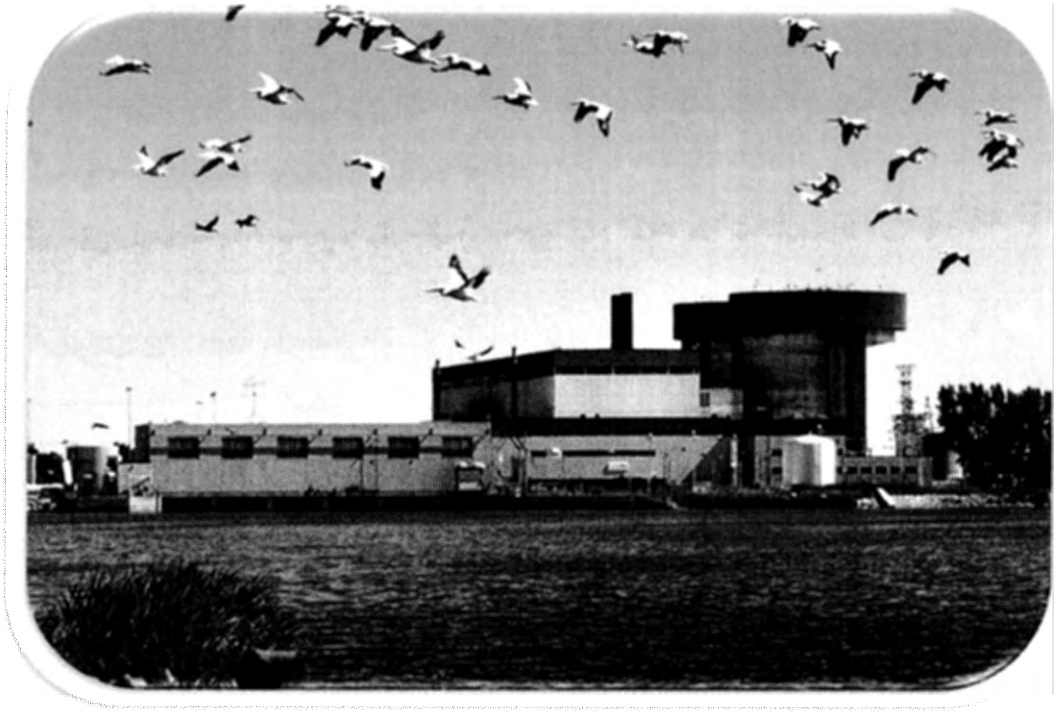
Constellation

Braidwood Nuclear Power Station



2024

Annual Radiological Environmental Operating Report

Document Number: 50-456/50-457

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1.0 LIST OF ACRONYMS AND DEFINITIONS

1. Airborne Activity Sampling: Continuous sampling of air through the collection of particulates and radionuclides on filter media.

2. ARERR: Annual Radioactive Effluent Release Report

3. AREOR: Annual Radiological Environmental Operating Report

4. BWR: Boiling Water Reactor

5. Composite Sample: A series of single collected portions (aliquots) analyzed as one sample. The aliquots making up the sample are collected at time intervals that are very short compared to the composite period.

6. Control: A sampling station in a location not likely to be affected by plant effluents due to its distance and/or direction from the station.

7. Curie (Ci): A measure of radioactivity; equal to 3.7×10^{10} disintegrations per second, or 2.22×10^{12} disintegrations per minute.

8. Direct Radiation Monitoring: The measurement of radiation dose at various distances from the plant is assessed using Thermoluminescent Dosimeters (TLD), Optically Stimulated Luminescence Dosimeters (OSLD) and pressurized ionization chambers.

9. EPA: Environmental Protection Agency

10. GPI: Groundwater Protection Initiative

11. Grab Sample: A single discrete sample drawn at one point in time.

12. Indicator: A sampling location that is likely to be affected by plant effluents due to its proximity and/or direction from the plant.

13. Ingestion Pathway: The ingestion pathway includes milk, fish, drinking water and garden produce. Also sampled (under special circumstances) are other media such as vegetation or animal products when additional information about particular radionuclides is needed.

14. ISFSI: Independent Spent Fuel Storage Installation

15. Lower Limit of Detection (LLD): An *a priori* measure of the detection capability of a radiochemistry measurement based on instrument setup, calibration, background, decay time, and sample volume. An LLD is expressed as an activity concentration. The MDA is used for reporting results. LLD are specified by a regulator, such as the NRC and are typically listed in the ODCM.

16. MDA: Minimum Detectable Activity. For radiochemistry instruments, the MDA is the *a posteriori* minimum concentration that a counting system detects. The smallest concentration or activity of radioactive material in a sample that will yield a net count above instrument background and that is detected with 95% probability, with only five % probability of falsely concluding that a blank observation represents a true signal.

17. MDC: Minimum Detectable Concentration. Essentially synonymous with MDA for the purposes of radiological monitoring.

18. Mean: The sum of all of the values in a distribution divided by the number of values in the distribution, synonymous with average.

19. Microcurie: 3.7×10^4 disintegrations per second, or 2.22×10^6 disintegrations per minute.

20. N/A: Not Applicable

21. NEI: Nuclear Energy Institute

22. NIST: National Institute of Standards and Technology.

23. NRC: Nuclear Regulatory Commission

24. ODCM: Offsite Dose Calculation Manual

25. OSLD: Optically Stimulated Luminescence Dosimeter

26. pCi/L: picocuries / Liter

27. PWR: Pressurized Water Reactor

28. REMP: Radiological Environmental Monitoring Program

29. TLD: Thermoluminescent Dosimeter

2.0 EXECUTIVE SUMMARY

Braidwood Station Units 1 and 2 Radiological Environmental Monitoring Program (REMP) was established prior to the station becoming operational to provide information on background radiation present in the area. The goal of Braidwood Station REMP is to evaluate the impact of the station on the environment. Environmental samples from different media are monitored as part of the program in accordance with specifications detailed in the Offsite Dose Calculation Manual (ODCM). The program compares data from Indicator locations near the plant, to Control locations farther away from the site to assess operation impacts.

The Annual Radiological Environmental Operating Report (AREOR) provides data obtained through analyses of environmental samples collected at Braidwood Station for the reporting period of January 1st through December 31st, 2024. During that time period 1,589 analyses were performed on 1,280 samples. In assessing all the data gathered for this report and comparing these results with preoperational data and/or 10-year average values, it was concluded that the operation of Braidwood Station had no adverse radiological impact on the enviroment.

2.1 Summary of Conclusions:

All values were consistent with historical results which indicate no adverse radiological environmental impacts associated with the operation of Braidwood Station. Naturally occurring radionuclides are present in the Earth's crust and atmosphere and exists in detectable quantities throughout the world. It is common to detect naturally occurring radionuclides in many of the samples collected for REMP. Some examples of naturally occurring radionuclides that are frequently seen in samples are potassium-40, beryllium-7, actinium-228 (present as a decay product of radium-228), and radium-226. Additionally, some relatively long-lived anthropogenic radioisotopes, such as strontium-90 and cesium-137, are also seen in some REMP samples; these radionuclides exist in measurable quantities throughout the world as a result of fallout from historic atmospheric nuclear weapons testing. Detailed information on the exposure of the U.S. population to ionizing radiation can be found in NCRP Report No. 160 [1].

3.0 INTRODUCTION

The Radiological Environmental Monitoring Program (REMP) provides data on measurable levels of radiation and radioactive materials in the environment. This program also evaluates the relationship between quantities of radioactive materials released from the plant and resultant doses to individuals from principal pathways of exposure. In this capacity, REMP provides a check on the effluent release program and dispersion modeling to ensure that concentrations in the environment due to radioactive effluents conform to the "As Low as Is Reasonably Achievable" (ALARA) design objectives of 10 CFR 50, Appendix I [2], and implements the requirements of Section IV.B.2 and IV.B.3 of Appendix I. REMP is designed to conform to the Nuclear Regulatory Commission (NRC) Regulatory Guide 4.1 [3], NUREG 1301/1302 [4] [5], and the 1979 NRC Branch Technical Position [6].

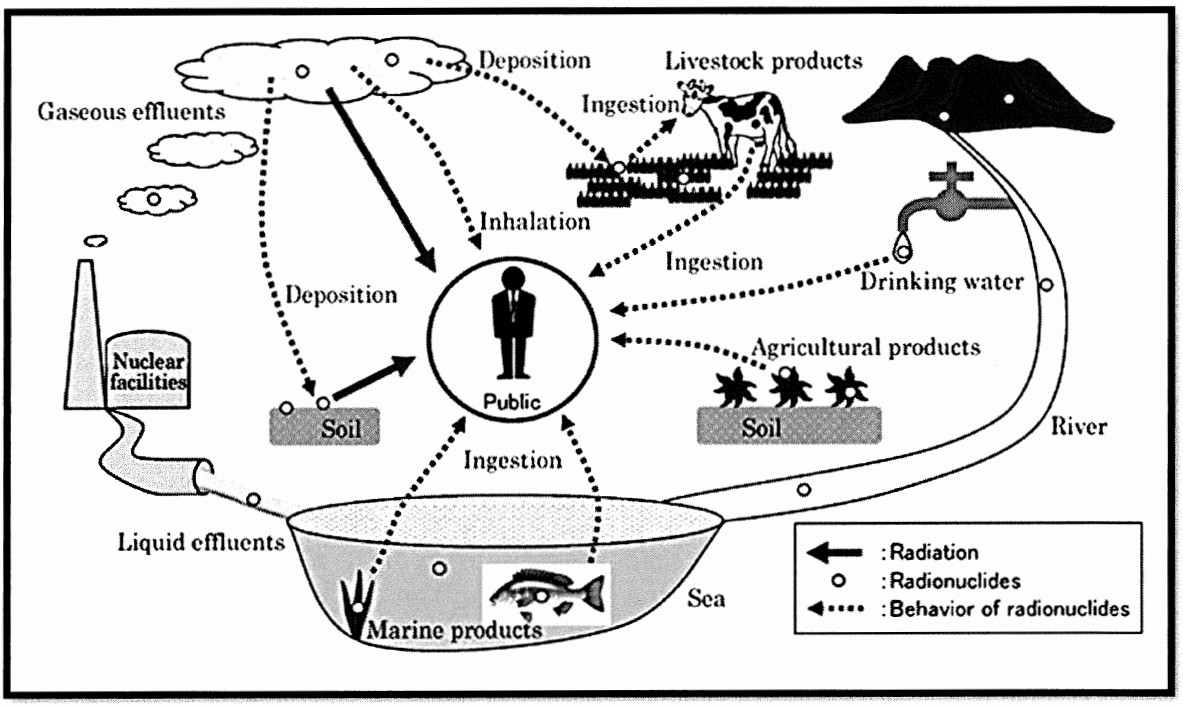


Figure 1, Potential exposure pathways to Members of the Public due to Plant Operations [7]

Quality assurance aspects of the sampling program and TLD/OSLD data collection are conducted in accordance with Regulatory Guides 4.15 [8] and 4.13 [9]. REMP also adheres to the requirements of the state of Illinois, Braidwood Station Technical Specifications, and Offsite Dose Calculation Manual (ODCM). These governing documents dictate the environmental sampling, sample analysis protocols, data reporting and quality assurance requirements for the environmental monitoring program.

The Annual Radiological Environmental Operating Report provides summaries of the environmental data from exposure pathways, interpretations of the data, and analyses of trends of the results. Routinely monitored pathways include ingestion, inhalation, and direct radiation. Routes of exposure are based on site specific information such as meteorology, receptor locations, and water usage around the plant.

4.0 SITE DESCRIPTION AND SAMPLE LOCATIONS

The Braidwood Station, consisting of two 3,645 MWt pressurized water reactors owned and operated by Constellation is located in Will County, Illinois. Unit No. 1 went critical on May 29, 1987. Unit No. 2 went critical on March 08, 1988. The site is located in northeastern Illinois, 20 miles south-southwest of Joliet, Illinois, 60 miles southwest of Chicago and southwest of the Kankakee River.

Braidwood Station sampling media are selected based on site specific information such as meteorology, receptor locations, and water usage around the plant. Sampling and analysis frequencies are documented in the Offsite Dose Calculation Manual and site procedures. Required sampling, analysis frequencies and location of sample collected are captured in the following tables and figures:

- Table 1: Radiological Environmental Sampling Program – Exposure Pathway – Direct Radiation
- Table 2, Radiological Environmental Sampling Program – Exposure Pathway - Airborne
- Table 3, Radiological Environmental Sampling Program – Exposure Pathway - Waterborne
- Table 4, Radiological Environmental Sampling Program – Exposure Pathway - Ingestion
- Table 5, REMP Sampling Locations – Direct Radiation
- Figure 2, Inner Ring and Other OSLD Locations of Braidwood Station, 2024
- Figure 3, Fixed Air Sampling and Outer Ring OSLD Locations for Braidwood Station, 2024
- Figure 4, Ingestions and Waterborne Exposure Pathway Sample Locations of Braidwood Station, 2024

5.0 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM REQUIREMENTS

Table 1: Radiological Environmental Sampling Program – Exposure Pathway – Direct Radiation

Requirement	Sample Location Description, Distance, and Direction	Sampling Collection/ Frequency	Type and Frequency of Analyses
Direct Radiation 48 OSLD monitoring stations with two dosimeters placed as follows: An inner ring of stations, one in each compass sector in the general area of the site boundary. An outer ring of stations, one in each compass sector at approximately 5 miles from the site An additional set located at the eight fixed air sampling locations An ISFSI set	See Table 5	Quarterly	Gamma dose Quarterly

Table 2, Radiological Environmental Sampling Program – Exposure Pathway - Airborne

Requirement	Sample Location Description, Distance, and Direction	Sampling Collection/ Frequency	Type and Frequency of Analyses
Airborne Radioiodine and Particulates Samples from 8 locations: Four locations close to the site boundary in different sectors of the highest calculated annual average ground level D/Q. Three samples from the vicinity of a community having the highest calculated annual average D/Q. One sample from Control Locations between 4 - 8 miles away in the least predominant wind direction.	BD-02 Custer Park, 5.0 miles E BD-03 County Line Road (Control), 6.2 miles ESE BD-04 Essex, 4.8 miles SSE BD-05 Gardner, 5.5 miles SW BD-06 Godley, 0.5 miles WSW BD-19 Nearsite NW, 0.3 miles NW BD-20 Nearsite N, 0.6 miles N BD-21 Nearsite NE, 0.5 miles NE	One week composite of continuous air sampling through glass fiber filter paper. Weekly composite of continuous air sampling through charcoal filter. Quarterly composite of each station	Particulate sampler: Gross Beta analysis following weekly filter change and Gamma isotopic quarterly on composite filters by location on near field and control samples. Radioiodine canister: I-131 analysis weekly on near field and control samples.

Table 3, Radiological Environmental Sampling Program – Exposure Pathway - Waterborne

Requirement	Sample Location Description, Distance, and Direction	Sampling Collection/ Frequency	Type and Frequency of Analyses
Surface Water One sample upstream (control) and five samples downstream	BD-10 Kankakee River Downstream, 5.4 miles NE BD-25 Kankakee River Upstream (Control), 9.6 miles E BD-38 Main Drainage Ditch, 1.5 miles S BD-40 Braidwood Station Cooling Lake, Onsite (1.0 mile E) BD-55 North Pond Fatlan Site, 0.6 miles NE BD-56 South Pond Fatlan Site, 0.6 miles NE	Monthly composite sample from weekly grab samples; quarterly composite from weekly grab samples	Gamma isotopic Monthly Gross Beta Monthly Fe-55 Monthly Ni-63 Monthly H-3 Quarterly
Public Water One sample downstream (indicator)	BD-22 Wilmington, 6.0 miles NE	Weekly grab samples; Monthly composites from weekly grab samples	H-3 Monthly Gamma isotopic Monthly Gross Beta Monthly I-131(Low Level) Monthly Fe-55 Monthly Ni-63 Monthly
Groundwater/Well Water Eight indicator locations down gradient from the plant	BD-13 Braidwood City Hall Well, 1.7 miles NNE BD-34 Gibson Well, 4.7 miles E BD-35 Joly Well, 4.7 miles E BD-36 Hutton Well, 4.7 miles E BD-37 Nurczyk Well, 4.7 miles E BD-50 Skole Well, 4.7 miles E BD-51 Fatlan Well, 0.6 miles NE BD-54 Cash Well, 0.9 miles NE	Quarterly grab samples	Gamma isotopic Quarterly H-3 Quarterly
Sediment from Shoreline One sample upstream (control) and two samples downstream (indicator)	BD-10 Kankakee River, Downstream, 5.4 miles NE BD-25 Kankakee River Upstream (Control), 9.6 miles E BD-57 Circulating Water Blowdown Discharge, 5.4 miles E	Semiannual grab samples	Gamma isotopic Semiannually Ni-63 Semiannually Fe-55 Semiannually

Table 4, Radiological Environmental Sampling Program – Exposure Pathway - Ingestion

Requirement	Sample Location Description, Distance, and Direction	Sampling Collection/ Frequency	Type and Frequency of Analyses
Goat milk One sample from a milking animal at a control location 15 to 30 km distant and in the least prevalent wind direction.	BD-18A 8270 Duck Pond Rd, Coal City, IL 60416(Control), 6.2 miles NNW	Biweekly when animals are on pasture; monthly at other times	Gamma isotopic and I-131 Biweekly when animals are on pasture; monthly at other times.
Fish One sample upstream and two samples downstream for each commercially and recreationally important species in vicinity of site discharge.	BD-25 Kankakee River, Upstream (Control), 9.6 miles E BD-28 Kankakee River, Discharge, 5.4 miles E BD-41 Cooling Lake, Onsite (1.0 mile E)	Semiannually	Gamma isotopic analysis on edible portions Ni-63 on edible portions Fe-55 on edible portions
Vegetation Seven locations producing vegetables from areas irrigated by water in which liquid plant wastes have been discharged and one sample collected from a control location.	BWD-G1 Nearsite NE, 0.54 miles NE BWD-G2 Nearsite W, 0.21 miles W Quadrant 1 Clark Farm, 3.8 miles ENE Quadrant 2 W.F. Soltwisch, 4.5 miles SSE Quadrant 3 Bruce Corsini, 5.4 miles SSW Quadrant 4 Bruce Sinkular, 1.9 miles NNW Control Gorman Farm, 9.0 miles NE	Grab samples during the growing season	Gamma isotopic on each sample

Table 5, REMP Sampling Locations – Direct Radiation

Site #	Location Type	Sector	Distance	Description
BD-101	Inner Ring	N	0.5 miles	
BD-102	Inner Ring	NNE	1.1 miles	
BD-103	Inner Ring	NE	1.0 mile	
BD-104	Inner Ring	ENE	0.7 miles	
BD-105	Inner Ring	E	2.2 miles	
BD-106	Inner Ring	ESE	2.5 miles	
BD-107	Inner Ring	SE	3.2 miles	
BD-108	Inner Ring	SSE	3.2 miles	
BD-109	Inner Ring	S	3.8 miles	
BD-110	Inner Ring	SSW	2.8 miles	
BD-111a	Inner Ring	SW	1.4 miles	
BD-112	Inner Ring	WSW	0.7 miles	
BD-113a	Inner Ring	W	0.5 miles	
BD-114	Inner Ring	WNW	0.4 miles	
BD-115	Inner Ring	NW	0.3 miles	
BD-116	Inner Ring	NNW	0.4 miles	
BD-201	Outer Ring	N	4.2 miles	
BD-202	Outer Ring	NNE	4.8 miles	
BD-203	Outer Ring	NE	4.9 miles	
BD-204	Outer Ring	ENE	4.3 miles	
BD-205	Outer Ring	E	4.0 miles	
BD-206	Outer Ring	ESE	4.5 miles	

Table 5, REMP Sampling Locations – Direct Radiation

Site #	Location Type	Sector	Distance	Description
BD-207	Outer Ring	SE	4.5 miles	
BD-208	Outer Ring	SSE	4.5 miles	
BD-209	Outer Ring	S	4.8 miles	
BD-210	Outer Ring	SSW	5.3 miles	
BD-211	Outer Ring	SW	4.8 miles	
BD-212	Outer Ring	WSW	5.0 miles	
BD-213	Outer Ring	W	4.8 miles	
BD-214	Outer Ring	WNW	4.3 miles	
BD-215	Outer Ring	NW	4.5 miles	
BD-216	Outer Ring	NNW	4.0 miles	
BD-02	Other	E	5.0 miles	Custer Park (indicator)
BD-03	Other	ESE	6.2 miles	13000 W. Road (control)
BD-04	Other	SSE	4.8 miles	Essex (indicator)
BD-05	Other	SW	5.5 miles	Gardner (indicator)
BD-06	Other	WSW	0.5 miles	Godley (indicator)
BD-19	Other	NW	0.3 miles	Nearsite NW (indicator)
BD-20	Other	N	0.6 miles	Nearsite N (indicator)
BD-21	Other	NE	0.5 miles	Nearsite NE (indicator)
BD-ISFSI-104-3	ISFSI	E	0.11 miles	
BD-ISFSI-104-4	ISFSI	E	0.13 miles	
BD-ISFSI-105-3	ISFSI	SE	0.23 miles	
BD-ISFSI-105-4	ISFSI	SE	0.20 miles	
BD-ISFSI-110-3	ISFSI	SE	0.18 miles	
BD-ISFSI-110-4	ISFSI	SE	0.15 miles	

6.0 MAPS OF COLLECTION SITES

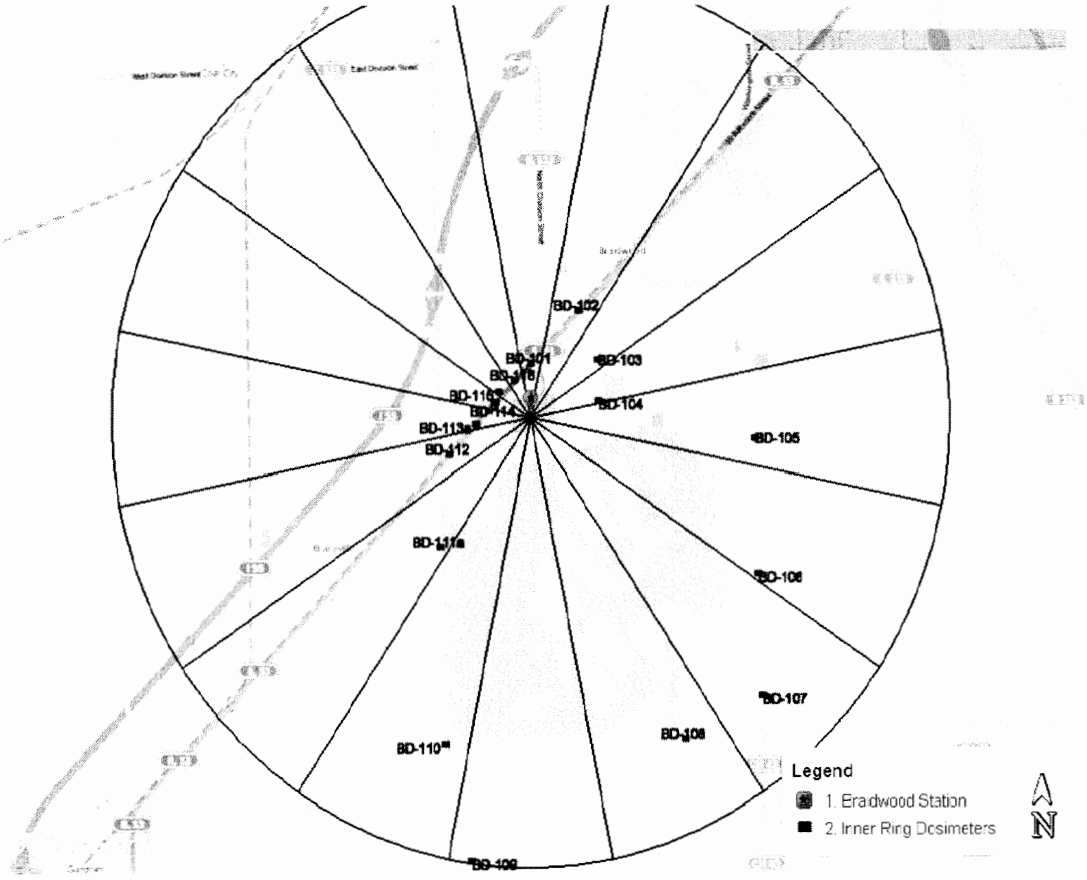


Figure 2, Inner Ring and Other OSLD Locations of Braidwood Station, 2024

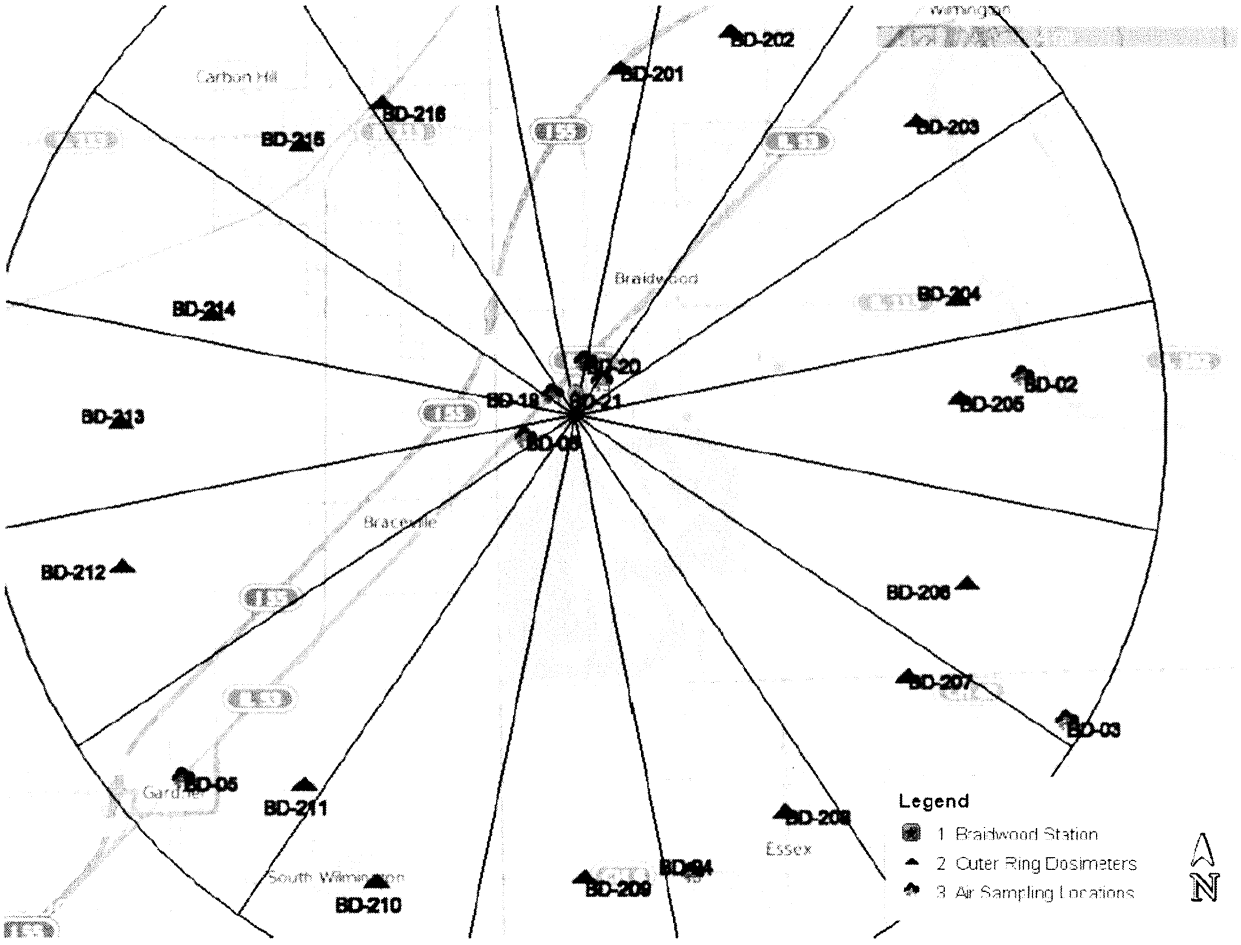


Figure 3, Fixed Air Sampling and Outer Ring OSLD Locations for Braidwood Station, 2024

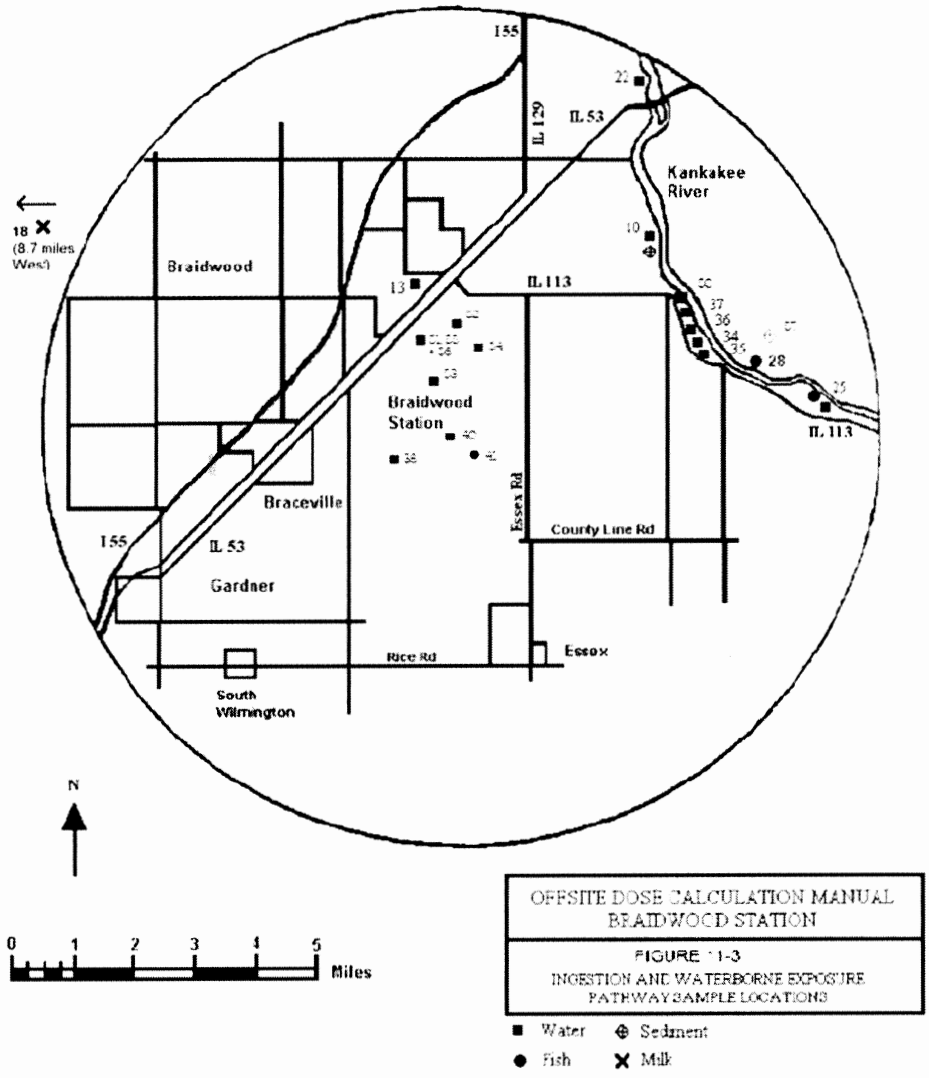


Figure 4, Ingestions and Waterborne Exposure Pathway Sample Locations of Braidwood Station, 2024

7.0 REPORTING LEVELS FOR RADIOACTIVITY CONCENTRATIONS IN ENVIRONMENTAL SAMPLES

Table 6, Reporting Levels for Radioactivity Concentrations in Environmental Samples

Radionuclide	Water (pCi/L)	Air Particulates or Gases (pCi/m^3)	Fish (pCi/kg-wet)	Milk (pCi/L)	Food Products (pCi/Kg-wet)
H-3	20,000 (1)	NA	NA	NA	NA
Mn-54	1,000	NA	30,000	NA	NA
Fe-59	400	NA	10,000	NA	NA
Co-58	1,000	NA	30,000	NA	NA
Co-60	300	NA	10,000	NA	NA
Zn-65	300	NA	20,000	NA	NA
Zr-Nb-95	400	NA	NA	NA	NA
I-131	2 (2)	0.9	NA	3	100
Cs-134	30	10	1,000	60	1,000
Cs-137	50	20	2,000	70	2,000
Ba-La-140	200	NA	NA	300	NA

Table 7, Maximum Values for the Limit of Detection

Radionuclide	Water (pCi/L)	Air Particulates or Gases (pCi/m^3)	Fish (pCi/kg-wet)	Milk (pCi/L)	Food Products (pCi/Kg-wet)	Sediment (pCi/Kg-dry)
Gross Beta	4	0.01	NA	NA	NA	NA
H-3	2,000	NA	NA	NA	NA	NA
Mn-54	15	NA	130	NA	NA	NA
Fe-59	30	NA	260	NA	NA	NA
Co-58, Co-60	15	NA	130	NA	NA	NA
Zn-65	30	NA	260	NA	NA	NA
Zr-Nb-95	15	NA	NA	NA	NA	NA
I-131	1 (3)	0.07	NA	1	60	NA
Cs-134	15	0.05	130	15	60	150
Cs-137	18	0.06	150	18	80	180
Ba-140	60	NA	NA	60	NA	NA
La-140	15	NA	NA	15	NA	NA

[1] **For** drinking water samples: **If** no drinking water pathway exists, a value **of 30,000 pCi/L** may be used.
[2] **If** no drinking water pathway exists, a value of 20 pCi/l may be used
[3] **If** no drinking water pathway exists, a value of 15 pCi/l may be used

8.0 SAMPLING PROGRAM, PROGRAM MODIFICATION AND INTEPRETATION OF RESULTS

At most nuclear stations, data was collected prior to plant operation to determine background radioactivity levels in the environment. Annual data is routinely compared to preoperational and/or 10-year average values to determine if changes in the environs are present. Strict comparison is difficult to make due to fallout from historical nuclear weapon testing. Cesium-137 can be routinely found in environmental samples as a results of above ground nuclear weapons testing. It is important to note, levels of Cs-137 in environment are observed to fluctuate, for example as silt distributions shift due to natural erosion and transport processes, Cs-137 may or may not be observed in sediment samples. Results from samples collected and analyzed during the year, 2024, are described below.

In the following sections, results from direct radiation, air, water, and food products analyzed as part of REMP in 2024 will be discussed. Sampling program descriptions and deviations will also be discussed.

8.1 Environmental Direct Radiation Dosimetry Results

Dose is measured as net exposure (field reading less transit reading) normalized to 91-day quarters. Data is treated and analyzed consistent with ANSI/HPS N13.37-2014, which compares the measured dose for each location to the baseline background dose for that location. Environmental dose rates vary by location, depending on geological and land use considerations, and remain relatively constant for any given location (unless land use changes). Some facilities observe seasonal variation in environmental doses. Baseline Background Doses have been determined for both quarterly and annual measurements at each location using historical field measurements.

ANSI/HPS N13.37-2014 uses the concept of minimum differential dose (MDD), which is the minimum facility-related dose that can be detected above background. Due to natural background variations and measurement sensitivities and uncertainties, minimum differential dose is not zero. MDD is calculated based on statistical performance of the dosimetry system in the environment and is site specific.

Normalized doses that exceed the Minimum Differential Dose value above the Baseline Background Dose are considered to indicate Facility-Related Dose; a quality assurance review is performed to verify that any results indicating Facility-Related Dose are accurate.

During the calendar year 2024, a total of 46 locations were monitored and data. Attachment 4, Environmental Direct Radiation Dosimetry Results, provides the annual direct radiation dosimetry analysis.

All OSLD measurements had a range of 11.2 to 64 mrem/std. quarter. A comparison of the Inner Ring, Outer Ring and Other data to the Control Location data, indicate that the ambient gamma radiation levels from all locations were similar.

8.2 Air Particulate and Radioiodine Sample Results

Air particulate filters and charcoal canisters were collected from locations specified in Table 2, Radiological Environmental Sampling Program – Exposure Pathway - Airborne. During the calendar year 2024, a total of 424 samples were collected and analyzed for gross beta, gamma-emitters and iodine. Particulate samplers are used to continuously collect airborne particulates on a filter. The samples are analyzed for gross beta activity following filter changeout which occurs weekly. Gamma isotopic analysis is also performed on the samples collected at each location and is analyzed quarterly. Naturally occurring beryllium-7 was detected on all the control and indicator samples at concentrations consistent with previous years Radioiodine (I-131) analysis is performed weekly on radioiodine sample cartridges.

All air particulate and radioiodine samples were below detection limit and were at levels consistent with previous years. All air particulate quarterly gamma composite samples were below the detection limit except for naturally occurring radionuclides.

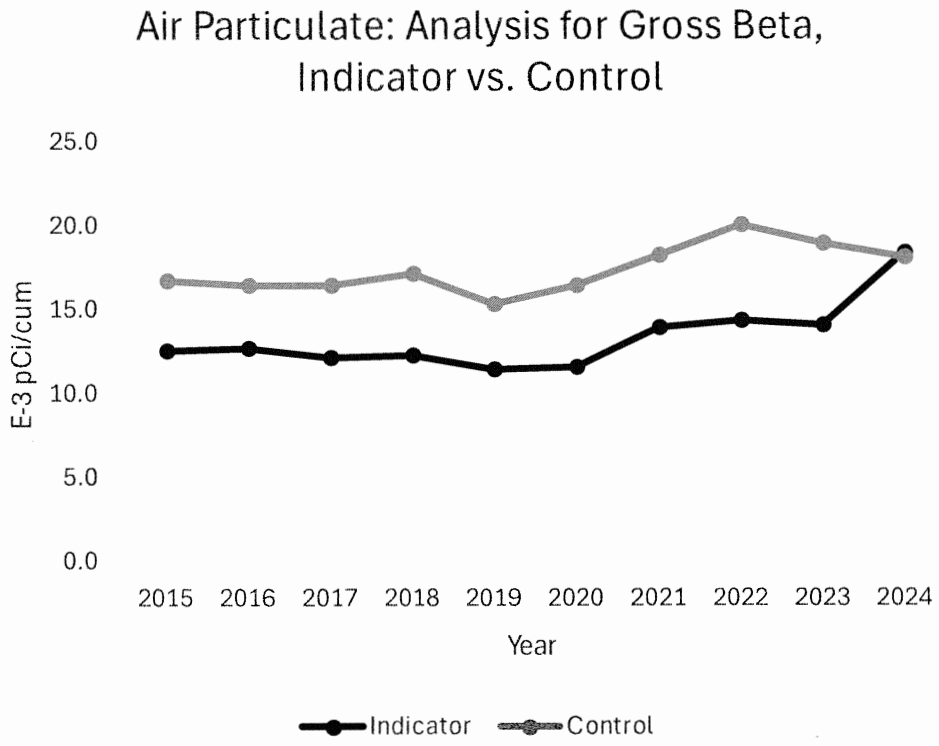


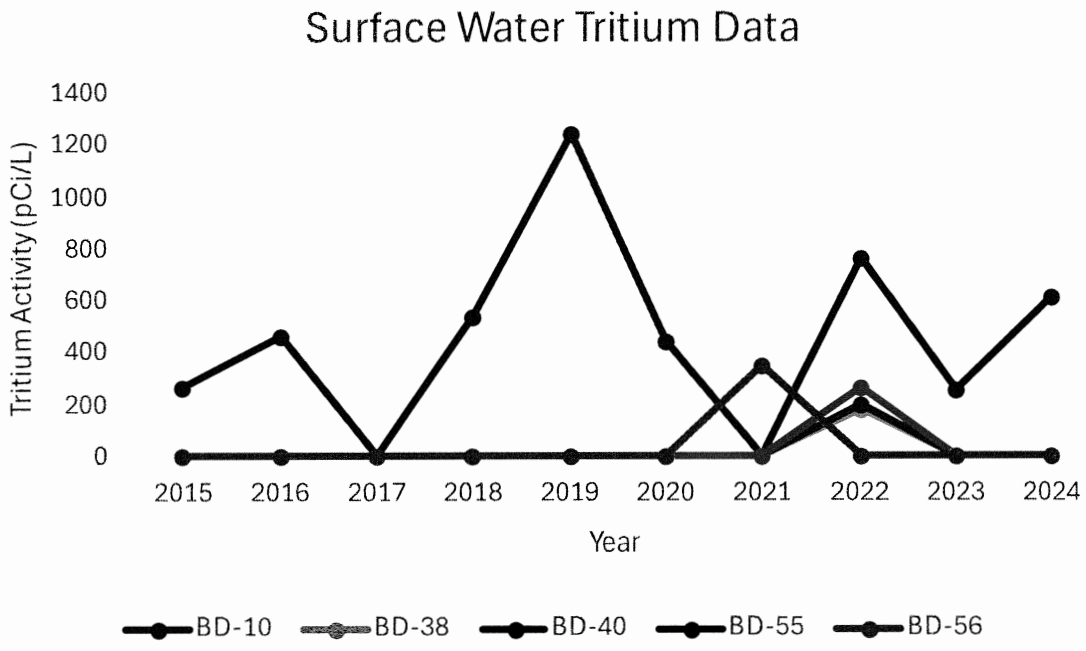
Figure 5, Air Particulate: Analysis for Gross Beta, Average for All Indicator vs. Control Location

Air particulate and radioiodine results from this monitoring period, 2024, were compared to 10-year average as shown in Figure 5, and there were no significant changes.

8.3 Waterborne Sample Results

8.3.1 Surface Water (i.e., Bay, Lake etc.)

Composite water samples are collected monthly at the upstream control location and at the downstream indicator locations. Monthly composite samples are analyzed for gamma-emitters. Aliquots from the monthly composites are combined to form a quarterly composite which is then analyzed for tritium. During the calendar year 2024, a total of 72 surface water samples were collected and analyzed in accordance with the requirements in the ODCM and shown in Table 3, Radiological Environmental Sampling Program – Exposure Pathway - Waterborne. Gross Beta was detected in 63 of the 72 samples with a range of 2 to 13 pCi/L. The required LLD for gross beta was met for all samples. Samples from all locations were analyzed for gamma-emitting nuclides. No nuclides were detected and all required LLDs were met. Tritium was detected in two samples with concentrations ranging from 485 to 738 pCi/L(Table 20, Quarterly Surface Water Tritium (pCi/L ± 2 Sigma)). Tritium concentrations in surface water were well below the EPA tritium drinking water limit of 20,000 pCi/L and were consistent with expected levels as a result of permitted liquid discharges.



*There are no detected tritium results for BD-25(Control). If there are detectable results in the future, it will be added to the graph.

Figure 6: Surface Water Tritium Results

8.3.2 REMP Groundwater

Groundwater samples were collected from control location upgradient from the plant and indicator location down gradient from the plant. During the calendar year 2024, a total of 32 groundwater water samples were collected from offsite monitoring wells and analyzed in accordance with the requirements in the ODCM and shown in Table 3, Radiological Environmental Sampling Program – Exposure Pathway - Waterborne. A total of 8 indicator samples were collected. These samples were analyzed for tritium and gamma quarterly. All samples were collected in new unused plastic bottles, which were rinsed with source water prior to collection.

Samples from all locations were analyzed for gamma-emitting nuclides. No nuclides were detected and all required LLDs were met. There has been no detectable tritium in any REMP groundwater samples in 2024 or the previous 10 years, therefore, no trend has been established above the detection limit to plot on a trending graph.

8.3.3 Public Water

A total of 12 public water samples were obtained in 2024. Monthly composites of weekly samples were analyzed for gross beta, gamma-emitting nuclides, tritium, Iodine-131(Low Level), Iron-55, and Nickel-63 monthly in accordance with requirements in the ODCM and shown in Table 3, Radiological Environmental Sampling Program – Exposure Pathway - Waterborne. Gross Beta was detected in 9 out of the 12 samples with concentrations ranging from 3 to 6 pCi/L. No gamma-emitting nuclides were detected and all required LLDs were met. Iron-55 and Nickel-63 was not detected and all required LLDs were met. Iodine-131(Low Level) was not detected in any of the samples and all required LLDs were met. Tritium was detected in 11 out of the 12 samples with concentrations ranging from 271 to 1,350 pCi/L. Tritium concentrations in public water were well below the EPA tritium drinking water limit of 20,000 pCi/L.

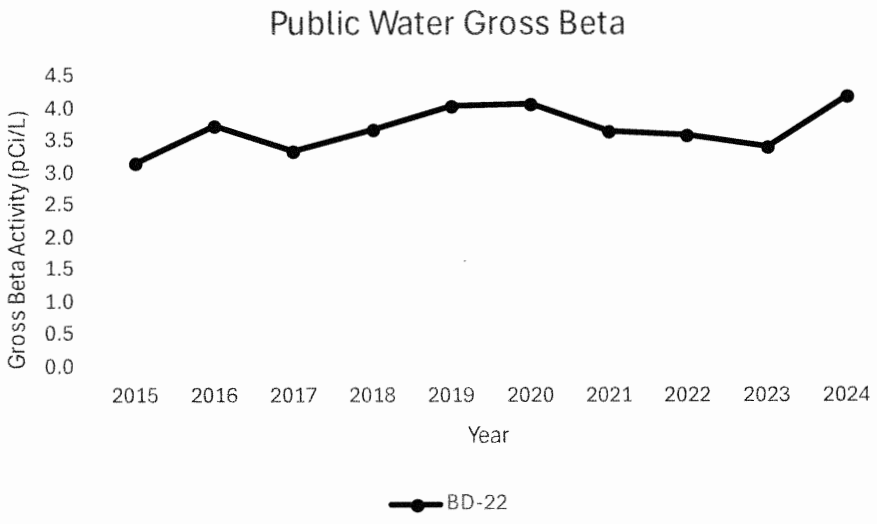


Figure 7: Public Water Gross Beta Sample Indicator Comparison

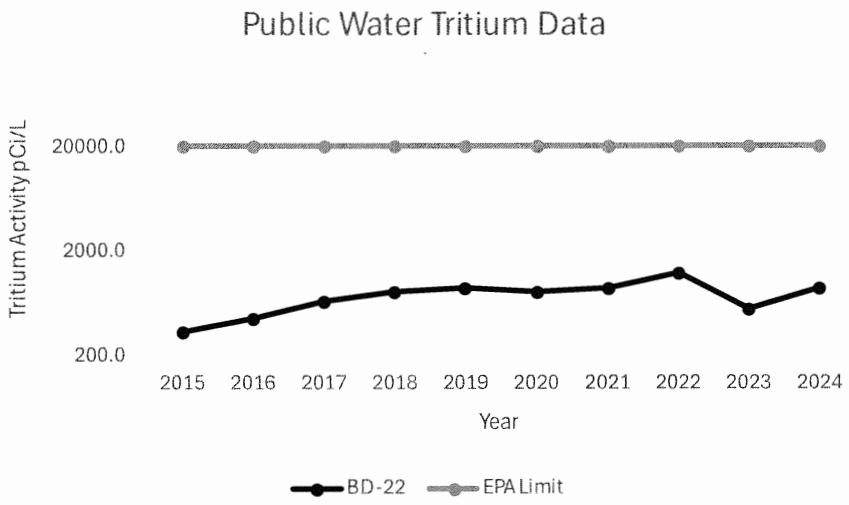


Figure 8: Public Water Tritium Sample Results

8.3.4 Sediment from Shoreline

Shoreline sediment collections were made in May and October, 2024 and analyzed for gamma-emitting isotopes, Iron-55, and Nickel-63. Samples are collected at both indicator and control locations. A total of 6 (2 from the control location and 4 from the indicator locations) shoreline samples were analyzed in accordance with requirements in the ODCM and shown in Table 3, Radiological Environmental Sampling Program – Exposure Pathway - Waterborne. Cesium-137 was detected in 1 of the 2 control samples at a concentration of 121 pCi/kg Dry. No other fission or activation products were found, and all required LLDs were met.

It is common to detect Cesium-137 in sediment samples at both indicator and control locations. Cesium-137 can be attributed to offsite sources such as weapons testing, Chernobyl, and Fukushima events. While Cs-137 is periodically found in sediment samples, the historical relationship between the indicator and control locations demonstrate that the plant is not the source of activity detected.

8.4 Ingestion Pathway Sample Results

8.4.1 Goat Milk

Milk samples from milking animals were collected at one location collected from an indicator location approximately 10 km that would have the highest dose potential. Samples were analyzed for gamma-emitting isotopes and Iodine-131(Low Level).

Vegetation collected, in 2024, were used as control samples in lieu of a control milk location.

No nuclides potentially associated with Braidwood Station were detected, and all required LLDs were met.

8.4.2 Fish

A total of 12 fish samples were collected in 2024. These samples were analyzed for gamma-emitting radionuclides, Iron-55, and Nickel-63 in edible portions, in accordance with requirements of the ODCM and summarized in Table 4, Radiological Environmental Sampling Program – Exposure Pathway - Ingestion. These samples are collected from the indicator and control areas as required by the ODCM.

No fission or activation products were detected and all required LLDs were met. Iron-55 and Nickel-63 were not detected, and all required LLDs were met.

8.4.3 Vegetation

A total of 109 food product-type samples were analyzed in 2024 for gamma-emitting radionuclides in accordance with requirements of the ODCM, as summarized in Table 4, Radiological Environmental Sampling Program – Exposure Pathway - Ingestion

No fission or activation products were detected, and all required LLDs were met.

9.0 LAND USE CENSUS

An annual land use census is required by the Offsite Dose Calculation Manual and is performed to ensure that changes in the use of areas at or beyond the site boundary are identified and modifications to REMP are made if required by changes in land use. The land use census satisfies the requirements of Section IV.B.3 of Appendix I to 10 CFR 50 [2]. NUREG-1301/1302 Control 3.12.2 specifies that "a Land Use Census shall be conducted and shall identify within a distance of 10 km (6.2 mi.) the location in each of the 16 meteorological sectors of the nearest milk animal, the nearest residence and the nearest garden of greater than 50 m^2 (500 ft^2) producing broad leaf vegetation. Note, per NUREG-1301/1302, Broad leaf vegetation sampling of at least three different kinds of vegetation may be performed at the SITE BOUNDARY in each of two different direction sectors with the highest predicted D/Qs in lieu of the garden census.

A Land Use Census was conducted during the calendar year, 2024, within the growing season to identify changes in land use, receptor locations, and new exposure pathways. The results for the 2024 Land Use Census are listed in Table 8: Land Use Census – Nearest Receptors within 8 miles. In summary, the highest D/Q locations for nearest livestock and nearest residence did not change following the 2024 census.

The Land Use Census included the addition of a new milk animal location located 6.2 miles away from the station. All other locations stayed the same.

Table 8: Land Use Census – Nearest Receptors within 8 miles

Sector	Direction	Nearest Residence	Distance (Miles)	Nearest Milk Animal	Distance (Miles)	Livestock	Distance (Miles)
A	N	34800 Route 129, 0.3 miles from corner of Division and Rt.129	0.5			Lestina, 1360 Division Street, Division and Rt. 133	2.6
B	NNE	470 S. Washington Street, Braidwood	0.9				
C	NE	Hank Tameling, 34940 S. Center, Next to station property	0.7				
D	ENE	34740 S. Center Street, Braidwood	0.6				
E	E	35047 Cemetery Road, Braidwood, NE corner of Cemetery and Smiley Rd.	1.5			Mark Favero, 23538 Smiley Road, north side of Smiley Rd.; just east of Essex Rd.	2.3
F	ESE	Ralph Morris, 35515 Essex Rd., 1st house south of Smiley, east side of Essex	2.2			James Hefner, 36718 Essex Road; westside, at McGuire Rd.	2.3
G	SE	James Hefner, 36718 Essex Road, corner of Cooper and Essex	2.7			E. Foley, Essex Rd. South of Cooper Rd.	2.7
H	SSE	Willis, 16700 6000N, across from South Wilmington Sportsmen's Club	4.5				
J	S	Richard Woodcock, south of 5000N on 19000W, east side of road	4.2				
K	SSW	4715 S. Kankakee Rd, Braceville	1.3			Joyce, 7550 E. Rice Road, S. Wilmington; north side of Rice just west of creek	5.3
L	SW	Larry Zin, 784 Rose Lane, End of Rose Lane	0.4				
M	WSW	Terri Case-Hughes, 784 Mesa, WSW side of station property line	0.5				
N	W	Dean Nove, 785 Elmo Court, west side of station property fence	0.4	Biros Dairy Farm, Reed Road and Rt. 47; east on Reed 1.2 miles; farm on north side of road	8.7	Don Francois, 3245 S. Berta Road, Braceville; 1 mile north of Braceville Rd. on west side of Berta	1.6
P	WNW	Casey Hansel, 490 Vernon Street, east of Rt. 53 on Vernon	0.4				
Q	NW	Gary Basham, 35020 S. Rt. 129, west of L-19 on Rt. 129	0.4				
R	NNW	Edward Carlo, 34908 S. State Road 129, west side of Rt. 129	0.4	8270 Duck Pond Rd, Coal City, IL 60416	6.2	8270 Duck Pond Rd, Coal City, IL 60416	6.2

10.0 SAMPLE DEVIATIONS, ANOMALIES AND UNAVAILABILITY

Sampling and analysis are performed for media types addressed in the Offsite Dose Calculation Manual. Sampling and analysis challenges may be experienced due to a multitude of reasons including environmental factors, loss of TLDs/OSLDs, contamination of samples, etc. To aid classification of sampling and analysis challenges experienced in 2024, the following three terms are used to describe the issues: Sample Anomalies, Sample Deviation, and Unavailable Samples.

Media that experienced downtime (i.e., air samplers or water samplers) during a surveillance period are classified as a "Sample Deviation". "Sample Anomalies" are defined as errors that were introduced to a sample once it arrived in the laboratory, errors that prevents the sample from being analyzed as it normally would or may have altered the outcome of the analysis (i.e., cross contamination, human error).

"Sample Unavailability" is defined as sample collection with no available sample (i.e., food crop, TLD).

All required samples were collected and analyzed as scheduled except for the following:

Table 9: Sample Deviation Summary

Sample Type	Location	Collection Date or Period	Reason for not conducting REMP sampling as required by ODCM	Plans for preventing reoccurrence
Ground Water	BD-50	01/11/25	No sample was collected due to external water being turned off. Residents were absent.	Sample was collected at a later time.
Surface Water	BD-25	01/18/2024	No sample. The area was inaccessible due to the river being frozen.	
Surface Water	BD-38	01/18/2024	No sample due to the lake being frozen.	
Surface Water	BD-55	01/18/2024	No sample due to the pond being frozen.	
Surface Water	BD-56	01/18/2024	No sample due to the pond being frozen	
Surface Water	BD-25	01/25/2024	No sample. The area was inaccessible due to the river being frozen.	
Surface Water	BD-25	02/01/2024	No sample. The area was inaccessible due to flooding	
Surface Water	BD-25	02/08/2024	No sample. The area was inaccessible due to flooding	
Surface Water	BD-25	04/04/2024	No sample. The area was inaccessible due to flooding	
Surface Water	BD-25	04/11/2024	No sample. The area was inaccessible due to flooding	
Surface Water	BD-25	04/18/2024	No sample. The area was inaccessible due to flooding	

Table 9: Sample Deviation Summary Cont'd

Sample Type	Location	Collection Date or Period	Reason for not conducting REMP sampling as required by ODCM	Plans for preventing reoccurrence
AP/AI	BD-05	04/25/2024	Timer indicates 4 hours less than expected due to a short power outage. During collection, the timer indicated an expected value of 160.2 hours.	
AP/AI	BD-05	05/23/2024	Timer indicates approximately 10 hours less than expected, possibly due to a power outage. During collection, the timer indicated a low value of 86.1 hours.	The timer was exchanged and run time was calculated
Ground Water	MW-11	2nd Quarter 2024	No sample was collected. Not enough water was present.	
AP/AI	BD-02	07/17/2024	Timer indicates approximately 35.5 hours less than expected due to a power outage caused by severe storms in the area. During the collection, the timer indicated an expected value of 190.6 hours	
AP/AI	BD-03	07/17/2024	Timer indicates approximately 10 hours less than expected due to a power outage caused by severe storms in the area. During the collection, the timer indicated an expected value of 191.3 hours.	
Surface Water	BD-25	07/17/2024	No sample. The area was inaccessible due to flooding	
Surface Water	BD-38	09/19/2024	No sample. This was due to the area being dried up.	
AP/AI	BD-06	10/31/2024	The timer shows approximately 20 hours less than expected, possibly due to a faulty timer.	The timer was exchanged
AP/AI	BD-06	11/07/2024	The timer shows lower readings of 105.0 hours possibly due to a broken timer. During the collection, the timer indicated an expected value of 169.1 hours.	The timer was exchanged, and the run time was calculated.
Surface Water	BD-10	12/05/2024	No sample. The area was inaccessible due to the river being frozen.	
Surface Water	BD-25	12/05/2024	No sample. The area was inaccessible due to the river being frozen.	
Surface Water	BD-56	12/05/2024	No sample due to the pond being frozen	
Surface Water	BD-10	12/12/2024	No sample. The area was inaccessible due to the river being frozen.	
Surface Water	BD-25	12/12/2024	No sample. The area was inaccessible due to the river being frozen.	

Table 9: Sample Deviation Summary Cont'd

Sample Type	Location	Collection Date or Period	Reason for not conducting REMP sampling as required by ODCM	Plans for preventing reoccurrence
Surface Water	BD-56	12/12/2024	No sample due to the pond being frozen	
Surface Water	BD-56	12/19/2024	No sample due to the pond being frozen	
Ground Water	MW-6	4th Quarter 2024	No sample collected. Not enough water present.	

11.0 OTHER SUPPLEMENTAL INFORMATION

11.1 NEI 07-07 Onsite Radiological Groundwater Monitoring Program

Braidwood Station Units 1 and 2 has developed a Groundwater Protection Initiative (GPI) program in accordance with NEI 07-07, Industry Ground Water Protection Initiative – Final Guidance Document. The purpose of the GPI is to ensure timely detection and an effective response to situations involving inadvertent radiological releases to groundwater in order to prevent migration of licensed radioactive material off-site and to quantify impacts on decommissioning. It is important to note, samples and results taken in support of NEI 07-07 on-site groundwater monitoring program are separate from the Radiological Environmental Monitoring Program (REMP). Results of the NEI 07-07 Radiological Groundwater Monitoring Program(RGPP) for onsite groundwater wells are provided in the RGPP report attached to the end of this document.

11.2 Corrections to Previous Reports

There were no corrections to the previous report in 2024.

12.0 BIBLIOGRAPHY

[1] NCRP, "Report No. 160, Ionizing Radiation Exposure of the Population of the United States," National Council on Radiation Protection, Bethesda, 2009.

[2] "10 CFR 50, "Domestic Licensing of Production and Utilization Facilities"," US Nuclear Regulatory Commission, Washington, DC.

[3] "Regulatory Guide 4.1, "Radiological Environmental Monitoring for Nuclear Power Plants", Revision 2," Nuclear Regulatory Commission, 2009.

[4] "NUREG-1301, "Offsite Dose Calculation Manual Guidance: Standard Radiological Effluent Controls for Pressurized Water Reactors," .," Nuclear Regulatory Commission, April 1991.

[5] "NUREG-1302, "Offsite Dose Calculation Manual Guidance: Standard Radiological Effluent Controls for Boiling Water Reactors,"," Nuclear Regulatory Commission, April 1991.

[6] "Branch Technical Position, Revision 1," NRC000096, Submitted March 30, 2012, November 1979.

[7] "Japan Atomic Energy Agency," 06 November 2020. [Online]. Available: https://www.jaea.go.jp/english/04/ntokai/houkan/houkan_02.html.

[8] "Regulatory Guide 4.15, Quality Assurance for Radiological Monitoring Programs (Inception through Normal Operations to License Termination) -- Effluent Streams and the Environment," Nuclear Regulatory Commission, July, 2007.

[9] "Regulatory Guide 4.13, Performance, Testing, and Procedural Specifications for Thermoluminescence Dosimetry: Environmental Applications, Revision 2," Nuclear Regulatory Commision, June, 2019.

[10] "NUREG/CR-2919, "XOQDOQ Computer Program for the Meteorological Evaluation of Routine Effluent Releases at Nuclear Power Stations,"," Nuclear Regulatory Commission, September, 1982.

[11] "Measurements of Radionuclides in the environment Sampling and Analysis of plutonium in soil," Nuclear Regulatory Commission, 1974.

[12] "Ionizing Radiation Exposure of the Population of the United States," Bethesda, MD, 2009.

[13] Nuclear Regulatory Commission, 30 June 2015. [Online]. Available: http://www.nrc.gov/reading-rm/basic-ref/students/animated-pwr.html. [Accessed October 2020].

[14] "ICRP Publication 60, "ICRP Publication 60: 1990 Recommendations of the International Commission on Radiological Protection, 60," Annals of the ICRP Volume 21/1-3,," International Commission on Radiation Protection, October, 1991.

[15] "NRC Resource Page," [Online]. Available: http://www.nrc.gov/about-nrc/radiation.html. [Accessed 10 November 2020].

[16] "NUREG-0133, Preparation of Effluent Technical Specifications for Nuclear Power Plants," Nuclear Regulatory Commission, 1987.

[17] "Regulatory Guide 1.109, "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Demonstrating Compliance with 10 CFR Part 50, Appendix I,," Nuclear Regulatory Commission, Ocotober, 1977.

[18] [Online]. Available: http://hps.org/hpspublications/radiationfactsheets.html. [Accessed 2020].

[19] "NEI 07-07, "Industry Ground Water Protection Initiative—Final Guidance Document,"," Nuclear Energy Institute, Washington, D.C..

[20] "ANSI 13.37, Environmental Dosimetry- Criteria for System Design and Implementation," Health Physics Society (HPS), May, 2019.

[21] "40 CFR Part 141, "National Primary Drinking Water Regulations,"," US Environmental Protection Agency, Washington, DC..

[22] Nuclear Regulatory Commission, 25 June 2015. [Online]. Available: http://www.nrc.gov/reading-rm/basic-ref/students/animated-bwr.html. [Accessed October 2020].

[23] "NEI 07-07, "Industry Ground Water Protection Initiative—Final Guidance Document," Rev. 1," Nuclear Energy Institute, Washington, D.C., 2019.

[24] Nuclear Regulatory Commission, 25 June 2015. [Online]. Available: http://www.nrc.gov/reading-rm/basic-ref/students/animated-bwr.html. [Accessed October 2020].

[25] [Online]. Available: http://hps.org/hpspublications/radiationfactsheets.html. [Accessed 2020].

[26] "Japan Atomic Energy Agency," 06 November 2020. [Online]. Available: https://www.jaea.go.jp/english/04/ntokai/houkan/houkan_02.html.

[27] "NRC Resource Page," [Online]. Available: http://www.nrc.gov/about-nrc/radiation.html. [Accessed 10 November 2020].

[28] "NUREG-0133, Preparation of Effluent Technical Specifications for Nuclear Power Plants," Nuclear Regulatory Commission, 1987.

[29] Nuclear Regulatory Commission, 30 June 2015. [Online]. Available: http://www.nrc.gov/reading-rm/basic-ref/students/animated-pwr.html. [Accessed October 2020].

[30] "Regulatory Guide 4.13, Performance, Testing, and Procedural Specifications for Thermoluminescence Dosimetry: Environmental Applications, Revision 2," Nuclear Regulatory Commision, June, 2019.

[31] "Regulatory Guide 4.15, Quality Assurance for Radiological Monitoring Programs (Inception through Normal Operations to License Termination) -- Effluent Streams and the Environment," Nuclear Regulatory Commission, July, 2007.

[32] "10 CFR 50 - Domestic Licensing of Production and Utilization Facilities," US Nuclear Regulatory Commission, Washington, DC.

[33] "40 CFR 190 - Environmental Radiation Protection Standards for Nuclear Power Operation," US Environmental Protection Agency, Washington, DC.

[34] "NUREG-0324 - XOQDOQ, Program for the Meteorological Evaluation of Routine Effluent Releases at Nuclear Power Stations," Nuclear Regulatory Commission, September, 1977.

[35] "NCRP Report No. 160 - Ionizing Radiation Exposure of the Population of the United States," National Council on Radiation Protection and Measurements, Bethesda, MD, 2009.

[36] "Regulatory Guide 1.109 - Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Demonstrating Compliance with 10 CFR Part 50, Appendix I," Nuclear Regulatory Commission, Ocotober, 1977.

[37] "40 CFR 141 - National Primary Drinking Water Regulations," US Environmental Protection Agency, Washington, DC..

[38] "10 CFR 20 - Standards for Protection Against Radiation," US Nuclear Regulatory Commission, Washington, DC.

Attachment 1, Data Table Summary

Table 10: Braidwood Data Summary Table

Medium or Pathway Sampled (Units)	Type, Total Number of Analyses performed (e.g., I-131, 400)		Lower Limit of Detection (LLD)	Indicator Mean[5]; (f[6]). Range[5]	Location with Highest Annual Mean		Control Mean[5] (f[6]). Range[5]	Number of Nonroutine Reported Measurements
					Name Distance and Direction	Mean[5] (f[6]) Range[5]		
Air Particulates (E-03 pCi/m^3)	Gross Beta, 424		10	18 (371/371) (7/36)	BD-05 Gardner 5.5 miles SW	19 (53/53) (9/36)	18 (53/53) (6/35)	0
	Gamma, 32	Mn-54	N/A	< LLD	< LLD	< LLD	< LLD	0
		Co-58	N/A	< LLD	< LLD	< LLD	< LLD	0
		Fe-59	N/A	< LLD	< LLD	< LLD	< LLD	0
		Co-60	N/A	< LLD	< LLD	< LLD	< LLD	0
		Zn-65	N/A	< LLD	< LLD	< LLD	< LLD	0
		Nb-95	N/A	< LLD	< LLD	< LLD	< LLD	0
		Zr-95	N/A	< LLD	< LLD	< LLD	< LLD	0
		Cs-134	50	< LLD	< LLD	< LLD	< LLD	0
		Cs-137	60	< LLD	< LLD	< LLD	< LLD	0
		Ba-140	N/A	< LLD	< LLD	< LLD	< LLD	0
		La-140	N/A	< LLD	< LLD	< LLD	< LLD	0
Airborne Radioiodine (E-03 pCi/m3)	I-131, 424		70	< LLD	< LLD	< LLD	N/A	0
Direct Radiation (mrem/qtr.)	Gamma Dose, 184		N/A	17 (180/180) (11.2/64)	BD-ISFSI-110-3 0.18 MILES SE	62.1 (4/4) (60.5/64)	14.9 (4/4) (13.1/16.8)	0

[5] Mean and range are based on detectable measurements only.
[6] Fraction are based on detectable measurements at specified locations, as indicated in parentheses.

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					Name Distance and Direction	Mean[5] (f[6]) Range[5]		
Goat Milk (pCi/L)	I-131(Low Level), 5		1	< LLD	< LLD	< LLD	N/A	0
	Gamma, 5	Mn-54	N/A	< LLD	< LLD	< LLD	N/A	0
		Co-58	N/A	< LLD	< LLD	< LLD	N/A	0
		Fe-59	N/A	< LLD	< LLD	< LLD	N/A	0
		Co-60	N/A	< LLD	< LLD	< LLD	N/A	0
		Zn-65	N/A	< LLD	< LLD	< LLD	N/A	0
		Nb-95	N/A	< LLD	< LLD	< LLD	N/A	0
		Zr-95	N/A	< LLD	< LLD	< LLD	N/A	0
		Cs-134	15	< LLD	< LLD	< LLD	N/A	0
		Cs-137	18	< LLD	< LLD	< LLD	N/A	0
		Ba-140	60	< LLD	< LLD	< LLD	N/A	0
		La-140	15	< LLD	< LLD	< LLD	N/A	0
Vegetation (pCi/kg-wet)	Gamma, 109	Mn-54	N/A	< LLD	< LLD	< LLD	< LLD	0
		Co-58	N/A	< LLD	< LLD	< LLD	< LLD	0
		Fe-59	N/A	< LLD	< LLD	< LLD	< LLD	0
		Co-60	N/A	< LLD	< LLD	< LLD	< LLD	0
		Zn-65	N/A	< LLD	< LLD	< LLD	< LLD	0
		Nb-95	N/A	< LLD	< LLD	< LLD	< LLD	0
		Zr-95	N/A	< LLD	< LLD	< LLD	< LLD	0
		I-131	60	< LLD	< LLD	< LLD	< LLD	0
		Cs-134	60	< LLD	< LLD	< LLD	< LLD	0
		Cs-137	80	< LLD	< LLD	< LLD	< LLD	0
		Ba-140	N/A	< LLD	< LLD	< LLD	< LLD	0
		La-140	N/A	< LLD	< LLD	< LLD	< LLD	0

[5] Mean and range are based on detectable measurements only.

[6] Fraction are based on detectable measurements at specified locations, as indicated in parentheses.

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Table 10: Braidwood Data Summary Table

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					Name Distance and Direction	Mean[5] (f[6]) Range[5]		
Surface Water (pCi/L)	Gross Beta, 72		4	6.4 (52/60) (2.4/13.4)	BD-40 Braidwood Station Cooling Lake Onsite	9.8 (12/12) (3.2/13.4)	4.8 (11/12) (3.2/7)	0
	H-3, 24		200	612 (2/20) (485/738)	BD-10 Kankakee River Downstream 5.4 miles NE	612 (2/4) (485/738)	< LLD	0
	Fe-55, 24		200	< LLD	< LLD	< LLD	< LLD	0
	Ni-63, 24		30	< LLD	< LLD	< LLD	< LLD	0
	Gamma, 72	Mn-54	15	< LLD	< LLD	< LLD	< LLD	0
		Co-58	15	< LLD	< LLD	< LLD	< LLD	0
		Fe-59	30	< LLD	< LLD	< LLD	< LLD	0
		Co-60	15	< LLD	< LLD	< LLD	< LLD	0
		Zn-65	30	< LLD	< LLD	< LLD	< LLD	0
		Nb-95	15	< LLD	< LLD	< LLD	< LLD	0
		Zr-95	30	< LLD	< LLD	< LLD	< LLD	0
		I-131	15	< LLD	< LLD	< LLD	< LLD	0
		Cs-134	15	< LLD	< LLD	< LLD	< LLD	0
		Cs-137	18	< LLD	< LLD	< LLD	< LLD	0
		Ba-140	60	< LLD	< LLD	< LLD	< LLD	0
		La-140	15	< LLD	< LLD	< LLD	< LLD	0

[5] Mean and range are based on detectable measurements only.

[6] Fraction are based on detectable measurements at specified locations is indicated in parentheses.

Attachment 1, Data Table Summary

Table 10: Braidwood Data Summary Table

Medium or Pathway Sampled (Units)	Type, Total Number of Analyses performed (e.g., I-131, 400)		Lower Limit of Detection (LLD)	Indicator Mean[5]; (f[6]). Range[5]	Location with Highest Annual Mean		Control Mean[5] (f[6]). Range[5]	Number of Nonroutine Reported Measurements
					Name Distance and Direction	Mean[5] (f[6]) Range[5]		
Public Water (pCi/L)	Gross Beta, 12		4	4.1 (9/12) (2.9/5.9)	BD-22 Wilmington 6.0 miles NE	4.1 (9/12) (2.9/5.9)	N/A	0
	H-3, 12		200	860 (11/12) (271/1350)	BD-22 Wilmington 6.0 miles NE	860 (11/12) (271/1350)	N/A	0
	I-131 (Low Level), 12		1	< LLD	< LLD	< LLD	N/A	0
	Fe-55, 12		200	< LLD	< LLD	< LLD	< LLD	0
	Ni-63, 12		30	< LLD	< LLD	< LLD	< LLD	0
	Gamma, 12	Mn-54	15	< LLD	< LLD	< LLD	< LLD	0
		Co-58	15	< LLD	< LLD	< LLD	< LLD	0
		Fe-59	30	< LLD	< LLD	< LLD	< LLD	0
		Co-60	15	< LLD	< LLD	< LLD	< LLD	0
		Zn-65	30	< LLD	< LLD	< LLD	< LLD	0
		Nb-95	15	< LLD	< LLD	< LLD	< LLD	0
		Zr-95	30	< LLD	< LLD	< LLD	< LLD	0
		Cs-134	15	< LLD	< LLD	< LLD	< LLD	0
		Cs-137	18	< LLD	< LLD	< LLD	< LLD	0
		Ba-140	60	< LLD	< LLD	< LLD	< LLD	0
		La-140	15	< LLD	< LLD	< LLD	< LLD	0

[5] Mean and range are based on detectable measurements only.
[6] Fraction are based on detectable measurements at specified locations, as indicated in parentheses.

Attachment 1, Data Table Summary

Table 10: Braidwood Data Summary Table

Medium or Pathway Sampled (Units)	Type, Total Number of Analyses performed (e.g., I-131, 400)		Lower Limit of Detection (LLD)	Indicator Mean[5]; (f[6]). Range[5]	Location with Highest Annual Mean		Control Mean[5] (f[6]). Range[5]	Number of Nonroutine Reported Measurements
					Name Distance and Direction	Mean[5] (f[6]) Range[5]		
Ground Water (pCi/L)	H-3, 32		200	< LLD	< LLD	< LLD	N/A	0
	Gamma, 32	Mn-54	15	< LLD	< LLD	< LLD	N/A	0
		Co-58	15	< LLD	< LLD	< LLD	N/A	0
		Fe-59	30	< LLD	< LLD	< LLD	N/A	0
		Co-60	15	< LLD	< LLD	< LLD	N/A	0
		Zn-65	30	< LLD	< LLD	< LLD	N/A	0
		Nb-95	15	< LLD	< LLD	< LLD	N/A	0
		Zr-95	30	< LLD	< LLD	< LLD	N/A	0
		I-131	15	< LLD	< LLD	< LLD	N/A	0
		Cs-134	15	< LLD	< LLD	< LLD	N/A	0
		Cs-137	18	< LLD	< LLD	< LLD	N/A	0
		Ba-140	60	< LLD	< LLD	< LLD	N/A	0
		La-140	15	< LLD	< LLD	< LLD	N/A	0

[5] Mean and range are based on detectable measurements only.
[6] Fraction are based on detectable measurements at specified locations, as indicated in parentheses.
is indicated in parentheses

Attachment 1, Data Table Summary

Table 10: Braidwood Data Summary Table

Medium or Pathway Sampled (Units)	Type, Total Number of Analyses performed (e.g., I-131, 400)		Lower Limit of Detection (LLD)	Indicator Mean[5]; (f[6]). Range[5]	Location with Highest Annual Mean		Control Mean[5] (f[6]). Range[5]	Number of Nonroutine Reported Measurements
					Name Distance and Direction	Mean[5] (f[6]) Range[5]		
Fish (pCi/kg Wet)	Fe-55, 12		260	< LLD	< LLD	< LLD	< LLD	0
	Ni-63, 12		260	< LLD	< LLD	< LLD	< LLD	0
	Gamma, 12	Mn-54	130	< LLD	< LLD	< LLD	< LLD	0
		Co-58	130	< LLD	< LLD	< LLD	< LLD	0
		Fe-59	260	< LLD	< LLD	< LLD	< LLD	0
		Co-60	130	< LLD	< LLD	< LLD	< LLD	0
		Zn-65	260	< LLD	< LLD	< LLD	< LLD	0
		Nb-95	N/A	< LLD	< LLD	< LLD	< LLD	0
		Zr-95	N/A	< LLD	< LLD	< LLD	< LLD	0
		Cs-134	130	< LLD	< LLD	< LLD	< LLD	0
		Cs-137	150	< LLD	< LLD	< LLD	< LLD	0
		Ba-140	N/A	< LLD	< LLD	< LLD	< LLD	0
		La-140	N/A	< LLD	< LLD	< LLD	< LLD	0

[5] Mean and range are based on detectable measurements only.
[6] Fraction are based on detectable measurements at specified locations, as indicated in parentheses.

Attachment 1, Data Table Summary

Table 10: Braidwood Data Summary Table

Medium or Pathway Sampled (Units)	Type, Total Number of Analyses performed (e.g., I-131, 400)		Lower Limit of Detection (LLD)	Indicator Mean[5]; (f^6). Range[5]	Location with Highest Annual Mean		Control Mean[5] (f^6). Range[5]	Number of Nonroutine Reported Measurements
					Name Distance and Direction	Mean[5] (f^6) Range[5]		
Sediment (pCi/kg Dry)	Fe-55, 6		260	< LLD	< LLD	< LLD	< LLD	0
	Ni-63, 6		260	< LLD	< LLD	< LLD	< LLD	0
	Gamma, 6	Mn-54	N/A	< LLD	< LLD	< LLD	< LLD	0
		Co-58	N/A	< LLD	< LLD	< LLD	< LLD	0
		Fe-59	N/A	< LLD	< LLD	< LLD	< LLD	0
		Co-60	N/A	< LLD	< LLD	< LLD	< LLD	0
		Zn-65	N/A	< LLD	< LLD	< LLD	< LLD	0
		Nb-95	N/A	< LLD	< LLD	< LLD	< LLD	0
		Zr-95	N/A	< LLD	< LLD	< LLD	< LLD	0
		Cs-134	150	< LLD	< LLD	< LLD	< LLD	0
		Cs-137	180	< LLD	BD-25 Kankakee River Upstream 9.6 miles	121 (1/2)	121 (1/2)	0
		Ba-140	N/A	< LLD	< LLD	< LLD	< LLD	0
		La-140	N/A	< LLD	< LLD	< LLD	< LLD	0

[5] Mean and range are based on detectable measurements only.
[6] Fraction are based on detectable measurements at specified locations, as indicated in parentheses.

Attachment 2, Complete Data Table for All Analysis Results Obtained in 2024

Note: Throughout Attachment 2, bold data entries are for the reported concentration

Table 11, Weekly Air Particulate Gross Beta (E^{-3} pCi/m^3)

Collection Date	BD-06	BD-19	BD-20	BD-21	BD-02	BD-04	BD-05	BD-03
12/28/2023	**18** ± 4	**12** ± 4	**16** ± 4	**17** ± 4	**12** ± 4	**16** ± 4	**16** ± 4	**13** ± 4
01/04/2024	**18** ± 5	**15** ± 4	**19** ± 5	**20** ± 5	**22** ± 5	**22** ± 5	**21** ± 5	**16** ± 4
01/11/2024	**26** ± 5	**25** ± 5	**26** ± 5	**28** ± 5	**21** ± 4	**29** ± 5	**20** ± 4	**28** ± 5
01/18/2024	**17** ± 4	**18** ± 4	**12** ± 4	**19** ± 4	**15** ± 4	**17** ± 4	**15** ± 4	**17** ± 4
01/25/2024	**15** ± 4	**14** ± 4	**13** ± 4	**19** ± 4	**10** ± 4	**15** ± 4	**18** ± 4	**15** ± 4
02/01/2024	**10** ± 4	**16** ± 4	**13** ± 4	**13** ± 4	**11** ± 4	**15** ± 4	**12** ± 4	**11** ± 4
02/08/2024	**19** ± 4	**16** ± 4	**17** ± 4	**16** ± 4	**14** ± 4	**19** ± 4	**18** ± 4	**14** ± 4
02/15/2024	**23** ± 5	**23** ± 5	**23** ± 5	**22** ± 5	**16** ± 4	**19** ± 4	**23** ± 5	**20** ± 5
02/22/2024	**20** ± 5	**21** ± 5	**24** ± 5	**22** ± 5	**19** ± 5	**36** ± 6	**21** ± 5	**21** ± 5
02/28/2024	**11** ± 4	**14** ± 4	**12** ± 4	**14** ± 4	**13** ± 4	**13** ± 4	**14** ± 4	**14** ± 4
03/07/2024	**19** ± 4	**25** ± 4	**19** ± 4	**17** ± 4	**17** ± 4	**20** ± 4	**17** ± 4	**17** ± 4
03/14/2024	**11** ± 4	**10** ± 4	**12** ± 4	**11** ± 4	**9** ± 4	**8** ± 3	**12** ± 4	**11** ± 4
03/21/2024	**16** ± 4	**16** ± 4	**13** ± 4	**17** ± 4	**14** ± 4	**13** ± 4	**15** ± 4	**14** ± 4
03/28/2024	**9** ± 4	**10** ± 4	**8** ± 4	**8** ± 4	**10** ± 4	**13** ± 4	**9** ± 4	**6** ± 4
04/04/2024	**10** ± 4	**8** ± 4	**13** ± 4	**10** ± 4	**10** ± 4	**9** ± 4	**10** ± 4	**11** ± 4
04/11/2024	**11** ± 4	**13** ± 4	**14** ± 4	**17** ± 4	**11** ± 4	**14** ± 4	**17** ± 4	**14** ± 4
04/18/2024	**11** ± 4	**13** ± 4	**13** ± 4	**15** ± 4	**10** ± 4	**11** ± 4	**17** ± 4	**19** ± 5
04/25/2024	**15** ± 4	**15** ± 4	**14** ± 4	**14** ± 4	**14** ± 4	**11** ± 4	**15** ± 4	**16** ± 4
05/02/2024	**13** ± 4	**14** ± 4	**14** ± 4	**15** ± 4	**12** ± 3	**13** ± 4	**15** ± 4	**17** ± 4
05/09/2024	**11** ± 4	**15** ± 4	**12** ± 4	**14** ± 4	**10** ± 4	**11** ± 4	**11** ± 4	**11** ± 4
05/16/2024	**17** ± 4	**17** ± 4	**17** ± 4	**17** ± 4	**13** ± 4	**21** ± 4	**19** ± 4	**18** ± 4

Table 11, Weekly Air Particulate Gross Beta (E-3 pCi/m3) Cont'd

Collection Date	BD-06	BD-19	BD-20	BD-21	BD-02	BD-04	BD-05	BD-03
05/23/2024	10 ± 4	11 ± 4	12 ± 4	12 ± 4	7 ± 3	14 ± 4	11 ± 4	11 ± 4
05/30/2024	15 ± 4	15 ± 4	15 ± 4	12 ± 4	11 ± 4	17 ± 4	12 ± 4	17 ± 5
06/06/2024	15 ± 4	10 ± 4	12 ± 4	14 ± 4	10 ± 4	16 ± 4	13 ± 4	13 ± 4
06/13/2024	18 ± 4	19 ± 4	16 ± 4	17 ± 4	15 ± 4	16 ± 4	17 ± 4	19 ± 4
06/20/2024	13 ± 4	15 ± 4	14 ± 4	15 ± 4	11 ± 4	15 ± 4	12 ± 4	11 ± 4
06/27/2024	13 ± 5	13 ± 5	11 ± 4	11 ± 4	11 ± 4	14 ± 5	14 ± 4	17 ± 5
07/03/2024	22 ± 4	16 ± 4	17 ± 4	18 ± 4	15 ± 4	19 ± 4	17 ± 4	19 ± 4
07/11/2024	17 ± 4	18 ± 4	18 ± 4	21 ± 5	13 ± 5	19 ± 4	15 ± 4	15 ± 5
07/17/2024	15 ± 4	17 ± 4	14 ± 4	14 ± 4	9 ± 3	16 ± 4	14 ± 4	13 ± 4
07/25/2024	16 ± 4	18 ± 4	19 ± 4	18 ± 4	15 ± 4	20 ± 4	17 ± 4	18 ± 4
08/01/2024	22 ± 4	21 ± 4	21 ± 4	21 ± 4	23 ± 5	18 ± 4	23 ± 4	16 ± 4
08/08/2024	18 ± 4	20 ± 4	18 ± 4	23 ± 5	12 ± 4	18 ± 4	21 ± 5	19 ± 4
08/15/2024	17 ± 4	16 ± 4	14 ± 4	17 ± 4	13 ± 4	16 ± 4	15 ± 4	15 ± 4
08/22/2024	30 ± 5	28 ± 5	24 ± 5	27 ± 5	24 ± 5	24 ± 5	26 ± 5	25 ± 5
08/29/2024	17 ± 4	12 ± 4	19 ± 4	18 ± 5	14 ± 4	15 ± 4	17 ± 5	12 ± 4
09/05/2024	27 ± 4	26 ± 4	25 ± 4	27 ± 4	22 ± 4	27 ± 4	29 ± 4	28 ± 4
09/13/2024	33 ± 6	33 ± 6	29 ± 5	30 ± 5	27 ± 5	31 ± 6	32 ± 6	35 ± 6
09/19/2024	20 ± 5	22 ± 5	22 ± 5	24 ± 5	17 ± 4	21 ± 5	24 ± 5	18 ± 4
09/26/2024	17 ± 4	19 ± 4	20 ± 4	22 ± 5	15 ± 4	17 ± 4	24 ± 5	20 ± 5
10/03/2024	28 ± 5	30 ± 5	31 ± 5	24 ± 5	22 ± 5	30 ± 5	28 ± 5	24 ± 5
10/10/2024	23 ± 4	23 ± 4	18 ± 4	24 ± 5	18 ± 4	23 ± 4	23 ± 5	19 ± 4
10/17/2024	26 ± 5	31 ± 5	29 ± 5	29 ± 5	24 ± 5	31 ± 5	29 ± 5	29 ± 5

Table 11, Weekly Air Particulate Gross Beta (E-3 pCi/m3) Cont'd

Collection Date	BD-06	BD-19	BD-20	BD-21	BD-02	BD-04	BD-05	BD-03
10/24/2024	**26** ± 5	**29** ± 5	**25** ± 5	**25** ± 5	**27** ± 5	**30** ± 5	**36** ± 6	**25** ± 5
10/31/2024	**13** ± 4	**14** ± 4	**10** ± 4	**14** ± 4	**13** ± 4	**12** ± 4	**15** ± 4	**14** ± 4
11/07/2024	**21** ± 4	**23** ± 4	**20** ± 4	**23** ± 5	**20** ± 4	**22** ± 4	**22** ± 4	**22** ± 4
11/14/2024	**25** ± 5	**24** ± 5	**24** ± 4	**26** ± 5	**22** ± 5	**22** ± 5	**28** ± 5	**22** ± 5
11/21/2024	**20** ± 5	**22** ± 5	**17** ± 5	**17** ± 5	**18** ± 5	**17** ± 5	**23** ± 5	**17** ± 5
11/27/2024	**24** ± 4	**28** ± 4	**27** ± 4	**25** ± 4	**28** ± 4	**28** ± 4	**27** ± 4	**26** ± 4
12/05/2024	**20** ± 4	**18** ± 4	**21** ± 4	**20** ± 4	**20** ± 4	**22** ± 5	**21** ± 5	**17** ± 4
12/12/2024	**24** ± 5	**31** ± 5	**27** ± 5	**33** ± 5	**28** ± 5	**31** ± 5	**34** ± 5	**30** ± 5
12/19/2024	**18** ± 4	**15** ± 4	**19** ± 4	**20** ± 5	**20** ± 4	**22** ± 5	**20** ± 5	**22** ± 4
12/26/2024	**31** ± 5	**35** ± 5	**28** ± 5	**32** ± 5	**27** ± 5	**29** ± 5	**32** ± 5	**29** ± 5

Table 12: Quarterly Air Particulate Gamma Isotopic (pCi/m^3 ± 2 Sigma)

Station	Nuclide	Q1	Q2	Q3	Q4
BD-06	Mn-54	< 2	< 3	< 3	< 2
	Co-58	< 2	< 3	< 3	< 2
	Fe-59	< 5	< 7	< 8	< 4
	Co-60	< 3	< 2	< 3	< 2
	Zn-65	< 5	< 6	< 7	< 6
	Nb-95	< 2	< 3	< 3	< 2
	Zr-95	< 4	< 6	< 6	< 3
	Cs-134	< 2	< 3	< 3	< 2
	Cs-137	< 2	< 2	< 2	< 2
	Ba-140	< 11	< 34	< 30	< 19
	La-140	< 5	< 15	< 17	< 9
BD-19	Mn-54	< 2	< 4	< 3	< 2
	Co-58	< 2	< 4	< 3	< 2
	Fe-59	< 4	< 10	< 9	< 5
	Co-60	< 2	< 4	< 4	< 3
	Zn-65	< 3	< 8	< 6	< 5
	Nb-95	< 2	< 4	< 3	< 2
	Zr-95	< 3	< 7	< 6	< 5
	Cs-134	< 2	< 3	< 3	< 2
	Cs-137	< 2	< 3	< 3	< 2
	Ba-140	< 9	< 42	< 49	< 18
	La-140	< 3	< 16	< 21	< 7

Station	Nuclide	Q1	Q2	Q3	Q4
BD-20	Mn-54	< 2	< 2	< 1	< 1
	Co-58	< 1	< 2	< 2	< 1
	Fe-59	< 4	< 6	< 6	< 5
	Co-60	< 3	< 2	< 2	< 2
	Zn-65	< 3	< 4	< 6	< 4
	Nb-95	< 2	< 3	< 3	< 2
	Zr-95	< 2	< 4	< 5	< 3
	Cs-134	< 1	< 3	< 2	< 1
	Cs-137	< 1	< 2	< 1	< 2
	Ba-140	< 10	< 28	< 46	< 16
	La-140	< 4	< 10	< 7	< 7
BD-21	Mn-54	< 1	< 2	< 2	< 2
	Co-58	< 1	< 2	< 3	< 3
	Fe-59	< 3	< 7	< 7	< 7
	Co-60	< 2	< 3	< 2	< 3
	Zn-65	< 1	< 4	< 7	< 6
	Nb-95	< 2	< 3	< 3	< 2
	Zr-95	< 2	< 4	< 6	< 4
	Cs-134	< 2	< 2	< 3	< 2
	Cs-137	< 1	< 3	< 3	< 2
	Ba-140	< 10	< 34	< 42	< 19
	La-140	< 3	< 15	< 16	< 6

Table 12: Quarterly Air Particulate Gamma Isotopic (pCi/m^3 ± 2 Sigma) Cont'd

Station	Nuclide	Q1	Q2	Q3	Q4
BD-02	Mn-54	< 1	< 2	< 2	< 2
	Co-58	< 2	< 2	< 2	< 2
	Fe-59	< 2	< 6	< 6	< 6
	Co-60	< 2	< 1	< 3	< 3
	Zn-65	< 5	< 5	< 4	< 4
	Nb-95	< 2	< 2	< 2	< 2
	Zr-95	< 3	< 4	< 4	< 3
	Cs-134	< 2	< 2	< 2	< 2
	Cs-137	< 2	< 1	< 2	< 2
	Ba-140	< 8	< 29	< 31	< 19
	La-140	< 7	< 14	< 15	< 9
BD-04	Mn-54	< 2	< 2	< 2	< 1
	Co-58	< 2	< 3	< 3	< 2
	Fe-59	< 3	< 7	< 7	< 4
	Co-60	< 2	< 3	< 1	< 2
	Zn-65	< 3	< 7	< 4	< 5
	Nb-95	< 1	< 3	< 2	< 2
	Zr-95	< 3	< 6	< 5	< 3
	Cs-134	< 1	< 3	< 3	< 2
	Cs-137	< 1	< 2	< 2	< 2
	Ba-140	< 7	< 35	< 35	< 14
	La-140	< 15	< 15	< 13	< 8

Station	Nuclide	Q1	Q2	Q3	Q4
BD-05	Mn-54	< 1	< 2	< 4	< 2
	Co-58	< 1	< 3	< 5	< 3
	Fe-59	< 3	< 6	< 14	< 6
	Co-60	< 2	< 2	< 5	< 3
	Zn-65	< 4	< 5	< 12	< 7
	Nb-95	< 1	< 3	< 6	< 3
	Zr-95	< 2	< 4	< 9	< 6
	Cs-134	< 1	< 2	< 4	< 3
	Cs-137	< 1	< 2	< 3	< 3
	Ba-140	< 7	< 23	< 70	< 30
	La-140	< 4	< 13	< 39	< 10
BD-03	Mn-54	< 3	< 4	< 4	< 2
	Co-58	< 2	< 5	< 4	< 2
	Fe-59	< 6	< 12	< 9	< 6
	Co-60	< 3	< 6	< 4	< 3
	Zn-65	< 6	< 10	< 8	< 5
	Nb-95	< 2	< 6	< 4	< 3
	Zr-95	< 6	< 9	< 7	< 5
	Cs-134	< 2	< 4	< 4	< 2
	Cs-137	< 2	< 4	< 3	< 3
	Ba-140	< 15	< 55	< 61	< 24
	La-140	< 6	< 17	< 21	< 10

Table 13, Weekly Air Iodine I-131 (E^{-3} pCi/m^3)

Collection Date	BD-06	BD-19	BD-20	BD-21	BD-02	BD-04	BD-05	BD-03
12/28/2023	< 35	< 36	< 37	< 18	< 44	< 45	< 41	< 46
01/04/2024	< 32	< 31	< 32	< 32	< 45	< 45	< 43	< 46
01/11/2024	< 46	< 46	< 47	< 47	< 58	< 58	< 54	< 59
01/18/2024	< 40	< 40	< 40	< 40	< 56	< 57	< 56	< 57
01/25/2024	< 47	< 48	< 48	< 48	< 40	< 38	< 37	< 40
02/01/2024	< 39	< 40	< 37	< 39	< 31	< 33	< 30	< 32
02/08/2024	< 38	< 38	< 38	< 38	< 27	< 26	< 13	< 26
02/15/2024	< 35	< 36	< 36	< 36	< 48	< 45	< 46	< 48
02/22/2024	< 43	< 45	< 45	< 48	< 51	< 50	< 48	< 51
02/28/2024	< 47	< 44	< 44	< 46	< 36	< 34	< 26	< 35
03/07/2024	< 40	< 40	< 39	< 42	< 41	< 39	< 16	< 41
03/14/2024	< 31	< 31	< 30	< 24	< 36	< 37	< 35	< 37
03/21/2024	< 22	< 10	< 11	< 11	< 11	< 21	< 22	< 22
03/28/2024	< 48	< 47	< 48	< 48	< 34	< 35	< 33	< 35
04/04/2024	< 34	< 33	< 33	< 34	< 32	< 32	< 31	< 34
04/11/2024	< 36	< 37	< 37	< 37	< 35	< 34	< 33	< 35
04/18/2024	< 49	< 48	< 48	< 49	< 37	< 35	< 16	< 35
04/25/2024	< 34	< 34	< 33	< 35	< 44	< 41	< 43	< 45
05/02/2024	< 41	< 40	< 40	< 40	< 35	< 35	< 33	< 36
05/09/2024	< 47	< 43	< 44	< 20	< 49	< 46	< 46	< 49
05/16/2024	< 36	< 36	< 34	< 37	< 31	< 30	< 30	< 29

Table 13, Weekly Air Iodine I-131 (E-3 pCi/m3) Cont'd

Collection Date	BD-06	BD-19	BD-20	BD-21	BD-02	BD-04	BD-05	BD-03
05/23/2024	< 48	< 47	< 48	< 48	< 44	< 43	< 17	< 43
05/30/2024	< 43	< 41	< 40	< 41	< 37	< 35	< 37	< 39
06/06/2024	< 54	< 52	< 52	< 54	< 44	< 45	< 17	< 44
06/13/2024	< 27	< 28	< 26	< 28	< 39	< 38	< 18	< 39
06/20/2024	< 38	< 36	< 37	< 37	< 42	< 17	< 41	< 44
06/27/2024	< 51	< 50	< 49	< 51	< 55	< 55	< 24	< 56
07/03/2024	< 39	< 38	< 38	< 40	< 33	< 33	< 35	< 33
07/11/2024	< 60	< 60	< 59	< 61	< 32	< 51	< 49	< 57
07/17/2024	< 35	< 34	< 34	< 35	< 31	< 30	< 20	< 30
07/25/2024	< 30	< 29	< 29	< 30	< 33	< 32	< 31	< 33
08/01/2024	< 38	< 37	< 37	< 38	< 32	< 31	< 31	< 32
08/08/2024	< 48	< 33	< 47	< 47	< 33	< 33	< 34	< 32
08/15/2024	< 25	< 25	< 16	< 25	< 27	< 26	< 25	< 25
08/22/2024	< 35	< 34	< 35	< 35	< 34	< 34	< 36	< 33
08/29/2024	< 29	< 28	< 27	< 29	< 39	< 38	< 41	< 40
09/05/2024	< 26	< 26	< 25	< 26	< 22	< 22	< 22	< 21
09/13/2024	< 51	< 51	< 56	< 52	< 56	< 56	< 57	< 55
09/19/2024	< 39	< 37	< 38	< 38	< 51	< 50	< 52	< 49
09/26/2024	< 30	< 32	< 32	< 33	< 32	< 29	< 14	< 32
10/03/2024	< 40	< 37	< 37	< 38	< 41	< 41	< 42	< 40
10/10/2024	< 38	< 38	< 36	< 39	< 40	< 39	< 40	< 39
10/17/2024	< 32	< 32	< 32	< 34	< 45	< 43	< 46	< 43

Table 13, Weekly Air Iodine I-131 (E-3 pCi/m3) Cont'd

Collection Date	BD-06	BD-19	BD-20	BD-21	BD-02	BD-04	BD-05	BD-03
10/24/2024	< 35	< 34	< 25	< 35	< 41	< 41	< 42	< 40
10/31/2024	< 38	< 38	< 37	< 39	< 44	< 44	< 46	< 45
11/07/2024	< 33	< 32	< 31	< 33	< 39	< 39	< 39	< 37
11/14/2024	< 36	< 36	< 35	< 37	< 42	< 43	< 43	< 42
11/21/2024	< 33	< 32	< 21	< 33	< 41	< 41	< 43	< 41
11/27/2024	< 39	< 40	< 37	< 40	< 34	< 33	< 35	< 33
12/05/2024	< 26	< 25	< 19	< 26	< 39	< 40	< 41	< 39
12/12/2024	< 53	< 50	< 50	< 53	< 52	< 51	< 53	< 52
12/19/2024	< 35	< 33	< 14	< 35	< 37	< 37	< 39	< 36
12/26/2024	< 32	< 32	< 31	< 33	< 37	< 37	< 39	< 38

Table 14, Monthly/Bi-Weekly Milk I-131 (pCi/L ± 2 Sigma)

Collection Date	BD-18A
06/14/2024	< 0.7
07/05/2024	< 0.9
08/07/2024	< 0.9
09/06/2024	< 0.8
12/06/2024	< 0.8

Table 15: Monthly/Bi-Weekly Milk Gamma Isotopic (pCi/L ± 2 Sigma)

Station	Collection Dates	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	Cs-134	Cs-137	Ba-140	La-140
BD-18A	06/14/2024	< 10	< 13	< 25	< 13	< 25	< 11	< 19	< 11	< 11	< 43	< 12
	07/05/2024	< 11	< 10	< 24	< 12	< 27	< 10	< 18	< 14	< 11	< 46	< 11
	08/07/2024	< 11	< 13	< 30	< 10	< 27	< 12	< 19	< 12	< 10	< 59	< 10
	09/06/2024	< 9	< 10	< 20	< 8	< 18	< 8	< 17	< 9	< 8	< 31	< 9
	12/06/2024	< 7	< 9	< 23	< 12	< 20	< 10	< 15	< 10	< 9	< 36	< 9

Table 16, Annual Vegetation Gamma Isotopic (pCi/kg Wet ± 2 Sigma)

Station		Collection Dates	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
BD-CONTROL	CARROT	09/20/2024	< 35	< 36	< 87	< 31	< 62	< 28	< 56	< 41	< 34	< 36	< 113	< 35
	COLLARD GREENS	09/20/2024	< 29	< 24	< 68	< 34	< 76	< 34	< 37	< 39	< 30	< 32	< 130	< 41
	BEET LEAVES	09/20/2024	< 19	< 17	< 41	< 19	< 44	< 20	< 32	< 22	< 23	< 19	< 75	< 25
	RED BEETS	09/20/2024	< 33	< 40	< 69	< 37	< 75	< 37	< 62	< 38	< 40	< 32	< 146	< 47
	CARROT	10/18/2024	< 34	< 33	< 72	< 41	< 84	< 33	< 77	< 47	< 44	< 33	< 155	< 42
	COLLARD GREENS	10/18/2024	< 36	< 30	< 81	< 22	< 84	< 31	< 70	< 48	< 44	< 41	< 149	< 34
	SWISS CHARD	10/18/2024	< 18	< 17	< 39	< 19	< 44	< 19	< 30	< 27	< 21	< 19	< 83	< 21

Table 16, Annual Vegetation Gamma Isotopic (pCi/kg Wet ± 2 Sigma) Cont'd

Station		Collection Dates	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
BD-QUAD 1	COLLARD GREENS	07/17/2024	< 30	< 32	< 67	< 38	< 85	< 30	< 61	< 52	< 36	< 37	< 133	< 27
	MUSTARD GREENS	07/17/2024	< 24	< 24	< 56	< 26	< 70	< 27	< 38	< 38	< 30	< 28	< 115	< 35
	RADISH	07/17/2024	< 38	< 46	< 107	< 43	< 96	< 40	< 68	< 50	< 45	< 40	< 175	< 41
	COLLARD GREENS	08/15/2024	< 33	< 41	< 95	< 29	< 74	< 38	< 67	< 53	< 39	< 34	< 128	< 44
	MUSTARD GREENS	08/15/2024	< 25	< 23	< 56	< 20	< 60	< 24	< 41	< 35	< 30	< 30	< 98	< 25
	RADISH	08/15/2024	< 19	< 19	< 38	< 19	< 51	< 18	< 35	< 29	< 24	< 22	< 86	< 24
	COLLARD GREENS	09/19/2024	< 30	< 32	< 65	< 26	< 67	< 29	< 56	< 51	< 31	< 35	< 160	< 44
	MUSTARD GREENS	09/19/2024	< 36	< 32	< 79	< 37	< 81	< 38	< 60	< 50	< 29	< 45	< 153	< 46
	RADISH	09/19/2024	< 24	< 31	< 60	< 28	< 74	< 30	< 44	< 42	< 33	< 38	< 124	< 31
	COLLARD GREENS	10/17/2024	< 33	< 33	< 69	< 38	< 75	< 28	< 57	< 48	< 30	< 26	< 118	< 50
	MUSTARD GREENS	10/17/2024	< 17	< 17	< 35	< 20	< 40	< 17	< 28	< 26	< 19	< 18	< 77	< 21
	RADISH	10/17/2024	< 36	< 34	< 76	< 31	< 88	< 36	< 59	< 46	< 37	< 41	< 165	< 54

Table 16, Annual Vegetation Gamma Isotopic (pCi/kg Wet ± 2 Sigma) Cont'd

Station		Collection Dates	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
BD-QUAD 2	ONION	07/17/2024	< 27	< 28	< 56	< 34	< 59	< 30	< 50	< 44	< 30	< 30	< 131	< 36
	RADISH	07/17/2024	< 28	< 31	< 60	< 32	< 64	< 34	< 55	< 45	< 31	< 28	< 111	< 47
	SWISS CHARD	07/17/2024	< 26	< 27	< 70	< 31	< 76	< 30	< 43	< 41	< 29	< 25	< 124	< 41
	COLLARD GREENS	08/15/2024	< 25	< 22	< 51	< 34	< 47	< 28	< 49	< 29	< 28	< 22	< 103	< 31
	RADISH	08/15/2024	< 27	< 18	< 57	< 35	< 54	< 25	< 45	< 35	< 26	< 26	< 95	< 30
	BEET LEAVES	08/15/2024	< 25	< 24	< 49	< 29	< 65	< 26	< 45	< 33	< 31	< 26	< 98	< 29
	RED BEETS	08/15/2024	< 16	< 15	< 43	< 19	< 38	< 17	< 27	< 20	< 19	< 18	< 70	< 21
	COLLARD GREENS	09/19/2024	< 28	< 28	< 56	< 28	< 61	< 30	< 47	< 35	< 28	< 22	< 104	< 33
	KALE	09/19/2024	< 33	< 28	< 70	< 37	< 95	< 31	< 49	< 45	< 37	< 32	< 144	< 44
	TURNIP	09/19/2024	< 12	< 12	< 30	< 15	< 34	< 14	< 22	< 17	< 13	< 13	< 49	< 14
	COLLARD GREENS	10/17/2024	< 38	< 38	< 74	< 35	< 84	< 40	< 73	< 51	< 43	< 31	< 169	< 50
	KALE	10/17/2024	< 31	< 28	< 57	< 34	< 91	< 30	< 62	< 44	< 36	< 30	< 143	< 36
	RADISH	10/17/2024	< 27	< 31	< 47	< 38	< 68	< 28	< 63	< 41	< 29	< 26	< 135	< 36

Table 16, Annual Vegetation Gamma Isotopic (pCi/kg Wet ± 2 Sigma) Cont'd

Station		Collection Dates	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
BD-QUAD 3	COLLARD GREENS	07/17/2024	< 35	< 36	< 72	< 38	< 83	< 37	< 59	< 51	< 39	< 35	< 147	< 47
	RADISH	07/17/2024	< 15	< 15	< 30	< 16	< 31	< 15	< 27	< 26	< 17	< 16	< 69	< 18
	BEET LEAVES	07/17/2024	< 14	< 14	< 30	< 15	< 32	< 15	< 24	< 22	< 16	< 15	< 67	< 20
	RED BEETS	07/17/2024	< 20	< 22	< 52	< 31	< 67	< 25	< 45	< 32	< 27	< 28	< 104	< 33
	COLLARD GREENS	08/15/2024	< 32	< 32	< 69	< 36	< 83	< 39	< 68	< 48	< 38	< 36	< 140	< 38
	RADISH	08/15/2024	< 20	< 19	< 38	< 22	< 39	< 19	< 30	< 25	< 20	< 18	< 79	< 27
	BEET LEAVES	08/15/2024	< 27	< 30	< 56	< 36	< 52	< 33	< 48	< 40	< 37	< 31	< 141	< 56
	RED BEETS	08/15/2024	< 23	< 26	< 55	< 31	< 52	< 21	< 51	< 30	< 21	< 25	< 96	< 16
	SWISS CHARD	08/15/2024	< 36	< 35	< 69	< 26	< 64	< 35	< 50	< 44	< 30	< 30	< 144	< 43
	COLLARD GREENS	09/19/2024	< 29	< 29	< 81	< 27	< 70	< 30	< 50	< 39	< 38	< 29	< 147	< 31
	RADISH	09/19/2024	< 87	< 86	< 164	< 98	< 200	< 89	< 147	< 125	< 91	< 90	< 355	< 127
	BEET LEAVES	09/19/2024	< 19	< 19	< 40	< 19	< 44	< 19	< 34	< 26	< 21	< 20	< 80	< 27
	RED BEETS	09/19/2024	< 28	< 31	< 71	< 38	< 78	< 33	< 54	< 49	< 33	< 32	< 143	< 47
	SWISS CHARD	09/19/2024	< 19	< 19	< 40	< 21	< 42	< 19	< 33	< 27	< 20	< 20	< 79	< 27
	COLLARD GREENS	10/17/2024	< 30	< 27	< 79	< 39	< 107	< 34	< 52	< 48	< 38	< 37	< 162	< 49
	RED BEETS	10/17/2024	< 31	< 26	< 50	< 35	< 61	< 31	< 53	< 42	< 34	< 33	< 121	< 35

Table 16, Annual Vegetation Gamma Isotopic (pCi/kg Wet ± 2 Sigma) Cont'd

Station		Collection Dates	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
BD-QUAD 4	MUSTARD GREENS	07/17/2024	< 21	< 24	< 48	< 24	< 55	< 25	< 44	< 35	< 29	< 22	< 116	< 24
	RADISH	07/17/2024	< 33	< 29	< 67	< 34	< 72	< 36	< 58	< 54	< 29	< 33	< 150	< 48
	RED BEETS	07/17/2024	< 23	< 22	< 44	< 25	< 48	< 22	< 38	< 35	< 24	< 24	< 100	< 31
	BEET LEAVES	07/17/2024	< 28	< 33	< 53	< 34	< 79	< 31	< 48	< 42	< 36	< 33	< 117	< 44
	KOHLRABI	08/15/2024	< 23	< 26	< 42	< 25	< 49	< 24	< 39	< 33	< 22	< 25	< 95	< 37
	MUSTARD GREENS	08/15/2024	< 14	< 14	< 27	< 16	< 29	< 14	< 24	< 20	< 15	< 15	< 58	< 20
	RADISH	08/15/2024	< 26	< 27	< 51	< 31	< 67	< 23	< 39	< 41	< 30	< 23	< 127	< 34
	KOHLRABI	09/19/2024	< 20	< 19	< 43	< 23	< 45	< 20	< 35	< 27	< 22	< 21	< 86	< 28
	RADISH	09/19/2024	< 27	< 31	< 68	< 30	< 68	< 34	< 60	< 44	< 35	< 31	< 153	< 42
	BEET LEAVES	09/19/2024	< 32	< 29	< 62	< 35	< 61	< 32	< 55	< 43	< 35	< 32	< 134	< 43
	RED BEETS	09/19/2024	< 28	< 24	< 66	< 31	< 79	< 29	< 35	< 35	< 36	< 22	< 105	< 35
	RADISH	10/17/2024	< 30	< 36	< 71	< 30	< 90	< 27	< 53	< 50	< 32	< 38	< 141	< 39

Table 16, Annual Vegetation Gamma Isotopic (pCi/kg Wet ± 2 Sigma) Cont'd

Station		Collection Dates	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
BWD-G1	KALE	07/11/2024	< 26	< 22	< 46	< 24	< 59	< 21	< 38	< 28	< 24	< 25	< 113	< 36
	TURNIP	07/11/2024	< 24	< 21	< 54	< 25	< 45	< 25	< 44	< 29	< 21	< 28	< 86	< 29
	CABBAGE	07/11/2024	< 33	< 27	< 65	< 34	< 57	< 34	< 47	< 45	< 33	< 36	< 144	< 23
	KALE	07/25/2024	< 37	< 38	< 91	< 54	< 64	< 40	< 77	< 52	< 39	< 38	< 146	< 57
	CABBAGE	07/25/2024	< 25	< 25	< 66	< 31	< 60	< 30	< 52	< 39	< 32	< 33	< 113	< 38
	KOHLRABI	07/25/2024	< 31	< 27	< 64	< 32	< 37	< 26	< 48	< 35	< 28	< 35	< 108	< 40
	SWISS CHARD	08/08/2024	< 29	< 29	< 59	< 36	< 68	< 26	< 48	< 37	< 33	< 33	< 110	< 34
	TURNIP	08/08/2024	< 23	< 22	< 49	< 20	< 59	< 27	< 36	< 35	< 24	< 25	< 90	< 21
	CABBAGE	08/08/2024	< 25	< 26	< 47	< 34	< 63	< 22	< 43	< 37	< 27	< 24	< 93	< 38
	KALE	08/22/2024	< 40	< 33	< 79	< 36	< 84	< 44	< 60	< 46	< 49	< 44	< 128	< 70
	TURNIP	08/22/2024	< 26	< 27	< 46	< 24	< 71	< 33	< 38	< 36	< 27	< 30	< 113	< 33
	CABBAGE	08/22/2024	< 23	< 21	< 51	< 18	< 40	< 21	< 27	< 25	< 24	< 17	< 80	< 27
	KALE	09/05/2024	< 20	< 17	< 42	< 21	< 47	< 19	< 38	< 29	< 24	< 24	< 90	< 26
	SWISS CHARD	09/05/2024	< 18	< 16	< 36	< 22	< 43	< 17	< 30	< 22	< 21	< 19	< 72	< 23
	TURNIP	09/05/2024	< 16	< 13	< 27	< 17	< 34	< 14	< 25	< 19	< 16	< 17	< 58	< 14
	KALE	09/19/2024	< 24	< 20	< 47	< 24	< 49	< 25	< 46	< 36	< 29	< 32	< 99	< 39
	SWISS CHARD	09/19/2024	< 28	< 28	< 63	< 33	< 79	< 28	< 48	< 41	< 30	< 28	< 130	< 42
	TURNIP	09/19/2024	< 28	< 28	< 60	< 24	< 63	< 23	< 39	< 36	< 31	< 28	< 130	< 29
	CABBAGE	10/03/2024	< 8	< 7	< 15	< 8	< 17	< 8	< 14	< 13	< 9	< 8	< 35	< 10
	KALE	10/03/2024	< 17	< 16	< 34	< 19	< 37	< 17	< 30	< 27	< 19	< 20	< 79	< 21
	RADISH	10/03/2024	< 30	< 29	< 51	< 39	< 71	< 30	< 50	< 48	< 32	< 32	< 136	< 47
	CABBAGE	10/17/2024	< 23	< 23	< 49	< 29	< 53	< 27	< 37	< 32	< 25	< 25	< 116	< 37
	KALE	10/17/2024	< 33	< 33	< 59	< 51	< 40	< 37	< 54	< 45	< 38	< 35	< 131	< 30
	RADISH	10/17/2024	< 30	< 28	< 57	< 29	< 81	< 29	< 49	< 36	< 29	< 30	< 116	< 46

Table 16, Annual Vegetation Gamma Isotopic (pCi/kg Wet ± 2 Sigma) Cont'd

Station		Collection Dates	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
BWD-G2	KALE	07/11/2024	< 31	< 38	< 79	< 33	< 67	< 38	< 53	< 52	< 30	< 42	< 141	< 48
	CABBAGE	07/11/2024	< 34	< 33	< 80	< 37	< 77	< 33	< 57	< 53	< 34	< 38	< 155	< 38
	KOHLRABI	07/11/2024	< 25	< 26	< 51	< 12	< 57	< 23	< 39	< 36	< 34	< 27	< 112	< 29
	KALE	07/25/2024	< 26	< 34	< 78	< 51	< 87	< 37	< 52	< 51	< 43	< 38	< 159	< 35
	CABBAGE	07/25/2024	< 31	< 38	< 76	< 40	< 80	< 40	< 54	< 48	< 40	< 35	< 145	< 32
	TURNIP	07/25/2024	< 28	< 35	< 64	< 35	< 72	< 28	< 58	< 44	< 31	< 34	< 143	< 27
	KALE	08/08/2024	< 26	< 27	< 57	< 27	< 77	< 26	< 60	< 31	< 31	< 29	< 148	< 37
	CABBAGE	08/08/2024	< 19	< 21	< 35	< 24	< 43	< 17	< 40	< 28	< 23	< 17	< 82	< 28
	TURNIP	08/08/2024	< 21	< 23	< 58	< 22	< 45	< 29	< 38	< 31	< 30	< 23	< 90	< 21
	KALE	08/22/2024	< 29	< 25	< 64	< 37	< 65	< 24	< 57	< 47	< 34	< 34	< 141	< 39
	CABBAGE	08/22/2024	< 16	< 19	< 43	< 17	< 42	< 21	< 31	< 34	< 23	< 27	< 101	< 34
	TURNIP	08/22/2024	< 30	< 25	< 61	< 24	< 81	< 26	< 59	< 42	< 28	< 38	< 137	< 37
	KOHLRABI	09/05/2024	< 17	< 15	< 30	< 18	< 30	< 17	< 30	< 20	< 19	< 18	< 61	< 20
	CABBAGE	09/05/2024	< 13	< 12	< 22	< 13	< 25	< 13	< 22	< 20	< 14	< 16	< 54	< 15
	TURNIP	09/05/2024	< 15	< 15	< 30	< 16	< 35	< 16	< 27	< 19	< 16	< 18	< 59	< 19
	CABBAGE	09/19/2024	< 17	< 14	< 33	< 16	< 31	< 19	< 25	< 31	< 20	< 20	< 90	< 26
	KALE	09/19/2024	< 27	< 26	< 54	< 28	< 68	< 26	< 46	< 38	< 28	< 33	< 137	< 47
	TURNIP	09/19/2024	< 29	< 25	< 60	< 29	< 57	< 22	< 43	< 43	< 36	< 37	< 120	< 48
	RADISH	10/03/2024	< 11	< 12	< 24	< 15	< 27	< 12	< 20	< 15	< 12	< 13	< 48	< 16
	SWISS CHARD	10/03/2024	< 14	< 15	< 31	< 15	< 29	< 14	< 23	< 19	< 13	< 16	< 57	< 17
	KALE	10/03/2024	< 24	< 22	< 51	< 28	< 60	< 25	< 41	< 37	< 29	< 26	< 103	< 33
	TURNIP	10/03/2024	< 13	< 12	< 26	< 13	< 24	< 12	< 22	< 16	< 13	< 13	< 50	< 17
	CABBAGE	10/17/2024	< 26	< 27	< 41	< 26	< 49	< 28	< 42	< 32	< 25	< 26	< 97	< 29
	KALE	10/17/2024	< 29	< 34	< 79	< 27	< 82	< 30	< 58	< 46	< 34	< 32	< 125	< 44
	TURNIP	10/17/2024	< 22	< 22	< 38	< 24	< 61	< 30	< 37	< 37	< 24	< 24	< 112	< 31

Table 17, Monthly Surface Water Gross Beta (pCi/L ± 2 Sigma)

Collection Date	BD-10	BD-25	BD-38	BD-40	BD-55	BD-56
01/04/2024 - 01/25/2024	**3** ± 2	**4** ± 2	**4** ± 2	**8** ± 3	**4** ± 2	**4** ± 2
02/01/2024 - 02/28/2024	**5** ± 2	**4** ± 2	**8** ± 2	**11** ± 3	**4** ± 2	**9** ± 2
03/07/2024 - 03/28/2024	**9** ± 3	**5** ± 2	**8** ± 3	**9** ± 3	**4** ± 2	< 4
04/04/2024 - 04/25/2024	**5** ± 2	**7** ± 2	**13** ± 3	**13** ± 3	**4** ± 2	**3** ± 2
05/02/2024 - 05/30/2024	**4** ± 2	**4** ± 2	**9** ± 3	**12** ± 3	< 3	< 3
06/06/2024 - 06/27/2024	**5** ± 2	**4** ± 2	**4** ± 2	**8** ± 3	**3** ± 2	< 3
07/03/2024 - 07/25/2024	**5** ± 2	**3** ± 2	< 4	**8** ± 3	< 3	< 3
08/01/2024 - 08/29/2024	**7** ± 2	**6** ± 2	**9** ± 3	**3** ± 2	**4** ± 2	**2** ± 2
09/05/2024 - 09/26/2024	**5** ± 2	**5** ± 2	**8** ± 3	**12** ± 3	**4** ± 2	**3** ± 2
10/03/2024 - 10/31/2024	**5** ± 2	< 3	**6** ± 4	**6** ± 4	< 4	**4** ± 2
11/07/2024 - 11/27/2024	**7** ± 2	**6** ± 2	**8** ± 3	**13** ± 3	**3** ± 2	**5** ± 2
12/05/2024 - 12/26/2024	**5** ± 2	**5** ± 2	**8** ± 3	**13** ± 3	**3** ± 2	**2** ± 1

Table 18, Monthly Surface Water Nickel-63 and Iron-55 (pCi/L ± 2 Sigma)

Station	Collection Date	Ni-63	Fe-55
BD-10	01/04/2024 - 01/25/2024	< 26	< 64
	02/01/2024 - 02/28/2024	< 28	< 74
	03/07/2024 - 03/28/2024	< 28	< 69
	04/04/2024 - 04/25/2024	< 25	< 78
	05/02/2024 - 05/30/2024	< 9	< 133
	06/06/2024 - 06/27/2024	< 28	< 80
	07/03/2024 - 07/25/2024	< 26	< 85
	08/01/2024 - 08/29/2024	< 23	< 83
	09/05/2024 - 09/26/2024	< 16	< 58
	10/03/2024 - 10/31/2024	< 16	< 129
	11/07/2024 - 11/27/2024	< 22	< 85
	12/05/2024 - 12/26/2024	< 21	< 39
BD-25	01/04/2024 - 01/25/2024	< 29	< 102
	02/01/2024 - 02/28/2024	< 27	< 67
	03/07/2024 - 03/28/2024	< 27	< 54
	04/04/2024 - 04/25/2024	< 28	< 51
	05/02/2024 - 05/30/2024	< 8	< 92
	06/06/2024 - 06/27/2024	< 28	< 131
	07/03/2024 - 07/25/2024	< 28	< 70
	08/01/2024 - 08/29/2024	< 23	< 64
	09/05/2024 - 09/26/2024	< 27	< 58
	10/03/2024 - 10/31/2024	< 19	< 192
	11/07/2024 - 11/27/2024	< 22	< 182
	12/05/2024 - 12/26/2024	< 21	< 37

Table 19, Monthly Surface Water Gamma Isotopic (pCi/L ± 2 Sigma)

Station	Collection Dates	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
BD-10	01/04/2024 - 01/25/2024	< 4	< 4	< 8	< 4	< 7	< 5	< 8	< 14	< 4	< 3	< 28	< 9
	02/01/2024 - 02/28/2024	< 4	< 5	< 11	< 4	< 8	< 5	< 9	< 13	< 4	< 5	< 28	< 10
	03/07/2024 - 03/28/2024	< 7	< 4	< 16	< 8	< 12	< 7	< 11	< 12	< 7	< 6	< 37	< 10
	04/04/2024 - 04/25/2024	< 7	< 6	< 13	< 5	< 10	< 6	< 10	< 14	< 6	< 4	< 28	< 13
	05/02/2024 - 05/30/2024	< 5	< 7	< 14	< 8	< 15	< 6	< 12	< 12	< 9	< 6	< 31	< 11
	06/06/2024 - 06/27/2024	< 5	< 5	< 13	< 6	< 11	< 6	< 8	< 9	< 5	< 6	< 29	< 10
	07/03/2024 - 07/25/2024	< 5	< 5	< 12	< 5	< 12	< 5	< 9	< 10	< 5	< 5	< 28	< 8
	08/01/2024 - 08/29/2024	< 4	< 5	< 11	< 5	< 9	< 6	< 10	< 14	< 6	< 6	< 36	< 12
	09/05/2024 - 09/26/2024	< 2	< 2	< 5	< 2	< 5	< 2	< 4	< 9	< 2	< 2	< 18	< 6
	10/03/2024 - 10/31/2024	< 7	< 9	< 14	< 9	< 12	< 7	< 13	< 12	< 9	< 7	< 37	< 13
	11/07/2024 - 11/27/2024	< 5	< 6	< 15	< 5	< 10	< 5	< 10	< 15	< 7	< 6	< 36	< 4
	12/19/2024 - 12/26/2024	< 3	< 3	< 6	< 3	< 5	< 3	< 5	< 8	< 3	< 3	< 17	< 6

Table 19, Monthly Surface Water Gamma Isotopic (pCi/L ± 2 Sigma) Cont'd

Station	Collection Dates	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
BD-25	01/04/2024 - 01/13/2024	< 1	< 2	< 5	< 2	< 3	< 2	< 3	< 15	< 2	< 2	< 20	< 8
	02/15/2024 - 02/28/2024	< 4	< 5	< 11	< 5	< 9	< 6	< 9	< 14	< 5	< 5	< 30	< 11
	03/07/2024 - 03/28/2024	< 7	< 6	< 13	< 8	< 12	< 8	< 10	< 13	< 9	< 7	< 32	< 13
	04/25/2024 - 04/25/2024	< 4	< 5	< 10	< 7	< 11	< 4	< 9	< 14	< 5	< 5	< 26	< 8
	05/02/2024 - 05/30/2024	< 6	< 7	< 16	< 6	< 12	< 7	< 13	< 11	< 7	< 7	< 28	< 10
	06/06/2024 - 06/27/2024	< 6	< 6	< 13	< 7	< 11	< 6	< 9	< 10	< 6	< 6	< 25	< 8
	07/03/2024 - 07/25/2024	< 4	< 4	< 10	< 5	< 7	< 4	< 8	< 6	< 5	< 4	< 17	< 6
	08/01/2024 - 08/29/2024	< 4	< 4	< 10	< 5	< 9	< 5	< 9	< 14	< 5	< 5	< 29	< 13
	09/05/2024 - 09/26/2024	< 2	< 2	< 5	< 2	< 4	< 2	< 4	< 8	< 2	< 2	< 16	< 5
	10/03/2024 - 10/31/2024	< 5	< 4	< 12	< 7	< 10	< 5	< 9	< 9	< 5	< 6	< 25	< 10
	11/07/2024 - 11/27/2024	< 5	< 5	< 9	< 4	< 8	< 5	< 8	< 14	< 4	< 5	< 30	< 8
	12/19/2024 - 12/26/2024	< 5	< 5	< 10	< 6	< 10	< 7	< 9	< 14	< 5	< 5	< 32	< 12

Table 19, Monthly Surface Water Gamma Isotopic (pCi/L ± 2 Sigma) Cont'd

Station	Collection Dates	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
BD-38	01/04/2024 - 01/25/2024	< 2	< 3	< 6	< 3	< 6	< 3	< 5	< 9	< 3	< 3	< 21	< 7
	02/01/2024 - 02/28/2024	< 4	< 5	< 11	< 5	< 9	< 5	< 8	< 13	< 5	< 4	< 30	< 9
	03/07/2024 - 03/28/2024	< 6	< 5	< 16	< 6	< 14	< 8	< 11	< 11	< 6	< 7	< 29	< 12
	04/04/2024 - 04/25/2024	< 5	< 5	< 11	< 5	< 11	< 6	< 9	< 13	< 4	< 5	< 33	< 9
	05/02/2024 - 05/30/2024	< 7	< 7	< 11	< 7	< 10	< 7	< 7	< 10	< 7	< 6	< 31	< 9
	06/06/2024 - 06/27/2024	< 6	< 6	< 15	< 4	< 12	< 7	< 10	< 9	< 8	< 6	< 27	< 9
	07/03/2024 - 07/25/2024	< 6	< 5	< 12	< 6	< 9	< 6	< 10	< 12	< 6	< 5	< 28	< 9
	08/01/2024 - 08/29/2024	< 5	< 5	< 11	< 4	< 9	< 6	< 9	< 14	< 6	< 4	< 30	< 10
	09/05/2024 - 09/26/2024	< 2	< 2	< 4	< 2	< 4	< 2	< 4	< 8	< 2	< 2	< 15	< 6
	10/03/2024 - 10/31/2024	< 7	< 7	< 14	< 9	< 17	< 7	< 14	< 14	< 8	< 9	< 34	< 13
	11/07/2024 - 11/27/2024	< 5	< 6	< 12	< 6	< 12	< 5	< 9	< 13	< 6	< 5	< 36	< 14
	12/05/2024 - 12/26/2024	< 3	< 5	< 11	< 4	< 9	< 5	< 8	< 13	< 4	< 4	< 28	< 9

Table 19, Monthly Surface Water Gamma Isotopic (pCi/L ± 2 Sigma) Cont'd

Station	Collection Dates	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
BD-40	01/04/2024 - 01/25/2024	< 4	< 4	< 9	< 4	< 8	< 6	< 9	< 12	< 3	< 5	< 37	< 10
	02/01/2024 - 02/28/2024	< 5	< 4	< 11	< 5	< 10	< 6	< 8	< 13	< 5	< 5	< 32	< 13
	03/07/2024 - 03/28/2024	< 5	< 5	< 11	< 6	< 13	< 8	< 11	< 12	< 6	< 6	< 26	< 12
	04/04/2024 - 04/25/2024	< 5	< 6	< 11	< 5	< 12	< 5	< 12	< 15	< 6	< 5	< 32	< 15
	05/02/2024 - 05/30/2024	< 7	< 6	< 17	< 6	< 10	< 8	< 11	< 9	< 8	< 6	< 28	< 10
	06/06/2024 - 06/27/2024	< 4	< 4	< 11	< 3	< 11	< 5	< 8	< 6	< 4	< 5	< 19	< 9
	07/03/2024 - 07/25/2024	< 5	< 6	< 11	< 5	< 12	< 6	< 11	< 9	< 6	< 6	< 24	< 11
	08/01/2024 - 08/29/2024	< 4	< 5	< 9	< 5	< 8	< 5	< 8	< 13	< 5	< 4	< 31	< 10
	09/05/2024 - 09/26/2024	< 2	< 2	< 5	< 2	< 4	< 2	< 4	< 9	< 2	< 2	< 19	< 6
	10/03/2024 - 10/31/2024	< 9	< 8	< 18	< 7	< 18	< 10	< 13	< 14	< 10	< 8	< 39	< 14
	11/07/2024 - 11/27/2024	< 6	< 7	< 14	< 7	< 14	< 6	< 12	< 14	< 7	< 5	< 37	< 13
	12/05/2024 - 12/26/2024	< 3	< 3	< 7	< 4	< 6	< 3	< 6	< 9	< 3	< 3	< 22	< 6

Table 19, Monthly Surface Water Gamma Isotopic (pCi/L ± 2 Sigma) Cont'd

Station	Collection Dates	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
BD-55	01/04/2024 - 01/11/2024	< 2	< 3	< 6	< 2	< 5	< 3	< 5	< 14	< 2	< 2	< 35	< 13
	02/01/2024 - 02/28/2024	< 4	< 5	< 13	< 5	< 9	< 6	< 9	< 14	< 5	< 5	< 33	< 11
	03/07/2024 - 03/28/2024	< 5	< 7	< 15	< 7	< 15	< 7	< 12	< 13	< 7	< 7	< 34	< 10
	04/04/2024 - 04/25/2024	< 4	< 5	< 12	< 6	< 11	< 6	< 9	< 15	< 6	< 5	< 30	< 11
	05/02/2024 - 05/30/2024	< 7	< 5	< 13	< 10	< 16	< 7	< 13	< 11	< 6	< 7	< 31	< 12
	06/06/2024 - 06/27/2024	< 6	< 7	< 15	< 7	< 15	< 8	< 12	< 9	< 8	< 8	< 28	< 13
	07/03/2024 - 07/25/2024	< 6	< 7	< 14	< 8	< 12	< 5	< 11	< 10	< 7	< 7	< 29	< 6
	08/01/2024 - 08/29/2024	< 5	< 6	< 11	< 5	< 9	< 5	< 9	< 14	< 5	< 4	< 31	< 10
	09/05/2024 - 09/26/2024	< 2	< 2	< 5	< 2	< 4	< 2	< 4	< 9	< 2	< 2	< 16	< 5
	10/03/2024 - 10/31/2024	< 5	< 6	< 12	< 7	< 13	< 6	< 12	< 10	< 8	< 6	< 31	< 9
	11/07/2024 - 11/27/2024	< 5	< 6	< 12	< 6	< 9	< 5	< 9	< 13	< 6	< 6	< 31	< 14
	12/05/2024 - 12/26/2024	< 5	< 4	< 12	< 7	< 9	< 7	< 10	< 15	< 6	< 5	< 43	< 12

Table 19, Monthly Surface Water Gamma Isotopic (pCi/L ± 2 Sigma) Cont'd

Station	Collection Dates	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
BD-56	01/04/2024 - 01/11/2024	< 1	< 2	< 3	< 1	< 2	< 2	< 3	< 15	< 1	< 1	< 19	< 7
	02/01/2024 - 02/28/2024	< 4	< 6	< 12	< 5	< 11	< 6	< 9	< 13	< 4	< 5	< 26	< 6
	03/07/2024 - 03/28/2024	< 7	< 7	< 10	< 7	< 12	< 5	< 12	< 11	< 8	< 6	< 29	< 12
	04/04/2024 - 04/25/2024	< 6	< 6	< 11	< 6	< 10	< 5	< 10	< 15	< 7	< 6	< 35	< 11
	05/02/2024 - 05/30/2024	< 6	< 8	< 16	< 7	< 13	< 6	< 14	< 11	< 8	< 8	< 29	< 12
	06/06/2024 - 06/27/2024	< 6	< 6	< 9	< 5	< 10	< 7	< 11	< 9	< 9	< 7	< 32	< 12
	07/03/2024 - 07/25/2024	< 6	< 6	< 10	< 7	< 13	< 7	< 10	< 10	< 6	< 6	< 30	< 10
	08/01/2024 - 08/29/2024	< 4	< 5	< 11	< 5	< 9	< 6	< 8	< 13	< 5	< 5	< 31	< 10
	09/05/2024 - 09/26/2024	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 8	< 2	< 2	< 15	< 5
	10/03/2024 - 10/31/2024	< 6	< 6	< 13	< 8	< 16	< 7	< 13	< 9	< 7	< 7	< 32	< 9
	11/07/2024 - 11/27/2024	< 5	< 5	< 12	< 6	< 10	< 5	< 9	< 12	< 6	< 6	< 32	< 10
	12/26/2024 - 12/26/2024	< 5	< 5	< 10	< 4	< 9	< 5	< 9	< 14	< 5	< 5	< 34	< 8

Table 20, Quarterly Surface Water Tritium (pCi/L ± 2 Sigma)

Station	Collection Dates	H-3
BD-10	01/04/2024 - 03/28/2024	< 184
	04/04/2024 - 06/27/2024	< 196
	07/03/2024 - 09/26/2024	**738** ± 157
	10/03/2024 - 12/26/2024	**485** ± 129
BD-25	01/04/2024 - 03/28/2024	< 189
	04/04/2024 - 06/27/2024	< 196
	07/03/2024 - 09/26/2024	< 185
	10/03/2024 - 12/26/2024	< 183
BD-38	01/04/2024 - 03/28/2024	< 186
	04/04/2024 - 06/27/2024	< 195
	07/03/2024 - 09/26/2024	< 179
	10/03/2024 - 12/26/2024	< 179
BD-40	01/04/2024 - 03/28/2024	< 183
	04/04/2024 - 06/27/2024	< 198
	07/03/2024 - 09/26/2024	< 183
	10/03/2024 - 12/26/2024	< 175
BD-55	01/04/2024 - 03/28/2024	< 183
	04/04/2024 - 06/27/2024	< 198
	07/03/2024 - 09/26/2024	< 184
	10/03/2024 - 12/26/2024	< 176
BD-56	01/04/2024 - 03/28/2024	< 184
	04/04/2024 - 06/27/2024	< 196
	07/03/2024 - 09/26/2024	< 184
	10/03/2024 - 12/26/2024	< 174

Table 21, Monthly Public Water Gross Beta, Tritium, Iron-55, Nickel-63, and I-131 (pCi/L ± 2 Sigma)

Station	Collection Dates	Gross Beta	H-3	Fe-55	Ni-63	I-131
BD-22	12/28/2023 - 01/25/2024	**4** ± 2	< 198	< 66	< 23	< 0.9
	01/25/2024 - 02/28/2024	< 2	**1090** ± 186	< 88	< 27	< 0.6
	02/28/2024 - 03/28/2024	< 3	**1140** ± 191	< 63	< 30	< 0.9
	03/28/2024 - 04/25/2024	**3** ± 2	**858** ± 169	< 196	< 23	< 1
	04/25/2024 - 05/30/2024	**3** ± 2	**286** ± 140	< 130	< 8	< 0.8
	05/30/2024 - 06/27/2024	**5** ± 2	**376** ± 122	< 141	< 25	< 1
	06/27/2024 - 07/25/2024	**6** ± 2	**271** ± 127	< 90	< 24	< 0.9
	07/25/2024 - 08/29/2024	< 4	**1050** ± 182	< 121	< 17	< 0.9
	08/29/2024 - 09/26/2024	**3** ± 2	**1350** ± 205	< 63	< 18	< 0.7
	09/26/2024 - 10/31/2024	**4** ± 2	**1070** ± 193	< 63	< 27	< 0.9
	10/31/2024 - 11/27/2024	**5** ± 2	**782** ± 158	< 88	< 27	< 0.9
	11/27/2024 - 01/02/2025	**4** ± 2	**1190** ± 189	< 165	< 24	< 0.9

Table 22, Monthly Public Water Gamma Isotopic (pCi/L ± 2 Sigma)

Station	Collection Dates	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	Cs-134	Cs-137	Ba-140	La-140
BD-22	12/28/2023 - 01/25/2024	< 2	< 3	< 5	< 2	< 5	< 3	< 4	< 2	< 2	< 18	< 5
	01/25/2024 - 02/28/2024	< 4	< 5	< 15	< 6	< 11	< 6	< 9	< 5	< 5	< 27	< 13
	02/28/2024 - 03/28/2024	< 5	< 5	< 12	< 5	< 13	< 5	< 10	< 5	< 5	< 23	< 8
	03/28/2024 - 04/25/2024	< 5	< 6	< 11	< 7	< 13	< 6	< 8	< 5	< 5	< 30	< 8
	04/25/2024 - 05/30/2024	< 5	< 6	< 13	< 7	< 12	< 5	< 12	< 6	< 6	< 28	< 11
	05/30/2024 - 06/27/2024	< 6	< 6	< 8	< 7	< 8	< 6	< 8	< 6	< 4	< 28	< 13
	06/27/2024 - 07/25/2024	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 1	< 1	< 11	< 4
	07/25/2024 - 08/29/2024	< 2	< 2	< 4	< 2	< 4	< 2	< 3	< 2	< 2	< 18	< 5
	08/29/2024 - 09/26/2024	< 1	< 1	< 3	< 2	< 3	< 1	< 2	< 1	< 1	< 9	< 3
	09/26/2024 - 10/31/2024	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 1	< 1	< 17	< 6
	10/31/2024 - 11/27/2024	< 6	< 8	< 16	< 6	< 14	< 6	< 17	< 9	< 7	< 21	< 12
	11/27/2024 - 01/02/2025	< 5	< 6	< 7	< 5	< 6	< 5	< 10	< 4	< 5	< 27	< 11

Table 23, Quarterly Groundwater Tritium (pCi/L ± 2 Sigma)

Collection Date	BD-13	BD-34	BD-35	BD-36	BD-37	BD-50	BD-51	BD-54
01/13/2024	< 192	< 179	< 188	< 184	< 179	(1)	< 184	< 198
03/28/2024						< 185		
04/11/2024	< 191	< 196	< 189	< 192	< 196	< 193	< 199	< 196
07/11/2024	< 198	< 194	< 187	< 190	< 191	< 185	< 188	< 185
10/10/2024	< 181	< 180	< 183	< 180	< 178	< 180	< 177	< 180

(1) See Sample Deviations Table

Table 24, Quarterly Ground Water Gamma Isotopic (pCi/L ± 2 Sigma)

Station	Collection Dates	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
BD-13	01/11/2024 - 01/11/2024	< 5	< 5	< 14	< 5	< 13	< 6	< 8	< 14	< 6	< 6	< 31	< 13
	04/11/2024 - 04/11/2024	< 6	< 8	< 13	< 9	< 15	< 8	< 12	< 11	< 8	< 9	< 34	< 12
	07/11/2024 - 07/11/2024	< 5	< 5	< 11	< 5	< 13	< 5	< 11	< 8	< 7	< 4	< 22	< 9
	10/10/2024 - 10/10/2024	< 7	< 7	< 14	< 5	< 15	< 7	< 13	< 9	< 7	< 7	< 34	< 10
BD-34	01/11/2024 - 01/11/2024	< 5	< 6	< 10	< 7	< 10	< 5	< 12	< 14	< 5	< 5	< 26	< 8
	04/11/2024 - 04/11/2024	< 8	< 7	< 18	< 7	< 13	< 8	< 8	< 10	< 8	< 7	< 31	< 8
	07/11/2024 - 07/11/2024	< 5	< 5	< 11	< 5	< 10	< 5	< 8	< 8	< 5	< 5	< 27	< 6
	10/10/2024 - 10/10/2024	< 7	< 5	< 15	< 8	< 18	< 8	< 14	< 14	< 6	< 9	< 37	< 12
BD-35	01/11/2024 - 01/11/2024	< 5	< 4	< 10	< 5	< 10	< 6	< 9	< 14	< 5	< 5	< 27	< 11
	04/11/2024 - 04/11/2024	< 5	< 6	< 13	< 6	< 13	< 6	< 9	< 11	< 7	< 7	< 31	< 10
	07/11/2024 - 07/11/2024	< 5	< 4	< 10	< 6	< 8	< 4	< 8	< 8	< 5	< 5	< 22	< 7
	10/10/2024 - 10/10/2024	< 7	< 7	< 15	< 8	< 18	< 7	< 12	< 11	< 7	< 8	< 28	< 10

Table 24, Quarterly Ground Water Gamma Isotopic (pCi/L ± 2 Sigma) Cont'd

Station	Collection Dates	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
BD-36	01/11/2024 - 01/11/2024	< 5	< 6	< 10	< 7	< 14	< 6	< 10	< 14	< 8	< 6	< 27	< 9
	04/11/2024 - 04/11/2024	< 7	< 5	< 13	< 6	< 11	< 8	< 10	< 10	< 6	< 7	< 29	< 10
	07/11/2024 - 07/11/2024	< 6	< 5	< 13	< 7	< 12	< 6	< 9	< 9	< 7	< 6	< 28	< 8
	10/10/2024 - 10/10/2024	< 6	< 7	< 11	< 7	< 10	< 7	< 13	< 10	< 8	< 7	< 24	< 8
BD-37	01/13/2024 - 01/13/2024	< 6	< 6	< 9	< 8	< 12	< 6	< 9	< 13	< 6	< 7	< 37	< 14
	04/11/2024 - 04/11/2024	< 7	< 8	< 14	< 9	< 16	< 7	< 14	< 9	< 6	< 8	< 36	< 12
	07/11/2024 - 07/11/2024	< 5	< 6	< 10	< 5	< 9	< 5	< 9	< 7	< 4	< 5	< 21	< 7
	10/10/2024 - 10/10/2024	< 7	< 7	< 16	< 6	< 15	< 6	< 10	< 10	< 8	< 6	< 26	< 8
BD-50	03/28/2024 - 03/28/2024	< 6	< 5	< 10	< 6	< 10	< 7	< 10	< 11	< 5	< 6	< 30	< 11
	04/11/2024 - 04/11/2024	< 7	< 7	< 16	< 8	< 16	< 5	< 11	< 10	< 8	< 7	< 32	< 11
	07/11/2024 - 07/11/2024	< 4	< 4	< 9	< 5	< 11	< 5	< 9	< 9	< 5	< 5	< 23	< 7
	10/10/2024 - 10/10/2024	< 6	< 7	< 13	< 6	< 9	< 6	< 11	< 11	< 5	< 6	< 24	< 9

Table 24, Quarterly Ground Water Gamma Isotopic (pCi/L ± 2 Sigma) Cont'd

Station	Collection Dates	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
BD-51	01/11/2024 - 01/11/2024	< 6	< 5	< 12	< 6	< 12	< 5	< 10	< 13	< 5	< 6	< 31	< 14
	04/11/2024 - 04/11/2024	< 7	< 6	< 14	< 8	< 13	< 6	< 12	< 11	< 7	< 7	< 29	< 10
	07/11/2024 - 07/11/2024	< 5	< 5	< 11	< 5	< 9	< 5	< 8	< 8	< 4	< 5	< 22	< 9
	10/10/2024 - 10/10/2024	< 5	< 7	< 10	< 7	< 11	< 7	< 8	< 8	< 6	< 6	< 32	< 14
BD-54	01/11/2024 - 01/11/2024	< 4	< 5	< 11	< 4	< 10	< 5	< 8	< 14	< 5	< 5	< 32	< 7
	04/11/2024 - 04/11/2024	< 6	< 7	< 12	< 7	< 11	< 7	< 12	< 12	< 6	< 7	< 31	< 9
	07/11/2024 - 07/11/2024	< 4	< 4	< 9	< 5	< 8	< 5	< 8	< 6	< 5	< 4	< 18	< 8
	10/10/2024 - 10/10/2024	< 7	< 6	< 11	< 8	< 15	< 8	< 12	< 12	< 8	< 7	< 37	< 11

Table 25, Semi-Annual Fish Iron-55, Nickel-63, and Gamma Isotopic (pCi/kg Wet ± 2 Sigma)

Station		Collection Dates	Fe-55	Ni-63	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
BD-25	Channel Catfish	06/03/2024	< 254	< 60	< 71	< 66	< 126	< 76	< 147	< 84	< 127	< 148	< 66	< 57	< 418	< 142
	Smallmouth Bass	06/03/2024	< 212	< 67	< 94	< 72	< 178	< 92	< 175	< 69	< 118	< 177	< 85	< 80	< 460	< 142
	Common Carp	09/23/2024	< 183	< 158	< 72	< 62	< 120	< 75	< 125	< 79	< 107	< 332	< 60	< 66	< 692	< 217
	Bigmouth Buffalo	09/23/2024	< 253	< 133	< 70	< 96	< 151	< 61	< 151	< 77	< 120	< 391	< 85	< 72	< 695	< 225
BD-28	Flathead Catfish	06/03/2024	< 143	< 73	< 58	< 60	< 107	< 68	< 135	< 71	< 97	< 102	< 64	< 58	< 253	< 102
	Common Carp	06/03/2024	< 242	< 75	< 68	< 63	< 154	< 50	< 137	< 75	< 125	< 121	< 66	< 58	< 349	< 88
	Channel Catfish	09/23/2024	< 248	< 119	< 50	< 52	< 124	< 48	< 104	< 51	< 77	< 263	< 51	< 42	< 407	< 123
	Common Carp	09/23/2024	< 254	< 124	< 68	< 61	< 200	< 63	< 119	< 77	< 77	< 497	< 53	< 59	< 715	< 273
BD-41	Largemouth Bass	06/03/2024	< 248	< 65	< 65	< 79	< 185	< 79	< 161	< 94	< 107	< 142	< 75	< 53	< 299	< 154
	Flathead Catfish	06/03/2024	< 215	< 53	< 62	< 61	< 142	< 82	< 91	< 69	< 102	< 115	< 57	< 51	< 318	< 121
	Largemouth Bass	09/23/2024	< 157	< 109	< 47	< 62	< 144	< 42	< 117	< 70	< 116	< 535	< 52	< 49	< 819	< 229
	Common Carp	09/23/2024	< 259	< 159	< 62	< 73	< 165	< 60	< 110	< 78	< 140	< 629	< 76	< 54	< 775	< 308

Table 26, Semi-Annual Shoreline Sediment Iron-55, Nickel-63, and Gamma Isotopic (pCi/kg Dry ± 2 Sigma)

Station	Collection Dates	Fe-55	Ni-63	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	Cs-134	Cs-137	Ba-140	La-140
BD-10	05/15/2024	< 1987	< 235	< 56	< 55	< 134	< 71	< 126	< 60	< 106	< 69	< 75	< 225	< 79
	10/16/2024	< 1982	< 235	< 87	< 90	< 192	< 97	< 281	< 113	< 154	< 110	< 95	< 398	< 125
BD-25	05/15/2024	< 1935	< 217	< 50	< 51	< 120	< 57	< 111	< 53	< 80	< 59	**121** ± 74	< 226	< 88
	10/16/2024	< 1544	< 240	< 53	< 57	< 114	< 57	< 130	< 58	< 113	< 65	< 67	< 258	< 68
BD-57	05/15/2024	< 1602	< 251	< 43	< 47	< 115	< 52	< 129	< 47	< 82	< 59	< 48	< 205	< 54
	10/16/2024	< 1473	< 131	< 69	< 70	< 130	< 61	< 160	< 78	< 110	< 72	< 76	< 331	< 103

Attachment 3, Cross Check Intercomparison Program

Participation in cross check intercomparison studies is mandatory for laboratories performing analyses of REMP samples satisfying the requirements in the Offsite Site Dose Calculation Manual. Intercomparison studies provide a consistent and effective means to evaluate the accuracy and precision of analyses performed by a laboratory. Study results should fall within specified control limits and results that fall outside the control limits are investigated and corrected.

Teledyne Brown Engineering Inc. (TBE) participated in the following proficiency testing studies provided by Eckert Ziegler Analytics, DOE's Mixed Analyte Performance Evaluation Program (MAPEP), and/or Environmental Resource Associates (ERA) in 2024. The Laboratory's intercomparison program results for 2024 are summarized below.

For the TBE laboratory, 152 out of 167 analyses performed met the specified acceptance criteria. Fifteen analyses did not meet the specified acceptance criteria and were addressed through the TBE Corrective Action Program. A summary is found below:

I. NCR 24-02: ERA March MRAD-40 study with Air Particulate AM-241 evaluated as "Not Acceptable." TBE reported 38.8 pCi/filter and the known value returned at 55.0 pCi/filter (range 39.3-73.3). The root cause investigation determined that the sample was not logged into the system correctly and therefore not prepared with the required tracer. To correct and prevent recurrence, personnel involved are to utilize a template to ensure all analyses are logged as required and the QA Manager will perform sample log review as a back up to ensure accuracy. Acceptable results returned in a later sample study, supporting effectiveness of corrective action.

II. NCR 24-03: ERA March MRAD-40 air particulate study GR-B evaluated as "Not Acceptable." TBE reported 42.1 pCi/filter and the known value returned at 22.2 pCi/filter (range 13.5-33.5). The root cause investigation determined that alpha-to-beta crosstalk was more significant than normal which caused the beta activity to report falsely high data. To correct and prevent recurrence, personnel involved are to adjust the alpha-to-beta crosstalk via correction calculation measures when high alpha activities are observed. Acceptable results returned in a later sample study, supporting effectiveness of corrective action.

III. NCR 24-05: ERA April RAD-137 water study GR-A evaluated as "Not Acceptable." TBE reported 35.2 pCi/L and the known value returned at 52.6 pCi/L (range 39.6-65.6). The root cause investigation determined that the provided samples contained a solids content that was significantly higher than the typical client samples tested by the laboratory. A set aliquot volume for prior ERA samples was used and not adjusted to account for the sudden increase in solid content. To correct and prevent recurrence, new sample types were ordered from ERA that used Am-241 to better reflect client sample testing and acceptable results were achieved. Acceptable results returned in a later sample study, supporting effectiveness of corrective action.

IV. NCR 24-06: E&Z Analytics March E14092 air particulate study Co-60 evaluated as "Not Acceptable." TBE reported 168 pCi and the known value returned at 126 pCi.

Additionally, March E14093 soil Ce-141 evaluated as "Not Acceptable." TBE reported 0.106pCi/g and the known value returned at 0.071pCi/g. The root cause investigation was unable to determine any anomaly thus no proposed corrective action. No recurrence has occurred.

V. CAR 24-02 (CAR 23-31): MAPEP February 24-MaS50 soil study Fe-55 evaluated as "Not Acceptable." TBE reported 297 Bg/Kg and the known value returned at 650 Bg/Kb (range 455-845). The root cause investigation suspects that the current analytical procedure is not sufficient to add the interferences added to the sample by MAPEP. This investigation is still ongoing (See NCR 24-16) as the suggested corrective action did not provide desired results.

VI. NCR 24-08: MAPEP February 24-MaS50 soil study Ni-63 evaluated as "Not Acceptable." TBE reported 1070 Bg/Kg and the known value returned at 1530 Bg/Kb (range 1071-1989). The root cause investigation suspected that the sample contained added interferences that are not typically seen in client samples. All QC efforts associated with the sample were acceptable and no anomalies found, even after reanalysis. To correct and prevent recurrence, samples suspected of additional interferences will include the addition of Ni-59 tracer to determine yield results when calculating results. TBE analytical procedure TBE-2013 was updated to include this change.

VII. NCR 24-09: MAPEP February 24-MaSU50 urine study Zn-65 evaluated as "Not Acceptable." The root cause investigation determined that the sample was spiked lower than TBE's typical detection limit and client requirements. The report was revised by MAPEP indicating "Not Evaluated," resulting in this nuclide to not be considered a failure.

VIII. NCR 24-10: MAPEP February 24-MaW50 water study Tc-99 evaluated as "Not Acceptable." TBE reported 9.95Bg/L and the known value returned 7.47Bg/L (range 5.23-9.71). The root cause investigation suspects Thorium interference that was not removed during the column separation process of the analytical procedure; however, it cannot be confirmed as all QC efforts associated with the sample were acceptable and with no anomalies found. To potentially correct and prevent recurrence, an additional rinse step was added to the procedure. Acceptable results returned in a later sample study, supporting effectiveness of corrective action.

IX. NCR 24-11: MAPEP February 24-RdV50 vegetation study Sr-90 evaluated as "Not Acceptable." TBE reported 0.276Bg/sample and the known value returned 0.529Bg/sample (range 0.370-0.688). The root cause investigation determined a laboratory accident resulting in a spilled (loss) of sample. No corrective action was performed as the cause was an unintentional sample spill.

X. NCR 24-14: ERA September MRAD-41 air particulate study U-234/238 evaluated as "Not Acceptable." TBE reported 14.0/14.2 pCi/filter and the known value returned at 31.1/30.9 pCi/filter (range 23.1-36.9). The root cause investigation determined that the laboratory technician placed double the amount of tracer in the sample by error. To correct and prevent recurrence, samples that have been digested/leached with carrier/tracer added will have a label placed over the cap indicating it has already been added. Additionally, the beaker that aliquot is put in should have markings to indicate

carrier/tracer has already been added to the sample.

XI. NCR 24-15: ERA September MRAD-41 water study Fe-55 evaluated as "Not Acceptable." TBE reported 615 pCi/L and the known value returned at 1230 pCi/L (range 723-1790). The root cause is still under investigation.

XII. NCR 24-16: MAPEP August 24-MaS50 soil study Fe-55 evaluated as "Not Acceptable." TBE did not report a value and the known value returned 780Bg/Kg (range 546-1014). The root cause is still under investigation.

XIII. NCR 24-17: MAPEP August 24-RdV51 vegetation study Sr-90 evaluated as "Not Acceptable." TBE reported 0.95Bg/sample and the known value returned 2.39Bg/sample (range 1.67-3.11). The root cause is still under investigation.

Table 27: Analytics Environmental Radioactivity Cross Check Program

Teledyne Brown Engineering Environmental Services

Month/Year	Identification Number	Matrix	Nuclide	Units	TBE Reported Value	Known Value [a]	Ratio of TBE to Analytics Result	Evaluation [b]
March 2024	E14089	Milk	Sr-89	pCi/L	79.6	78.2	1.02	A
			Sr-90	pCi/L	12.6	11.9	1.06	A
	E14090	Milk	Ce-141	pCi/L	75.6	85.0	0.89	A
			Co-58	pCi/L	-0.069	Not Measured		
			Co-60	pCi/L	139	158	0.88	A
			Cr-51	pCi/L	212	230	0.92	A
			Cs-134	pCi/L	167	198	0.84	A
			Cs-137	pCi/L	158	171	0.93	A
			Fe-59	pCi/L	81.1	86.5	0.94	A
			I-131	pCi/L	80.9	90.8	0.89	A
			Mn-54	pCi/L	173	183	0.95	A
			Zn-65	pCi/L	165	176	0.93	A
	E14091	Charcoal	I-131	pCi	90.1	90.3	1.00	A
	E14092	AP	Ce-141	pCi	68.1	67.5	1.01	A
			Co-58	pCi	1.73	Not Measured		
			Co-60	pCi	168	126	1.34	N(1)
			Cr-51	pCi	182	183	0.99	A
			Cs-134	pCi	157	157	1.00	A
			Cs-137	pCi	132	136.0	0.97	A
			Fe-59	pCi	70.3	68.6	1.02	A
			Mn-54	pCi	144	145	0.99	A
			Zn-65	pCi	125	140	0.89	A
	E14093	Soil	Ce-141	pCi/g	0.106	0.071	1.48	N(1)
			Co-58	pCi/g	-0.005	Not Measured		
			Co-60	pCi/g	0.121	0.133	0.91	A
			Cr-51	pCi/g	0.198	0.194	1.02	A
			Cs-134	pCi/g	0.206	0.166	1.24	W
			Cs-137	pCi/g	0.207	0.209	0.99	A
			Fe-59	pCi/g	0.063	0.073	0.87	A
			Mn-54	pCi/g	0.140	0.153	0.91	A
			Zn-65	pCi/g	0.149	0.148	1.01	A
	E14094	AP	Sr-89	pCi	83.9	90.6	0.93	A
			Sr-90	pCi	11.7	13.8	0.85	A

(a) The Analytics known value is equal to 100% of the parameter present in the standard as determined by gravimetric and/or volumetric measurements made during standard preparation

(b) Analytics evaluation based on TBE internal QC limits:
A = Acceptable - reported result falls within ratio limits of 0.80-1.20
W = Acceptable with warning - reported result falls within 0.70-0.80 or 1.20-1.30
N = Not Acceptable - reported result falls outside the ratio limits of < 0.70 and > 1.30

(1) See **NCR 24-06**

Table 27: Analytics Environmental Radioactivity Cross Check Program Cont'd

Teledyne Brown Environmental Services

Month/Year	Identification Number	Matrix	Nuclide	Units	TBE Reported Value	Known Value [a]	Ratio of TBE to Analytics Result	Evaluation [b]
September 2024	E14095	Milk	Sr-89	pCi/L	88.0	92.3	0.95	A
			Sr-90	pCi/L	12.4	15.2	0.82	A
	E14096	Milk	Ce-141	pCi/L	124	124	1.00	A
			Co-58	pCi/L	154	150	1.03	A
			Co-60	pCi/L	232	236	0.98	A
			Cr-51	pCi/L	284	274	1.04	A
			Cs-134	pCi/L	180.0	187	0.96	A
			Cs-137	pCi/L	126	127	0.99	A
			Fe-59	pCi/L	127.0	113	1.12	A
			I-131	pCi/L	85.3	89.0	0.96	A
			Mn-54	pCi/L	162	162	1.00	A
			Zn-65	pCi/L	294	275	1.07	A
	E14097	Charcoal	I-131	pCi	98.8	92.6	1.07	A
	E14098	AP	Ce-141	pCi	82.0	76.7	1.07	A
			Co-58	pCi	91.0	92.6	0.98	A
			Co-60	pCi	180	146	1.23	W
			Cr-51	pCi	208	170	1.22	W
			Cs-134	pCi	116	116	1.00	A
			Cs-137	pCi	83.1	78.9	1.05	A
			Fe-59	pCi	75.6	70.2	1.08	A
			Mn-54	pCi	101	100	1.01	A
			Zn-65	pCi	167	170	0.98	A
	E14099	Soil	Ce-141	pCi/g	0.224	0.222	1.01	A
			Co-58	pCi/g	0.249	0.268	0.93	A
			Co-60	pCi/g	0.420	0.423	0.99	A
			Cr-51	pCi/g	0.492	0.492	1.00	A
			Cs-134	pCi/g	0.278	0.336	0.83	A
			Cs-137	pCi/g	0.276	0.295	0.94	A
			Fe-59	pCi/g	0.233	0.204	1.14	A
			Mn-54	pCi/g	0.279	0.290	0.96	A
			Zn-65	pCi/g	0.538	0.494	1.09	A
	E14100	AP	Sr-89	pCi	79.8	82.7	0.96	A
			Sr-90	pCi	12.0	13.6	0.88	A
	E14197	Liquid	Gr-A (Am241)	pCi/L	47.6	50.1	0.95	A
			Gr-B (Cs137)	pCi/L	248	270	0.92	A

(a) The Analytics known value is equal to 100% of the parameter present in the standard as determined by gravimetric and/or volumetric measurements made during standard preparation

(b) Analytics evaluation based on TBE internal QC limits:
A = Acceptable - reported result falls within ratio limits of 0.80-1.20
W = Acceptable with warning - reported result falls within 0.70-0.80 or 1.20-1.30
N = Not Acceptable - reported result falls outside the ratio limits of < 0.70 and > 1.30

Table 28: DOE's Mixed Analyte Performance Evaluation Program (MAPEP)

Teledyne Brown Engineering Environmental Services

Month/Year	Identification Number	Matrix	Nuclide	Units	TBE Reported Value	Known Value (a)	Acceptance Range	Evaluation (b)
February 2024	24-MaS50	Soil	Fe-55	Bq/kg	297	650	455 - 845	N(3)
			Ni-63	Bq/kg	1070	1530	1071 - 1989	N(4)
			Tc-99	Bq/kg	325	336	235 - 437	A
			Th-228	Bq/kg	34.6	48.8	34.2 - 63.4	W
			Th-230	Bq/kg	49.7	54.0	38.0 - 70.0	A
			Th-232	Bq/kg	36.4	45.1	31.6 - 58.6	A
	24-MaSU50	Urine	Cs-134	Bq/L	1.12	1.36	0.95 - 1.77	A
			Cs-137	Bq/L	2.00	2.23	1.56 - 2.90	A
			Co-57	Bq/L	1.06	1.26	0.88 - 1.64	A
			Co-60	Bq/L	2.26	2.38	1.67 - 3.09	A
			K-40	Bq/L	-1.80	NR	-	
			Mn-54	Bq/L	1.44	1.51	1.06 - 1.96	A
			U-234	Bq/L	0.00101		*(1)*	A
			U-238	Bq/L	0.00228		*(1)*	A
			Zn-65	Bq/L	-0.42	0.84	0.59 - 1.09	NE(5)
	24-MaW50	Water	Ni-63	Bq/L	0.338	0.80	*(2)*	A
			Tc-99	Bq/L	9.95	7.47	5.23 - 9.71	N(6)
	24-RdV50	Vegetation	Cs-134	Bq/sample	2.80	3.67	2.57 - 4.77	W
			Cs-137	Bq/sample	2.21	2.57	1.80 - 3.34	A
			Co-57	Bq/sample	2.23	2.53	1.77 - 3.29	A
			Co-60	Bq/sample	2.42	2.96	2.07 - 3.85	A
			Mn-54	Bq/sample	0.033		*(1)*	A
			Sr-90	Bq/sample	0.276	0.529	0.370 - 0.688	N(7)
			Zn-65	Bq/sample	6.83	8.02	5.61 - 10.43	A

(a) The MAPEP known value is equal to 100% of the parameter present in the standard as determined by gravimetric and/or volumetric measurements made during standard preparation

(b) DOE/MAPEP evaluation:

A = Acceptable - reported result falls within ratio limits of 0.80-1.20

W = Acceptable with warning - reported result falls within 0.70-0.80 or 1.20-1.30

N = Not Acceptable - reported result falls outside the ratio limits of < 0.70 and > 1.30

(1) False positive test

(2) Sensitivity evaluation

(3) See **CAR 23-31 - Analyte not on XCHK list**

(4) See **NCR 24-08**

(5) Not Evaluated

(6) See **NCR 24-10**

(7) See **NCR 24-11**

(8) Not Reported

(9) See **NCR 24-16**

(10) See **NCR 24-17**

Table 28: DOE's Mixed Analyte Performance Evaluation Program (MAPEP) Cont'd

Teledyne Brown Engineering Environmental Services

Month/Year	Identification Number	Matrix	Nuclide	Units	TBE Reported Value	Known Value (a)	Acceptance Range	Evaluation (b)
August 2024	24-MaS51	Soil	Fe-55	Bq/kg	*(8)*	780	546 - 1014	N(9)
			Ni-63	Bq/kg	1140.00	1450.00	1015 - 1885	W
			Tc-99	Bq/kg	155.00	171.00	120 - 222	A
			Th-228	Bq/kg	38.00	43.30	30.3 - 56.3	A
			Th-230	Bq/kg	46.10	44.00	30.8 - 57.2	A
			Th-232	Bq/kg	38.90	42.60	29.8 - 55.4	A
	24-MaW51	Water	Ni-63	Bq/L	0.60	-	*(1)*	A
			Tc-99	Bq/L	11.90	11.20	7.8 - 14.6	A
	24-RdV51	Vegetation	Cs-134	Bq/sample	3.12	2.89	2.02 - 3.76	A
			Cs-137	Bq/sample	2.18	1.91	1.34 - 2.48	A
			Co-57	Bq/sample	0.00	-	*(1)*	A
			Co-60	Bq/sample	2.24	2.01	1.41 - 2.61	A
			Mn-54	Bq/sample	3.76	3.53	2.47 - 4.59	A
			Sr-90	Bq/sample	0.95	2.39	1.67 - 3.11	N(10)
			Zn-65	Bq/sample	10.30	9.13	6.39 - 11.87	A

(a) The MAPEP known value is equal to 100% of the parameter present in the standard as determined by gravimetric and/or volumetric measurements made during standard preparation

(b) DOE/MAPEP evaluation:

A = Acceptable - reported result falls within ratio limits of 0.80-1.20

W = Acceptable with warning - reported result falls within 0.70-0.80 or 1.20-1.30

N = Not Acceptable - reported result falls outside the ratio limits of < 0.70 and > 1.30

(1) False positive test

(2) Sensitivity evaluation

(3) See **CAR 23-31 - Analyte not on XCHK list**

(4) See **NCR 24-08**

(5) Not Evaluated

(6) See **NCR 24-10**

(7) See **NCR 24-11**

(8) Not Reported

(9) See **NCR 24-16**

(10) See **NCR 24-17**

Table 29: ERA Environmental Radioactivity Cross Check Program

Teledyne Brown Engineering Environmental Services

Month/Year	Identification Number	Matrix	Nuclide	Units	TBE Reported Value	Known Value [a]	Acceptance Limits	Evaluation [b]
March 2024	MRAD-40	Water	Am-241	pCi/L	101	139	95.4 - 178	A
			Fe-55	pCi/L	2185	2480	1460- 3610	A
			Pu-238	pCi/L	62.0	70.4	42.3 - 91.2	A
			Pu-239	pCi/L	61.2	76.5	47.3 - 94.3	A
		Soil	Am-241	pCi/kg	NR	1880	1020 - 2660	
			Pu-238	pCi/kg	667	512	255 - 778	A
			Pu-239	pCi/kg	562	545	297 - 784	A
			Sr-90	pCi/kg	4050	3630	1130 - 5650	A
			U-234	pCi/kg	3040	4360	2040 - 5710	A
			U-238	pCi/kg	3270	4320	2370 - 5800	A
		AP	Am-241	pCi/filter	38.8	55.0	39.3 - 73.3	N(1)
			Fe-55	pCi/filter	387	386	141 - 616	A
			Pu-238	pCi/filter	45.9	41.1	31.0 - 50.5	A
			Pu-239	pCi/filter	54.9	56.1	41.9 - 67.7	A
			U-234	pCi/filter	11.1	11.6	8.60 - 13.6	A
			U-238	pCi/filter	12.8	11.5	8.68 - 13.7	A
			GR-A	pCi/filter	116	95.9	50.1 - 158	A
			GR-B	pCi/filter	42.1	22.2	13.5 - 33.5	N(2)
April 2024	RAD-137	Water	Ba-133	pCi/L	62.8	65.9	50.1 - 81.7	A
			Cs-134	pCi/L	51.0	57.8	42.8 - 72.8	A
			Cs-137	pCi/L	153	186	149 - 223	A
			Co-60	pCi/L	92.1	98.8	79.7 - 118	A
			Zn-65	pCi/L	208	240	188 - 292	A
			GR-A	pCi/L	35.2	52.6	39.6 - 65.6	N(3)
			GR-B	pCi/L	49	46.5	33.9 - 59.1	A
			U-Nat	pCi/L	56.0	59.3	52.8-65.8	A
			H-3	pCi/L	19,000	21,300	18,200 - 24,400	A
			Sr-89	pCi/L	48.9	52.2	37.8 - 66.6	A
			Sr-90	pCi/L	32.6	37.6	32.0 - 43.2	A
			I-131	pCi/L	21.8	25.1	21.7 - 28.5	A

(a) The ERA known value is equal to 100% of the parameter present in the standard as determined by gravimetric and/or volumetric measurements made during standard preparation.

(b) ERA evaluation:

A = Acceptable - Reported value falls within the Acceptance Limits

N = Not Acceptable - Reported value falls outside of the Acceptance Limits

*(1) See **NCR 24-02***

*(2) See **NCR 24-03***

*(3) See **NCR 24-05***

*(4) See **NCR 24-15***

*(5) See **NCR 24-14***

Attachment 4, Environmental Direct Radiation Dosimetry Results

Monitoring Location	Quarterly Baseline, B_Q (mrem)	B_Q + MDD_Q (mrem)	Normalized Quarterly Monitoring Data, M_Q (mrem)				Quarterly Facility Dose, $F_Q=M_Q-B_Q$ (mrem, or "ND" if $F_Q \leq MDD_Q$)				Annual Baseline, B_A (mrem)	B_A + MDD_A (mrem)	Annual Monitoring Data, M_A (mrem)	Annual Facility Dose, $F_A=M_A-B_A$ (mrem, or "ND" if $F_A \leq MDD_A$)
			1	2	3	4	1	2	3	4				
BD-03	16.2	20.9	16.3	13.4	13.1	16.8	ND	ND	ND	ND	64.9	74.6	59.6	ND
BD-02	15.9	20.6	14.1	16.5	16.2	16.8	ND	ND	ND	ND	63.8	73.4	63.6	ND
BD-04	15.1	19.7	13.8	14.8	13.4	15.9	ND	ND	ND	ND	60.4	70.1	57.9	ND
BD-05	16.1	20.8	16.7	17.2	15.6	16.6	ND	ND	ND	ND	64.5	74.1	66.1	ND
BD-101	15.7	20.4	17.0	14.3	14.4	15.1	ND	ND	ND	ND	62.9	72.5	60.8	ND
BD-102	15.7	20.3	12.6	15.3	13.7	14.5	ND	ND	ND	ND	62.6	72.3	56.1	ND
BD-103	15.6	20.2	15.8	17.1	14.6	15.3	ND	ND	ND	ND	62.4	72.0	62.8	ND
BD-104	14.6	19.2	15.7	14.9	12.9	14.1	ND	ND	ND	ND	58.4	68.1	57.6	ND
BD-105	14.9	19.5	13.6	13.0	13.9	13.7	ND	ND	ND	ND	59.5	69.1	54.2	ND
BD-106	14.5	19.2	13.0	14.3	15.0	16.4	ND	ND	ND	ND	58.2	67.8	58.7	ND
BD-107	14.7	19.4	14.8	16.3	15.3	15.8	ND	ND	ND	ND	58.9	68.6	62.2	ND
BD-108	15.3	20.0	15.2	14.0	13.7	15.5	ND	ND	ND	ND	61.3	70.9	58.4	ND
BD-109	18.3	22.9	18.2	17.6	17.5	17.9	ND	ND	ND	ND	73.2	82.9	71.2	ND
BD-110	14.5	19.2	12.4	14.2	12.7	14.0	ND	ND	ND	ND	58.1	67.8	53.3	ND
BD-111a	15.2	19.9	14.6	12.9	14.4	12.0	ND	ND	ND	ND	60.9	70.6	53.9	ND
BD-112	14.8	19.4	14.0	15.4	14.4	13.1	ND	ND	ND	ND	61.9	71.5	56.9	ND
BD-113a	15.7	20.3	14.5	14.7	14.7	13.9	ND	ND	ND	ND	62.8	72.5	57.8	ND
BD-114	15.4	20.0	14.9	15.9	14.7	15.1	ND	ND	ND	ND	61.4	71.1	60.6	ND
BD-115	15.5	20.1	15.3	18.3	14.3	15.4	ND	ND	ND	ND	61.9	71.6	63.3	ND

MDD_Q = Quarterly Minimum Differential Dose = 4.63 mrem
MDD_A = Annual Minimum Differential Dose = 9.65 mrem
ND = Not Detected, where $M_Q \leq (B_Q+MDD_Q)$ or $M_A \leq (B_A+MDD_A)$

Attachment 4, Environmental Direct Radiation Dosimetry Results

Monitoring Location	Quarterly Baseline, B_Q (mrem)	B_Q + MDD_Q (mrem)	Normalized Quarterly Monitoring Data, M_Q (mrem)				Quarterly Facility Dose, $F_Q=M_Q-B_Q$ (mrem, or "ND" if $F_Q \leq MDD_Q$)				Annual Baseline, B_A (mrem)	B_A + MDD_A (mrem)	Annual Monitoring Data, M_A (mrem)	Annual Facility Dose, $F_A=M_A-B_A$ (mrem, or "ND" if $F_A \leq MDD_A$)
			1	2	3	4	1	2	3	4				
BD-116	16.1	20.8	15.6	14.9	15.8	16.3	ND	ND	ND	ND	64.6	74.2	62.6	ND
BD-201	18.5	23.2	19.1	19.3	19.2	19.1	ND	ND	ND	ND	70.4	80.1	76.7	ND
BD-202	15.6	20.2	15.7	14.5	14.5	14.0	ND	ND	ND	ND	59.2	68.8	58.7	ND
BD-203	15.3	20.0	13.8	14.1	14.8	16.7	ND	ND	ND	ND	61.3	70.9	59.4	ND
BD-204	14.5	19.1	13.3	14.7	12.7	13.9	ND	ND	ND	ND	58.1	67.7	54.6	ND
BD-205	14.8	19.5	15.1	14.1	13.2	14.7	ND	ND	ND	ND	59.3	69.0	57.1	ND
BD-206	15.4	20.1	15.1	15.3	14.3	15.7	ND	ND	ND	ND	61.8	71.4	60.4	ND
BD-207	14.4	19.0	14.5	13.9	14.2	12.4	ND	ND	ND	ND	57.6	67.2	55.0	ND
BD-208	15.3	19.9	15.4	15.2	14.5	12.9	ND	ND	ND	ND	61.2	70.8	58.0	ND
BD-209	19.9	24.5	18.4	18.9	19.0	17.9	ND	ND	ND	ND	79.4	89.1	74.2	ND
BD-210	17.3	21.9	16.9	17.8	15.9	18.2	ND	ND	ND	ND	69.2	78.8	68.8	ND
BD-211	19.8	24.4	20.7	21.8	18.8	19.1	ND	ND	ND	ND	79.0	88.7	80.4	ND
BD-212	17.9	22.5	15.4	15.8	13.7	15.6	ND	ND	ND	ND	71.5	81.2	60.5	ND
BD-213	14.3	18.9	13.1	15.9	14.6	11.2	ND	ND	ND	ND	57.2	66.8	54.8	ND
BD-214	16.8	21.4	16.5	16.0	16.7	19.4	ND	ND	ND	ND	67.1	76.7	68.6	ND
BD-215	14.9	19.6	15.7	15.1	14.4	13.6	ND	ND	ND	ND	59.8	69.4	58.8	ND
BD-216	17.4	22.1	15.3	17.1	17.2	16.8	ND	ND	ND	ND	69.7	79.4	66.4	ND
BD-06	15.0	19.7	12.2	15.5	12.9	14.8	ND	ND	ND	ND	60.1	69.8	55.4	ND

MDD_Q = Quarterly Minimum Differential Dose = 4.63 mrem
MDD_A = Annual Minimum Differential Dose = 9.65 mrem
ND = Not Detected, where $M_Q \leq (B_Q+MDD_Q)$ or $M_A \leq (B_A+MDD_A)$

Attachment 4, Environmental Direct Radiation Dosimetry Results

Monitoring Location	Quarterly Baseline, B_Q (mrem)	B_Q + MDD_Q (mrem)	Normalized Quarterly Monitoring Data, M_Q (mrem)				Quarterly Facility Dose, $F_Q=M_Q-B_Q$ (mrem, or "ND" if $F_Q \leq MDD_Q$)				Annual Baseline, B_A (mrem)	B_A + MDD_A (mrem)	Annual Monitoring Data, M_A (mrem)	Annual Facility Dose, $F_A=M_A-B_A$ (mrem, or "ND" if $F_A \leq MDD_A$)
			1	2	3	4	1	2	3	4				
BD-19	16.4	21.1	16.4	17.9	15.1	17.2	ND	ND	ND	ND	65.7	75.4	66.6	ND
BD-20	16.1	20.7	16.4	16.8	14.1	16.0	ND	ND	ND	ND	64.2	73.8	63.3	ND
BD-21	15.5	20.1	15.9	16.5	15.0	15.6	ND	ND	ND	ND	62.1	71.7	63.0	ND
BD-ISFSI-104-3	15.7	19.8	14.8	15.0	13.9	12.8	ND	ND	ND	ND	62.8	70.7	56.5	ND
BD-ISFSI-104-4	15.7	19.8	17.5	20.8	18.5	19.5	ND	5.1	ND	ND	62.8	70.7	76.3	13.5
BD-ISFSI-105-3	15.7	19.8	18.3	19.0	19.3	20.2	ND	ND	ND	4.5	62.8	70.7	76.8	14
BD-ISFSI-105-4	15.7	19.8	27.0	32.7	31.7	27.0	11.3	17.0	16.0	11.3	62.8	70.7	118.4	55.6
BD-ISFSI-110-3	15.7	19.8	62.5	64.0	60.5	61.4	46.8	48.3	44.8	45.7	62.8	70.7	248.4	185.6
BD-ISFSI-110-4	15.7	19.8	20.9	26.2	21.5	23.0	5.2	10.5	5.8	7.3	62.8	70.7	91.6	28.8

MDD_Q = Quarterly Minimum Differential Dose = 4.63 mrem
MDD_A = Annual Minimum Differential Dose = 9.65 mrem
ND = Not Detected, where $M_Q \leq (B_Q+MDD_Q)$ or $M_A \leq (B_A+MDD_A)$

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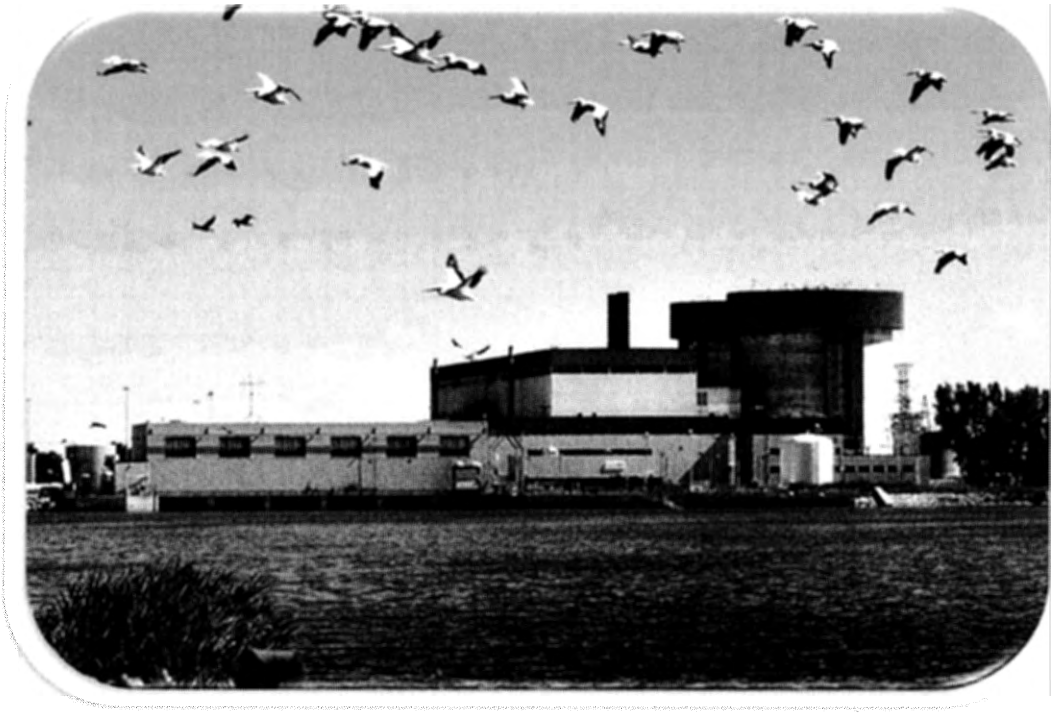
Constellation

Braidwood Nuclear Power Station



2024

Annual Radiological Groundwater Protection Program Report

Document Number: 50-456/50-457

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1.0 LIST OF ACRONYMS AND DEFINITIONS

1. Composite Sample: A series of single collected portions (aliquots) analyzed as one sample. The aliquots making up the sample are collected at time intervals that are very short compared to the composite period.

2. Control: A sampling station in a location not likely to be affected by plant effluents due to its distance and/or direction from the Plant.

3. Counting Error: An estimate of the two-sigma uncertainty associated with the sample results based on total counts accumulated.

4. Curie (Ci): A measure of radioactivity; equal to 3.7×10^{10} disintegrations per second, or 2.22×10^{12} disintegrations per minute.

5. Grab Sample: A single discrete sample drawn at one point in time.

6. Indicator: A sampling location that is potentially affected by plant effluents due to its proximity and/or direction from the plant.

7. Ingestion Pathway: The ingestion pathway includes milk, fish, drinking water and garden produce. Also sampled (under special circumstances) are other media such as vegetation or animal products when additional information about particular radionuclides is needed.

8. LLD: Lower Limit of Detection. An *a priori* measure of the detection capability of a radiochemistry measurement based on instrument setup, calibration, background, decay time, and sample volume. An LLD is expressed as an activity concentration. The MDA is used for reporting results. LLD are specified by a regulator, such as the NRC and are typically listed in the ODCM.

9. MDA: Minimum Detectable Activity. For radiochemistry instruments, the MDA is the *a posteriori* minimum concentration that a counting system detects. The smallest concentration or activity of radioactive material in a sample that will yield a net count above instrument background and that is detected with 95% probability, with only 5% probability of falsely concluding that a blank observation represents a true signal.

10. MDC: Minimum Detectable Concentration. Essentially synonymous with MDA for the purposes of radiological monitoring.

11. Mean: The sum of all of the values in a distribution divided by the number of values in the distribution, synonymous with average.

12. Microcurie (µCi): 3.7×10^4 disintegrations per second, or 2.22×10^6 disintegrations per minute.

13. millirem (mrem): 1/1000 rem; a unit of radiation dose equivalent in tissue.

14. Milliroentgen (mR): 1/1000 Roentgen; a unit of exposure to X- or gamma radiation.

15. N/A: Not Applicable

16. NEI: Nuclear Energy Institute

17. NRC: Nuclear Regulatory Commission

18. ODCM: Offsite Dose Calculation Manual

19. Protected Area: A 10 CFR 73 security term is an area encompassed by physical barriers and to which access is controlled for security purposes. The fenced area immediately surrounding the plant and around ISFSI are commonly classified by the licensee as "Protected areas." Access to the protected area requires a security badge or escort.

20. REMP: Radiological Environmental Monitoring Program

21. Restricted Area: A 10 CFRR 20 defined term where access to which is limited by the licensee for the purpose of protecting individuals against undue risks from exposure to radiation and radioactive materials.

22. TRM: Technical Requirements Manual

23. TS: Technical Specification

24. Unrestricted Area: An area, access to which is neither limited nor controlled by the licensee.

2.0 NEI 07-07 ONSITE RADIOLOGICAL GROUNDWATER MONITORING PROGRAM

Braidwood Nuclear Power Station has developed a Groundwater Protection Initiative (GPI) program in accordance with NEI 07-07, Industry Ground Water Protection Initiative – Final Guidance Document [1]. The purpose of the GPI is to ensure timely detection and an effective response to situations involving inadvertent radiological releases to groundwater in order to prevent migration of licensed radioactive material off-site and to quantify impacts on decommissioning. During 2024, Braidwood Station collected and analyzed groundwater samples in accordance with the requirements of approved procedures following regulatory methods..

This section is included in this report to communicate results of NEI 07-07 Radiological Groundwater Monitoring Program. Monitoring wells installed as part of GPI program are sampled and analyzed as summarized in Table 1, Groundwater Protection Program Monitoring Well Sampling Locations. In addition to reporting results from NEI 07-07 monitoring wells, voluntary communications to offsite governmental agencies for onsite leaks or spills per NEI 07-07 Objective 2.2, are also reported as part of this report. It is important to note, samples and results taken in support of NEI 07-07 groundwater monitoring program are not part of the Radiological Environmental Monitoring Program (REMP) but are reported as an attachment to the AREOR.

Table 1, Groundwater Protection Program Monitoring Well Sampling Locations

Site	Site Type
0WM31P	Drinking Water
MW-2	Monitoring Well
MW-4	Monitoring Well
MW-5	Monitoring Well
MW-6	Monitoring Well
MW-7	Monitoring Well
MW-9	Monitoring Well
MW-11	Monitoring Well
MW-102R	Monitoring Well
MW-141D	Monitoring Well
MW-142D	Monitoring Well
MW-143D	Monitoring Well
MW-144D	Monitoring Well
MW-145D	Monitoring Well
MW-154	Background Well
MW-155	Background Well
MW-159D	Monitoring Well
MW-162D	Monitoring Well
MW-BW-201S	Monitoring Well

Table 1, Groundwater Protection Program Monitoring Well Sampling Locations
Cont'd

Site	Site Type
MW-BW-202S	Monitoring Well
MW-BW-203S	Monitoring Well
MW-BW-207I	Monitoring Well
PS-7	Monitoring Well
PS-8	Monitoring Well
PS-9	Monitoring Well
PS-10	Monitoring Well
PS-11	Monitoring Well
PS-12	Monitoring Well
PS-13	Monitoring Well
PS-14	Monitoring Well
PS-15	Monitoring Well
RW-6	Recovery Well
RW-11	Recovery Well
RW-12	Recovery Well
VB1-1	Monitoring Well
VB2-5DR	Monitoring Well
VB3-2	Monitoring Well
VB5-2	Monitoring Well
VB6-1	Monitoring Well
VB7-1	Monitoring Well
VB6-1	Monitoring Well
VB7-1	Monitoring Well
VB8-2R	Monitoring Well
VB9-1	Monitoring Well
VB10-1R	Monitoring Well
VB11-1	Monitoring Well

MAP OF COLLECTION SITES

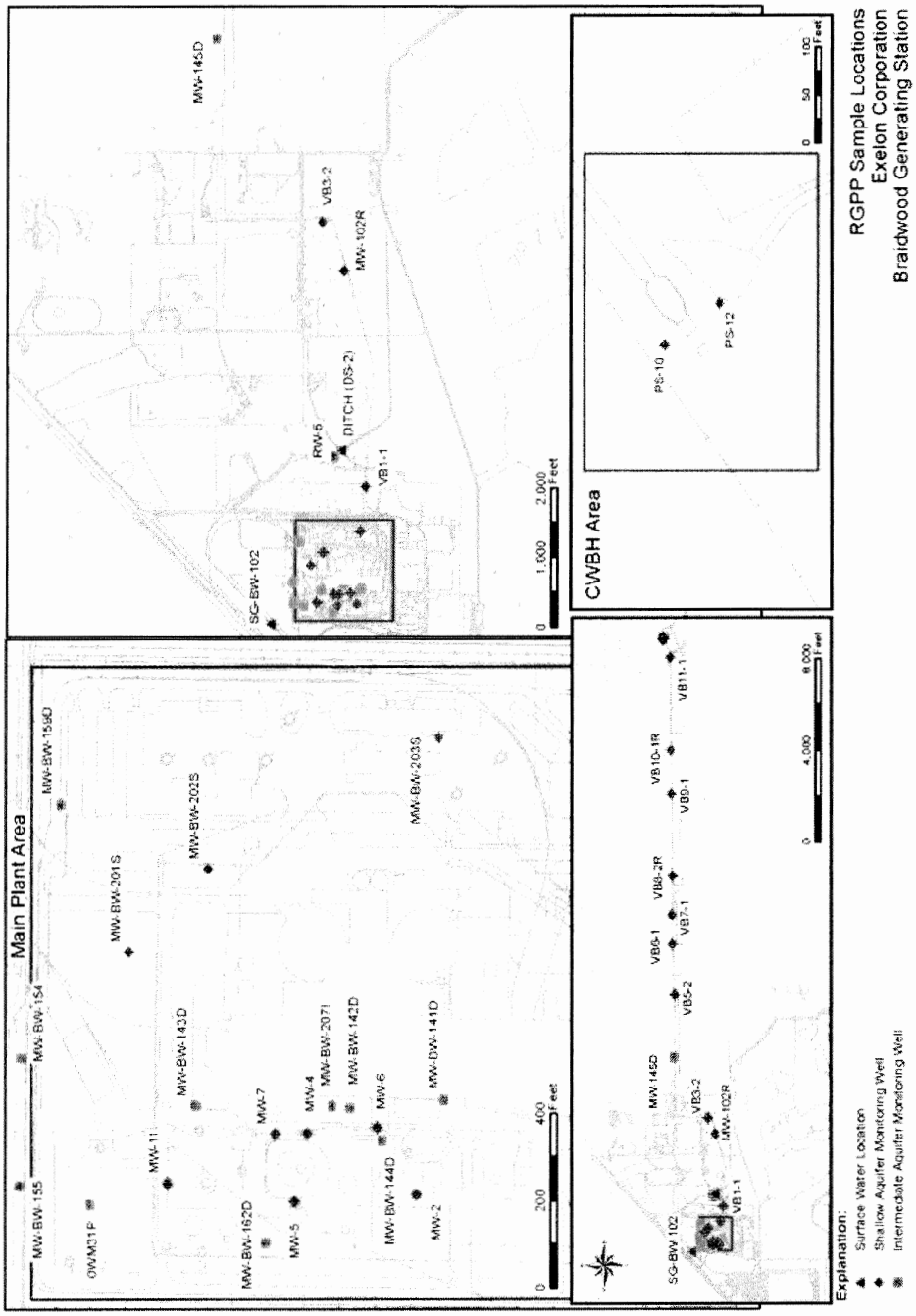

Figure 1, Groundwater Monitoring Well Sample Locations Braidwood Station, 2024

Radiological Groundwater Monitoring Program tritium results are summarized in Table 2, Groundwater Protection Monitoring Well Tritium and Strontium in Ground Water Samples (pCi/L ± 2 sigma). No groundwater monitoring locations had detectable gamma or HTD in 2024.

Table 2, Groundwater Protection Monitoring Well Tritium and Strontium in Ground Water Samples (pCi/L ± 2 sigma)

Site	Collection Date	H-3	Sr-89	Sr-90
MW-102R	2/15/2024	< 198	< 7	< 1.0
MW-102R	4/24/2024	< 193		
MW-102R	9/26/2024	< 187		
MW-102R	10/16/2024	< 197		
MW-11	2/13/2024	320 ± 134	< 10	< 0.9
MW-11	6/20/2024	304 ± 130		
MW-11	8/26/2024	< 180		
MW-11	10/15/2024	< 184		
MW-141D	2/14/2024	383 ± 136	< 5	< 0.9
MW-142D	2/14/2024	508 ± 139	< 7	< 0.9
MW-143D	2/14/2024	< 196	< 8	< 0.9
MW-144D	2/14/2024	533 ± 143	< 8	< 0.9
MW-145D	3/5/2024	< 187	< 8	< 0.9
MW-145D	5/1/2024	< 191		
MW-145D	7/24/2024	< 191		
MW-145D	10/3/2024	< 183		
MW-154	2/16/2024	< 195	< 6	< 1.0
MW-155	2/16/2024	< 195	< 8	< 0.9
MW-159D	2/13/2024	238 ± 128	< 6	< 0.9
MW-162D	2/13/2024	322 ± 131	< 9	< 0.9
MW-2	2/14/2024	848 ± 172	< 7	< 0.9
MW-2	4/25/2024	479 ± 135		
MW-2	8/26/2024	262 ± 121		
MW-2	10/14/2024	218 ± 122		
MW-4	2/14/2024	378 ± 133	< 8	< 1.0
MW-4	4/22/2024	473 ± 136		
MW-4	8/29/2024	341 ± 121		
MW-4	10/14/2024	336 ± 131		
MW-5	2/14/2024	415 ± 136	< 6	< 1.0
MW-5	4/25/2024	285 ± 128		
MW-5	9/11/2024	394 ± 125		
MW-5	10/14/2024	< 186		
MW-6	2/14/2024	701 ± 156	< 5	< 1.0
MW-6	4/25/2024	258 ± 136		
MW-6	8/29/2024	596 ± 136		

Table 2, Groundwater Protection Monitoring Well Tritium and Strontium in Ground Water Samples (pCi/L ± 2 sigma) Cont'd

Site	Collection Date	H-3	Sr-89	Sr-90
MW-7	2/14/2024	543 ± 142	< 7	< 1.0
MW-7	4/25/2024	398 ± 134		
MW-7	8/29/2024	383 ± 125		
MW-7	10/15/2024	288 ± 127		
MW-9	8/30/2024	< 189		
MW-BW-141D	4/25/2024	325 ± 127		
MW-BW-141D	8/28/2024	476 ± 131		
MW-BW-141D	10/14/2024	312 ± 130		
MW-BW-142D	4/25/2024	621 ± 143		
MW-BW-142D	8/29/2024	588 ± 143		
MW-BW-142D	10/14/2024	584 ± 142		
MW-BW-143D	4/23/2024	< 188		
MW-BW-143D	8/29/2024	< 189		
MW-BW-143D	10/14/2024	< 188		
MW-BW-144D	4/25/2024	738 ± 154		
MW-BW-144D	8/28/2024	348 ± 132		
MW-BW-144D	10/14/2024	291 ± 129		
MW-BW-154	4/26/2024	< 184		
MW-BW-154	9/27/2024	< 183		
MW-BW-154	10/16/2024	< 187		
MW-BW-155	4/26/2024	< 200		
MW-BW-155	9/27/2024	< 189		
MW-BW-155	10/16/2024	< 186		
MW-BW-159D	4/25/2024	< 189		
MW-BW-159D	8/26/2024	< 182		
MW-BW-159D	10/18/2024	< 183		
MW-BW-162D	4/22/2024	401 ± 131		
MW-BW-162D	9/12/2024	272 ± 123		
MW-BW-162D	10/15/2024	222 ± 125		
MW-BW-201S	2/14/2024	262 ± 130	< 8	< 0.9
MW-BW-201S	4/22/2024	< 194		
MW-BW-201S	9/11/2024	< 187		
MW-BW-201S	10/15/2024	< 187		
MW-BW-202I	8/30/2024	< 185		
MW-BW-202S	2/14/2024	249 ± 132	< 9	< 1.0

Table 2, Groundwater Protection Monitoring Well Tritium and Strontium in Ground Water Samples (pCi/L ± 2 sigma) Cont'd

Site	Collection Date	H-3	Sr-89	Sr-90
MW-BW-202S	4/22/2024	< 190		
MW-BW-202S	8/29/2024	< 183		
MW-BW-202S	10/15/2024	< 197		
MW-BW-203I	8/30/2024	< 192		
MW-BW-203S	2/13/2024	< 194	< 8	< 0.9
MW-BW-203S	4/22/2024	258 ± 126		
MW-BW-203S	8/29/2024	< 184		
MW-BW-203S	10/15/2024	< 191		
MW-BW-207I	2/14/2024	547 ± 143	< 8	< 0.9
MW-BW-207I	4/25/2024	423 ± 133		
MW-BW-207I	9/11/2024	302 ± 129		
MW-BW-207I	10/14/2024	259 ± 128		
PS-10	2/15/2024	< 196	< 5	< 0.9
PS-10	4/24/2024	< 193		
PS-10	9/26/2024	< 187		
PS-10	10/17/2024	< 190		
PS-12	2/15/2024	< 193	< 7	< 1.0
PS-12	4/24/2024	< 193		
PS-12	9/26/2024	< 194		
PS-12	10/17/2024	< 192		
RW-6	2/15/2024	< 198	< 6	< 0.8
RW-6	4/24/2024	< 186		
RW-6	9/27/2024	< 188		
RW-6	10/16/2024	< 190		
VB-11-1	10/3/2024	< 185		
VB-5-2	10/3/2024	< 187		
VB-6-1	10/3/2024	< 190		
VB-7-1	10/3/2024	< 186		
VB1-1	2/16/2024	< 193	< 8	< 0.8
VB1-1	4/26/2024	249 ± 123		
VB1-1	9/27/2024	< 191		
VB1-1	10/16/2024	< 188		
VB10-1R	3/5/2024	< 188	< 4	< 0.8
VB10-1R	5/1/2024	< 193		

Table 2, Groundwater Protection Monitoring Well Tritium and Strontium in Ground Water Samples (pCi/L ± 2 sigma) Cont'd

Site	Collection Date	H-3	Sr-89	Sr-90
VB10-1R	7/24/2024	< 193	< 5	< 1
VB10-1R	10/3/2024	< 189		
VB11-1	3/5/2024	< 191		
VB11-1	5/1/2024	< 193		
VB11-1	7/24/2024	< 195		
VB3-2	2/15/2024	< 198	< 7	< 0.9
VB3-2	5/11/2024	< 190		
VB3-2	9/26/2024	< 185		
VB3-2	10/17/2024	< 197		
VB5-2	3/5/2024	< 189	< 3	< 0.9
VB5-2	5/1/2024	< 195		
VB5-2	7/24/2024	< 191		
VB6-1	3/5/2024	< 187	< 5	< 0.9
VB6-1	5/1/2024	< 195		
VB6-1	7/24/2024	< 190		
VB7-1	3/5/2024	< 189	< 4	< 0.9
VB7-1	5/1/2024	< 197		
VB7-1	7/24/2024	< 195		
VB8-2R	3/5/2024	< 189	< 5	< 1.0
VB8-2R	5/1/2024	< 192		
VB8-2R	7/24/2024	< 189		
VB8-2R	10/3/2024	< 184		
VB9-1	3/5/2024	< 187	< 4	< 0.8
VB9-1	5/1/2024	< 197		
VB9-1	7/24/2024	< 195		
VB9-1	10/3/2024	< 184		

Table 3, Groundwater Protection Program Monitoring Well Gamma Isotopic in Groundwater Samples (pCi/L ± 2 sigma)

No Groundwater Samples Analyzed for Gamma Isotopic in 2024

Table 4, Groundwater Protection Program Monitoring Well Hard-To-Detects in Groundwater Samples (pCi/L ± 2 sigma)

No Groundwater Samples Analyzed for Hard-To-Detects in 2024

2.1 Voluntary Notification

During 2024, Braidwood Nuclear Power Station did not make a voluntary NEI 07-07 notification to State/Local officials, NRC, and to other stakeholders required by site procedures.

BIBLIOGRAPHY

[1] "NEI 07-07 - Industry Ground Water Protection Initiative — Final Guidance Document, Rev. 1," Nuclear Energy Institute, Washington, D.C., 2019.

[2] Nuclear Regulatory Commission, 25 June 2015. [Online]. Available: http://www.nrc.gov/reading-rm/basic-ref/students/animated-bwr.html. [Accessed October 2020].

[3] "Japan Atomic Energy Agency," 06 November 2020. [Online]. Available: https://www.jaea.go.jp/english/04/ntokai/houkan/houkan_02.html.

[4] "NRC Resource Page," [Online]. Available: http://www.nrc.gov/about-nrc/radiation.html. [Accessed 10 November 2020].

[5] Nuclear Regulatory Commission, 30 June 2015. [Online]. Available: http://www.nrc.gov/reading-rm/basic-ref/students/animated-pwr.html. [Accessed October 2020].

[6] "Regulatory Guide 1.109 - Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Demonstrating Compliance with 10 CFR Part 50, Appendix I," Nuclear Regulatory Commission, Ocotober, 1977.

[7] "NUREG-0133 - Preparation of Effluent Technical Specifications for Nuclear Power Plants," Nuclear Regulatory Commission, 1987.

[8] "NCRP Report No. 160 - Ionizing Radiation Exposure of the Population of the United States," National Council on Radiation Protection and Measurements, Bethesda, MD, 2009.

[9] Health Physics Society, [Online]. Available: http://hps.org/hpspublications/radiationfactsheets.html. [Accessed 2020].