	240[1]	-	16000[2]	-	2.4[1]	J	650[1]	-	-	-
Upgradient															
Mud Lake Water Supply	11/05/25	-	-	-		0.23	J	-	-	-	-	-	-	-	-
Other Samples															
Perched															
Advanced Test Reactor Complex															
PW-11	10/06/25	-	-	-		31	-	-	-	-	-	-	-	-	-
PW-12	10/08/25	-	-	-		3.2	-	-	-	-	-	-	-	-	-
USGS-073	11/13/25	-	-	-		17	-	-	-	-	-	-	-	-	-
PW-9	11/13/25	-	-	-		2.7	-	-	-	-	-	-	-	-	-

Surface Water															
Little Lost River	11/20/25	-	-	-	-	1.0	J	-	-	-	-	-	-	-	-
Birch Creek	11/20/25	-	-	-	-	0.85	J	-	-	-	-	-	-	-	-
Waste Water															
MFC-IWP	10/07/25	2.3	-	39	-	1.5	-	11	-	0.086	J	0.85	J	0.64	J
TRA Cold Waste Pond	10/14/25	1.8	J	52	-	3.6	-	6.7	J	<1	U	0.34	J	1.3	J

Samples were filtered in the field unless otherwise noted.
Data qualifiers: U = undetected, J = estimate, R = rejected, "<" = less than detection limit, "+" or "-" after a J means that the estimated result is biased high or low, respectively.
"-" = not analyzed.
Note 1. Lab indicated that a 25:1 dilution of this sample was required for this analyte. This raised the lab's reporting level by a factor of 25.
Note 2. Lab indicated that a 5:1 dilution of this sample was required for this analyte.

Table 23. Dissolved nutrient concentrations (mg/L) in water samples, fourth quarter, 2025.

Sample Location	Sample Date	Nitrate + Nitrate*		Total Phosphorus	
Aquifer Samples					
Boundary					
USGS-014	11/17/25	1.3	-	-	-
USGS-104	11/17/25	0.88	-	-	-
Highway 3	11/20/25	0.56	-	-	-
Distant					
Alpheus Spring	11/04/25	2.1[2]	-	-	-
Clear Spring	11/04/25	2.8[1]	-	-	-
Bill Jones Hatchery	11/04/25	2.0[1]	-	-	-
Shoshone Water Supply	11/04/25	1.6	-	-	-
Minidoka Water Supply	11/04/25	1.4	-	-	-
Facility					
Advanced Test Reactor Complex					
Middle-1823	10/06/25	1.0	-	-	-
TRA-08	10/06/25	1.0	-	-	-
TRA-07	10/06/25	0.92	-	-	-
USGS-140	11/13/25	1.1	-	-	-
Central Facilities Area					
CFA 2	11/17/25	4.2[2]	-	-	-
Materials and Fuels Complex					
USGS-148	11/17/25	2.6[1]	-	-	-
Naval Reactors Facility					
USGS-099	11/17/25	1.8	-	-	-
Radioactive Waste Management Complex					
RWMC Production	11/24/25	1.0	-	-	-
USGS-120	11/24/25	0.86	-	-	-
Test Area North					
TAN-37	10/22/25	0.40	-	31[4]	-
Upgradient					
Mud Lake Water Supply	11/05/25	0.0044	J	-	-

Sample Location	Sample Date	Nitrate + Nitrate*		Total Phosphorus	
Other Samples					
Perched					
Advanced Test Reactor Complex					
PW-11	10/06/25	1.4	-	-	-
PW-12	10/08/25	3.0[1]	-	-	-
USGS-073	11/13/25	32[3]	-	-	-
PW-9	11/13/25	2.6[2]	-	-	-
Surface water					
Little Lost River	11/20/25	0.34	-	-	-
Birch Creek	11/20/25	0.24	-	-	-
Waste water					
MFC-IWP	10/07/25	3.1[1]	-	0.24	-
TRA Cold Waste Pond	10/14/25	1.1	-	0.14	-

Samples were filtered in the field unless otherwise noted.
Data qualifiers: U = undetected, J = estimate, R = rejected, "<" = less than detection limit, "+" or "-" after a J means that the estimated result is biased high or low, respectively.
"-" = not analyzed.
Note 1. Lab indicated that a 2:1 dilution of this sample was required for this analyte.
Note 2. Lab indicated that a 4:1 dilution of this sample was required for this analyte.
Note 3. Lab indicated that a 20:1 dilution of this sample was required for this analyte.
Note 4. Lab indicated that a 100:1 dilution of this sample was required for this analyte.

Table 24. Volatile organic compound concentrations (µg/L) in water samples, fourth quarter, 2025. Only VOCs detected this quarter or in the recent past are shown.

Sample Location	Sample Date	TCE		PCE		cis-1,2-DCE		trans-1,2-DCE		Vinyl Chloride		Carbon Tetrachloride		Chloroform	
Aquifer Samples															
Facility															
Radioactive Waste Management Complex															
RWMC Production	11/24/25	2.84	-	<0.5	U	<0.5	U	<0.5	U	<0.5	U	5.86	-	1.80	-
USGS-120	11/24/25	0.5	-	<0.5	U	<0.5	U	<0.5	U	<0.5	U	1.50	-	<0.5	U
Test Area North															
TAN-37	10/22/25	<10[1]	U	<10[1]	U	<10[1]	U	<10[1]	U	<10[1]	U	<10[1]	U	<10[1]	U

Abbreviations: PCE = tetrachloroethene; TCE = trichloroethene; cis-1,2-DCE = cis-1,2-dichloroethene; trans-1,2-DCE = trans-1,2-dichloroethene.
Data qualifiers: U = undetected, J = estimate, R = rejected, "<" = less than detection limit, "+" or "-" after a J means that the estimated result is biased high or low, respectively.
Note 1. Lab indicated that a 20:1 dilution of this sample was required for this analyte. This raised the lab's reporting level by a factor of 20.

Terrestrial Monitoring Results

The DEQ-INL OP conducts terrestrial (soil and milk) monitoring to characterize deposition and migration of contaminants and provide independent verification of DOE's terrestrial monitoring programs. Physical soil sampling and *in-situ* gamma spectrometry are used to characterize actual deposition and accumulation of radioactive contaminants in soils. Milk samples are collected to evaluate the potential for ingestion of radioactivity by the population around the INL. Twelve milk samples were analyzed during the quarter.

Milk

DEQ-INL OP monitors milk for the naturally occurring radionuclide potassium-40 (^{40}K) and man-made iodine-131 (^{131}I). Milk samples are collected on a monthly basis. Results for analyses of milk samples are presented in **Table 25**. ^{40}K was detected in all samples within the expected range of concentration. ^{131}I was not detected. Based on measurements of radionuclides in milk, there were no discernable impacts to the off-site environment from INL operations.

Table 25. Gamma spectrometry analysis data for milk samples, fourth quarter, 2025.

Sample Location/Dairy	Sample Date	Naturally occurring Potassium-40		Man-made Iodine-131		
		Concentration[2]	1 SD	Concentration[2]		1 SD
Monitoring Samples						
Gooding	10/13/25	**1415**	58	0.1	U	0.9
Gooding	11/03/25	**1348**	55	-0.4	U	0.8
Gooding	12/08/25	**1368**	57	-0.5	U	0.8
Monteview	10/27/25	**1290**	55	-1.2	U	0.9
Monteview	11/24/25	**1320**	56	-0.7	U	1.0
Monteview	12/22/25	**1320**	56	-1.2	U	0.8
Ucon	10/04/25	**1505**	61	1.5	U	1.2
Ucon	10/31/25	**1451**	58	-1.3	U	0.8
Ucon	11/29/25	**1375**	56	-0.1	U	0.6
Verification Samples[1]						
Howe	10/20/25	**1373**	57	-1.5	U	1.1
Dietrich	11/17/25	**1359**	57	-0.2	U	0.8
Terreton	12/15/25	**1362**	57	0.5	U	1.0

[1] DEQ-INL OP samples collected by the off-site INL environmental surveillance contractor.
[2] Concentrations with associated uncertainties (1 SD) are expressed in pCi/L. **Bold** concentrations are positive detections, greater than or equal to 3 SD. Data qualifiers: U = undetected, J = estimate, R = rejected, "+" or "-" after a J means that the estimated result is biased high or low, respectively.

Soil

DEQ-INL OP monitors long-term radiological conditions via physical soil sampling as well as field instrumentation capable of identifying and measuring in-situ concentrations of gamma-emitting radionuclides in soil. Monitoring concentrations of gamma-emitting radionuclides in surface soil provides some insight to transport, deposition, and accumulation of radioactive material in the environment as a result of INL operations as well as historical above ground testing of nuclear weapons. *In-Situ* gamma spectroscopic measurements were performed at 41 locations during the fourth calendar quarter of 2025. The gamma spectra were analyzed using a uniform homogeneous distribution of nuclides with depth as recommended by NCRP (NCRP report 129). ^{137}Cs was the only man-made gamma emitting radionuclide detected. Analysis results for ^{137}Cs concentrations for in-situ soil monitoring are shown in **Table 26**.

Table 26. *In-Situ* gamma spectroscopic analysis results (137Cs) for soil, fourth quarter, 2025.

Location	Date Acquired	Concentration[1]	1 SD
On Site Sampling Locations			
ESER Soil Site FAA Tower	11/10/2025	**0.445**	0.041
Large Grid 18-8	11/10/2025	**0.479**	0.048
Large Grid 24-2	11/10/2025	**0.438**	0.037
Large Grid 18-3	11/10/2025	**0.224**	0.044
Large Grid 24-7	11/10/2025	**0.220**	0.031
Rover	11/10/2025	**0.218**	0.029
Large Grid 6-3	11/12/2025	**0.500**	0.033
EFS[2] Air Station	11/12/2025	**0.533**	0.042
INL Main Gate	11/13/2025	**0.368**	0.030
Van Buren Air station	11/13/2025	**0.328**	0.019
Rest Area Air Station	11/13/2025	**0.377**	0.037
Base of Howe	11/13/2025	**0.330**	0.045
ESER Soil Site Howe	11/13/2025	**0.297**	0.037
Large Grid 24-9	11/14/2025	**0.305**	0.017
Large Grid 24-8	11/14/2025	**0.330**	0.055
Large Grid 18-1	11/14/2025	**0.364**	0.045
Large Grid 18-7	11/14/2025	**0.268**	0.030
ESER Soil Site Reno Ranch	11/14/2025	**0.423**	0.026
Large Grid 30-1	11/14/2025	**0.457**	0.039
Sand Dunes Air Station	11/15/2025	**0.156**	0.048
ESER Soil Site Mud Lake #2	11/15/2025	**0.376**	0.050
ESER Soil Site Atomic City	11/21/2025	**0.318**	0.028
Boundary Sampling Locations			
ESER Soil Site Frenchman's Cabin	11/7/2025	**0.338**	0.036
Large Grid 12-5	11/7/2025	**0.347**	0.038
Large Grid 12-4	11/7/2025	**0.248**	0.041
Howe Met Tower Air Station	11/13/2025	**0.181**	0.027
ESER Soil Site Monteview	11/15/2025	**0.278**	0.032
Monteview Air Station	11/15/2025	**0.170**	0.031
Mud Lake Air Station[3]	11/15/2025	0.051	0.019
ESER Soil Site Butte City	11/21/2025	**0.366**	0.038
Atomic City Air Station	11/21/2025	**0.292**	0.036
Distant Sampling Locations			
IF Air Station[4]	11/4/2025	**0.155**	0.035
IF CMS[5]	11/5/2025	**0.118**	0.027
St Anthony	11/6/2025	**0.400**	0.047
Sage Junction	11/6/2025	**0.324**	0.040
Roberts Met Tower	11/6/2025	**0.293**	0.044
Big Southern Butte	11/7/2025	**0.273**	0.030
Large Grid 18-4	11/7/2025	**0.290**	0.027
ESER Soil Site Blackfoot	11/12/2025	**0.228**	0.040
Crystal Ice Caves	11/12/2025	**0.413**	0.042
ESER Soil Site Carey	11/21/2025	**0.431**	0.042

[1]Concentrations with associated uncertainties (1 SD) are reported in pCi/g. **Bold** concentrations are considered positive detections, greater than or equal to 3 SD.
[2]Experimental Field Station.
[3]Only measurement not exceeding 3 SD thus not considered a positive detection.
[4]DEQ-INL OP air monitoring station near airport, Idaho Falls, ID.
[5]DEQ-INL OP EcoGamma Community Monitoring Station (CMS) near John's Hole Bridge, Idaho Falls, ID.

The average Cesium-137 value was 0.32 picocuries per gram (pCi/g) with a minimum value of 0.05 pCi/g and a maximum of 0.53 pCi/g, well below the DEQ-INL OP action level of 6.4 pCi/g and the recommended federal screening limit for surface soil of 6.8 pCi/g (NCRP Report 129).

In 2025, INLOP transitioned from the Ortec GMX-25200-P HPGe detector to the Ortec Detective EX-100T HPGe detector for in-situ gamma spectrometry measurements. A comprehensive technical evaluation compared selected 2025 measurements against four independent reference datasets spanning 1986-2022, including *in-situ* and laboratory soil measurements. Cs-137 concentrations, after decay correction to 2025, are consistent with independent laboratory measurements and all historical baseline datasets within acceptance criteria (|Relative Percent Difference| ≤ 20%, |Normalized Difference| ≤ 3.0). K-40 concentrations measured with the Detective EX-100T are systematically lower (~15-22%) relative to prior-year INLOP measurements and historical reference data; this offset is spatially uniform across all monitoring locations and is attributed to detector efficiency and geometry differences associated with the instrumentation transition. Spatial patterns and relative site rankings are preserved across all monitoring locations. The 2025 dataset is considered technically valid and suitable for continued environmental monitoring purposes.

Based upon terrestrial radiological measurements of soil, there were no discernable impacts to the off-site environment from INL operations. Long-term accumulation of radionuclides observed by soil monitoring was consistent with historical measurements and was in the range of concentrations expected from historic fallout including above-ground testing of nuclear weapons which ceased worldwide by 1980.

Quality Assurance

Measurements of constituent concentrations in environmental media are subject to inaccuracy from errors that may be introduced during the collection, transportation, and analysis of samples, calibration of equipment, and recording and reporting of results. While it is impossible to quantify every error that may affect a result, a quality assurance (QA) program can evaluate the overall quality of a dataset and, in many cases, identify and address errors or inaccuracies. DEQ-INL OP's QA program is designed to (1) ensure sample integrity, (2) evaluate the precision and accuracy of analytical results, and (3) ensure that the environmental data are representative and complete.

This section summarizes the quality assurance assessment of the data collected by DEQ-INL OP in the fourth quarter of 2025. Included are the results of quality control (QC) samples (blanks, duplicates, and spikes) that DEQ-INL OP submitted to Idaho State University's Environmental Monitoring Laboratory (ISU-EML) for radiological analyses and to the Idaho Bureau of Laboratories-Boise (IBL) for non-radiological analyses during the quarter. The analytical results of QC samples are used to assess the precision, accuracy, and representativeness of the environmental data presented in this report. During the fourth quarter of 2025, DEQ-INL OP and contracted laboratories performed 125 QC analyses on various radiological and non-radiological samples. (**Table 27**).

All samples referenced in this report were collected in accordance with written procedures maintained by the DEQ-INL OP. Analytical methods and QC procedures used by the laboratories were performed in accordance with approved written procedures maintained by each lab. QC samples analyzed by the labs as part of each lab's internal QA program are not discussed in this report.

Blank Samples

Blank samples consist of matrices that contain immeasurable or acceptably low concentrations of the analyte(s) of interest. They are used to monitor contamination introduced during sample collection, storage, shipment, and analysis. For water matrices other than tritium, a blank sample consists of 18-megaohm deionized water from the DEQ-Idaho Falls Regional office. Mud Lake Well #2 serves as the water source for tritium analysis blanks, notable for its low atmospheric recharge, which results in tritium concentrations below detectable levels.

A blank sample is categorized as a field blank, equipment blank, or trip blank depending on how the blank is handled. A field blank is used to monitor for contamination introduced from the environment during sample collection, an equipment blank is used to monitor for contamination introduced by contaminated equipment, and a trip blank is used to monitor for contamination introduced during transportation of samples (trip blanks are typically only used for VOCs). Also, method blanks for airborne tritium are used to monitor for contamination introduced during processing of molecular sieve sample material. Most water blank samples submitted to laboratories by DEQ-INL OP are field blanks.

For all radiological analyses a blank sample result is considered acceptable if it is less than three standard deviations (3 SD) of the result. Non-radiological groundwater blank results less than MDL (method detection limit) are acceptable and reported as <RDL (<reporting detection limit). Non-radiological blank results greater than MDL and less than RDL are reported as detected estimates (J-qualifier). If a blank result exceeds acceptance criteria, detected results in other samples collected, transported, or analyzed together with the failed blank may be qualified as biased high (J+) or rejected (R), or may remain unqualified, depending on the relative sizes of the blank detection and other sample results.

Sample results for blank 47-mm TSP filters submitted for gross alpha and gross beta screening in air for the fourth quarter of 2025 are presented in **Table 28**. Blank sample results for selected gamma emitters in air from 47-mm TSP filter quarterly composites and 8x10-inch monthly composites from fourth quarter 2025 are presented in **Table 29**. Blank sample results for radiochemical analysis of 8x10-inch TSP filter quarterly composites from third quarter 2025 are presented in **Table 30**. All TSP blank sample results met acceptance criteria.

Method blank and control sample analysis results used to assess data quality for tritium in water vapor in air are presented in **Table 31**. Method blanks are prepared by vaporizing tritium-free water and passing the air-vapor mixture through molecular sieve columns. The molecular sieve material is then processed identically to the field samples. Control samples are used to determine if tritium contamination is introduced into the samples from areas used for processing field samples and storage of the processed water. All results for tritium method blanks and control samples met acceptance criteria.

Blank sample results for radiological constituents in water are presented in **Table 32.** Blank sample results for metals, common ions and nutrients, and volatile organic compounds (VOCs) in water are presented in **Tables 33, 34,** and **35**. Two VOC blank results (**Table 35**) for chloromethane from 10/22/25 were greater than the method detection limit (MDL) but less than the reporting detection limit and are listed as detected estimates (J-qualifier). There were no field sample detections for chloromethane. All other blank sample results for water met acceptance criteria.

Duplicate Samples

A duplicate sample is one that is collected at the same location and approximately the same time as another sample (referred to as the "original" sample). Duplicate sample results are compared to the original sample's results to evaluate reproducibility. Significant differences between the two could indicate poor analytical precision or a non-uniform sample matrix.

The difference between the results of an original and duplicate sample (referred to below as a "duplicate-sample pair") is evaluated differently for radiological and non-radiological analyses. For radiological analyses, the results of a duplicate-sample pair are considered to be in agreement if their absolute difference is less than or equal to three times the pooled error of the results:

$|R_1 - R_2| \leq 3\sqrt{SD_1^2 + SD_2^2}$
R_1 = Original sample result
R_2 = Duplicate sample result
SD_1 = Analytical uncertainty (1 sample standard deviation) of the original result
SD_2 = Analytical uncertainty (1 sample standard deviation) of the duplicate result

Duplicate radiological results are also considered to be in agreement if their relative percent difference (RPD) is no more than ±20 percent. RPD is calculated as:

$$RPD = \frac{R_1 - R_2}{(R_1 + R_2)/2} \times 100$$

For non-radiological analyses, the RPD is used to evaluate duplicate sample pairs in which both results exceed five times the reporting detection limit (RDL). An RPD of up to ±20 percent is acceptable. If one or both sample results are less than five times the RDL, the results agree if their absolute difference is less than or equal to the RDL.

Duplicate sample results for selected gamma emitters in air from 8x10-inch monthly TSP filter composites from the Idaho Falls monitoring location are presented in **Table 36**. Duplicate sample results for radiochemical analysis of 8x10-inch TSP filter quarterly composites from third quarter 2025, from the Idaho Falls monitoring location, are presented n **Table 37.** All TSP duplicate sample results met acceptance criteria.

Duplicate results for quarterly average EcoGamma readings from the Big Southern Butte monitoring location are presented in **Table 38.** These duplicate results met acceptance criteria.

Duplicate results for radiological analyses in groundwater and surface water are presented in **Table 39**. Duplicate results for metals, common ions and nutrients, and VOCs in groundwater are presented in **Tables 40, 41,** and **42.** All duplicate water sample results met acceptance criteria for the fourth quarter 2025.

Duplicate results for gamma-emitters in soil are presented in **Table 43**. All duplicate soil results met acceptance criteria for the fourth quarter 2025.

Spiked Samples

Spiked samples are samples to which known concentrations of specific analytes have been added. They are used to assess a laboratory's analytical accuracy. The percent recovery (%R) of each spiked-sample analysis is calculated as the ratio of the spike concentration determined by the lab to the known spike concentration. DEQ-INL OP considers the lab's result to be in control if the percent recovery is 100 ± 25%. If the percent recovery of a spiked sample is 50-74%, detected results of samples analyzed in the same batch as the spiked sample may be qualified as low-biased estimates (J-), and undetected results may be qualified as undetected estimates (UJ). If the percent recovery of a spiked sample is 126-150%, detected results of associated samples may be qualified as high-biased estimates (J+), and undetected results may be qualified as undetected (U). If the percent recovery of a spiked sample is <50% or >150%, the results of all associated samples may be qualified as rejected (R), except for undetected sample results associated with a spiked-sample analysis having a percent recovery >150%, in which case the sample result remains qualified as undetected (U).

Fourth quarter spiked sample results for metals, common ions and nutrients, and VOCs in water are presented in **Tables 44, 45,** and **46**. For VOCs, the results for methylene chloride and vinyl chloride did not meet acceptance criteria. There were no field sample detections for methylene chloride or vinyl chloride. All other spiked sample results met acceptance criteria.

DEQ-INL OP also prepares additional "spike-like" quality control samples to assess ambient radiation measurement bias. Once per quarter, DEQ-INL OP irradiates several electret ionization chambers (EICs) at ISU to verify EIC response. Irradiations of EICs are conducted in a repeatable geometry to a known exposure of near 30 mR and two additional higher and lower exposures, ranging from 15 to 60 mR. EIC responses are compared directly with the exposure received from the NIST traceable cesium-137 source provided by ISU-EML. EIC response is considered acceptable if each measurement has a percent recovery of 100 ± 25% when compared to the known irradiated quantity. Overall response for each control set is considered acceptable if the average of the three individual results for the set has a percent recovery of 100 ± 25%. Real-time pressure correction is used to calculate the net exposure measured by these EIC control sets. The ISU irradiation results for the fourth quarter 2025 are presented in **Table 47**. All individual EIC results and all EIC control set averages passed the DEQ-INL OP acceptance criterion.

Laboratory QC Issues

None.

DEQ-INL OP Equipment QC Issues

There were 37 TSP air filter samples with estimated results for gross alpha and beta this quarter due to mechanical issues in the sampling systems. For most of these, the gas meter malfunctioned. In five of these, the gas meter quit working entirely or the air pump failed. These issues have been corrected.

Qualification of Low-Level Sample Results

Starting in the first quarter of 2024, DEQ-INL OP changed the methods used for qualifying and reporting sample results. These changes apply primarily to low-level results. The changes listed below will bring DEQ-INL OP's qualification and reporting conventions more closely in line with the INL contractors' methods.

For radiological results, the minimum detectable concentration (MDC) will no longer be used as the criterion above which the result is considered a positive detection. The following criteria will be used instead[7,8,9]:

1. Results greater than or equal to 3 SD are reported as positive detections, where SD is the sample standard deviation.
2. Results less than 3 SD are reported as non-detections (U qualifier).
3. Field sample results are reported together with the 1-SD value.

For non-radiological results, the qualification and reporting conventions followed by the sample analysis contractor, Idaho Bureau of Laboratories (IBL), will be used. With each result, the IBL reports both the Method Detection Limit[10] (MDL) and the higher Reporting Detection Limit[11] (RDL).

1. Results greater than MDL and greater than RDL are reported as positive detections.
2. Results greater than MDL but less than RDL are reported as detected estimates (J qualifier) with greater associated uncertainty.
3. Results less than MDL are non-detections and reported as less than (RDL value).

Analytical QA/QC Assessment

Other than those discussed above, no issues involving sample chain of custody, sample holding times, and the analysis of blank, duplicate, and spiked samples were observed during the fourth quarter of 2025 which significantly affected data quality. The ratio of total QC analyses to total field sample analyses of 14.8% is above the DEQ-INL OP minimum requirement of 10%. Methodologies and data reports issued by the contracting laboratories conformed to the requirements of DEQ-INL OP during the fourth quarter of 2025.

[7] Idaho National Laboratory Site Environmental Surveillance Program Report, Fourth Quarter 2023, INL/RPT-24-77413, p.
[8] HANDBOOK FOR THE DEPARTMENT OF ENERGY'S MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM (MAPEP), MAPEP-HB-1, July 6,2022, p.30.
[9] An Update of Hydrologic Conditions and Distribution of Selected Constituents in Water, Eastern Snake River Aquifer and Perched Groundwater Zones, Idaho National Laboratory, Idaho, Emphasis 2019–21, U. S. Geological Survey, DOE/ID-22261, p. 29.
[10] The MDL is defined as the minimum concentration of substance that can be measured and reported with 99% confidence that an analyte concentration is greater than zero and is determined from an analysis of a sample in a given matrix containing the analyte.
[11] IBL utilizes the Practical Quantitation Limit (PQL) as the Reporting Detection Limit (RDL) for final data reports. PQL represents a practical and routinely achievable quantitation limit with a high degree of certainty (> 99.9% confidence) that the result is a positive detection.

Data usability is the measure of field sample results that are not rejected divided by the total number of field sample results obtained. The overall data usability (non-rejected results divided by the total number of field sample results reported) of 100.0% for the fourth quarter of 2025 is well above the acceptable value of 90% for the DEQ-INL OP ESP and is summarized in **Table 27**. The overall data completeness (usable results divided by the total number of field sample results expected) of 99.8% is also well above the acceptable value of 90%.

Preventative Maintenance and Equipment Reliability

All equipment was calibrated and checked according to prescribed periodicity. Service reliability for air sampling equipment for the fourth quarter of 2025 is summarized in **Table 48**.

Conclusion

All data collected for the fourth quarter of 2025 have been assigned the applicable qualifiers to designate the appropriate use of the data. The overall data usability of 100.0% and data completeness of 99.8% are well above the acceptable value of 90% for the quarter, with the data meeting the requirements and data quality objectives established by DEQ-INL OP.

Table 27. Summary of the analyses performed, fourth quarter, 2025.

Media Sampled	Collection Device	Analyte	Field Sample Analyses	QC Blank Analyses	QC Duplicate Analyses	QC Spike Analyses	Field Data Rejected[1]	Analyzing Lab[2]
Air								
Total Suspended Particulate	47-mm filters	Gross alpha	168	14	0	0	0	ISU-EML
		Gross beta	168	14	0	0	0	ISU-EML
		Gamma emitters	12	1	0	0	0	ISU-EML
	8x10-inch filter	Gamma emitters	36	3	3	0	0	ISU-EML
		Radiochemical[6]:						
		Sr-90	12	1	1	0	0	ISU-Sub
		Pu-238, 239/240	12	1	1	0	0	ISU-Sub
		Am-241	12	1	1	0	0	ISU-Sub
Water Vapor	Desiccant column	Tritium	39	4 [8]	0	0	0	ISU-EML
Gaseous	Charcoal filter	Iodine-131	14	0	0	0	0	ISU-EML
Precipitation	Poly bottle	Tritium	12	0	0	0	0	ISU-EML
		Gamma emitters	12	0	0	0	0	ISU-EML
Water								
Ground water, perched ground water, waste pond effluent, and surface water	Grab or composite	Gross alpha	27	3	4	0	0	ISU-EML
		Gross beta	27	3	4	0	0	ISU-EML
		Gamma emitters	27	3	4	0	0	ISU-EML
		Tritium	27	3	4	0	0	ISU-EML
		Low-level tritium	9	2	2	0	0	ISU-EML
		Radiochemical[7]:						
		Sr-90	6	2	0	0	0	ISU-Sub
		Tc-99	1	0	0	0	0	ISU-Sub
		U-234, 235, 238	3	1	1	0	0	ISU-Sub
		Pu-238, 239/240	2	0	1	0	0	ISU-Sub
		Am-241	3	0	1	0	0	ISU-Sub
		I-129	0	0	0	0	0	ISU-Sub
		Metals	27	3	4	1	0	IBL
		Common Ions	27	3	4	1	0	IBL
		Nutrients	27	3	4	1	0	IBL
		Volatile Organics	3	3	1	1	0	IBL
Terrestrial								
Milk	Grab or composite	Gamma emitters	12	0	0	0	0	ISU-EML
Soil	*in situ*	Gamma emitters	41	0	4	0	0	DEQ-INL OP
	Grab – "puck"	Gamma emitters	0	0	0	0	0	ISU-EML
Radiation								
Ambient	EICs	Gamma Radiation	68	0	0	9	0	DEQ-INL OP
	EcoGamma	Gamma Radiation	11	NA	1	0	0	DEQ-INL OP
Total analyses performed			**845**	**67**	**45**	**13**	**0**	
Total QC analyses performed (blanks, duplicates, and spikes)			**125**					
Ratio of total QC analyses to total sample analyses[3]			**14.8%**					
Data usability[4], percent			**100.0%**					
Data completeness[5], percent			**99.8%**					

[1] Combined Laboratory and DEQ-INL OP rejection criteria (data was rejected for any reason).

[2] ISU-EML = Idaho State University – Environmental Monitoring Laboratory; ISU Sub = Subcontract laboratory to ISU-EML; IBL = Idaho Bureau of Laboratories, Boise; IBL Sub = Subcontract laboratory to IBL; DEQ-INL OP = Analyzed by INL Oversight Program, Idaho Department of Environmental Quality.

[3] DEQ-INL OP requires that the number of QC analyses performed be at least 10 percent of the number of sample analyses performed.

[4] Data usability is calculated as [total analyses – rejected data]/[total analyses]. DEQ-INL OP considers a data usability rate of 90 percent or higher to be acceptable.

[5] Data completeness is calculated as usable results divided by the total number of field sample results expected. DEQ-INL OP considers a data completeness rate of 90 percent or higher to be acceptable.

[6] Radiochemical analyses for these filter composites include Strontium-90 (Sr-90), Plutonium-238 and 239/240 (Pu-238, 239/240), and Americium-241 (Am-241).

[7] Radiochemical analyses for these water samples may include Strontium-90, Technetium-99 (Tc-99), Uranium 234, 235, and 238 (U-234, 235, 238), Plutonium-238 and 239/240, Americium-241, and Iodine-129 (I-129).

[8] Method blanks and control samples are included here.

Table 28. Blank analysis results for gross alpha and beta in 47-mm particulate air (TSP), fourth quarter, 2025.

Collection Period		Corrected volume (m^3)[1]	Gross alpha			Gross beta		
Start	Stop		Value		3 SD	Value		3 SD
09/25/25	10/02/25	567	0.2	U	0.3	0.2	U	0.9
10/02/25	10/09/25	567	0.1	U	0.3	0.4	U	0.9
10/09/25	10/16/25	567	0.0	U	0.3	0.0	U	0.9
10/16/25	10/23/25	567	0.3	U	0.4	0.4	U	0.9
10/23/25	10/30/25	567	0.0	U	0.3	0.2	U	0.9
10/30/25	11/06/25	567	0.2	U	0.6	0.5	U	0.9
11/06/25	11/13/25	567	0.1	U	0.3	0.2	U	0.9
11/13/25	11/20/25	567	0.1	U	0.3	-0.7	U	0.9
11/20/25	11/26/25	487	0.2	U	0.6	-0.1	U	0.9
11/26/25	12/04/25	654	0.2	U	0.3	-0.1	U	0.6
12/04/25	12/11/25	567	0.0	U	0.3	0.2	U	0.9
12/11/25	12/18/25	567	0.0	U	0.3	0.2	U	0.9
12/18/25	12/23/25	410	-0.1	U	0.6	0.6	U	1.2
12/23/25	12/31/25	651	0.1	U	0.3	0.1	U	0.9

Concentration values and associated uncertainty (3 SD) are expressed in 1 x 10^{-3} pCi/m^3.
A blank sample result is acceptable if it is less than three standard deviations (3 SD) of the result. **Bold** concentrations are positive detections, greater than or equal to 3 SD.
Data qualifiers: U = undetected, J = estimate, R = rejected, "+" or "-" after a J means that the estimated result is biased high or low, respectively.
[1] A volume equal to the average of the weekly volumes collected through each valid field filter was used to compute "concentrations" for the blank for meaningful comparison to sample results. No air was passed through the blank filters.

Table 29. Blank results for gamma spectrometry analysis of monthly composites of 8x10-inch TSP air filters, and quarterly composites of 47-mm TSP air filters, fourth quarter, 2025.

Time period	Beryllium-7			Ruthenium-106/ Rhodium-106			Antimony-125			Cesium-134			Cesium-137		
	Conc		3 SD	Conc		3 SD	Conc		3 SD	Conc		3 SD	Conc		3 SD
Monthly composites[1] of 8x10-inch TSP air filters															
Oct	2	U	18	-2	U	60	0	U	6	-1	U	3	0	U	3
Nov	-7	U	36	17	U	96	1	U	12	2	U	6	2	U	6
Dec	5	U	24	-9	U	54	3	U	9	0	U	3	1	U	3
Quarterly composite[2] of 47-mm TSP air filters															
4th Qtr.	6	U	78	123	U	339	-4	U	18	5	U	12	-1	U	12

Concentrations (Conc) are expressed in 1 x 10^{-5} pCi/m^3 with associated uncertainty (3 SD) and minimum detectable concentration (MDC).
A blank sample result is acceptable if it is less than three standard deviations (3 SD) of the result. **Bold** concentrations are positive detections, greater than or equal to 3 SD.
Data qualifiers: U = undetected, J = estimate, R = rejected, "+" or "-" after a J means that the estimated result is biased high or low, respectively.
[1]These concentrations (Conc) are from blank 8x10-inch filters collected weekly, composited, and analyzed for the calendar month. [2]These concentrations are from blank 47-mm filters collected weekly, composited, and analyzed for the calendar quarter. A composite volume equal to the sum of the weekly average volumes collected through each valid field filter was used to compute "air concentrations" for the blank for meaningful comparison to sample results. No air actually passed through the blank filters.

Table 30. Blank analysis results for radiochemical analysis of 8x10-inch TSP air filters, quarterly composite samples, from third quarter, 2025.

Sample Description	^{90}Sr			^{238}Pu			$^{239}Pu/^{240}Pu$			^{241}Am		
	Value[1]		3 SD	Value[1]		3 SD	Value[1]	Qualifier	3 SD	Value[1]		3 SD
3Q 25 Blank	0.22	U	0.39	0.03	U	0.06	0.02	U	0.06	0.04	U	0.18

Concentrations are expressed in 1 x 10^{-5} pCi/m^3 with associated uncertainty (3 SD).
A blank sample result is acceptable if it is less than three standard deviations (3 SD) of the result. **Bold** concentrations are positive detections, greater than or equal to 3 SD.
Data qualifiers: U = undetected, J = estimate, R = rejected, "+" or "-" after a J means that the estimated result is biased high or low, respectively.
[1] These concentrations are from blank filters collected weekly, composited, and analyzed for the calendar quarter. A composite volume equal to the sum of the weekly average volumes collected through each valid field filter was used to compute "air concentrations" for the blank for meaningful comparison to sample results. No air was passed through the blank filters.

Table 31. Method blank and control sample analysis results for tritium in water vapor from air samples, fourth quarter, 2025.

Sample Number	Start Date	Collection Date	Analysis Date	Tritium		
				Concentration		3 SD
Method Blanks						
OP254ZTR01	12/02/25	12/04/25	01/12/26	-0.02	U	0.06
OP254ZTR02	12/08/25	12/10/25	01/12/26	0.03	U	0.06
Control Samples						
Refrigerator	10/10/25	10/01/25	01/12/26	0.04	U	0.06
Sink	10/10/25	10/01/25	01/12/26	0.02	U	0.06

Concentrations are expressed in nCi/L with associated uncertainty (3 SD).
A blank sample result is acceptable if it is less than three standard deviations (3 SD) of the result. **Bold** concentrations are positive detections, greater than or equal to 3 SD.
Data qualifiers: U = undetected, J = estimate, R = rejected, "+" or "-" after a J means that the estimated result is biased high or low, respectively.

Table 32. Blank analysis results (pCi/L) for radiological constituents in water, fourth quarter, 2025.

Sample Number	Sample Date	Blank Type	Concentration		3 SD	Within Blank Criteria?
Gross Alpha						
251W569	10/06/25	Field	0.0	U	0.3	Yes
251W659	10/22/25	Field	0.0	U	0.3	Yes
251W723	10/14/25	Field	0.0	U	0.3	Yes
Gross Beta						
251W569	10/06/25	Field	0.3	U	0.9	Yes
251W659	10/22/25	Field	-0.3	U	0.9	Yes
251W723	10/14/25	Field	-0.3	U	0.9	Yes
Cesium-137						
251W569	10/06/25	Field	-0.5	U	1.8	Yes
251W659	10/22/25	Field	-0.3	U	2.1	Yes
251W723	10/14/25	Field	0.3	U	2.1	Yes
Tritium (standard method)						
251W570	10/06/25	Field	0	U	90	Yes
251W661	10/22/25	Field	20	U	90	Yes
251W724	10/14/25	Field	10	U	90	Yes
Tritium (low-level method)						
251W508	07/14/25	Field	4	U	6	Yes
251W533	08/27/25	Field	0	U	6	Yes
Strontium-90						
251W660	10/22/25	Field	-0.017	U	0.579	Yes
251W647	10/06/25	Field	0.163	U	0.600	Yes
Uranium-234						
251W662	10/22/25	Field	0.0023	U	0.0155	Yes
Uranium-235						
251W662	10/22/25	Field	-0.0029	U	0.0087	Yes
Uranium-238						
251W662	10/22/25	Field	0.0069	U	0.0155	Yes
Technetium-99						
None	-	-	-	-	-	-

Concentrations are expressed in pCi/L with associated uncertainty (3 SD).
A blank sample result is acceptable if it is less than three standard deviations (3 SD) of the result. **Bold** concentrations are positive detections, greater than or equal to 3 SD.
Data qualifiers: U = undetected, J = estimate, R = rejected, "+" or "-" after a J means that the estimated result is biased high or low, respectively.

Table 33. Blank analysis results (µg/L) for metals in water, fourth quarter, 2025.

Sample Number	Sample Date	Blank Type	Arsenic	Barium	Chromium	Iron	Lead	Manganese	Selenium	Zinc
251W572	10/06/25	Field	-	-	<1.0	-	-	-	-	-
251W726	10/14/25	Field	<2.0	<1.0	<1.0	<10	<1.0	<1.0	<2.0	-
251W664	10/22/25	Field	<2.0	<1.0	<1.0	<10	<1.0	<1.0	-	-

Blank results less than MDL (method detection limit) are acceptable and reported as <RDL (<reporting detection limit).
Data qualifiers: U = undetected, J = estimate, R = rejected, "+" or "-" after a J means that the estimated result is biased high or low, respectively.

Table 34. Blank analysis results (mg/L) for common ions and nutrients in water, fourth quarter, 2025.

Sample Number	Sample Date	Blank Type	Calcium	Magnesium	Sodium	Potassium	Chloride	Sulfate	Alkalinity†	NO_3+NO_2*	Total Phosphorus
251W571, 573	10/06/25	Field	-	-	-	-	<0.4	<0.8	<1.0	<0.01	-
251W725, 726, 727	10/14/25	Field	<0.1	<0.1	<0.1	<0.1	<0.4	<0.8	<1.0	<0.01	<0.005
251W663, 664, 665	10/22/25	Field	<0.1	<0.1	<0.1	<0.1	<0.4	<0.8	<1.0	<0.01	<0.005

Blank results less than MDL (method detection limit) are acceptable and reported as <RDL (<reporting detection limit).
Data qualifiers: U = undetected, J = estimate, R = rejected, "+" or "-" after a J means that the estimated result is biased high or low, respectively.

Table 35. Blank analysis results (µg/L) for VOCs in water, fourth quarter, 2025.

Sample Number	Sample Date	Blank Type	PCE	TCE	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl Chloride	1,1-DCA	Carbon Tetrachloride	Methylene Chloride	Chloro-form	Chloro-methane	MEK
251W666	10/22/25	Field	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.4 J	<10
251W728	10/22/25	Trip	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.2 J	<10
251W764	11/24/25	Trip	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<10

Abbreviations: PCE = tetrachloroethene; TCE = trichloroethene; 1,1-DCE = 1,1-dichloroethene; cis-1,2-DCE = cis-1,2-dichloroethene; trans-1,2-DCE = trans-1,2-dichloroethene; 1,1-DCA = 1,1-dichloroethane
MEK = Methyl Ethyl Ketone.
Blank results less than MDL (method detection limit) are acceptable and reported as <RDL (<reporting detection limit). Blank results greater than MDL and less than RDL are reported as detected estimates (J-qualifier).
Data qualifiers: U = undetected, J = estimate, R = rejected, "+" or "-" after a J means that the estimated result is biased high or low, respectively.

Table 36. Duplicate sample results for gamma emitters from monthly composited 8x10-inch TSP air filters, fourth quarter, 2025.

Month and Nuclide	Original Sample ID	Concentration (R_1)		1 SD_1	Duplicate Sample ID	Concentration (R_2)		1 SD_2	RPD (%)	$\lvert R_1-R_2 \rvert$	$3(SD_1^2+SD_2^2)^{1/2}$	Within either criterion?
October												
^{7}Be	Idaho Falls	**116.3**	-	2.2	Idaho Falls Dup	**129.4**	-	2.4	-11	13.1	9.8	Yes
$^{106}Ru/^{106}Rh$		0.44	U	0.24		0.14	U	0.20	103	0.30	0.94	Yes
^{125}Sb		-0.03	U	0.03		0.03	U	0.03	NA[1]	0.06	0.13	Yes
^{134}Cs		0.01	U	0.01		0.01	U	0.01	0	0.00	0.04	Yes
^{137}Cs		0.03	U	0.01		0.02	U	0.01	40	0.01	0.04	Yes
November												
^{7}Be	Idaho Falls	**103.2**	-	3.2	Idaho Falls Dup	**118.3**	-	3.7	-14	15.1	14.7	Yes
$^{106}Ru/^{106}Rh$		0.25	U	0.30		-0.07	U	0.24	356	0.32	1.15	Yes
^{125}Sb		0.06	U	0.05		-0.01	U	0.03	280	0.07	0.17	Yes
^{134}Cs		0.01	U	0.01		0.00	U	0.01	200	0.01	0.07	Yes
^{137}Cs		0.0	U	0.01		-0.01	U	0.01	-200	0.01	0.04	Yes
December												
^{7}Be	Idaho Falls	**85.5**	-	2.6	Idaho Falls Dup	**98.0**	-	1.9	-14	12.5	9.7	Yes
$^{106}Ru/^{106}Rh$		-0.09	U	0.18		0.01	U	0.21	250	0.10	0.82	Yes
^{125}Sb		0.02	U	0.02		0.01	U	0.04	67	0.01	0.13	Yes
^{134}Cs		0.00	U	0.01		0.02	U	0.02	-200	0.02	0.07	Yes
^{137}Cs		0.00	U	0.01		0.01	U	0.01	-200	0.01	0.04	Yes

Air concentrations and uncertainties (1 SD) are expressed in units of 10^{-3} pCi/m^3. **Bold** concentrations are positive detections, greater than or equal to 3 SD.
Data qualifiers: U = undetected, J = estimate, R = rejected, "+" or "-" after a J means that the estimated result is biased high or low, respectively.
Criteria for duplicate agreement: RPD (relative percent difference) within ± 20% or $\lvert R_1-R_2 \rvert \leq 3(SD_1^2+SD_2^2)^{1/2}$.
[1]RPD calculation results in division by zero.

Table 37. Duplicate sample results for radiochemical analyses of composited 8x10 inch TSP air filters from the third quarter of 2025.

Nuclide	Original Sample ID	Concentration (R_1)		1 SD_1	Duplicate Sample ID	Concentration (R_2)		1 SD_2	RPD (%)	$\lvert R_1-R_2 \rvert$	$3(SD_1^2+SD_2^2)^{1/2}$	Within either criterion?
$^{89/90}Sr$	Idaho Falls	**6.95**	-	0.55	Idaho Falls Dup	**6.91**	-	0.55	1	0.04	2.33	Yes
^{238}Pu		0.04	U	0.03		0.02	U	0.02	67	0.02	0.11	Yes
$^{239}Pu/^{240}Pu$		0.03	U	0.02		0.03	U	0.02	0	0.00	0.08	Yes
^{241}Am		-0.03	U	0.04		0.08	U	0.05	-440	0.11	0.19	Yes

Air concentrations and uncertainties (1 SD) are expressed in units of 10^{-5} pCi/m^3. **Bold** concentrations are positive detections, greater than or equal to 3 SD.
Data qualifiers: U = undetected, J = estimate, R = rejected, "+" or "-" after a J means that the estimated result is biased high or low, respectively.
Criteria for duplicate agreement: RPD (relative percent difference) within ± 20% or $\lvert R_1-R_2 \rvert \leq 3(SD_1^2+SD_2^2)^{1/2}$.

Table 38. Duplicate results for quarterly average EcoGamma readings (µR/hr) for the fourth quarter of 2025.

Primary EcoGamma ID	Quarterly Average (R_1) and {Median}	1 SD_1	Duplicate EcoGamma ID	Quarterly Average (R_2) and {Median}	1 SD_2	RPD (%)	$\lvert R_1-R_2 \rvert$	$3(SD_1^2+SD_2^2)^{1/2}$	Within either criterion?
Big Southern Butte	14.4 {14.4}	0.8	Big Southern Butte DUP	13.9 {13.9}	0.7	3.5	0.5	3.2	Yes

Criteria for duplicate agreement: RPD (relative percent difference) within ± 20% or $\lvert R_1-R_2 \rvert \leq 3(SD_1^2+SD_2^2)^{1/2}$.

Table 39. Duplicate sample results (pCi/L) for radiological constituents in groundwater and/or surface water, fourth quarter, 2025.

Analysis/Sample Location	Original Sample Number	Concentration (R_1)		1 SD_1	Duplicate Sample Number	Concentration (R_2)		1 SD_2	RPD (%)	$\lvert R_1-R_2 \rvert$	$3(SD_1^2+SD_2^2)^{1/2}$	Within either criterion?
Gross Alpha												
Birch Creek	251W574	**2.3**	-	0.4	251W580	**1.5**	-	0.3	42	0.8	1.5	Yes
USGS-140	251W642	0.5	U	0.3	251W718	0.8	U	0.4	-46	0.3	1.3	Yes
USGS-120	251W694	0.5	U	0.4	251W765	1.2	U	0.4	-82	0.7	1.7	Yes
Bill Jones Hatchery	251W734	0.6	U	0.3	251W759	1.1	U	0.4	-59	0.5	1.5	Yes
Gross Beta												
Birch Creek	251W574	0.7	U	0.4	251W580	0.9	U	0.3	-25	0.2	1.5	Yes
USGS-140	251W642	**2.3**	-	0.4	251W718	**2.4**	-	0.4	-4	0.1	1.7	Yes
USGS-120	251W694	**1.7**	-	0.4	251W765	**1.4**	-	0.4	53	1.0	1.7	Yes
Bill Jones Hatchery	251W734	**3.0**	-	0.4	251W759	**3.1**	-	0.4	-3	0.1	1.7	Yes
Cesium-137												
Birch Creek	251W574	0.0	U	0.6	251W580	1.0	U	0.7	-200	1.0	2.8	Yes
USGS-140	251W642	1.2	U	0.7	251W718	0.0	U	0.6	200	1.2	2.8	Yes
USGS-120	251W694	1.4	U	0.7	251W765	0.2	U	0.6	80	1.2	2.8	Yes
Bill Jones Hatchery	251W734	0.2	U	0.7	251W759	-0.1	U	0.6	600	0.3	2.8	Yes
Tritium (standard method)												
Birch Creek	251W575	20	U	30	251W581	-20	U	30	NA[1]	40	127	Yes
USGS-140	251W643	**650**	-	40	251W719	**620**	-	40	5	30	169	Yes
USGS-120	251W697	90	U	30	251W768	80	U	30	12	10	127	Yes
Bill Jones Hatchery	251W735	60	U	30	251W760	-40	U	30	1000	100	170	Yes
Tritium (low-level method)												
MV-57	251W518	0	U	2	251W523	4	U	2	200	4	8	Yes
Bill Jones Hatchery	251W735	1	U	2	251W760	2	U	2	-67	1	8	Yes
Strontium-90												
None	-	-	-	-	-	-	-	-	-	-	-	-
Technetium-99												
None	-	-	-	-	-	-	-	-	-	-	-	-
Uranium-234												
USGS-120	251W698	**1.85**	-	0.15	251W769	**1.73**	-	0.11	7	0.12	3.88	Yes
Uranium-235												
USGS-120	251W698	0.0517	U	0.0232	251W769	0.0305	U	0.0125	52	0.0212	0.0791	Yes
Uranium-238												
USGS-120	251W698	**0.796**	-	0.088	251W769	**0.859**	-	0.069	-8	0.063	0.336	Yes
Plutonium-238												
USGS-120	251W696	-0.00869	U	0.00436	251W767	0.00653	U	0.00378	-1409	0.0152	0.0173	Yes
Plutonium-239/240												
USGS-120	251W696	0.00217	U	0.00218	251W767	-0.00218	U	0.00218	-87000	0.0044	0.0092	Yes

Analysis/Sample Location	Original Sample Number	Concentration (R_1)		1 SD_1	Duplicate Sample Number	Concentration (R_2)		1 SD_2	RPD (%)	$\lvert R_1-R_2 \rvert$	$3(SD_1^2+SD_2^2)^{1/2}$	Within either criterion?
Americium-241												
USGS-120	251W695	0.00759	U	0.00440	251W766	0.00232	U	0.00402	106	0.0053	0.0149	Yes

Bold concentrations are positive detections, greater than or equal to 3 SD.
Data qualifiers: U = undetected, J = estimate, R = rejected, "+" or "-" after a J means that the estimated result is biased high or low, respectively.
Criteria for duplicate agreement: RPD (relative percent difference) within ± 20% or $\lvert R_1-R_2 \rvert \leq 3(SD_1^2+SD_2^2)^{1/2}$.
[1]RPD calculation results in division by zero.

Table 40. Duplicate sample results for metals (µg/L) in groundwater, fourth quarter, 2025.

Sample Location	Sample Number	Sample Date	Arsenic	Barium	Chromium	Iron	Lead	Manganese	Selenium	Zinc
Bill Jones Hatchery	251W737	11/04/25	-	-	3.6	-	-	-	-	-
Bill Jones Hatchery	251W762	11/04/25	-	-	3.4	-	-	-	-	-
RPD (%)			-	-	**5.7**	-	-	-	-	-
USGS-140	251W645	11/13/25	-	-	16	-	-	-	-	-
USGS-140	251W721	11/13/25	-	-	16	-	-	-	-	-
RPD (%)			**-**	**-**	**0.0**	**-**	**-**	**-**	**-**	**-**
Birch Creek	251W578	11/20/25	-	-	0.85 J	-	-	-	-	-
Birch Creek	251W584	11/20/25	-	-	1.0	-	-	-	-	-
RPD (%)			**-**	**-**	**-16**	**-**	**-**	**-**	**-**	**-**
USGS-120	251W700	11/24/25	-	-	9.0	-	-	-	-	-
USGS-120	251W771	11/24/25	-	-	9.2	-	-	-	-	-
RPD (%)			**-**	**-**	**-2.2**	**-**	**-**	**-**	**-**	**-**

Criteria for duplicate agreement: RPD (relative percent difference) within ± 20%. If one or both sample results are less than five times the RDL (reporting detection limit), the results agree if their absolute difference is less than or equal to the RDL.
Data qualifiers: U = undetected, J = estimate, R = rejected, "+" or "-" after a J means that the estimated result is biased high or low, respectively.

Table 41. Duplicate sample results for common ions and nutrients (mg/L) in groundwater, fourth quarter, 2025.

Sample Location	Sample Number	Sample Date	Calcium	Magnesium	Sodium	Potassium	Chloride	Sulfate	Total Alkalinity[†]	Total Nitrogen	Total Phosphorus
Bill Jones Hatchery	251W736, 737, 738	11/04/25	31	16	17	3.5	12.9	28.9	134	2.0	-
Bill Jones Hatchery	251W761, 762, 763	11/04/25	32	16	17	3.5	13.0	29.0	136	2.0	-
RPD (%)			**-3.2**	**0.0**	**0.0**	**0.0**	**-7.7**	**3.5**	**-1.5**	**0.0**	**-**
USGS-140	251W644, 646	11/13/25	-	-	-	-	15.0	31.5	163	1.1	-
USGS-140	251W720, 722	11/13/25	-	-	-	-	15.0	31.4	164	1.1	-
RPD (%)			**-**	**-**	**-**	**-**	**0.0**	**0.3**	**-0.6**	**0.0**	**-**
Birch Creek	251W576, 579	11/20/25	-	-	-	-	4.65	25.0	146	0.24	-
Birch Creek	251W582, 585	11/20/25	-	-	-	-	4.65	25.0	147	0.24	-
RPD (%)			**-**	**-**	**-**	**-**	**0.0**	**0.0**	**-0.7**	**0.0**	**-**

Sample Location	Sample Number	Sample Date	Calcium	Magnesium	Sodium	Potassium	Chloride	Sulfate	Total Alkalinity†	Total Nitrogen	Total Phosphorus
USGS-120	251W699, 701	11/24/25	-	-	-	-	17.6	32.7	145	0.86	-
USGS-120	251W770,772	11/24/25	-	-	-	-	17.9	33.4	143	0.86	-
RPD (%)			**-**	**-**	**-**	**-**	**-1.7**	**-2.1**	**1.4**	**0.0**	**-**

†As $CaCO_3$.

Criteria for duplicate agreement: RPD (relative percent difference) within ± 20%. If one or both sample results are less than five times the RDL (reporting detection limit), the results agree if their absolute difference is less than or equal to the RDL.

Data qualifiers: U = undetected, J = estimate, R = rejected, "+" or "-" after a J means that the estimated result is biased high or low, respectively.

Table 42. Duplicate sample results (µg/L) for VOCs in water, fourth quarter, 2025.

Location	Sample Number	Sample Date	PCE	TCE	1,1-DCE	cis-1,2-DCE	trans-1,2-DCE	Vinyl Chloride	1,1-DCA	Carbon Tetrachloride	Methylene Chloride	Chloro-methane	Styrene	Chloro-form	MEK
USGS-120	251W702	11/24/25	<0.5	0.50	<0.5	<0.5	<0.5	<0.5	<0.5	1.50	<0.5	0.28 J	<0.5	0.30 J	<10
USGS-120	251W773	11/24/25	<0.5	0.46 J	<0.5	<0.5	<0.5	<0.5	<0.5	1.47	<0.5	<0.5	<0.5	0.32 J	<10
RPD (%)			**0.0**	**8.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**2.0**	**0.0**	**Note 1**	**0.0**	**-6.5**	**0.0**

RPD = relative percent difference.

Abbreviations: PCE = tetrachloroethene; TCE = trichloroethene; 1,1-DCE = 1,1-dichloroethene; cis-1,2-DCE = cis-1,2-dichloroethene; trans-1,2-DCE = trans-1,2-dichloroethene; 1,1-DCA = 1,1-dichloroethane, MEK = Methyl Ethyl Ketone (2-Butanone).

Criteria for duplicate agreement: RPD (relative percent difference) within ± 20%. **Note 1**: If one or both sample results are less than five times the RDL (reporting detection limit), the results agree if their absolute difference is less than or equal to the RDL (0.5 µg/L for chloromethane).

Data qualifiers: U = undetected, J = estimate, R = rejected, "+" or "-" after a J means that the estimated result is biased high or low, respectively.

Table 43. Duplicate in-situ analyses of gamma emitting radionuclides in soil, fourth quarter, 2025.

Analysis/Sample Location	Sample Date	Original Result (pCi/g)	± 1 SD_1	Duplicate Result (pCi/g)	± 1 SD_2	RPD (%)	$\lvert R_1-R_2 \rvert$	$3(SD_1^2+SD_2^2)^{1/2}$	Within either criterion?
Cs-137									
Idaho Falls	11/04/25	**0.155**	0.035	**0.139**	0.030	11	0.016	0.138	Yes
Large Grid 6-3	11/12/25	**0.500**	0.033	**0.486**	0.043	2.8	0.014	0.163	Yes
ESER Soil Site Carey	11/21/25	**0.431**	0.042	**0.388**	0.043	11	0.043	0.180	Yes
ESER Soil Site Atomic City	11/21/25	**0.318**	0.028	**0.318**	0.024	0.0	0.00	0.111	Yes
K-40									
Idaho Falls	11/04/25	**12.1**	0.3	**11.8**	0.2	2.5	0.3	1.1	Yes
Large Grid 6-3	11/12/25	**16.7**	0.3	**16.9**	0.3	-1.2	0.2	1.3	Yes
ESER Soil Site Carey	11/21/25	**14.0**	0.3	**13.3**	0.3	-5.1	0.7	1.3	Yes
ESER Soil Site Atomic City	11/21/25	**13.4**	0.3	**13.3**	0.3	0.7	0.1	1.3	Yes

Concentrations are reported in pCi/g with associated uncertainty (1 SD). **Bold** concentrations are positive detections, greater than or equal to 3 SD.

Data qualifiers: U = undetected, J = estimate, R = rejected, "+" or "-" after a J means that the estimated result is biased high or low, respectively.

Criteria for duplicate agreement: RPD (relative percent difference) within ± 20% or $\lvert R_1-R_2 \rvert \leq 3(SD_1^2+SD_2^2)^{1/2}$.

Table 44. Spiked sample results (µg/L) for metals in water, fourth quarter, 2025.

Sample Number	Sample Date	Barium			Chromium			Lead			Manganese			Zinc		
		Spike	Result	%R	Spike	Result	%R	Spike	Result	%R	Spike	Result	%R	Spike	Result	%R
251W657	10/21/25	-	-	-	97.0	97	100	-	-	-	-	-	-	-	-	-

A percent recovery (%R) of 100 ± 25% is considered acceptable.

Table 45. Spiked sample results (mg/L) for common ions and nutrients in water, fourth quarter, 2025.

Sample Number	Sample Date	Chloride			Sulfate			Total Alkalinity			$NO_3 + NO_2$*			Total Phosphorus		
		Spike	Result	%R	Spike	Result	%R	Spike	Result	%R	Spike	Result	%R	Spike	Result	%R
251W656, 658	10/21/25	59.6	61.6	103	23.2	23.4	101	62.0	61.2	99	2.17	2.3	106	-	-	-

*As N.

A percent recovery (%R) of 100 ± 25% is considered acceptable.

Table 46. Spiked sample results (µg/L) for VOCs in water, fourth quarter, 2025.

Sample Number	Sample Date	Carbon Tetrachloride			Styrene			Tetrachloroethene			Trichloroethene			Vinyl Chloride		
		Spike	Result	%R	Spike	Result	%R	Spike	Result	%R	Spike	Result	%R	Spike	Result	%R
251W716	10/21/25	8.75	7.96	91	19.3	15.2	79	19.3	17.6	91	11.0	10.9	99	7.80	10.3	132

Table 46 continued. Spiked sample results (µg/L) for VOCs in water, fourth quarter, 2025.

Sample Number	Sample Date	1,1-Dichloroethene			trans-1,2-Dichloroethene			cis-1,2-Dichloroethene			1,2-Dichloroethane			Methylene Chloride		
		Spike	Result	%R	Spike	Result	%R	Spike	Result	%R	Spike	Result	%R	Spike	Result	%R
251W716	10/21/25	17.5	21.6	123	11.9	12.8	106	14.7	12.7	86	10.7	12.4	116	5.89	15.0	255

A percent recovery (%R) of 100 ± 25% is considered acceptable.

Table 47. ISU-EML electret ionization chamber (EIC) irradiation results (categorized as spiked samples), fourth quarter, 2025.

Electret #	Exposure Received		Net Measured Exposure[1]		%R	Within Spec?
	(mR)	Uncertainty (1 SD, mR)	(mR)	Uncertainty (1 SD, mR)		
SOI918	39.6	1.4	35.7	1.4	90.3	Yes
SOI897	39.6	1.4	37.1	1.4	93.6	Yes
SOJ140	39.6	1.4	35.8	1.4	90.3	Yes
				Triplicate AVG:	**91.4**	**Yes**
SNQ168	30.0	1.1	28.3	1.3	94.5	Yes
SNQ262	30.0	1.1	29.6	1.3	98.6	Yes
SNQ265	30.0	1.1	29.1	1.3	96.8	Yes
				Triplicate AVG:	**96.6**	**Yes**
SMV095	19.9	0.7	19.6	1.3	98.3	Yes
SNQ048	19.9	0.7	17.9	1.3	89.9	Yes
SOI858	19.9	0.7	19.1	1.4	95.9	Yes
				Triplicate AVG:	**94.7**	**Yes**

A percent recovery (%R) of 100 ± 25% is considered acceptable.

[1] Net measured exposure estimate includes a correction for atmospheric pressure.

Table 48. Air sampling field equipment service reliability (percent operational), fourth quarter, 2025.

Station Locations	Sample Type				
	47-mm TSP	8x10-inch TSP	Radioiodine	Atmospheric Moisture	Precipitation
Onsite Locations					
Big Lost River Rest Area	100%	100%	100%	100%	100%
Experimental Field Station	100%	100%	100%	100%	NC[1]
MFC Guard House	100%	100%	100%	100%	NC[1]
Sand Dunes Tower	100%	100%	100%	100%	NC[1]
Van Buren Avenue	100%	100%	100%	100%	NC[1]
Boundary Locations					
Atomic City	100%	100%	100%	100%	100%
Howe	100%	100%	100%	100%	100%
Monteview	100%	100%	100%	100%	100%
Mud Lake	100%	100%	100%	100%	100%
Distant Locations[2]					
Craters of the Moon	100%	100%	100%	100%	NC[1]
Idaho Falls	100%	100%	100%	100%	100%
Idaho Falls Duplicate[3]	NC[1]	100%	NC[1]	NC[1]	NC[1]

Note: The values in this table were calculated by dividing the number of weeks the equipment was in operation by the number of weeks in the quarter.

[1] NC = Sample not collected at this location.

[2] Fort Hall Station, operated by the Shoshone-Bannock Tribes, is not included here.

[3] A duplicate 8x10-inch filter TSP sampler is currently installed at the Idaho Falls location.

Appendix A

Table A-1. Weekly concentrations (in 1 x 10^{-3} pCi/m^3) for gross alpha and gross beta analyses of 47-mm TSP filters for all locations, fourth quarter, 2025.

Sample Location	Collection Date		Gross Alpha		Gross Beta	
	Start	Stop	Concentration	1 SD	Concentration	1 SD
On-Site Locations						
Big Lost River Rest Area	09/25/25	10/02/25	**0.8 J[3]**	0.2	**27.1 J[3]**	0.7
	10/02/25	10/09/25	**0.8 J[3]**	0.2	**26.8 J[3]**	0.7
	10/09/25	10/16/25	0.4 J[3]	0.2	**17.3 J[3]**	0.6
	10/16/25	10/23/25	**0.8 J[3]**	0.2	**25.2 J[3]**	0.7
	10/23/25	10/30/25	**0.9 J[3]**	0.2	**27.0 J[3]**	0.7
	10/30/25	11/06/25	**1.2 J[3]**	0.2	**34.8 J[3]**	0.8
	11/06/25	11/13/25	**0.9 J[3]**	0.2	**28.9 J[3]**	0.7
	11/13/25	11/20/25	**0.8 J[3]**	0.2	**23.5 J[3]**	0.7
	11/20/25	11/26/25[4]	**1.0 J[3]**	0.2	**27.6 J[3]**	0.8
	11/26/25	12/04/25[5]	**1.1 J[3]**	0.2	**39.9 J[3]**	0.8
	12/04/25	12/11/25	0.2	0.1	**13.7**	0.5
	12/11/25	12/18/25	**1.0**	0.2	**29.3**	0.7
	12/18/25	12/23/25[6]	0.2	0.2	**11.0**	0.6
	12/23/25	12/31/25[5]	**0.6**	0.1	**17.3**	0.5
Experimental Field Station	09/25/25	10/02/25	**1.5**	0.2	**27.6**	0.7
	10/02/25	10/09/25	**1.3**	0.2	**25.7**	0.7
	10/09/25	10/16/25	**1.0**	0.2	**19.0**	0.6
	10/16/25	10/23/25	**1.2**	0.2	**26.4**	0.7
	10/23/25	10/30/25	**1.5**	0.2	**28.2**	0.7
	10/30/25	11/06/25	**0.9**	0.2	**38.0**	0.8
	11/06/25	11/13/25	**2.1**	0.3	**34.1**	0.8
	11/13/25	11/20/25	**1.2 J[2]**	0.2	**29.6 J[2]**	0.8
	11/20/25	11/26/25[4]	**0.9**	0.2	**35.7**	0.9
	11/26/25	12/04/25[5]	**0.8 J[3]**	0.2	**38.9 J[3]**	0.8
	12/04/25	12/11/25	**0.7**	0.2	**18.5**	0.6
	12/11/25	12/18/25	**1.5**	0.2	**33.5**	0.8
	12/18/25	12/23/25[6]	0.1	0.2	**10.7**	0.6
	12/23/25	12/31/25[5]	**0.8**	0.2	**17.6**	0.6
MFC[5] Guard House	09/25/25	10/02/25	**0.9 J[2]**	0.2	**26.3 J[2]**	0.7
	10/02/25	10/09/25	**1.3**	0.2	**24.7**	0.7
	10/09/25	10/16/25	**0.7**	0.2	**17.7**	0.6
	10/16/25	10/23/25	**1.2**	0.2	**26.8**	0.7
	10/23/25	10/30/25	**1.0**	0.2	**26.9**	0.7
	10/30/25	11/06/25	**1.0**	0.2	**32.9**	0.8
	11/06/25	11/13/25	**1.3**	0.2	**28.7**	0.7
	11/13/25	11/20/25	**1.0**	0.2	**22.7**	0.7
	11/20/25	11/26/25[4]	**0.9**	0.2	**25.3**	0.8
	11/26/25	12/04/25[5]	**0.9**	0.2	**37.5**	0.8
	12/04/25	12/11/25	0.3	0.2	**13.5**	0.5
	12/11/25	12/18/25	**1.1**	0.2	**28.5**	0.7
	12/18/25	12/23/25[6]	**1.0**	0.3	**10.1**	0.6
	12/23/25	12/31/25[5]	**1.0**	0.2	**17.3**	0.5
Sand Dunes Tower	09/25/25	10/02/25	**0.8**	0.2	**29.3**	0.7
	10/02/25	10/09/25	**1.1**	0.2	**25.6**	0.7
	10/09/25	10/16/25	0.5	0.2	**19.0**	0.6
	10/16/25	10/23/25	**1.1**	0.2	**24.4**	0.7
	10/23/25	10/30/25	**0.7**	0.2	**26.2**	0.7
	10/30/25	11/06/25	**0.9**	0.2	**34.8**	0.8
	11/06/25	11/13/25	**0.9**	0.2	**33.1**	0.8
	11/13/25	11/20/25	**0.6**	0.2	**22.3**	0.7
	11/20/25	11/26/25[4]	**1.3**	0.2	**40.4**	0.9
	11/26/25	12/04/25[5]	**1.1**	0.2	**41.4**	0.8
	12/04/25	12/11/25	**0.7**	0.2	**25.8**	0.7

	12/11/25	12/18/25	**1.1**	0.2	**42.5**	0.9
	12/18/25	12/23/25[6]	0.3	0.2	**10.9**	0.6
	12/23/25	12/31/25[5]	**0.7**	0.2	**19.0**	0.6

Table A-1 continued. Weekly concentrations (in 1 x 10^{-3} pCi/m^3) for gross alpha and gross beta analyses of 47-mm TSP filters for all locations, fourth quarter, 2025.

Sample Location	Collection Date		Gross Alpha		Gross Beta	
	Start	Stop	Concentration	1 SD	Concentration	1 SD
Van Buren Avenue	09/25/25	10/02/25	**1.3 J[3]**	0.2	**27.8 J[3]**	0.7
	10/02/25	10/09/25	**1.2 J[3]**	0.2	**24.2 J[3]**	0.7
	10/09/25	10/16/25	0.5 J[3]	0.2	**16.7 J[3]**	0.6
	10/16/25	10/23/25	**1.8 J[3]**	0.2	**25.7 J[3]**	0.7
	10/23/25	10/30/25	**0.9 J[3]**	0.2	**26.1 J[3]**	0.7
	10/30/25	11/06/25	**0.7 J[3]**	0.2	**34.5 J[3]**	0.8
	11/06/25	11/13/25	**1.0 J[3]**	0.2	**32.6 J[3]**	0.8
	11/13/25	11/20/25	**0.9 J[3]**	0.2	**23.7 J[3]**	0.7
	11/20/25	11/26/25[4]	**0.7 J[3]**	0.2	**32.0 J[3]**	0.8
	11/26/25	12/04/25[5]	**0.9 J[3]**	0.2	**41.3 J[3]**	0.8
	12/04/25	12/11/25	**0.6 J[3]**	0.2	**14.7 J[3]**	0.6
	12/11/25	12/18/25	**1.0 J[3]**	0.2	**30.3 J[3]**	0.7
	12/18/25	12/23/25[6]	0.4 J[3]	0.2	**10.9 J[3]**	0.6
	12/23/25	12/31/25[5]	**0.7 J[3]**	0.2	**17.8 J[3]**	0.5
Boundary Locations						
Atomic City	09/25/25	10/02/25	NS[7]	NS[7]	NS[7]	NS[7]
	10/03/25	10/09/25	**1.5 J[3]**	0.2	**25.6 J[3]**	0.8
	10/09/25	10/16/25	**0.6 J[3]**	0.2	**19.3 J[3]**	0.6
	10/16/25	10/23/25	**2.3 J[3]**	0.3	**26.5 J[3]**	0.7
	10/23/25	10/30/25	**1.6 J[3]**	0.2	**28.7 J[3]**	0.7
	10/30/25	11/06/25	**1.4 J[3]**	0.2	**35.9 J[3]**	0.8
	11/06/25	11/13/25	**1.5 J[3]**	0.2	**36.1 J[3]**	0.8
	11/13/25	11/20/25	**1.0 J[3]**	0.2	**26.0 J[3]**	0.7
	11/20/25	11/26/25[4]	**0.9 J[3]**	0.2	**32.3 J[3]**	0.8
	11/26/25	12/04/25[5]	**1.5 J[3]**	0.2	**39.1 J[3]**	0.8
	12/04/25	12/11/25	**0.9 J[3]**	0.2	**13.7 J[3]**	0.5
	12/11/25	12/18/25	**1.4 J[3]**	0.2	**32.8 J[3]**	0.8
	12/18/25	12/23/25[6]	**1.0 J[3]**	0.3	**11.7 J[3]**	0.6
	12/23/25	12/31/25[5]	**0.8 J[3]**	0.2	**16.5 J[3]**	0.5
Howe	09/25/25	10/02/25	**1.1**	0.2	**26.7**	0.7
	10/02/25	10/09/25	**1.0**	0.2	**23.4**	0.6
	10/09/25	10/16/25	**0.9**	0.2	**17.7**	0.6
	10/16/25	10/23/25	**1.1**	0.2	**27.3**	0.7
	10/23/25	10/30/25	**1.0**	0.2	**26.4**	0.7
	10/30/25	11/06/25	**1.0**	0.2	**32.5**	0.7
	11/06/25	11/13/25	**1.3**	0.2	**30.7**	0.7
	11/13/25	11/20/25	**0.9**	0.2	**26.9**	0.7
	11/20/25	11/26/25[4]	**0.7**	0.2	**29.0**	0.8
	11/26/25	12/04/25[5]	**1.0**	0.2	**37.0**	0.7
	12/04/25	12/11/25	**0.6**	0.2	**21.0**	0.6
	12/11/25	12/18/25	**1.3 J[2]**	0.2	**39.3 J[2]**	0.9
	12/18/25	12/23/25[6]	**0.6**	0.2	**9.5**	0.6
	12/23/25	12/31/25[5]	**0.5**	0.1	**15.9**	0.5

Table A-1 continued. Weekly concentrations (in 1 x 10^{-3} pCi/m^3) for gross alpha and gross beta analyses for 47-mm TSP filters for all locations, fourth quarter, 2025.

Sample Location	Collection Date		Gross Alpha		Gross Beta	
	Start	Stop	Concentration	1 SD	Concentration	1 SD
Monteview	09/25/25	10/02/25	**0.6**	0.2	**23.9**	0.7
	10/02/25	10/09/25	0.4	0.2	**16.3**	0.6
	10/09/25	10/16/25	**1.1**	0.2	**24.9**	0.7
	10/16/25	10/23/25	**0.6**	0.2	**25.3**	0.7
	10/23/25	10/30/25	**1.2**	0.2	**35.9**	0.8
	10/30/25	11/06/25	**1.1**	0.2	**24.0**	0.7
	11/06/25	11/13/25	**0.9**	0.2	**26.6**	0.7
	11/13/25	11/20/25	**0.9**	0.2	**33.9**	0.8
	11/20/25	11/26/25[4]	**1.1**	0.2	**39.0**	0.7
	11/26/25	12/04/25[5]	**1.0**	0.2	**20.6**	0.6
	12/04/25	12/11/25	**1.4**	0.2	**8.3**	0.5
	12/11/25	12/18/25	0.3	0.2	**12.1**	0.6
	12/18/25	12/23/25[6]	**0.7**	0.2	**16.6**	0.5
	12/23/25	12/31/25[5]	**0.6**	0.2	**23.9**	0.7
Mud Lake	09/25/25	10/02/25	**1.1**	0.2	**29.2**	0.7
	10/02/25	10/09/25	**1.0**	0.2	**23.8**	0.7
	10/09/25	10/16/25	**0.7**	0.2	**16.3**	0.6
	10/16/25	10/23/25	**1.0**	0.2	**27.0**	0.7
	10/23/25	10/30/25	**1.1**	0.2	**28.2**	0.7
	10/30/25	11/06/25	**0.9**	0.2	**35.4**	0.8
	11/06/25	11/13/25	**0.9**	0.2	**36.0**	0.8
	11/13/25	11/20/25	**1.1**	0.2	**25.1**	0.7
	11/20/25	11/26/25[4]	**0.7**	0.2	**35.2**	0.9
	11/26/25	12/04/25[5]	**1.2**	0.2	**39.9**	0.8
	12/04/25	12/11/25	**0.7**	0.2	**24.2**	0.7
	12/11/25	12/18/25	**1.2**	0.2	**40.3**	0.8
	12/18/25	12/23/25[6]	0.2	0.2	**10.1**	0.6
	12/23/25	12/31/25[5]	**0.6**	0.1	**18.3**	0.6
Distant Locations						
Craters of the Moon	09/25/25	10/02/25	**0.8**	0.2	**24.8**	0.7
	10/02/25	10/09/25	**0.8**	0.2	**22.0**	0.6
	10/09/25	10/16/25	**1.0**	0.2	**17.8**	0.6
	10/16/25	10/23/25	**1.1**	0.2	**22.8**	0.6
	10/23/25	10/30/25	**0.9**	0.2	**20.6**	0.6
	10/30/25	11/06/25	0.5	0.2	**28.1**	0.7
	11/06/25	11/13/25	**0.3**	0.1	**25.0**	0.7
	11/13/25	11/20/25	**0.3**	0.1	**19.2**	0.6
	11/20/25	11/26/25[4]	**1.8**	0.3	**26.1**	0.7
	11/26/25	12/04/25[5]	**0.7**	0.1	**31.4**	0.7
	12/04/25	12/11/25	**0.3**	0.1	**9.6**	0.5
	12/11/25	12/18/25	**0.5**	0.1	**19.9**	0.6
	12/18/25	12/23/25[6]	0.1	0.2	**7.8**	0.6
	12/23/25	12/31/25[5]	**0.4**	0.1	**14.3**	0.5

Table A-1 continued. Weekly concentrations (in 1 x 10^{-3} pCi/m^3) for gross alpha and gross beta analyses of 47-mm TSP filters for all locations, fourth quarter, 2025.

Sample Location	Collection Date		Gross Alpha		Gross Beta	
	Start	Stop	Concentration	1 SD	Concentration	1 SD
Fort Hall[1]	09/25/25	10/02/25	**1.0**	0.2	**27.0**	0.7
	10/02/25	10/09/25	**0.9**	0.2	**22.5**	0.7
	10/09/25	10/16/25	**0.9**	0.2	**18.5**	0.6
	10/16/25	10/23/25	**1.3**	0.2	**24.9**	0.7
	10/23/25	10/30/25	**1.0**	0.2	**25.3**	0.7
	10/30/25	11/06/25	**1.2**	0.2	**32.6**	0.8
	11/06/25	11/13/25	**0.9**	0.2	**27.9**	0.8
	11/13/25	11/20/25	**1.1**	0.2	**24.1**	0.7
	11/20/25	11/26/25[4]	**1.0**	0.2	**26.2**	0.8
	11/26/25	12/04/25[5]	**0.9**	0.2	**34.2**	0.8
	12/04/25	12/11/25	**0.6**	0.2	**11.0**	0.5
	12/11/25	12/18/25	**1.0**	0.2	**30.1**	0.8
	12/18/25	12/23/25[6]	0.6	0.3	**14.6**	0.7
	12/23/25	12/31/25[5]	**0.6**	0.1	**15.2**	0.5
Idaho Falls	09/25/25	10/02/25	**1.2**	0.2	**26.5**	0.7
	10/02/25	10/09/25	**1.2**	0.2	**21.8**	0.6
	10/09/25	10/16/25	**0.9**	0.2	**18.2**	0.6
	10/16/25	10/23/25	**1.3**	0.2	**26.1**	0.7
	10/23/25	10/30/25	**1.3**	0.2	**25.8**	0.7
	10/30/25	11/06/25	**1.2**	0.2	**32.4**	0.7
	11/06/25	11/13/25	**1.9**	0.2	**24.9**	0.7
	11/13/25	11/20/25	**1.0**	0.2	**26.6**	0.7
	11/20/25	11/26/25[4]	**1.4**	0.2	**25.7**	0.7
	11/26/25	12/04/25[5]	**1.3**	0.2	**37.8**	0.7
	12/04/25	12/11/25	**0.9**	0.2	**11.9**	0.5
	12/11/25	12/18/25	**1.2**	0.2	**28.1**	0.7
	12/18/25	12/23/25[6]	0.3	0.2	**12.9**	0.6
	12/23/25	12/31/25[5]	**0.6**	0.1	**14.9**	0.5

Note: **Bold** concentrations are positive detections, greater or equal to 3 SD.
[1]Operated by Shoshone-Bannock Tribes.
[2] Volume is an estimate due to power outage. Results are a usable estimate (J).
[3] Volume is an estimate due to mechanical issues. Results are a usable estimate (J).
[4] Sample collected 1 day early due to holiday.
[5] Sample collected 1 day later due to holiday.
[6] Sample collected 2 days early due to holiday.
[7] No sample due to mechanical failure (NS).
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Appendix B

Table B-1. Results for all electret ionization chamber (EIC) locations, fourth quarter, 2025.

Sample Location	Net Corrected Exposure Rate (µR/hr)[1]	1 SD (µR/hr)
On-Site Locations		
Big Lost River Rest Area	13.3	1.2
Van Buren Avenue	13.9	1.7
Experimental Field Station	17.6, 20.6	-
Main Gate	16.3	2.5
Sand Dunes Tower	13.0	1.3
MP276 -20	12.0	1.0
MP274 -20	10.1	2.3
MP272 -20	11.4	0.6
MP270 -20	16.1	1.2
MP268 -20	12.5	0.5
MP266 -20	12.6	1.4
MP264 -20	13.4	1.7
MP270 -20/26	15.6, 18.1	-
MP268 -20/26	13.2	2.3
MP266 -20/26	10.7	1.6
MP263 -20/26	16.1, 16.5	-
MP261 -20/26	12.3	2.0
MP259 -20/26	14.0, 14.6	-
MP256 -20/26	12.0	1.5
MFC (EBR II)	14.8	0.7
EBR I	14.2	1.0
RWMC	13.2	1.3
CFA	16.2	0.8
CITRC (PBF)	13.4	1.2
INTEC	19.3	1.1
ATR (TRA)	13.5	0.7
NRF	14.7	0.9
TAN/SMC	10.3	1.6
MP39-33	10.9, 12.2	-
MP37-33	12.7	2.7
MP35-33	12.2	2.5
MP33-33	15.4	2.3
MP31-33	12.3	1.0
MP29-33	13.8	1.9
MP27-33	14.9	1.6
MP25-33	10.3	2.1
MP23-33	11.4	1.1
Base of Howe	14.4	1.5
Rover	11.9	1.3
T4 North	11.7	1.9
T4 South	12.7	1.0
MFC Guard House[2]	13.4	1.1
Boundary Locations		
Atomic City	12.9	1.9
Mud Lake/ Terreton	11.8	0.8
Monteview	10.2	0.4
Howe Met. Tower	12.2	0.5
MP282 -20	13.4	2.0
MP280 -20	12.4	1.9
MP278 -20	12.6	0.2
Mud Lake Bank of Commerce	14.3, 16.4	-

Table B-1. continued. Results for all electret ionization chamber (EIC) locations, fourth quarter, 2025.

Sample Location	Net Corrected Exposure Rate (µR/hr)[1]	1 SD (µR/hr)
MP43-33	15.4, 15.8	-
MP41-33	15.4	0.9
MP21-33	11.3	0.6
MP19-33	15.1, 15.5	-
MP14-33	9.8	0.9
MP11-33	10.5	0.7
MP06-33	11.5, 14.7	-
MP03-33	13.4	0.8
Distant Locations		
Arco	11.7, 13.9	-
Craters of the Moon	15.4	0.7
Taber	12.8	0.2
Blackfoot	8.1	0.8
Fort Hall	9.7	0.9
Idaho Falls	11.6	1.2
Hamer	16.2	2.0
Sugar City	16.1, 17.8	-
Roberts	14.9	1.7
Big Southern Butte[2]	11.5	1.2

[1]Results are the average of triplicate exposure rate measurements with the associated sample variability (1 SD), or the 2 measured exposure rates remaining after removal of an outlying value. One of the triplicate measurements is rejected if it is outside the average of the triplicate measurements ±2 SD of the historical population variability. Typically, the two most consistent measurements are reported, based on judgment of the data analyst.

[2]MFC Guard House is a new monitoring location. EIC data collection began during the third quarter of 2025.

Appendix C

Table C-1. Summary of the minimum detectable concentrations (MDCs) for radiological analytes and reporting detection limits (RDLs) for non-radiological analytes, together with the EPA Maximum Contaminant Levels (MCLs) and DOE Derived Concentration Standards (DCSs) for comparison.

Media Sampled	Collection Device	Analyte	Typical MDC or RDL range[1]	Units	EPA Limit[2,3]	DOE DCS[4]	Notes
Air							
Total Suspended Particulate	47-mm filters	Gross alpha	$(0.3 – 0.7) \times 10^{-3}$	pCi/m^3	--	0.11	5
		Gross beta	$(1 – 2) \times 10^{-3}$	pCi/m^3	1	9.6	5, 16
		Gamma emitters	$(0.1 – 0.2) \times 10^{-3}$	pCi/m^3 (^{137}Cs)	1.9×10^{-2}	38	
	8x10-inch filter	Gamma emitters	$(0.03 – 0.07) \times 10^{-5}$	pCi/m^3 (^{137}Cs)	1.9×10^{-2}	38	
		Radiochemical:					
		Sr-90	$(0.4 – 0.7) \times 10^{-5}$	pCi/m^3	1.9×10^{-2}	9.6	
		Pu-238	$(0.05 – 0.2) \times 10^{-5}$	pCi/m^3	2.1×10^{-3}	0.12	
		Pu-239/240	$(0.03 – 0.1) \times 10^{-5}$	pCi/m^3	2.0×10^{-3}	0.11	
		Am-241	$(0.2 – 0.4) \times 10^{-5}$	pCi/m^3	1.9×10^{-3}	0.13	
Water Vapor	Desiccant column	Tritium	0.3 – 0.6	pCi/m^3	1.5×10^{3}	1.3×10^{5}	
Gaseous	Charcoal filter	Iodine-131	$(6 – 8) \times 10^{-4}$	pCi/m^3	2.1×10^{-1}	4.5×10^{2}	
Precipitation	Plastic Carboy	Tritium	100 – 140	pCi/L	20,000	2.6×10^{6}	6
		Gamma emitters	2 - 3	pCi/L (^{137}Cs)	200	4.1×10^{3}	6
Water							
Ground water, perched ground water, waste pond effluent, and surface water	Grab or composite	Gross alpha	0.3 – 1.9	pCi/L	15	4.0×10^{2}	
		Gross beta	0.8 – 1.9	pCi/L	4 mrem/yr	1.7×10^{3}	
		Gamma emitters	0.5 – 3.0	pCi/L (^{137}Cs)	200	4.1×10^{3}	
		Tritium – standard analytical method	140 - – 189	pCi/L	20,000	2.6×10^{6}	
		Tritium – low-level analytical method	5 – 15	pCi/L	20,000	2.6×10^{6}	7
		Radiochemical:					
		Sr-90	0– 0.8	pCi/L	8	1.7×10^{3}	
		Tc-99	0.8 – 1.4	pCi/L	900	3.9×10^{5}	
		U-234	0.01 – 0.8	pCi/L	30 µg/L (total U)	1.2×10^{3}	8
		U-235	0.02 – 0.6	pCi/L		1.3×10^{3}	
		U-238	0.01 – 0.7	pCi/L		1.4×10^{3}	
		Pu-238	0.01 – 0.2	pCi/L	15	4.3×10^{2}	9
		Pu-239/240	0.01 – 0.2	pCi/L	15	4.0×10^{2}	9
		Am-241	0.03 – 0.1	pCi/L	15	7.4×10^{2}	9
		I-129	0.002	pCi/L	1	5.7×10^{2}	

Media Sampled	Collection Device	Analyte	Typical MDC or RDL range[1]	Units	EPA Limit[2,3]	DOE DCS[4]	Notes
		Metals					
		Arsenic	2	µg/L	10	--	
		Barium	1	µg/L	2000	--	
		Chromium	1	µg/L	100	--	
		Iron	10	µg/L	300*	--	
		Lead	1	µg/L	15	--	
		Manganese	1	µg/L	50*	--	
		Selenium	2	µg/L	50	--	
		Zinc	5	µg/L	5000*	--	
		Common Ions					
		Alkalinity (as $CaCO_3$)	1.0	mg/L	--	--	
		Calcium	0.1	mg/L	--	--	
		Chloride	0.4	mg/L	250*	--	
		Magnesium	0.1	mg/L	--	--	
		Potassium	0.1	mg/L	--	--	
		Sodium	0.1	mg/L	--	--	
		Sulfate	0.8	mg/L	250*	--	
		Nutrients					
		Nitrate/Nitrite	0.01	mg/L	10 (NO_3^-),1 (NO_2^-)	--	
		Total Phosphorus	0.005	mg/L	--	--	
		Volatile Organics					
		Tetrachloroethene (PCE)	0.5	µg/L	5	--	
		Trichloroethene (TCE)	0.5	µg/L	5	--	
		1,1-Dichloroethene	0.5	µg/L	7	--	
		cis-1,2-dichloroethene	0.5	µg/L	70	--	
		trans-1,2-dichloroethene	0.5	µg/L	100	--	
		Vinyl chloride	0.5	µg/L	2	--	
		Carbon tetrachloride	0.5	µg/L	5	--	
		Chloroform	0.5	µg/L	80	--	10
		Chloromethane	0.5	µg/L	--	--	
		Methylene Chloride	0.5	µg/L	5	--	
		Methyl Ethyl Ketone	10	µg/L	--	--	
		1,1-Dichloroethane	0.5	µg/L	--	--	
Terrestrial							
Milk	Grab or composite	Gamma emitters	4.0	pCi/L (^{131}I)	4.59×10^3	1.0×10^4	11
Soil	*in situ*	Gamma emitters	0.02 – 0.03	pCi/g (^{137}Cs)	6.8	6.8	12
	Grab	Gamma emitters	0.09	pCi/g (^{137}Cs)	6.8	6.8	12

Media Sampled	Collection Device	Analyte	Typical MDC or RDL range[1]	Units	EPA Limit[2,3]	DOE DCS[4]	Notes
Radiation							
Ambient	EICs	Gamma Radiation	5	mR	--	100 mrem/yr (103.5 mR/yr)	13, 14,
	EcoGamma	Gamma Radiation	1	µR/hr	--	100 mrem/yr (103,500 µR/yr)	13, 15,

Notes:

1.Minimum Detectable Concentrations (MDCs) are a measure of method/instrument performance. They are not a criterion above which a result is considered a detection. DOE Derived concentration standards (DCS) and EPA Maximum Contaminant Levels (MCLs) are listed here only as reference values for comparison to typical MDC or Reporting Detection Limit (RDL) ranges. The MCLs are the most restrictive and do not necessarily apply to the environmental media sampled. For example, the MCLs for water listed here are the highest levels of contaminants legally allowed in public drinking water systems in Idaho, but most wells sampled by DEQ-INL OP are not used for drinking water.

2. For radionuclides in water - EPA derived concentrations (pCi/l) of Beta and Photon Emitters in Drinking Water Yielding a Dose of 4 mrem/year to the Total Body or to any Critical Organ as defined in NBS Handbook 69. For non-radiological analytes – 40 CFR Part 141: National Primary Drinking Water Regulations. The Maximum Contaminant Levels (MCLs) listed here are the highest levels of contaminants legally allowed in public drinking water systems in Idaho. A * designates a Secondary MCL (SMCL), which is a guideline recommended by the EPA for constituents that may affect the taste, color, or odor of drinking water. The values listed are generally consistent with the Idaho Primary Constituent Standards (PCSs) and Secondary Constituent Standards in IDAPA 58.01.11, Ground Water Quality Rule, Tables II and III.

3. For radionuclides in air – EPA Concentration Levels for Environmental Compliance as defined in 40 CFR 61, subpart H -National Emission Standards for Emissions of Radionuclides Other Than Radon from Department of Energy Facilities, and Appendix E, Table 2.

4. Derived concentration standards (DCS) set by the DOE represent reference values for radiation exposure. They are based on a radiation dose of 100 mrem/year for exposure through a particular exposure mode such as direct exposure, inhalation, or ingestion of water (DOE-STD-1196-2022).

5. Based on the most restrictive human-made alpha emitter (^{239}Pu) and beta-emitter (^{90}Sr) and the most restrictive absorption type in DOE-STD-1196-2022, Table 7.

6. There are no regulatory standards for precipitation. For comparison only, the MCL and DCS for water are listed.

7. Water samples from locations at which tritium concentrations are too low to be detected by the standard method are re-analyzed for tritium using an electrolytic enrichment method (referred to as the low-level method), which has a minimum detectable concentration (MDC) about ten times lower than the standard method.

8. Example: For natural uranium, 30 µg/L (total U) is equivalent to approximately 10.3 pCi/L U-234, 0.468 pCi/L U-235, and 10.0 pCi/L U-238.

9. There are no specific MCLs for these nuclides. Listed MCLs are the gross alpha activity MCL.

10. MCL is for total trihalomethanes.

11. The Food and Drug Administration derived intervention level for I-131 in milk is 170 Bq/L or 4590 pCi/L. The DOE DCS for I-131 in milk is 1.0 x10^4 pCi/L.

12. Recommended federal screening limit for surface soil is 6.8 pCi/g (NCRP Report No. 129,"Recommended Screening Limits for Contaminated Surface Soil and Review of Factors Relevant to Site-Specific Studies", Table 2.1, Agricultural (AG) land use).

13. Mrem/hr is converted to µR/yr assuming 1.035 R/rad in muscle.

14. The "Typical MDC" for EICs is expressed as the EIC sensitivity for gamma radiation with less than a 10% error, which is 5 mR per the EPERM System Manual.

15. The "Typical MDC" for the EcoGamma is expressed as the lower end of EcoGamma low range.

16. Per the EPA RadNet Sampling and Analyses Schedules, Routine Sample Analyses [for air filters], "If the beta concentration is greater than 1 pCi/m3, gamma spectroscopy and possibly other analyses are performed."

Appendix D

Table D-1. List of volatile organic compounds (VOCs) analyzed for water samples.

Analyte	Reporting Detection Limit (RDL) (expressed in µg/L)
1,1,1,2-Tetrachloroethane	0.5
1,1,1-Trichloroethane	0.5
1,1,2,2-Tetrachloroethane	0.5
1,1,2-Trichloroethane	0.5
1,1-Dichloro-2-Propanone	5
1,1-Dichloroethane	0.5
1,1-Dichloroethene	0.5
1,1-Dichloropropene	0.5
1,2,3-Trichlorobenzene	0.5
1,2,3-Trichloropropane	0.5
1,2,4-Trichlorobenzene	0.5
1,2,4-Trimethylbenzene	1
1,2-Dibromo-3-chloropropane	0.5
1,2-Dibromoethane	0.5
1,2-Dichlorobenzene	0.5
1,2-Dichloroethane	0.5
1,2-Dichloropropane	0.5
1,3,5-Trimethylbenzene	0.5
1,3-Dichlorobenzene	0.5
1,3-Dichloropropane	0.5
1,4-Dichlorobenzene	0.5
1-Chlorobutane	0.5
2,2-Dichloropropane	0.5
2-Butanone	10
2-Chlorotoluene	0.5
2-Hexanone	2.5
2-Nitropropane	1
4-Chlorotoluene	0.5
Acrylonitrile	1
Allyl chloride	0.5
Benzene	0.5
Bromobenzene	0.5
Bromochloromethane	0.5
Bromodichloromethane	0.5

Table D-1 continued. List of volatile organic compounds (VOCs) analyzed for water samples.

Analyte	Reporting Detection Limit (RDL) (expressed in µg/L)
Bromoform	0.5
Bromomethane	0.5
Carbon disulfide	0.5
Carbon tetrachloride	0.5
Chlorobenzene	0.5
Chloroethane	0.5
Chloroform	0.5
Chloromethane	0.5
Dibromochloromethane	0.5
Dibromomethane	0.5
Dichlorodifluoromethane	0.5
Diethyl ether	0.5
Ethyl methacrylate	0.5
Ethylbenzene	0.5
Hexachlorobutadiene	0.5
Hexachloroethane	0.5
Iodomethane	1
Isopropylbenzene (Cumene)	0.5
MTBE	0.5
Methacrylonitrile	0.5
Methyl Acrylate	0.5
Methyl Isobutyl Ketone	2.5
Methyl methacrylate	0.5
Methylene chloride	0.5
Naphthalene	0.5
Pentachloroethane	1
Propionitrile	0.5
Styrene	0.5
Tetrachloroethene	0.5
Tetrahydrofuran	1
Toluene	0.5
Trichloroethene	0.5
Trichlorofluoromethane	0.5
Vinyl chloride	0.5
cis-1,2-Dichloroethene	0.5
cis-1,3-Dichloropropene	0.5
m,p-Xylene	0.5
n-Butylbenzene	0.5
n-Propylbenzene	0.5
o-Xylene	0.5
p-Isopropyltoluene	0.5
sec-Butylbenzene	1

Table D-1 continued. List of volatile organic compounds (VOCs) analyzed for water samples.

Analyte	Reporting Detection Limit (RDL) (expressed in µg/L)
tert-Butylbenzene	0.5
trans-1,2-Dichloroethene	0.5
trans-1,3-Dichloropropene	1
trans-1,4-Dichloro-2-Butene	0.5