



2025 Groundwater Radiological Monitoring Results Associated with the Advanced Test Reactor Complex Cold Waste Ponds

February 2026



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**Prepared for the
U.S. Department of Energy
Office of Nuclear Energy, Science, and Technology
Under DOE Idaho Operations Office
Contract DE-AC07-05ID14517**

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ABSTRACT

This report summarizes radiological monitoring results from groundwater wells associated with the Idaho National Laboratory Site's Advanced Test Reactor Complex Cold Waste Ponds Reuse Permit (I-161-03, Modification 3). All radiological monitoring was performed to fulfill the Department of Energy requirements under the Atomic Energy Act.

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ACRONYMS

AEA	Atomic Energy Act
ATR	Advanced Test Reactor
CWP	Cold Waste Ponds
DEQ	Department of Environmental Quality
DOE	Department of Energy
INL	Idaho National Laboratory
pCi/L	picocuries per liter

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1. BACKGROUND

The radiological monitoring information presented in this report is provided based upon an agreement between the Idaho Department of Environmental Quality (DEQ) and the U.S. Department of Energy Idaho Operations Office. This agreement is documented in the Reuse Permit (I-161-03, Modification 3) for the Idaho National Laboratory (INL) Advanced Test Reactor (ATR) Complex Cold Waste Ponds (CWP), (Saffle 2025). Section 2, “Additional Facility Information,” of the reuse permit states “The Permittee agrees to provide to DEQ the results of ground water radiological monitoring with respect to the INL ATR Complex Cold Waste Ponds that is performed to fulfill U.S. DOE requirements under the Atomic Energy Act (AEA). The Permittee agrees to provide the results at the same time as the annual report.” This report fulfills the terms of that agreement.

2. REPORTING PERIOD

Section 4.5 of the Reuse Permit for the ATR Complex CWP states the reporting year runs from November 1 through October 31. This report covers the 2025 reporting year which runs from November 1, 2024, to October 31, 2025. A minor modification, Modification 3, was issued July 24, 2025, to update the authorized representative (Saffle 2025). This modification did not change groundwater monitoring or the reporting period.

3. GROUNDWATER SAMPLE RESULTS

Section 5.2.2 of the Reuse Permit requires groundwater monitoring to be conducted twice annually in April/May and September/October for nonradiological constituents. During these events, groundwater samples were also collected for radiological constituents to satisfy the release objectives of DOE Order 458.1, “Radiation Protection of the Public and the Environment.”

Groundwater samples were collected from aquifer wells USGS-098, USGS-065, TRA-08, USGS-076, Middle-1823, USGS-136, and USGS-058 in April and September 2025. Samples were analyzed for gross alpha, gross beta, tritium, strontium-90, and gamma spectrometry. A duplicate sample from USGS-076 was also collected and analyzed for radiological constituents in April 2025.

The results of these analyses meeting the criteria of a positive detection, defined as measurements exceeding the instrument’s minimum detection level and greater than three times the uncertainty, are reported in Table 1.

The issuance of Reuse Permit I-161-03 added USGS-136 as a monitoring point in Section 5.2.2. USGS-136 is also sampled for radiological constituents to meet conditions for the operation of the Remote-Handled Low-Level Waste Disposal Facility which is outside the scope of the reuse permit and not included in this report. Results specific to this operation are reported in the “Annual Summary Report for the Remote-Handled Low-Level Waste Disposal Facility”.

Table 1. Positive radiological detections in groundwater samples collected during 2025 from the Advanced Test Reactor Complex Cold Waste Ponds Reuse Permit monitoring wells.

Monitoring Well	Sample Date	Parameter	Sample Result ^a (pCi/L)
USGS-098	4/22/2025	Gross Alpha	1.3 (± 0.414)
		Gross Beta	2.31 (± 0.247)
	9/24/2025	Gross Beta	1.84 (± 0.358)
USGS-065	4/23/2025	Gross Alpha	1.67 (± 0.286)
		Gross Beta	5.43 (± 0.433)
		Tritium	777 (± 136)
	9/25/2025	Gross Alpha	1.09 (± 0.282)
		Gross Beta	3.74 (± 0.441)
		Tritium	658 (± 137)
TRA-08	4/28/2025	Gross Beta	2.53 (± 0.237)
		Tritium	521 (± 121)
	9/29/2025	Gross Alpha	0.793 (± 0.228)
		Gross Beta	2.22 (± 0.274)
		Tritium	616 (± 130)
USGS-076	4/24/2025	Gross Alpha	0.951 (± 0.197) [0.872 (± 0.184)] ^c
		Gross Beta	1.72 (± 0.344) [2.24 (± 0.29)] ^c
		Tritium	508 (± 129) [395 (± 120)] ^c
	9/30/2025	Gross Alpha	0.702 (± 0.208)
		Gross Beta	2.62 (± 0.236)
		Tritium	
Middle-1823	4/23/2025	Gross Alpha	0.544 (± 0.168)
		Gross Beta	2.77 (± 0.406)
		Tritium	482 (± 106)
	9/25/2025	Gross Beta	2.77 (± 0.337)
		Tritium	326 (± 107)
USGS-136 ^b	4/28/2025	Gross Alpha	0.83 (± 0.172)
		Gross Beta	2.75 (± 0.324)
		Tritium	507 (± 122)
	9/29/2025	Gross Alpha	1.18 (± 0.245)
		Gross Beta	2.17 (± 0.29)
		Tritium	481 (± 122)
USGS-058	4/22/2025	Gross Beta	1.8 (± 0.227)
	9/24/2025	Gross Beta	1.88 (± 0.294)
a. One sigma uncertainty shown in parentheses. b. Monitoring for Remote-Handled Low-Level Waste Disposal Facility is not included. c. Analytical result of field duplicate, shown in brackets, from sample collected on April 24, 2025, from well USGS-076.			

4. REFERENCES

42 USC § 2011–2259, “Atomic Energy Act of 1954,” *United States Code*.

DOE Order 458.1, “Radiation Protection of the Public and the Environment,” U.S. Department of Energy, September 15, 2020.

Saffle, T., DEQ, to M. J. McAnulty, DOE-ID, July 24th 2025, “I-161-03 INL Advanced Test Reactor Complex Cold Waste Ponds, Permit Modification 3,” CCN 258649.