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BRAIDWOOD STATION

UNIT 1 and UNIT 2

Annual Radiological
Environmental Operating Report

1 January through 31 December 2021

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Environmental Services

Exelon Generation®

Braidwood Station
Braceville, IL 60407

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Appendices

I. Preface

The following sections of the preface are meant to help define key concepts, provide clarity, and give context to the readers of this report.

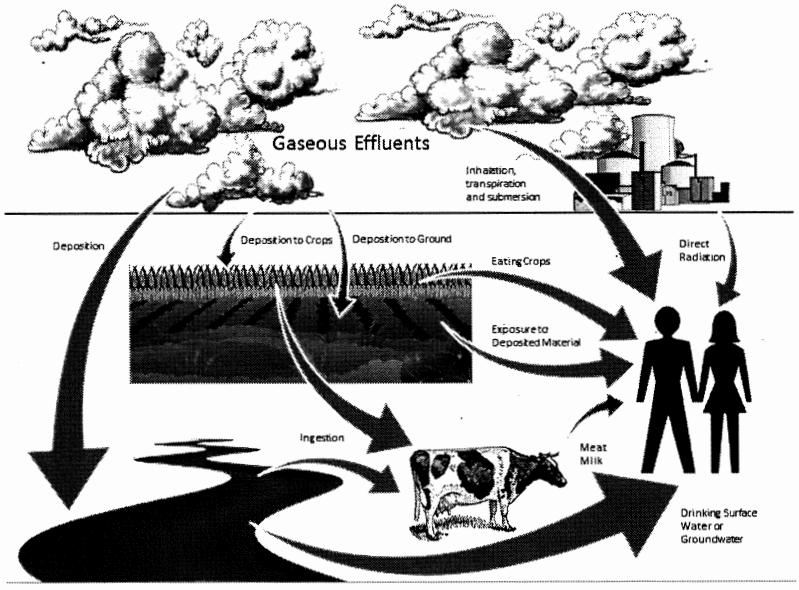
Annual Reports

The Nuclear Regulatory Commission (NRC) is the federal agency who has the role to protect public health and safety through the development of regulations governing nuclear power reactors and ensuring their compliance. As part of the many commitments Nuclear Power Plants have to the NRC to ensure this safety, they provide two reports annually to specifically address how the station's operation impacts the environment of local communities. The NRC then reviews these reports and makes them available to the public. The names of the reports are the Annual Radioactive Effluent Release Report (ARERR) and the Annual Radiological Environmental Operating Report (AREOR).

The ARERR reports the results of the sampling from the effluent release paths at the station analyzed for radioactivity. An effluent is a liquid or gaseous waste containing plant-related radioactive material emitted at the boundary of the facility.

The AREOR reports the results of the samples obtained in the environment surrounding the station. Environmental samples include air, water, vegetation, and other sample types that are identified as potential pathways radioactivity can reach humans.

Graphic 1. Examples of Gaseous and Liquid Effluent Pathways

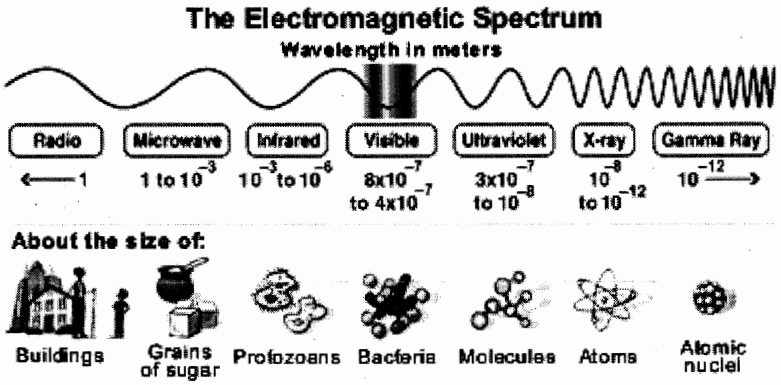


Graphic 1 demonstrates some potential exposure pathways from Braidwood Nuclear Power Station. The ARERR and AREOR together ensure Nuclear Power Plants are operating in a manner that is within established regulatory commitments meant to adequately protect the public.

Understanding Radiation

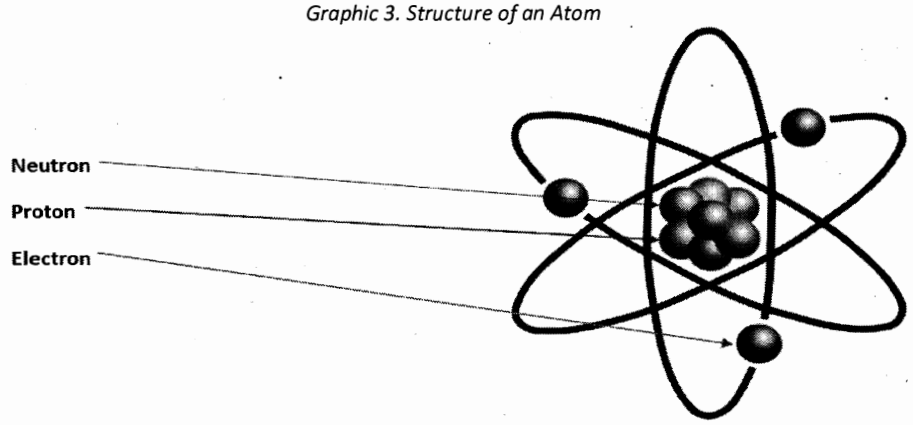
Generally radiation is defined as emitted energy in the form of waves or particles. If radiation has enough energy to displace electrons from an atom it is termed "ionizing", otherwise it is "non-ionizing". Non-Ionizing radiation includes light, heat given off from a stove, radiowaves and microwaves. Ionizing radiation occurs in atoms, particles too small for the eye to see. So, what are atoms and how does radiation come from them?

Graphic 2. Types of Radiation, from NASA Hubblesite



An atom is the smallest part of an element that maintains the characteristics of that element. Atoms are made up of three parts: protons, neutrons, and electrons.

Graphic 3. Structure of an Atom



The number of protons in an atom determines the element. For example, a hydrogen atom will always have one proton while an oxygen atom will always have eight protons. The protons are clustered with the neutrons forming the nucleus at the center of the atom. Orbiting around the nucleus are the relatively small electrons.

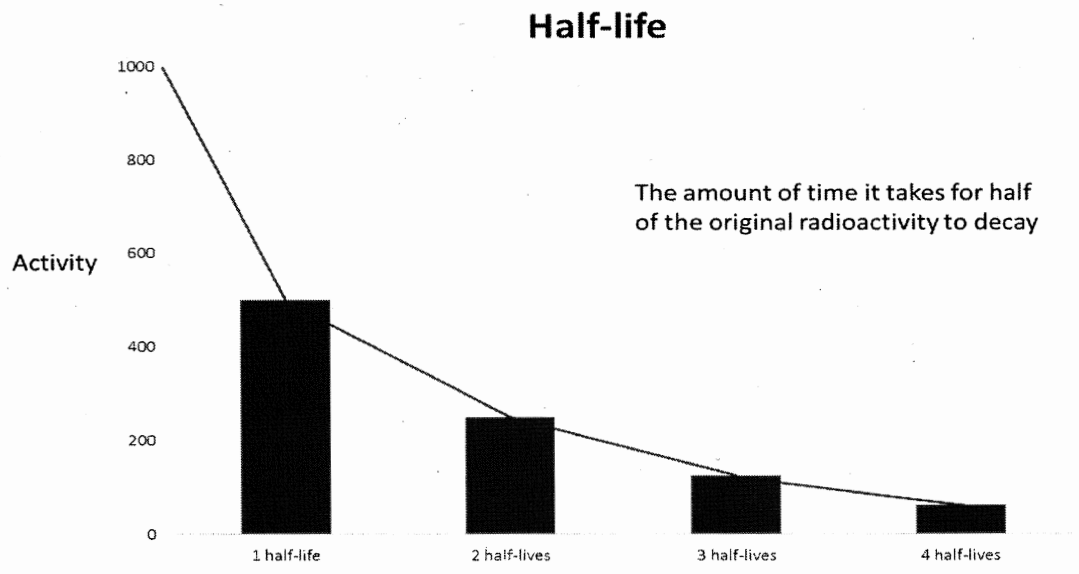
Isotopes are atoms that have the same number of protons but different numbers of neutrons. Different isotopes of an element will all have the same chemical properties and many isotopes are radioactive while other isotopes are not radioactive. A radioactive isotope can emit radiation because it contains excess energy in its nucleus. Radioactive atoms and isotopes are also referred to as radionuclides and radioisotopes.

There are two basic ways that radionuclides are produced at a nuclear power plant. The first is fission, which creates radionuclides that are called *fission products*. Fission occurs when a very large atom, such as uranium-235 (U-235) or plutonium-239 (Pu-239), absorbs a neutron into its nucleus making the atom unstable. The unstable atom can then split into smaller atoms. When fission occurs there is a large amount of energy released, in the form of heat. A nuclear power plant uses the heat generated to boil water that spins turbines to produce electricity.

The second way a radionuclide is produced at a nuclear power plant is through a process called activation. Radionuclides produced in this method are termed *activation products*. Pure water that passes over the fissioning atoms is used to cool the reactor and also produce steam to turn the turbines. Although this water is considered to be very pure, there are always some contaminants within the water from material used in the plant's construction and operation. These contaminants are exposed to the fission process and may become activation products. The atoms in the water itself can also become activated and create radionuclides.

Over time, radioactive atoms will reach a stable state and no longer be radioactive. To do this they must release their excess energy. This release of excess energy is called radioactive decay. The time it takes for a radionuclide to become stable is measured in units called half-lives. A half-life is the amount of time it takes for half of the original radioactivity to decay. Each radionuclide has a specific half-life. Some half-lives can be very long and measured in years while others may be very short and measured in seconds.

Graphic 4. Radioactive Decay Half-Life



In the annual reports you will see both man-made and naturally-ocurring radionuclides listed, for example potassium-40 (K-40, natural) and cobalt-60 (Co-60, man-made). We are mostly concerned about man-made radionuclides because they can be produced as by-products when generating electricity at a nuclear power plant. It is important to note that there are also other ways man-made radionuclides are produced, such as detonating nuclear weapons. Weapons testing has deposited

some of the same man-made radionuclides into the environment as those generated by nuclear power, and some are still present today because of long half-lives.

Measuring Radiation

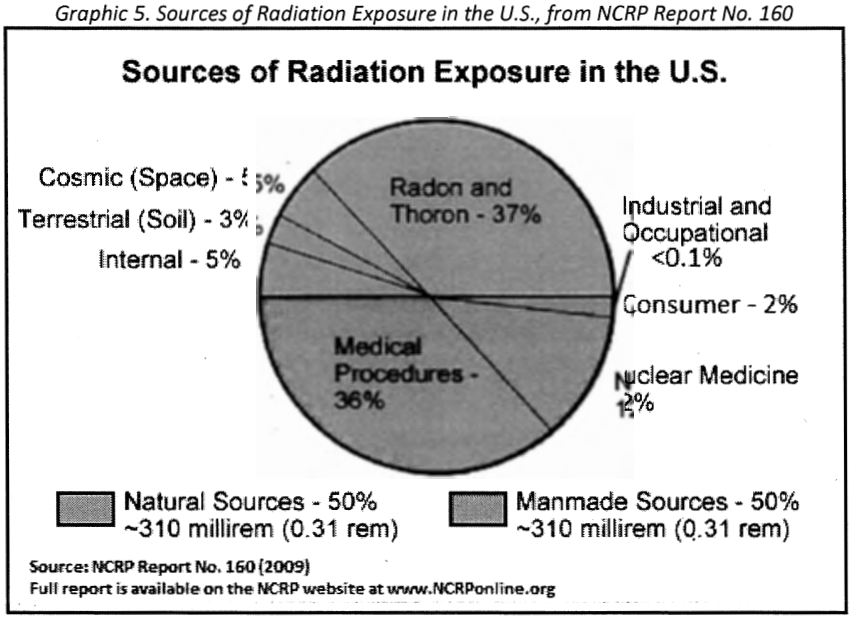
There are four different but interrelated units for measuring radioactivity, exposure, absorbed dose, and dose equivalent. Together, they are used to scientifically report the amount of radiation and its effects on humans.

- Radioactivity refers to the amount of ionizing radiation released by a material. The units of measure for radioactivity used within the AREOR and ARERR are the Curie (Ci). Small fractions of the Ci often have a prefix, such as the microCurie (µCi), which means 1/1,000,000 of a Curie.
- Exposure describes the amount of radiation traveling through the air. The units of measure for exposure used within the AREOR and ARERR are the Roentgen (R). Traditionally direct radiation monitors placed around the site are measured milliRoentgen (mR), 1/1,000 of one R.
- Absorbed dose describes the amount of radiation absorbed by an object or person. The units of measure for absorbed dose used within the AREOR and ARERR are the rad. Noble gas air doses are reported by the site are measured in millirad (mrad), 1/1,000 of one rad.
- Dose equivalent (or effective dose) combines the amount of radiation absorbed and the health effects of that type of radiation. The units used within the AREOR and ARERR are the Roentgen equivalent man (rem). Regulations require doses to the whole body, specific organ, and direct radiation to be reported in millirem (mrem), 1/1,000 of one rem.

Sources of Radiation

People are exposed to radiation every day of their lives and have been since the dawn of mankind. Some of this radiation is naturally occurring while some is man-made. There are many factors that will determine the amount of radiation individuals will be exposed to such as where they live, medical treatments, etc. The average person in the United States is exposed to approximately 620 mrem each year. Half of this exposure, 310 mrem, comes from natural sources and the other half, 310 mrem, from man-made sources. Graphic 5 shows what the typical sources of radiation are for an individual over a calendar year:

Graphic 5. Sources of Radiation Exposure in the U.S., from NCRP Report No. 160

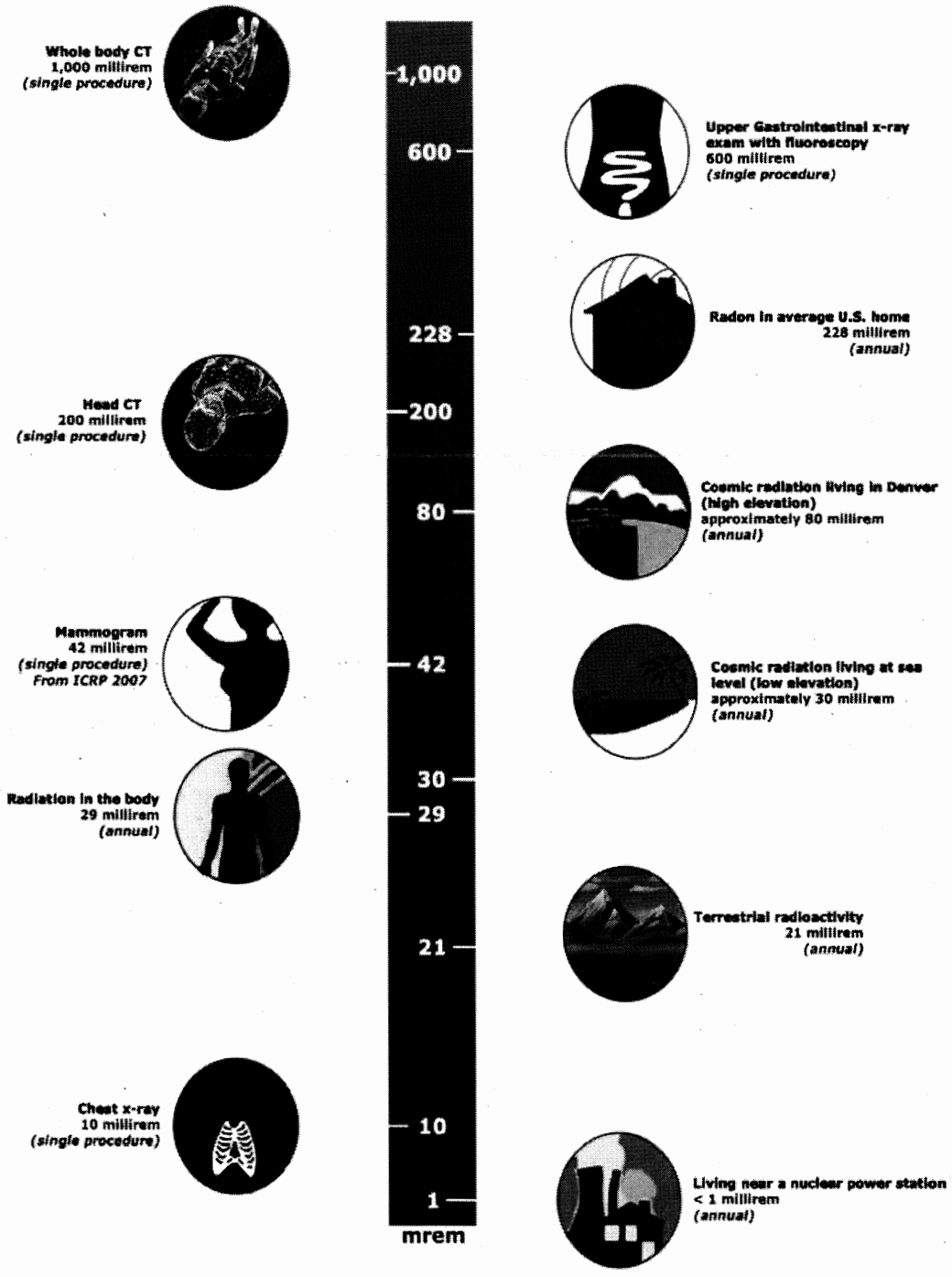


The radiation from a nuclear power plant is included in the chart as part of the "Industrial and Occupational" fraction, <0.1%. The largest natural source of radiation is from radon, because radon gas travels in the air we breathe. Perhaps you know someone who had a CT scan at a hospital to check his or her bones, brain, or heart. CT scans are included in the chart as "Medical Procedures" which make up the next largest fraction. Graphic 6 on the following page shows some of the common doses humans receive from radiation every year.

Graphic 6 .Relative Doses from Radiation Sources, from EPA Radiation Doses and Sources

RELATIVE DOSES FROM RADIATION SOURCES

All doses from the National Council on Radiation Protection & Measurements, Report No. 160 (unless otherwise denoted)

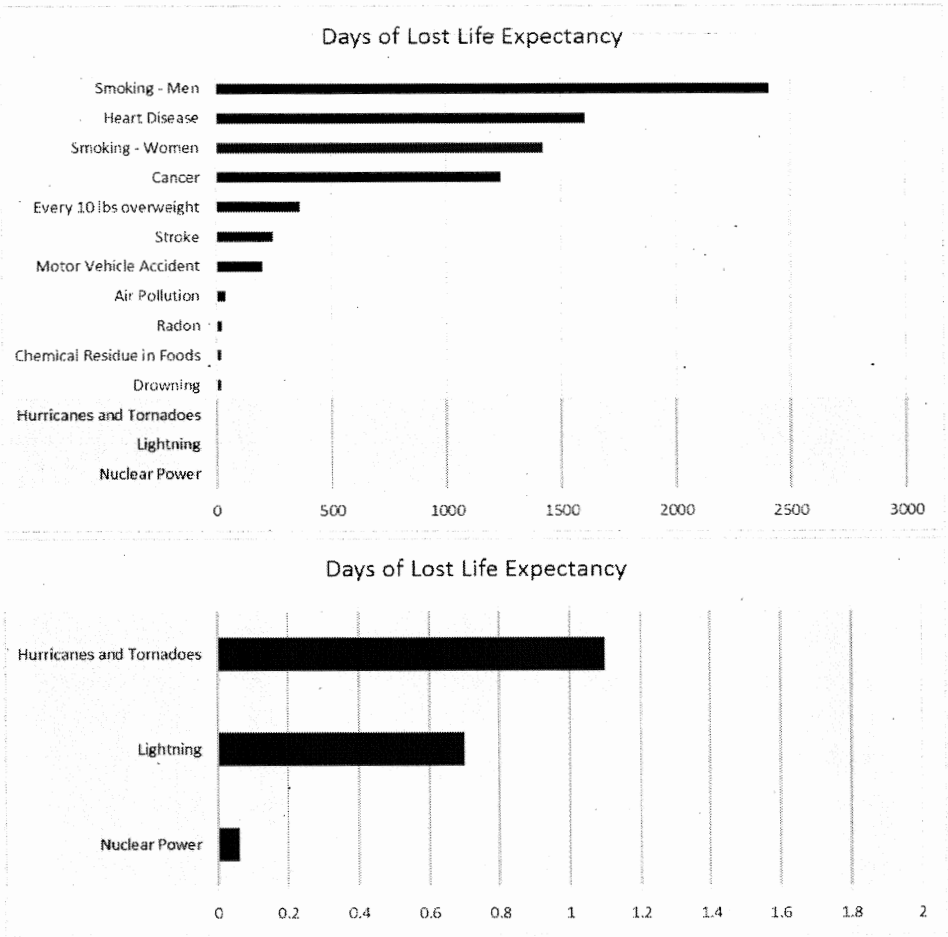


Radiation Risk

Current science suggests there is some risk from any exposure to radiation. However, it is very hard to tell whether cancers or deaths can be attributed to very low doses of radiation or by something else. U.S. radiation protection standards are based on the premise that any radiation exposure carries some risk.

The following graph is an example of one study that tries to relate risk from many different factors. This graph represents risk as "Days of Lost Life Expectancy". All the categories are averaged over the entire population except Male Smokers, Female Smokers, and individuals that are overweight. Those risks are only for people that fall into those categories. The category for Nuclear Power is a government estimate based on all radioactivity releases from nuclear power, including accidents and wastes.

Graphic 7. Days of Lost Life Expectancy, Adapted from the Journal of American Physicians and Surgeons Volume 8 Number 2 Summer 2003



II. Summary and Conclusions

This report on the Radiological Environmental Monitoring Program (REMP) conducted for Exelon's Braidwood Station covers the period January 1, 2021, through December 31, 2021. During that time period 1,589 analyses were performed on 1,276 samples. In assessing all the data gathered for this report and comparing these results with preoperational data, it was concluded that the operation of Braidwood Station had no adverse radiological impact on the environment.

Surface, public, and ground/well water samples were analyzed for concentrations of tritium and gamma-emitting nuclides. Surface water and public water samples were also analyzed for concentrations of gross beta. Gross beta and tritium activities detected were consistent with those detected in previous years. No fission or activation products were detected. As part of an effort to implement industry best practices, both gaseous and liquid station effluents were evaluated for all 10CFR61 required nuclides. Nuclides exceeding 1% relative abundance in the waste stream were added to the list of nuclides that Teledyne Brown evaluates in potentially impacted REMP matrices. For Braidwood Station, nickel-63 (Ni-63) exceeds 1% relative abundance in the radwaste resins. Occasionally, Ni-63 is observed in liquid release tank quarterly composites, therefore, beginning in the fall of 2013 the station requested that Ni-63 be evaluated in the downstream surface water, sediment, and fish analyses. Nickel-63 has not been observed in downstream surface water.

Fish (commercially and/or recreationally-important species) and sediment samples were analyzed for concentrations of gamma-emitting nuclides. No fission or activation products were detected in fish. Nickel-63 was not detected in any fish or sediment samples analyzed. No plant-produced fission or activation products were found in sediment.

Air particulate samples were analyzed for concentrations of gross beta and gamma-emitting nuclides. No fission or activation products were detected.

High sensitivity iodine-131 (I-131) analyses were performed on weekly air samples. All results were less than the minimum detectable concentration for I-131.

Cow milk samples were analyzed for concentrations of I-131 and gamma-emitting nuclides. Iodine-131 was not detected in any milk samples. Concentrations of naturally-occurring potassium-40 (K-40) were detected. No fission or activation products were found in any samples and all required LLDs (Lower Limit of Detection) were met.

Food Product samples were analyzed for concentrations of gamma-emitting nuclides. No fission or activation products were found in any samples and all required LLDs were met.

Environmental gamma radiation measurements were performed quarterly using Optically Stimulated Luminescence Dosimeters (OSLD). Beginning in 2012, Exelon changed the type of dosimetry used for the Radiological Environmental Monitoring Program (REMP). Optically Stimulated Luminescent Dosimetry were deployed and Thermo-luminescent Dosimetry (TLD) were discontinued. This change may result in a step change in readings, up or down, depending on site characteristics. The

relative comparison to control locations remains valid. OSLD technology is different than that used in a TLD but has the same purpose (to measure direct radiation). A dose evaluation was performed by taking the highest readings at the ISFSI pad and extrapolating dose to the nearest resident. The dose to the nearest resident was estimated to be 0.18 mrem in 2021.

III. Introduction

The Braidwood Station, consisting of two 3,645 MWt pressurized water reactors owned and operated by Exelon Corporation 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.

This report covers those analyses performed by Teledyne Brown Engineering (TBE) and Landauer Technologies on samples collected during the period January 1, 2021, through December 31, 2021.

A. Objectives of the REMP

The objectives of the REMP are to:

1. Provide data on measurable levels of radiation and radioactive materials in the site environs;
2. Evaluate the relationship between quantities of radioactive material released from the plant and resultant radiation doses to individuals from principal pathways of exposure.

B. Implementation of the Objectives

The implementation of the objectives is accomplished by:

1. Identifying significant exposure pathways;
2. Establishing baseline radiological data of media within those pathways;
3. Continuously monitoring those media before and during Station operation to assess Station radiological effects (if any) on man and the environment.

IV. Program Description

A. Sample Collection

Samples for the Braidwood Station REMP were collected for Exelon Nuclear by Environmental Inc. Midwest Labs (EIML). This section describes the general collection methods used by EIML to obtain environmental samples for the Braidwood Station REMP in 2021. Sample locations and descriptions can be found in Table B–1 and Figures B–1 through B–3, Appendix B. The sampling methods used by EIML are listed in Table B-2.

Aquatic Environment

The aquatic environment was evaluated by performing radiological analyses on samples of surface water, public water, well water, fish, and sediment. Two-gallon water samples were collected weekly from six surface water locations [BD-10, BD-25 (Control (C)), BD-38, BD-40, BD-55 and BD-56], and one weekly composite sample of public drinking water at location (BD-22) and ground/well water samples collected quarterly from eight locations (BD-13, BD-34, BD-35, BD-36, BD-37, BD-50, BD-51 and BD-54). All samples were collected in new plastic bottles, which were rinsed with source water prior to collection per procedure. Fish samples comprising the flesh of quillback, golden redhorse, flathead catfish, smallmouth bass, channel catfish, largemouth bass and common carp were collected semiannually at three locations, BD-25 (C), BD-28 and BD-41. Sediment samples composed of recently deposited substrate were collected at three locations semiannually, BD-10, BD-25 (C), and BD-57.

Atmospheric Environment

The atmospheric environment was evaluated by performing radiological analyses on samples of air particulate and airborne iodine. Air particulate samples were collected and analyzed weekly at eight locations [BD-02, BD-03 (C), BD-04, BD-05, BD-06, BD-19, BD-20 and BD-21]. Airborne iodine and particulate samples were obtained at each location, using a vacuum pump with charcoal and glass fiber filters installed. The pumps were run continuously and sampled air at the rate of approximately one cubic foot per minute. The air particulate filters and air iodine cartridges were replaced weekly and sent to the laboratory for analysis.

Terrestrial Environment

The terrestrial environment was evaluated by performing radiological analyses on food product samples. Food products and broadleaf vegetation were collected at six locations (BD-Control, BD-Quad 1, BD-Quad 2, BD-Quad 3, BD-Quad 4, BWD-G1 and BWD-G2). Various types of samples were collected and placed in new unused plastic bags and sent to the laboratory for analysis.

Ambient Gamma Radiation

Beginning in 2012, Exelon changed the type of dosimetry used for the

Radiological Environmental Monitoring Program (REMP). Optically Stimulated Luminescent Dosimeters (OSLD) were deployed and the use of Thermoluminescent Dosimeters (TLD) was discontinued. This change may result in a step change in readings, up or down, depending on site characteristics. The relative comparison to control locations remains valid. OSLD technology is different than that used in a TLD but has the same purpose (to measure direct radiation).

Each location consisted of two OSLDs. The OSLDs were exchanged quarterly and sent to Landauer for analysis. The OSLDs were placed at locations on and around the Braidwood Station site as follows:

An inner ring consisting of sixteen locations (BD-101, BD-102, BD-103, BD-104, BD-105, BD-106, BD-107, BD-108, BD-109, BD-110, BD-111a, BD-112, BD-113a, BD-114, BD-115 and BD-116) at or near the site boundary.

An outer ring consisting of sixteen locations (BD-201, BD-202, BD-203, BD-204, BD-205, BD-206, BD-207, BD-208, BD-209, BD-210, BD-211, BD-212, BD-213, BD-214, BD-215 and BD-216) extending to approximately 5 miles from the site.

An additional set located at the eight fixed air sampling locations (BD-02, BD-3 (C), BD-04, BD-05, BD-06, BD-19, BD-20 and BD-21).

An ISFSI set consisting of six locations (BD-ISFSI-104-3, BD-ISFSI-104-4, BD-ISFSI-105-3, BD-ISFSI-105-4, BD-ISFSI-110-3 and BD-ISFSI-110-4).

The specific OSLD locations were determined by the following criteria:

1. The presence of relatively dense population;
2. Site meteorological data taking into account distance and elevation for each of the sixteen–22 1/2 degree sectors around the site;
3. Where estimated annual dose from Braidwood Station, if any, would be most significant.

B. Sample Analysis

This section describes the general analytical methodologies used by TBE to analyze the environmental samples for radioactivity for the Braidwood Station REMP in 2021. The analytical procedures used by the laboratories are listed in Table B-2.

In order to achieve the stated objectives, the current program includes the following analyses:

1. Concentrations of beta emitters in public and surface water and air particulates.
2. Concentrations of gamma emitters in public, ground/well and surface water, air particulates, milk, grass, fish, sediment and food products.
3. Concentrations of tritium in public, ground/well and surface water.
4. Concentrations of I-131 in air, milk and public water.

5. Concentrations of Ni-63 in surface water, fish and sediment.
6. Ambient gamma radiation levels at various site environs.

C. Data Interpretation

The radiological and direct radiation data collected prior to Braidwood Station becoming operational were used as a baseline with which these operational data were compared. For the purpose of this report, Braidwood Station was considered operational at initial criticality. In addition, data was compared to previous years' operational data for consistency and trending. Several factors were important in the interpretation of the data:

1. Lower Limit of Detection and Minimum Detectable Concentration

The lower limit of detection (LLD) was defined as the smallest concentration of radioactive material in a sample that would yield a net count (above background) that would be detected with only a 5% probability of falsely concluding that a blank observation represents a "real" signal. The LLD was intended as a before the fact estimate of a system (including instrumentation, procedure and sample type) and not as an after the fact criteria for the presence of activity. All analyses were designed to achieve the required Braidwood Station detection capabilities for environmental sample analysis.

The MDC is the smallest concentration of radioactive material in a sample that will yield a net count, above system background, that will be detected with 95% probability with only 5% probability of falsely concluding that a blank observation represents a "real" signal. The MDC is an *a posteriori* determination.

2. Net Activity Calculation and Reporting of Results

Net activity for a sample was calculated by subtracting background activity from the sample activity. Since the REMP measures extremely small changes in radioactivity in the environment, background variations may result in sample activity being lower than the background activity resulting in a negative number. An MDC was reported in all cases where positive activity was not detected.

Gamma spectroscopy results for each type of sample were grouped as follows:

For surface water, public water, ground/well water, air particulate/radioiodine, milk, vegetation and fish, twelve nuclides, Mn-54, Co-58, Fe-59, Co-60, Zn-65, Nb-95, Zr-95, I-131, Cs-134, Cs-137, Ba-140 and La-140 were reported.

For sediment, eleven nuclides, Mn-54, Co-58, Fe-59, Co-60, Zn-65, Nb-95, Zr-95, Cs-134, Cs-137, Ba-140 and La-140 were reported.

Means and standard deviations of the results were calculated. The standard deviations represent the variability of measured results for different samples rather than the single analysis uncertainty.

D. Program Exceptions

For 2021, the Braidwood Station REMP had a sample recovery rate in excess of 99%. Sample anomalies and missed samples are listed in the tables below:

Table D-1 LISTING OF SAMPLE ANOMALIES

Sample Type	Location Code	Collection Date	Reason
APAI	BD-02	01/20/21	Low reading of 71.6 hrs., possibly caused by a power outage. NOTE: during the 01/28/21 collection, the timer indicated 192.5 hrs. - expected time for the 8 days collection period.
AP/AI	BD-02	02/04/21	Timer malfunctioned at 29.5 hrs. Pump appears to run during the entire period Timer exchanged. NOTE: during the collection on 02/11/21, the timer indicated correct reading of 174.9 hrs.
APAI	BD-03	02/18/21	Timer indicates appr. 9.4 hrs. less than expected, possibly due to a power outage.
APAI	BD-21	02/18/21	Station inaccessible due to unplowed snow on the access road. Station contacted, road cleared, sample collected on 02/19/21.
APAI	BD-06	06/10/21	Timer indicates appr. 4.2 hrs. less than expected, probably due to a power outage.
APAI	BD-06	06/17/21	Timer indicates lower reading of 156.3 hrs., probably due to a power outage caused by severe thunderstorms in the area.
VE (MI)	BWD-G1	06/17/21	Only 2 different kinds of vegetables collected. Growth season delayed by cold weather.
VE (MI)	BWD-G2	06/17/21	Only 1 kind of vegetable collected. Growth season delayed by cold weather.
VE (MI)	Control	06/17/21	Only 1 kind of vegetable collected. Growth season delayed by cold weather.
AP/AI	BD-06	06/24/21	Timer indicates lower reading of 145.0 hrs. The cause determined to be a faulty timer. Timer exchanged.
VE (MI)	Control	07/31/21	Only 2 different kinds of vegetables collected during July. Growth season delayed by cold weather.
VE (MI)	Control	08/31/21	Only 2 different kinds of vegetables collected during August due to a crop failure.
SW	BD-55	09/30/21	3rd quarter composite sample was recreated using leftover monthly gamma grab samples due to the original glass sample container being broken.
Air Sampler	BD-06	10/28/21	Sampler indicates low Vmax. Pump replaced.
AP/AI	BD-05	11/11/21	Timer indicates approx.. 4.9 hrs. less than expected, possibly due to a power outage. NOTE: during the 11/19/21 collection, the timer indicated 198.6 hrs. - expected value for the collection period.

In addition, to the preceding table, the initial 2021 OSLD dose readings were incorrect. For the 2nd, 3rd and 4th quarters, the 1st quarter deploy controls was used to calculate the normalized net dose. The deploy controls were not placed into the onsite vault for the appropriate time periods during the 2nd - 4th quarters.

Therefore, the dose readings were incorrect and 1st quarter deploy control doses were applied to the following three quarters. A new background vault rate was also calculated in 2021, and the quarterly readings were updated using the new rate of 0.08 mrem/day. (IR 04483926)

Table D-2 LISTING OF MISSED SAMPLES

Sample Type	Location Code	Collection Date(s)	Reason
M	BD-18	01/07/21 02/04/21 03/04/21	No sample; farmer stopped milking cows before calving season
SW	BD-55	01/07/21 - 03/04/21	No sample; lake frozen
SW	BD-56	01/07/21 - 02/25/21	No sample; lake frozen
SW	BD-10	01/28/21 - 02/25/21	No sample; lake frozen
SW	BD-25	01/28/21 - 03/04/21	No sample, location inaccessible due to snow accumulation
SW	BD-38	02/11/21 02/18/21	No sample; lake frozen
OSLD	BD-104	03/04/21	The holder with OSLD samples found missing, possibly due to vandalism or snow-removing activity. Premises searched unsuccessfully. Samples EX 00070546N and EX 00069802M installed on 03/05/21.
MI	BD-18	06/03/21 06/17/21	No sample, very limited milk production
SW	BD-25	10/28/21 11/04/21	No sample; area flooded, access restricted

Each program exception was reviewed to understand the causes of the program exception. Sampling and maintenance issues were reviewed with the personnel involved to prevent recurrence. Occasional equipment breakdowns, power outages and weather related issues were unavoidable.

The overall sample recovery rate indicates that the appropriate procedures and equipment are in place to assure reliable program implementation.

E. Program Changes

There were no program changes in 2021.

V. Results and Discussion

A. Aquatic Environment

1. Surface Water (SW)

Samples were taken weekly and composited monthly at six locations (BD-10, BD-25 (C), BD-38, BD-40, BD-55 and BD-56). Of these locations, only BD-10 could be affected by Braidwood Station's effluent releases as it is downstream of the NPDES-permitted outfall. The following analyses were performed:

Gross Beta

Samples from all locations were analyzed for concentrations of gross beta (Table C–I.1, Appendix C). Gross beta was detected in 53 of 66 samples. The values ranged from 2.1 to 13.7 pCi/L. Concentrations detected were consistent with those detected in previous years. (Figures C–1 through C-3, Appendix C)

Tritium

Quarterly composites of weekly collections were analyzed for tritium activity (Table C–I.2, Appendix C). Tritium activity was detected in 1 of 24 samples at a concentration of 352 ± 122 pCi/L. Concentrations detected were consistent with those detected in previous years. (Figures C–4 through C-6, Appendix C)

Nickel-63

Monthly samples were analyzed for Ni-63 activity. Ni-63 was not detected and the required LLD was met. (Table C–I.3, Appendix C)

Iron-55

Monthly samples were analyzed for Ni-63 activity. Fe-55 was not detected and the required LLD was met. (Table C–I.4, Appendix C)

Gamma Spectrometry

Samples from all locations were analyzed for gamma emitting nuclides. No nuclides were detected and all required LLDs were met. (Table C–I.4, Appendix C)

2. Public Water (PW)

Monthly composites of weekly samples were made at one location (BD-22). This location could be affected by Braidwood Station's effluent releases. The following analyses were performed:

Gross Beta

Samples from the location were analyzed for concentrations of gross beta (Tables C–II.1, Appendix C). Gross beta was detected in 9 of 12 samples. The values ranged from 2.5 to 5.5 pCi/L. Concentrations

detected were consistent with those detected in previous years. (Figure C–7, Appendix C)

Tritium

Monthly composites of weekly samples from BD-22 were analyzed for tritium activity (Table C–II.2, Appendix C). Tritium was detected in 11 of 12 samples. Concentrations ranged from 235 to 2,210 pCi/L. Concentrations detected were consistent with those detected in previous years (Figure C–8, Appendix C).

Iodine

Monthly composites of weekly samples from the location were analyzed for I-131. Iodine was not detected in any samples and the required LLD was met. (Table C-II.3, Appendix C)

Nickel-63

Monthly samples were analyzed for Ni-63 activity. Ni-63 was not detected and the required LLD was met. (Table C–II.4, Appendix C)

Iron-55

Monthly samples were analyzed for Fe-55 activity. Fe-55 was not detected and the required LLD was met. (Table C–II.5, Appendix C)

Gamma Spectrometry

Samples from the location were analyzed for gamma emitting nuclides. No nuclides were detected and all required LLDs were met. (Table C–II.6, Appendix C)

3. Ground/Well Water (WW)

Quarterly samples were collected at eight locations (BD-13, BD-34, BD-35, BD-36, BD-37, BD-50, BD-51 and BD-54). The following analyses were performed:

Tritium

Quarterly grab samples from the locations were analyzed for tritium activity (Table C–III.1, Appendix C). Tritium was not detected in any sample and the required LLD was met. Concentrations were consistent with those in previous years. (Figures C–9 through C–13, Appendix C)

Gamma Spectrometry

Samples from all locations were analyzed for gamma emitting nuclides. No nuclides were detected and all required LLDs were met. (Table C-II.3, Appendix C)

4. Fish

Fish samples comprising the flesh of shorthead redhorse, golden

redhorse, smallmouth bass, common carp, largemouth bass and bluegill were collected at three locations (BD-25, BD-28, and BD-41) semiannually. Location BD-28 could be affected by Braidwood Station's effluent releases. The following analyses were performed:

Iron-55

The edible portion of fish samples from all three locations was analyzed for Fe-55 activity. Fe-55 was not detected and the required LLD was met. (Table C-II.3, Appendix C)

Nickel-63

The edible portion of fish samples from all three locations was analyzed for Ni-63 activity. Ni-63 was not detected and the required LLD was met. (Table C–IV.1, Appendix C)

Gamma Spectrometry

The edible portion of fish samples from all three locations was analyzed for gamma emitting nuclides. No fission or activation products were found. No nuclides were detected and all required LLDs were met. (Table C–IV.1, Appendix C)

5. Sediment (BS)

Aquatic sediment samples were collected at three locations (BD-10, BD-25 (C), and BD-57) semiannually. The locations at the Braidwood Station outfall to the Kankakee River (BD-57) and downstream of the outfall (BD-10), could be affected by Braidwood Station's effluent releases. The following analyses were performed:

Iron-55

Sediment samples from all three locations was analyzed for Fe-55 activity. Fe-55 was not detected and the required LLD was met. (Table C–V.1, Appendix C)

Nickel-63

Sediment samples from all three locations was analyzed for Ni-63 activity. Ni-63 was not detected and the required LLD was met. (Table C–V.1, Appendix C)

Gamma Spectrometry

Sediment samples from the location were analyzed for gamma emitting nuclides. No fission or activation products were found and all required LLDs were met. (Table C–V.1, Appendix C)

B. Atmospheric Environment

1. Airborne (AP/AI)

a. Air Particulates

Continuous air particulate samples were collected from eight locations on a weekly basis. The eight locations were separated into three groups: Near field samplers (BD-06, BD-19, BD-20 and BD-21), far field samplers within 10 km of the site (BD-02, BD-04 and BD-05) and the Control sampler between 10 and 30 km from the site (BD-03). The following analyses were performed:

Gross Beta

Weekly samples were analyzed for concentrations of beta emitters (Table C–VI.1 and C-VI.2, Appendix C). Detectable gross beta activity was observed at all locations. Comparison of results among the three groups aid in determining the effects, if any, resulting from the operation of Braidwood Station. The results from the near field (Group I) ranged from 6E-03 to 32E-03 pCi/m^3 with a mean of 16E-03 pCi/m^3. The results from the far field (Group II) ranged from 6E-03 to 34E-03 pCi/m^3 with a mean of 16E-03 pCi/m^3. The results from the Control location (Group III) ranged from 8E-03 to 31E-03 pCi/m^3 with a mean of 17E-03 pCi/m^3. Comparison of the 2021 air particulate data with previous years' data indicate no effects from the operation of Braidwood Station. Additionally, a comparison of the weekly values for 2021 indicate no notable differences among the three groups. (Figures C–14 through C-18, Appendix C)

Gamma Spectrometry

Weekly samples were composited quarterly and analyzed for gamma emitting nuclides. No nuclides were detected and all required LLDs were met. (Table C–VI.3, Appendix C)

b. Airborne Iodine

Continuous air samples were collected from eight locations (BD-02, BD-03, BD-04, BD-05, BD-06, BD-19, BD-20 and BD-21) and analyzed weekly. The following analysis was performed:

I-131

Continuous air samples were collected from eight locations for I-131. All results were less than the minimum detectable concentration for I-131. The required LLD was met for all analyses.
(Table C–VII.1, Appendix C)

C. Terrestrial Environment

1. Milk (MI)

Samples were collected from one location (control location BD-18) biweekly in May and monthly in March, October and November. The following analyses were performed:

Iodine-131

Milk samples were analyzed for concentrations of I-131. Iodine-131 was not detected in any samples. All required LLDs were met. (Table C–VIII.1, Appendix C)

Gamma Spectrometry

Each milk sample was analyzed for concentrations of gamma emitting nuclides. No nuclides were detected and all required LLDs were met. (Table C–VIII.2 & Table C-VIII.3, Appendix C)

2. Food Products (VE)

Food product samples were collected at eight locations: BD-Control, BD-Quad 1, BD-Quad 2, BD-Quad 3, BD-Quad 4, BWD-G1 and BWD-G2 when available. The following analysis was performed:

Gamma Spectrometry

Samples from all locations were analyzed for gamma emitting nuclides. No nuclides were detected and all required LLDs were met. (Table C–IX.1, Appendix C)

D. Ambient Gamma Radiation

Ambient gamma radiation levels were measured utilizing Optically Stimulated Luminescence Dosimeter (OSLD). Forty-eight OSLD locations were established around the site, each with two OSLD's installed for measurement. The data was analyzed using methods acceptable for demonstrating compliance with the Environmental Protection Agency (EPA) 40 CFR 190, "Environmental Radiation Protection Standards for Nuclear Power Operations". It incorporates the concepts of ANSI/HPS N13.37, "Environmental Dosimetry". Results of OSLD measurements are listed in Tables C–X.1 to C–X.3, Appendix C.

All OSLD measurements had a range of 12.8 to 38.0 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.

Annual Facility Dose was reported for station BD-ISFSI-105-4. The direct dose to the nearest resident was estimated to be 0.18 mrem for the year.

E. Land Use Survey

A Land Use Survey conducted during August 25, 2021, around the Braidwood Station was performed by EIML for Exelon Nuclear to comply with section 12.5.2 of the Braidwood Station's Offsite Dose Calculation Manual ODCM). The purpose of the survey was to document the nearest resident, milk-producing animal and garden of greater than 500 ft^2 in each of the sixteen 22 ½ degree sectors around the site. For dose calculation, a garden is assumed at the nearest residence. There were no notable changes to the 2021 land use census. The results of this survey are summarized below:

Distance in Miles from the Braidwood Station Reactor Buildings				
Sector		Residence Miles	Livestock Miles	Milk Farm Miles
A	N	0.50	2.6	-
B	NNE	0.88	-	-
C	NE	0.65	-	-
D	ENE	0.60	-	-
E	E	1.50	2.3	-
F	ESE	2.20	2.3	-
G	SE	2.70	2.7	-
H	SSE	4.50	-	-
J	S	4.20	-	-
K	SSW	4.00	5.3	-
L	SW	0.40	-	-
M	WSW	0.45	-	-
N	W	0.35	1.6	8.7
P	WNW	0.40	-	-
Q	NW	0.40	-	-
R	NNW	0.40	-	-

F. Errata Data

There was no errata data for 2021 REMP.

G. Summary of Results – Inter-Laboratory Comparison Program

The TBE Laboratory analyzed Performance Evaluation (PE) samples of air particulate, air iodine, milk, soil, vegetation, and water matrices for various analytes. The PE samples supplied by Analytics Inc., Environmental Resource Associates (ERA) and Department of Energy (DOE) Mixed Analyte Performance Evaluation Program (MAPEP), were evaluated against the following pre-set acceptance criteria:

1. Analytics Evaluation Criteria

   Analytics' evaluation report provides a ratio of TBE's result and Analytics' known value. Since flag values are not assigned by Analytics, TBE evaluates the reported ratios based on internal QC requirements based on the DOE MAPEP criteria.

2. ERA Evaluation Criteria

   ERA's evaluation report provides an acceptance range for control and warning limits with associated flag values. ERA's acceptance limits are established per the USEPA, National Environmental Laboratory Accreditation Conference (NELAC), state-specific Performance Testing (PT) program requirements or ERA's SOP for the Generation of Performance Acceptance Limits, as applicable. The acceptance limits are either determined by a regression equation specific to each analyte or a fixed percentage limit promulgated under the appropriate regulatory document.

3. DOE Evaluation Criteria

   MAPEP's evaluation report provides an acceptance range with associated flag values. MAPEP defines three levels of performance:

   - Acceptable (flag = "A") - result within ± 20% of the reference value
   - Acceptable with Warning (flag = "W") - result falls in the ± 20% to ± 30% of the reference value
   - Not Acceptable (flag = "N") – bias is greater than 30% of the reference value

   Note: The Department of Energy (DOE) Mixed Analyte Performance Evaluation Program (MAPEP) samples are created to mimic conditions found at DOE sites which do not resemble typical environmental samples obtained at commercial nuclear power facilities.

For the TBE laboratory, 146 out of 154 analyses performed met the specified acceptance criteria. Seven analyses did not meet the specified acceptance criteria for the following reasons and were addressed through the TBE Corrective Action Program. A summary is found below:

1. The ERA MRAD March 2021 Water Fe-55 result was evaluated as *Not Acceptable*. The reported value for Fe-55 was 579 pCi/L and the known result was 275 pCi/L (acceptance range 162 - 400). When reviewing the original sample data, it was found that the carrier yield was 52.6% (lower than typical water samples). Looking at the etched plate that was counted, it appeared that some loss of sample could have occurred. The sample was logged for reanalysis and used as the workgroup duplicate. The results were acceptable at 197 and 221 respectively. Yields were 97.4% and 105.7% and the plated samples were centered with no apparent loss of sample. The loss of sample

during plating resulted in a low yield which produced an artificially high sample result. (NCR 21-01)

2. The MAPEP February 2021 AP Gross Alpha result was evaluated as *Not Acceptable*. The reported value was 0.371 Bq/sample and the known result was 1.77 Bq/sample (acceptance range 0.53 - 3.01). A similar failure had occurred several years prior due to the filter being placed with the wrong side up on the detector. At that time, a small dot was placed on the top of the filter prior to removal from the package to indicate the correct side for counting. The current sample was still in the detector when the result was received (dot side facing the detector). The sample was recounted with a similar result and was flipped and recounted. The flipped result was 0.661 Bq/sample, within the acceptable range. Because TBE cannot rely on receiving correct packaging from the provider, MAPEP AP cross-checks will be counted on both sides going forward. *NOTE: The August sample had the same packaging issue (upside down).* (NCR 21-02)

3. The MAPEP February 2021 soil Ni-63 was evaluated as *Not Acceptable*. The reported value was 310 Bq/kg and the known result was 689 (acceptance range 482 - 896). All workgroup QC was reviewed with no anomalies. The analytical procedure had been revised prior to this analysis to eliminate added interferences. The sample yield was >100%, indicative of incomplete separation from interferences, leading to a lower result. The procedure was again revised after acceptable results were obtained. (NCR 21-03)

4. The ERA October 2021 water Gross Beta result was evaluated as *Not Acceptable*. The reported value was 63.0 pCi/L and the known was 55.7 (acceptance range 38.1 - 62.6) or 113% of the known. The 2-sigma error was 6.8, placing the reported result well within the acceptable range. All QA was reviewed with no anomalies. A follow-up Quick Response cross-check was analyzed with a 120% ratio (see item 7). (NCR 21-10)

5. The ERA October 2021 water Tritium result was evaluated as *Not Acceptable*. The reported value was 13,800 pCi/L and the known was 17,200 (acceptance range 15,000 - 18,900). The 2-sigma error was 1,430, placing the result within the acceptable range. TBE's internal QC acceptance is 70% - 130%, while ERA's for this sample was 87% - 110%. All QA was reviewed with no anomalies. A Quick Response follow-up cross-check was analyzed with a result of 17,500 pCi/L (known 17,800 pCi/L). (NCR 21-11)

6. The MAPEP August 2021 soil Ni-63 result was evaluated as *Not Acceptable*. The reported value was 546 Bq/kg and the known result was 1,280 Bq/kg (acceptance range 896 - 1,664). All QC was reviewed and no anomalies found. The procedure revision to remove added MAPAP interferences was ineffective for this sample. No client soil matrix samples were analyzed for Ni-63 in 2020 or 2021. The root cause investigation is still ongoing at this time. (NCR 21-13)

7. The ERA December 2021 Quick Response water Gross Beta result was evaluated as *Not Acceptable*. The reported value was 47.6 pCi/L and the known was 39.8 pCi/L or 120% of the known (acceptance range of 26.4 - 47.3). The 2-sigma error was 6.1, placing the reported result well within the acceptable range. All QA was reviewed with no anomalies. The original

sample was recounted on a different detector with a result of 40.3 ± 6.27 pCi/L. The "failure" of this sample and the RAD-127 was due to the narrow upper acceptance ranges assigned (119% and 112%) (NCR 21-14)

The Inter-Laboratory Comparison Program provides evidence of "in control" counting systems and methods, and that the laboratories are producing accurate and reliable data.

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APPENDIX A

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT ANNUAL SUMMARY

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TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR BRAIDWOOD STATION, 2021

NAME OF FACILITY: BRAIDWOOD **DOCKET NUMBERS: 50-456 & 50-457**

LOCATION OF FACILITY: BRACEVILLE, IL **REPORTING PERIOD: 2021**

MEDIUM OR PATHWAY SAMPLED *(UNIT OF MEASUREMENT)*	TYPES OF ANALYSIS PERFORMED	NUMBER OF ANALYSIS PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	**INDICATOR LOCATIONS** MEAN (M) (F) *RANGE*	**CONTROL LOCATION** MEAN (M) (F) *RANGE*	**LOCATION WITH HIGHEST ANNUAL MEAN (M)** MEAN (M) (F) *RANGE*	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
SURFACE WATER	**GR-B**	66	4	6	4.3	9	BD-40 INDICATOR	0
(PCI/LITER)				(44/55)	(9/11)	(12/12)	BRAIDWOOD STATION COOLING LAKE	
				2.1 - 13.7	*2.6 - 6.1*	*5.2 - 13.7*	ONSITE	
	H-3	24	200	352	<LLD	352	BD-56 INDICATOR	0
				(1/20)		(1/4)	SOUTH POND FATLAN SITE	
							0.6 MI NE OF SITE	
	NI-63	22	30	<LLD	<LLD	-		0
	FE-55	22	200	<LLD	<LLD	-		0
	GAMMA	66						
	MN-54		15	<LLD	<LLD	-		0
	CO-58		15	<LLD	<LLD	-		0
	FE-59		30	<LLD	<LLD	-		0
	CO-60		15	<LLD	<LLD	-		0
	ZN-65		30	<LLD	<LLD	-		0
	NB-95		15	<LLD	<LLD	-		0
	ZR-95		30	<LLD	<LLD	-		0
	I-131		15	<LLD	<LLD	-		0
	CS-134		15	<LLD	<LLD	-		0
	CS-137		18	<LLD	<LLD	-		0
	BA-140		60	<LLD	<LLD	-		0
	LA-140		15	<LLD	<LLD	-		0
PUBLIC WATER	**GR-B**	12	4	3.5	NA	3.5	BD-22 INDICATOR	0
(PCI/LITER)				(9/12)		(9/12)	WILMINGTON	
				2.5 - 5.5		*2.5 - 5.5*	6.0 MILES NE OF SITE	
	H-3	12	200	1007	NA	1007	BD-22 INDICATOR	0
				(11/12)		(11/12)	WILMINGTON	
				235 - 2210		*235 - 2210*	6.0 MILES NE OF SITE	
	I-131	12	1	<LLD	NA	-		0
	NI-63	12	30	<LLD	<LLD	-		0
	FE-55	12	200	<LLD	<LLD	-		0

(M) The Mean Values are calculated using the positive values. (F) Fraction of detectable measurement are indicated in parentheses.

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NAME OF FACILITY: BRAIDWOOD **DOCKET NUMBERS: 50-456 & 50-457**

LOCATION OF FACILITY: BRACEVILLE, IL **REPORTING PERIOD: 2021**

MEDIUM OR PATHWAY SAMPLED *(UNIT OF MEASUREMENT)*	TYPES OF ANALYSIS PERFORMED	NUMBER OF ANALYSIS PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	**INDICATOR LOCATIONS** MEAN (M) (F) *RANGE*	**CONTROL LOCATION** MEAN (M) (F) *RANGE*	**LOCATION WITH HIGHEST ANNUAL MEAN (M)** MEAN (M) (F) *RANGE*	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
PUBLIC WATER	**GAMMA**	12						
(PCI/LITER)	*MN-54*		15	<LLD	NA	-		0
	CO-58		15	<LLD	NA	-		0
	FE-59		30	<LLD	NA	-		0
	CO-60		15	<LLD	NA	-		0
	ZN-65		30	<LLD	NA	-		0
	NB-95		15	<LLD	NA	-		0
	ZR-95		30	<LLD	NA	-		0
	CS-134		15	<LLD	NA	-		0
	CS-137		18	<LLD	NA	-		0
	BA-140		60	<LLD	NA	-		0
	LA-140		15	<LLD	NA	-		0
GROUND WATER *(PCI/LITER)*	**H-3**	32	200	<LLD	NA	-		0
	GAMMA	32						
	MN-54		15	<LLD	NA	-		0
	CO-58		15	<LLD	NA	-		0
	FE-59		30	<LLD	NA	-		0
	CO-60		15	<LLD	NA	-		0
	ZN-65		30	<LLD	NA	-		0
	NB-95		15	<LLD	NA	-		0
	ZR-95		30	<LLD	NA	-		0
	I-131		15	<LLD	NA	-		0
	CS-134		15	<LLD	NA	-		0
	CS-137		18	<LLD	NA	-		0
	BA-140		60	<LLD	NA	-		0
	LA-140		15	<LLD	NA	-		0
FISH *(PCI/KG WET)*	**FE-55**	12	260	<LLD	<LLD	-		0
	NI-63	12	260	<LLD	<LLD	-		0

(M) The Mean Values are calculated using the positive values. (F) Fraction of detectable measurement are indicated in parentheses.

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LOCATION OF FACILITY: BRACEVILLE, IL **REPORTING PERIOD: 2021**

MEDIUM OR PATHWAY SAMPLED *(UNIT OF MEASUREMENT)*	TYPES OF ANALYSIS PERFORMED	NUMBER OF ANALYSIS PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	**INDICATOR LOCATIONS** MEAN (M) (F) *RANGE*	**CONTROL LOCATION** MEAN (M) (F) *RANGE*	**LOCATION WITH HIGHEST ANNUAL MEAN (M)** MEAN (M) (F) *RANGE*	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
FISH	**GAMMA**	12						
(PCI/KG WET)	*MN-54*		130	<LLD	<LLD	-		0
	CO-58		130	<LLD	<LLD	-		0
	FE-59		260	<LLD	<LLD	-		0
	CO-60		130	<LLD	<LLD	-		0
	ZN-65		260	<LLD	<LLD	-		0
	NB-95		NA	<LLD	<LLD	-		0
	ZR-95		NA	<LLD	<LLD	-		0
	I-131		NA	<LLD	<LLD	-		0
	CS-134		130	<LLD	<LLD	-		0
	CS-137		150	<LLD	<LLD	-		0
	BA-140		NA	<LLD	<LLD	-		0
	LA-140		NA	<LLD	<LLD	-		0
SEDIMENT *(PCI/KG DRY)*	**FE-55**	6	2000	<LLD	<LLD	-		0
	NI-63	6	260	<LLD	<LLD	-		0
	GAMMA	6						
	MN-54		NA	<LLD	<LLD	-		0
	CO-58		NA	<LLD	<LLD	-		0
	FE-59		NA	<LLD	<LLD	-		0
	CO-60		NA	<LLD	<LLD	-		0
	ZN-65		NA	<LLD	<LLD	-		0
	NB-95		NA	<LLD	<LLD	-		0
	ZR-95		NA	<LLD	<LLD	-		0
	CS-134		150	<LLD	<LLD	-		0
	CS-137		180	<LLD	<LLD	-		0
	BA-140		NA	<LLD	<LLD	-		0
	LA-140		NA	<LLD	<LLD	-		0

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TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR BRAIDWOOD STATION, 2021

NAME OF FACILITY: BRAIDWOOD **DOCKET NUMBERS: 50-456 & 50-457**

LOCATION OF FACILITY: BRACEVILLE, IL **REPORTING PERIOD: 2021**

MEDIUM OR PATHWAY SAMPLED *(UNIT OF MEASUREMENT)*	TYPES OF ANALYSIS PERFORMED	NUMBER OF ANALYSIS PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	**INDICATOR LOCATIONS** MEAN (M) (F) *RANGE*	**CONTROL LOCATION** MEAN (M) (F) *RANGE*	**LOCATION WITH HIGHEST ANNUAL MEAN (M)** MEAN (M) (F) *RANGE*	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
AIR PARTICULATE	**GR-B**	416	10	19	18	20	BD-02 INDICATOR	0
(E-3 PCI/CU.METER)				(364/364)	(52/52)	(52/52)	CUSTER PARK	
				6 - 42	*7 - 39*	*7 - 36*	5.0 MILES E OF SITE	
	GAMMA	32						
	MN-54		NA	<LLD	<LLD	-		0
	CO-58		NA	<LLD	<LLD	-		0
	FE-59		NA	<LLD	<LLD	-		0
	CO-60		NA	<LLD	<LLD	-		0
	ZN-65		NA	<LLD	<LLD	-		0
	NB-95		NA	<LLD	<LLD	-		0
	ZR-95		NA	<LLD	<LLD	-		0
	CS-134		50	<LLD	<LLD	-		0
	CS-137		60	<LLD	<LLD	-		0
	BA-140		NA	<LLD	<LLD	-		0
	LA-140		NA	<LLD	<LLD	-		0
AIR IODINE	**GAMMA**	416						
(E-3 PCI/CU.METER)	*I-131*		70	<LLD	<LLD	-		0
MILK	**I-131**	5	1	<LLD	<LLD	-		0
(PCI/LITER)								
	GAMMA	5						
	MN-54		NA	<LLD	<LLD	-		0
	CO-58		NA	<LLD	<LLD	-		0
	FE-59		NA	<LLD	<LLD	-		0
	CO-60		NA	<LLD	<LLD	-		0
	ZN-65		NA	<LLD	<LLD	-		0
	NB-95		NA	<LLD	<LLD	-		0
	ZR-95		NA	<LLD	<LLD	-		0
	CS-134		15	<LLD	<LLD	-		0
	CS-137		18	<LLD	<LLD	-		0
	BA-140		60	<LLD	<LLD	-		0
	LA-140		15	<LLD	<LLD	-		0

(M) The Mean Values are calculated using the positive values. (F) Fraction of detectable measurement are indicated in parentheses.

TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR BRAIDWOOD STATION, 2021

NAME OF FACILITY: BRAIDWOOD **DOCKET NUMBERS: 50-456 & 50-457**

LOCATION OF FACILITY: BRACEVILLE, IL **REPORTING PERIOD: 2021**

MEDIUM OR PATHWAY SAMPLED *(UNIT OF MEASUREMENT)*	TYPES OF ANALYSIS PERFORMED	NUMBER OF ANALYSIS PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	**INDICATOR LOCATIONS** MEAN (M) (F) *RANGE*	**CONTROL LOCATION** MEAN (M) (F) *RANGE*	**LOCATION WITH HIGHEST ANNUAL MEAN (M)** MEAN (M) (F) *RANGE*	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
GRASS	**GAMMA**	0						
(PCI/KG WET)	*MN-54*		NA					0
	CO-58		NA					0
	FE-59		NA					0
	CO-60		NA					0
	ZN-65		NA					0
	NB-95		NA					0
	ZR-95		NA					0
	CS-134		60					0
	CS-137		60					0
	BA-140		80					0
	LA-140		NA					0
			NA					0
VEGETATION	**GAMMA**	128						
(PCI/KG WET)	*MN-54*		NA	<LLD	<LLD	-		0
	CO-58		NA	<LLD	<LLD	-		0
	FE-59		NA	<LLD	<LLD	-		0
	CO-60		NA	<LLD	<LLD	-		0
	ZN-65		NA	<LLD	<LLD	-		0
	NB-95		NA	<LLD	<LLD	-		0
	ZR-95		NA	<LLD	<LLD	-		0
	I-131		60	<LLD	<LLD	-		0
	CS-134		60	<LLD	<LLD	-		0
	CS-137		80	<LLD	<LLD			0
	BA-140		NA	<LLD	<LLD	-		0
	LA-140		NA	<LLD	<LLD	-		0
DIRECT RADIATION	**OSLD-QUARTERLY**	183	NA	17.5	17.8	31.7	BD-ISFSI-105-4 INDICATOR	0
(MILLIREM/QTR.)				(179/179)	(4/4)	(4/4)		
				12.8 - 38.0	*15.7 - 18.9*	*15.9 - 38.0*	0.20 MILES SE	

(M) The Mean Values are calculated using the positive values. (F) Fraction of detectable measurement are indicated in parentheses.

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APPENDIX B

LOCATION DESIGNATION, DISTANCE & DIRECTION, AND SAMPLE COLLECTION & ANALYTICAL METHODS

TABLE B-1: Radiological Environmental Monitoring Program - Sampling Locations, Distance and Direction, Braidwood Station, 2021

Location	Location Description	Distance & Direction From Site
A. Surface Water		
BD-10	Kankakee River Downstream (indicator)	5.4 miles NE
BD-25	Kankakee River Upstream (control)	9.6 miles E
BD-38	Main Drainage Ditch (indicator)	1.5 miles SE
BD-40	Braidwood Station Cooling Lake (indicator)	Onsite (1.0 mile E)
BD-55	North Pond Fatlan Site (indicator)	0.6 miles NE
BD-56	South Pond Fatlan Site (indicator)	0.6 miles NE
B. Drinking (Potable) Water		
BD-22	Wilmington (indicator)	6.0 miles NE
C. Ground/Well Water		
BD-13	Braidwood City Hall Well (indicator)	1.7 miles NNE
BD-34	Gibson Well (indicator)	4.7 miles E
BD-35	Joly Well (indicator)	4.7 miles E
BD-36	Hutton Well (indicator)	4.7 miles E
BD-37	Nurczyk Well (indicator)	4.7 miles E
BD-50	Skole Well (indicator)	4.7 miles E
BD-51	Fatlan Well (indicator)	0.6 miles NE
BD-54	Cash Well (indicator)	0.9 miles NE
D. Milk - Bi-Weekly / Monthly		
BD-18	Biros' Farm (control)	8.7 miles W
E. Air Particulates / Air Iodine		
BD-02	Custer Park (indicator)	5.0 miles E
BD-03	County Line Road (control)	6.2 miles ESE
BD-04	Essex (indicator)	4.8 miles SSE
BD-05	Gardner (indicator)	5.5 miles SW
BD-06	Godley (indicator)	0.5 miles WSW
BD-19	Nearsite NW (indicator)	0.3 miles NW
BD-20	Nearsite N (indicator)	0.6 miles N
BD-21	Nearsite NE (indicator)	0.5 miles NE
F. Fish		
BD-25	Kankakee River, Upstream (control)	9.6 miles E
BD-28	Kankakee River, Discharge (indicator)	5.4 miles E
BD-41	Cooling Lake (indicator)	Onsite (1.0 mile E)
G. Sediment		
BD-10	Kankakee River, Downstream (indicator)	5.4 miles NE
BD-25	Kankakee River Upstream (control)	9.6 miles E
BD-57	Circulating Water Blowdown Discharge (indicator)	5.4 miles E
H. Food Products		
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	Terri Schultz	4.8 miles SSW
Quadrant 4	Bruce Sinkular	1.9 miles NNW
Control	Gorman Farm	9.0 miles NE

TABLE B-1: Radiological Environmental Monitoring Program - Sampling Locations, Distance and Direction, Braidwood Station, 2021

Location	Location Description	Distance & Direction From Site
I. Environmental Dosimetry - OSLD		
Inner Ring		
BD-101		0.5 miles N
BD-102		1.1 miles NNE
BD-103		1.0 mile NE
BD-104		0.7 miles ENE
BD-105		2.2 miles E
BD-106		2.5 miles ESE
BD-107		3.2 miles SE
BD-108		3.2 miles SSE
BD-109		3.8 miles S
BD-110		2.8 miles SSW
BD-111a		1.4 miles SW
BD-112		0.7 miles WSW
BD-113a		0.5 miles W
BD-114		0.4 miles WNW
BD-115		0.3 miles NW
BD-116		0.4 miles NNW
Outer Ring		
BD-201		4.2 miles N
BD-202		4.8 miles NNE
BD-203		4.9 miles NE
BD-204		4.3 miles ENE
BD-205		4.0 miles E
BD-206		4.5 miles ESE
BD-207		4.5 miles SE
BD-208		4.5 miles SSE
BD-209		4.8 miles S
BD-210		5.3 miles SSW
BD-211		4.8 miles SW
BD-212		5.0 miles WSW
BD-213		4.8 miles W
BD-214		4.3 miles WNW
BD-215		4.5 miles NW
BD-216		4.0 miles NNW
Other		
BD-02	Custer Park (indicator)	5.0 miles E
BD-03	13000 W. Road (control)	6.2 miles ESE
BD-04	Essex (indicator)	4.8 miles SSE
BD-05	Gardner (indicator)	5.5 miles SW
BD-06	Godley (indicator)	0.5 miles WSW
BD-19	Nearsite NW (indicator)	0.3 miles NW
BD-20	Nearsite N (indicator)	0.6 miles N
BD-21	Nearsite NE (indicator)	0.5 miles NE
ISFSI		
BD-ISFSI-104-3		0.11 miles E
BD-ISFSI-104-4		0.13 miles E
BD-ISFSI-105-3		0.23 miles SE
BD-ISFSI-105-4		0.20 miles SE
BD-ISFSI-110-3		0.18 miles SE
BD-ISFSI-110-4		0.15 miles SE

TABLE B-1: Radiological Environmental Monitoring Program - Sampling Locations, Distance and Direction, Braidwood Station, 2021

Distance in Miles from the Braidwood Station ISFSI Pad, 2021		
Sector		Residence Miles
N	WNW	0.7
P	WNW	0.7
Q	NW	0.7
R	NNW	0.7

Distance in Miles from the Braidwood Station Reactor Buildings, 2020				
Sector		Residence Miles	Livestock Miles	Milk Farm Miles
A	N	0.5	2.6	-
B	NNE	0.9	-	-
C	NE	0.7	-	-
D	ENE	0.8	3.3	-
E	E	1.5	2.3	-
F	ESE	2.2	2.3	-
G	SE	2.7	2.7	-
H	SSE	4.5	-	-
J	S	4.2	4.8	-
K	SSW	1.3	5.3	-
L	SW	0.4	1.2	-
M	WSW	0.5	-	-
N	W	0.4	1.6	8.7
P	WNW	0.4	-	-
Q	NW	0.4	-	-
R	NNW	0.4	-	-

TABLE B-2: Radiological Environmental Monitoring Program – Summary of Sample Collection and Analytical Methods, Braidwood Station, 2021

Sample Medium	Analysis	Sampling Method	Analytical Procedure Number
Surface Water	Gamma Spectroscopy	Monthly composite from weekly grab samples	TBE, TBE-2007 Gamma-Emitting Radioisotope Analysis
Surface Water	Gross Beta	Monthly composite from weekly grab samples	TBE, TBE-2008 Gross Alpha and/or Gross Beta Activity in Various Matrices
Surface Water	Iron-55	Monthly composite from weekly grab samples	TBE, TBE-2006 Iron-55 Activity in Various Matrices
Surface Water	Nickel-63	Monthly composite from weekly grab samples	TBE, TBE-2013 Radionickel Activity in Various Matrices
Surface Water	Tritium	Quarterly composite from weekly grab samples	TBE, TBE-2011 Tritium Analysis in Drinking Water by Liquid Scintillation
Drinking Water	Gamma Spectroscopy	Monthly composite from weekly composite samples	TBE, TBE-2007 Gamma-Emitting Radioisotope Analysis TBE. TBE-2023 Compositing of Samples
Drinking Water	Gross Beta	Monthly composite from weekly composite samples	TBE, TBE-2008 Gross Alpha and/or Gross Beta Activity in Various Matrices TBE. TBE-2023 Compositing of Samples
Drinking Water	Iodine	Monthly composite from weekly composite samples	TBE, TBE-2012 Radioiodine in Various Matrices TBE. TBE-2023 Compositing of Samples
Drinking Water	Iron-55	Monthly composite from weekly grab samples	TBE, TBE-2006 Iron-55 Activity in Various Matrices
Drinking Water	Nickel-63	Monthly composite from weekly grab samples	TBE, TBE-2013 Radionickel Activity in Various Matrices
Drinking Water	Tritium	Monthly composite from weekly composite samples	TBE, TBE-2011 Tritium Analysis in Drinking Water by Liquid Scintillation TBE. TBE-2023 Compositing of Samples
Ground/ Well Water	Gamma Spectroscopy	Quarterly grab sample	TBE, TBE-2007 Gamma-Emitting Radioisotope Analysis
Ground/ Well Water	Tritium	Quarterly grab sample	TBE, TBE-2011 Tritium analysis in Drinking Water by Liquid Scintillation
Fish	Gamma Spectroscopy	Semi-annual samples collected via electro-shocking or other techniques	TBE, TBE-2007 Gamma-Emitting Radioisotope Analysis
Fish	Iron-55	Semi-annual samples collected via electro-shocking or other techniques	TBE, TBE-2006 Iron-55 Activity in Various Matrices
Fish	Nickel-63	Semi-annual samples collected via electroshocking or other techniques	TBE, TBE-2013 Radionickel Activity in Various Matrices
Sediment	Gamma Spectroscopy	Semi-annual grab samples	TBE-2007 Gamma-Emitting Radioisotope Analysis
Sediment	Iron-55	Semi-annual grab samples	TBE, TBE-2006 Iron-55 Activity in Various Matrices
Sediment	Nickel-63	Semi-annual grab samples	TBE, TBE-2013 Radionickel Activity in Various Matrices
Air Particulates	Gross Beta	One-week composite of continuous air sampling through glass fiber filter paper	TBE, TBE-2008 Gross Alpha and/or Gross Beta Activity in Various Matrices
Air Particulates	Gamma Spectroscopy	Quarterly composite of each station	TBE, TBE-2007 Gamma-Emitting Radioisotope Analysis TBE. TBE-2023 Compositing of Samples
Air Iodine	I-131	Weekly composite of continuous air sampling through charcoal filter	TBE, TBE-2007 Gamma-Emitting Radioisotope Analysis
Milk	Gamma Spectroscopy	Bi-weekly grab sample May through October. Monthly all other times	TBE, TBE-2007 Gamma-Emitting Radioisotope Analysis
Milk	I-131	Bi-weekly grab sample May through October. Monthly all other times	TBE, TBE-2012 Radioiodine in Various Matrices
Food Products	Gamma Spectroscopy	Grab samples during the growing season	TBE, TBE-2007 Gamma-Emitting Radioisotope Analysis
OSLD	Optically Stimulated Luminescence Dosimetry	Quarterly OSLDs comprised of two Al_2O_3:C Landauer Incorporated elements.	Landauer Incorporated

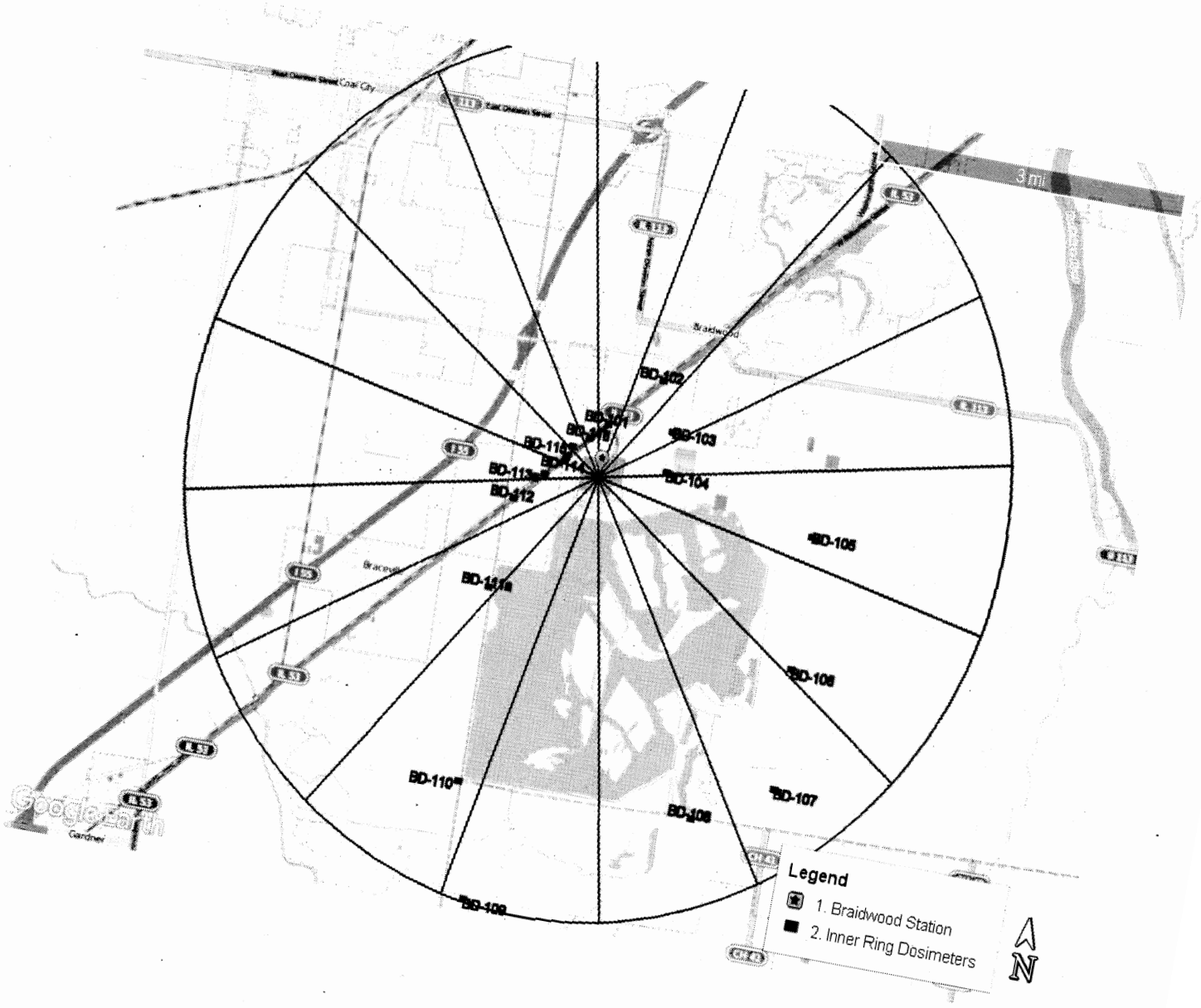

Figure B-1
Inner Ring and Other OSLD Locations
of Braidwood Station, 2021

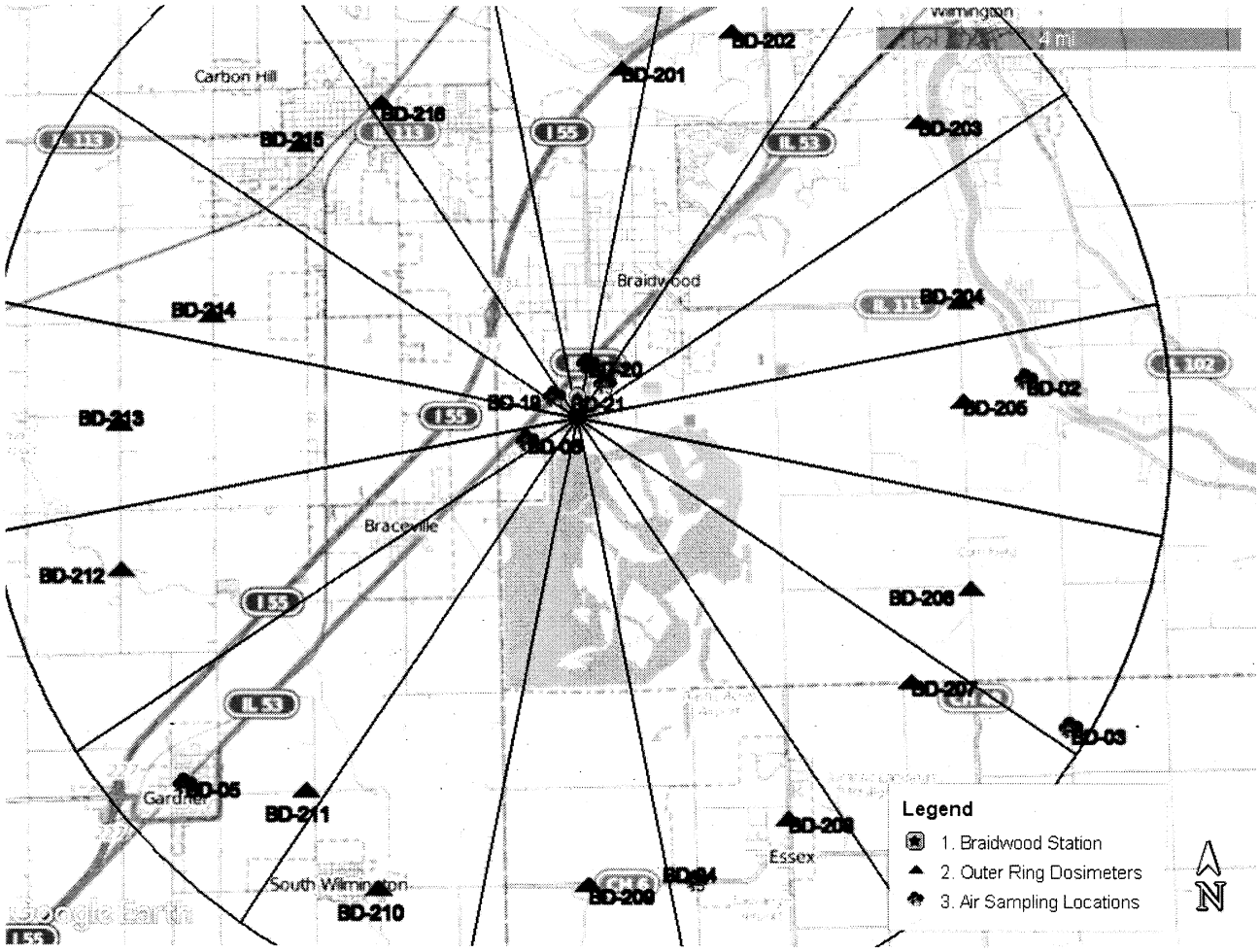

Figure B-2
Fixed Air Sampling and Outer Ring
OSLD Locations of Braidwood Station, 2021

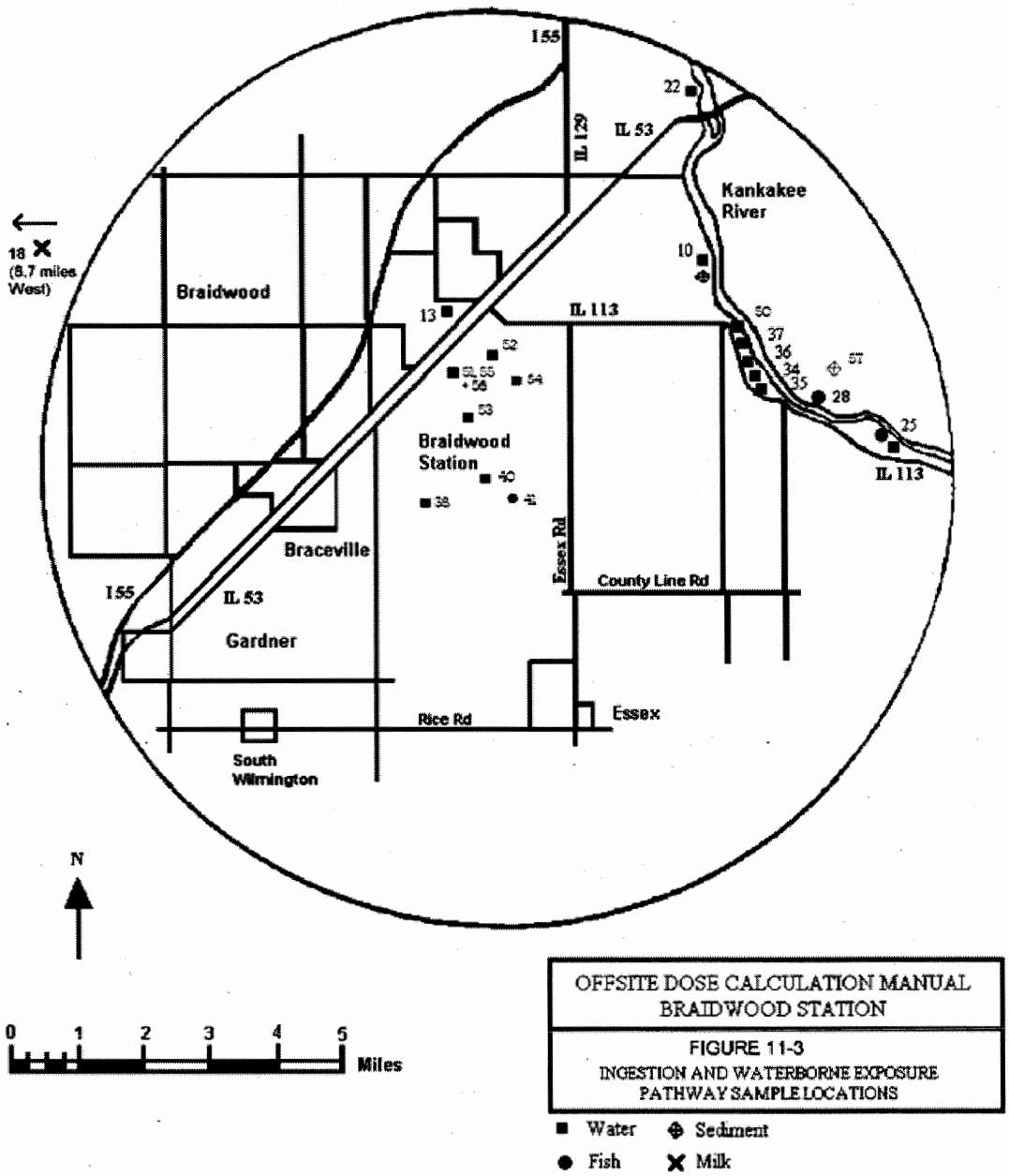

Figure B-3
Ingestion and Waterborne Exposure Pathway
Sample Locations of Braidwood Station, 2021

APPENDIX C

DATA TABLES AND FIGURES

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Table C-I.1 CONCENTRATIONS OF GROSS BETA IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2021

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	BD-10	BD-25	BD-38	BD-40	BD-55	BD-56
01/07/21 - 01/28/21	4.9 ± 1.9	3.7 ± 1.7	8.0 ± 2.3	7.4 ± 2.3	*(1)*	*(1)*
02/04/21 - 02/25/21	*(1)*	*(1)*	< 3.4	5.2 ± 2.5	*(1)*	(1)
03/04/21 - 03/25/21	< 2.1	2.6 ± 1.7	3.2 ± 1.9	6.6 ± 2.3	2.1 ± 1.4	< 2.3
04/01/21 - 04/29/21	3.1 ± 1.9	< 2.8	5.4 ± 2.5	9.4 ± 3.2	3.4 ± 1.7	< 2.9
05/06/21 - 05/27/21	4.7 ± 2.0	4.6 ± 2.0	5.2 ± 2.7	8.8 ± 2.9	< 2.4	< 3.0
06/03/21 - 06/24/21	3.3 ± 1.8	4.1 ± 1.9	4.2 ± 2.0	8.7 ± 2.4	< 2.2	3.9 ± 1.9
07/01/21 - 07/29/21	6.1 ± 2.1	6.1 ± 2.1	6.9 ± 2.7	12.5 ± 3.2	3.1 ± 1.6	3.4 ± 1.9
08/05/21 - 08/26/21	4.6 ± 1.9	3.5 ± 1.7	5.6 ± 2.0	6.5 ± 2.2	3.0 ± 1.6	< 2.3
09/02/21 - 09/30/21	3.4 ± 1.9	< 2.7	7.6 ± 2.9	13.7 ± 3.3	2.4 ± 1.6	< 2.6
10/07/21 - 10/28/21	8.3 ± 2.2	6.1 ± 2.1	7.4 ± 2.5	7.3 ± 2.3	3.9 ± 1.6	3.4 ± 1.8
11/04/21 - 11/26/21	5.6 ± 2.2	5.4 ± 2.2	9.0 ± 2.9	12.8 ± 3.3	< 2.4	< 2.8
12/02/21 - 12/30/21	4.7 ± 1.9	3.0 ± 1.8	8.1 ± 2.5	9.5 ± 2.7	3.8 ± 1.6	2.9 ± 1.8
MEAN ± 2 STD DEV	5.0 ± 2.5	5.0 ± 1.1	7.6 ± 6.6	8.7 ± 4.4	4.0 ± 1.6	4.3 ± 1.1

Table C-I.2 CONCENTRATIONS OF TRITIUM IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2021

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	BD-10	BD-25	BD-38	BD-40	BD-55	BD-56
01/07/21 - 03/25/21	< 183	< 184	< 180	< 182		
03/04/21 - 03/25/21					< 184	< 191
04/01/21 - 06/24/21	< 184	< 179	< 181	< 180	< 178	< 177
07/01/21 - 09/30/21	< 193	< 196	< 180	< 177	< 173	< 180
10/07/21 - 12/30/21	< 173	< 163	< 178	< 190	< 175	352 ± 122
MEAN ± 2 STD DEV	-	-	-	-	-	352 ± 0

THE MEAN AND TWO STANDARD DEVIATION ARE CALCULATED USING THE POSITIVE VALUES

(1) SEE PROGRAM EXCEPTIONS FOR EXPLANATION

Table C-I.3 CONCENTRATIONS OF NICKEL-63 IN SURFACE WATER SAMPLES COLLECTED IN THE VACINITY OF BRAIDWOOD STATION, 2021

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	BD-10	BD-25
01/07/21 - 01/20/21	< 17	< 18
03/11/21 - 03/25/21	< 4	< 4
04/01/21 - 04/29/21	< 23	< 24
05/06/21 - 05/27/21	< 29	< 30
06/03/21 - 06/24/21	< 19	< 19
07/01/21 - 07/29/21	< 20	< 21
08/05/21 - 08/26/21	< 16	< 17
09/02/21 - 09/30/21	< 19	< 19
10/07/21 - 10/21/21	< 18	< 18
11/11/21 - 11/26/21	< 25	< 26
12/02/21 - 12/30/21	< 19	< 19
MEAN	-	-

Table C-I.4 CONCENTRATIONS OF IRON-55 IN SURFACE WATER SAMPLES COLLECTED IN THE VACINITY OF BRAIDWOOD STATION, 2021

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	BD-10	BD-25
01/07/21 - 01/20/21	< 168	< 37
03/11/21 - 03/25/21	< 58	< 70
04/01/21 - 04/29/21	< 52	< 46
05/06/21 - 05/27/21	< 64	< 100
06/03/21 - 06/24/21	< 117	< 128
07/01/21 - 07/29/21	< 86	< 162
08/05/21 - 08/26/21	< 95	< 39
09/02/21 - 09/30/21	< 83	< 57
10/07/21 - 10/21/21	< 129	< 98
11/11/21 - 11/26/21	< 196	< 96
12/02/21 - 12/30/21	< 96	< 188
MEAN	-	-

Table C-I.5 **CONCENTRATIONS OF GAMMA EMITTERS IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2021**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION PERIOD	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	01/07/21 - 01/20/21	< 4	< 4	< 9	< 3	< 7	< 4	< 7	< 10	< 4	< 4	< 23	< 8
	02/04/21 - 02/25/21 *(1)*												
	03/04/21 - 03/25/21	< 3	< 3	< 6	< 3	< 5	< 3	< 5	< 10	< 3	< 3	< 20	< 6
	04/01/21 - 04/29/21	< 7	< 5	< 12	< 7	< 12	< 7	< 13	< 13	< 7	< 6	< 32	< 14
	05/06/21 - 05/27/21	< 4	< 3	< 5	< 4	< 8	< 5	< 11	< 13	< 5	< 5	< 32	< 9
	06/03/21 - 06/24/21	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 8	< 2	< 2	< 15	< 5
	07/01/21 - 07/29/21	< 2	< 2	< 5	< 2	< 5	< 2	< 4	< 6	< 2	< 2	< 14	< 5
	08/05/21 - 08/26/21	< 2	< 2	< 4	< 2	< 4	< 2	< 4	< 8	< 2	< 2	< 16	< 5
	09/02/21 - 09/30/21	< 7	< 5	< 12	< 5	< 9	< 8	< 13	< 11	< 8	< 7	< 28	< 7
	10/07/21 - 10/28/21	< 4	< 4	< 9	< 5	< 7	< 6	< 8	< 13	< 6	< 6	< 28	< 10
	11/04/21 - 11/26/21	< 8	< 7	< 13	< 8	< 19	< 8	< 9	< 9	< 8	< 6	< 33	< 11
	12/02/21 - 12/30/21	< 5	< 5	< 12	< 4	< 7	< 5	< 9	< 15	< 5	< 5	< 31	< 9
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
BD-25	01/07/21 - 01/20/21	< 5	< 6	< 13	< 6	< 15	< 8	< 13	< 12	< 7	< 5	< 32	< 14
	02/04/21 - 02/25/21 *(1)*												
	03/11/21 - 03/25/21	< 3	< 3	< 7	< 3	< 5	< 3	< 6	< 10	< 3	< 3	< 24	< 7
	04/01/21 - 04/29/21	< 6	< 6	< 14	< 5	< 12	< 7	< 11	< 14	< 5	< 5	< 36	< 8
	05/06/21 - 05/27/21	< 3	< 3	< 10	< 6	< 11	< 5	< 7	< 14	< 6	< 4	< 31	< 11
	06/03/21 - 06/24/21	< 2	< 2	< 5	< 2	< 4	< 2	< 4	< 9	< 2	< 2	< 16	< 6
	07/01/21 - 07/29/21	< 5	< 4	< 10	< 6	< 9	< 7	< 9	< 10	< 5	< 5	< 26	< 11
	08/05/21 - 08/26/21	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 6	< 2	< 2	< 12	< 4
	09/02/21 - 09/30/21	< 3	< 4	< 9	< 7	< 10	< 4	< 10	< 9	< 5	< 6	< 23	< 8
	10/07/21 - 10/21/21	< 2	< 2	< 4	< 2	< 4	< 2	< 4	< 9	< 2	< 2	< 17	< 5
	11/11/21 - 11/26/21	< 5	< 5	< 12	< 6	< 11	< 6	< 10	< 10	< 5	< 6	< 29	< 13
	12/02/21 - 12/30/21	< 4	< 4	< 10	< 5	< 9	< 5	< 8	< 15	< 5	< 5	< 35	< 11
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
BD-38	01/07/21 - 01/28/21	< 8	< 7	< 14	< 6	< 13	< 6	< 10	< 10	< 8	< 8	< 34	< 10
	02/04/21 - 02/25/21	< 4	< 4	< 9	< 4	< 9	< 4	< 8	< 6	< 5	< 5	< 18	< 7
	03/04/21 - 03/25/21	< 2	< 2	< 5	< 2	< 4	< 2	< 4	< 8	< 2	< 2	< 16	< 5
	04/01/21 - 04/29/21	< 4	< 4	< 11	< 5	< 10	< 4	< 7	< 13	< 5	< 5	< 36	< 10
	05/06/21 - 05/27/21	< 3	< 4	< 7	< 4	< 7	< 4	< 6	< 9	< 3	< 3	< 23	< 7
	06/03/21 - 06/24/21	< 2	< 2	< 4	< 2	< 4	< 2	< 4	< 8	< 2	< 2	< 15	< 6
	07/01/21 - 07/29/21	< 3	< 3	< 6	< 2	< 6	< 3	< 5	< 7	< 3	< 2	< 18	< 6
	08/05/21 - 08/26/21	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 6	< 2	< 2	< 13	< 5
	09/02/21 - 09/30/21	< 6	< 5	< 11	< 7	< 15	< 5	< 9	< 10	< 7	< 8	< 31	< 12
	10/07/21 - 10/28/21	< 5	< 5	< 12	< 5	< 11	< 5	< 10	< 14	< 5	< 5	< 34	< 11
	11/04/21 - 11/26/21	< 5	< 6	< 17	< 6	< 6	< 6	< 9	< 10	< 7	< 6	< 30	< 13
	12/02/21 - 12/30/21	< 5	< 5	< 10	< 5	< 9	< 5	< 9	< 15	< 4	< 4	< 35	< 11
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-

(1) SEE PROGRAM EXCEPTIONS FOR EXPLANATION

Table C-I.5 **CONCENTRATIONS OF GAMMA EMITTERS IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2021**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION PERIOD	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	01/07/21 - 01/28/21	< 6	< 6	< 8	< 6	< 15	< 4	< 14	< 7	< 6	< 6	< 25	< 12
	02/04/21 - 02/25/21	< 4	< 4	< 6	< 3	< 7	< 4	< 7	< 5	< 5	< 3	< 18	< 6
	03/04/21 - 03/25/21	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 8	< 2	< 2	< 15	< 5
	04/01/21 - 04/29/21	< 7	< 8	< 16	< 7	< 13	< 6	< 11	< 14	< 6	< 6	< 37	< 10
	05/06/21 - 05/27/21	< 3	< 4	< 8	< 3	< 6	< 3	< 7	< 13	< 4	< 3	< 27	< 9
	06/03/21 - 06/24/21	< 2	< 2	< 5	< 2	< 4	< 2	< 4	< 9	< 2	< 2	< 16	< 6
	07/01/21 - 07/29/21	< 2	< 2	< 4	< 2	< 4	< 2	< 4	< 6	< 2	< 2	< 14	< 4
	08/05/21 - 08/26/21	< 2	< 2	< 4	< 2	< 4	< 2	< 4	< 7	< 2	< 2	< 15	< 6
	09/02/21 - 09/30/21	< 5	< 4	< 10	< 6	< 12	< 4	< 8	< 9	< 4	< 5	< 23	< 5
	10/07/21 - 10/28/21	< 5	< 5	< 11	< 7	< 10	< 5	< 8	< 11	< 4	< 5	< 33	< 8
	11/04/21 - 11/26/21	< 5	< 6	< 13	< 6	< 12	< 6	< 12	< 11	< 7	< 7	< 30	< 9
	12/02/21 - 12/30/21	< 4	< 5	< 10	< 5	< 9	< 5	< 8	< 15	< 4	< 5	< 35	< 14
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
BD-55	01/07/21 - 01/28/21 *(1)*												
	02/04/21 - 02/25/21 *(1)*												
	03/11/21 - 03/25/21	< 3	< 3	< 7	< 3	< 5	< 3	< 5	< 9	< 3	< 3	< 20	< 7
	04/01/21 - 04/29/21	< 6	< 7	< 13	< 5	< 10	< 7	< 13	< 12	< 8	< 6	< 28	< 10
	05/06/21 - 05/27/21	< 5	< 5	< 11	< 5	< 10	< 6	< 7	< 14	< 5	< 5	< 35	< 12
	06/03/21 - 06/24/21	< 1	< 1	< 3	< 1	< 3	< 1	< 3	< 6	< 1	< 1	< 11	< 4
	07/01/21 - 07/29/21	< 2	< 2	< 6	< 2	< 4	< 2	< 4	< 7	< 3	< 2	< 15	< 5
	08/05/21 - 08/26/21	< 1	< 2	< 4	< 2	< 3	< 2	< 3	< 6	< 2	< 2	< 13	< 4
	09/02/21 - 09/30/21	< 5	< 5	< 11	< 5	< 9	< 5	< 8	< 9	< 6	< 5	< 22	< 9
	10/07/21 - 10/28/21	< 4	< 5	< 10	< 5	< 10	< 5	< 7	< 13	< 5	< 4	< 28	< 9
	11/04/21 - 11/26/21	< 6	< 7	< 18	< 6	< 15	< 8	< 12	< 13	< 7	< 7	< 31	< 11
	12/02/21 - 12/30/21	< 4	< 5	< 9	< 4	< 10	< 5	< 8	< 15	< 4	< 5	< 31	< 10
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
BD-56	01/07/21 - 01/28/21 *(1)*												
	02/04/21 - 02/25/21 *(1)*												
	03/04/21 - 03/25/21	< 2	< 2	< 5	< 2	< 4	< 2	< 4	< 8	< 2	< 2	< 16	< 6
	04/01/21 - 04/29/21	< 6	< 4	< 13	< 7	< 9	< 5	< 11	< 14	< 6	< 6	< 35	< 13
	05/06/21 - 05/27/21	< 4	< 4	< 7	< 4	< 7	< 5	< 7	< 11	< 5	< 4	< 27	< 9
	06/03/21 - 06/24/21	< 2	< 2	< 4	< 2	< 4	< 2	< 4	< 8	< 2	< 2	< 16	< 6
	07/01/21 - 07/29/21	< 2	< 2	< 5	< 2	< 5	< 2	< 4	< 6	< 3	< 2	< 13	< 5
	08/05/21 - 08/26/21	< 2	< 2	< 4	< 2	< 4	< 2	< 3	< 8	< 2	< 2	< 15	< 4
	09/02/21 - 09/30/21	< 4	< 6	< 9	< 5	< 11	< 6	< 9	< 9	< 6	< 6	< 25	< 8
	10/07/21 - 10/28/21	< 6	< 6	< 14	< 7	< 11	< 7	< 10	< 15	< 7	< 5	< 33	< 14
	11/04/21 - 11/26/21	< 7	< 6	< 15	< 6	< 12	< 6	< 11	< 13	< 7	< 6	< 29	< 12
	12/02/21 - 12/30/21	< 5	< 5	< 13	< 5	< 9	< 7	< 9	< 15	< 5	< 6	< 35	< 14
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-

(1) SEE PROGRAM EXCEPTIONS FOR EXPLANATION

Table C-II.1 **CONCENTRATIONS OF GROSS BETA IN PUBLIC WATER SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2021**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	BD-22
12/31/20 - 01/28/21	2.5 ± 1.5
01/28/21 - 02/25/21	< 2.6
02/25/21 - 03/25/21	3.0 ± 1.3
03/25/21 - 04/29/21	2.7 ± 1.7
04/29/21 - 05/27/21	3.4 ± 1.6
05/27/21 - 06/24/21	< 2.4
06/24/21 - 07/29/21	4.5 ± 2.5
07/29/21 - 08/26/21	< 2.4
08/26/21 - 09/30/21	4.0 ± 1.6
09/30/21 - 10/28/21	2.6 ± 1.6
10/28/21 - 11/26/21	5.5 ± 1.9
11/26/21 - 12/30/21	3.7 ± 1.6
MEAN ± 2 STD DEV	3.5 ± 2.0

Table C-II.2 **CONCENTRATIONS OF TRITIUM IN PUBLIC WATER SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2021**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	BD-22
12/31/20 - 01/28/21	2210 ± 291
01/28/21 - 02/25/21	1780 ± 240
02/25/21 - 03/25/21	1920 ± 267
03/25/21 - 04/29/21	962 ± 170
04/29/21 - 05/27/21	315 ± 129
05/27/21 - 06/24/21	235 ± 119
06/24/21 - 07/29/21	416 ± 133
07/29/21 - 08/26/21	1310 ± 210
08/26/21 - 09/30/21	707 ± 144
09/30/21 - 10/28/21	599 ± 138
10/28/21 - 11/26/21	< 175
11/26/21 - 12/30/21	626 ± 136
MEAN ± 2 STD DEV	1007 ± 1385

Table C-II.3 **CONCENTRATIONS OF I-131 IN PUBLIC WATER SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2021**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	BD-22
12/31/20 - 01/28/21	< 0.9
01/28/21 - 02/25/21	< 0.9
02/25/21 - 03/25/21	< 0.8
03/25/21 - 04/29/21	< 0.9
04/29/21 - 05/27/21	< 0.9
05/27/21 - 06/24/21	< 0.9
06/24/21 - 07/29/21	< 0.8
07/29/21 - 08/26/21	< 0.8
08/26/21 - 09/30/21	< 0.8
09/30/21 - 10/28/21	< 0.4
10/28/21 - 11/26/21	< 0.9
11/26/21 - 12/30/21	< 0.9
MEAN	-

THE MEAN AND TWO STANDARD DEVIATION ARE CALCULATED USING THE POSITIVE VALUES

Table C-II.4 CONCENTRATIONS OF NICKEL-63 IN PUBLIC WATER SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2021

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	BD-22
12/31/20 - 01/28/21	< 24
01/28/21 - 02/25/21	< 30
02/25/21 - 03/25/21	< 24
03/25/21 - 04/29/21	< 28
04/29/21 - 05/27/21	< 21
05/27/21 - 06/24/21	< 25
06/24/21 - 07/29/21	< 13
07/29/21 - 08/26/21	< 28
08/26/21 - 09/30/21	< 24
09/30/21 - 10/28/21	< 23
10/28/21 - 11/26/21	< 16
11/26/21 - 12/30/21	< 21
MEAN	-

Table C-II.5 CONCENTRATIONS OF IRON-55 IN PUBLIC WATER SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2021

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	BD-22
12/31/20 - 01/28/21	< 57
01/28/21 - 02/25/21	< 68
02/25/21 - 03/25/21	< 182
03/25/21 - 04/29/21	< 100
04/29/21 - 05/27/21	< 187
05/27/21 - 06/24/21	< 55
06/24/21 - 07/29/21	< 68
07/29/21 - 08/26/21	< 86
08/26/21 - 09/30/21	< 97
09/30/21 - 10/28/21	< 159
10/28/21 - 11/26/21	< 189
11/26/21 - 12/30/21	< 47
MEAN	-

Table C-II.6

CONCENTRATIONS OF GAMMA EMITTERS IN PUBLIC WATER SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2021

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION PERIOD	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	Cs-134	Cs-137	Ba-140	La-140
BD-22	12/31/20 - 01/28/21	< 4	< 5	< 10	< 6	< 11	< 6	< 9	< 6	< 5	< 27	< 13
	01/28/21 - 02/25/21	< 4	< 4	< 11	< 6	< 10	< 6	< 10	< 6	< 6	< 21	< 9
	02/25/21 - 03/25/21	< 2	< 2	< 4	< 2	< 4	< 2	< 4	< 2	< 2	< 15	< 5
	03/25/21 - 04/29/21	< 3	< 3	< 6	< 3	< 6	< 3	< 5	< 3	< 4	< 21	< 6
	04/29/21 - 05/27/21	< 5	< 4	< 10	< 5	< 8	< 6	< 8	< 4	< 5	< 27	< 9
	05/27/21 - 06/24/21	< 3	< 3	< 6	< 3	< 5	< 3	< 5	< 3	< 3	< 18	< 6
	06/24/21 - 07/29/21	< 1	< 1	< 3	< 1	< 3	< 1	< 2	< 1	< 1	< 12	< 4
	07/29/21 - 08/26/21	< 2	< 2	< 4	< 2	< 4	< 2	< 3	< 2	< 2	< 17	< 5
	08/26/21 - 09/30/21	< 5	< 4	< 12	< 5	< 9	< 5	< 7	< 5	< 6	< 24	< 11
	09/30/21 - 10/28/21	< 6	< 4	< 10	< 5	< 11	< 7	< 10	< 6	< 7	< 31	< 14
	10/28/21 - 11/26/21	< 5	< 4	< 10	< 5	< 10	< 4	< 8	< 4	< 5	< 30	< 12
	11/26/21 - 12/30/21	< 5	< 6	< 11	< 6	< 9	< 6	< 9	< 6	< 5	< 36	< 12
	MEAN	-	-	-	-	-	-	-	-	-	-	-

Table C-III.1 **CONCENTRATIONS OF TRITIUM IN GROUND/WELL WATER SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2021**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	BD-13	BD-34	BD-35	BD-36	BD-37	BD-50	BD-51	BD-54
01/14/21 - 01/14/21	< 182	< 182	< 185	< 187	< 183	< 185	< 183	< 182
04/09/21 - 04/09/21	< 189	< 189	< 182	< 183	< 178	< 186	< 183	< 190
07/08/21 - 07/08/21	< 179	< 183	< 183	< 183	< 181	< 181	< 183	< 180
10/14/21 - 10/14/21	< 184	< 191	< 179	< 194	< 182	< 197	< 185	< 178
MEAN	-	-	-	-	-	-	-	-

Table C-III.2

CONCENTRATIONS OF GAMMA EMITTERS IN GROUND/WELL WATER SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2021

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION PERIOD	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	01/14/21 - 01/14/21	< 8	< 7	< 14	< 9	< 15	< 9	< 14	< 11	< 8	< 8	< 31	< 9
	04/09/21 - 04/09/21	< 5	< 5	< 8	< 5	< 10	< 6	< 9	< 6	< 6	< 4	< 18	< 9
	07/08/21 - 07/08/21	< 7	< 7	< 13	< 7	< 15	< 7	< 10	< 9	< 8	< 7	< 33	< 10
	10/14/21 - 10/14/21	< 5	< 5	< 10	< 5	< 9	< 5	< 8	< 8	< 6	< 5	< 20	< 8
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
BD-34	01/14/21 - 01/14/21	< 6	< 6	< 14	< 6	< 11	< 7	< 10	< 8	< 6	< 6	< 24	< 9
	04/09/21 - 04/09/21	< 4	< 5	< 12	< 5	< 14	< 6	< 10	< 9	< 7	< 5	< 24	< 7
	07/08/21 - 07/08/21	< 7	< 5	< 11	< 5	< 9	< 6	< 11	< 8	< 7	< 7	< 25	< 11
	10/14/21 - 10/14/21	< 5	< 4	< 10	< 5	< 8	< 5	< 8	< 7	< 6	< 5	< 23	< 7
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
BD-35	01/14/21 - 01/14/21	< 7	< 7	< 12	< 6	< 13	< 8	< 11	< 10	< 7	< 7	< 31	< 12
	04/09/21 - 04/09/21	< 5	< 5	< 10	< 5	< 10	< 6	< 9	< 6	< 5	< 5	< 20	< 9
	07/08/21 - 07/08/21	< 7	< 5	< 15	< 6	< 14	< 7	< 11	< 8	< 6	< 5	< 31	< 13
	10/14/21 - 10/14/21	< 5	< 5	< 11	< 5	< 11	< 6	< 9	< 8	< 6	< 6	< 28	< 8
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
BD-36	01/14/21 - 01/14/21	< 7	< 6	< 19	< 10	< 16	< 9	< 12	< 12	< 8	< 5	< 41	< 8
	04/09/21 - 04/09/21	< 8	< 6	< 14	< 8	< 15	< 10	< 12	< 11	< 8	< 7	< 26	< 10
	07/08/21 - 07/08/21	< 5	< 6	< 10	< 6	< 11	< 6	< 9	< 8	< 5	< 6	< 23	< 9
	10/14/21 - 10/14/21	< 6	< 6	< 13	< 8	< 20	< 6	< 11	< 9	< 7	< 7	< 25	< 11
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
BD-37	01/14/21 - 01/14/21	< 4	< 6	< 9	< 5	< 13	< 7	< 8	< 8	< 5	< 5	< 22	< 10
	04/09/21 - 04/09/21	< 5	< 5	< 10	< 5	< 9	< 6	< 10	< 7	< 6	< 6	< 20	< 10
	07/08/21 - 07/08/21	< 5	< 6	< 11	< 6	< 11	< 7	< 13	< 9	< 7	< 6	< 25	< 8
	10/14/21 - 10/14/21	< 5	< 5	< 11	< 5	< 9	< 8	< 10	< 10	< 6	< 5	< 22	< 10
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-

Table C-III.2

CONCENTRATIONS OF GAMMA EMITTERS IN GROUND/WELL WATER SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2021

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION PERIOD	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-50	01/14/21 - 01/14/21	< 6	< 6	< 12	< 8	< 13	< 6	< 10	< 9	< 7	< 7	< 25	< 8
	04/09/21 - 04/09/21	< 5	< 4	< 9	< 7	< 12	< 5	< 10	< 7	< 5	< 5	< 22	< 7
	07/08/21 - 07/08/21	< 7	< 8	< 13	< 7	< 17	< 7	< 12	< 11	< 8	< 7	< 32	< 10
	10/14/21 - 10/14/21	< 3	< 4	< 9	< 4	< 9	< 4	< 7	< 8	< 4	< 4	< 21	< 7
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
BD-51	01/14/21 - 01/14/21	< 6	< 6	< 12	< 7	< 15	< 7	< 9	< 11	< 7	< 8	< 29	< 12
	04/09/21 - 04/09/21	< 5	< 5	< 11	< 6	< 11	< 6	< 10	< 7	< 5	< 7	< 22	< 8
	07/08/21 - 07/08/21	< 5	< 6	< 14	< 4	< 13	< 6	< 10	< 9	< 7	< 6	< 24	< 8
	10/14/21 - 10/14/21	< 5	< 5	< 11	< 4	< 10	< 5	< 8	< 7	< 4	< 5	< 23	< 9
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
BD-54	01/14/21 - 01/14/21	< 5	< 5	< 13	< 6	< 12	< 6	< 9	< 11	< 7	< 7	< 31	< 8
	04/09/21 - 04/09/21	< 6	< 5	< 12	< 5	< 10	< 5	< 10	< 8	< 5	< 5	< 23	< 8
	07/08/21 - 07/08/21	< 7	< 6	< 15	< 6	< 12	< 6	< 11	< 10	< 7	< 6	< 31	< 13
	10/14/21 - 10/14/21	< 5	< 5	< 11	< 6	< 10	< 6	< 9	< 9	< 6	< 6	< 28	< 9
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-

Table C-IV.1 **CONCENTRATIONS OF IRON-55, NICKEL-63 AND GAMMA EMITTERS IN FISH SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2021**

RESULTS IN UNITS OF PCI/KG WET ± 2 SIGMA

SITE	COLLECTION PERIOD	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															
Shorthead Redhorse	05/04/21	< 180	< 172	< 52	< 50	< 118	< 46	< 107	< 51	< 89	< 90	< 56	< 45	< 213	< 81
Golden Redhorse	05/04/21	< 241	< 234	< 36	< 44	< 70	< 36	< 96	< 44	< 63	< 69	< 40	< 40	< 213	< 71
Smallmouth Bass	10/12/21	< 178	< 158	< 59	< 66	< 124	< 71	< 179	< 76	< 100	< 160	< 84	< 69	< 371	< 97
Golden Redhorse	10/12/21	< 65	< 149	< 82	< 81	< 155	< 68	< 184	< 87	< 145	< 171	< 80	< 89	< 420	< 117
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BD-28															
Golden Redhorse	05/04/21	< 237	< 155	< 53	< 47	< 83	< 43	< 85	< 49	< 76	< 71	< 41	< 50	< 231	< 77
Common Carp	05/04/21	< 179	< 185	< 27	< 30	< 47	< 26	< 53	< 24	< 53	< 55	< 33	< 23	< 148	< 42
Golden Redhorse	10/12/21	< 243	< 169	< 63	< 58	< 150	< 65	< 139	< 64	< 119	< 136	< 80	< 65	< 392	< 107
Smallmouth Bass	10/12/21	< 66	< 125	< 56	< 51	< 111	< 51	< 104	< 53	< 88	< 112	< 65	< 53	< 329	< 40
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BD-41															
Common Carp	05/04/21	< 116	< 211	< 35	< 44	< 83	< 38	< 89	< 41	< 63	< 54	< 53	< 36	< 209	< 60
Largemouth Bass	05/04/21	< 197	< 183	< 28	< 35	< 67	< 33	< 73	< 35	< 57	< 62	< 37	< 29	< 184	< 59
Bluegill	10/12/21	< 91	< 207	< 65	< 82	< 154	< 45	< 150	< 80	< 119	< 162	< 57	< 53	< 425	< 151
Largemouth Bass	10/12/21	< 68	< 97	< 58	< 59	< 93	< 70	< 126	< 50	< 100	< 125	< 55	< 55	< 328	< 121
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table C-V.1 **CONCENTRATIONS OF IRON-55, NICKEL-63 AND GAMMA EMITTERS IN SEDIMENT SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2021**

RESULTS IN UNITS OF PCI/KG DRY ± 2 SIGMA

SITE	COLLECTION PERIOD	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	05/12/21	< 1037	< 208	< 90	< 82	< 197	< 83	< 134	< 88	< 131	< 75	< 100	< 676	< 227
	10/12/21	< 1793	< 218	< 84	< 76	< 142	< 86	< 164	< 87	< 155	< 96	< 106	< 408	< 151
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-	-
BD-25	05/25/21	< 1897	< 222	< 79	< 66	< 179	< 70	< 178	< 76	< 129	< 91	< 95	< 378	< 79
	10/12/21	< 1956	< 244	< 61	< 59	< 124	< 46	< 128	< 57	< 84	< 59	< 67	< 253	< 103
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-	-
BD-57	05/25/21	< 1742	< 210	< 112	< 90	< 226	< 105	< 237	< 127	< 165	< 106	< 127	< 471	< 149
	10/12/21	< 1800	< 162	< 61	< 63	< 116	< 53	< 157	< 53	< 114	< 62	< 61	< 311	< 105
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-	-

Table C-VI.1

CONCENTRATIONS OF GROSS BETA IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2021

RESULTS IN UNITS OF E-3 PCI/CU METER ± 2 SIGMA

COLLECTION PERIOD	GROUP I - NEAR FIELD				GROUP II - FAR FIELD			GROUP III - CONTROL
	BD-06	BD-19	BD-20	BD-21	BD-02	BD-04	BD-05	BD-03
12/31/20 - 01/07/21	16 ± 4	15 ± 4	14 ± 4	17 ± 4	15 ± 4	14 ± 4	16 ± 4	12 ± 4
01/07/21 - 01/14/21	20 ± 5	21 ± 5	19 ± 4	16 ± 4	22 ± 5	21 ± 5	18 ± 4	20 ± 5
01/14/21 - 01/20/21	18 ± 5	20 ± 5	18 ± 5	16 ± 5	32 ± 9	14 ± 4	19 ± 5	13 ± 4
01/20/21 - 01/28/21	9 ± 3	10 ± 3	10 ± 3	10 ± 3	9 ± 3	9 ± 3	15 ± 4	10 ± 3
01/28/21 - 02/04/21	17 ± 4	16 ± 4	22 ± 5	17 ± 4	17 ± 4	14 ± 4	17 ± 5	18 ± 5
02/04/21 - 02/11/21	28 ± 5	37 ± 5	35 ± 5	32 ± 5	34 ± 5	34 ± 5	31 ± 5	33 ± 5
02/11/21 - 02/19/21	16 ± 4	19 ± 4	16 ± 4	17 ± 4	20 ± 4	16 ± 4	17 ± 4	22 ± 4
02/18/21 - 02/25/21	24 ± 5	27 ± 5	22 ± 5	26 ± 5	22 ± 4	20 ± 4	25 ± 5	25 ± 5
02/25/21 - 03/04/21	25 ± 5	18 ± 4	21 ± 5	17 ± 4	16 ± 4	15 ± 4	19 ± 5	16 ± 4
03/04/21 - 03/11/21	16 ± 4	20 ± 4	18 ± 4	16 ± 4	16 ± 4	18 ± 4	19 ± 4	16 ± 4
03/11/21 - 03/18/21	19 ± 5	16 ± 4	19 ± 5	15 ± 4	18 ± 4	17 ± 4	17 ± 4	12 ± 4
03/18/21 - 03/25/21	14 ± 4	18 ± 5	14 ± 4	13 ± 4	13 ± 4	12 ± 4	17 ± 4	17 ± 4
03/25/21 - 04/01/21	14 ± 4	13 ± 4	15 ± 4	15 ± 4	12 ± 4	18 ± 5	16 ± 4	13 ± 4
04/01/21 - 04/09/21	15 ± 4	18 ± 4	21 ± 4	18 ± 4	17 ± 4	17 ± 4	17 ± 4	17 ± 4
04/09/21 - 04/15/21	7 ± 4	8 ± 4	9 ± 4	7 ± 4	9 ± 4	9 ± 4	9 ± 4	7 ± 4
04/15/21 - 04/22/21	13 ± 4	9 ± 4	11 ± 4	10 ± 4	16 ± 4	12 ± 4	13 ± 4	14 ± 4
04/22/21 - 04/29/21	20 ± 5	24 ± 5	18 ± 5	16 ± 4	20 ± 5	19 ± 5	20 ± 5	18 ± 5
04/29/21 - 05/06/21	14 ± 4	16 ± 4	14 ± 4	10 ± 3	12 ± 4	15 ± 4	15 ± 4	14 ± 4
05/06/21 - 05/13/21	7 ± 3	11 ± 4	11 ± 4	7 ± 3	13 ± 4	6 ± 3	11 ± 4	9 ± 4
05/13/21 - 05/20/21	14 ± 4	21 ± 5	21 ± 5	15 ± 4	24 ± 5	18 ± 4	19 ± 5	20 ± 5
05/20/21 - 05/27/21	14 ± 4	15 ± 4	17 ± 5	17 ± 4	15 ± 4	15 ± 4	15 ± 4	16 ± 4
05/27/21 - 06/03/21	21 ± 4	23 ± 5	23 ± 5	20 ± 4	21 ± 5	21 ± 4	20 ± 5	20 ± 5
06/03/21 - 06/10/21	15 ± 4	18 ± 4	18 ± 4	15 ± 4	21 ± 5	17 ± 4	16 ± 4	18 ± 4
06/10/21 - 06/17/21	12 ± 4	16 ± 4	15 ± 4	15 ± 4	16 ± 4	18 ± 4	16 ± 4	17 ± 4
06/17/21 - 06/24/21	19 ± 5	19 ± 4	17 ± 4	16 ± 4	21 ± 5	19 ± 4	19 ± 5	16 ± 4
06/24/21 - 07/01/21	11 ± 4	9 ± 4	9 ± 4	9 ± 3	7 ± 3	11 ± 4	10 ± 4	12 ± 4
07/01/21 - 07/08/21	16 ± 4	17 ± 4	21 ± 5	16 ± 4	19 ± 4	20 ± 4	17 ± 4	18 ± 4
07/08/21 - 07/15/21	12 ± 4	17 ± 5	12 ± 4	12 ± 4	12 ± 4	14 ± 4	14 ± 4	8 ± 4
07/15/21 - 07/22/21	12 ± 4	14 ± 4	15 ± 4	13 ± 4	15 ± 4	14 ± 4	14 ± 4	16 ± 4
07/22/21 - 07/29/21	32 ± 5	32 ± 5	29 ± 5	29 ± 5	32 ± 5	33 ± 5	31 ± 5	31 ± 5
07/29/21 - 08/05/21	17 ± 4	17 ± 4	16 ± 4	15 ± 4	17 ± 5	21 ± 5	17 ± 5	21 ± 5
08/05/21 - 08/12/21	21 ± 5	22 ± 5	21 ± 5	20 ± 5	23 ± 5	28 ± 5	20 ± 4	23 ± 5
08/12/21 - 08/19/21	17 ± 4	18 ± 5	21 ± 5	17 ± 4	18 ± 4	20 ± 5	24 ± 5	15 ± 4
08/19/21 - 08/26/21	20 ± 5	26 ± 5	22 ± 5	17 ± 5	22 ± 5	21 ± 5	22 ± 5	21 ± 5
08/26/21 - 09/02/21	22 ± 4	16 ± 4	20 ± 4	19 ± 4	22 ± 4	19 ± 4	21 ± 4	15 ± 4
09/02/21 - 09/09/21	16 ± 4	18 ± 4	20 ± 5	20 ± 4	20 ± 4	19 ± 4	18 ± 4	19 ± 4
09/09/21 - 09/16/21	25 ± 5	24 ± 5	28 ± 5	27 ± 5	27 ± 5	32 ± 5	22 ± 5	21 ± 5
09/16/21 - 09/23/21	18 ± 5	22 ± 5	16 ± 4	17 ± 4	20 ± 5	18 ± 4	18 ± 4	19 ± 5
09/23/21 - 09/30/21	23 ± 6	21 ± 6	21 ± 6	23 ± 5	24 ± 6	24 ± 5	25 ± 6	21 ± 6
09/30/21 - 10/07/21	24 ± 4	27 ± 5	35 ± 5	27 ± 5	27 ± 5	24 ± 5	29 ± 5	24 ± 5
10/07/21 - 10/14/21	22 ± 5	23 ± 5	20 ± 5	24 ± 5	23 ± 5	23 ± 5	22 ± 5	21 ± 5
10/14/21 - 10/21/21	28 ± 5	26 ± 5	25 ± 5	23 ± 5	23 ± 5	28 ± 5	23 ± 5	17 ± 5
10/21/21 - 10/28/21	10 ± 4	11 ± 4	12 ± 4	12 ± 4	13 ± 4	13 ± 4	10 ± 4	9 ± 4
10/28/21 - 11/04/21	14 ± 4	15 ± 4	11 ± 4	15 ± 4	14 ± 4	12 ± 4	15 ± 5	11 ± 4
11/04/21 - 11/11/21	37 ± 6	35 ± 5	35 ± 5	35 ± 5	34 ± 5	38 ± 6	38 ± 6	36 ± 6
11/11/21 - 11/19/21	11 ± 3	14 ± 4	16 ± 4	12 ± 3	12 ± 3	13 ± 3	14 ± 4	10 ± 3
11/19/21 - 11/26/21	20 ± 5	20 ± 5	17 ± 5	21 ± 5	19 ± 5	19 ± 5	19 ± 5	16 ± 5
11/26/21 - 12/02/21	25 ± 5	30 ± 6	27 ± 6	27 ± 5	29 ± 6	22 ± 5	27 ± 6	25 ± 6
12/02/21 - 12/09/21	16 ± 4	18 ± 5	19 ± 5	16 ± 4	18 ± 4	17 ± 5	16 ± 4	11 ± 4
12/09/21 - 12/16/21	21 ± 5	21 ± 5	19 ± 5	23 ± 5	22 ± 5	22 ± 5	21 ± 5	19 ± 5
12/16/21 - 12/23/21	28 ± 5	21 ± 5	26 ± 5	36 ± 6	29 ± 5	27 ± 5	26 ± 5	28 ± 6
12/23/21 - 12/30/21	33 ± 5	42 ± 6	42 ± 6	40 ± 6	36 ± 6	38 ± 5	32 ± 5	39 ± 6
MEAN ± 2 STD DEV	18 ± 13	20 ± 14	19 ± 14	18 ± 14	20 ± 14	19 ± 14	19 ± 12	18 ± 14

THE MEAN AND TWO STANDARD DEVIATION ARE CALCULATED USING THE POSITIVE VALUES

Table C-VI.2 **MONTHLY AND YEARLY VALUES OF GROSS BETA CONCENTRATIONS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2021**

RESULTS IN UNITS OF E-3 PCI/CU METER ± 2 SIGMA

GROUP I - NEAR FIELD LOCATIONS				GROUP II - FAR FIELD LOCATIONS				GROUP III - CONTROL LOCATIONS			
COLLECTION PERIOD		MIN	MAX	MEAN ± 2SD	COLLECTION PERIOD	MIN	MAX	MEAN ± 2SD	COLLECTION PERIOD	MIN	MAX	MEAN ± 2SD
12/31/20	01/28/21	9	21	16 ± 8	12/31/20 - 01/28/21	9	32	17 ± 12	12/31/20 - 01/28/21	10	20	14 ± 9
01/28/21	02/25/21	16	37	23 ± 14	01/28/21 - 02/25/21	14	34	22 ± 14	01/28/21 - 02/25/21	18	33	24 ± 13
02/25/21	03/25/21	13	25	17 ± 6	02/25/21 - 03/25/21	12	19	16 ± 4	02/25/21 - 03/25/21	12	17	15 ± 4
03/25/21	04/29/21	7	24	14 ± 10	03/25/21 - 04/29/21	9	20	15 ± 8	03/25/21 - 04/29/21	7	18	14 ± 9
04/29/21	05/27/21	7	21	14 ± 8	04/29/21 - 05/27/21	6	24	15 ± 9	04/29/21 - 05/27/21	9	20	15 ± 9
05/27/21	06/24/21	12	23	18 ± 6	05/27/21 - 06/24/21	16	21	19 ± 4	05/27/21 - 06/24/21	16	20	18 ± 3
06/24/21	07/29/21	9	32	17 ± 15	06/24/21 - 07/29/21	7	33	17 ± 16	06/24/21 - 07/29/21	8	31	17 ± 18
07/29/21	09/02/21	5	26	19 ± 6	07/29/21 - 09/02/21	17	28	21 ± 6	07/29/21 - 09/02/21	15	23	19 ± 7
09/02/21	09/30/21	16	28	21 ± 7	09/02/21 - 09/30/21	18	32	22 ± 9	09/02/21 - 09/30/21	19	21	20 ± 3
09/30/21	10/28/21	10	35	22 ± 14	09/30/21 - 10/28/21	10	29	21 ± 12	09/30/21 - 10/28/21	9	24	18 ± 14
10/28/21	12/02/21	11	37	24 ± 17	10/28/21 - 12/02/21	12	38	24 ± 18	10/28/21 - 12/02/21	10	36	20 ± 22
12/02/21	12/30/21	16	42	26 ± 19	12/02/21 - 12/30/21	16	38	25 ± 15	12/02/21 - 12/30/21	11	39	24 ± 24
12/31/20	12/30/21	6	32	16 ± 11	12/31/20 - 12/30/21	6	34	16 ± 11	12/31/20 - 12/30/21	8	31	17 ± 11

THE MEAN AND TWO STANDARD DEVIATION ARE CALCULATED USING THE POSITIVE VALUES

Table C-VI.3

CONCENTRATIONS OF GAMMA EMITTERS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2021

RESULTS IN UNITS OF E-3 PCI/CU METER ± 2 SIGMA

SITE	COLLECTION PERIOD	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	Cs-134	Cs-137	Ba-140	La-140
BD-02	12/31/20 - 03/25/21	< 2	< 2	< 6	< 3	< 5	< 2	< 5	< 2	< 2	< 13	< 5
	03/25/21 - 06/24/21	< 2	< 3	< 6	< 3	< 6	< 3	< 5	< 2	< 2	< 21	< 7
	06/24/21 - 09/30/21	< 2	< 2	< 7	< 3	< 5	< 3	< 5	< 3	< 3	< 16	< 8
	09/30/21 - 12/30/21	< 3	< 3	< 8	< 3	< 7	< 3	< 5	< 4	< 4	< 15	< 8
	MEAN	-	-	-	-	-	-	-	-	-	-	-
BD-03	12/31/20 - 03/25/21	< 3	< 3	< 7	< 4	< 8	< 2	< 5	< 2	< 2	< 22	< 12
	03/25/21 - 06/24/21	< 2	< 2	< 5	< 2	< 7	< 2	< 5	< 2	< 2	< 18	< 5
	06/24/21 - 09/30/21	< 2	< 2	< 3	< 2	< 4	< 1	< 4	< 2	< 2	< 9	< 3
	09/30/21 - 12/30/21	< 2	< 2	< 3	< 3	< 4	< 2	< 3	< 2	< 2	< 15	< 6
	MEAN	-	-	-	-	-	-	-	-	-	-	-
BD-04	12/31/20 - 03/25/21	< 2	< 2	< 6	< 3	< 7	< 2	< 4	< 3	< 2	< 16	< 10
	03/25/21 - 06/24/21	< 2	< 2	< 6	< 2	< 5	< 2	< 3	< 2	< 2	< 13	< 6
	06/24/21 - 09/30/21	< 2	< 1	< 5	< 1	< 4	< 2	< 4	< 2	< 2	< 8	< 4
	09/30/21 - 12/30/21	< 3	< 3	< 6	< 3	< 8	< 3	< 4	< 3	< 3	< 23	< 7
	MEAN	-	-	-	-	-	-	-	-	-	-	-
BD-05	12/31/20 - 03/25/21	< 4	< 3	< 12	< 4	< 9	< 3	< 7	< 4	< 3	< 26	< 10
	03/25/21 - 06/24/21	< 2	< 2	< 6	< 3	< 6	< 3	< 4	< 3	< 2	< 22	< 8
	06/24/21 - 09/30/21	< 2	< 3	< 5	< 2	< 6	< 2	< 5	< 2	< 2	< 14	< 6
	09/30/21 - 12/30/21	< 2	< 2	< 5	< 1	< 5	< 2	< 4	< 2	< 2	< 13	< 4
	MEAN	-	-	-	-	-	-	-	-	-	-	-
BD-06	12/31/20 - 03/25/21	< 1	< 2	< 7	< 2	< 4	< 2	< 4	< 3	< 2	< 17	< 4
	03/25/21 - 06/24/21	< 3	< 4	< 6	< 5	< 7	< 3	< 6	< 4	< 3	< 30	< 11
	06/24/21 - 09/30/21	< 3	< 3	< 8	< 3	< 7	< 3	< 5	< 3	< 3	< 17	< 7
	09/30/21 - 12/30/21	< 2	< 2	< 5	< 2	< 5	< 2	< 2	< 2	< 2	< 11	< 5
	MEAN	-	-	-	-	-	-	-	-	-	-	-

Table C-VI.3

CONCENTRATIONS OF GAMMA EMITTERS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2021

RESULTS IN UNITS OF E-3 PCI/CU METER ± 2 SIGMA

SITE	COLLECTION PERIOD	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	Cs-134	Cs-137	Ba-140	La-140
BD-19	12/31/20 - 03/25/21	< 4	< 3	< 10	< 4	< 10	< 5	< 8	< 5	< 4	< 26	< 9
	03/25/21 - 06/24/21	< 2	< 3	< 5	< 3	< 6	< 2	< 5	< 2	< 2	< 17	< 9
	06/24/21 - 09/30/21	< 2	< 1	< 3	< 2	< 5	< 1	< 3	< 1	< 2	< 12	< 5
	09/30/21 - 12/30/21	< 2	< 2	< 6	< 4	< 7	< 3	< 4	< 2	< 2	< 11	< 5
	MEAN	-	-	-	-	-	-	-	-	-	-	-
BD-20	12/31/20 - 03/25/21	< 2	< 2	< 7	< 3	< 6	< 2	< 4	< 3	< 1	< 20	< 8
	03/25/21 - 06/24/21	< 2	< 1	< 3	< 2	< 3	< 2	< 3	< 2	< 2	< 15	< 9
	06/24/21 - 09/30/21	< 2	< 2	< 2	< 2	< 4	< 2	< 3	< 2	< 2	< 11	< 5
	09/30/21 - 12/30/21	< 3	< 2	< 3	< 2	< 6	< 2	< 3	< 2	< 2	< 14	< 5
	MEAN	-	-	-	-	-	-	-	-	-	-	-
BD-21	12/31/20 - 03/25/21	< 2	< 2	< 5	< 2	< 6	< 2	< 4	< 2	< 2	< 12	< 5
	03/25/21 - 06/24/21	< 2	< 2	< 6	< 2	< 5	< 2	< 4	< 2	< 2	< 18	< 3
	06/24/21 - 09/30/21	< 2	< 1	< 3	< 2	< 4	< 2	< 3	< 2	< 2	< 10	< 2
	09/30/21 - 12/30/21	< 2	< 1	< 5	< 2	< 4	< 2	< 3	< 2	< 1	< 9	< 3
	MEAN	-	-	-	-	-	-	-	-	-	-	-

Table C-VII.1 CONCENTRATIONS OF I-131 IN AIR IODINE SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2021

RESULTS IN UNITS OF E-3 PCI/CU METER ± 2 SIGMA

COLLECTION PERIOD	GROUP I - NEAR FIELD				GROUP II - FAR FIELD			GROUP III - CONTROL
	BD-06	BD-19	BD-20	BD-21	BD-02	BD-04	BD-05	BD-03
12/31/20 - 01/07/21	< 34	< 33	< 34	< 34	< 51	< 52	< 52	< 50
01/07/21 - 01/14/21	< 34	< 33	< 34	< 34	< 35	< 36	< 37	< 36
01/14/21 - 01/20/21	< 46	< 44	< 43	< 45	< 38	< 32	< 34	< 33
01/20/21 - 01/28/21	< 28	< 27	< 28	< 26	< 19	< 48	< 50	< 49
01/28/21 - 02/04/21	< 38	< 37	< 37	< 36	< 32	< 31	< 35	< 34
02/04/21 - 02/11/21	< 43	< 59	< 61	< 57	< 44	< 48	< 25	< 47
02/11/21 - 02/19/21	< 31	< 64	< 64	< 50	< 60	< 63	< 65	< 44
02/18/21 - 02/25/21	< 34	< 35	< 35	< 34	< 42	< 44	< 44	< 44
02/25/21 - 03/04/21	< 18	< 41	< 42	< 40	< 32	< 32	< 29	< 33
03/04/21 - 03/11/21	< 17	< 31	< 32	< 31	< 29	< 31	< 31	< 30
03/11/21 - 03/18/21	< 48	< 47	< 20	< 47	< 64	< 69	< 69	< 69
03/18/21 - 03/25/21	< 30	< 30	< 30	< 28	< 34	< 37	< 36	< 37
03/25/21 - 04/01/21	< 63	< 63	< 64	< 62	< 41	< 39	< 40	< 41
04/01/21 - 04/09/21	< 28	< 28	< 28	< 27	< 30	< 32	< 31	< 31
04/09/21 - 04/15/21	< 34	< 33	< 33	< 15	< 48	< 48	< 50	< 50
04/15/21 - 04/22/21	< 35	< 34	< 35	< 33	< 39	< 39	< 39	< 38
04/22/21 - 04/29/21	< 35	< 35	< 35	< 34	< 52	< 22	< 53	< 52
04/29/21 - 05/06/21	< 46	< 46	< 47	< 43	< 52	< 50	< 53	< 23
05/06/21 - 05/13/21	< 43	< 43	< 43	< 40	< 15	< 15	< 14	< 15
05/13/21 - 05/20/21	< 35	< 35	< 35	< 34	< 35	< 34	< 35	< 35
05/20/21 - 05/27/21	< 35	< 34	< 34	< 33	< 43	< 41	< 44	< 44
05/27/21 - 06/03/21	< 51	< 31	< 31	< 29	< 53	< 48	< 23	< 54
06/03/21 - 06/10/21	< 53	< 50	< 50	< 21	< 39	< 39	< 37	< 39
06/10/21 - 06/17/21	< 44	< 41	< 42	< 40	< 32	< 16	< 32	< 34
06/17/21 - 06/24/21	< 36	< 35	< 35	< 34	< 44	< 41	< 44	< 44
06/24/21 - 07/01/21	< 55	< 56	< 55	< 52	< 56	< 55	< 58	< 60
07/01/21 - 07/08/21	< 38	< 37	< 38	< 15	< 42	< 42	< 42	< 44
07/08/21 - 07/15/21	< 37	< 37	< 37	< 35	< 32	< 31	< 32	< 33
07/15/21 - 07/22/21	< 49	< 50	< 49	< 20	< 48	< 48	< 48	< 49
07/22/21 - 07/29/21	< 40	< 39	< 40	< 38	< 42	< 40	< 42	< 42
07/29/21 - 08/05/21	< 44	< 46	< 46	< 43	< 42	< 38	< 42	< 43
08/05/21 - 08/12/21	< 27	< 27	< 28	< 27	< 31	< 32	< 15	< 31
08/12/21 - 08/19/21	< 29	< 31	< 30	< 13	< 34	< 33	< 33	< 34
08/19/21 - 08/26/21	< 34	< 33	< 35	< 33	< 37	< 36	< 37	< 38
08/26/21 - 09/02/21	< 40	< 41	< 42	< 41	< 45	< 42	< 46	< 45
09/02/21 - 09/09/21	< 46	< 46	< 47	< 44	< 52	< 51	< 21	< 53
09/09/21 - 09/16/21	< 46	< 46	< 47	< 46	< 41	< 41	< 42	< 41
09/16/21 - 09/23/21	< 49	< 48	< 50	< 47	< 39	< 37	< 38	< 16
09/23/21 - 09/30/21	< 44	< 45	< 46	< 18	< 64	< 58	< 64	< 65
09/30/21 - 10/07/21	< 33	< 33	< 35	< 35	< 29	< 30	< 24	< 29
10/07/21 - 10/14/21	< 38	< 38	< 38	< 37	< 32	< 15	< 32	< 32
10/14/21 - 10/21/21	< 44	< 45	< 45	< 18	< 51	< 49	< 50	< 53
10/21/21 - 10/28/21	< 34	< 33	< 35	< 33	< 32	< 30	< 32	< 33
10/28/21 - 11/04/21	< 38	< 39	< 39	< 37	< 50	< 47	< 50	< 53
11/04/21 - 11/11/21	< 51	< 50	< 50	< 21	< 46	< 47	< 47	< 46
11/11/21 - 11/19/21	< 18	< 28	< 28	< 27	< 18	< 17	< 18	< 18
11/19/21 - 11/26/21	< 32	< 34	< 34	< 32	< 34	< 32	< 32	< 34
11/26/21 - 12/02/21	< 20	< 20	< 20	< 20	< 29	< 27	< 30	< 30
12/02/21 - 12/09/21	< 32	< 31	< 31	< 31	< 36	< 37	< 36	< 37
12/09/21 - 12/16/21	< 32	< 32	< 31	< 30	< 31	< 31	< 31	< 16
12/16/21 - 12/23/21	< 36	< 35	< 36	< 34	< 34	< 33	< 36	< 36
12/23/21 - 12/30/21	< 37	< 37	< 37	< 30	< 63	< 59	< 64	< 67
MEAN	-	-	-	-	-	-	-	-

Table C-VIII.1 CONCENTRATIONS OF I-131 IN MILK SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2021

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	CONTROL FARM BD-18
03/31/21	< 0.9
05/05/21	< 0.9
05/20/21	< 0.8
10/21/21	< 0.9
11/03/21	< 0.6
MEAN	-

Table C-VIII.2 **CONCENTRATIONS OF GAMMA EMITTERS IN MILK SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2021**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION PERIOD	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	Cs-134	Cs-137	Ba-140	La-140
BD-18	03/31/21	< 8	< 7	< 15	< 8	< 16	< 8	< 14	< 6	< 7	< 37	< 9
	05/05/21	< 6	< 8	< 18	< 9	< 20	< 5	< 12	< 7	< 9	< 26	< 11
	05/20/21	< 5	< 5	< 11	< 6	< 11	< 6	< 9	< 6	< 6	< 22	< 7
	10/21/21	< 7	< 6	< 14	< 6	< 16	< 6	< 10	< 6	< 7	< 24	< 9
	11/03/21	< 7	< 8	< 16	< 7	< 16	< 7	< 11	< 8	< 7	< 31	< 9
	MEAN	-	-	-	-	-	-	-	-	-	-	-

Table C-VIII.3 **CONCENTRATIONS OF GAMMA EMITTERS IN GRASS SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2021**

RESULTS IN UNITS OF PCI/KG WET ± 2 SIGMA

SITE	COLLECTION PERIOD	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140

No Substitute Grass Samples Taken in 2021

Table C-IX.1

CONCENTRATIONS OF GAMMA EMITTERS IN VEGETATION SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2021

RESULTS IN UNITS OF PCI/KG WET ± 2 SIGMA

SITE	COLLECTION PERIOD	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													
Lettuce	06/17/21	< 33	< 38	< 68	< 36	< 81	< 35	< 64	< 43	< 43	< 38	< 140	< 48
Collard Greens	06/30/21	< 35	< 34	< 71	< 42	< 74	< 36	< 62	< 52	< 37	< 35	< 164	< 64
Swiss Chard	06/30/21	< 31	< 39	< 75	< 39	< 76	< 42	< 63	< 50	< 31	< 28	< 159	< 58
Collard Greens	07/22/21	< 36	< 33	< 79	< 36	< 94	< 38	< 57	< 53	< 35	< 38	< 188	< 43
Radish	07/29/21	< 42	< 39	< 86	< 39	< 81	< 35	< 57	< 47	< 31	< 40	< 177	< 57
Swiss Chard	07/30/21	< 42	< 34	< 82	< 47	< 88	< 39	< 72	< 54	< 44	< 40	< 168	< 45
Radish Leaves	08/13/21	< 17	< 30	< 49	< 29	< 60	< 26	< 38	< 32	< 27	< 25	< 101	< 24
Swiss Chard	08/13/21	< 16	< 17	< 35	< 19	< 36	< 18	< 30	< 22	< 18	< 17	< 71	< 23
Radish Leaves	08/26/21	< 21	< 15	< 52	< 31	< 47	< 25	< 35	< 31	< 27	< 24	< 94	< 27
Radish	08/26/21	< 40	< 35	< 78	< 27	< 78	< 32	< 63	< 55	< 33	< 38	< 188	< 57
Radish Leaves	08/26/21	< 21	< 15	< 52	< 31	< 47	< 25	< 35	< 31	< 27	< 24	< 94	< 27
Radish	09/09/21	< 35	< 30	< 74	< 38	< 68	< 32	< 54	< 49	< 37	< 34	< 162	< 43
Radish Leaves	09/09/21	< 21	< 22	< 44	< 25	< 50	< 24	< 33	< 31	< 22	< 22	< 113	< 31
Radish Leaves	09/09/21	< 21	< 22	< 44	< 25	< 50	< 24	< 33	< 31	< 22	< 22	< 113	< 31
Swiss Chard	09/09/21	< 28	< 28	< 56	< 32	< 56	< 27	< 49	< 34	< 31	< 29	< 113	< 35
Collard Greens	09/09/21	< 38	< 36	< 75	< 40	< 80	< 40	< 69	< 59	< 44	< 42	< 175	< 55
Radish Leaves	09/23/21	< 24	< 29	< 55	< 25	< 58	< 28	< 46	< 40	< 25	< 29	< 106	< 29
Collard Greens	09/23/21	< 35	< 34	< 68	< 38	< 76	< 43	< 67	< 51	< 46	< 32	< 136	< 54
Radish	09/23/21	< 34	< 33	< 79	< 35	< 77	< 36	< 46	< 46	< 34	< 33	< 151	< 62
Radish Leaves	09/23/21	< 24	< 29	< 55	< 25	< 58	< 28	< 46	< 40	< 25	< 29	< 106	< 29
Collard Greens	09/23/21	< 35	< 34	< 68	< 38	< 76	< 43	< 67	< 51	< 46	< 32	< 136	< 54
Turnip Leaves	10/08/21	< 28	< 31	< 65	< 36	< 62	< 36	< 54	< 42	< 36	< 31	< 86	< 26
Swiss Chard	10/07/21	< 34	< 33	< 72	< 39	< 70	< 26	< 57	< 47	< 33	< 32	< 116	< 43
Collard	10/07/21	< 24	< 26	< 48	< 28	< 55	< 25	< 44	< 35	< 27	< 28	< 117	< 39
Turnip	10/07/21	< 32	< 29	< 72	< 37	< 81	< 31	< 60	< 43	< 44	< 32	< 128	< 33
Swiss Chard	10/21/21	< 35	< 33	< 82	< 41	< 73	< 34	< 51	< 53	< 38	< 34	< 151	< 45
Collard	10/21/21	< 26	< 26	< 53	< 27	< 56	< 27	< 41	< 37	< 28	< 28	< 119	< 39
Radish	10/21/21	< 19	< 17	< 35	< 17	< 36	< 15	< 32	< 23	< 21	< 21	< 89	< 26
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
BD-QUAD 1													
Collard Greens	07/22/21	< 28	< 28	< 58	< 33	< 61	< 29	< 50	< 40	< 31	< 30	< 124	< 36
Zucchini Leaves	07/22/21	< 28	< 26	< 50	< 28	< 58	< 25	< 42	< 36	< 30	< 28	< 109	< 35
Collard Greens	08/19/21	< 30	< 24	< 55	< 32	< 37	< 25	< 40	< 47	< 32	< 33	< 115	< 43
Kohlrabi	08/19/21	< 22	< 17	< 31	< 19	< 40	< 17	< 32	< 28	< 18	< 19	< 77	< 22
Collard Greens	09/23/21	< 34	< 32	< 85	< 33	< 76	< 30	< 55	< 46	< 32	< 34	< 131	< 23
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-

Table C-IX.1

CONCENTRATIONS OF GAMMA EMITTERS IN VEGETATION SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2021

RESULTS IN UNITS OF PCI/KG WET ± 2 SIGMA

SITE	COLLECTION PERIOD	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													
White Radish	07/08/21	< 18	< 25	< 44	< 26	< 57	< 23	< 41	< 31	< 26	< 28	< 115	< 34
Onion	07/08/21	< 19	< 16	< 37	< 18	< 43	< 21	< 27	< 30	< 21	< 18	< 83	< 25
Collard Greens	07/08/21	< 28	< 31	< 63	< 31	< 65	< 30	< 63	< 43	< 24	< 39	< 104	< 41
Onion	08/19/21	< 22	< 17	< 48	< 23	< 39	< 23	< 38	< 27	< 26	< 20	< 87	< 27
Collard Greens	08/19/21	< 23	< 21	< 50	< 23	< 50	< 22	< 41	< 33	< 23	< 23	< 94	< 36
Swiss Chard	08/19/21	< 16	< 15	< 35	< 17	< 42	< 15	< 28	< 19	< 18	< 15	< 68	< 20
Onion	09/23/21	< 13	< 14	< 33	< 15	< 36	< 20	< 34	< 27	< 18	< 19	< 81	< 20
Collard Greens	09/23/21	< 30	< 24	< 47	< 23	< 53	< 27	< 45	< 35	< 27	< 23	< 103	< 26
Swiss Chard	09/23/21	< 31	< 28	< 57	< 33	< 49	< 28	< 42	< 31	< 34	< 30	< 104	< 33
Red Beets	09/23/21	< 19	< 24	< 44	< 21	< 55	< 23	< 35	< 29	< 28	< 24	< 88	< 27
Kale	10/14/21	< 37	< 41	< 70	< 39	< 85	< 36	< 75	< 46	< 28	< 35	< 147	< 65
Cabbage	10/14/21	< 14	< 13	< 31	< 13	< 35	< 14	< 24	< 18	< 16	< 15	< 60	< 20
Collard Greens	10/14/21	< 29	< 32	< 82	< 28	< 70	< 36	< 63	< 43	< 39	< 29	< 125	< 44
Swiss Chard	10/14/21	< 25	< 26	< 48	< 17	< 48	< 30	< 42	< 34	< 26	< 29	< 123	< 25
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
BD-QUAD 3													
Carrots	07/22/21	< 28	< 34	< 74	< 45	< 83	< 34	< 64	< 48	< 43	< 42	< 136	< 48
Collard Greens	07/22/21	< 32	< 36	< 75	< 28	< 81	< 39	< 59	< 41	< 39	< 44	< 141	< 46
Red Beets	07/22/21	< 30	< 28	< 44	< 32	< 74	< 34	< 44	< 49	< 25	< 29	< 116	< 19
Cabbage	08/19/21	< 19	< 20	< 36	< 18	< 38	< 19	< 32	< 30	< 22	< 17	< 88	< 19
Collard Greens	08/19/21	< 22	< 23	< 43	< 19	< 53	< 22	< 40	< 31	< 20	< 19	< 108	< 20
Red Beets	08/19/21	< 18	< 18	< 38	< 19	< 31	< 17	< 33	< 31	< 19	< 20	< 81	< 24
Cabbage	09/23/21	< 33	< 43	< 70	< 31	< 70	< 35	< 70	< 48	< 36	< 36	< 127	< 43
Collard Greens	09/23/21	< 35	< 36	< 65	< 29	< 78	< 35	< 55	< 41	< 37	< 37	< 111	< 53
Red Beets	09/23/21	< 21	< 22	< 45	< 25	< 60	< 25	< 36	< 33	< 24	< 26	< 111	< 30
Carrots	09/23/21	< 20	< 21	< 48	< 22	< 47	< 25	< 31	< 27	< 23	< 21	< 88	< 22
Collard Greens	10/14/21	< 31	< 31	< 59	< 29	< 70	< 30	< 57	< 34	< 34	< 27	< 129	< 39
Red Beets	10/14/21	< 13	< 19	< 38	< 23	< 42	< 17	< 32	< 28	< 24	< 22	< 82	< 22
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
BD-QUAD 4													
Radishes	07/22/21	< 38	< 34	< 68	< 39	< 78	< 44	< 52	< 51	< 36	< 34	< 164	< 52
Red Beets	07/22/21	< 34	< 28	< 71	< 40	< 78	< 31	< 51	< 44	< 43	< 37	< 151	< 40
Mustard Greens	07/22/21	< 29	< 32	< 69	< 33	< 73	< 30	< 68	< 46	< 28	< 26	< 156	< 53
Mustard Greens	08/19/21	< 27	< 25	< 55	< 31	< 53	< 28	< 47	< 43	< 29	< 31	< 123	< 34
Red Beets	08/19/21	< 16	< 17	< 30	< 20	< 36	< 17	< 23	< 22	< 16	< 15	< 67	< 19
Swiss Chard	08/19/21	< 26	< 24	< 60	< 30	< 72	< 32	< 46	< 41	< 35	< 28	< 122	< 40
Radish	09/23/21	< 29	< 27	< 73	< 29	< 70	< 32	< 38	< 40	< 34	< 27	< 121	< 16
Red Beets	09/23/21	< 34	< 26	< 81	< 25	< 82	< 36	< 63	< 41	< 35	< 37	< 130	< 35
Collard Greens	09/23/21	< 28	< 22	< 70	< 34	< 55	< 31	< 50	< 30	< 21	< 27	< 90	< 42
Swiss Chard	10/14/21	< 33	< 33	< 65	< 32	< 73	< 32	< 53	< 40	< 33	< 23	< 138	< 32
Red Beets	10/14/21	< 29	< 26	< 60	< 35	< 82	< 30	< 50	< 50	< 35	< 36	< 133	< 37
Collard Greens	10/14/21	< 37	< 29	< 73	< 42	< 73	< 30	< 58	< 42	< 36	< 31	< 130	< 55
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-

Table C-IX.1

CONCENTRATIONS OF GAMMA EMITTERS IN VEGETATION SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2021

RESULTS IN UNITS OF PCI/KG WET ± 2 SIGMA

SITE	COLLECTION PERIOD	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	06/17/21	< 38	< 41	< 86	< 37	< 81	< 39	< 69	< 55	< 42	< 41	< 160	< 49
Kohlrabi	06/17/21	< 36	< 35	< 59	< 31	< 89	< 41	< 57	< 51	< 39	< 30	< 143	< 47
Kale	07/01/21	< 34	< 30	< 79	< 39	< 74	< 29	< 51	< 45	< 34	< 35	< 136	< 53
Cabbage	07/01/21	< 28	< 32	< 62	< 32	< 72	< 33	< 48	< 42	< 35	< 30	< 142	< 46
Kohlrabi	07/01/21	< 18	< 20	< 44	< 21	< 44	< 19	< 41	< 29	< 16	< 26	< 111	< 35
Kale	07/15/21	< 30	< 30	< 86	< 29	< 58	< 30	< 51	< 51	< 32	< 38	< 150	< 46
CABBAGE	07/15/21	< 31	< 29	< 68	< 32	< 69	< 31	< 50	< 49	< 33	< 35	< 130	< 42
Swiss Chard	07/15/21	< 35	< 41	< 68	< 36	< 74	< 34	< 67	< 42	< 38	< 44	< 159	< 47
Turnip	07/29/21	< 18	< 21	< 42	< 26	< 40	< 20	< 36	< 30	< 21	< 23	< 91	< 25
Cabbage	07/29/21	< 31	< 27	< 58	< 27	< 78	< 26	< 63	< 42	< 40	< 27	< 128	< 54
Swiss Chard	07/29/21	< 28	< 24	< 57	< 22	< 66	< 27	< 54	< 43	< 34	< 34	< 109	< 46
Kale	08/12/21	< 28	< 27	< 61	< 24	< 55	< 27	< 47	< 39	< 37	< 35	< 130	< 48
Cabbage	08/12/21	< 16	< 21	< 45	< 20	< 32	< 20	< 28	< 29	< 20	< 20	< 65	< 22
Turnip	08/12/21	< 21	< 17	< 38	< 24	< 51	< 18	< 37	< 28	< 24	< 21	< 102	< 27
Kale	08/26/21	< 38	< 33	< 80	< 37	< 66	< 33	< 53	< 54	< 35	< 35	< 148	< 22
Cabbage	08/26/21	< 19	< 16	< 37	< 21	< 34	< 20	< 33	< 33	< 27	< 22	< 90	< 32
Kohlrabi	08/26/21	< 25	< 19	< 47	< 27	< 46	< 28	< 49	< 48	< 28	< 28	< 94	< 21
Turnip	09/09/21	< 27	< 24	< 50	< 22	< 56	< 28	< 43	< 40	< 24	< 29	< 128	< 24
Kale	09/09/21	< 26	< 31	< 54	< 28	< 52	< 27	< 40	< 37	< 33	< 33	< 108	< 30
Kohlrabi	09/09/21	< 25	< 16	< 54	< 25	< 55	< 23	< 44	< 37	< 29	< 28	< 125	< 21
Cabbage	09/23/21	< 27	< 23	< 55	< 24	< 50	< 23	< 39	< 35	< 28	< 21	< 101	< 30
Kale	09/23/21	< 29	< 26	< 52	< 33	< 65	< 27	< 59	< 50	< 29	< 30	< 95	< 37
Turnip	09/23/21	< 24	< 20	< 47	< 24	< 54	< 29	< 39	< 36	< 30	< 28	< 118	< 21
Cabbage	10/07/21	< 21	< 18	< 45	< 24	< 44	< 22	< 27	< 29	< 17	< 26	< 94	< 30
Kale	10/07/21	< 34	< 33	< 65	< 37	< 97	< 38	< 48	< 43	< 42	< 40	< 121	< 40
Turnip	10/07/21	< 21	< 20	< 45	< 22	< 46	< 23	< 34	< 28	< 22	< 23	< 110	< 18
Kohlrabi	10/21/21	< 17	< 23	< 30	< 19	< 42	< 19	< 31	< 29	< 23	< 21	< 80	< 27
Kale	10/21/21	< 22	< 27	< 46	< 26	< 62	< 28	< 44	< 41	< 34	< 32	< 96	< 39
Swiss Chard	10/21/21	< 36	< 26	< 67	< 33	< 79	< 32	< 61	< 44	< 36	< 30	< 131	< 36
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-

Table C-IX.1

CONCENTRATIONS OF GAMMA EMITTERS IN VEGETATION SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2021

RESULTS IN UNITS OF PCI/KG WET ± 2 SIGMA

SITE	COLLECTION PERIOD	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													
Kohlrabi	06/17/21	< 35	< 29	< 65	< 30	< 73	< 29	< 45	< 36	< 29	< 31	< 111	< 35
Cabbage	07/01/21	< 27	< 30	< 65	< 27	< 77	< 33	< 62	< 54	< 32	< 33	< 140	< 41
Kohlrabi	07/01/21	< 27	< 22	< 52	< 30	< 48	< 26	< 34	< 40	< 24	< 32	< 106	< 42
Swiss Chard	07/01/21	< 35	< 31	< 57	< 34	< 67	< 38	< 50	< 52	< 34	< 39	< 132	< 58
Cabbage	07/15/21	< 25	< 28	< 71	< 33	< 86	< 32	< 52	< 51	< 34	< 32	< 151	< 19
Kale	07/15/21	< 50	< 42	< 92	< 40	< 104	< 46	< 83	< 47	< 49	< 48	< 187	< 57
Swiss Chard	07/15/21	< 30	< 31	< 77	< 31	< 89	< 34	< 58	< 48	< 47	< 33	< 134	< 38
Turnip	07/29/21	< 29	< 32	< 61	< 36	< 60	< 32	< 52	< 47	< 30	< 34	< 134	< 45
Kohlrabi	07/29/21	< 24	< 34	< 63	< 28	< 52	< 30	< 51	< 40	< 39	< 27	< 123	< 38
Swiss Chard	07/29/21	< 35	< 37	< 83	< 35	< 102	< 37	< 61	< 52	< 47	< 41	< 165	< 49
Kale	08/12/21	< 42	< 34	< 81	< 41	< 93	< 43	< 59	< 51	< 44	< 41	< 154	< 40
Turnip	08/12/21	< 31	< 30	< 60	< 34	< 56	< 30	< 47	< 29	< 33	< 31	< 108	< 35
Swiss Chard	08/12/21	< 42	< 42	< 84	< 31	< 97	< 26	< 58	< 46	< 43	< 45	< 149	< 50
Kohlrabi	08/26/21	< 26	< 21	< 48	< 23	< 72	< 21	< 51	< 55	< 30	< 32	< 146	< 41
Cabbage	08/26/21	< 35	< 28	< 62	< 35	< 74	< 33	< 55	< 48	< 31	< 33	< 128	< 28
Swiss Chard	08/26/21	< 30	< 37	< 57	< 36	< 82	< 36	< 54	< 49	< 38	< 40	< 151	< 33
Turnip	09/09/21	< 25	< 22	< 49	< 20	< 55	< 24	< 49	< 38	< 29	< 31	< 125	< 35
Cabbage	09/09/21	< 23	< 28	< 45	< 20	< 44	< 27	< 46	< 40	< 30	< 28	< 116	< 31
Swiss Chard	09/09/21	< 28	< 22	< 62	< 29	< 70	< 30	< 44	< 38	< 30	< 31	< 96	< 18
Swiss Chard	09/23/21	< 23	< 31	< 46	< 35	< 48	< 31	< 48	< 40	< 32	< 34	< 130	< 25
Cabbage	09/23/21	< 26	< 23	< 61	< 22	< 58	< 26	< 37	< 39	< 31	< 34	< 113	< 25
Kohlrabi	09/23/21	< 25	< 23	< 50	< 25	< 54	< 23	< 35	< 34	< 22	< 22	< 102	< 28
Swiss Chard	10/07/21	< 29	< 28	< 46	< 29	< 74	< 38	< 52	< 44	< 32	< 30	< 150	< 30
Turnip	10/07/21	< 25	< 19	< 57	< 25	< 50	< 20	< 47	< 38	< 26	< 26	< 113	< 32
Cabbage	10/07/21	< 22	< 23	< 47	< 18	< 51	< 24	< 37	< 37	< 24	< 25	< 98	< 25
Swiss Chard	10/21/21	< 26	< 28	< 56	< 32	< 73	< 29	< 45	< 37	< 25	< 33	< 118	< 50
Kale	10/21/21	< 30	< 28	< 54	< 33	< 55	< 28	< 48	< 37	< 27	< 26	< 137	< 36
Cabbage	10/21/21	< 22	< 23	< 39	< 26	< 37	< 25	< 42	< 36	< 23	< 25	< 110	< 33
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-

Table C-X.1

QUARTERLY OSLD RESULTS FOR BRAIDWOOD STATION, 2021

RESULTS IN UNITS OF MREM/QUARTER ± 2 STANDARD DEVIATIONS

2021	Monitoring Location	Location Quarterly Baseline, BQ (mrem)	B_Q + MDD_Q (mrem)	2019 Normalized Net Dose, MQx (mrem/std. Qtr.)				Quarterly Facility Dose, F_Q (mrem)				Annual Baseline, B_A (mrem)	B_A + MDD_A (mrem)	Normalized Annual Dose, M_A (mrem/yr)	Annual Facility Dose, F_A
				1	2	3	4	1	2	3	4				
Control	BD-03	14.20	27.43	15.8	18.1	18.3	18.9	ND	ND	ND	ND	56.80	109.87	71.06	ND
Ind - Far	BD-02	13.50	26.73	14.1	16.5	16.7	19.5	ND	ND	ND	ND	54.20	107.27	66.72	ND
	BD-04	12.80	26.03	13.7	15.7	15.7	19.5	ND	ND	ND	NA	45.70	98.77	45.05	ND
	BD-05	14.40	27.63	15.9	17.6	16.9	19.8	ND	ND	ND	ND	57.80	110.87	70.07	ND
Ind - Inner	BD-101	13.50	26.73	14.9	17.4	16.9	18.8	ND	ND	ND	ND	53.90	106.97	68.03	ND
	BD-102	12.30	25.53	13.6	14.7	15.7	17.6	ND	ND	ND	ND	49.00	102.07	61.56	ND
	BD-103	13.10	26.33	15.3	16.8	16.8	19.2	ND	ND	ND	ND	52.50	105.57	68.14	ND
	BD-104	12.00	25.23	*(1)*	14.8	15.0	17.6	N/A	ND	ND	ND	45.30	98.37	47.35	ND
	BD-105	12.50	25.73	13.1	16.1	15.5	18.8	ND	ND	ND	ND	50.10	103.17	63.47	ND
	BD-106	12.40	25.63	13.3	15.0	16.7	18.0	ND	ND	ND	ND	49.70	102.77	62.97	ND
	BD-107	13.00	26.23	14.9	15.8	17.2	18.8	ND	ND	ND	ND	52.10	105.17	66.73	ND
	BD-108	12.70	25.93	13.6	14.7	14.9	18.7	ND	ND	ND	ND	50.80	103.87	61.87	ND
	BD-109	16.10	29.33	16.4	19.3	18.7	22.0	ND	ND	ND	ND	64.40	117.47	76.35	ND
	BD-110	12.50	25.73	14.0	15.3	15.7	18.0	ND	ND	ND	ND	50.00	103.07	62.98	ND
	BD-111a	12.40	25.63	15.0	15.4	14.3	18.3	ND	ND	ND	ND	49.60	102.67	62.99	ND
	BD-112	12.40	25.63	14.4	15.7	15.7	18.7	ND	ND	ND	ND	49.50	102.57	64.50	ND
	BD-113a	13.20	26.43	14.1	16.2	15.1	19.2	ND	ND	ND	ND	52.90	105.97	64.60	ND
	BD-114	13.50	26.73	15.0	17.2	16.0	18.4	ND	ND	ND	ND	54.00	107.07	66.61	ND
	BD-115	13.10	26.33	13.7	17.5	17.4	18.4	ND	ND	ND	ND	52.40	105.47	67.00	ND
	BD-116	14.10	27.33	14.9	17.5	17.0	19.0	ND	ND	ND	ND	56.30	109.37	68.43	ND
Ind - Outer	BD-201	17.20	30.43	17.0	19.6	20.6	24.2	ND	ND	ND	ND	68.70	121.77	81.33	ND
	BD-202	13.20	26.43	13.6	16.4	16.5	19.5	ND	ND	ND	ND	52.60	105.67	65.91	ND
	BD-203	13.60	26.83	13.8	16.5	16.5	20.8	ND	ND	ND	ND	54.50	107.57	67.54	ND
	BD-204	12.00	25.23	13.4	15.6	15.2	17.7	ND	ND	ND	ND	48.20	101.27	61.85	ND
	BD-205	12.70	25.93	13.7	15.6	15.8	20.2	ND	ND	ND	ND	50.60	103.67	65.22	ND
	BD-206	13.20	26.43	15.0	16.3	16.7	18.9	ND	ND	ND	ND	52.70	105.77	66.93	ND
	BD-207	12.10	25.33	12.8	15.4	14.6	19.0	ND	ND	ND	ND	48.50	101.57	61.76	ND
	BD-208	13.10	26.33	14.1	14.9	15.8	18.7	ND	ND	ND	ND	52.30	105.37	63.50	ND
	BD-209	16.50	29.73	16.6	18.5	21.5	21.4	ND	ND	ND	ND	66.00	119.07	77.97	ND
	BD-210	15.40	28.63	18.7	17.8	18.6	20.6	ND	ND	ND	ND	61.70	114.77	75.67	ND
	BD-211	17.50	30.73	17.5	19.3	21.4	24.7	ND	ND	ND	ND	69.80	122.87	82.86	ND
	BD-212	13.50	26.73	14.1	17.0	16.2	18.2	ND	ND	ND	ND	54.00	107.07	65.49	ND
	BD-213	12.20	25.43	13.9	14.9	15.5	17.9	ND	ND	ND	ND	48.80	101.87	62.17	ND
	BD-214	15.40	28.63	16.9	17.8	19.2	20.1	ND	ND	ND	ND	61.50	114.57	73.92	ND
	BD-215	13.00	26.23	14.5	16.8	16.8	18.6	ND	ND	ND	ND	52.00	105.07	66.71	ND
	BD-216	14.70	27.93	15.8	17.4	17.8	20.2	ND	ND	ND	ND	58.70	111.77	71.08	ND
Ind- Near	BD-06	12.90	26.13	14.0	15.8	16.2	18.3	ND	ND	ND	ND	51.60	104.67	64.29	ND
	BD-19	14.50	27.73	14.6	18.1	17.9	21.0	ND	ND	ND	ND	58.10	111.17	71.58	ND
	BD-20	13.60	26.83	14.9	17.7	16.9	18.9	ND	ND	ND	ND	54.50	107.57	68.43	ND
	BD-21	13.50	26.73	13.9	16.5	16.7	19.5	ND	ND	ND	ND	53.90	106.97	66.52	ND
Other (ISFSI)	BD-ISFSI-104-3	15.90	29.13	19.4	20.6	16.0	24.8	ND	ND	ND	ND	63.80	116.87	80.75	ND
	BD-ISFSI-104-4	17.90	31.13	18.6	20.7	20.9	25.6	ND	ND	ND	ND	71.6	124.7	85.8	ND
	BD-ISFSI-105-3	19.40	32.63	21.4	23.4	23.8	26.6	ND	ND	ND	ND	77.8	130.9	95.1	ND
	BD-ISFSI-105-4	28.70	41.93	38.0	36.8	36.1	38.2	ND	ND	ND	ND	114.8	167.9	149.1	ND
	BD-ISFSI-110-3	20.80	34.03	16.7	21.2	19.0	23.4	ND	ND	ND	ND	83.2	136.3	80.3	ND
	BD-ISFSI-110-4	20.90	34.13	24.5	26.5	22.9	25.9	ND	ND	ND	ND	83.4	136.5	99.8	ND

(1) SEE PROGRAM EXCEPTIONS SECTIONS FOR EXPLANATION

ND= Non-Detect

TABLE C-X.2 MEAN QUARTLY OSLD RESULTS FOR THE INNER RING, OUTER RING, OTHER, CONTROL, AND INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI) LOCATIONS FOR BRAIDWOOD STATION, 2021

RESULTS IN UNITS OF MREM/QUARTER ± 2 STANDARD DEVIATION OF THE STATION DATA

COLLECTION PERIOD	SITE BOUNDARY ± 2 S.D.	INTERMEDIATE DIST ± 2 S.D.	OTHER ± 2 S.D.	CONTROL ± 2 S.D.	ISFSI ± 2 S.D.
JAN-MAR	14.4 + 1.8	15.1 + 3.5	14.4 + 1.5	15.7 + 0.0	23.1 + 15.6
APR-JUN	16.2 + 2.6	16.8 + 2.9	16.8 + 1.9	18.1 + 0.0	24.8 + 12.5
JUL-SEP	16.1 + 2.3	17.4 + 4.5	16.7 + 1.4	18.3 + 0.0	23.1 + 13.9
OCT-DEC	18.7 + 2.0	20.0 + 4.0	19.5 + 1.6	18.9 + 0.0	16.4 + 1.3

TABLE C-X.3 SUMMARY OF THE AMBIENT DOSIMETRY PROGRAM FOR BRAIDWOOD STATION, 2021

RESULTS IN UNITS OF MREM/QUARTER ± 2 STANDARD DEVIATION

LOCATION	SAMPLES ANALYZED	PERIOD MINIMUM	PERIOD MAXIMUM	PERIOD MEAN ± 2 S.D.
SITE BOUNDARY	63	13.1	22.0	16.4 ± 3.8
INTERMEDIATE DISTANCE	64	12.8	24.7	17.3 ± 5.1
OTHER	28	13.7	21.0	16.9 ± 3.9
CONTROL	4	15.7	18.9	17.8 ± 2.8
ISFSI	24	15.5	38.0	21.9 ± 13.1

SITE BOUNDARY STATIONS - BD-101, BD-102, BD-103, BD-104, BD-105, BD-106, BD-107, BD-108, BD-109, BD-110, BD-111A, BD-112 BD-113A, BD-114, BD-115, BD-116

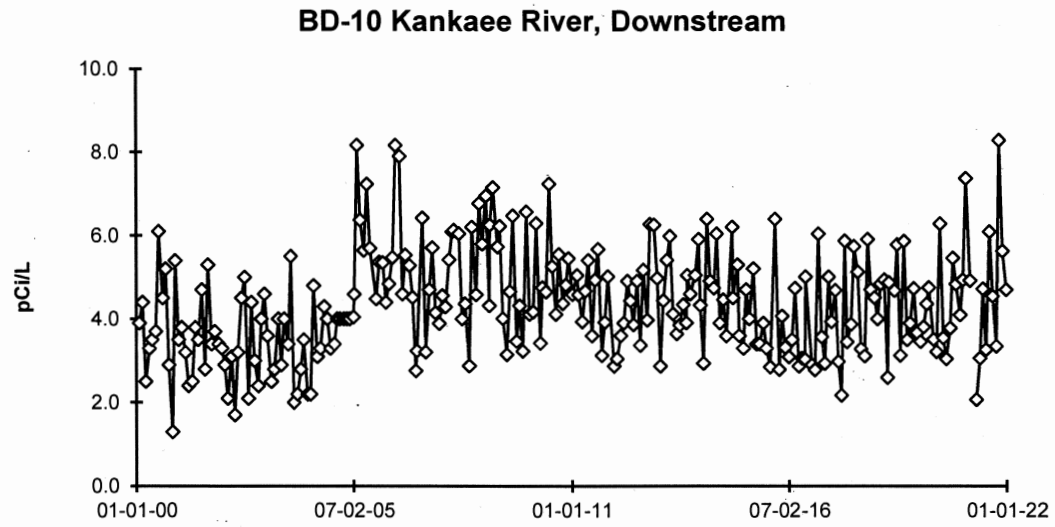
INTERMEDIATE DISTANCE STATIONS - BD-201, BD-202, BD-203, BD-204, BD-205, BD-206, BD-207, BD-208, BD-209, BD-210, BD-211, BD-212, BD-213, BD-214, BD-215, BD-216

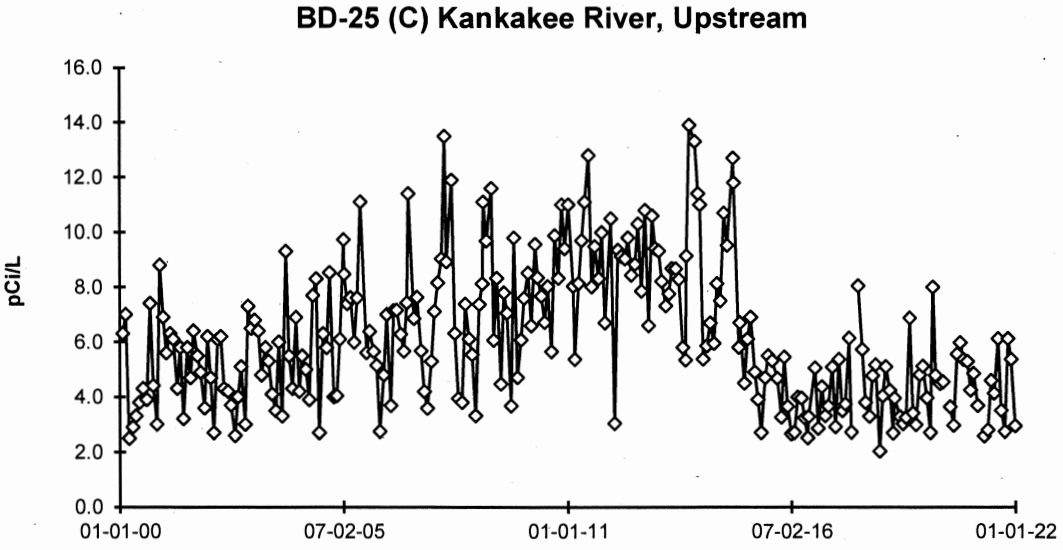
OTHER STATIONS - BD-02, BD-04, BD-05, BD-06, BD-19, BD-20, BD-21

CONTROL STATION - BD-03

ISFSI STATIONS - BD-ISFSI-104-3, BD-ISFSI-104-4, BD-ISFSI-105-3, BD-ISFSI-105-4, BD-ISFSI-110-3, BS-ISFSI-110-4

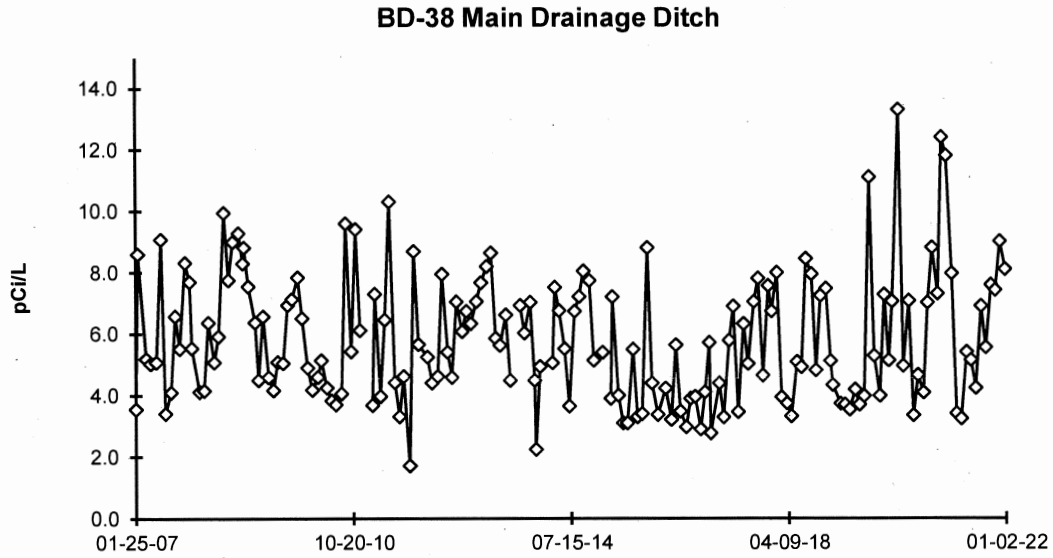
FIGURE C-1
Surface Water - Gross Beta - Stations BD-10 and BD-25 (C) Collected in the Vicinity of Braidwood Station, 2000 - 2021





DUE TO VENDOR CHANGE IN 2005, < VALUES ARE LLD VALUES JANUARY THROUGH JUNE 2005 AND MDC VALUES AFTER JUNE 2005

FIGURE C-2
Surface Water - Gross Beta - Stations BD-38 and BD-40 Collected in the Vicinity of Braidwood Station, 2006 - 2021



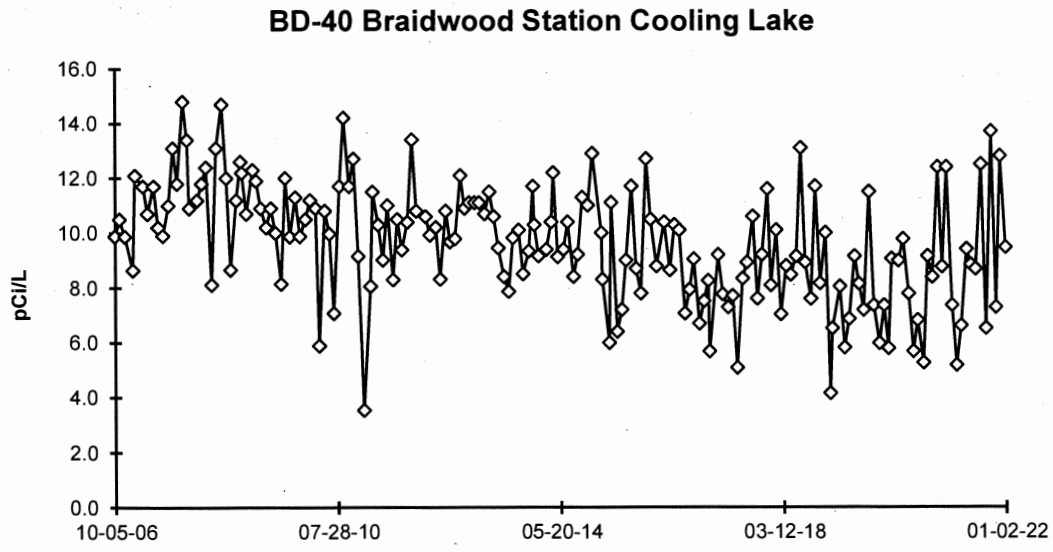
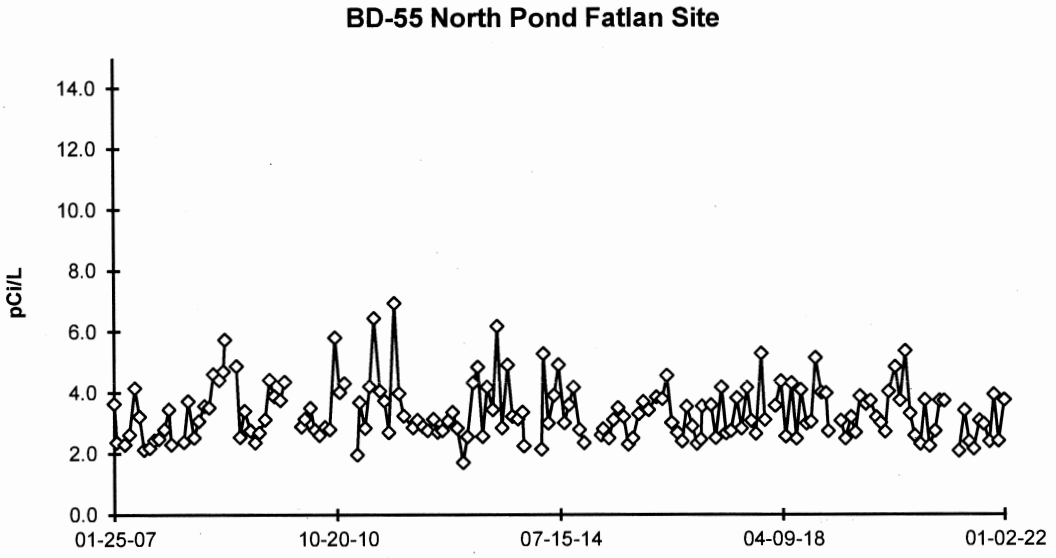
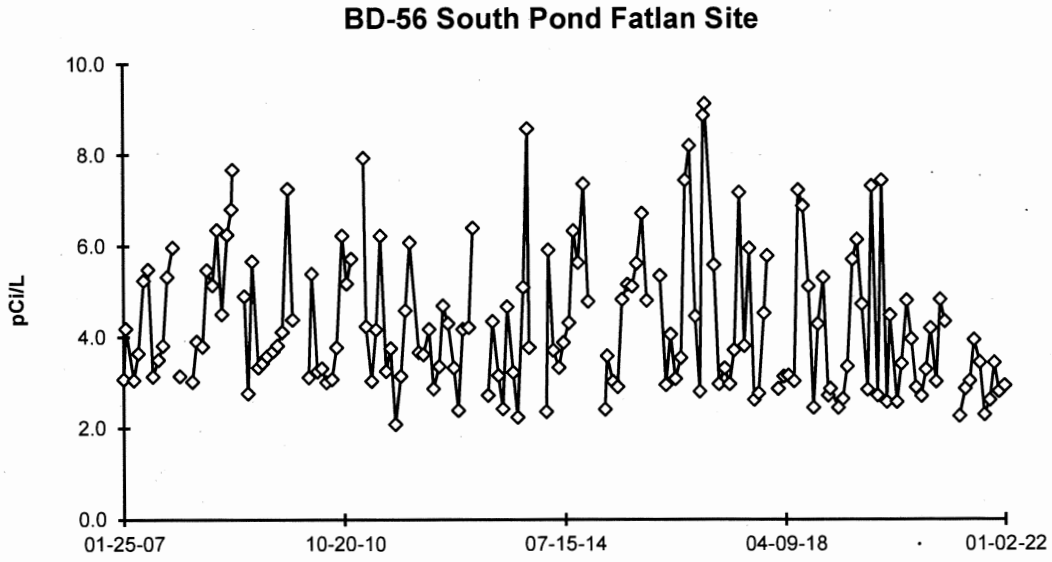


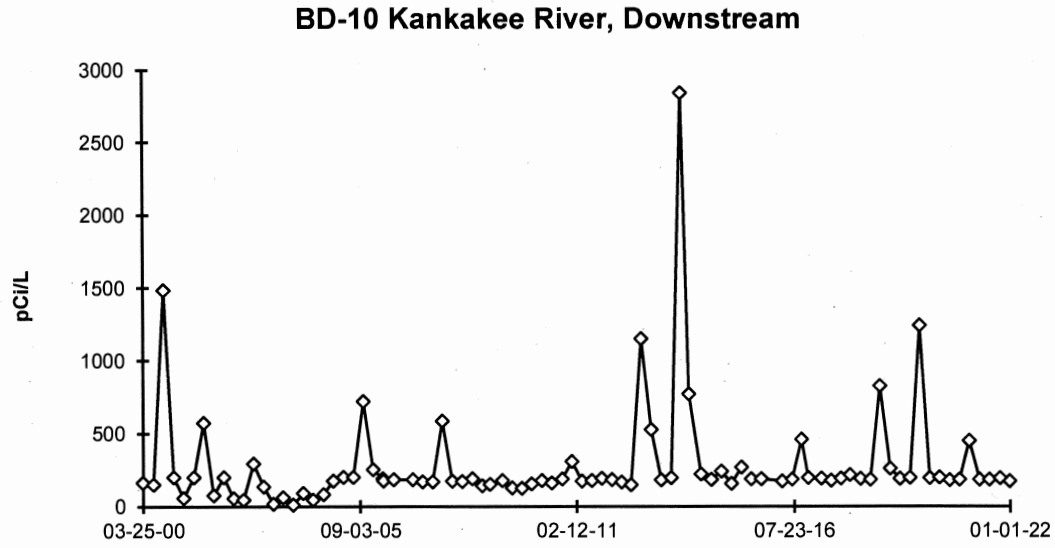
FIGURE C-3
Surface Water - Gross Beta - Stations BD-55 and BD-56 Collected in the Vicinity of Braidwood Station, 2007 - 2021

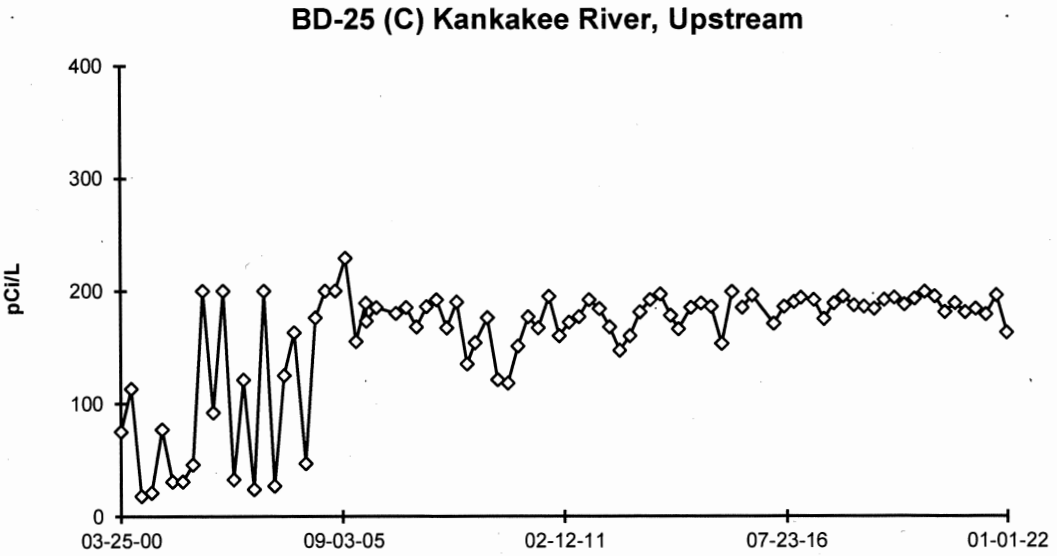




GAPS IN DATA ARE DUE TO SAMPLING POINTS BEING FROZEN AT TIME OF COLLECTION

FIGURE C-4
Surface Water - Tritium - Stations BD-10 and BD-25 (C) Collected in the Vicinity of Braidwood Station, 2000 - 2021

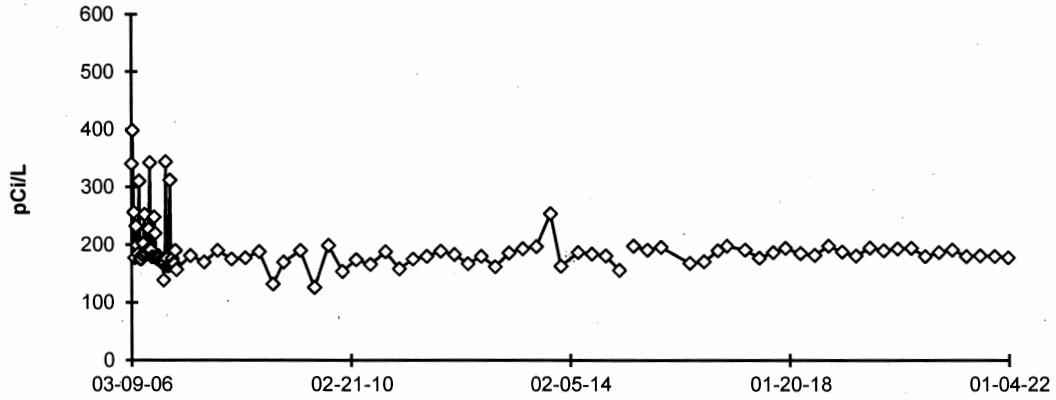




DUE TO VENDOR CHANGE IN 2005, < VALUES ARE LLD VALUES JANUARY THROUGH JUNE 2005 AND MDC VALUES AFTER JUNE 2005

FIGURE C-5
Surface Water - Tritium - Stations BD-38 and BD-40 Collected in the Vicinity of Braidwood Station, 2006 - 2021

BD-38 Main Drainage Ditch



BD-40 Braidwood Station Cooling Lake

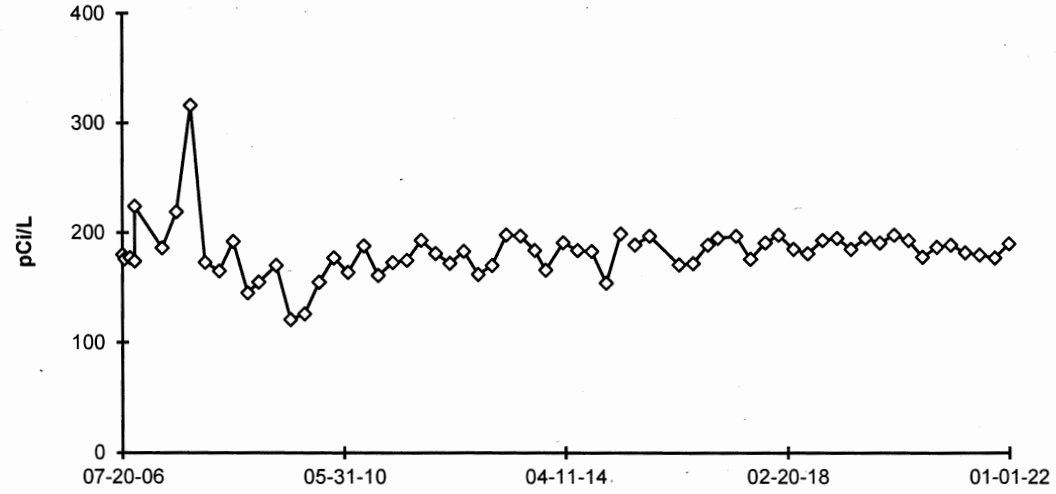
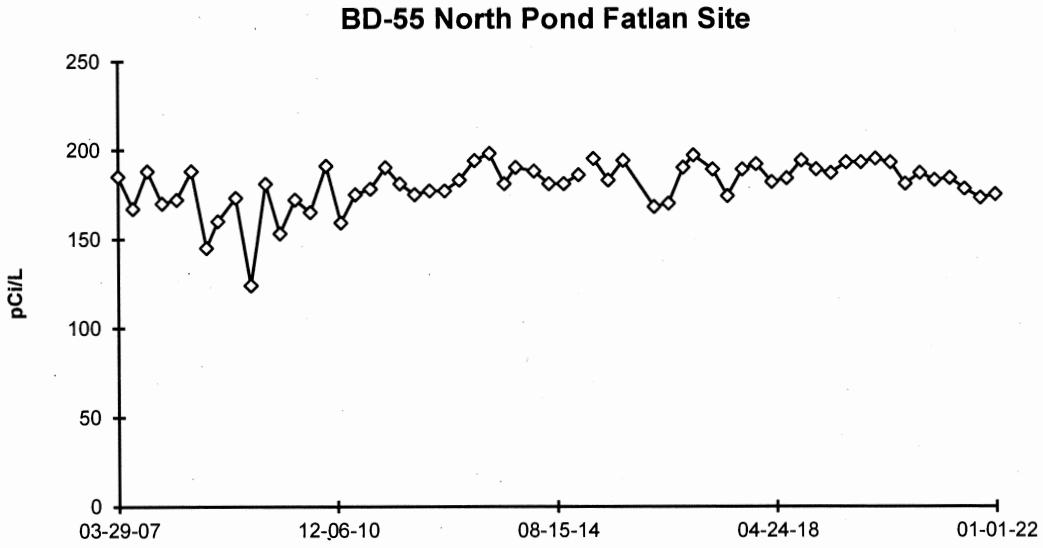


FIGURE C-6
Surface Water - Tritium - Stations BD-55 and BD-56
Collected in the Vicinity of Braidwood Station, 2007 - 2021



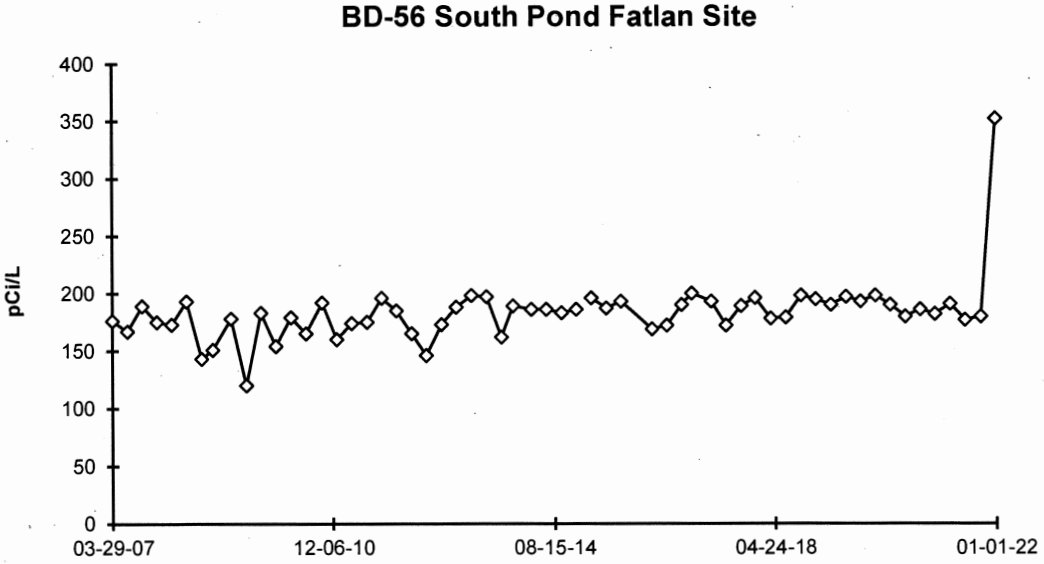
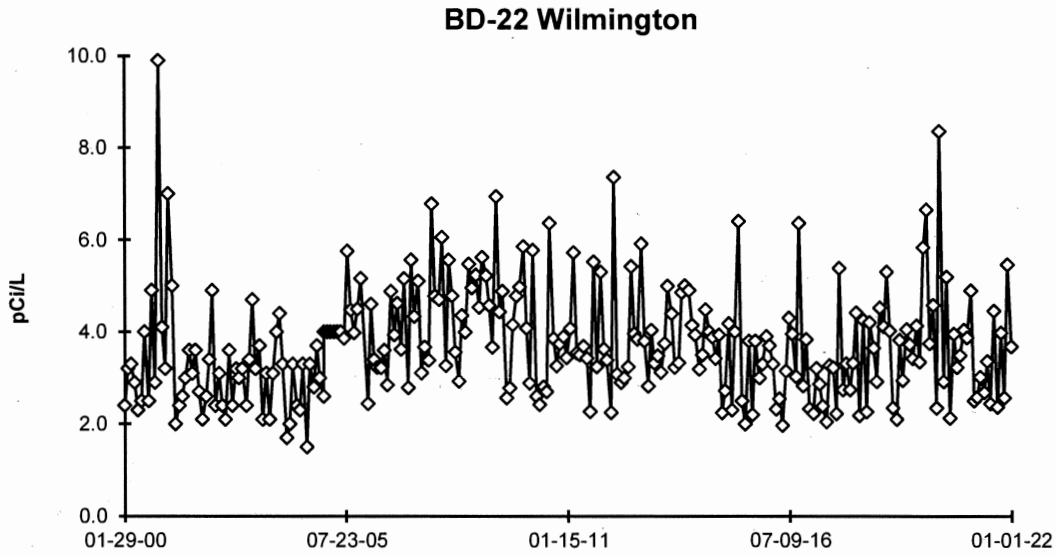
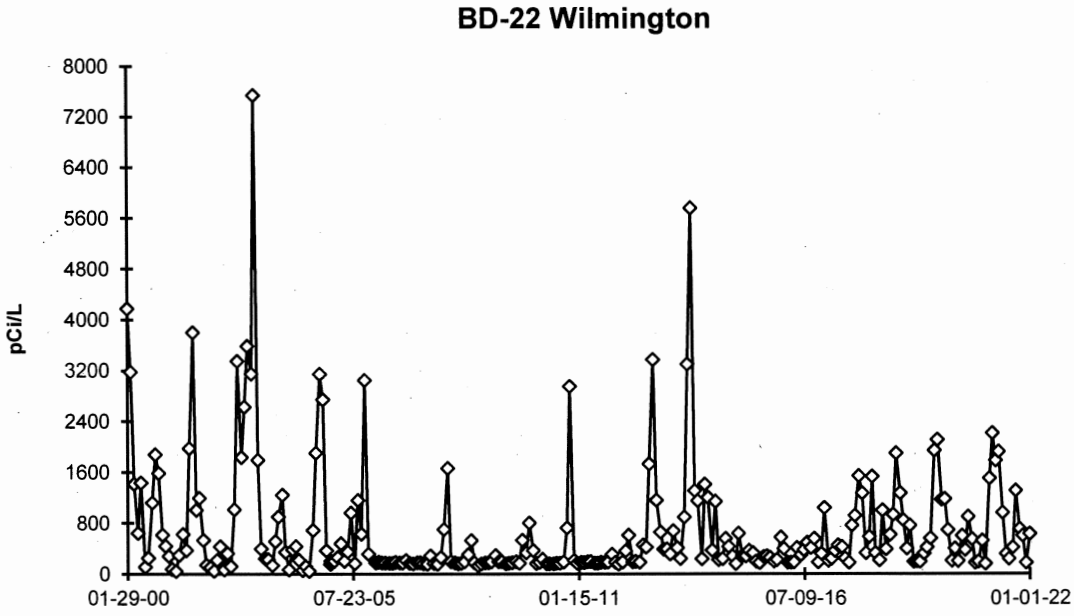


FIGURE C-7
Public Water - Gross Beta - Station BD-22
Collected in the Vicinity of Braidwood Station, 2000 - 2021



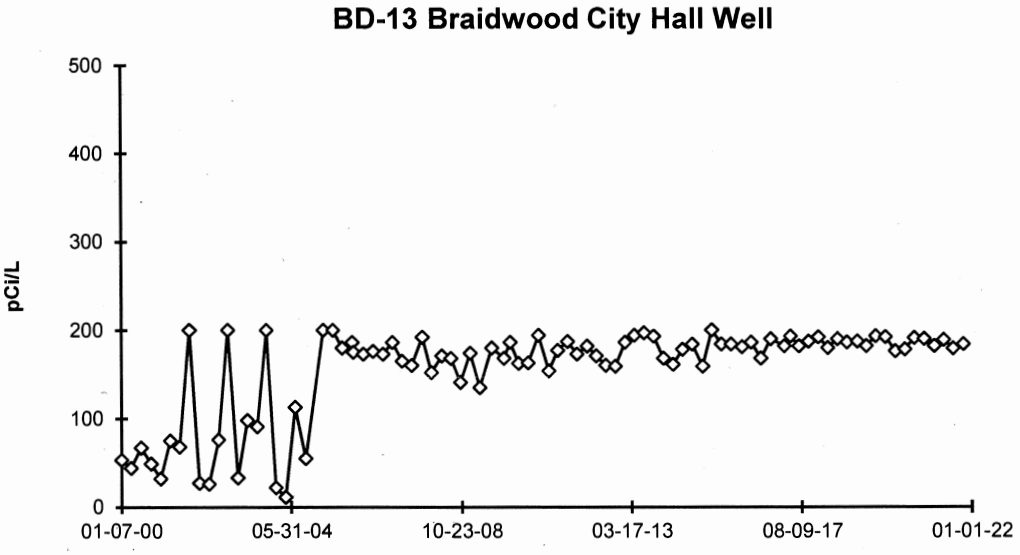
DUE TO VENDOR CHANGE, < VALUES ARE LLD VALUES JANUARY THROUGH JUNE 2005 AND MDC VALUES AFTER JUNE 2005

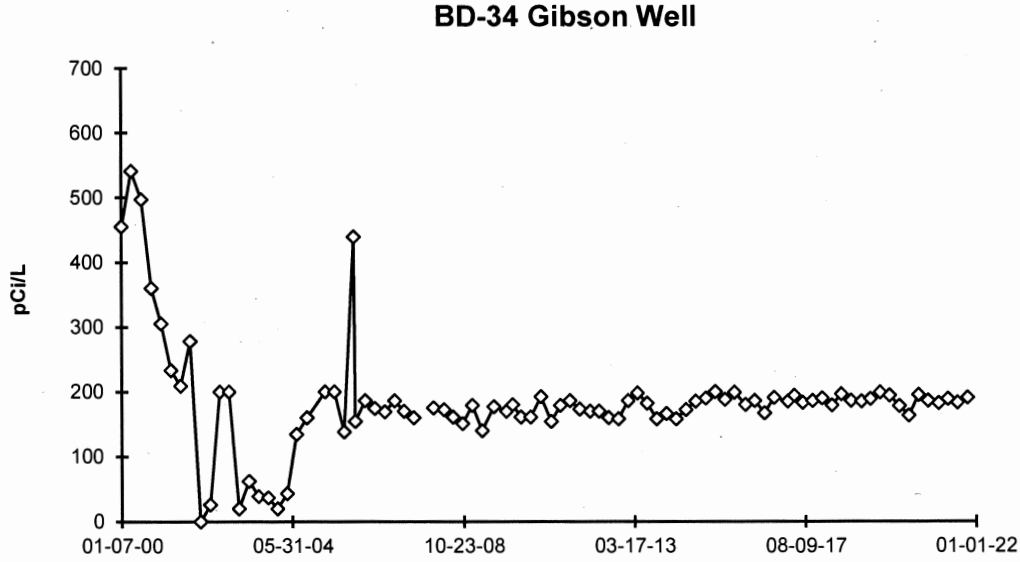
FIGURE C-8
Public Water - Tritium - Station BD-22
Collected in the Vicinity of Braidwood Station, 2000 - 2021



DUE TO VENDOR CHANGE, < VALUES ARE LLD VALUES JANUARY THROUGH JUNE 2005 AND MDC VALUES AFTER JUNE 2005

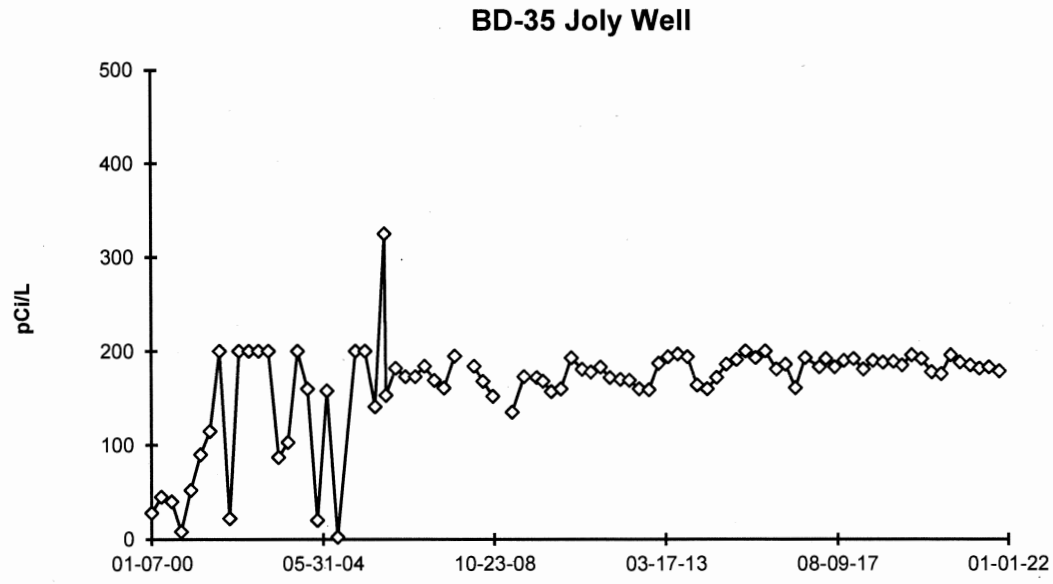
FIGURE C-9
Ground/Well Water - Tritium - Stations BD-13 and BD-34 Collected in the Vicinity of Braidwood Station, 2000 - 2021

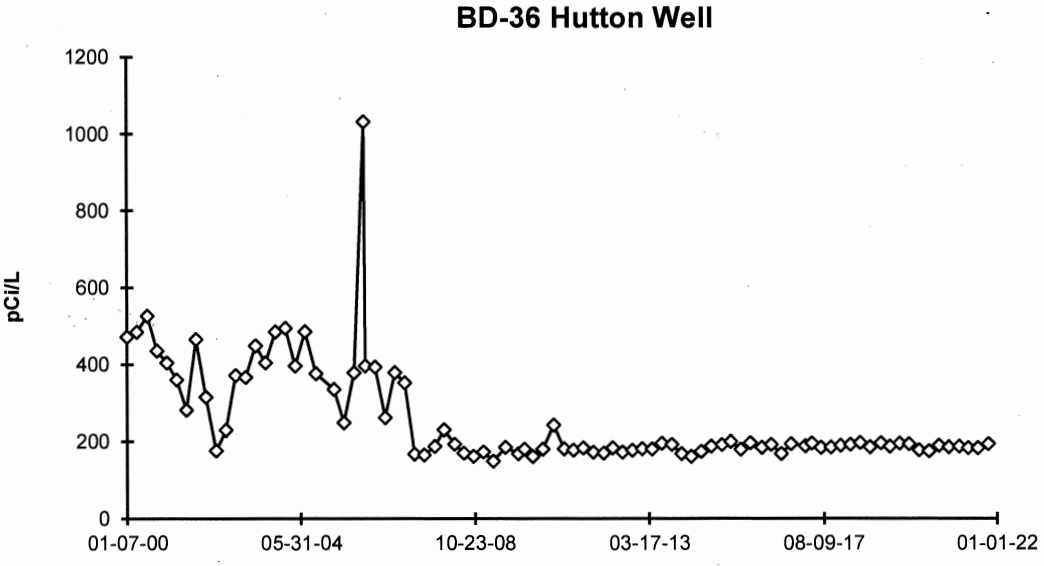




DUE TO VENDOR CHANGE IN 2005, < VALUES ARE LLD VALUES JANUARY THROUGH JUNE 2005 AND MDC VALUES AFTER JULY.

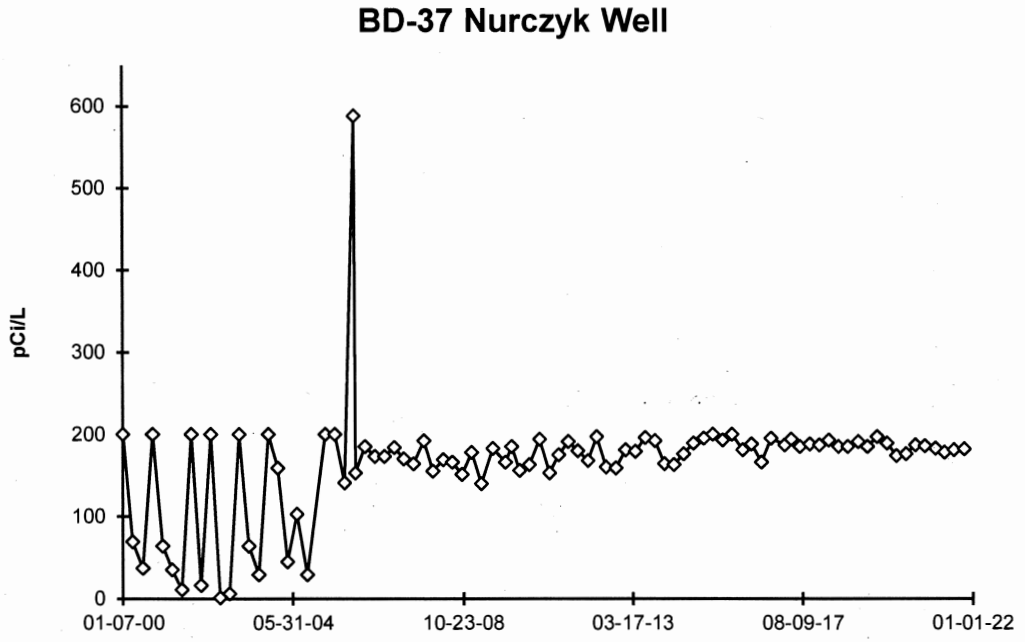
FIGURE C-10
Ground/Well Water - Tritium - Stations BD-35 and BD-36 Collected in the Vicinity of Braidwood Station, 2000 - 2021





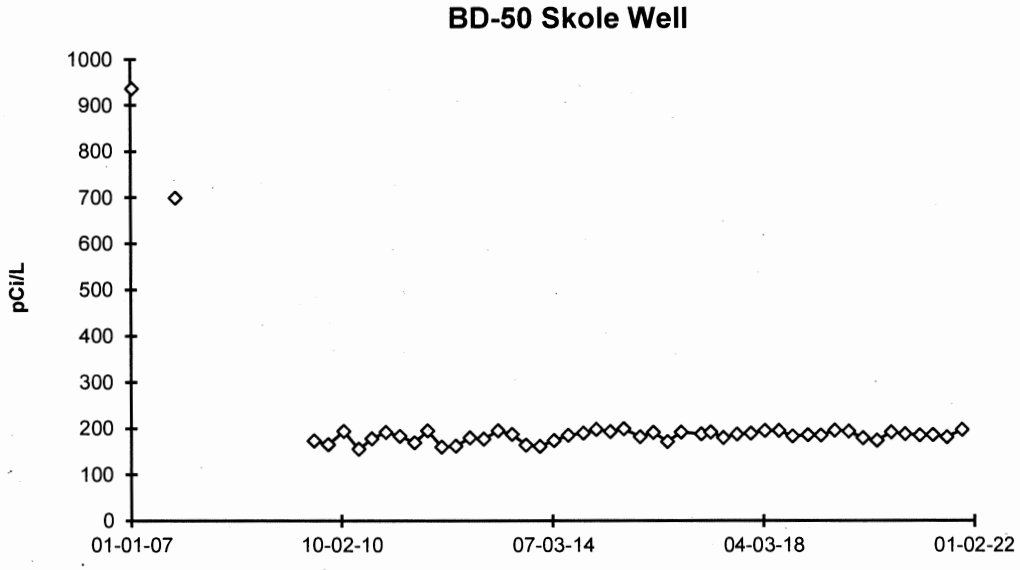
DUE TO VENDOR CHANGE IN 2005, < VALUES ARE LLD VALUES JANUARY THROUGH JUNE 2005 AND MDC VALUES AFTER JULY.

FIGURE C-11
Ground/Well Water - Tritium - Station BD-37
Collected in the Vicinity of Braidwood Station, 2000 - 2021



DUE TO VENDOR CHANGE IN 2005, < VALUES ARE LLD VALUES JANUARY THROUGH JUNE 2005 AND MDC VALUES AFTER JULY.

FIGURE C-12
Ground/Well Water - Tritium - Station BD-50 and BD-51 Collected in the Vicinity of Braidwood Station, 2007 - 2021



STATION BD-50 WAS INITIALLY DISCONTINUED ON 10/18/07 AND RESUMED ON 04/08/10

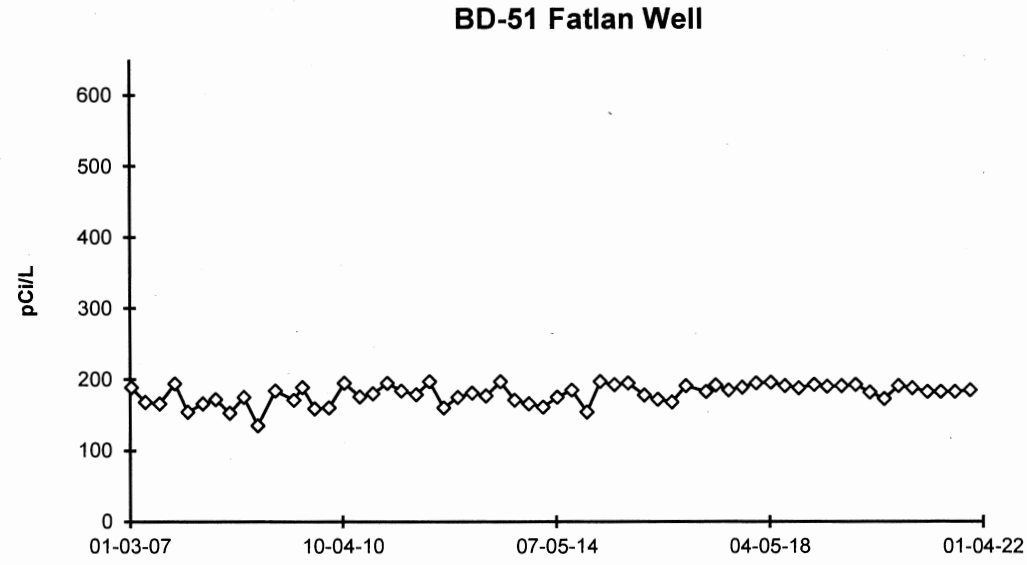


FIGURE C-13
Ground/Well Water - Tritium - Station BD-54
Collected in the Vicinity of Braidwood Station, 2007 - 2021

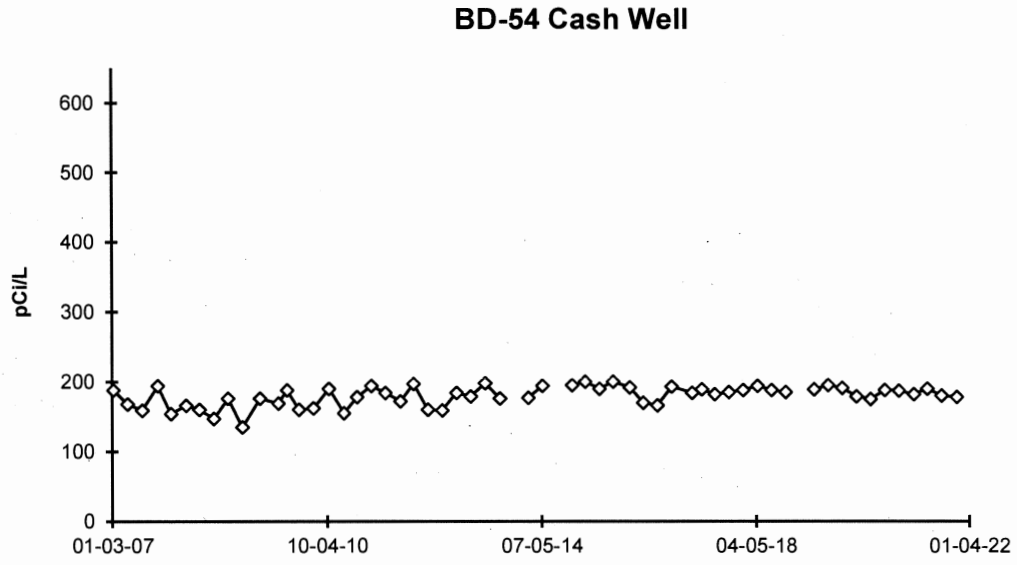
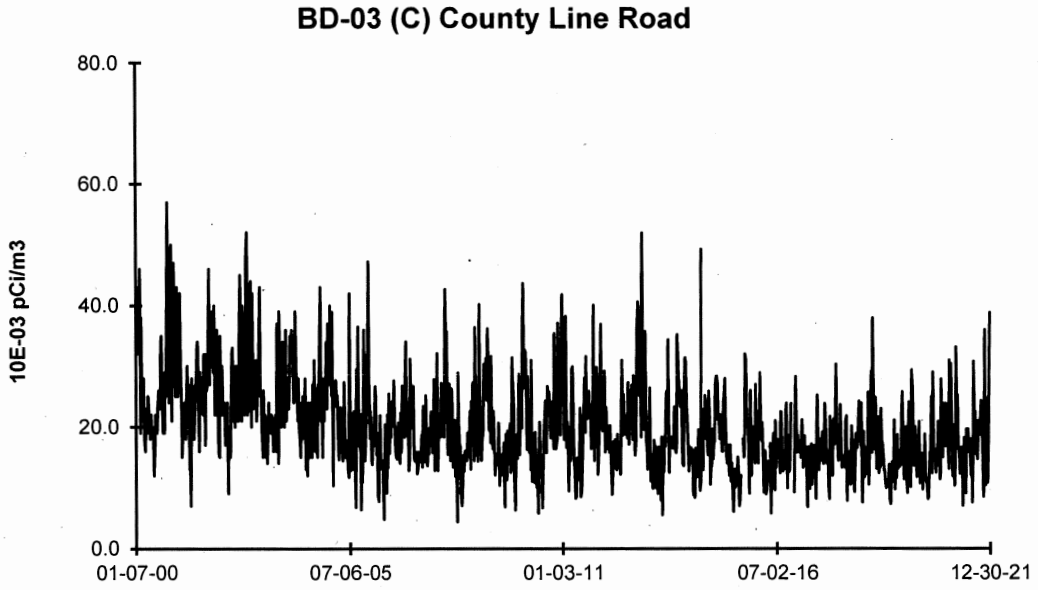


FIGURE C-14
Air Particulate - Gross Beta- Stations BD-03 (C) and BD-06 Collected in the Vicinity of Braidwood Station, 2000 - 2021



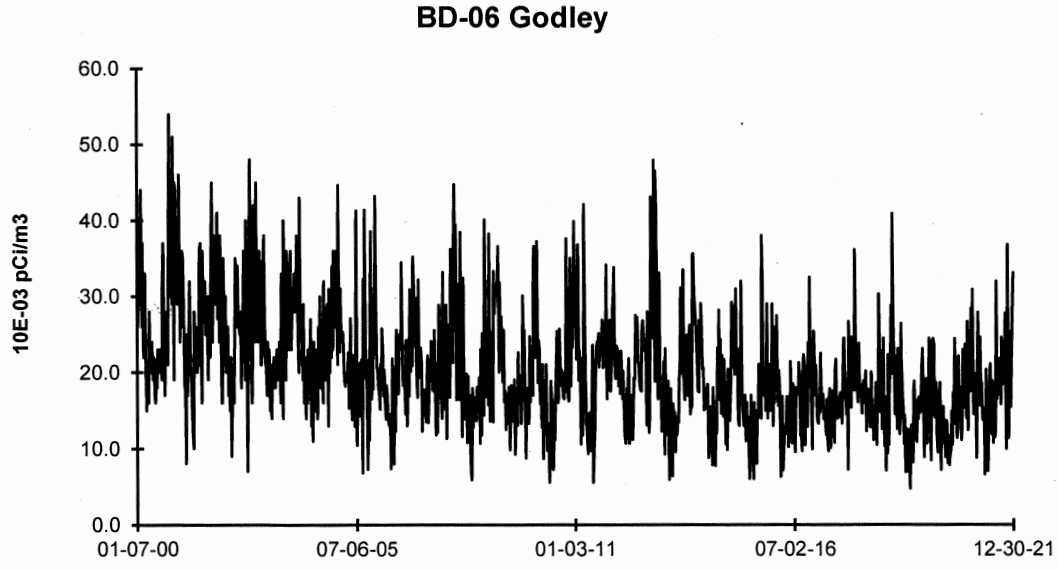
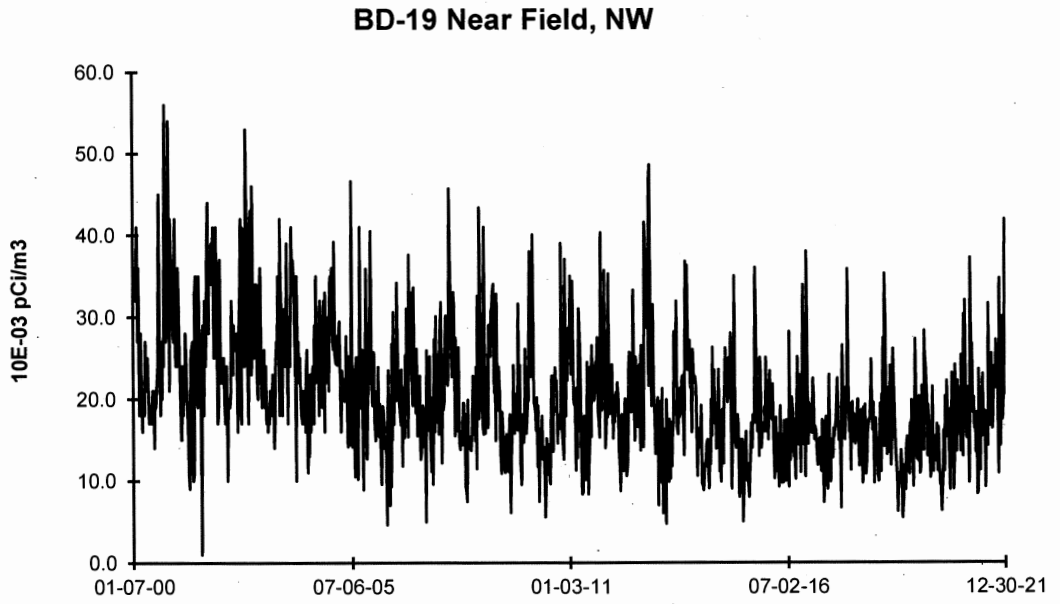


FIGURE C-15
Air Particulate - Gross Beta- Stations BD-19 and BD-20 Collected in the Vicinity of Braidwood Station, 2000 - 2021



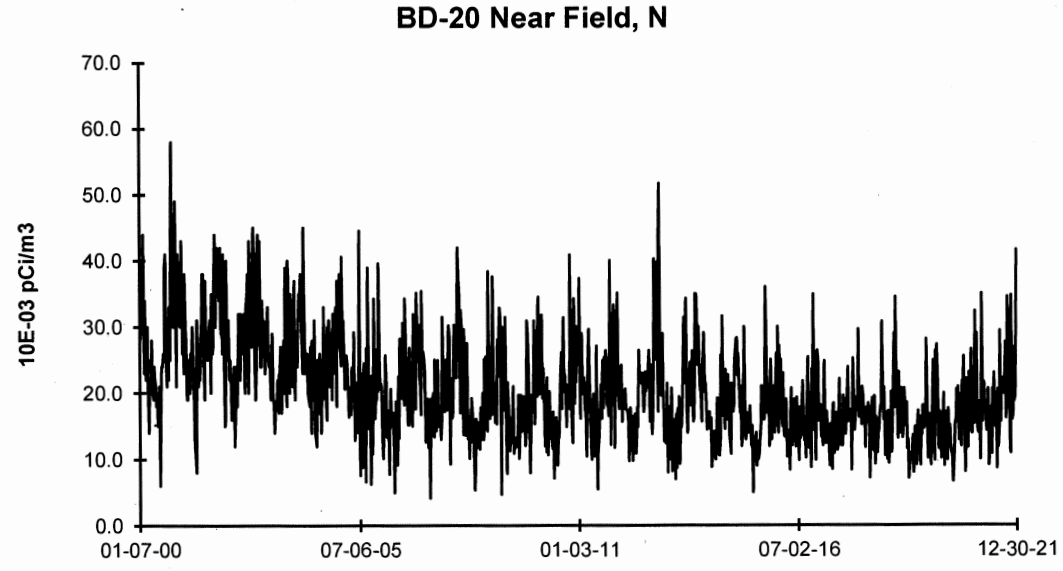


FIGURE C-16
Air Particulate - Gross Beta- Station BD-21
Collected in the Vicinity of Braidwood Station, 2000 - 2021

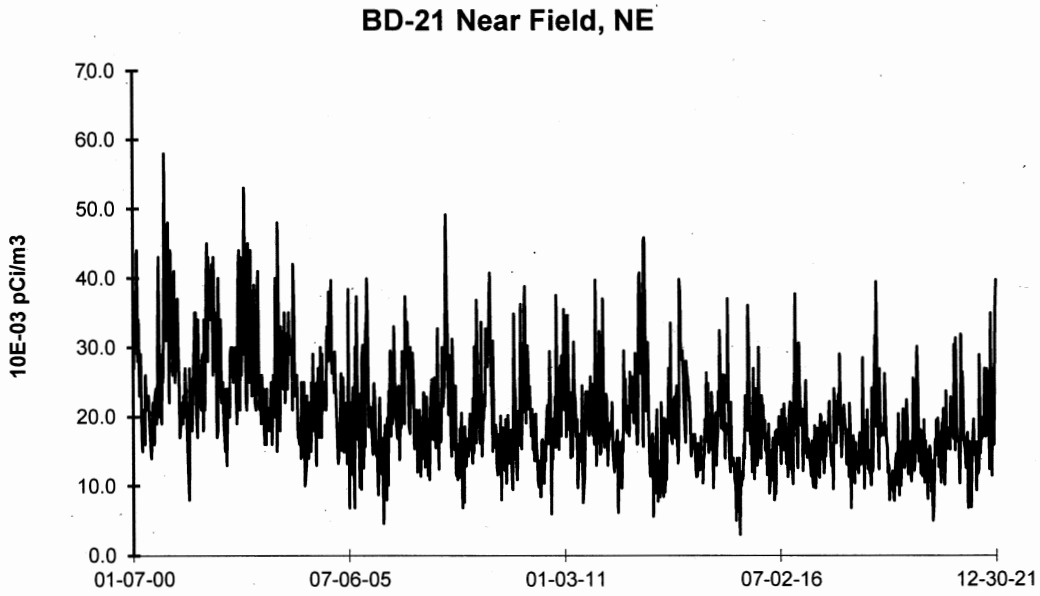
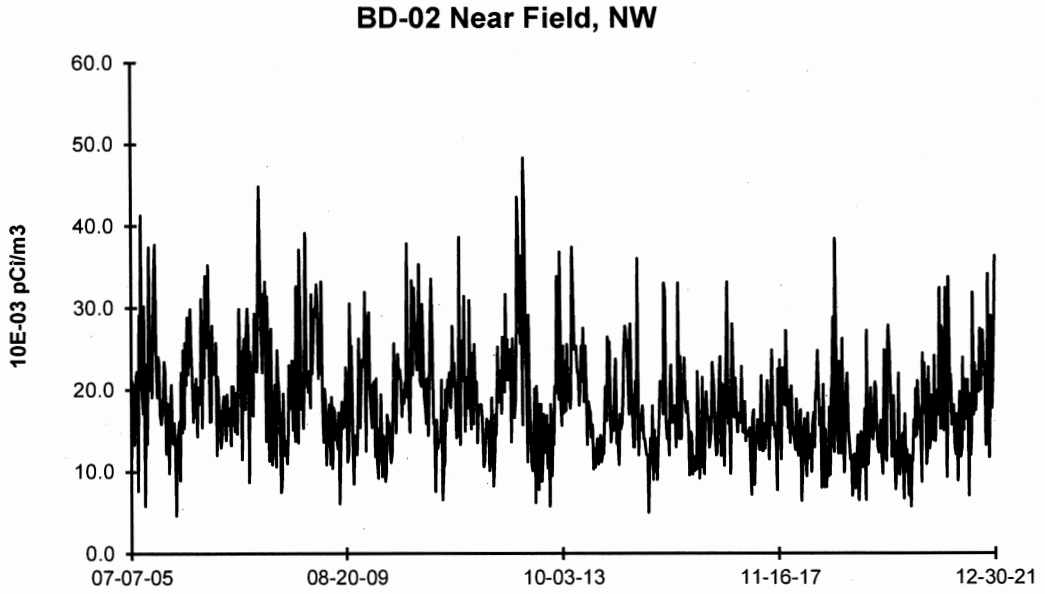


FIGURE C-17
Air Particulate - Gross Beta- Stations BD-02 and BD-04 Collected in the Vicinity of Braidwood Station, 2005 - 2021



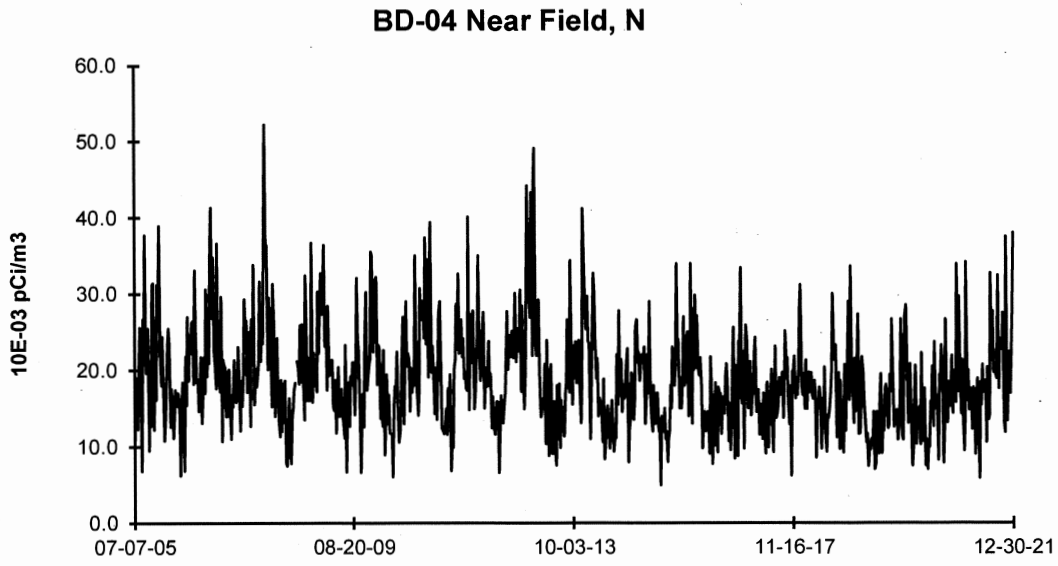
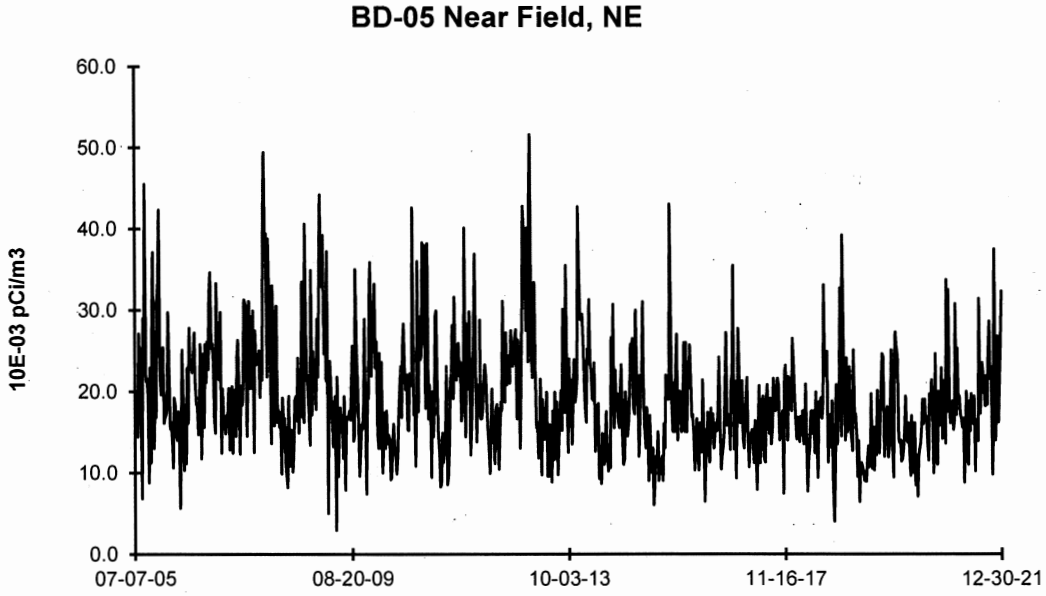


FIGURE C-18
Air Particulate - Gross Beta- Station BD-05
Collected in the Vicinity of Braidwood Station, 2005 - 2021



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APPENDIX D

INTER-LABORATORY COMPARISON PROGRAM

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Table D.1 **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 2021	E13466	Milk	Sr-89	pCi/L	84.6	87.1	0.97	A
			Sr-90	pCi/L	11.5	12.6	0.91	A
	E13467	Milk	Ce-141	pCi/L	111	125	0.89	A
			Co-58	pCi/L	123	128	0.96	A
			Co-60	pCi/L	140	154	0.91	A
			Cr-51	pCi/L	252	242	1.04	A
			Cs-134	pCi/L	130	151	0.86	A
			Cs-137	pCi/L	110	110	1.00	A
			Fe-59	pCi/L	105	109	0.96	A
			I-131	pCi/L	77.6	86.9	0.89	A
			Mn-54	pCi/L	111	112	0.99	A
			Zn-65	pCi/L	200	211	0.95	A
	E13468	Charcoal	I-131	pCi	83.5	88.5	0.94	A
	E13469	AP	Ce-141	pCi	103.0	103	1.00	A
			Co-58	pCi	93.3	105	0.89	A
			Co-60	pCi	136	126	1.08	A
			Cr-51	pCi	213	198	1.07	A
			Cs-134	pCi	123.0	124	0.99	A
			Cs-137	pCi	86.3	90.1	0.96	A
			Fe-59	pCi	81.3	89.6	0.91	A
			Mn-54	pCi	93.5	92.0	1.02	A
			Zn-65	pCi	166	173	0.96	A
	E13470	Soil	Ce-141	pCi/g	0.232	0.262	0.89	A
			Co-58	pCi/g	0.251	0.268	0.94	A
			Co-60	pCi/g	0.306	0.322	0.95	A
			Cr-51	pCi/g	0.517	0.506	1.02	A
			Cs-134	pCi/g	0.263	0.317	0.83	A
			Cs-137	pCi/g	0.278	0.301	0.92	A
			Fe-59	pCi/g	0.228	0.229	1.00	A
			Mn-54	pCi/g	0.221	0.235	0.94	A
			Zn-65	pCi/g	0.448	0.441	1.02	A
	E13471	AP	Sr-89	pCi	92.2	95.5	0.97	A
			Sr-90	pCi	11.7	13.9	0.84	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 D.1 **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)]
September 2021	E13472	Milk	Sr-89	pCi/L	66.4	85.4	0.78	W
			Sr-90	pCi/L	11.9	14.0	0.85	A
	E13473	Milk	Ce-141	pCi/L	118	114	1.03	A
			Co-58	pCi/L	116	118	0.98	A
			Co-60	pCi/L	142	145	0.98	A
			Cr-51	pCi/L	244	236	1.03	A
			Cs-134	pCi/L	81	93.1	0.87	A
			Cs-137	pCi/L	105	112	0.94	A
			Fe-59	pCi/L	105	102	1.03	A
			I-131	pCi/L	65.1	85.6	0.76	W
			Mn-54	pCi/L	128	128	1.00	A
			Zn-65	pCi/L	158	153	1.03	A
	E13474	Charcoal	I-131	pCi	85.2	90.9	0.94	A
	E13475	AP	Ce-141	pCi	126	135	0.94	A
			Co-58	pCi	148	139	1.07	A
			Co-60	pCi	183	171	1.07	A
			Cr-51	pCi	322	278	1.16	A
			Cs-134	pCi	118	110	1.08	A
			Cs-137	pCi	147	132	1.12	A
			Fe-59	pCi	131	120	1.09	A
			Mn-54	pCi	161	151	1.06	A
			Zn-65	pCi	202	180	1.12	A
	E13476	Soil	Ce-141	pCi/g	0.215	0.219	0.98	A
			Co-58	pCi/g	0.208	0.226	0.92	A
			Co-60	pCi/g	0.277	0.277	1.00	A
			Cr-51	pCi/g	0.388	0.452	0.86	A
			Cs-134	pCi/g	0.157	0.178	0.88	A
			Cs-137	pCi/g	0.270	0.284	0.95	A
			Fe-59	pCi/g	0.218	0.195	1.12	A
			Mn-54	pCi/g	0.239	0.246	0.97	A
			Zn-65	pCi/g	0.312	0.293	1.06	A
	E13477	AP	Sr-89	pCi	85.6	68.3	1.25	W
			Sr-90	pCi	12.6	11.2	1.13	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 D.2 **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 2021	21-GrF44	AP	Gross Alpha	Bq/sample	0.371	1.77	0.53 - 3.01	N[3]
			Gross Beta	Bq/sample	0.731	0.65	0.325 - 0.974	A
	21-MaS44	Soil	Ni-63	Bq/kg	310	689.0	482 - 896	N[4]
			Tc-99	Bq/kg	457	638	447 - 829	W
	21-MaSU44	Urine	Cs-134	Bq/L	2.34	2.73	1.91 - 3.55	A
			Cs-137	Bq/L	2.54	2.71	1.90 - 3.52	A
			Co-57	Bq/L	0.4100		*(1)*	A
			Co-60	Bq/L	2.24	2.44	1.71 - 3.17	A
			Mn-54	Bq/L	2.03	2.03	1.42 - 2.64	A
			K-40	Bq/L	52.8	54.0	38 - 70	A
			U-234	Bq/L	0.108	0.0877	0.0614 - 0.114	W
			U-238	Bq/L	0.101	0.091	0.064 - 0.118	A
			Zn-65	Bq/L	1.06	1.34	*(2)*	A
	21-MaW44	Water	Ni-63	Bq/L	6.7	8.2	5.7 - 10.7	A
			Tc-99	Bq/L	3.850	4.01	2.81 - 5.21	A
	21-RdV44	Vegetation	Cs-134	Bq/sample	3.13	3.60	2.5 - 4.7	A
			Cs-137	Bq/sample	4.64	4.69	3.28 - 6.10	A
			Co-57	Bq/sample	5.25	5.05	3.54 - 6.57	A
			Co-60	Bq/sample	2.86	2.99	2.09 - 3.89	A
			Mn-54	Bq/sample	5.02	5.25	3.68 - 6.83	A
			Sr-90	Bq/sample	0.631	0.673	0.471 - 0.875	A
			Zn-65	Bq/sample	-0.233		*(1)*	A
August 2021	21-GrF45	AP	Gross Alpha	Bq/sample	0.368	0.960	0.288 - 1.632	A
			Gross Beta	Bq/sample	0.595	0.553	0.277 - 0.830	A
	21-MaS45	Soil	Ni-63	Bq/kg	546	1280	896 - 1664	N[5]
			Tc-99	Bq/kg	453	777	544 - 1010	N[5]
	21-MaSU45	Urine	Cs-134	Bq/L	3.10	3.62	2.53 - 4.71	A
			Cs-137	Bq/L	0.083		*(1)*	A
			Co-57	Bq/L	0.844	0.87	0.606 - 1.125	A
			Co-60	Bq/L	0.0535		*(1)*	A
			Mn-54	Bq/L	0.459	0.417	*(2)*	A
			K-40	Bq/L	48.8	54.0	38 - 70	A
			U-234	Bq/L	0.133	0.116	0.081 - 0.151	A
			U-238	Bq/L	0.137	0.121	0.085 - 0.157	A
			Zn-65	Bq/L	0.339	0.420	*(2)*	A
	21-MaW45	Water	Ni-63	Bq/L	33.5	39.5	27.7 - 51.4	A
			Tc-99	Bq/L	3.5	3.7	2.60 - 4.82	A
	21-RdV45	Vegetation	Cs-134	Bq/sample	3.42	4.34	3.04 - 5.64	W
			Cs-137	Bq/sample	2.14	2.21	1.55 - 2.87	A
			Co-57	Bq/sample	4.08	4.66	3.26 - 6.06	A
			Co-60	Bq/sample	2.81	3.51	2.46 - 4.56	A
			Mn-54	Bq/sample	0.035		*(1)*	A
			Sr-90	Bq/sample	1.15	1.320	0.92 - 1.72	A
			Zn-65	Bq/sample	2.05	2.43	1.70 - 3.16	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 **NCR 21-02***
*(4) See **NCR 21-03***
*(5) See **NCR 21-13***
(6) Tc-99 cross-checks done for TBE information only - not required

Table D.3 **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 2021	MRAD-34	Water	Am-241	pCi/L	175	157	108 - 201	A
			Fe-55	pCi/L	579	275	162 - 400	N[1]
			Pu-238	pCi/L	181	171	103 - 222	A
			Pu-239	pCi/L	153	142	87.9 - 175	A
		Soil	Sr-90	pCi/kg	6570	9190	2860 - 14,300	A
		AP	Fe-55	pCi/filter	107	121	44.2 - 193	A
			U-234	pCi/filter	25.99	25.5	18.9 - 29.9	A
			U-238	pCi/filter	24.7	25.3	19.1 - 30.2	A
April 2021	RAD-125	Water	Ba-133	pCi/L	92.3	90.5	76.2 - 99.6	A
			Cs-134	pCi/L	62.9	70.5	57.5 - 77.6	A
			Cs-137	pCi/L	161	168	151 - 187	A
			Co-60	pCi/L	22.5	20.9	17.7 - 25.8	A
			Zn-65	pCi/L	183	177.0	159 - 208	A
			GR-A	pCi/L	30.8	30.2	15.4 - 39.4	A
			GR-B	pCi/L	60.1	67.5	46.8 - 74.2	A
			U-Nat	pCi/L	36.45	36.9	30.0 - 40.8	A
			H-3	pCi/L	13,400	14,600	12,800 - 16,100	A
			Sr-89	pCi/L	64.5	63.5	51.4 - 71.5	A
			Sr-90	pCi/L	22.8	23.0	16.5 - 27.0	A
			I-131	pCi/L	28.2	26.7	22.2 - 31.4	A
September 2021	MRAD-35	Water	Am-241	pCi/L	68	63.7	43.7 - 81.5	A
			Fe-55	pCi/L	179	246	145 - 358	A
			Pu-238	pCi/L	102	114	68.5 - 148	A
			Pu-239	pCi/L	32	34.3	21.2 - 42.3	A
		Soil	Sr-90	pCi/kg	6160	6090	1,900 - 9,490	A
		AP	Fe-55	pCi/filter	493	548	200 - 874	A
			Pu-238	pCi/filter	28	28.5	21.5 - 35.0	A
			Pu-239	pCi/filter	21	21.6	16.1 - 26.1	A
			U-234	pCi/filter	7.95	7.76	5.75 - 9.09	A
			U-238	pCi/filter	8.0	7.69	5.81 - 9.17	A
October 2021	RAD-127	Water	Ba-133	pCi/L	82.8	87.5	73.6 - 96.2	A
			Cs-134	pCi/L	64.0	70.1	57.1 - 77.1	A
			Cs-137	pCi/L	145	156	140 - 174	A
			Co-60	pCi/L	83.2	85.9	77.3 - 96.8	A
			Zn-65	pCi/L	133	145	130 - 171	A
			GR-A	pCi/L	76.0	66.7	35.0 - 82.5	A
			GR-B	pCi/L	63.0	55.7	38.1 - 62.6	N[2]
			U-Nat	pCi/L	52.88	55.5	45.3 - 61.1	A
			H-3	pCi/L	13,800	17,200	15,000 - 18,900	N[3]
			Sr-89	pCi/L	54.9	61.0	49.1 - 68.9	A
			Sr-90	pCi/L	24.8	29.3	21.3 - 34.0	A
			I-131	pCi/L	27.4	26.4	21.9 - 31.1	A
December 2021	QR 120121Y	Water	GR-B	pCi/L	47.6	39.8	26.4 - 47.3	N[4]
			H-3	pCi/L	17,500	17,800	15,600 - 19,600	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 21-01***
*(2) See **NCR 21-10***
*(3) See **NCR 21-11***
*(4) See **NCR 21-14***

APPENDIX E

ERRATA DATA

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There was no errata data for 2021.

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APPENDIX F

ANNUAL RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM REPORT (ARGPPR)

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Docket No: 50-456
50-457

BRAIDWOOD STATION

UNIT 1 and UNIT 2

Annual Radiological
Groundwater Protection Program Report

1 January through 31 December 2021

Prepared By
Teledyne Brown Engineering
Environmental Services

Exelon Generation®

Braidwood Station
Braceville, IL 60407

May 2022

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Appendices

I. Summary and Conclusions

In 2021, Exelon continued a comprehensive program that evaluates the impact of station operations on groundwater and surface water in the vicinity of Braidwood Station. This report reviews groundwater and surface water samples collected from the environment, both on and off station property, in 2021. During that time period, 416 analyses were performed on 136 samples from 35 locations.

In assessing all the data gathered for this report, it was concluded that the operation of Braidwood Station had no adverse radiological impact on the environment.

Gamma-emitting radionuclides associated with licensed plant operations were not detected at concentrations greater than their respective Lower Limits of Detection (LLDs) as specified in the Offsite Dose Calculation Manual (ODCM) in any of the groundwater or surface water samples. In the case of tritium, Exelon specified that its laboratories achieve a lower limit of detection 10 times less than Braidwood's ODCM and 100 times less than federal regulation.

Strontium-89/90 (Sr-89/90) was not detected at a concentration greater than the LLD of 10.0 and 1.0 picocuries per liter (pCi/L) respectively in any of the groundwater samples tested.

No tritium (H-3) was detected in any sample at concentrations greater than the United States Environmental Protection Agency (USEPA) drinking water standard (and the Nuclear Regulatory Commission Reporting Limit) of 20,000 pCi/L. Low levels of tritium were detected in groundwater and surface water at concentrations greater than the LLD of 200 pCi/L in 46 of 127 samples. The tritium concentrations ranged from 183 ± 112 pCi/L to 801 ± 163 pCi/L. The tritium that was detected in the groundwater or surface water is believed to be the result of isolated historical releases and/or background from external sources greater than 200 pCi/L.

Gross Alpha analyses in the dissolved and suspended fractions were performed on groundwater water samples throughout the sampling year in 2021. Gross Alpha (dissolved) was detected in 2 groundwater samples with concentrations ranging from 1.4 ± 0.8 pCi/L to 2.7 ± 1.0 pCi/L. Gross Alpha (suspended) was detected in 3 groundwater samples with concentrations ranging from 2.4 ± 1.2 pCi/L to 5.2 ± 1.4 pCi/L.

Gross Alpha analyses in the dissolved and suspended fractions were not performed on surface water samples in 2021.

Hard-To-Detect analyses including iron-55 (Fe-55), nickel-63 (Ni-63), americium-241 (Am-241), cerium-242 (Cm-242), cerium 243/244 (Cm-243/244), plutonium-238 (Pu-238), plutonium-239/240 (Pu-239/240), uranium-234 (U-234), uranium-235 (U-235) and uranium-238 (U-238) were performed on 4 sample locations in 2021. All HTD's were below required detection limits.

II. Introduction

The Braidwood Station, consisting of two 3,645 MWt pressurized water reactors owned and operated by Exelon Corporation 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.

This report covers those analyses performed by Teledyne Brown Engineering (TBE) and Environmental Inc. Midwest Labs (EIML) on samples collected in 2021.

A. Objective of the Radiological Groundwater Protection Program (RGPP)

The long-term objectives of the RGPP are as follows:

1. Identify suitable locations to monitor and evaluate potential impacts from station operations to preclude radiological impact to the environment and potential drinking water sources;

2. Understand the local hydrogeologic regime in the vicinity of the station and maintain up-to-date knowledge of flow patterns on the surface and shallow subsurface;

3. Perform routine water sampling and radiological analysis of water from selected locations;

4. Report new leaks, spills, or other detections with potential radiological significance to stakeholders in a timely manner;

5. Regularly assess analytical results to identify adverse trends;

6. Take necessary corrective actions to protect groundwater resources.

B. Implementation of the Objectives

The objectives identified have been implemented at Braidwood Station as discussed below:

1. Exelon identified locations to monitor and evaluated potential impacts from station operations

2. The Braidwood Station reports describe the local hydrogeologic regime. Periodically, the flow patterns on the surface and shallow subsurface are updated based on ongoing measurements

3. Braidwood Station will continue to perform routine sampling and radiological analysis of water from selected locations

4. Braidwood Station has implemented procedures to identify and report new leaks, spills, or other detections with potential radiological significance in a timely manner

5. Braidwood Station staff and consulting hydrogeologist assess analytical results on an ongoing basis to identify adverse trends

C. Program Description

1. Sample Collection

Sample locations can be found in Table A-1 and Figures A-1 through A-5, Appendix A.

2. Groundwater and Surface Water

Samples of groundwater and surface water are collected, managed, transported and analyzed in accordance with EPA methods. Sample locations, sample collection frequencies and analytical frequencies are managed in accordance with approved station procedures. Contractor and/or station personnel are trained in the collection, preservation management and shipment of samples as well as in documentation of sampling events. Analytical laboratories are subject to internal quality assurance programs, industry cross-check programs as well as nuclear industry audits. Station personnel review and evaluate all analytical data as it is received. Additionally, analytical data results are reviewed by an independent hydrogeologist for adverse trends or changes to hydrogeologic conditions.

D. Characteristics of Tritium (H-3)

Tritium is a radioactive isotope of hydrogen. Its chemical properties are the same as hydrogen. Tritiated water behaves the same as ordinary water in both the environment and the body. Tritiated water can be taken into the body by drinking water, breathing air, eating food or absorption through the skin. Once tritiated water enters the body, it disperses quickly and is uniformly distributed. Tritiated water is excreted primarily through urine with a clearance rate characterized by an effective biological half-life of about 14 days. With such a short biological half-life, an acute ingestion would be cleared rapidly. Organically bound tritium (tritium that is incorporated into carbon containing compounds) can remain in the body for a longer period. Tritium is produced naturally in the upper atmosphere when cosmic rays interact with air molecules. Tritium is also produced during nuclear weapons explosions, as a by-product in reactors producing electricity and in special production reactors. Like normal water, tritiated water is colorless and odorless. Tritiated water behaves chemically and physically like non-tritiated water in the subsurface and therefore tritiated water will travel at the same velocity as non-tritiated groundwater.

III. Program Description

A. Sample Analysis

This section describes the general analytical methodologies used by Teledyne Brown Engineering (TBE) and Environmental Incorporated Midwest Laboratory (EIML) to analyze the environmental samples for radioactivity for the Braidwood Station RGPP in 2021.

In order to achieve the stated objectives, the current program includes the following analyses:

1. Concentrations of gamma emitters in groundwater and surface water
2. Concentrations of strontium in groundwater and surface water
3. Concentrations of tritium in groundwater and surface water
4. Concentrations of Gross Alpha (Dissolved and Suspended) in groundwater and surface water
5. Concentrations of Am-241 in groundwater
6. Concentrations of Cm-242 and Cm-243/244 in groundwater
7. Concentrations of Pu-238 and Pu-239/240 in groundwater
8. Concentrations of U-234, U-235 and U-238 in groundwater
9. Concentrations of Fe-55 in groundwater
10. Concentrations of Ni-63 in groundwater

B. Data Interpretation

The radiological data collected prior to Braidwood Station becoming operational was used as a baseline with which these operational data was compared. For the purpose of this report, Braidwood Station was considered operational at initial criticality. Several factors were important in the interpretation of the data:

1. Lower Limit of Detection and Minimum Detectable Concentration

   The lower limit of detection (LLD) is specified by federal regulation as a minimum sensitivity value that must be achieved routinely by the analytical parameter.

2. Laboratory Measurements Uncertainty

   The estimated uncertainty in measurement of tritium in environmental samples is frequently on the order of 50% of the measurement value.

   Statistically, the exact value of a measurement is expressed as a range with a stated level of confidence. The convention is to report results with a 95% level of confidence. The uncertainty comes from calibration standards, sample volume or weight measurements, sampling uncertainty and other factors. Exelon reports the uncertainty of a

measurement created by statistical process (counting error) as well as all sources of error (Total Propagated Uncertainty or TPU). Each result has two values calculated. Exelon reports the TPU by following the result with plus or minus (±) the estimated sample standard deviation, as TPU, that is obtained by propagating all sources of analytical uncertainty in measurements.

Analytical uncertainties are reported at the 95% confidence level in this report for reporting consistency with the AREOR.

Gamma spectroscopy results for each type of sample were grouped as follows:

For groundwater and surface water 14 nuclides, Be-7, K-40, Mn-54, Co-58, Fe-59, Co-60, Zn-65, Nb-95, Zr-95, I-131, Cs-134, Cs-137, Ba-140 and La-140 were reported.

C. Background Analysis

A pre-operational radiological environmental monitoring program (REMP) was conducted to establish background radioactivity levels prior to operation of the Station. The environmental media sampled and analyzed during the pre-operational REMP were atmospheric radiation, fall-out, domestic water, surface water, marine life and foodstuffs. The results of the monitoring were detailed in the report entitled, Environmental Radiological Monitoring for Braidwood Nuclear Power Station Commonwealth Edison Company, Annual Report 1986, May 1987.

1. Background Concentrations of Tritium

The purpose of the following discussion is to summarize background measurements of tritium in various media performed by others.

a. Tritium Production

Tritium is created in the environment from naturally-occurring processes both cosmic and subterranean, as well as from anthropogenic (i.e., man-made) sources. In the upper atmosphere, "Cosmogenic" tritium is produced from the bombardment of stable nuclides and combines with oxygen to form tritiated water, which will then enter the hydrologic cycle. Below ground, "lithogenic" tritium is produced by the bombardment of natural lithium present in crystalline rocks by neutrons produced by the radioactive decay of naturally abundant uranium and thorium. Lithogenic production of tritium is usually negligible compared to other sources due to the limited abundance of lithium in rock. The lithogenic tritium is introduced directly to groundwater.

A major anthropogenic source of tritium and Sr-90 comes from the former atmospheric testing of thermonuclear weapons. Levels of tritium in precipitation increased significantly during the 1950s and early 1960s and later with additional testing, resulting in the release

of significant amounts of tritium to the atmosphere. The Canadian heavy water nuclear power reactors, other commercial power reactors, nuclear research and weapons production continue to influence tritium concentrations in the environment.

b. Precipitation Data

Precipitation samples are routinely collected at stations around the world for the analysis of tritium and other radionuclides. Two publicly available databases that provide tritium concentrations in precipitation are Global Network of Isotopes in Precipitation (GNIP) and USEPA's RadNet database. GNIP provides tritium precipitation concentration data for samples collected worldwide from 1960 to 2014. RadNet provides tritium precipitation concentration data for samples collected at stations throughout the U.S. from 1960 up to and including 2021. Based on GNIP data for sample stations located in the U.S. Midwest, tritium concentrations peaked around 1963. This peak, which approached 10,000 pCi/L for some stations, coincided with the atmospheric testing of thermonuclear weapons. Tritium concentrations in surface water showed a sharp decline up until 1975 followed by a gradual decline since that time. Tritium concentrations in Midwest precipitation have typically been below 100 pCi/L since around 1980. Tritium concentrations in wells may still be above the 200 pCi/L detection limit from the external causes described above. Water from previous years and decades is naturally captured in groundwater, so some well water sources today are affected by the surface water from the 1960s that was elevated in tritium.

c. Surface Water Data

Tritium concentrations are routinely measured in large surface water bodies, including Lake Michigan and the Mississippi River. Illinois surface water data were typically less than 100 pCi/L.

The USEPA RadNet surface water data typically has a reported 'Combined Standard Uncertainty' of 35 to 50 pCi/L. According to USEPA, this corresponds to a ± 70 to 100 pCi/L 95% confidence bound on each given measurement. Therefore, the typical background data provided may be subject to measurement uncertainty of approximately ± 70 to 100 pCi/L.

The radio-analytical laboratory is counting tritium results to an Exelon-specified LLD of 200 pCi/L. Typically, the lowest positive measurement will be reported within a range of 40 – 240 pCi/L or 140 ± 100 pCi/L. These sample results cannot be distinguished as different from background at this concentration.

IV. Results and Discussion

A. Missed Samples

There were no missed samples during 2021.

B. Groundwater Results

Samples were collected from on- and off-site wells throughout the year in accordance with the Station radiological groundwater protection program. Analytical results and anomalies are discussed below:

Tritium

Samples from all locations were analyzed for tritium activity. Tritium values ranged from the lower detection limit to 801 pCi/L.
(Tables B-I.1, Appendix B)

Strontium

Thirty-six samples for analyzed for Sr-89 and Sr-90. Sr-89 was less than the required detection limit of 10.0 pCi/liter. Sr-90 was less than the required detection limit of 1.0 pCi/liter. (Table B-I.1, Appendix B)

Gross Alpha (dissolved and suspended)

Gross Alpha analyses in the dissolved and suspended fractions were performed on groundwater water samples throughout the sampling year in 2021. Gross Alpha (suspended) was detected in 2 groundwater samples with a concentration range of 1.4 ± 0.8 pCi/L to 2.7 ± 1.0 pCi/L. Gross Alpha (dissolved) was detected in 2 groundwater samples. The concentrations ranged from 2.4 ± 1.2 pCi/L to 5.2 ± 1.4 pCi/L.
(Table B-I.1, Appendix B)

Hard-To-Detect

Hard-To-Detect analyses including Fe-55, Ni-63, Am-241, Cm-242, Cm-243/244, Pu-238, Pu-239/240, U-234, U-235 and U-238 were analyzed at 4 locations in 2021. All HTD's were less than required detection limits. (Table B-I.3, Appendix B)

Gamma Emitters

Naturally-occurring K-40 was detected in two samples with concentrations of 42 ± 28 pCi/L and 72 ± 33 pCi/L. No other gamma-emitting nuclides were detected in any of the samples analyzed. (Table B–I.2, Appendix B)

C. Surface Water Results

Samples were collected from two surface water locations throughout the year in accordance with the station radiological groundwater protection program. Analytical results and anomalies are discussed below:

Tritium

Samples from all locations were analyzed for tritium activity. Tritium values were all less than the lower limit of detection. (Table B-II.1, Appendix B)

D. Summary of Results – Inter-Laboratory Comparison Program

Inter-Laboratory Comparison Program results for TBE are presented in the AREOR.

E. Leaks, Spills, and Releases

There were no leaks, spills or releases to groundwater in 2021.

F. Trends and Analyses

Since June 2017, the CWBD House well tritium concentrations have been decreasing steadily. Monitoring of groundwater wells surrounding the plant indicate that tritium concentrations in affected areas near the Turbine Building have remained relatively unchanged since 2010.

G. Investigations

There were no new investigations in 2021.

H. Actions Taken

1. Installation of Monitoring Wells

   Corrective actions taken in response to the CWBD House event included the placement of multiple monitoring wells at various depths in the vicinity of the CWBD house to determine soil contamination levels, as well as the establishment of soil remediation efforts to remove the tritium contamination from the area.

2. Compensatory Actions

   The discharges of the CWBD House remediation wells are treated as non-routine planned discharges. They are sampled regularly and permitted in the same manner as other ODCM pathways. The corresponding activity values are included as part of Table B-I.1 in this report.

3. Use of all remediation and support equipment from Exelon Braidwood Station property has stopped due to closure of the Braidwood Generating Station Consent Order No. 06 MR 248. Consent Order No. 06 MR 248 was terminated on May 14, 2020 by the Illinois Attorney General and Illinois Environmental Protection Agency.

APPENDIX A

LOCATION DESIGNATION

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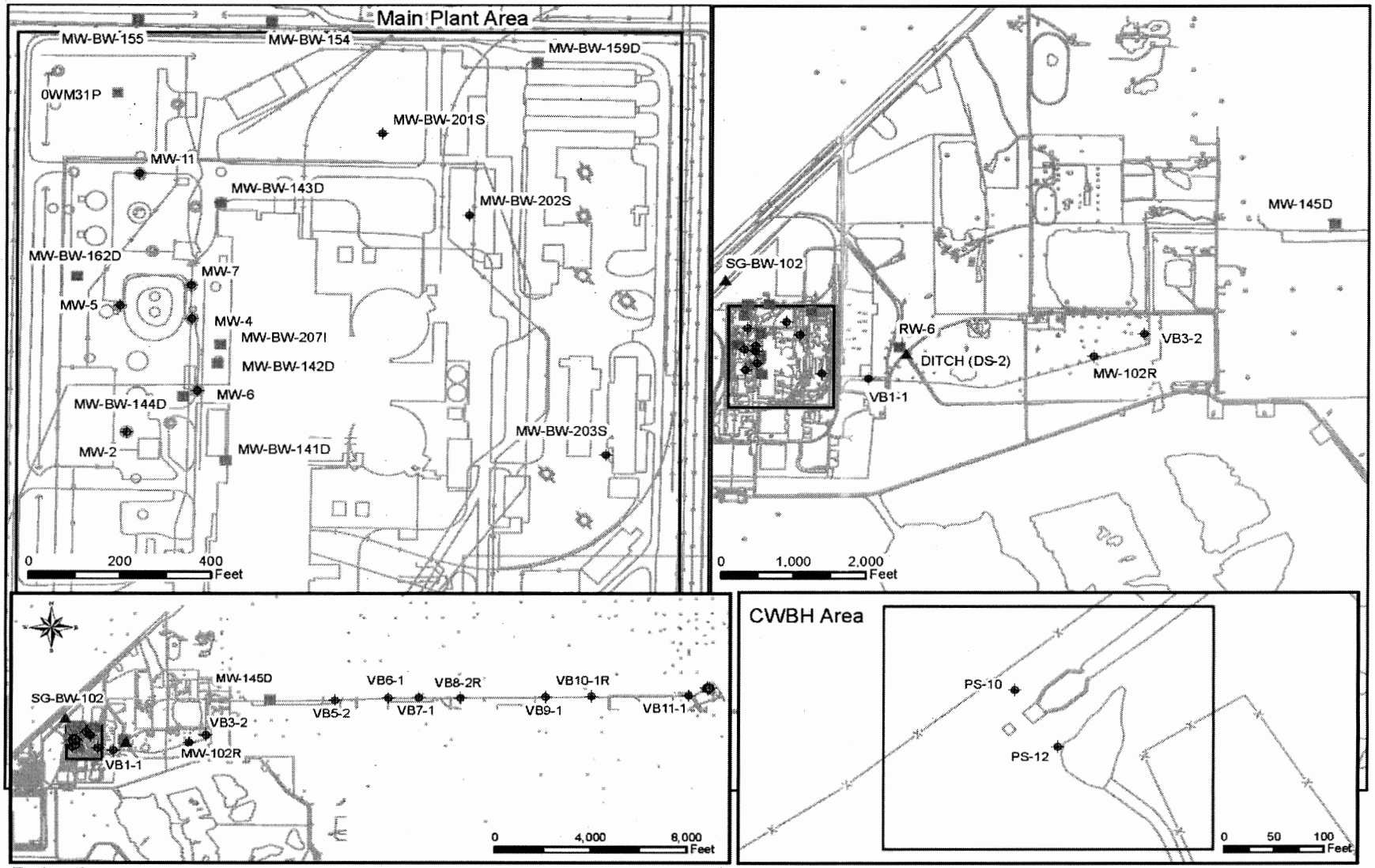
TABLE A-1: Radiological Groundwater Protection Program Sampling Locations, Braidwood Station, 2021

Station Code	Sample Description
0WM31P	Drinking Water
DITCH F (DS-2)	Surface 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
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
SG-BW-102 DITCH C	Surface Water
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



Explanation:

- Surface Water Location
- Shallow Aquifer Monitoring Well
- Intermediate Aquifer Monitoring Well

RGPP Sample Locations
Exelon Corporation
Braidwood Generating Station

Figure A-1
RGPP Groundwater Monitoring Well Sample Locations
Braidwood Station, 2021

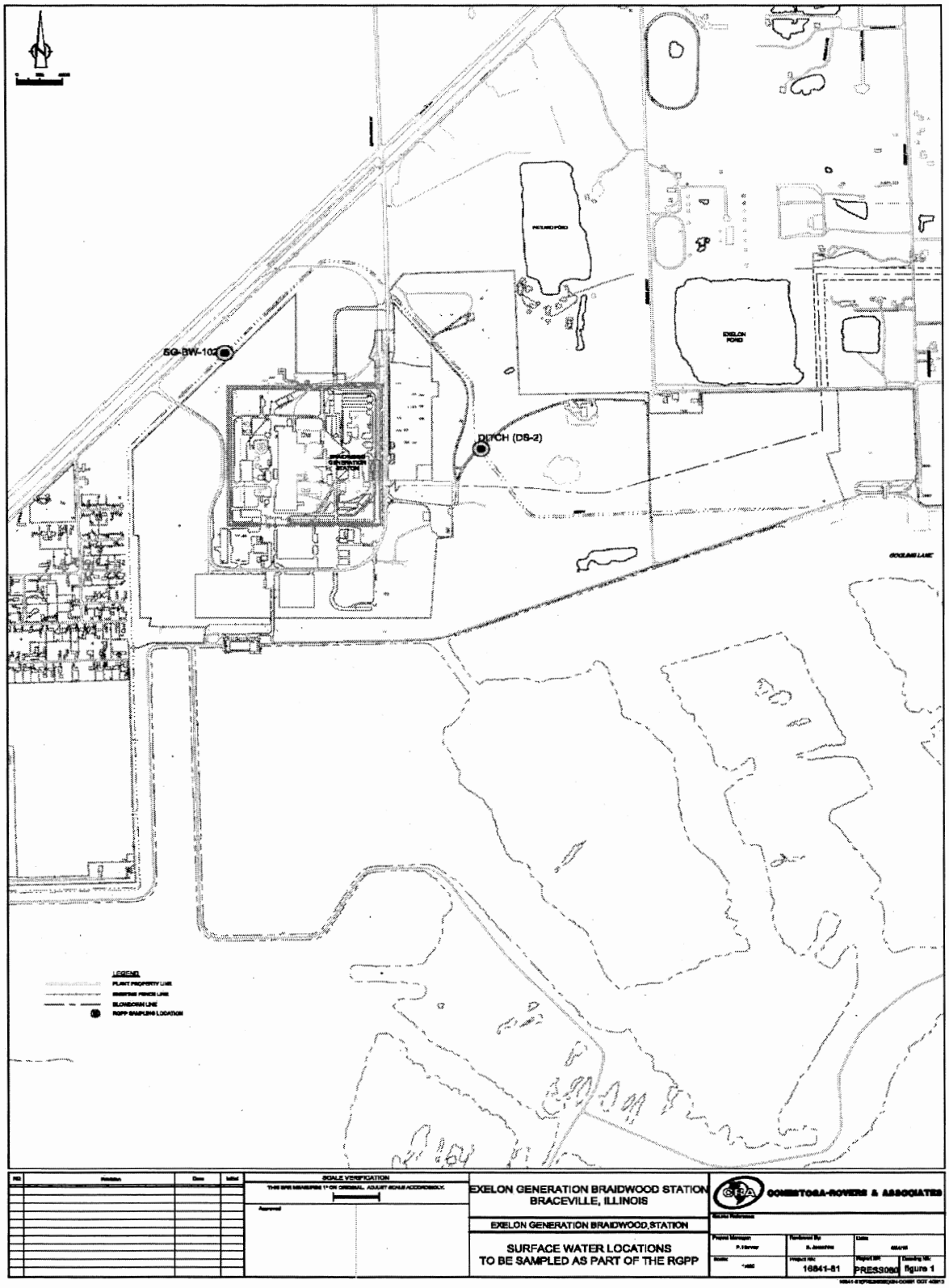


Figure A-5
RGPP CWBD Monitoring Water Sample Locations
Braidwood Station, 2021

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APPENDIX B

DATA TABLES

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TABLE B-I.1 CONCENTRATIONS OF TRITIUM, STRONTIUM, AND GROSS ALPHA IN GROUNDWATER SAMPLES COLLECTED IN THE VICINITIY OF BRAIDWOOD STATION, 2021

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	H-3	Sr-89	Sr-90	Gr-A (Dis)	Gr-A (Sus)
MW-2	03/29/21	452 ± 135				
MW-2	05/03/21	216 ± 121				
MW-2	09/05/21	332 ± 128	< 4.0	< 0.7	< 0.5	< 0.4
MW-2	10/21/21	293 ± 126				
MW-4	03/29/21	463 ± 134				
MW-4	04/18/21	398 ± 129				
MW-4	07/15/21	394 ± 133	< 8.9	< 0.9	< 1.2	< 0.9
MW-4	10/23/21	397 ± 129				
MW-5	03/29/21	192 ± 121				
MW-5	05/04/21	< 178				
MW-5	07/20/21	< 189	< 6.5	< 0.9	< 0.7	< 0.9
MW-5	10/21/21	< 186				
MW-6	03/29/21	451 ± 129				
MW-6	04/17/21	456 ± 132				
MW-6	07/20/21	563 ± 140	< 8.7	< 1.0	< 1.8	< 1.0
MW-6	10/23/21	670 ± 144				
MW-7	03/30/21	353 ± 127				
MW-7	04/18/21	362 ± 127				
MW-7	07/15/21	194 ± 126	< 8.7	< 0.9	< 0.5	< 0.9
MW-7	10/26/21	236 ± 122				
MW-11	03/30/21	< 187			< 0.8	< 0.5
MW-11	05/03/21	< 182	< 8.2	< 0.8	< 0.8	< 0.5
MW-11	09/16/21	239 ± 123	< 4.8	< 0.9	< 1.4	< 0.9
MW-11	10/21/21	240 ± 122				
MW-102R	03/17/21	< 180				
MW-102R	06/17/21	< 174				
MW-102R	07/16/21	< 189	< 9.1	< 0.9	< 0.3	< 0.9
MW-141D	03/29/21	412 ± 129				
MW-141D	04/17/21	426 ± 131				
MW-141D	09/05/21	366 ± 129	< 6.4	< 0.8	< 1.8	< 0.5
MW-141D	10/21/21	461 ± 144				
MW-142D	03/29/21	648 ± 145				
MW-142D	04/29/21	796 ± 155				
MW-142D	09/27/21	709 ± 149	< 6.5	< 0.9	< **3.1**	< 1.2
MW-142D	10/23/21	801 ± 163				
MW-143D	03/30/21	204 ± 118			2.4 ± 1.0	5.2 ± 1.4
MW-143D	04/30/21	< 190	< 7.9	< 0.8	1.4 ± 0.8	< 1.3
MW-143D	09/14/21	< 176	< 4.7	< 0.8	2.7 ± 1.0	2.4 ± 1.2
MW-143D	10/26/21	< 185				
MW-144D	03/29/21	197 ± 117				
MW-144D	05/04/21	183 ± 112				
MW-144D	09/16/21	< 187	< 8.4	< 0.8	< 0.7	< 0.9
MW-144D	10/21/21	281 ± 127				
MW-145D	03/24/21	< 181				
MW-145D	06/06/21	< 192				
MW-145D	09/14/21	< 183	< 4.4	< 0.8	< 0.6	< 0.7
MW-145D	12/13/21	< 189				
MW-154	03/19/21	< 177			< 0.5	< 1.0
MW-154	04/25/21	< 184	< 9.1	< 1.0	< 0.5	< 1.0

***BOLD** Values = Unable to meet detection limits due to high solids content*

TABLE B-I.1 CONCENTRATIONS OF TRITIUM, STRONTIUM, AND GROSS ALPHA IN GROUNDWATER SAMPLES COLLECTED IN THE VICINITIY OF BRAIDWOOD STATION, 2021

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	H-3	Sr-89	Sr-90	Gr-A (Dis)	Gr-A (Sus)
MW-154	09/13/21	< 190	< 7.4	< 0.9	< 0.4	< 0.4
MW-154	10/24/21	< 180				
MW-155	03/19/21	< 174			< 0.7	< 1.0
MW-155	04/25/21	< 188	< 9.4	< 0.9	< 0.7	< 1.0
MW-155	09/13/21	< 189	< 4.4	< 0.7	< 0.5	< 0.4
MW-155	10/24/21	< 192				
MW-159D	03/12/21	< 180				
MW-159D	04/30/21	< 185				
MW-159D	09/27/21	< 184	< 5.2	< 0.9	< 2.5	< 0.9
MW-159D	10/21/21	257 ± 131				
MW-162D	03/12/21	227 ± 119				
MW-162D	04/30/21	311 ± 128				
MW-162D	09/30/21	268 ± 138	< 4.2	< 0.9	< 0.7	< 0.7
MW-162D	10/21/21	316 ± 127				
MW-BW-201S	03/30/21	317 ± 126				
MW-BW-201S	04/30/21	< 191				
MW-BW-201S	09/27/21	< 183	< 4.7	< 0.9	< 0.9	< 0.7
MW-BW-201S	10/21/21	242 ± 121				
MW-BW-202S	03/12/21	< 180				
MW-BW-202S	04/30/21	< 182				
MW-BW-202S	09/21/21	203 ± 121	< 4.9	< 0.8	< 2.0	< 0.9
MW-BW-202S	10/21/21	334 ± 131				
MW-BW-203S	03/12/21	< 175				
MW-BW-203S	04/18/21	234 ± 122				
MW-BW-203S	09/21/21	< 180	< 6.6	< 0.9	< 1.4	< 0.7
MW-BW-203S	10/23/21	229 ± 129				
MW-BW-207I	03/31/21	596 ± 141				
MW-BW-207I	04/30/21	691 ± 146				
MW-BW-207I	07/20/21	684 ± 150	< 8.4	< 0.8	< 1.5	< 0.9
MW-BW-207I	10/23/21	632 ± 142				
OWM31P	03/31/21	< 181				
OWM31P	06/15/21	< 172				
PS-10	03/17/21	< 177				
PS-10	04/18/21	< 176				
PS-10	07/16/21	< 185	< 7.7	< 0.9	< 0.8	< 0.9
PS-10	10/24/21	< 178				
PS-12	03/17/21	< 178				
PS-12	04/18/21	< 182				
PS-12	07/16/21	< 184	< 9.4	< 0.9	< 0.6	< 0.9
PS-12	10/24/21	< 179				
RW-6	03/19/21	252 ± 121				
RW-6	04/11/21	< 180				
RW-6	07/16/21	221 ± 122	< 8.7	< 0.7	< 1.8	< 2.2
RW-6	10/24/21	271 ± 124				
VB1-1	03/19/21	< 176				
VB1-1	04/25/21	< 181				
VB1-1	09/20/21	< 188	< 5.5	< 0.5	< 0.9	< 0.7
VB1-1	10/24/21	< 191				
VB3-2	03/17/21	< 178				
VB3-2	04/11/21	< 182				
VB3-2	04/25/21	< 187				

TABLE B-I.1 CONCENTRATIONS OF TRITIUM, STRONTIUM, AND GROSS ALPHA IN GROUNDWATER SAMPLES COLLECTED IN THE VICINITIY OF BRAIDWOOD STATION, 2021

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	H-3	Sr-89	Sr-90	Gr-A (Dis)	Gr-A (Sus)
VB3-2	07/16/21	< 186	< 8.9	< 0.9	< 0.5	< 0.9
VB3-2	10/24/21	< 191				
VB5-2	03/24/21	< 180				
VB5-2	05/06/21	< 183				
VB5-2	06/06/21	< 189				
VB5-2	09/14/21	< 188	< 4.0	< 0.9	< 0.7	< 2.7
VB5-2	12/13/21	< 196				
VB6-1	03/24/21	< 180				
VB6-1	05/06/21	< 183				
VB6-1	06/06/21	< 187				
VB6-1	09/14/21	< 184	< 3.8	< 0.8	< 0.8	< 0.7
VB6-1	12/13/21	< 167				
VB7-1	03/24/21	< 182				
VB7-1	06/06/21	< 188				
VB7-1	09/14/21	< 189	< 6.0	< 0.9	< 0.8	< 0.7
VB7-1	12/13/21	< 179				
VB8-2R	03/24/21	< 176				
VB8-2R	06/06/21	< 188				
VB8-2R	09/14/21	< 192				
VB8-2R	09/29/21		< 6.8	< 0.8	< 0.9	< 0.5
VB8-2R	12/13/21	< 170				
VB9-1	03/24/21	< 181				
VB9-1	06/06/21	< 191				
VB9-1	09/14/21	< 186	< 5.7	< 0.9	< 0.9	< 0.7
VB9-1	12/13/21	< 167				
VB10-1R	03/24/21	< 181				
VB10-1R	06/06/21	< 194				
VB10-1	09/14/21	< 186	< 5.3	< 0.9	< 1.0	< 0.7
VB10-1R	12/13/21	< 170				
VB11-1	03/24/21	< 178				
VB11-1	06/16/21	< 185				
VB11-1	09/14/21	< 189				
VB11-1	09/29/21		< 6.5	< 0.9	< 1.1	< 0.5
VB11-1	12/13/21	< 172				

TABLE B-I.2

CONCENTRATIONS OF GAMMA EMITTERS IN GROUNDWATER SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2021

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	Be-7	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
MW-2	09/05/21	< 15	53 ± 22	< 1	< 2	< 4	< 2	< 3	< 2	< 3	< 7	< 2	< 2	< 13	< 4
MW-4	07/15/21	< 16	< 27	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 5	< 2	< 2	< 12	< 4
MW-5	07/20/21	< 17	< 34	< 2	< 2	< 4	< 2	< 4	< 2	< 3	< 4	< 2	< 2	< 10	< 4
MW-6	07/20/21	< 15	< 28	< 2	< 2	< 3	< 2	< 3	< 2	< 3	< 4	< 2	< 2	< 9	< 3
MW-7	07/15/21	< 15	< 32	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 5	< 2	< 2	< 11	< 4
MW-11	09/16/21	< 16	< 15	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 8	< 2	< 2	< 14	< 5
MW-102R	07/16/21	< 19	< 39	< 2	< 2	< 4	< 2	< 4	< 2	< 4	< 6	< 2	< 2	< 14	< 4
MW-141D	09/05/21	< 15	< 15	< 1	< 1	< 3	< 1	< 3	< 2	< 3	< 6	< 2	< 1	< 13	< 4
MW-142D	09/27/21	< 15	59 ± 25	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 4	< 2	< 2	< 9	< 3
MW-143D	09/14/21	< 20	< 24	< 2	< 2	< 5	< 2	< 5	< 3	< 4	< 4	< 2	< 2	< 12	< 4
MW-144D	09/16/21	< 15	< 36	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 7	< 2	< 2	< 14	< 4
MW-145D	09/14/21	< 16	< 28	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 4	< 2	< 2	< 9	< 3
MW-154	09/13/21	< 14	< 33	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 3	< 2	< 2	< 9	< 3
MW-155	09/13/21	< 16	< 32	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 4	< 2	< 2	< 9	< 3
MW-159D	09/27/21	< 13	< 34	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 3	< 2	< 2	< 9	< 3
MW-162D	09/30/21	< 13	45 ± 16	< 1	< 2	< 3	< 1	< 3	< 1	< 2	< 4	< 2	< 1	< 9	< 3
MW-BW-201S	09/27/21	< 10	< 11	< 1	< 1	< 2	< 1	< 2	< 1	< 2	< 3	< 1	< 1	< 6	< 2
MW-BW-202S	09/21/21	< 17	< 31	< 2	< 2	< 4	< 2	< 4	< 2	< 3	< 6	< 2	< 2	< 13	< 4
MW-BW-203S	09/21/21	< 16	< 19	< 2	< 2	< 4	< 2	< 4	< 2	< 3	< 6	< 2	< 2	< 13	< 4
MW-BW-207I	07/20/21	< 15	< 15	< 2	< 2	< 4	< 2	< 4	< 2	< 3	< 4	< 2	< 2	< 9	< 3
PS-10	07/16/21	< 15	< 30	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 6	< 2	< 2	< 12	< 4
PS-12	07/16/21	< 14	< 27	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 6	< 2	< 2	< 12	< 4
RW-6	07/16/21	< 16	< 16	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 5	< 2	< 2	< 12	< 4
VB1-1	09/20/21	< 15	< 16	< 2	< 2	< 4	< 2	< 4	< 2	< 3	< 5	< 2	< 2	< 13	< 4
VB3-2	07/16/21	< 17	< 21	< 2	< 2	< 4	< 2	< 4	< 2	< 4	< 6	< 2	< 2	< 13	< 5
VB5-2	09/14/21	< 15	104 ± 23	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 4	< 2	< 2	< 9	< 3
VB6-1	09/14/21	< 14	< 31	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 3	< 2	< 2	< 9	< 3
VB7-1	09/14/21	< 15	< 31	< 2	< 2	< 3	< 2	< 3	< 2	< 3	< 4	< 2	< 2	< 9	< 3
VB8-2R	09/29/21	< 15	< 15	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 3	< 2	< 2	< 8	< 3
VB9-1	09/14/21	< 16	< 17	< 2	< 2	< 4	< 2	< 4	< 2	< 3	< 4	< 2	< 2	< 10	< 4
VB10-1	09/14/21	< 11	< 19	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 3	< 1	< 1	< 7	< 2
VB11-1	09/29/21	< 29	< 30	< 4	< 3	< 7	< 3	< 7	< 4	< 6	< 5	< 4	< 3	< 15	< 5

TABLE B-I.3

CONCENTRATIONS OF HARD TO DETECTS IN GROUNDWATER SAMPLES COLLECTED AS PART OF THE RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM, IN THE VICINITY OF BRAIDWOOD STATION, 2021

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	Fe-55	Ni-63	Am-241	Cm-242	Cm-243/244	Pu-238	Pu-239/240	U-234	U-235	U-238
MW-2	09/05/21	< 86	< 4.8								
MW-4	07/15/21	< 73	< 4.4								
MW-5	07/20/21	< 128	< 5.0								
MW-6	07/20/21	< 107	< 4.5								
MW-7	07/15/21	< 79	< 4.7								
MW-11	03/30/21			< 0.11	< 0.03	< 0.09	< 0.08	< 0.15	< 0.05	< 0.11	< 0.05
MW-11	09/16/21	< 159	< 4.9								
MW-102R	07/16/21	< 66	< 4.3								
MW-141D	09/05/21	< 52	< 4.0								
MW-142D	09/27/21	< 47	< 4.9								
MW-143D	04/30/21			< 0.13	< 0.07	< 0.20	< 0.09	< 0.17	< 0.08	< 0.12	< 0.11
MW-143D	09/14/21	< 191	< 4.8								
MW-144D	09/16/21	< 170	< 5.0								
MW-145D	09/14/21	< 63	< 4.7								
MW-154	04/25/21			< 0.14	< 0.16	< 0.05	< 0.07	< 0.04	< 0.17	< 0.11	< 0.11
MW-154	09/13/21	< 169	< 4.3								
MW-155	04/25/21			< 0.05	< 0.03	< 0.07	< 0.08	< 0.13	< 0.12	< 0.13	< 0.09
MW-155	09/13/21	< 133	< 4.0								
MW-159D	09/27/21	< 64	< 4.4								
MW-162D	09/30/21	< 180	< 5.0								
MW-BW-201S	09/27/21	< 183	< 4.4								
MW-BW-202S	09/21/21	< 52	< 4.3								
MW-BW-203S	09/21/21	< 94	< 3.9								
MW-BW-207I	07/20/21	< 86	< 4.4								
PS-10	07/16/21	< 148	< 4.2								
PS-12	07/16/21	< 116	< 4.5								
RW-6	07/16/21	< 186	< 4.5								
VB1-1	09/20/21	< 187	< 4.3								
VB3-2	07/16/21	< 53	< 4.3								
VB5-2	09/14/21	< 87	< 4.8								
VB6-1	09/14/21	< 51	< 4.0								
VB7-1	09/14/21	< 51	< 3.8								
VB8-2R	09/29/21	< 182	< 4.3								
VB9-1	09/14/21	< 62	< 4.4								
VB10-1	09/14/21	< 135	< 4.2								
VB11-1	09/14/21	< 160	< 4.3								

TABLE B-II.1 CONCENTRATIONS OF TRITIUM IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2021

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	H-3
DITCH F (DS-2)	03/17/21	< 175
DITCH F (DS-2)	04/11/21	< 183
SG-BW-102 DITCH C	03/17/21	< 176
SG-BW-102 DITCH C	04/25/21	< 185

TABLE B-II.2

CONCENTRATIONS OF GAMMA EMITTERS IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2021

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

No samples collected or analyzed for gamma emitters in 2021