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CALLAWAY ENERGY CENTER
FULTON, MISSOURI

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ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT

to

THE UNITED STATES NUCLEAR REGULATORY COMMISSION

Part I

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Prepared by

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and
Ameren Missouri
Callaway Energy Center

Submitted by

UNION ELECTRIC CO.
dba Ameren Missouri

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PREFACE

This Annual Radiological Environmental Operating Report (AREOR) describes the Ameren Missouri Callaway Energy Center Radiological Environmental Monitoring Program (REMP), and the program results for the calendar year 2023. It is submitted in accordance with section 5.6.2 of the Callaway Energy Center Technical Specifications.

Staff members of Microbac Laboratories - Northbrook were responsible for the acquisition of data presented in this report. Environmental samples were collected by Ameren Missouri personnel or contractors to Ameren Missouri and shipped to Microbac Laboratories - Northbrook and Stanford Dosimetry, LLC, for analysis.

The report was prepared by Microbac Laboratories – Northbrook and the Ameren Missouri Callaway Energy Center.

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1.0 INTRODUCTION

This report presents an analysis of the results of the Radiological Environmental Monitoring Program (REMP) conducted during 2023 for the Union Electric Company (dba Ameren Missouri) Callaway Energy Center.

The objectives of the REMP are to monitor potential critical pathways of radioactive effluent to man and determine the radiological impact on the environment caused by operation of the Callaway Energy Center. The Radiological Environmental Monitoring Program was initiated in April 1982.

The Callaway Energy Center consists of one 3565 MWt pressurized water reactor, which achieved initial criticality on October 2, 1984. The plant is located on a plateau approximately ten miles southeast of the City of Fulton in Callaway County, Missouri and approximately eighty miles west of the St. Louis metropolitan area. The Missouri River flows by the site in an easterly direction approximately five miles south of the site at its closest point.

Tabulation of the individual analyses for the year 2023 is included in Part II of this report.

2.0 SUMMARY

The Radiological Environmental Monitoring Program, as required by the U.S. Nuclear Regulatory Commission (NRC) Technical Specifications for the Callaway Energy Center is described herein. Results for the year 2023 are summarized and discussed.

For the year, the Callaway Energy Center was operated in compliance with Offsite Dose Calculation Manual (ODCM) and Radiological Effluent Controls (REC) requirements. Results from the REMP indicate the Callaway Energy Center has had no significant radiological impact on the health and safety of the public or on the environment.

3.0 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

3.1 Program Design and Data Interpretation

The purpose of the Radiological Environmental Monitoring Program at the Callaway Energy Center is to assess the impact of the plant on its environment. For this purpose, samples are collected from waterborne, airborne, ingestion and terrestrial pathways and analyzed for radioactive content. Direct radiation levels are monitored by thermoluminescent dosimeters (TLDs).

Sources of environmental radiation can include the following:

- (1) Natural background radiation arising from cosmic rays and primordial radionuclides;
- (2) Fallout from atmospheric nuclear detonations;
- (3) Releases from nuclear power plants, planned or accidental; and
- (4) Industrial and medical radioactive waste.

Effects due to operation of the Callaway Energy Center must be distinguished from those due to other sources in interpreting the data.

The indicator-control concept is a major interpretive aid; where feasible the design of the Callaway Energy Center program has both indicator and control stations. Most types of samples are collected at indicator locations (nearby, downwind, or downstream) and at control locations (distant, upwind, or upstream). A station effect would be indicated if the radiation level at an indicator location was significantly larger than that at the control location. The difference would have to be greater than could be accounted for by typical fluctuations in radiation levels arising from other sources.

The monitoring program includes analyses for iodine-131, a fission product, and tritium, which is produced by cosmic rays, atmospheric nuclear detonations, and also by nuclear power plants. Most samples are analyzed for gamma-emitting isotopes, with results for the following groups quantified: zirconium-95, cesium-137, and cerium-144. These three gamma-emitting isotopes are selected as radiological impact indicators because of the different characteristic proportions in which they appear in the fission product mix produced by a nuclear reactor and that produced by a nuclear detonation. Each of the three isotopes is produced in roughly equivalent amounts by a reactor: each constitutes about 10% of the total activity of fission products ten days after reactor shutdown. On the other hand, ten days after a nuclear explosion, the contributions of zirconium-95, cerium-144, and cesium-137 to the activity of the resulting debris are in the approximate ratio 4:1:0.03 (Eisenbud, 1963).

The other group quantified consists of niobium-95, ruthenium-103 and -106, cesium-134, barium-lanthanum-140, and cerium-141. These isotopes are released in small quantities by nuclear power plants, but to date their major source of injection into the general environment has been atmospheric nuclear testing. Nuclides of the next group, manganese-54, cobalt-58 and -60, and zinc-65, are activation products and arise from activation of corrosion products. They are typical components of nuclear power plant effluents but are not produced in significant quantities by nuclear detonation.

Nuclides of the final group, beryllium-7, which is of cosmogenic origin, and potassium-40, a naturally-occurring isotope, were chosen as analytical monitors and should not be considered radiological impact indicators.

Other means of distinguishing sources of environmental radiation can be employed in interpreting the data. Current radiation levels can be compared with previous levels, including pre-operational data. Results of the monitoring program can be related to those obtained in other parts of the world. Finally, results can be related to events known to cause elevated levels of radiation in the environment, e.g., a nuclear accident.

3.2 Program Description

The sampling and analysis schedules for the environmental radiological monitoring program at the Callaway Energy Center are summarized in Tables 5.1 and 5.2 and briefly reviewed below. Table 5.1 identifies sampling locations and specifies as to type (indicator or control) and its distance, and direction relative to the reactor site. The types of samples collected at each location, required analyses and the frequency of collections are presented in Table 5.2.

To monitor the air environment, airborne particulate and airborne iodine samples are collected by continuous pumping, at six locations. The airborne particulates are collected on glass fiber filters and the airborne iodine through activated charcoal cartridges. Both filters and cartridges are exchanged weekly. Airborne particulates are analyzed for gamma-emitting isotopes. Charcoal cartridges are analyzed for iodine-131.

The ingestion pathway is monitored by sampling of milk (if available), fish and green leafy vegetation.

Milk samples are collected semimonthly when animals are on pasture and monthly the rest of the year. There were no milk indicator or control stations identified by the Land Use Census for the subject year. Milk samples are analyzed for iodine-131 and gamma-emitting isotopes when available.

Monthly during the growing season, edible green leafy vegetation is collected from both indicator and control locations. Vegetation samples typically consist of mustard greens, turnip greens, cabbage, lettuce, collards, radish greens, swiss chard, broccoli and poke. Other edible broad leaf vegetation is collected if primary varieties are not available. The samples are analyzed for iodine-131 and other gamma-emitting isotopes.

The waterborne pathway is monitored by sampling surface water, groundwater and drinking water, and shoreline sediments. Water samples are analyzed for tritium and gamma-emitting isotopes, and sediments are analyzed for gamma-emitting isotopes.

The waterborne pathway is also monitored by upstream and downstream semiannual collections of fish. The five most abundant recreational or commercial fish species are collected. The edible portions of the samples are analyzed for gamma-emitting isotopes.

Monthly composite samples of surface water from the Missouri River are collected from one indicator location (S02) and from one control location (S01). The surface water samples are composites of daily collections by automatic river samplers.

Onsite surface water from ponds is analyzed for tritium and gamma-emitting isotopes. The collection frequencies are semiannually.

To monitor possible sources of ground water contamination due to plant operations, non-potable ground water samples were collected monthly or quarterly from well locations both onsite and along the discharge pipeline. The samples were analyzed for tritium and gamma-emitting isotopes.

Potable well water samples are collected quarterly from the plant drinking water supply and neighboring property owners. The samples were analyzed for tritium and gamma-emitting isotopes.

Shoreline sediment is collected semiannually at the plant's intake (A) and discharge (C). These samples are collected within two feet of the edge of the water. The samples are analyzed for gamma-emitting isotopes.

3.2 Program Description (continued)

The direct ambient gamma radiation pathway is also considered. This exposure is monitored by thermoluminescent dosimeters (TLDs) at forty-four locations in and around the Callaway site. The TLDs are placed in 16 sectors around the plant as specified in the ODCM-RECS. Five of the TLD stations have neutron monitoring capability and three locations are designated as controls. TLDs are exchanged and analyzed quarterly.

Soil is collected annually from seven indicator locations (F2, F6, PR3, PR7, W2, W5 and W6) and two control locations (M9, W1) to monitor the terrestrial environment. The samples are analyzed for gamma-emitting isotopes.

3.3 Program Execution

The program was executed as described in the preceding section with the following exceptions.

(1) Food Products-Leafy Green Vegetables:

There were no viable samples available for collection in April 2023 at any of the sampling locations, CA-FPL-V9, CA-FPL-V16, CA-FPL-V19 and CA-FPL-V20 due to it being too early in the growing season (CR#202302405).

Sample location CA-FPL-V9 was unable to provide a vegetation sample in May 2023 due growing conditions (CR#202303264).

(2) Non-potable Wells:

The well sample scheduled to be collected 2/24/23 at location CA-WWA-U1MW-47 could not be collected due to a dry well (CR#202301282).

The well sample scheduled to be collected 5/31/23 at well location CA-WWA-U1MW-47 could not be collected due to a dry well (CR#202303703).

The well samples scheduled to be collected 11/13/23 at well locations CA-WWA-U1MW-004, CA-WWA-U1-MW-005, CA-WWA-U1MW-47 could not be collected due to dry well conditions (CR#202308663).

(3) Direct Radiation:

During the quarterly changeout of TLD's from first to second quarter the TLD at location CA-IDM-10 was found to be missing (CR#202302537).

(4) Surface Water:

River Samplers Out of Service Time:

Sampler S01, the upstream sampler located in the plant water intake structure about 550 feet upstream of the discharge, was out of service for approximately 0 days (0.0% of the year) during 2023.

Sampler S02, the downstream sampler located at the end of the mixing zone in Portland, MO, was out of service for approximately 13 days (3.56% of the year) during 2023. Functioning 96.44% of 2023. Portland pump noise issue 6 days without automatic sampling (CR 202208509). Portland River sampler vault flooded 7 additional days without automatic sampling (CR 202305288).

During those out of service times, daily grab samples are collected as required per Callaway's procedures.

3.4 Laboratory Procedures

Gamma-spectroscopic analyses were performed with HPGe detectors. Levels of iodine-131 in vegetation and concentrations of airborne iodine-131 in charcoal samples were also determined by gamma spectroscopy.

Tritium was measured by liquid scintillation.

ATI Environmental Inc. Midwest Laboratory was acquired by Microbac Laboratories, Inc. effective June 1, 2023. The Northbrook Illinois laboratory now operates within the Microbac network of laboratories at the same location and with the same personnel as they did while part of ATI. Inc.

Analytical procedures used by Microbac Laboratories, Inc. are on file at the laboratory and are available for inspection. Procedures are based on those prescribed by the Health and Safety Laboratory of the U.S. Dep't of Energy, Edition 28, 1997, U.S. Environmental Protection Agency for Measurement of Radioactivity in Drinking Water, 1980, and the U.S. Environmental Protection Agency, EERF, Radiochemical Procedures Manual, 1984.

Microbac Laboratories, Inc. – Northbrook has a comprehensive quality control/quality assurance program designed to assure the reliability of data obtained. Details of the QA Program are presented elsewhere (Microbac Laboratories, Inc. - Northbrook, 2023). The QA Program includes participation in Interlaboratory Comparison (crosscheck) Programs. Results obtained through Quality control samples and crosscheck program results are presented in Appendix A.

Environmental TLDs are processed by Environmental Dosimetry Company, affiliated with Stanford Dosimetry, LLC.

3.5 Program Modifications

Food Products – Leafy Green Vegetables Collection and Analysis was modified by removing the previous control location V12 due to individual no longer wanting to participate in program. The new control location is V20, Nathaniel Kline.

3.6 Detection and Reporting Limits

Table 5.3 gives the minimum required detection limits for radiological environmental sample analysis. For each sample type, the table lists the detection level for each isotope. The lower limit of detection (LLD) used in this report is described in NRC Regulatory Guide 4.1 Rev. 1, "Program for Monitoring Radioactivity in the Environs of Nuclear Power Plants" and the NRC Radiological Assessment Branch Technical Position, Rev. 1, November 1979, "An Acceptable Radiological Environmental Monitoring Program".

3.7 Land Use Census

The Land Use Census is performed annually during the growing season. In 2023 the field inspection of the sectors was conducted September 27, 2023, within a five-mile radius of the Callaway Energy Center. The area around the plant was divided into 16 meteorological sectors. The locations of the nearest resident, nearest milk animal, and nearest garden of greater than 500 square feet producing broadleaf vegetation were identified.

The results of the census are presented in Table 5.4. The table includes radial direction and distance from the Callaway Energy Center for each location. The bearings listed in Table 5.4 were measured from the Callaway Plant to the sample location.

There are no changes to the closest residents in 2023. A potential new garden was identified in sector R. No milking animals were located during the survey however one resident stated that they are in the process of acquiring cows and anticipate having goats milking sometime in 2024. We intend to update ODCM and Land Use as required once we are notified of the actual start of milking and usage.

All residents included in the summary were verified by the Callaway County Assessor's GIS aerial photography.

The Missouri Department of Natural Resources has not identified any new water wells along the Mud Creek or Logan Creek corridors.

The US Army Corps of Engineers was contacted and they confirmed that no new drinking water intakes have been located along the Missouri River within ten (10) river miles downstream from the Callaway Plant. In addition, no irrigation uses of the Missouri River were identified between the discharge point and Portland, MO during the survey.

3.8 Errata from previous Annual Radiological Environmental Operating Reports

None.

4.0 RESULTS AND DISCUSSION

All collections and analyses were made as scheduled, except for those listed in Table 5.5.

Results are summarized in Table 5.6 as recommended by the Nuclear Regulatory Commission. For each type of analysis and sample medium, the table lists the mean and range of all indicator and control locations, as well as that location with the highest mean and range.

The tabulated results of all measurements are not included in this section, although references to these results will be made in the discussion. A complete tabulation of results for 2023 is contained in Part II of the Annual Report on the Radiological Environmental Monitoring Program for the Callaway Energy Center.

4.1 Atmospheric Nuclear Detonations and Nuclear Accidents

The Fukushima Daiichi nuclear accident occurred March 11, 2011. There were no reported accidents involving significant release to the environment at nuclear reactor facilities in 2023. The last reported atmospheric test was conducted on October 16, 1980, by the People's Republic of China. There were no reported atmospheric nuclear tests in 2023.

4.2 Program Findings

Airborne Particulates and Iodine

No gamma-emitting isotopes were identified other than naturally occurring Be-7. There was no I-131 activity detected in any of the charcoal canister samples.

Air sampling for 2023 indicates no radiological effects of plant operation.

Direct Radiation (TLDs)

Forty-four gamma sensitive TLDs were placed in 16 sectors around the Callaway site each quarter. Measurements from forty-one indicator locations averaged 15.0 mrem/quarter and the three control locations averaged 14.1 mrem/quarter. Readings ranged from 9.8 to 17.5 mrem /quarter, with the highest quarterly average from the indicator location CA-IDM-10, averaging 16.7 mrem/quarter. The TLD readings were consistent with the results for the years 2000 through 2022 as detailed in table 5.7.

Five neutron sensitive TLDs were placed in locations at the Site Boundary closest to the Independent Spent Fuel Storage Facility Installation (ISFSI) and at a control location approximately 14 miles from the site. There was no significant measurable neutron dose and there was no effect from the ISFSI in 2023.

Milk

Sampling has been discontinued since 2018 because there are not enough sampling locations to fulfill the milk sampling requirement. No milking animals were located during the 2023 Land Use Census. Leafy green (broadleaf) vegetation sampling was performed in lieu of milk sampling.

4.2 Program Findings (continued)

Broadleaf Vegetation

There was no I-131 activity detected in broadleaf vegetation samples. No gamma-emitting isotopes were detected in broadleaf vegetation samples except for naturally occurring potassium-40. Vegetation data for 2023 show no radiological effects of plant operation.

Fish

Edible portions of fish were analyzed by gamma spectroscopy. No gamma-emitting isotopes, except for naturally occurring potassium-40, were detected in fish.

Soil

Cesium-137 activity was detected at six of the seven indicator sample locations at an average concentration of 171 pCi/kg dry. The cesium-137 activity is consistent with levels observed from 1999 through 2022; these levels are attributable to the deposition of fallout from previous decades.

Surface Water

Tritium was detected in nine out of the thirteen samples tested in 2023 at the downstream location S02 ranging from 205 pCi/L to 1163 pCi/L. No gamma-emitting isotopes were detected in any of the samples taken in 2023.

Surface Water, Ponds

No tritium or gamma activity was detected in any of the twelve pond samples analyzed in 2023.

Drinking Water Wells (potable water)

Sixty-four samples from sixteen different locations were analyzed for tritium and gamma-emitting isotopes in 2023. No tritium or gamma-emitting isotopes were detected.

Wells and Ponds (non-potable water)

Eight groundwater samples from deep wells F-05 and F-15 were analyzed for tritium and gamma-emitting isotopes. No tritium or gamma emitting isotopes detected from any of the deep well samples taken in 2023.

Twenty-six samples from the wells that were part of the limited site investigation (LSI) in 2014 were analyzed for tritium in 2023 including Wells CA-WWA-U1MW-031, CA-WWA-U1MW-034, CA-WWA-U1MW-036, CA-WWA-U1MW-039, CA-WWA-U1MW-047, CA-WWA-U1MW-058 and CA-WWA-U1MW-059. Fourteen were positive ranging from 195 to 370 pCi/L with an average concentration of 253 pCi/L. These levels were a slight decline from 2022 and show that the natural attenuation described in previous AREOR's is continuing.

Wells, CA-WWA-U1MW-GWS, CA-WWA-U1MW-937B, CA-WWA-U1MW-937D, CA-WWA-U1MW-939R, CA-WWA-U1MW-940, CA-WWA-U1MW-941 and CA-WWA-U1MW-IFSFI (sump) are in the Plant Protected Area adjacent to the power block. As described in previous AREOR's, the tritium activity in the wells within the power block are believed to be the result of washout from gaseous effluents. The 2023 results are consistent with the results from 2015 through 2022 and demonstrate the continued decline from previous years due to natural attenuation.

4.2 Program Findings (continued)

Sediments

Two samples of shoreline sediments were collected in May and again in September of 2023 at both an indicator and a control location and analyzed for gamma-emitting isotopes. Cesium-137 was detected at both the indicator and control location for the September collection at a level of 52.0 and 53.4 pCi/kg dry respectively; these levels are attributable to the deposition of fallout from previous decades. No other gamma-emitting isotopes were detected excepting naturally occurring potassium-40 in any of the sediment samples.

5.0 TABLES

Table 5.1. Sampling Locations. (TLDs) Update with additions (if any) and deletions

Location Code	Distance / Direction ¹	Description	Sample Types ²
1a	10.8 mi. 310° NW	City of Fulton on Hwy Z, 0.65 mi. E of Bus. 54, W of Campus Apartments	IDM
3	1.2 mi. 308° NW	0.1 mi. West of Hwy CC on Gravel Rd., 0.8 mi. South Hwy O	IDM
5	1.3 mi. 79° ENE	Meteorological Tower	IDM
6	2.0 mi. 274° W	Cty Rd. 428, 1.2 mi. West of Hwy CC	IDM
7	1.4 mi. 184° S	Cty Rd. 459, 2.6 mi. North of Hwy 94	IDM
9	3.8 mi. 183° S	NW Side of the Cty Rd. 459 and Hwy 94 Junction	IDM
10	3.9 mi. 159° SSE	Hwy 94, 1.8 mi. East of Cty Rd. 459	IDM
11a	4.7 mi. 139° SE	City of Portland	IDM
14	4.9 mi. 122° ESE	SE Side of Intersection Hwy D and Hwy 94	IDM
17	3.7 mi. 88° E	Cty Rd. 4053, 0.3 mi. E of Hwy 94	IDM
18a	3.7 mi. 67° ENE	East side of Hwy D, 0.5 mi. South of Hwy O	IDM
20	4.7 mi. 46° NE	City of Readsville	IDM
21	3.8 mi. 23° NNE	Cty Rd. 155, 1.9 mi. North of Hwy O	IDM
22a	0.9 mi. 10° NNE	Cty Rd 448, 0.9 mi south of HWY O, co-located with air station A8	IDM
23	6.6 mi. 15° NNE	City of Yucatan	IDM
26 ³	11.7 mi. 82° E	Town of Americus	IDM
27 ³	9.3 mi. 114° ESE	Town of Bluffton	IDM
30a	4.4 mi. 206° SSW	City of Steedman, N side of Belgian Dr., 150 ft. East of Hwy CC	IDM
31a	7.8 mi. 224° SW	City of Mokane, Jct. Hwy C and Cty Rd. 400, 0.9 mi. N. of Hwy 94	IDM
32	5.4 mi. 250° WSW	Hwy VV, 0.6 mi. west of Cty Rd. 447	IDM
32a	5.0 mi. 243° WSW	Cty Rd. 447	IDM
33	7.4 mi. 272° W	City of Hams Prairie, SE of Hwy C and Hwy AD Junction	IDM
34	9.5 mi. 292° WNW	NE Side of Hwy C and Cty Rd. 408 Junction	IDM
35	5.8 mi. 340° NNW	City of Toledo	IDM
36	4.9 mi. 7° N	Cty Rd. 155, 0.8 mi. South of Cty Rd. 132	IDM
37	0.5 mi. 195° SSW	Cty Rd. 459, 0.9 mi. South of Hwy CC	IDM
38	4.6 mi. 334° NNW	Cty Rd. 133, 1.5 mi. South of Hwy UU	IDM
39	5.4 mi. 312° NW	Cty Rd. 111	IDM
39a	5.0 mi. 308° NW	Cty Rd. 111	IDM
40	4.2 mi. 292° WNW	NE Side of Cty Rd. 112 and Hwy O Junction	IDM
41	5.2 mi. 277° W	Hwy AD, 2.5 mi. East of Hwy C	IDM
42	4.4 mi. 231° SW	Cty Rd. 447, 2.6 mi. North of Cty Rd. 463	IDM
43	0.5 mi. 223° SW	Cty Rd. 459, 0.7 mi. South of Hwy CC	IDM
44	1.7 mi. 254° WSW	Hwy CC, 1.0 mi. South of Cty Rd. 459	IDM
45	1.0 mi. 285° WNW	Cty Rd. 428, 0.1 mi. West of Hwy CC	IDM
46	1.5 mi. 328° NNW	NE Side of Hwy CC and Cty Rd. 466 Intersection	IDM
47	1.0 mi. 10° N	Cty Rd. 448, 0.9 mi. South of Hwy O	IDM
48	0.4 mi. NE	Cty Rd. 448, 1.5 mi. South of Hwy O, Plant Security Sign Post	IDM
49	1.6 mi. 95° E	Cty Rd. 448, Reform Wildlife Mgmt. Parking Area, Gate Post.	IDM
50	0.9 mi. 168° SSE	Cty Rd. 459, 3.3 mi. North of Hwy 94	IDM
51a	0.3 mi. 150° SE	Owner Control Fence, SE of the Water Treatment Plant	IDM
52	0.4 mi. 111° ESE	Light Pole Near the East Plant Security Fence	IDM
60 ³	13.5 mi. 224° SW	Just past Tebbetts City sign	IDM

Table 5.1. Sampling Locations. (TLDs, continued)

Location Code	Distance / Direction ¹	Description	Sample Types ²
60N ³	13.5 mi 224° SW	Co-located with location 60	IDM
61	1.9 mi 334° NNW	Community of Reform, Corner of CC and O	IDM
61N	1.9 mi 334° NNW	Co-located with location 61	IDM
62N	1.2 mi. 308° NW	Co-located with location 3	IDM
63N	0.9 mi. 10° NNE	Co-located with air station A8 and location 22a	IDM
64N	1.0 mi. 285° WNW	Co-located with location 45	IDM

Table 5.1. Sampling Locations (Airborne Radioiodine and Particulate samples, Surface Ponds, Potable Water)

A1	1.3 mi. 79° ENE	Meteorological Tower	APT, AIO
A7	9.5 mi. 312° NW	C. Bartley Farm, Fulton, MO	APT, AIO
A8	0.9 mi. 10° NNE	County Road 448, 0.9 miles South of Hwy 0	APT, AIO
A9	1.9 mi. 334° NNW	Community of Reform	APT, AIO
A10	0.89 mi 276° W	EOF Parking lot	APT, AIO
A11	0.71 mi 166° SSE	Sludge lagoons lift pumps area	APT, AIO
3	2.9 mi. 168° SSE	Potable water, County Road 448 Ward Residence	DWA
4	2.6 mi. 158° SSE	Potable water, County Road 448 Miller Residence	DWA
5	2.5 mi. 153° SSE	Potable water, County Road 448 Brucker Brothers Farm	DWA
7	2.1 mi. 108° ESE	Potable water, County Road 448 S. Kriete Residence	DWA
8 ⁴	3.4 mi. 193° SSW	Potable water, County Road 457 Curry Residence	DWA
9	2.9 mi. 204° SSW	Potable water, County Road 457 Clardy Residence	DWA
10	2.7 mi. 208° SSW	Potable water, County Road 457 T. Dillon Residence	DWA
12	3.6 mi. 165° SSE	Potable water, County Road 464 J. Dillon Residence	DWA
21	2.4 mi. 120° ESE	Potable water, County Road 469 Baumgarth Residence	DWA
22	4.8 mi. 140° SE	Potable water, State Road 94 Plummer Residence	DWA
23	5.6 mi. 142° SE	Potable water, County Road 466 Curdt Residence	DWA
24	2.9 mi. 203° SSW	Potable water, County Road 457 Farley Residence	DWA
25	1.89 mi. 79° E	Potable water, County Road 448 M. Kriete Residence	DWA
V16	1.64 mi. 255° WSW	Potable water, Hwy CC Wallendorf Farm, Steedman, MO	DWA
V19	3.28 MI. 162° SSE	Potable water, Dillon Drive, Dillon Farm, Portland, MO	DWA
PW1	Callaway Cafeteria, 0.13 mi. 234° SW	Potable water, Unit 1 Construction well #3 open from 400'-1400'	DWA
Pond 01	0.6 mi. 264° W	Fishing Pond	SWA
Pond 02	0.7 mi. 232° SW	Fishing Pond	SWA
Outfall 010	0.6 mi. 42° NE	Stormwater Run-Off Pond	SWA
Wetlands 01	0.6 mi. 152° SSE	Wetlands Pond #1	SWA
Wetlands 02	0.7 mi. 160° SSE	Wetlands Pond #2	SWA
Sludge Lagoon	~0.8 mi. 153° SSE ⁵	In-service Sludge Lagoon	SWA
S01 ³	4.8 mi. 150° SSE	555 feet Upstream of Discharge North Bank	SWA
S02	4.9 mi. 138° SE	1.1 River Miles Downstream of Discharge North Bank	SWA

Table 5.1. Sampling Locations, Non-potable Groundwater Wells

Location Code	Distance / Direction ¹	Description	Sample Types ²
U1MW-937B	Plant Peninsula Area, 0.04 mi. 209° SSW	Monitoring Well, West of the Turbine Bldg.	WWA
U1MW-937D	Plant Peninsula Area, 0.1 mi. 92° E	Monitoring Well, North of Discharge Monitor Tanks	WWA
U1MW-939R	Plant Peninsula Area, 0.05 mi. 109° ESE	Monitoring Well, East of the Fuel Bldg.	WWA
U1MW-940	Plant Peninsula Area, 0.05 mi. 78° ENE	Monitoring Well, West of the Radwaste Bldg.	WWA
U1MW-941	Plant Peninsula Area, 0.07 mi. 81° E	Monitoring Well, West of the Radwaste Bldg.	WWA
U1MW-GWS	Plant Peninsula Area, 0.02 mi. 135° SE	Ground Water Sump, West of Reactor Bldg. and Fuel Bldg.	WWA
U1MW-ISFSI	ISFSI sump, 0.08 mi. 21° NNE	Near ISFSI pad	WWA
U1MW-004	3.7 mi. 165° SSE	South of Dillon residence, Groundwater Monitoring Well	WWA
U1MW-005	3.8 mi. 160° SSE	South of Brownlee / Hudson residence, Groundwater Monitoring Well	WWA
U1MW-006	3.0 mi. 171° S	South of Ward Residence, Groundwater Monitoring Well	WWA
U1MW-010	3.1 mi. 173° S	Old Pipeline Bed, Groundwater Monitoring Well	WWA
U1MW-013	0.8 mi. 159° SSE	Pipeline Corridor, south of sludge ponds	WWA
U1MW-014	3.7 mi. 171° S	Pipeline Corridor, near manhole 6B	WWA
U1MW-015	3.9 mi. 162° SSE	Pipeline Corridor, North of HWY 94.	WWA
U1MW-016	4.5 mi. 151° SSE	Pipeline Corridor, near heavy haul road at intake structure	WWA
U1MW-017	3.68 mi. 171° S	Pipeline Corridor, near manhole 6B	WWA
U1MW-018	3.75 mi. 172° S	Pipeline Corridor, near manhole 6B	WWA
U1MW-019	3.71 mi. 172° S	Pipeline Corridor, near manhole 5	WWA
U1MW-020	3.88 mi. 164° SSE	Pipeline Corridor, near manhole 3B	WWA
U1MW-031	0.18 mi. 78° ENE	~1m from manhole 86-2 & 1m from HDPE discharge pipeline	WWA
U1MW-034	0.21 mi. 98° E	~130m from manhole 86-2, HDPE discharge line bedding	WWA
U1MW-036	0.26 mi. 122° ESE	~300m from MH 86-2, HDPE discharge line bedding at cross connection pipe	WWA
U1MW-039	0.61 mi. 168° SSE	~1100m from manhole 86-2, HDPE discharge line bedding outside OCA	WWA
U1MW-047	4.56 mi. 151° SSE	Upstream side of HDPE gate valve vault at intake structure inside HDPE pipeline bedding	WWA
U1MW-058	0.31 mi. 132° SE	~400m from manhole 86-2, Techite discharge line bedding	WWA
U1MW-059	1.04 mi. 166° SSE	~1700m from MH86-2, Techite discharge line bedding outside OCA	WWA
U2 MW 2S	1.8 mi. 5° N	Located on the periphery of the plateau	WWA
U2 MW 5S	1.1 mi. 261° W	Located on the periphery of the plateau	WWA
U2 MW 8	0.4 mi. 12° NNE	Located radially outward from central part of the plateau	WWA
U2 MW 16	2.9 mi. 203° SSW	Located along Mud Creek, Farley Property, screened for CJC aquifer	WWA
F05	0.9 mi. 169° S	CJC aquifer monitoring well	WWA
F15	0.4 mi. 29° NNE	Outside OCA fence in center portion of plateau, screened for CJC aquifer	WWA

Table 5.1. Sampling Locations, Soil, Food Products, Milk, Fish, and Sediments.

Location Code	Distance / Direction ¹	Description	Sample Types ²
F2	1.0 mi. 235 ° SW	Callaway Plant Forest Ecology Plot F2.	SOL
F6	1.6 mi. 51 ° NE	Callaway Plant Forest Ecology Plot F6.	SOL
PR3	0.95 mi. 108 ° ESE	Callaway Plant Forest Ecology Plot PR3.	SOL
PR7	0.46 mi. 320 ° NNW	Callaway Plant Forest Ecology Plot PR7.	SOL
W1 ³	0.52 mi. 150 ° SSE	Callaway Plant Wetlands #1, High Ground.	SOL
W2	0.55 mi. 155 ° SSE	Callaway Plant Wetlands #1, Inlet Area.	SOL
W5	~0.8 mi. 153 ° SSE ⁵	In-service Sludge Lagoon.	SOL
W6	0.67 mi. 154 ° SSE	Callaway Plant Wetlands #2, inlet area	SOL
M9 ³	13 mi. 228 ° SW	Ferguson Farm, Tebbetts, MO.	SOL
V9	1.9 mi. 294 ° WNW	Meehan Farm, Steedman, MO	FPL
V16	1.64 mi. 255 ° WSW	Wallendorf Farm, Steedman, MO	FPL
V19	3.28 mi. 162 ° SSE	Richard and Amy Dillon Farm	FPL
V20	17.73 mi. 238 ° WSW	Nathaniel Kline, 3651 State Road AA, Holts Summit, MO	FPL
A ^{3,6}	~4.8 mi. 150 ° SSE	Between 0.6 and 10.0 river miles upstream of the plant intake.	AQF
A ³ ,	~4.8 mi. 150 ° SSE	Upstream of the plant intake.	AQS
C ⁶	~4.9 mi. 138 ° SE	Downstream, of the plant discharge, between the confluence of the Missouri River and Logan Creek and the Portland boat ramp	AQF
C	~4.9 mi. 138 ° SE	Vicinity of Portland – north bank	AQS

¹ Distances are measured from the midpoint of the two reactors as described in Final Safety Analysis Report (FSAR) Sec. 2.1.1.1.

² AIO = Air Iodine, APT = Air Particulate, AQF = Fish, AQS = Sediment, FPL = Leafy Green Vegetables, FC = Food Crops, IDM = TLD, MLK = Milk, SOL = Soil, SWA = Surface Water, DWA = Drinking Water, WWA = Ground Water.

³ Control Location.

⁴ Property ownership changed from Brandt to Curry in 2022.

⁵ The coordinates of the in-service sludge lagoon are determined at the time of sampling in accordance with HTP-ZZ-07101-DTI-REMP-SMPL-SCHED.

⁶ The expanded collection areas provide sufficient habitat to collect the required number of species, see HTP-ZZ-07101-DTI-REMP-SMPL-SCHED.

Table 5.2. Collection Frequencies and Required Analyses ¹ (January 1 through December 31, 2023)

Sample Type	Media Code	Collection Frequency	Required Analyses
Direct radiation	IDM	Quarterly	Gamma dose for each sample. Neutron dose for the samples monitoring ISFSI direct radiation.
Airborne iodine	AIO	Weekly	¹³¹ I
Air particulate	APT	Weekly	PGE ³ each sample
Surface water (river)	SWA	Monthly composite	PGE and ³ H
Surface water (onsite ponds)	SWA	Semiannually	PGE and ³ H. If contaminated with gamma emitting nuclides of plant origin, analyze for HTD ⁴ nuclides.
Groundwater (not potable)	WWA	Quarterly ⁵	PGE and ³ H. If contaminated with gamma emitting nuclides of plant origin, analyze for HTD ⁴ nuclides. ⁶
Well water-potable	DWA	Quarterly	PGE and ³ H. If contaminated with gamma emitting nuclides of plant origin, analyze for HTD ⁴ nuclides.
Shoreline sediment	AQS	Semiannually	PGE
Sludge pond sediment	SOL	Annually	PGE
Soil	SOL	Annually	PGE
Milk animal	MLK	Semimonthly when animals are on pasture, monthly other times	PGE and ¹³¹ I
Leafy green vegetables	FPL	Monthly when available ²	PGE and ¹³¹ I
Fish	AQF	Semiannually	PGE on edible portion

¹ Samples required by ODCM unless specified otherwise.

² The growing season is defined as the months April 1- November 1 but will vary according to weather conditions.

³ Principal Gamma Emitters (PGE) are defined as ⁵⁴Mn, ⁵⁹Fe, ⁵⁸Co, ⁶⁰Co, ⁶⁵Zn, ⁹⁵Zr/Nb, ¹³⁴Cs, ¹³⁷Cs, ¹⁴⁰Ba/La and other gamma- emitting nuclides that may be identified during the gamma spectroscopy analysis.

⁴ Hard to Detect (HTD) nuclides are defined as ⁸⁹Sr, ⁹⁰Sr, ⁵⁵Fe, ⁶³Ni, ²³⁷Np, ²³⁸Pu, ^{239/240}Pu, ²⁴¹Pu, ²⁴¹Am, ²⁴²Cm and ^{243/244}Cm.

⁵ Monthly for locations U1MW-937B, U1MW-937D, U1MW-939R, U1MW-940, U1MW-941 and U1MW-GWS.

⁶ Wells ISFSI Sump, U1MW-18, U1MW-19, U1MW-20, U1MW-31, U1MW-34, U1MW-36, U1MW-39, U1MW-47, U1MW-58, U1MW-59, U2MW-2S, U2MW-5S, U2MW-8, and U2MW-16 are analyzed for tritium only.

Table 5.3. Minimum Required Detection Capabilities for REMP Sample Analysis¹

Analysis	Water (pCi/L)	Airborne (pCi/m ³)	Fish (pCi/kg wet)	Milk (pCi/L)	Food Products (pCi/kg wet)	Non-Food Products (pCi/kg wet)	Soil and Sediment (pCi/kg dry)
H-3	3000/2000 ³					3000	
Mn-54	15		130				
Fe-59	30		260				
Co-58/60	15		130				
Zn-65	30		260				
Zr-Nb-95 ²	15						
I-131	1000/1 ³	0.07		1	60		
Cs-134	15	0.05	130	15	60	60	150
Cs-137	18	0.06	150	18	80	80	180
Ba-La-140 ²	15			15			

¹ This list does not mean only these nuclides will be detected and reported. Other peaks which are measurable and identifiable will be reported.

² Total activity, parent plus daughter activity.

³ LLDs for Surface and Drinking / Ground water are the same, with the exception of H-3 and I-131. The Drinking / Ground water LLDs for H-3 and I-131 are 2000 and 1 pCi/liter respectively.

Table 5.4 2023 Land Use Census Results.

Closest Receptor in Miles

Sector	Residence	Garden ^{1, 2}	Milk ¹
N(A)	2.37	NI	NI
NNE(B)	2.16	2.97	NI
NE(C)	2.26	NI	NI
ENE(D)	2.86	NI	NI
E(E)	3.51	NI	NI
ESE(F)	2.11	4.47	NI
SE(G)	2.72	NI	NI
SSE(H)	3.11	3.28	NI
S(J)	2.86	NI	NI
SSW(K)	2.38	NI	NI
SW(L)	2.63	2.72	NI
WSW(M)	1.20	1.96	NI
W(N)	1.56	3.55	NI
WNW(P)	1.93	1.93	NI
NW(Q)	2.07	NI	NI
NNW(R)	1.81	NI	NI

¹ NI = None Identified.

² Broadleaf Vegetation

Table 5.5. Missed Collections and Analyses, Callaway Energy Center

Sample Type	Analysis	Location(s)	Collection Date or Period	Comments
WWA	H-3	CA-WWA-U1MW-47	02/24/2023	No water due to dry well (CR#202301282).
FPL	Gamma	(CA-FPL-V9, CA-FPL-V16, CA-FPL-V19, CA-FPL-V20)	April 2023	No viable vegetable samples available (CR#202302405).
FPL	Gamma	CA-FPL-V9	May 2023	Unable to collect vegetables due to growing conditions (CR#202303264).
WWA	H-3	CA-WWA-U1MW-47	05/31/2023	No water due to dry well (CR#202303703).
IDM	Gamma	CA-IDM-10	2 nd Quarter '23	TLD missing in field (CR#202302537).
WWA	H-3	CA-WWA-U1MW-004 CA-WWA-U1MW-005 CA-WWA-U1MW-047	11/13/2023	No water due to dry well (CR#202308663).

Table 5.6 Radiological Environmental Monitoring Program Summary

Sample Type (Units)	Type and Number of Analyses(a)		Req'd LLD(b)	Indicator Locations Mean, Fraction, Range (c)	Location with Highest Annual Mean		Control Locations Mean, Fraction, Range (c)	Number Non-Routine Results(e)
					Location (d)	Mean, Fraction, Range (c)		
Waterborne Pathway								
Surface Water (pCi/L)	H-3	25	3000	579 (9/13) (205-1163)	-	-	ND	0
	GS	25	(b)	ND	-	-	ND	0
Surface Water, Ponds (pCi/L)	H-3	12	3000	ND	-	-	None	0
	GS	12	(b)	ND	-	-	None	0
Potable Wells (pCi/L)	H-3	64	2000	ND	-	-	ND	0
	GS	64	(b)	ND	-	-	ND	0
Wells (non-potable) (pCi/L)	H-3	172	3000	460 (61/172) (178-2410)	CA-WWA-GWS 0.02 mi. 135° / SE	858 (12/13) (194-2410)	None	0
	GS	116	(b)	ND	-	-	None	0
Sediments (pCi/kg) dry	Cs-134	4	150	ND	-	-	ND	0
	Cs-137	4	180	52 (1/2)	-	-	53 (1/2)	0
Airborne Pathway								
Airborne Particulates (pCi/m³)	GS	312	(b)	ND	-	-	None	0
Airborne Iodine (pCi/m³)	I-131	312	0.07	ND	-	-	None	0
Soil								
Soil (pCi/kg) dry	Cs-134	9	150	ND	-	-	ND	0
	Cs-137	9	180	171 (6/7) (47-281)	F-006 1.6 mi. 51° / NE	281 (1/1)	ND	0

Table 5.6 Radiological Environmental Monitoring Program Summary

Sample Type (Units)	Type and Number of Analyses(a)		Req'd LLD(b)	Indicator Locations Mean, Fraction, Range (c)	Location with Highest Annual Mean		Control Locations Mean, Fraction, Range (c)	Number Non-Routine Results(e)
					Location (d)	Mean, Fraction, Range (c)		
Ingestion Pathway								
Food Products Leafy Green Vegetables (pCi/kg wet)	GS	70	(b)	ND	-	-	ND	0
Fish Edible Flesh (pCi/kg) wet	GS	20	(b)	ND	-	-	ND	0
Milk (pCi/L)	I-131	0	1	none	-	-	ND	0
	GS	0	(b)	none	-	-	ND	0
Direct Radiation								
(Quarterly TLDs) (mrem/Qtr)	Gamma	175	-	15.0 (163/163) (10.2-17.2)	CA-IDM-10 3.9 mi. 159° SSE	16.7 (3/3) (16.2-17.2)	14.1 (12/12) (9.8-17.5)	0
	Neutron	20	-	ND	-	-	ND	0

(a) GS = gamma spectroscopy.

(b) LLD = nominal lower limit of detection based on a 4.66 sigma counting error for background sample. LLD's for gamma spectroscopy are in Table 5.3.

(c) Mean and range are based on detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parentheses (F). ND= not detected.

(d) Locations are specified by station code (Table 5.2) and distance (miles) and direction relative to reactor site.

(e) Non-routine results are those which exceed ten times the control station value. If no control station value is available, the result is considered non-routine if it exceeds ten times the preoperational value for the location.

(f) Units: pCi/L.

Table 5.7 Direct Radiation Dose (mrem/90 days) for the Period 2000-2022.

Station Code	Mean	3 σ	Mean + 3 σ	Max
CA-IDM-1A	15.8	2.8	18.6	18.0
CA-IDM-3*	16.8	2.8	19.6	20.0
CA-IDM-5	14.2	2.7	16.9	17.1
CA-IDM-6	16.2	3.5	19.7	19.0
CA-IDM-7	16.0	3.1	19.1	19.0
CA-IDM-9	14.9	2.5	17.4	17.0
CA-IDM-10	16.9	2.7	19.6	19.3
CA-IDM-11A	16.9	3.0	19.9	19.3
CA-IDM-14	15.8	2.7	18.5	18.7
CA-IDM-17	15.9	3.1	18.9	18.3
CA-IDM-18A	16.0	4.4	20.4	18.9
CA-IDM-20	16.4	2.8	19.3	19.3
CA-IDM-21	16.2	3.4	19.6	19.0
CA-IDM-22A*	14.2	5.3	19.5	18.0
CA-IDM-23	16.5	2.6	19.1	19.0
CA-IDM-26(C)	11.3	2.3	13.6	13.1
CA-IDM-27(C)	17.1	2.9	19.9	20.0
CA-IDM-30A	15.6	2.7	18.3	18.2
CA-IDM-31A	16.8	2.7	19.5	19.0
CA-IDM-32	16.6	2.8	19.4	19.0
CA-IDM-32A	15.9	3.9	19.8	20.0
CA-IDM-33	15.9	2.7	18.5	18.0
CA-IDM-34	15.3	2.8	18.1	18.0
CA-IDM-35	14.7	2.6	17.2	17.3
CA-IDM-36	15.2	3.5	18.7	18.7
CA-IDM-37	15.7	2.8	18.5	18.0
CA-IDM-38	11.3	2.2	13.6	13.9
CA-IDM-39	15.6	3.2	18.8	19.0
CA-IDM-39A	16.2	3.4	19.6	19.0
CA-IDM-40	16.7	3.4	20.1	19.2
CA-IDM-41	15.6	3.2	18.8	19.0
CA-IDM-42	13.6	2.5	16.1	16.2
CA-IDM-43	15.8	2.9	18.7	18.7
CA-IDM-44	16.1	3.3	19.4	19.0
CA-IDM-45*	14.7	3.2	17.9	20.0
CA-IDM-46	16.3	2.7	19.0	19.9
CA-IDM-47	15.5	2.8	18.3	18.0
CA-IDM-48	16.4	2.9	19.3	19.0
CA-IDM-49	15.2	3.2	18.4	18.0
CA-IDM-50	16.1	3.0	19.1	20.0
CA-IDM-51A	16.9	2.7	19.6	19.8
CA-IDM-52	16.5	2.8	19.3	19.1
CA-IDM-60(C)*	15.9	2.7	18.6	18.0
CA-IDM-61*	14.1	4.1	18.2	15.7

* ISFSI monitoring
(C) Control location

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APPENDIX A

INTERLABORATORY AND INTRALABORATORY COMPARISON PROGRAM RESULTS

NOTE: Appendix A is updated four times a year. The complete appendix is included in March, June, September and December monthly progress reports only.

January, 2023 through December, 2023

Appendix A

Interlaboratory/ Intralaboratory Comparison Program Results

Microbac Laboratories - Northbrook (previously Environmental Inc.) has participated in interlaboratory comparison (crosscheck) programs since the formulation of its quality program in December 1971. These programs are operated by agencies and/or companies which supply environmental sample types containing concentrations of radionuclides known to the issuing entity but not to participant laboratories. The purpose of such a program is to provide an independent check on a laboratory's analytical procedures and to alert it of any possible problems.

Participant laboratories measure the concentration of specified radionuclides and report them to the issuing agency. Several months later, the agency reports the known values to the participant laboratories and specifies control limits. Results consistently higher or lower than the known values or outside the control limits indicate a need to check the instruments or procedures used.

Results in Table A-1 were obtained through participation in the RAD PT Study Proficiency Testing Program administered by Environmental Resource Associates, serving as a replacement for studies conducted previously by the U.S. EPA Environmental Monitoring Systems Laboratory, Las Vegas, Nevada.

Table A-2 lists results for thermoluminescent dosimeters (TLDs), via irradiation and evaluation by the University of Wisconsin-Madison Radiation Calibration Laboratory at the University of Wisconsin Medical Radiation Research Center.

Table A-3 lists results of the analyses on intralaboratory "spiked" samples for the past twelve months. All samples are prepared using NIST traceable sources. Data for previous years available upon request.

Table A-4 lists results of the analyses on intralaboratory "blank" samples for the past twelve months. Data for previous years available upon request.

Table A-5 lists analytical results from the intralaboratory "duplicate" program for the past twelve months. Acceptance is based on each result being within 25% of the mean of the two results or the two sigma uncertainties of each result overlap.

The results in Table A-6 were obtained through participation in the Mixed Analyte Performance Evaluation Program.

Results in Table A-7 were obtained through participation in the MRAD PT Study Proficiency Testing Program administered by Environmental Resource Associates, serving as a replacement for studies conducted previously by the Environmental Measurement Laboratory Quality Assessment Program (EML).

Attachment A lists the laboratory acceptance criteria for various analyses.

Out-of-limit results are explained directly below the result.

Attachment A

ACCEPTANCE CRITERIA FOR INTRALABORATORY "SPIKED" SAMPLES

Analysis	Ratio of lab result to known value.
Gamma Emitters	0.8 to 1.2
Strontium-89, Strontium-90	0.8 to 1.2
Potassium-40	0.8 to 1.2
Gross alpha	0.5 to 1.5
Gross beta	0.8 to 1.2
Tritium	0.8 to 1.2
Radium-226, Radium-228	0.7 to 1.3
Plutonium	0.8 to 1.2
Iodine-129, Iodine-131	0.8 to 1.2
Nickel-63, Technetium-99, Uranium-238	0.7 to 1.3
Iron-55	0.8 to 1.2
Other Analyses	0.8 to 1.2

TABLE A-1. Interlaboratory Comparison Crosscheck program, Environmental Resource Associates (ERA)^a.
RAD study

Lab Code	Date	Concentration (pCi/L)				
		Analysis	Laboratory Result	ERA Value	Acceptance Limits	Acceptance
RAD-132 Study						
ERDW-162	2/23/2023	Ba-133	33.0 ± 3.5	30.5	24.2 - 34.6	Pass
ERDW-162	2/23/2023	Cs-134	30.7 ± 3.0	28.2	21.9 - 31.1	Pass
ERDW-162	2/23/2023	Cs-137	191 ± 7	190	171 - 211	Pass
ERDW-162	2/23/2023	Co-60	110 ± 4	110	99.0 - 123	Pass
ERDW-162	2/23/2023	Zn-65	109 ± 8	105	94.5 - 125	Pass
ERDW-162	2/23/2023	Gr. Alpha	25.3 ± 0.2	30.0	15.3 - 39.2	Pass
ERDW-162	2/23/2023	G. Beta	15.0 ± 0.1	16.5	9.25 - 24.8	Pass
ERDW-162	2/23/2023	Ra-226	7.58 ± 0.52	8.26	6.21 - 9.71	Pass
ERDW-162	2/23/2023	Ra-228	7.44 ± 1.53	7.17	4.51 - 9.20	Pass
ERDW-162	2/23/2023	H-3	22,600 ± 467	21,600	18,900 - 23,800	Pass
RAD-134 Study						
ERDW-1956	7/10/2023	Ba-133	64.1 ± 4.7	66.5	55.4 - 73.2	Pass
ERDW-1956	7/10/2023	Cs-134	97.0 ± 4.8	90.8	74.5 - 99.9	Pass
ERDW-1956	7/10/2023	Cs-137	179 ± 8	163	147 - 181	Pass
ERDW-1956	7/10/2023	Co-60	26.6 ± 2.9	20.7	17.5 - 25.6	Fail ^b
ERDW-1956	7/10/2023	Zn-65	318 ± 12	290	261 - 339	Pass
ERDW-50167	7/10/2023	Gr. Alpha	34.3 ± 1.9	47.9	24.9 - 60.3	Pass
ERDW-50167	7/10/2023	G. Beta	27.4 ± 1.2	28.6	18.2 - 36.4	Pass
ERDW-50171	7/10/2023	Ra-226	19.3 ± 0.9	17.4	12.9 - 19.9	Pass
ERDW-50171	7/10/2023	Ra-228	7.11 ± 1.59	7.16	4.50 - 9.18	Pass
ERDW-50173	7/10/2023	H-3	10,500 ± 326	9,860	8,570 - 10,800	Pass
ERDW-50169	7/10/2023	I-131	23.9 ± 1.2	24.4	20.2 - 28.9	Pass

^a Results obtained by Microbac Laboratories Inc. - Northbrook as a participant in the crosscheck program for proficiency testing in drinking water conducted by Environmental Resource Associates (ERA).

^b The Cobalt-60 result did not meet ERA acceptance criteria. The sample was reanalyzed and passed for all analytes. (Co-60 reanalysis result was 21.2 ± 3.0 pCi/L). No cause for the earlier failure could be determined.

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TABLE A-3. Intralaboratory "Spiked" Samples

Lab Code ^b	Date	Analysis	Concentration ^a		Control Limits ^d	Acceptance	Ratio Lab/Known
			Laboratory results 2s, n=1 ^c	Known Activity			
SPDW-26	1/5/2023	Ra-228	11.8 ± 1.9	13.4	9.4 - 17.4	Pass	0.88
SPDW-50002	1/11/2023	H-3	21,747 ± 452	22,100	17,680 - 26,520	Pass	0.98
SPDW-50004	1/20/2023	H-3	21,861 ± 458	22,100	17,680 - 26,520	Pass	0.99
SPDW-50006	1/5/2023	Ra-226	11.3 ± 0.3	12.3	8.6 - 16.0	Pass	0.92
SPDW-50034	1/27/2023	Ra-226	12.6 ± 0.4	12.3	8.6 - 16.0	Pass	1.02
LCS-SO-012723	8/1/2020	Cs-134	17.1 ± 0.2	19.2	15.4 - 23.0	Pass	0.89
LCS-SO-012723	8/1/2020	Zn-65	13.8 ± 1.7	14.1	11.3 - 16.9	Pass	0.98
LCS-SO-012723	8/1/2020	Co-60	26.4 ± 0.2	27.0	21.6 - 32.4	Pass	0.98
LCS-SO-012723	8/1/2020	Co-57	30.7 ± 0.1	30.9	24.7 - 37.1	Pass	0.99
LCS-SO-012723	8/1/2020	Mn-54	17.7 ± 0.8	16.5	13.2 - 19.8	Pass	1.07
LCS-SO-012723	8/1/2020	K-40	18.4 ± 0.7	16.8	13.4 - 20.2	Pass	1.10
SPDW-50010	1/31/2023	Ra-228	9.7 ± 1.3	13.4	9.4 - 17.4	Pass	0.72
SPDW-50008	2/3/2023	H-3	21,961 ± 459	22,100	17,680 - 26,520	Pass	0.99
SPDW-50016	2/10/2023	H-3	22,137 ± 462	22,100	17,680 - 26,520	Pass	1.00
SPDW-50012	2/24/2023	Sr-90	18.6 ± 1.2	17.1	13.7 - 20.5	Pass	1.09
SPDW-50032	2/16/2023	Ra-228	13.1 ± 1.9	13.4	9.4 - 17.4	Pass	0.98
SPDW-50018	2/16/2023	Gr. Alpha	19.1 ± 1.3	23.5	11.8 - 28.2	Pass	0.81
SPDW-50018	2/16/2023	Gr. Beta	133 ± 2	141	112 - 169	Pass	0.94
SPDW-50021	2/17/2023	H-3	21,843 ± 459	22,100	17,680 - 26,520	Pass	0.99
SPDW-50047	2/24/2023	Ra-226	12.8 ± 0.4	12.3	8.6 - 16.0	Pass	1.04
SPDW-50049	3/17/2023	H-3	22,120 ± 465	22,100	17,680 - 26,520	Pass	1.00
SPDW-50056	3/24/2023	H-3	21,911 ± 463	22,100	17,680 - 26,520	Pass	0.99
SPDW-50060	3/16/2023	Ra-226	12.9 ± 0.4	12.3	8.6 - 16.0	Pass	1.05
SPDW-50097	4/13/2023	Ra-226	11.7 ± 0.5	12.3	8.6 - 16.0	Pass	0.95
SPDW-50068	4/14/2023	H-3	22,656 ± 482	22,100	17,680 - 26,520	Pass	1.03
SPDW-50081	4/25/2023	H-3	21,594 ± 461	22,100	17,680 - 26,520	Pass	0.98
SPDW-50131	5/3/2023	Ra-226	11.4 ± 0.3	12.3	8.6 - 16.0	Pass	0.93
SPDW-50104	5/12/2023	H-3	21,513 462	22,100	17,680 - 26,520	Pass	0.97
SPDW-50117	5/26/2023	H-3	22,069 468	22,100	17,680 - 26,520	Pass	1.00
SPDW-50182	6/8/2023	Ra-226	10.4 ± 0.3	12.3	8.6 - 16.0	Pass	0.85
SPDW-50137	6/12/2023	H-3	21,898 ± 456	22,100	17,680 - 26,520	Pass	0.99
SPDW-50138	6/12/2023	H-3	21,898 ± 456	22,100	17,680 - 26,520	Pass	0.99
SPDW-50153	6/26/2023	H-3	21,672 ± 456	22,100	17,680 - 26,520	Pass	0.98
SPDW-50153	6/26/2023	H-3	21,672 ± 456	22,100	17,680 - 26,520	Pass	0.98
SPDW-50259	7/19/2023	Ra-226	10.5 ± 0.3	12.3	8.6 - 16.0	Pass	0.85
SPDW-50219	8/15/2023	Sr-90	17.5 ± 1.1	17.1	13.7 - 20.5	Pass	1.02
SPDW-50291	8/28/2023	Ra-226	11.0 ± 0.3	12.3	8.6 - 16.0	Pass	0.89
SPDW-50249	8/22/2023	Gr. Alpha	16.7 ± 1.4	23.5	11.8 - 28.2	Pass	0.71
SPDW-50249	8/22/2023	Gr. Beta	128 ± 2	141	112 - 169	Pass	0.91
SPDW-50252	8/18/2023	H-3	21,628 ± 459	22,100	17,680 - 26,520	Pass	0.98
SPDW-50257	8/25/2023	H-3	22,152 ± 469	22,100	17,680 - 26,520	Pass	1.00

^a Liquid sample results are reported in pCi/Liter, air filters (pCi/m³), charcoal (pCi/charcoal canister), and solid samples (pCi/kg).

^b Laboratory codes : W & SPW (Water), MI (milk), AP (air filter), SO (soil), VE (vegetation), CH (charcoal canister), F (fish), U (urine).

^c Results are based on single determinations.

^d Acceptance criteria are listed in Attachment A of this report. A-6

TABLE A-3. Intralaboratory "Spiked" Samples

Lab Code ^b	Date	Analysis	Concentration ^a		Control Limits ^d	Acceptance	Ratio Lab/Known
			Laboratory results 2s, n=1 ^c	Known Activity			
LCS-09/12/23	8/1/2020	Cs-134	17,533 ± 346	19,170	15,336 - 23,004	Pass	0.91
LCS-09/12/23	8/1/2020	Co-60	27,480 ± 347	26,055	20,844 - 31,266	Pass	1.05
LCS-09/12/23	8/1/2020	K-40	20,183 1268	18,468	14,774 - 22,162	Pass	1.09
SPDW-50270	9/6/2023	H-3	22,287 ± 469	22,100	17,680 - 26,520	Pass	1.01
SPDW-50283	9/25/2023	H-3	21,062 ± 444	22,100	17,680 - 26,520	Pass	0.95
SPDW-50291	8/28/2023	Ra-226	11.0 ± 0	12.3	8.6 - 16.0	Pass	0.89
SPDW-50316	10/3/2023	H-3	21,406 ± 454	22,100	17,680 - 26,520	Pass	0.97
SPW-50330	11/17/2023	H-3	21,143 ± 543	22,100	17,680 - 26,520	Pass	0.96
LCS-SO-112823	8/1/2020	Cs-134	17.2 ± 0.2	19.2	15.4 - 23.0	Pass	0.90
LCS-SO-112823	8/1/2020	Zn-65	14.9 ± 3.1	14.1	11.3 - 16.9	Pass	1.06
LCS-SO-112823	8/1/2020	Co-60	26.0 ± 0.3	27.0	21.6 - 32.4	Pass	0.96
LCS-SO-112823	8/1/2020	Co-57	29.3 ± 0.9	30.9	24.7 - 37.1	Pass	0.95
LCS-SO-112823	8/1/2020	Mn-54	17.5 ± 1.3	16.5	13.2 - 19.8	Pass	1.06
LCS-SO-112823	8/1/2020	K-40	18.0 ± 0.7	16.8	13.4 - 20.2	Pass	1.07
SPW-3908	12/18/2023	NI-63	2,032 ± 27	1,788	1,430 - 2,146	Pass	1.14
SPW-3910	12/18/2023	Fe-55	269 ± 24	232	186 - 278	Pass	1.16
SPDW-50378	12/19/2023	H-3	21,102 ± 452	22,100	17,680 - 26,520	Pass	0.95
SPDW-50388	12/28/2023	H-3	20,540 ± 445	22,100	17,680 - 26,520	Pass	0.93
SPDW-50393	12/19/2023	Ra-226	11.6 ± 0.3	12.3	8.6 - 16.0	Pass	0.94

^a Liquid sample results are reported in pCi/Liter, air filters (pCi/m3), charcoal (pCi/charcoal canister), and solid samples (pCi/kg).

^b Laboratory codes : W & SPW (Water), MI (milk), AP (air filter), SO (soil), VE (vegetation), CH (charcoal canister), F (fish), U (urine).

^c Results are based on single determinations.

^d Acceptance criteria are listed in Attachment A of this report.

TABLE A-4. Intralaboratory "Blank" Samples

Lab Code ^b	Sample Type	Date	Analysis ^c	Concentration ^a		Acceptance Criteria (4.66 σ)
				Laboratory results (4.66σ)		
				LLD	Activity ^d	
SPW-25	Water	1/5/2023	Ra-228	0.98	0.74 ± 0.54	2
SPDW-50000	Water	1/6/2023	I-131	0.36	-0.10 ± 0.16	1
SPDW-50001	Water	1/11/2023	H-3	157	13 ± 74	200
SPDW-50003	Water	1/20/2023	H-3	161	98 ± 85	200
SPDW-50005	Water	1/5/2023	Ra-226	0.02	0.00 ± 0.03	2
SPDW-50033	Water	1/27/2023	Ra-226	0.03	-0.01 ± 0.03	2
SPDW-50009	Water	1/31/2023	Ra-228	1.40	0.69 ± 0.75	2
SPDW-50007	Water	2/3/2023	H-3	160	17 ± 80	200
SPDW-50015	Water	2/10/2023	H-3	159	91 ± 84	200
SPDW-50011	Water	2/9/2023	Sr-89	0.62	0.24 ± 0.49	5
SPDW-50011	Water	2/9/2023	Sr-90	0.66	-0.02 ± 0.30	1
SPDW-50018	Water	2/16/2023	Gr. Alpha	0.62	0.01 ± 0.44	2
SPDW-50018	Water	2/16/2023	Gr. Beta	0.78	-0.10 ± 0.54	4
SPDW-50020	Water	2/17/2023	H-3	154	122 ± 80	200
SPDW-50031	Water	2/16/2023	Ra-228	0.82	0.42 ± 0.43	2
SPDW-50046	Water	2/24/2023	Ra-226	0.03	0.05 ± 0.04	2
SPDW-50044	Water	3/13/2023	I-131	0.15	-0.06 ± 0.08	1
SPDW-50048	Water	3/17/2023	H-3	163	80 ± 80	200
SPDW-50055	Water	3/24/2023	H-3	169	63 ± 82	200
SPDW-50059	Water	3/16/2023	Ra-226	0.04	-0.02 ± 0.03	2
SPDW-50063	Water	3/28/2023	Ra-226	0.06	-0.01 ± 0.05	2
SPDW-50067	Water	4/14/2023	H-3	173	92 ± 87	200
SPDW-50069	Water	4/17/2023	I-131	0.11	-0.05 ± 0.08	1
SPDW-50102	Water	5/15/2023	I-131	0.15	-0.01 ± 0.08	1
SPDW-50103	Water	5/12/2023	H-3	161	67 ± 80	200
SPDW-50116	Water	5/26/2023	H-3	161	122 ± 87	200
SPDW-50137	Water	6/12/2023	H-3	157	125 ± 80	200
SPDW-50154	Water	6/26/2023	H-3	157	105 ± 80	200
SPDW-50181	Water	6/8/2023	Ra-226	0.04	-0.07 ± 0.03	2
SPDW-50218	Water	8/15/2023	Sr-89	0.66	-0.07 ± 0.48	5
SPDW-50218	Water	8/15/2023	Sr-90	0.55	0.02 ± 0.26	1
SPDW-50248	Water	8/22/2023	Gr. Alpha	0.57	-0.03 ± 0.40	2
SPDW-50248	Water	8/22/2023	Gr. Beta	0.70	0.28 ± 0.50	4
SPDW-50256	Water	8/25/2023	H-3	161	75 ± 84	200
SPDW-50258	Water	7/19/2023	Ra-226	0.06	-0.25 ± 0.04	2
SPDW-50270	Water	9/6/2023	H-3	160	90 ± 81	200
SPDW-50282	Water	9/25/2023	H-3	163	53 ± 79	200
SPDW-50290	Water	8/28/2023	Ra-226	0.05	0.00 ± 0.04	2

^a Liquid sample results are reported in pCi/Liter, air filters (pCi/m³), charcoal (pCi/charcoal canister), and solid samples (pCi/g).

^b Laboratory codes : W & SPW (Water), MI (milk), AP (air filter), SO (soil), VE (vegetation), CH (charcoal canister), F (fish), U (urine).

^c I-131(G); iodine-131 as analyzed by gamma spectroscopy.

^d Activity reported is a net activity result.

TABLE A-4. Intralaboratory "Blank" Samples

Lab Code ^b	Sample Type	Date	Analysis ^c	Concentration ^a		Acceptance Criteria (4.66 σ)
				Laboratory results (4.66σ)		
				LLD	Activity ^d	
SPDW-50311	Water	10/16/2023	I-131	0.25	0.06 ± 0.14	1
SPDW-50312	Water	10/3/2023	Ra-226	0.04	0.06 ± 0.09	2
SPDW-50315	Water	10/27/2023	H-3	169	5 ± 79	200
SPDW-50329	Water	11/17/2023	H-3	170	51 ± 82	200
SPDW-50379	Water	11/17/2023	Ra-226	0.05	0.09 ± 0.04	2
SPDW-50346	Water	12/5/2023	H-3	0.10	-0.12 ± 0.07	1
SPDW-50347	Water	12/5/2023	Ra-228	1.27	-0.07 ± 0.62	2
SPW-3907	Water	12/18/2023	Ni-63	149	0 ± 91	200
SPW-3909	Water	12/18/2023	Fe-55	435	7 ± 265	2000
SPDW-50377	Water	12/19/2023	H-3	173	-42 ± 78	200
SPDW-50387	Water	12/28/2023	H-3	171	-21 ± 79	200

^a Liquid sample results are reported in pCi/Liter, air filters (pCi/m³), charcoal (pCi/charcoal canister), and solid samples (pCi/g).

^b Laboratory codes : W & SPW (Water), MI (milk), AP (air filter), SO (soil), VE (vegetation), CH (charcoal canister), F (fish), U (urine).

^c I-131(G); iodine-131 as analyzed by gamma spectroscopy.

^d Activity reported is a net activity result.

TABLE A-5. Intralaboratory "Duplicate" Samples

Lab Code ^b	Date	Analysis	Concentration ^a		Averaged Result	Acceptance
			First Result	Second Result		
VW-65,66	1/10/2023	Gr. Beta	15.4 ± 2.0	17.2 ± 2.1	16.3 ± 1.5	Pass
VW-107,108	1/18/2023	H-3	153 ± 88	132 ± 87	143 ± 62	Pass
SG-187,188	1/30/2023	Gr. Alpha	28.1 ± 3.9	22.0 ± 3.5	25.1 ± 2.6	Pass
SG-187,188	1/30/2023	Gr. Beta	22.3 ± 1.8	22.2 ± 1.8	22.3 ± 1.3	Pass
SG-187,188	1/30/2023	Pb-214	4.08 ± 0.16	3.38 ± 0.09	3.73 ± 0.09	Pass
SG-187,188	1/30/2023	Ac-228	3.88 ± 0.28	3.98 ± 0.14	3.93 ± 0.16	Pass
SWU-201,202	1/31/2023	H-3	171 ± 89	234 ± 92	203 ± 64	Pass
SW-243,244	2/7/2023	H-3	358 ± 98	262 ± 93	310 ± 68	Pass
PW-266,267	2/6/2023	Ra-226	0.61 ± 0.18	0.37 ± 0.20	0.49 ± 0.13	Pass
DW-50028,50029	2/27/2023	Ra-226	0.68 ± 0.13	0.76 ± 0.13	0.72 ± 0.09	Pass
DW-50028,50029	2/27/2023	Ra-228	2.26 ± 0.65	1.20 ± 0.65	1.73 ± 0.46	Pass
DW-50052,50053	2/27/2023	Ra-228	0.48 ± 0.57	1.19 ± 0.65	0.84 ± 0.43	Pass
DW-50035,50036	2/28/2023	Gr. Alpha	3.68 ± 1.42	4.00 ± 1.29	3.84 ± 0.96	Pass
DW-50035,50036	2/28/2023	Gr. Beta	2.50 ± 0.64	1.99 ± 0.64	2.25 ± 0.45	Pass
LW-518,519	3/8/2023	Gr. Beta	1.71 ± 0.64	1.38 ± 0.64	1.55 ± 0.45	Pass
SG-571,572	3/8/2023	Pb-214	7.80 ± 0.46	8.20 ± 0.35	8.00 ± 0.29	Pass
SG-571,572	3/8/2023	Ac-228	11.9 ± 0.8	11.4 ± 0.6	11.7 ± 0.5	Pass
SG-571,572	3/8/2023	Gr. Alpha	86.5 ± 10.6	89.6 ± 11.0	88.1 ± 7.6	Pass
DW-50052,50053	3/17/2023	Gr. Alpha	9.16 ± 1.02	14.7 ± 1.2	11.9 ± 0.8	Pass
DW-50052,50053	3/17/2023	Gr. Beta	6.03 ± 0.71	7.58 ± 0.75	6.81 ± 0.52	Pass
CF-700,701	3/22/2023	K-40	2.91 ± 0.32	3.30 ± 0.36	3.11 ± 0.24	Pass
SW-679,680	3/27/2023	H-3	14,480 ± 389	14,487 ± 389	14,484 ± 275	Pass
SG-974,975	4/4/2023	Gr. Alpha	12.0 ± 2.1	12.1 ± 2.1	12.1 ± 1.5	Pass
DW-50074,50075	4/21/2023	Ra-226	1.63 ± 0.22	1.56 ± 0.28	1.60 ± 0.18	Pass
DW-50074,50075	4/21/2023	Ra-228	3.41 ± 0.98	2.14 ± 0.80	2.78 ± 0.63	Pass
U-1038,1039	4/20/2023	Gr. Beta	6.14 ± 1.71	6.46 ± 2.19	6.30 ± 1.39	Pass
VW-1101,1102	4/25/2023	H-3	358 ± 96	334 ± 95	346 ± 68	Pass
DW-50092,50093	5/1/2023	Ra-226	1.00 ± 0.22	1.46 ± 0.19	1.23 ± 0.15	Pass
DW-50092,50093	5/1/2023	Ra-228	1.11 ± 0.73	1.57 ± 0.82	1.34 ± 0.55	Pass
VW-1122,1123	5/2/2023	H-3	307 ± 93	229 ± 89	268 ± 64	Pass
VW-1269,1270	5/17/2023	H-3	366 ± 100	214 ± 92	290 ± 68	Pass
DW-50110,50111	5/29/2023	Ra-226	6.27 ± 0.40	4.77 ± 0.26	5.52 ± 0.24	Pass
DW-50110,50111	5/29/2023	Ra-228	2.81 ± 0.97	3.53 ± 0.98	3.17 ± 0.69	Pass
SW-1356,1357	5/30/2023	H-3	380 ± 94	257 ± 88	319 ± 64	Pass
VW-1398,1399	5/24/2023	H-3	571 ± 103	613 ± 105	592 ± 74	Pass
SG-1377,1378	5/30/2023	Pb-214	1.07 ± 0.14	1.19 ± 0.15	1.13 ± 0.10	Pass
SG-1377,1378	5/30/2023	Ac-228	1.23 ± 0.28	1.11 ± 0.23	1.17 ± 0.18	Pass

TABLE A-5. Intralaboratory "Duplicate" Samples

Lab Codeb	Date	Analysis	Concentration ^a		Averaged Result	Acceptance
			First Result	Second Result		
DW-50124,50125	6/5/2023	Ra-226	0.25 ± 0.08	0.24 ± 0.09	0.25 ± 0.06	Pass
AP-060523A/B	6/5/2023	Gr. Beta	0.023 ± 0.003	0.0236 ± 0.003	0.023 ± 0.002	Pass
DW-50126,50127	6/5/2023	Gr. Alpha	2.50 ± 1.17	3.87 ± 1.39	3.19 ± 0.91	Pass
VWV-1441,1442	6/6/2023	Gr. Beta	2.55 ± 0.64	1.91 ± 0.67	2.23 ± 0.46	Pass
SW-1483,1484	6/8/2023	H-3	281 ± 90	281 ± 90	281 ± 64	Pass
CF-1546,1547	6/12/2023	K-40	7.77 ± 0.34	7.48 ± 0.48	7.63 ± 0.29	Pass
AP-061223A/B	6/12/2023	Gr. Beta	0.031 ± 0.005	0.030 ± 0.005	0.031 ± 0.004	Pass
S-1567,1568	6/14/2023	K-40	9.75 ± 0.71	9.80 ± 0.77	9.78 ± 0.52	Pass
VWV-1630,1631	6/6/2023	H-3	319 ± 93	236 ± 89	278 ± 64	Pass
F-1945,1946	6/26/2023	K-40	3.81 ± 0.34	3.22 ± 0.54	3.52 ± 0.32	Pass
DW-50157,50158	6/26/2023	Gr. Beta	0.93 ± 0.59	1.09 ± 0.06	1.01 ± 0.30	Pass
AP-062823A/B	6/28/2023	Gr. Beta	0.026 ± 0.004	0.021 ± 0.003	0.024 ± 0.003	Pass
AP-070323A/B	7/3/2023	Gr. Beta	0.028 ± 0.003	0.026 ± 0.003	0.027 ± 0.002	Pass
DW-50160,50161	7/5/2023	Ra-226	2.63 ± 0.32	2.77 ± 0.27	2.70 ± 0.21	Pass
DW-50160,50161	7/5/2023	Ra-228	2.46 ± 0.78	2.51 ± 0.81	2.49 ± 0.56	Pass
AP-071123A/B	7/11/2023	Gr. Beta	0.025 ± 0.003	0.027 ± 0.003	0.026 ± 0.002	Pass
DW-50188,50189	7/21/2023	Ra-226	3.07 ± 0.30	2.63 ± 0.20	2.85 ± 0.18	Pass
DW-50188,50189	7/21/2023	Ra-228	5.28 ± 0.92	5.08 ± 0.90	5.18 ± 0.64	Pass
DW-50197,50198	7/24/2023	Gr. Alpha	5.82 ± 1.50	5.78 ± 1.30	5.80 ± 0.99	Pass
DW-50200,50201	7/24/2023	Ra-226	2.51 ± 0.24	4.07 ± 0.29	3.29 ± 0.19	Pass
DW-50200,50201	7/24/2023	Ra-228	7.04 ± 1.13	6.55 ± 1.09	6.80 ± 0.79	Pass
SG-2199,2200	7/25/2023	Pb-214	1.18 ± 0.22	1.03 ± 0.19	1.11 ± 0.15	Pass
SG-2199,2200	7/25/2023	Ac-228	1.74 ± 0.32	1.86 ± 0.42	1.80 ± 0.26	Pass
AP-072623A/B	7/26/2023	Gr. Beta	0.021 ± 0.003	0.021 ± 0.003	0.021 ± 0.002	Pass
AP-080223A/B	8/2/2023	Gr. Beta	0.015 ± 0.003	0.016 ± 0.003	0.016 ± 0.002	Pass
SG-2315,2316	8/3/2023	Gr. Alpha	59.5 ± 6.7	48.2 ± 6.1	53.9 ± 4.5	Pass
SG-2315,2316	8/3/2023	Gr. Beta	39.8 ± 2.9	34.4 ± 2.6	37.1 ± 1.9	Pass
AP-080723A/B	8/7/2023	Gr. Beta	0.025 ± 0.005	0.025 ± 0.005	0.025 ± 0.004	Pass
DW-50200,50201	8/9/2023	Ra-228	1.88 ± 0.71	1.29 ± 0.70	1.59 ± 0.50	Pass
AP-081423A/B	8/14/2023	Gr. Beta	0.030 ± 0.003	0.028 ± 0.003	0.029 ± 0.002	Pass
AP-082123A/B	8/21/2023	Gr. Beta	0.020 ± 0.003	0.022 ± 0.003	0.021 ± 0.002	Pass
DW-50262,50263	8/24/2023	Ra-228	2.62 ± 0.87	1.46 ± 0.52	2.04 ± 0.51	Pass
DW-50262,50263	8/24/2023	Ra-228	2.62 ± 0.87	2.80 ± 0.67	2.71 ± 0.55	Pass
AP-082823A/B	8/28/2023	Gr. Beta	0.023 ± 0.003	0.028 ± 0.003	0.026 ± 0.002	Pass
DW-50268,50269	8/29/2023	Gr. Alpha	0.87 ± 0.69	0.97 ± 0.81	0.92 ± 0.53	Pass
SG-2660,2661	9/4/2023	Gr. Alpha	68.5 ± 7.1	51.0 ± 6.3	59.8 ± 4.7	Pass
SG-2660,2661	9/4/2023	Pb-214	13.7 ± 0.5	14.2 ± 0.5	14.0 ± 0.4	Pass
SG-2660,2661	9/4/2023	Ac-228	14.4 ± 0.8	14.3 ± 0.9	14.4 ± 0.6	Pass
AP-090523A/B	9/5/2023	Gr. Beta	0.023 ± 0.003	0.023 ± 0.003	0.023 ± 0.002	Pass
AP-091223A/B	9/12/2023	Gr. Beta	0.024 ± 0.002	0.025 ± 0.002	0.025 ± 0.001	Pass

TABLE A-5. Intralaboratory "Duplicate" Samples

Lab Code ^b	Date	Analysis	Concentration ^a		Averaged Result	Acceptance
			First Result	Second Result		
W-2776,2777	9/18/2023	Gr. Alpha	1.86 ± 1.73	0.99 ± 1.64	1.43 ± 1.19	Pass
W-2776,2777	9/18/2023	Ra-226	0.43 ± 0.10	0.55 ± 0.27	0.49 ± 0.14	Pass
W-2776,2777	9/18/2023	Ra-228	1.71 ± 1.07	3.33 ± 1.12	2.52 ± 0.77	Pass
AP-092023A/B	9/20/2023	Gr. Beta	0.039 ± 0.004	0.042 ± 0.004	0.041 ± 0.003	Pass
DW-50296,50297	9/27/2023	Ra-226	0.51 ± 0.09	0.54 ± 0.20	0.53 ± 0.11	Pass
AP-092823A/B	9/28/2023	Gr. Beta	0.030 ± 0.004	0.034 ± 0.004	0.032 ± 0.003	Pass
S-3136,3137	10/11/2023	Pb-214	1.93 ± 0.06	1.84 ± 0.08	1.89 ± 0.05	Pass
S-3135,3136	10/11/2023	Ac-228	4.06 ± 0.17	3.84 ± 0.19	3.95 ± 0.13	Pass
SG-3511,3512	10/10/2023	Gr. Alpha	59.0 ± 6.2	68.5 ± 6.6	63.8 ± 4.5	Pass
SG-3511,3512	10/10/2023	Gr. Beta	52.1 ± 2.9	54.6 ± 3.0	53.4 ± 2.1	Pass
SG-3511,3512	10/10/2023	Pb-214	9.67 ± 0.25	9.57 ± 0.29	9.62 ± 0.19	Pass
SG-3511,3512	10/10/2023	Ac-228	8.99 ± 0.43	8.79 ± 0.53	8.89 ± 0.34	Pass
SG-3521,3522	11/8/2023	Gr. Alpha	57.3 ± 7.3	70.9 ± 7.6	64.1 ± 5.3	Pass
SG-3521,3522	11/8/2023	Pb-214	11.2 ± 0.2	11.7 ± 0.2	11.5 ± 0.1	Pass
SG-3521,3522	11/8/2023	Ac-228	13.0 ± 0.4	13.4 ± 0.5	13.2 ± 0.3	Pass
DW-50335,50336	11/17/2023	Gr. Alpha	3.70 ± 1.00	3.46 ± 0.90	3.58 ± 0.67	Pass
DW-50335,50336	11/17/2023	Gr. Beta	1.73 ± 0.63	2.07 ± 0.06	1.90 ± 0.32	Pass
W-3647,3648	11/20/2023	H-3	2,815 ± 181	2,829 ± 182	2,822 ± 128	Pass
DW-50358,50359	12/4/2023	Gr. Beta	2.53 ± 0.61	1.66 ± 0.62	2.10 ± 0.43	Pass
DW-50349,50350	12/4/2023	Ra-226	0.04 ± 0.11	0.32 ± 0.10	0.18 ± 0.07	Pass
DW-50349,50350	12/4/2023	Ra-228	1.37 ± 0.48	1.57 ± 0.47	1.47 ± 0.34	Pass
DW-50365,50366	12/11/2023	Gr. Alpha	1.4 ± 0.79	1.95 ± 0.91	1.675 ± 0.60	Pass
DW-50365,50366	12/11/2023	Gr. Beta	3.18 ± 0.62	3.18 ± 0.66	3.18 ± 0.45	Pass
DW-50374,50375	12/13/2023	Gr. Alpha	0.89 ± 0.60	0.54 ± 0.67	0.715 ± 0.45	Pass
W-4035.4036	12/31/2023	H-3	157,638 ± 1,218	159,848 ± 1,227	158,743 ± 864	Pass
W-4035.4036	12/31/2023	Ni-63	2,410 ± 78	2,337 ± 78	2,373 ± 55	Pass
W-4035.4036	12/31/2023	Sr-90	49.8 ± 5.2	42.7 ± 4.8	46.3 ± 3.5	Pass

TABLE A-6. Department of Energy's Mixed Analyte Performance Evaluation Program (MAPEP).

Lab Code ^b	Reference Date	Analysis	Laboratory result	Concentration ^a		
				Known Activity	Acceptance Range ^c	Acceptance
MAAP-544	2/1/2023	Gross Alpha	1.23 ± 0.10	0.97	0.29 - 1.65	Pass
MAAP-544	2/1/2023	Gross Beta	1.67 ± 0.06	1.49	0.75 - 2.24	Pass
MADW-543	2/1/2023	Gross Alpha	0.843 ± 0.074	1.19	0.36 - 2.02	Pass
MADW-543	2/1/2023	Gross Beta	0.578 ± 0.093	5.94	2.97 - 8.91	Fail ^d
MASO-540	2/1/2023	Cs-134	2.33 ± 2.77	0	NA ^c	Pass
MASO-540	2/1/2023	Cs-137	1.22 ± 2.41	0	NA ^c	Pass
MASO-540	2/1/2023	Co-57	585 ± 4	698	489 - 907	Pass
MASO-540	2/1/2023	Co-60	727 ± 8	795	557 - 1034	Pass
MASO-540	2/1/2023	Mn-54	1180 ± 10	1230	861 - 1599	Pass
MASO-540	2/1/2023	Zn-65	846 ± 11	990	693 - 1287	Pass
MASO-540	2/1/2023	K-40	526 ± 23	574	402 - 746	Pass
MADW-545	2/1/2023	Cs-134	9.17 ± 0.17	9.6	6.7 - 12.5	Pass
MADW-545	2/1/2023	Cs-137	9.38 ± 0.29	8.7	6.1 - 11.3	Pass
MADW-545	2/1/2023	Co-57	-0.01 ± 0.08	0.0	NA ^c	Pass
MADW-545	2/1/2023	Co-60	7.47 ± 0.18	7.24	5.07 - 9.41	Pass
MADW-545	2/1/2023	Mn-54	12.3 ± 0.3	11.3	7.9 - 14.7	Pass
MADW-545	2/1/2023	Zn-65	15.7 ± 0.5	15.3	10.7 - 19.9	Pass
MADW-545	2/1/2023	K-40	1.23 ± 1.52	0	NA ^c	Pass
MADW-545	2/1/2023	Sr-90	-0.0035 ± 0.0172	0	NA ^c	Pass
MAAP-538	2/1/2023	Cs-134	1.12 ± 0.04	1.52	1.06 - 1.98	Pass
MAAP-538	2/1/2023	Cs-137	0.56 ± 0.07	0.630	0.441 - 0.819	Pass
MAAP-538	2/1/2023	Co-57	0.62 ± 0.30	0.661	0.463 - 0.859	Pass
MAAP-538	2/1/2023	Co-60	0.89 ± 0.07	1.05	0.74 - 1.37	Pass
MAAP-538	2/1/2023	Mn-54	2.02 ± 0.09	2.14	1.50 - 2.78	Pass
MAAP-538	2/1/2023	Zn-65	2.13 ± 0.14	2.25	1.58 - 2.93	Pass
MAAP-538	2/1/2023	Sr-90	0.004 ± 0.061	0	NA ^c	Pass
MASO-540	2/1/2023	Cs-134	2.33 ± 2.77	0	NA ^c	Pass
MASO-540	2/1/2023	Cs-137	1.22 ± 2.41	0	NA ^c	Pass
MASO-540	2/1/2023	Co-57	585 ± 4	698	489 - 907	Pass
MASO-540	2/1/2023	Co-60	727 ± 8	795	557 - 1034	Pass
MASO-540	2/1/2023	Mn-54	1180 ± 10	1230	861 - 1599	Pass
MASO-540	2/1/2023	Zn-65	846 ± 11	990	693 - 1287	Pass
MASO-540	2/1/2023	K-40	526 ± 23	574	402 - 746	Pass

TABLE A-6. Department of Energy's Mixed Analyte Performance Evaluation Program (MAPEP).

Lab Code ^b	Reference Date	Analysis	Laboratory result	Concentration ^a		
				Known Activity	Acceptance Range ^c	Acceptance
MADW-545	2/1/2023	Cs-134	9.17 ± 0.17	9.6	6.7 - 12.5	Pass
MADW-545	2/1/2023	Cs-137	9.38 ± 0.29	8.7	6.1 - 11.3	Pass
MADW-545	2/1/2023	Co-57	-0.01 ± 0.08	0.0	NA ^c	Pass
MADW-545	2/1/2023	Co-60	7.47 ± 0.18	7.24	5.07 - 9.41	Pass
MADW-545	2/1/2023	Mn-54	12.3 ± 0.3	11.3	7.9 - 14.7	Pass
MADW-545	2/1/2023	Zn-65	15.7 ± 0.5	15.3	10.7 - 19.9	Pass
MADW-545	2/1/2023	K-40	1.23 ± 1.52	0	NA ^c	Pass
MADW-545	2/1/2023	Sr-90	-0.0035 ± 0.0172	0	NA ^c	Pass
MAAP-538	2/1/2023	Cs-134	1.12 ± 0.04	1.52	1.06 - 1.98	Pass
MAAP-538	2/1/2023	Cs-137	0.56 ± 0.07	0.630	0.441 - 0.819	Pass
MAAP-538	2/1/2023	Co-57	0.62 ± 0.30	0.661	0.463 - 0.859	Pass
MAAP-538	2/1/2023	Co-60	0.89 ± 0.07	1.05	0.74 - 1.37	Pass
MAAP-538	2/1/2023	Mn-54	2.02 ± 0.09	2.14	1.50 - 2.78	Pass
MAAP-538	2/1/2023	Zn-65	2.13 ± 0.14	2.25	1.58 - 2.93	Pass
MAAP-538	2/1/2023	Sr-90	0.004 ± 0.061	0	NA ^c	Pass
MAVE-545	2/1/2023	Cs-134	7.45 ± 0.39	7.60	5.32 - 9.88	Pass
MAVE-545	2/1/2023	Cs-137	0.010 ± 0.084	0	NA ^c	Pass
MAVE-545	2/1/2023	Co-57	6.83 ± 0.17	6.93	4.85 - 9.01	Pass
MAVE-545	2/1/2023	Co-60	6.89 ± 0.17	6.51	4.56 - 8.46	Pass
MAVE-545	2/1/2023	Mn-54	9.08 ± 0.28	8.03	5.62 - 10.44	Pass
MAVE-545	2/1/2023	Zn-65	7.83 ± 0.39	7.43	5.20 - 9.66	Pass
MAAP-2761	8/1/2023	Gross Alpha	0.16 ± 0.04	0.255	0.077 - 0.434	Pass
MAAP-2761	8/1/2023	Gross Beta	1.16 ± 0.07	0.927	0.464 - 1.391	Pass
MADW-2753	8/1/2023	Gross Alpha	1.20 ± 0.06	1.59	0.48 - 2.70	Pass
MADW-2753	8/1/2023	Gross Beta	14.7 ± 0.1	16.27	8.14 - 24.41	Pass
MASO-2757	8/1/2023	Cs-134	612 ± 8	693	485 - 901	Pass
MASO-2757	8/1/2023	Cs-137	1900 ± 20	1810	1267 - 2353	Pass
MASO-2757	8/1/2023	Co-57	1020 ± 20	1060	742 - 1378	Pass
MASO-2757	8/1/2023	Co-60	901 ± 10	898	629 - 1167	Pass
MASO-2757	8/1/2023	Mn-54	6.53 ± 3.22	0	NA ^c	Pass
MASO-2757	8/1/2023	Zn-65	1270 ± 30	1160	812 - 1508	Pass
MASO-2757	8/1/2023	K-40	702 ± 54	574	402 - 746	Pass

TABLE A-6. Department of Energy's Mixed Analyte Performance Evaluation Program (MAPEP).

Lab Code ^b	Reference Date	Analysis	Laboratory result	Concentration ^a		
				Known Activity	Acceptance Range ^c	Acceptance
MADW-2751	8/1/2023	Cs-134	8.88 ± 0.18	11.3	7.9 - 14.7	Pass
MADW-2751	8/1/2023	Cs-137	7.95 ± 0.30	8.7	6.1 - 11.3	Pass
MADW-2751	8/1/2023	Co-57	16.5 ± 0.3	19.3	13.5 - 25.1	Pass
MADW-2751	8/1/2023	Co-60	0.09 ± 0.06	0	NA ^c	Pass
MADW-2751	8/1/2023	Mn-54	11.6 ± 0.3	12.7	8.9 - 16.5	Pass
MADW-2751	8/1/2023	Zn-65	17.9 ± 0.6	19.1	13.4 - 24.8	Pass
MADW-2751	8/1/2023	K-40	1.56 ± 1.60	0	NA ^c	Pass
MAAP-2755	8/1/2023	Cs-134	1.30 ± 0.10	1.60	1.12 - 2.08	Pass
MAAP-2755	8/1/2023	Cs-137	0.04 ± 0.03	0	NA ^c	Pass
MAAP-2755	8/1/2023	Co-57	1.47 ± 0.05	1.63	1.14 - 2.12	Pass
MAAP-2755	8/1/2023	Co-60	0.04 ± 0.09	0	NA ^c	Pass
MAAP-2755	8/1/2023	Mn-54	1.59 ± 0.09	1.57	1.10 - 2.04	Pass
MAAP-2755	8/1/2023	Zn-65	1.71 ± 0.14	1.89	1.32 - 2.46	Pass
MAAP-2755	8/1/2023	Sr-90	0.533 ± 0.040	0.614	0.430 - 0.796	Pass
MAVE-2759	8/1/2023	Cs-134	4.25 ± 0.14	4.96	3.49 - 6.47	Pass
MAVE-2759	8/1/2023	Cs-137	0.025 ± 0.050	0	NA ^c	Pass
MAVE-2759	8/1/2023	Co-57	4.28 ± 0.13	4.24	2.97 - 5.51	Pass
MAVE-2759	8/1/2023	Co-60	2.49 ± 0.11	2.79	1.95 - 3.63	Pass
MAVE-2759	8/1/2023	Mn-54	2.45 ± 0.16	2.6	1.8 - 3.3	Pass
MAVE-2759	8/1/2023	Zn-65	0.058 - 0.107	0	NA ^c	Pass

^a Results are reported in units of Bq/kg (soil), Bq/L (water) or Bq/total sample (filters, vegetation).

^b Laboratory codes as follows: MAW (water), MADW (water), MAAP (air filter), MASO (soil) and MAVE (vegetation).

^c MAPEP results are presented as the known values and expected laboratory precision (1 sigma, 1 determination) and control limits as defined by the MAPEP. A known value of "zero" indicates an analysis was included in the testing series as a "false positive". MAPEP does not provide an acceptance range.

^d A decimal point was misplaced in a unit conversion. If the conversion was done properly the result: 5.78 ± 0.93 Bq/L would have been within MAPEP's acceptance range.

TABLE A-7. Interlaboratory Comparison Crosscheck Program, Environmental Resource Associates (ERA)^a.
MRAD-38 Study

Lab Code ^b	Date	Analysis	Concentration ^a			
			Laboratory Result	ERA Value ^c	Acceptance Limits ^d	Acceptance
ERAP-599	3/20/2023	Cs-134	139	153	99 - 188	Pass
ERAP-599	3/20/2023	Cs-137	970	892	733 - 1170	Pass
ERAP-599	3/20/2023	Co-60	474	467	397 - 593	Pass
ERAP-599	3/20/2023	Mn-54	< 3.3	< 35.0	0.00 - 35.0	Pass
ERAP-599	3/20/2023	Zn-65	1280	1110	910 - 1700	Pass
ERAP-599	3/20/2023	Sr-90	143	137	87 - 187	Pass
ERAP-598	3/20/2023	Gross Alpha	72.7	76.8	40.1 - 127	Pass
ERAP-598	3/20/2023	Gross Beta	35.0	32.8	19.9 - 49.6	Pass

^a Results obtained by Microbac Laboratories - Northbrook as a participant in the crosscheck program for proficiency testing administered by Environmental Resource Associates, serving as a replacement for studies conducted previously by the Environmental Measurements Laboratory Quality Assessment Program (EML).

^b Laboratory code ERAP (air filter). Results are reported in units of (pCi/Filter).

^c The ERA Assigned values for the air filter standards are equal to 100% of the parameter present in the standard as determined by the gravimetric and/or volumetric measurements made during standard preparation as applicable.

^d The acceptance limits are established per the guidelines contained in the Department of Energy (DOE) report EML-564, Analysis of Environmental Measurements Laboratory (EML) Quality Assessment Program (QAP) Data Determination of Operational Criteria and Control Limits for Performance Evaluation Purposes or ERA's SOP for the generation of Performance Acceptance Limits.



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Appendix B

Data Reporting Conventions

APPENDIX B. DATA REPORTING CONVENTIONS

Data Reporting Conventions

1.0. All activities, except gross alpha and gross beta, are decay corrected to collection time or the end of the collection period.

2.0. Single Measurements

Each single measurement is reported as follows: $x \pm s$
where: x = value of the measurement;
 s = 2σ counting uncertainty (corresponding to the 95% confidence level).

In cases where the activity is less than the lower limit of detection L , it is reported as: $< L$,
where L = the lower limit of detection based on 4.66σ uncertainty for a background sample.

3.0. Duplicate analyses

If duplicate analyses are reported, the convention is as follows. :

3.1 Individual results: For two analysis results; $x_1 \pm s_1$ and $x_2 \pm s_2$

Reported result: $x \pm s$; where $x = (1/2)(x_1 + x_2)$ and $s = (1/2)\sqrt{s_1^2 + s_2^2}$

3.2. Individual results: $< L_1, < L_2$ Reported result: $< L$, where L = lower of L_1 and L_2

3.3. Individual results: $x \pm s, < L$ Reported result: $x \pm s$ if $x \geq L$; $< L$ otherwise.

4.0. Computation of Averages and Standard Deviations

4.1 Averages and standard deviations listed in the tables are computed from all of the individual measurements over the period averaged; for example, an annual standard deviation would not be the average of quarterly standard deviations. The average $\bar{x}$ and standard deviation "s" of a set of n numbers $x_1, x_2, \dots, x_n$ are defined as follows:

$$\bar{x} = \frac{1}{n} \sum x \qquad s = \sqrt{\frac{\sum (x - \bar{x})^2}{n-1}}$$

4.2 Values below the highest lower limit of detection are not included in the average.

4.3 If all values in the averaging group are less than the highest LLD, the highest LLD is reported.

4.4 If all but one of the values are less than the highest LLD, the single value x and associated two sigma error is reported.

4.5 In rounding off, the following rules are followed:

4.5.1. If the number following those to be retained is less than 5, the number is dropped, and the retained numbers are kept unchanged. As an example, 11.443 is rounded off to 11.44.

4.5.2. If the number following those to be retained is equal to or greater than 5, the number is dropped and the last retained number is raised by 1. As an example, 11.445 is rounded off to 11.45.

Appendix C. NON-RADIOLOGICAL MONITORING PROGRAM

1.0. Introduction

Union Electric Company Callaway Plant, d.b.a. Ameren Missouri Callaway Energy Center, in accordance with federal regulations and a desire to maintain the quality of the local environment around Callaway Plant has implemented an Environmental Protection Plan, (EPP) contained in Appendix B of the Callaway Plant Operating License.

The objective of the EPP is to provide for protection of non-radiological environmental values during operation of the Callaway Plant.

This report describes the conduct of the EPP for the Callaway Plant during 2023.

2.0. Unusual or Important Events

No unusual or important events reportable under the EPP Section 4.1 were identified during 2023.

3.0. EPP Non-compliances

During 2023, there was zero non-compliance with the EPP.

4.0. Nonroutine Reports

There were no nonroutine reports submitted in accordance with the EPP, Section 5.4.2 in 2023.

5.0. Plant Design and Operation Environmental Evaluations.

This section lists all changes in the plant design, operation, tests or experiments installed during 2023, which could have involved a potentially significant unreviewed environmental question in accordance with section 3.1 of Appendix B.

During 2023, no major plant changes were completed that could have involved a potentially significant unreviewed environmental question.

APPENDIX D

Sampling Location Maps

Figure D-1. Radiological Environmental Sampling Locations 1, 2, 3, mile radius from site location.

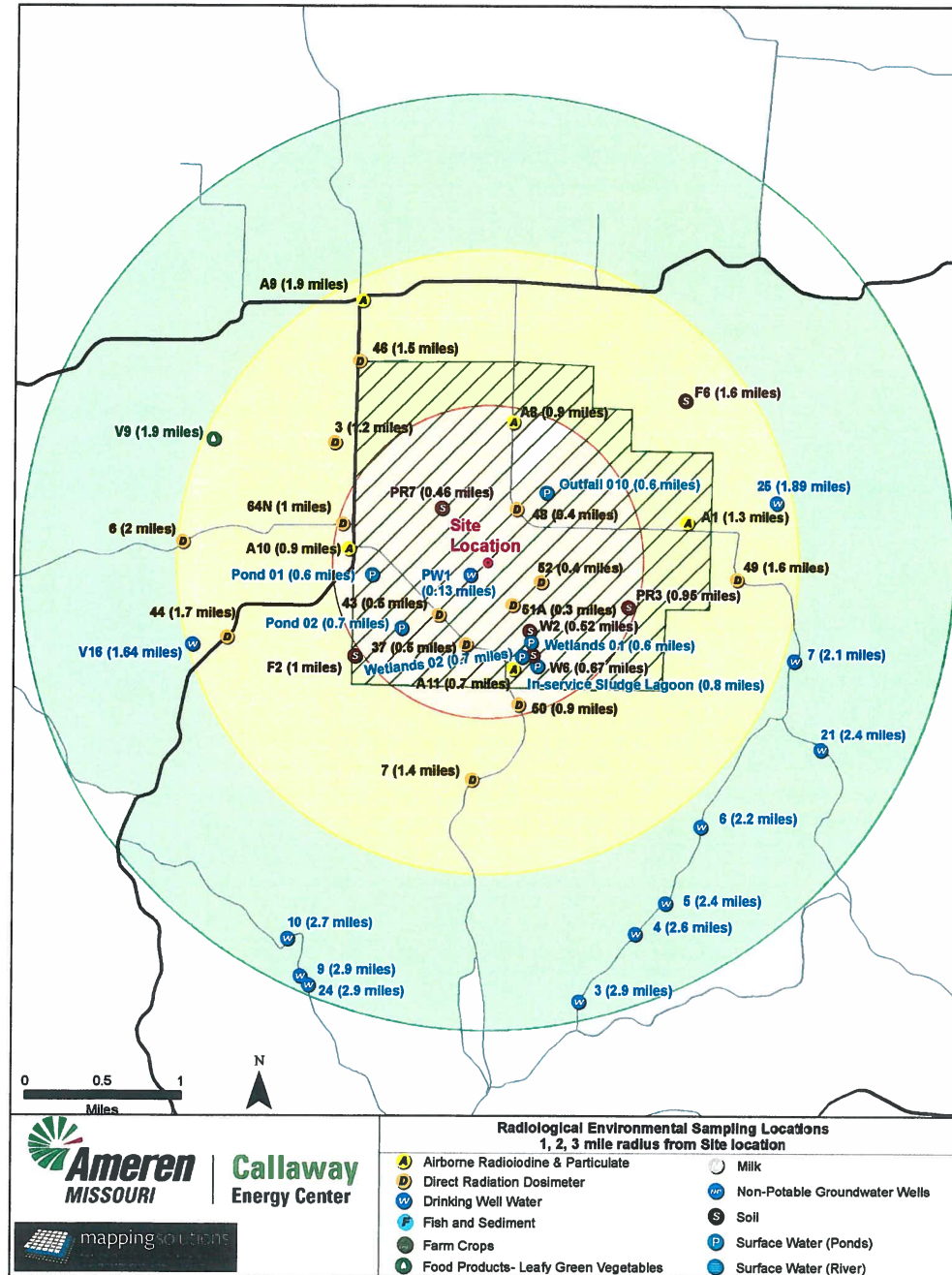


Figure D-2. Radiological Environmental Sampling Locations 3, 4, 5, 6 mile radius from site location.

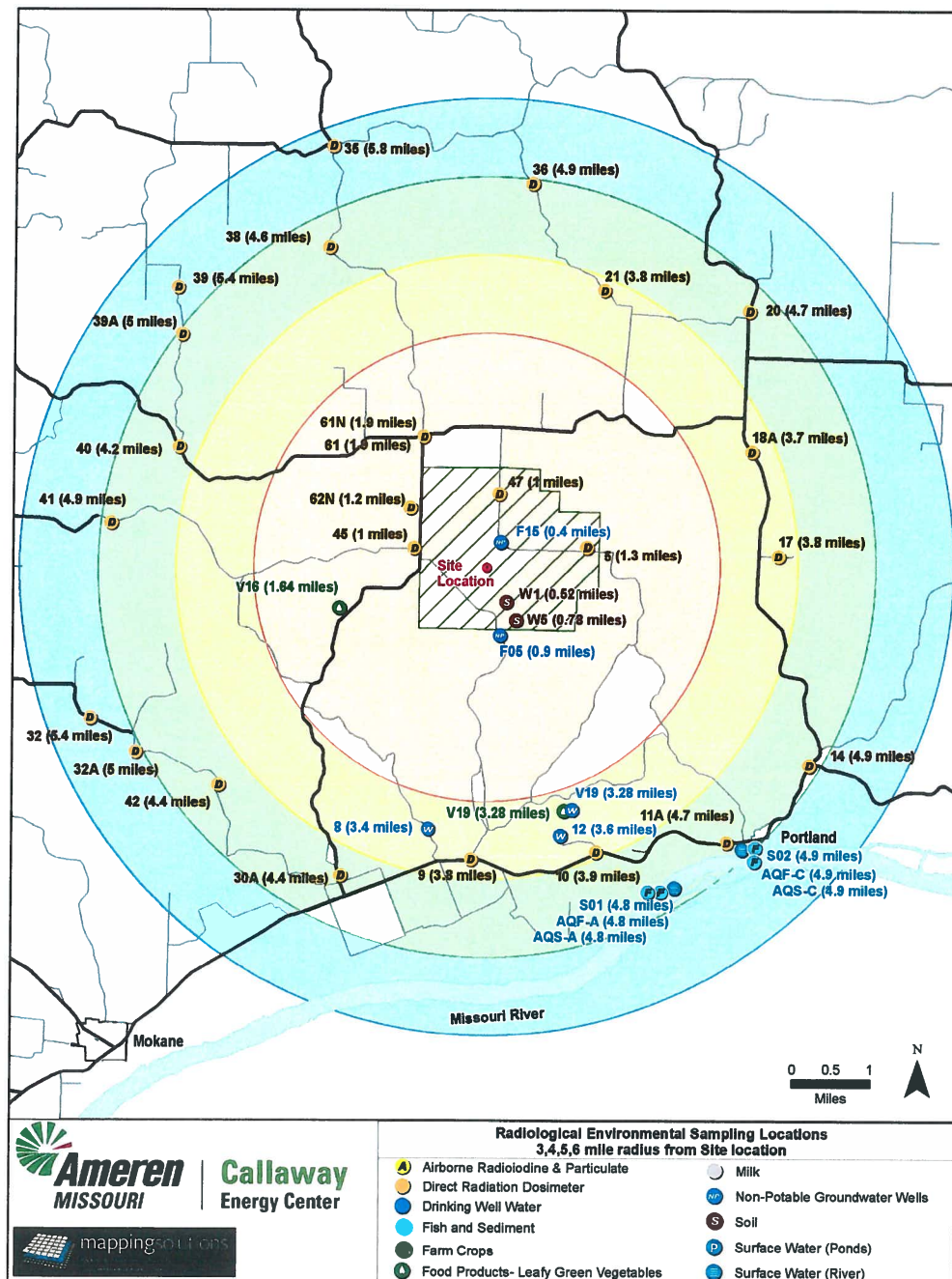


Figure D-3. Radiological Environmental Sampling Locations 5, 10, 15 mile radius from site location.

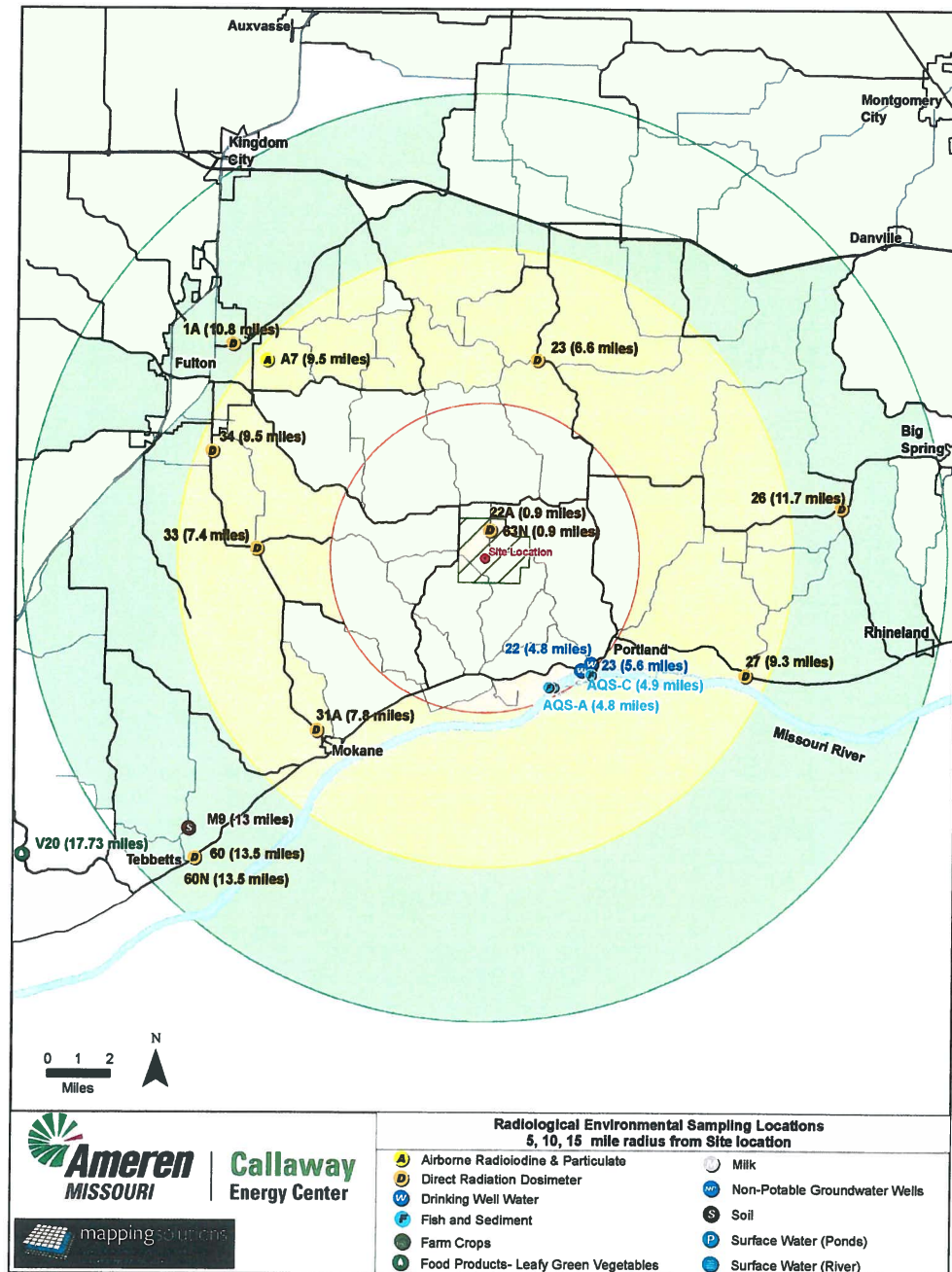


Figure D-4. Non-Potable Groundwater Monitoring Wells, 600 ft radius from Site.

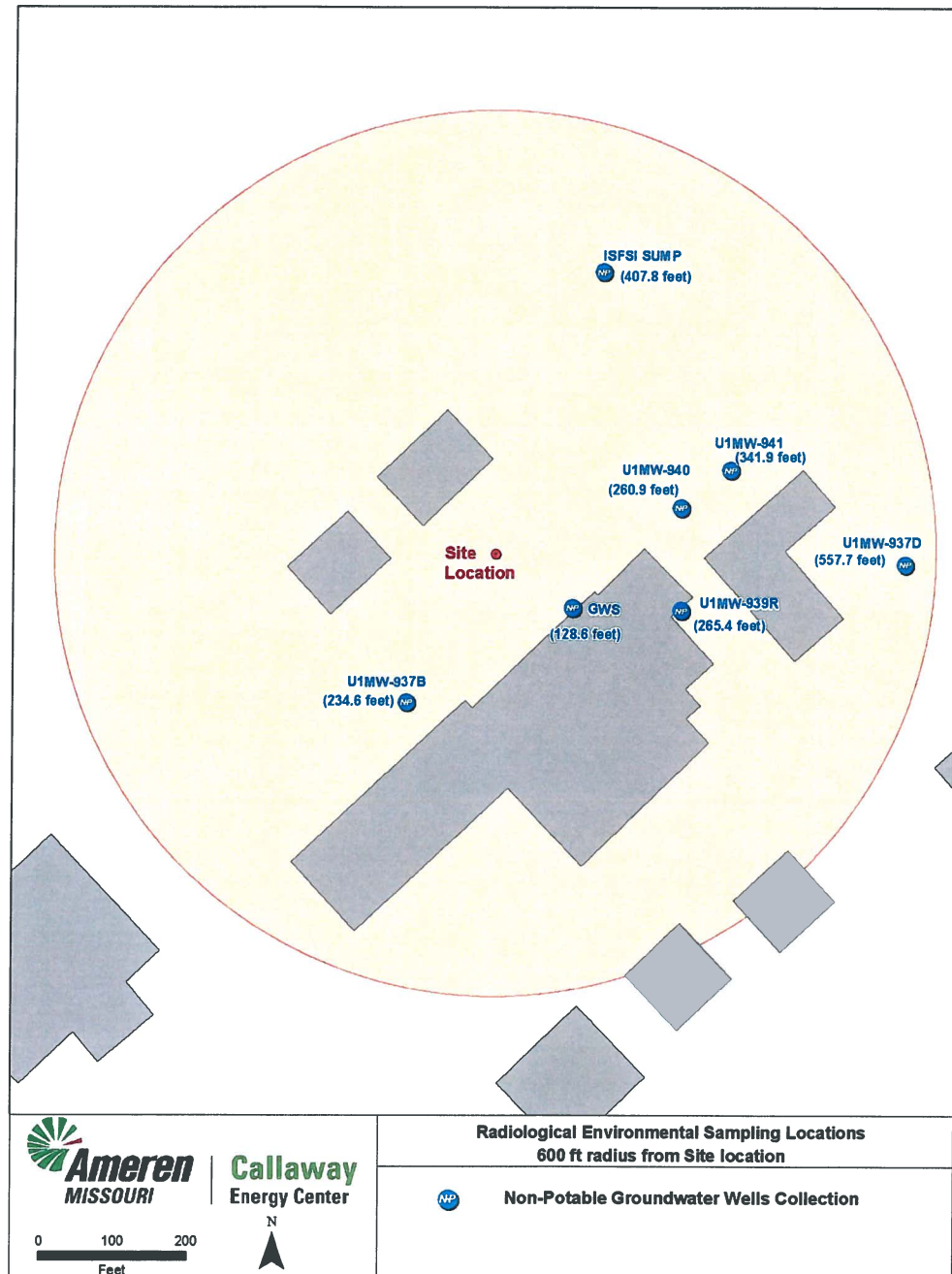
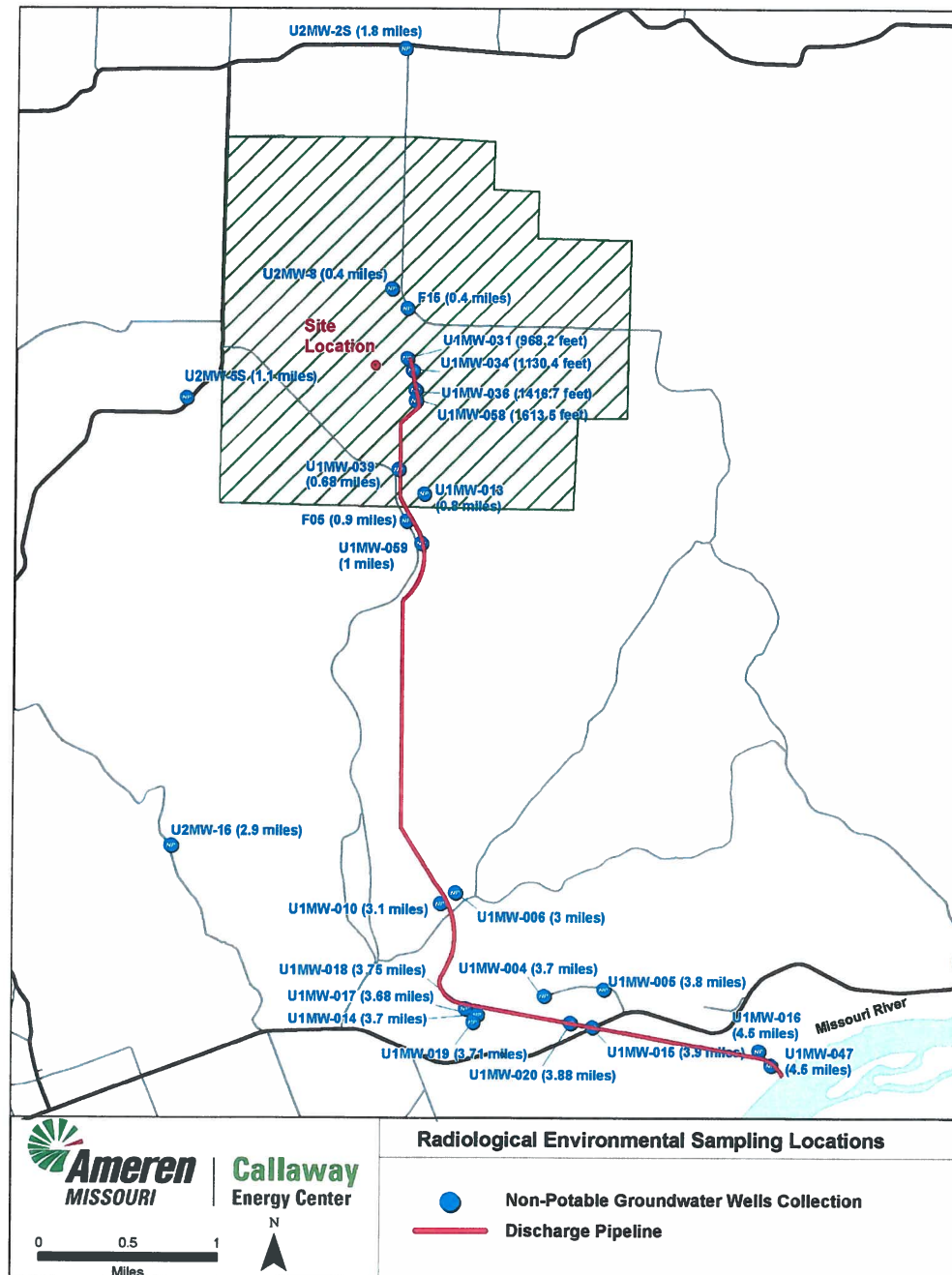


Figure D-5. Non-Potable Groundwater Monitoring Wells Collection.





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FULTON, MISSOURI

Docket Numbers 50-483 and 72-1045

ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT

to

THE UNITED STATES NUCLEAR REGULATORY COMMISSION

Part II

DATA TABULATIONS AND ANALYSES

January 1 to December 31, 2023

Prepared by

Microbac Laboratories - Northbrook

Submitted by

Union Electric Co.
dba Ameren Missouri

Project No. 8036

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1.0 INTRODUCTION

The following constitutes a supplement to the Annual Report for the Radiological Environmental Monitoring Program conducted at the Ameren Missouri, Callaway Energy Center, Fulton, Missouri in 2023. Results of completed analyses are presented in the attached tables.

For information regarding sampling locations, type and frequency of collection, and sample codes, refer to Part I, Tables 5.1 - 5.2 and the figures in Appendix D.

Analyses results from additional sampling may be found in Appendix A.

2.0 DATA TABLES

Table 1. Air particulates and charcoal cartridges, analyses for gamma-emitting isotopes and I-131^a.

Collection: Continuous, weekly exchange.
Units: pCi/m³

Location		CA-A-001							
		⁷ Be	⁵⁸ Co	⁶⁰ Co	⁹⁵ Zr	¹³⁴ Cs	¹³⁷ Cs	¹⁴⁰ BaLa	¹⁴⁴ Ce
Required LLDs		-	-	-	-	0.050	0.060	-	-
Date									
Collected	Vol.								
01-05-23	277	< 0.14	< 0.012	< 0.003	< 0.023	< 0.009	< 0.004	< 0.040	< 0.048
01-12-23	282	< 0.11	< 0.008	< 0.008	< 0.019	< 0.007	< 0.008	< 0.045	< 0.039
01-19-23	282	< 0.08	< 0.011	< 0.007	< 0.020	< 0.005	< 0.008	< 0.035	< 0.047
01-26-23	262	< 0.08	< 0.003	< 0.004	< 0.016	< 0.010	< 0.007	< 0.060	< 0.039
02-02-23	260	< 0.11	< 0.009	< 0.007	< 0.014	< 0.011	< 0.007	< 0.030	< 0.056
02-09-23	265	0.17 ± 0.09	< 0.006	< 0.006	< 0.011	< 0.009	< 0.009	< 0.014	< 0.049
02-16-23	261	0.15 ± 0.06	< 0.009	< 0.019	< 0.015	< 0.010	< 0.014	< 0.018	< 0.052
02-23-23	255	0.17 ± 0.09	< 0.007	< 0.009	< 0.015	< 0.009	< 0.008	< 0.016	< 0.037
03-02-23	258	< 0.07	< 0.008	< 0.009	< 0.013	< 0.011	< 0.007	< 0.009	< 0.038
03-09-23	258	< 0.16	< 0.007	< 0.022	< 0.036	< 0.011	< 0.018	< 0.132	< 0.073
03-16-23	256	< 0.06	< 0.006	< 0.005	< 0.011	< 0.004	< 0.003	< 0.047	< 0.020
03-23-23	260	< 0.17	< 0.019	< 0.013	< 0.025	< 0.015	< 0.011	< 0.054	< 0.051
03-30-23	258	< 0.11	< 0.011	< 0.019	< 0.020	< 0.011	< 0.016	< 0.033	< 0.057
04-06-23	257	< 0.17	< 0.011	< 0.010	< 0.022	< 0.012	< 0.011	< 0.018	< 0.048
04-13-23	262	< 0.16	< 0.008	< 0.014	< 0.027	< 0.015	< 0.015	< 0.033	< 0.069
04-20-23	259	0.24 ± 0.12	< 0.007	< 0.022	< 0.018	< 0.012	< 0.018	< 0.015	< 0.053
04-27-23	267	0.19 ± 0.10	< 0.012	< 0.007	< 0.020	< 0.011	< 0.004	< 0.007	< 0.051
05-04-23	262	0.23 ± 0.09	< 0.005	< 0.018	< 0.016	< 0.008	< 0.016	< 0.013	< 0.053
05-11-23	260	0.19 ± 0.09	< 0.005	< 0.005	< 0.011	< 0.007	< 0.008	< 0.012	< 0.042
05-18-23	260	0.24 ± 0.09	< 0.009	< 0.015	< 0.012	< 0.007	< 0.012	< 0.017	< 0.038
05-25-23	262	0.17 ± 0.09	< 0.009	< 0.008	< 0.015	< 0.007	< 0.006	< 0.027	< 0.037
06-01-23	264	0.18 ± 0.10	< 0.008	< 0.009	< 0.017	< 0.009	< 0.009	< 0.013	< 0.036
06-08-23	267	0.35 ± 0.13	< 0.010	< 0.009	< 0.022	< 0.010	< 0.007	< 0.047	< 0.041
06-15-23	259	0.21 ± 0.12	< 0.006	< 0.003	< 0.018	< 0.008	< 0.004	< 0.018	< 0.039
06-22-23	271	0.18 ± 0.09	< 0.008	< 0.011	< 0.019	< 0.007	< 0.005	< 0.014	< 0.035
06-29-23	271	0.22 ± 0.10	< 0.007	< 0.008	< 0.017	< 0.005	< 0.007	< 0.045	< 0.039

^a Iodine-131 concentrations are < 0.07 pCi/m³ unless noted otherwise.

Table 1. Air particulates and charcoal cartridges, analyses for gamma-emitting isotopes and I-131^a.

Collection: Continuous, weekly exchange.
Units: pCi/m³

Location		CA-A-001 (cont.)							
		⁷ Be	⁵⁸ Co	⁶⁰ Co	⁹⁵ Zr	¹³⁴ Cs	¹³⁷ Cs	¹⁴⁰ BaLa	¹⁴⁴ Ce
Required LLDs		-	-	-	-	0.050	0.060	-	-
Date									
Collected	Vol.								
07-06-23	266	< 0.10	< 0.010	< 0.005	< 0.024	< 0.009	< 0.007	< 0.137	< 0.045
07-13-23	270	< 0.12	< 0.010	< 0.008	< 0.017	< 0.008	< 0.008	< 0.068	< 0.039
07-20-23	265	< 0.10	< 0.006	< 0.005	< 0.022	< 0.011	< 0.005	< 0.049	< 0.042
07-27-23	269	0.26 ± 0.14	< 0.008	< 0.019	< 0.018	< 0.010	< 0.013	< 0.055	< 0.029
08-03-23	270	< 0.10	< 0.010	< 0.005	< 0.022	< 0.011	< 0.008	< 0.050	< 0.040
08-10-23	262	< 0.12	< 0.006	< 0.009	< 0.016	< 0.010	< 0.007	< 0.022	< 0.041
08-17-23	269	< 0.10	< 0.006	< 0.009	< 0.017	< 0.009	< 0.008	< 0.046	< 0.041
08-24-23	269	0.14 ± 0.08	< 0.008	< 0.005	< 0.015	< 0.007	< 0.006	< 0.019	< 0.039
08-31-23	266	< 0.08	< 0.008	< 0.004	< 0.015	< 0.011	< 0.008	< 0.033	< 0.039
09-07-23	272	< 0.09	< 0.009	< 0.009	< 0.017	< 0.009	< 0.009	< 0.038	< 0.037
09-14-23	274	< 0.08	< 0.009	< 0.006	< 0.012	< 0.010	< 0.006	< 0.023	< 0.041
09-21-23	275	0.19 ± 0.10	< 0.008	< 0.011	< 0.013	< 0.008	< 0.006	< 0.020	< 0.038
09-28-23	273	< 0.07	< 0.008	< 0.012	< 0.015	< 0.011	< 0.006	< 0.011	< 0.034
10-05-23	275	0.18 ± 0.08	< 0.005	< 0.015	< 0.012	< 0.007	< 0.012	< 0.030	< 0.027
10-12-23	281	< 0.06	< 0.009	< 0.007	< 0.013	< 0.007	< 0.006	< 0.031	< 0.038
10-19-23	278	0.15 ± 0.07	< 0.006	< 0.008	< 0.015	< 0.011	< 0.007	< 0.029	< 0.035
10-26-23	280	0.13 ± 0.07	< 0.008	< 0.009	< 0.016	< 0.010	< 0.006	< 0.012	< 0.037
11-02-23	275	< 0.07	< 0.006	< 0.009	< 0.013	< 0.010	< 0.004	< 0.014	< 0.033
11-08-23	324	0.19 ± 0.10	< 0.004	< 0.004	< 0.008	< 0.009	< 0.006	< 0.006	< 0.027
11-16-23	312	0.13 ± 0.07	< 0.005	< 0.003	< 0.013	< 0.009	< 0.005	< 0.027	< 0.031
11-22-23	232	< 0.08	< 0.007	< 0.009	< 0.018	< 0.012	< 0.005	< 0.035	< 0.049
11-30-23	314	0.14 ± 0.06	< 0.007	< 0.006	< 0.013	< 0.007	< 0.005	< 0.020	< 0.032
12-07-23	271	< 0.07	< 0.009	< 0.008	< 0.016	< 0.008	< 0.007	< 0.039	< 0.025
12-14-23	273	< 0.06	< 0.008	< 0.006	< 0.020	< 0.012	< 0.007	< 0.016	< 0.034
12-20-23	239	< 0.09	< 0.009	< 0.004	< 0.009	< 0.012	< 0.007	< 0.060	< 0.043
12-28-23	307	0.19 ± 0.08	< 0.008	< 0.009	< 0.011	< 0.009	< 0.006	< 0.058	< 0.033

^a Iodine-131 concentrations are < 0.07 pCi/m³ unless noted otherwise.

Table 1. Air particulates and charcoal cartridges, analyses for gamma-emitting isotopes and I-131^a.

Collection: Continuous, weekly exchange.

Units: pCi/m³

Location		CA-A-007							
		⁷ Be	⁵⁸ Co	⁶⁰ Co	⁹⁵ Zr	¹³⁴ Cs	¹³⁷ Cs	¹⁴⁰ BaLa	¹⁴⁴ Ce
Required LLDs		-	-	-	-	0.050	0.060	-	-
Date									
Collected	Vol.								
01-05-23	240	< 0.14	< 0.009	< 0.010	< 0.027	< 0.012	< 0.006	< 0.067	< 0.055
01-12-23	244	< 0.14	< 0.007	< 0.012	< 0.014	< 0.010	< 0.011	< 0.045	< 0.058
01-19-23	240	< 0.11	< 0.007	< 0.005	< 0.023	< 0.012	< 0.006	< 0.083	< 0.044
01-26-23	244	< 0.10	< 0.009	< 0.020	< 0.023	< 0.009	< 0.017	< 0.057	< 0.039
02-02-23	243	< 0.15	< 0.006	< 0.009	< 0.012	< 0.012	< 0.010	< 0.040	< 0.072
02-09-23	243	0.18 ± 0.07	< 0.015	< 0.011	< 0.011	< 0.011	< 0.009	< 0.038	< 0.057
02-16-23	240	< 0.12	< 0.007	< 0.007	< 0.017	< 0.010	< 0.010	< 0.016	< 0.057
02-23-23	232	< 0.09	< 0.008	< 0.010	< 0.019	< 0.012	< 0.010	< 0.031	< 0.046
03-01-23	234	< 0.13	< 0.010	< 0.006	< 0.017	< 0.009	< 0.011	< 0.014	< 0.042
03-09-23	232	< 0.19	< 0.021	< 0.014	< 0.036	< 0.015	< 0.013	< 0.156	< 0.069
03-16-23	230	0.09 ± 0.04	< 0.006	< 0.005	< 0.010	< 0.005	< 0.003	< 0.044	< 0.023
03-23-23	270	< 0.10	< 0.010	< 0.012	< 0.019	< 0.010	< 0.011	< 0.075	< 0.051
03-30-23	267	< 0.15	< 0.007	< 0.007	< 0.020	< 0.012	< 0.006	< 0.025	< 0.047
04-06-23	262	< 0.13	< 0.010	< 0.020	< 0.014	< 0.011	< 0.016	< 0.042	< 0.062
04-13-23	268	< 0.14	< 0.014	< 0.022	< 0.027	< 0.012	< 0.019	< 0.032	< 0.047
04-20-23	269	0.17 ± 0.05	< 0.003	< 0.004	< 0.007	< 0.004	< 0.003	< 0.003	< 0.020
04-27-23	273	0.18 ± 0.10	< 0.006	< 0.009	< 0.020	< 0.012	< 0.007	< 0.009	< 0.038
05-04-23	267	0.25 ± 0.11	< 0.010	< 0.007	< 0.010	< 0.010	< 0.007	< 0.025	< 0.039
05-11-23	271	< 0.04	< 0.007	< 0.017	< 0.015	< 0.007	< 0.013	< 0.017	< 0.042
05-18-23	264	0.19 ± 0.09	< 0.007	< 0.005	< 0.014	< 0.008	< 0.005	< 0.011	< 0.026
05-25-23	265	0.21 ± 0.11	< 0.006	< 0.005	< 0.012	< 0.006	< 0.008	< 0.027	< 0.040
06-01-23	241	0.16 ± 0.08	< 0.011	< 0.009	< 0.020	< 0.006	< 0.006	< 0.015	< 0.045
06-08-23	267	0.27 ± 0.11	< 0.011	< 0.009	< 0.019	< 0.011	< 0.006	< 0.030	< 0.044
06-15-23	241	0.17 ± 0.10	< 0.010	< 0.008	< 0.015	< 0.006	< 0.009	< 0.041	< 0.044
06-22-23	241	0.17 ± 0.09	< 0.006	< 0.004	< 0.021	< 0.010	< 0.007	< 0.019	< 0.035
06-29-23	237	0.20 ± 0.12	< 0.008	< 0.007	< 0.022	< 0.013	< 0.007	< 0.079	< 0.044

^a Iodine-131 concentrations are < 0.07 pCi/m³ unless noted otherwise.

Table 1. Air particulates and charcoal cartridges, analyses for gamma-emitting isotopes and I-131^a.

Collection: Continuous, weekly exchange.

Units: pCi/m³

Location		CA-A-007 (cont.)							
		⁷ Be	⁵⁸ Co	⁶⁰ Co	⁹⁵ Zr	¹³⁴ Cs	¹³⁷ Cs	¹⁴⁰ BaLa	¹⁴⁴ Ce
Required LLDs		-	-	-	-	0.050	0.060	-	-
Date									
Collected	Vol.								
07-06-23	236	< 0.10	< 0.011	< 0.005	< 0.026	< 0.009	< 0.009	< 0.126	< 0.044
07-13-23	233	< 0.16	< 0.011	< 0.008	< 0.022	< 0.012	< 0.009	< 0.079	< 0.047
07-20-23	272	< 0.09	< 0.007	< 0.009	< 0.018	< 0.010	< 0.005	< 0.083	< 0.038
07-27-23	276	< 0.14	< 0.009	< 0.004	< 0.022	< 0.011	< 0.010	< 0.044	< 0.034
08-03-23	277	< 0.09	< 0.006	< 0.006	< 0.015	< 0.010	< 0.008	< 0.049	< 0.036
08-10-23	254	< 0.08	< 0.008	< 0.008	< 0.016	< 0.010	< 0.009	< 0.028	< 0.037
08-17-23	243	< 0.08	< 0.010	< 0.007	< 0.018	< 0.012	< 0.006	< 0.024	< 0.042
08-24-23	293	0.13 ± 0.07	< 0.008	< 0.006	< 0.012	< 0.009	< 0.006	< 0.030	< 0.032
08-31-23	266	< 0.08	< 0.007	< 0.010	< 0.015	< 0.010	< 0.010	< 0.016	< 0.040
09-07-23	272	< 0.06	< 0.008	< 0.008	< 0.018	< 0.010	< 0.006	< 0.061	< 0.037
09-14-23	273	0.18 ± 0.09	< 0.010	< 0.011	< 0.017	< 0.009	< 0.009	< 0.040	< 0.038
09-21-23	276	0.17 ± 0.10	< 0.009	< 0.005	< 0.016	< 0.008	< 0.007	< 0.023	< 0.036
09-28-23	279	< 0.06	< 0.006	< 0.005	< 0.012	< 0.009	< 0.007	< 0.009	< 0.035
10-05-23	278	< 0.10	< 0.006	< 0.004	< 0.016	< 0.008	< 0.008	< 0.033	< 0.029
10-12-23	282	< 0.08	< 0.007	< 0.007	< 0.014	< 0.011	< 0.008	< 0.022	< 0.037
10-19-23	282	0.14 ± 0.08	< 0.007	< 0.007	< 0.015	< 0.010	< 0.008	< 0.014	< 0.039
10-26-23	277	0.14 ± 0.08	< 0.006	< 0.010	< 0.015	< 0.010	< 0.006	< 0.020	< 0.035
11-02-23	279	< 0.07	< 0.006	< 0.006	< 0.012	< 0.008	< 0.008	< 0.014	< 0.038
11-08-23	235	< 0.12	< 0.008	< 0.006	< 0.016	< 0.012	< 0.006	< 0.007	< 0.049
11-16-23	316	< 0.07	< 0.007	< 0.004	< 0.012	< 0.005	< 0.006	< 0.022	< 0.033
11-22-23	235	< 0.11	< 0.009	< 0.009	< 0.018	< 0.012	< 0.008	< 0.041	< 0.046
11-30-23	317	0.14 ± 0.06	< 0.007	< 0.005	< 0.013	< 0.007	< 0.005	< 0.020	< 0.031
12-07-23	273	< 0.10	< 0.012	< 0.007	< 0.017	< 0.011	< 0.006	< 0.087	< 0.039
12-14-23	276	< 0.09	< 0.010	< 0.005	< 0.018	< 0.011	< 0.007	< 0.059	< 0.040
12-20-23	241	< 0.08	< 0.011	< 0.010	< 0.017	< 0.012	< 0.006	< 0.042	< 0.041
12-28-23	309	0.17 ± 0.09	< 0.007	< 0.004	< 0.011	< 0.010	< 0.006	< 0.015	< 0.031

^a Iodine-131 concentrations are < 0.07 pCi/m³ unless noted otherwise.

Table 1. Air particulates and charcoal cartridges, analyses for gamma-emitting isotopes and I-131^a.

Collection: Continuous, weekly exchange.

Units: pCi/m³

Location		CA-A-008							
		⁷ Be	⁵⁸ Co	⁶⁰ Co	⁹⁵ Zr	¹³⁴ Cs	¹³⁷ Cs	¹⁴⁰ BaLa	¹⁴⁴ Ce
Required LLDs		-	-	-	-	0.050	0.060	-	-
Date									
Collected	Vol.								
01-05-23	278	< 0.11	< 0.007	< 0.005	< 0.020	< 0.007	< 0.007	< 0.022	< 0.026
01-12-23	285	< 0.12	< 0.006	< 0.019	< 0.017	< 0.010	< 0.015	< 0.036	< 0.054
01-19-23	281	< 0.09	< 0.006	< 0.010	< 0.019	< 0.010	< 0.007	< 0.051	< 0.034
01-26-23	284	< 0.12	< 0.011	< 0.011	< 0.013	< 0.008	< 0.004	< 0.021	< 0.033
02-02-23	284	< 0.12	< 0.008	< 0.019	< 0.019	< 0.010	< 0.014	< 0.035	< 0.044
02-09-23	282	0.13 ± 0.05	< 0.004	< 0.004	< 0.005	< 0.004	< 0.004	< 0.008	< 0.021
02-16-23	283	< 0.10	< 0.004	< 0.009	< 0.012	< 0.008	< 0.008	< 0.017	< 0.039
02-23-23	276	0.19 ± 0.08	< 0.008	< 0.003	< 0.015	< 0.010	< 0.008	< 0.013	< 0.040
03-02-23	266	< 0.09	< 0.007	< 0.007	< 0.013	< 0.007	< 0.005	< 0.019	< 0.035
03-09-23	265	< 0.15	< 0.014	< 0.011	< 0.025	< 0.011	< 0.007	< 0.144	< 0.040
03-16-23	264	< 0.13	< 0.006	< 0.017	< 0.012	< 0.009	< 0.012	< 0.069	< 0.040
03-23-23	265	< 0.12	< 0.012	< 0.019	< 0.017	< 0.009	< 0.014	< 0.077	< 0.032
03-30-23	262	< 0.13	< 0.012	< 0.011	< 0.015	< 0.011	< 0.011	< 0.051	< 0.041
04-06-23	259	< 0.14	< 0.009	< 0.007	< 0.023	< 0.012	< 0.008	< 0.041	< 0.056
04-13-23	260	< 0.15	< 0.011	< 0.009	< 0.013	< 0.012	< 0.008	< 0.016	< 0.076
04-20-23	253	0.14 ± 0.04	< 0.004	< 0.005	< 0.004	< 0.004	< 0.003	< 0.011	< 0.023
04-27-23	251	< 0.10	< 0.012	< 0.012	< 0.025	< 0.011	< 0.006	< 0.015	< 0.039
05-04-23	243	0.35 ± 0.14	< 0.010	< 0.006	< 0.018	< 0.011	< 0.008	< 0.016	< 0.047
05-11-23	245	0.31 ± 0.16	< 0.008	< 0.007	< 0.017	< 0.010	< 0.008	< 0.023	< 0.053
05-18-23	244	< 0.12	< 0.006	< 0.005	< 0.010	< 0.009	< 0.005	< 0.027	< 0.048
05-25-23	244	< 0.08	< 0.010	< 0.009	< 0.022	< 0.010	< 0.006	< 0.046	< 0.041
06-01-23	242	< 0.09	< 0.007	< 0.005	< 0.020	< 0.010	< 0.007	< 0.021	< 0.042
06-08-23	242	0.24 ± 0.13	< 0.011	< 0.010	< 0.025	< 0.011	< 0.008	< 0.088	< 0.039
06-15-23	239	0.16 ± 0.09	< 0.007	< 0.009	< 0.016	< 0.013	< 0.008	< 0.041	< 0.042
06-22-23	242	< 0.08	< 0.009	< 0.011	< 0.020	< 0.012	< 0.006	< 0.020	< 0.041
06-29-23	241	< 0.12	< 0.009	< 0.008	< 0.022	< 0.012	< 0.007	< 0.030	< 0.039

^a Iodine-131 concentrations are < 0.07 pCi/m³ unless noted otherwise.

Table 1. Air particulates and charcoal cartridges, analyses for gamma-emitting isotopes and I-131^a.

Collection: Continuous, weekly exchange.
Units: pCi/m³

Location		CA-A-008 (cont.)							
		⁷ Be	⁵⁸ Co	⁶⁰ Co	⁹⁵ Zr	¹³⁴ Cs	¹³⁷ Cs	¹⁴⁰ BaLa	¹⁴⁴ Ce
Required LLDs		-	-	-	-	0.050	0.060	-	-
Date									
Collected	Vol.								
07-06-23	234	< 0.11	< 0.009	< 0.009	< 0.022	< 0.011	< 0.008	< 0.251	< 0.048
07-13-23	239	< 0.13	< 0.014	< 0.007	< 0.025	< 0.011	< 0.006	< 0.173	< 0.045
07-20-23	234	< 0.11	< 0.018	< 0.009	< 0.023	< 0.012	< 0.009	< 0.058	< 0.047
07-27-23	238	< 0.15	< 0.009	< 0.005	< 0.020	< 0.014	< 0.008	< 0.047	< 0.041
08-03-23	236	< 0.09	< 0.011	< 0.009	< 0.020	< 0.009	< 0.010	< 0.082	< 0.042
08-10-23	234	< 0.12	< 0.010	< 0.009	< 0.022	< 0.012	< 0.007	< 0.028	< 0.045
08-17-23	232	< 0.10	< 0.008	< 0.006	< 0.020	< 0.015	< 0.008	< 0.054	< 0.043
08-24-23	258	< 0.08	< 0.003	< 0.007	< 0.013	< 0.010	< 0.009	< 0.031	< 0.040
08-31-23	249	< 0.08	< 0.008	< 0.007	< 0.016	< 0.008	< 0.008	< 0.015	< 0.042
09-07-23	258	0.25 ± 0.12	< 0.007	< 0.004	< 0.013	< 0.013	< 0.008	< 0.077	< 0.042
09-14-23	259	0.18 ± 0.09	< 0.009	< 0.007	< 0.018	< 0.011	< 0.006	< 0.034	< 0.043
09-21-23	255	< 0.10	< 0.009	< 0.005	< 0.015	< 0.010	< 0.005	< 0.025	< 0.042
09-28-23	260	0.20 ± 0.09	< 0.006	< 0.007	< 0.018	< 0.010	< 0.006	< 0.010	< 0.042
10-05-23	286	0.19 ± 0.10	< 0.011	< 0.003	< 0.018	< 0.007	< 0.008	< 0.031	< 0.036
10-12-23	321	< 0.07	< 0.006	< 0.005	< 0.012	< 0.009	< 0.007	< 0.016	< 0.031
10-19-23	348	0.14 ± 0.07	< 0.005	< 0.002	< 0.012	< 0.008	< 0.006	< 0.027	< 0.028
10-26-23	272	0.14 ± 0.08	< 0.006	< 0.008	< 0.014	< 0.009	< 0.008	< 0.012	< 0.038
11-02-23	273	< 0.05	< 0.009	< 0.010	< 0.017	< 0.010	< 0.006	< 0.018	< 0.038
11-08-23	234	0.14 ± 0.08	< 0.004	< 0.006	< 0.011	< 0.007	< 0.006	< 0.007	< 0.042
11-16-23	313	0.19 ± 0.09	< 0.007	< 0.008	< 0.012	< 0.006	< 0.007	< 0.016	< 0.028
11-22-23	233	< 0.09	< 0.008	< 0.012	< 0.019	< 0.011	< 0.006	< 0.058	< 0.056
11-30-23	315	0.16 ± 0.10	< 0.006	< 0.008	< 0.013	< 0.008	< 0.005	< 0.025	< 0.034
12-07-23	272	< 0.10	< 0.009	< 0.006	< 0.017	< 0.012	< 0.008	< 0.064	< 0.040
12-14-23	276	< 0.09	< 0.006	< 0.009	< 0.016	< 0.010	< 0.008	< 0.069	< 0.035
12-20-23	240	< 0.10	< 0.010	< 0.005	< 0.017	< 0.012	< 0.006	< 0.060	< 0.041
12-28-23	307	0.17 ± 0.08	< 0.007	< 0.009	< 0.010	< 0.009	< 0.006	< 0.038	< 0.033

^a Iodine-131 concentrations are < 0.07 pCi/m³ unless noted otherwise.

Table 1. Air particulates and charcoal cartridges, analyses for gamma-emitting isotopes and I-131^a.

Collection: Continuous, weekly exchange.
Units: pCi/m³

Location		CA-A-009							
		⁷ Be	⁵⁸ Co	⁶⁰ Co	⁹⁵ Zr	¹³⁴ Cs	¹³⁷ Cs	¹⁴⁰ BaLa	¹⁴⁴ Ce
Required LLDs		-	-	-	-	0.050	0.060	-	-
Date									
Collected	Vol.								
01-05-23	262	< 0.10	< 0.005	< 0.009	< 0.019	< 0.008	< 0.007	< 0.049	< 0.053
01-12-23	268	< 0.09	< 0.010	< 0.007	< 0.024	< 0.009	< 0.009	< 0.016	< 0.042
01-19-23	266	< 0.09	< 0.010	< 0.008	< 0.019	< 0.010	< 0.007	< 0.066	< 0.036
01-26-23	268	< 0.13	< 0.010	< 0.007	< 0.015	< 0.009	< 0.009	< 0.045	< 0.043
02-02-23	269	< 0.13	< 0.008	< 0.006	< 0.016	< 0.009	< 0.005	< 0.014	< 0.050
02-09-23	266	0.15 ± 0.04	< 0.004	< 0.005	< 0.007	< 0.004	< 0.003	< 0.013	< 0.019
02-16-23	268	0.12 ± 0.04	< 0.004	< 0.003	< 0.006	< 0.004	< 0.005	< 0.006	< 0.015
02-23-23	261	< 0.08	< 0.005	< 0.007	< 0.012	< 0.011	< 0.009	< 0.028	< 0.039
03-02-23	269	< 0.09	< 0.009	< 0.008	< 0.018	< 0.008	< 0.006	< 0.078	< 0.034
03-09-23	267	< 0.17	< 0.009	< 0.005	< 0.021	< 0.011	< 0.006	< 0.054	< 0.056
03-16-23	267	< 0.11	< 0.010	< 0.008	< 0.022	< 0.009	< 0.007	< 0.070	< 0.046
03-23-23	268	< 0.19	< 0.017	< 0.008	< 0.026	< 0.014	< 0.014	< 0.110	< 0.066
03-30-23	266	< 0.14	< 0.013	< 0.020	< 0.019	< 0.010	< 0.016	< 0.049	< 0.051
04-06-23	263	< 0.14	< 0.009	< 0.009	< 0.016	< 0.013	< 0.005	< 0.038	< 0.045
04-13-23	268	0.23 ± 0.13	< 0.012	< 0.013	< 0.012	< 0.014	< 0.008	< 0.031	< 0.056
04-20-23	260	< 0.11	< 0.008	< 0.020	< 0.020	< 0.010	< 0.018	< 0.016	< 0.053
04-27-23	261	0.19 ± 0.10	< 0.009	< 0.010	< 0.010	< 0.010	< 0.008	< 0.008	< 0.055
05-04-23	256	< 0.12	< 0.011	< 0.008	< 0.012	< 0.011	< 0.008	< 0.030	< 0.038
05-11-23	259	< 0.13	< 0.009	< 0.011	< 0.022	< 0.009	< 0.006	< 0.018	< 0.029
05-18-23	261	< 0.14	< 0.009	< 0.009	< 0.026	< 0.011	< 0.009	< 0.015	< 0.035
05-25-23	261	0.18 ± 0.09	< 0.007	< 0.008	< 0.019	< 0.011	< 0.008	< 0.033	< 0.039
06-01-23	260	0.28 ± 0.13	< 0.007	< 0.007	< 0.019	< 0.011	< 0.005	< 0.072	< 0.040
06-08-23	258	0.22 ± 0.13	< 0.009	< 0.006	< 0.012	< 0.010	< 0.007	< 0.044	< 0.039
06-15-23	255	0.20 ± 0.09	< 0.009	< 0.009	< 0.015	< 0.010	< 0.007	< 0.032	< 0.035
06-22-23	260	0.15 ± 0.09	< 0.009	< 0.007	< 0.020	< 0.010	< 0.009	< 0.032	< 0.035
06-29-23	258	0.15 ± 0.09	< 0.006	< 0.005	< 0.019	< 0.006	< 0.007	< 0.061	< 0.038

^a Iodine-131 concentrations are < 0.07 pCi/m³ unless noted otherwise.

Table 1. Air particulates and charcoal cartridges, analyses for gamma-emitting isotopes and I-131^a.

Collection: Continuous, weekly exchange.
Units: pCi/m³

Location		CA-A-009 (cont.)							
		⁷ Be	⁵⁸ Co	⁶⁰ Co	⁹⁵ Zr	¹³⁴ Cs	¹³⁷ Cs	¹⁴⁰ BaLa	¹⁴⁴ Ce
Required LLDs		-	-	-	-	0.050	0.060	-	-
Date									
Collected	Vol.								
07-06-23	257	< 0.11	< 0.014	< 0.012	< 0.028	< 0.012	< 0.005	< 0.103	< 0.039
07-13-23	260	< 0.14	< 0.012	< 0.007	< 0.017	< 0.012	< 0.007	< 0.101	< 0.040
07-20-23	255	0.30 ± 0.11	< 0.010	< 0.007	< 0.021	< 0.012	< 0.009	< 0.059	< 0.044
07-27-23	260	< 0.11	< 0.009	< 0.010	< 0.019	< 0.012	< 0.008	< 0.043	< 0.034
08-03-23	260	0.22 ± 0.12	< 0.007	< 0.007	< 0.018	< 0.009	< 0.006	< 0.037	< 0.042
08-10-23	257	< 0.10	< 0.010	< 0.009	< 0.019	< 0.009	< 0.008	< 0.036	< 0.037
08-17-23	257	< 0.08	< 0.009	< 0.007	< 0.018	< 0.009	< 0.008	< 0.023	< 0.042
08-24-23	261	< 0.09	< 0.009	< 0.005	< 0.011	< 0.009	< 0.009	< 0.023	< 0.039
08-31-23	256	< 0.08	< 0.007	< 0.007	< 0.015	< 0.012	< 0.008	< 0.025	< 0.040
09-07-23	259	< 0.10	< 0.009	< 0.008	< 0.023	< 0.010	< 0.006	< 0.104	< 0.041
09-14-23	258	< 0.09	< 0.007	< 0.008	< 0.016	< 0.009	< 0.008	< 0.049	< 0.042
09-21-23	257	0.22 ± 0.11	< 0.008	< 0.008	< 0.017	< 0.010	< 0.009	< 0.017	< 0.040
09-28-23	259	0.16 ± 0.08	< 0.012	< 0.007	< 0.017	< 0.011	< 0.008	< 0.012	< 0.038
10-05-23	258	< 0.11	< 0.008	< 0.009	< 0.021	< 0.006	< 0.005	< 0.060	< 0.041
10-12-23	254	< 0.08	< 0.009	< 0.005	< 0.017	< 0.011	< 0.009	< 0.025	< 0.040
10-19-23	253	< 0.09	< 0.009	< 0.009	< 0.018	< 0.010	< 0.009	< 0.015	< 0.040
10-26-23	253	< 0.08	< 0.009	< 0.009	< 0.021	< 0.012	< 0.009	< 0.022	< 0.040
11-02-23	258	< 0.06	< 0.007	< 0.012	< 0.015	< 0.011	< 0.008	< 0.015	< 0.039
11-08-23	217	< 0.20	< 0.009	< 0.008	< 0.012	< 0.013	< 0.009	< 0.049	< 0.050
11-16-23	293	< 0.07	< 0.006	< 0.004	< 0.014	< 0.005	< 0.007	< 0.014	< 0.031
11-22-23	217	< 0.10	< 0.009	< 0.008	< 0.026	< 0.011	< 0.007	< 0.063	< 0.047
11-30-23	293	0.20 ± 0.12	< 0.006	< 0.018	< 0.018	< 0.010	< 0.014	< 0.024	< 0.047
12-07-23	252	< 0.06	< 0.009	< 0.009	< 0.014	< 0.011	< 0.009	< 0.043	< 0.044
12-14-23	254	< 0.13	< 0.009	< 0.010	< 0.023	< 0.011	< 0.008	< 0.075	< 0.039
12-20-23	239	< 0.09	< 0.011	< 0.007	< 0.018	< 0.012	< 0.007	< 0.025	< 0.046
12-28-23	306	0.17 ± 0.09	< 0.007	< 0.004	< 0.011	< 0.010	< 0.006	< 0.015	< 0.031

^a Iodine-131 concentrations are < 0.07 pCi/m³ unless noted otherwise.

Table 1. Air particulates and charcoal cartridges, analyses for gamma-emitting isotopes and I-131^a.

Collection: Continuous, weekly exchange.
Units: pCi/m³

Location		CA-A-010							
		⁷ Be	⁵⁸ Co	⁶⁰ Co	⁹⁵ Zr	¹³⁴ Cs	¹³⁷ Cs	¹⁴⁰ BaLa	¹⁴⁴ Ce
Required LLDs		-	-	-	-	0.050	0.060	-	-
Date									
Collected	Vol.								
01-05-23	274	< 0.11	< 0.008	< 0.009	< 0.012	< 0.009	< 0.007	< 0.045	< 0.047
01-12-23	264	< 0.08	< 0.008	< 0.005	< 0.021	< 0.012	< 0.007	< 0.043	< 0.045
01-19-23	264	< 0.09	< 0.011	< 0.008	< 0.019	< 0.010	< 0.008	< 0.031	< 0.036
01-26-23	271	< 0.08	< 0.007	< 0.006	< 0.022	< 0.010	< 0.006	< 0.060	< 0.034
02-02-23	273	< 0.13	< 0.010	< 0.007	< 0.010	< 0.011	< 0.012	< 0.030	< 0.037
02-09-23	273	0.16 ± 0.09	< 0.007	< 0.008	< 0.013	< 0.007	< 0.006	< 0.018	< 0.024
02-16-23	273	0.14 ± 0.04	< 0.003	< 0.005	< 0.007	< 0.004	< 0.004	< 0.009	< 0.017
02-23-23	274	0.21 ± 0.09	< 0.007	< 0.009	< 0.018	< 0.007	< 0.006	< 0.013	< 0.033
03-02-23	278	< 0.08	< 0.005	< 0.006	< 0.012	< 0.009	< 0.006	< 0.068	< 0.032
03-09-23	279	0.12 ± 0.05	< 0.006	< 0.005	< 0.009	< 0.004	< 0.005	< 0.048	< 0.016
03-16-23	278	< 0.13	< 0.011	< 0.008	< 0.014	< 0.009	< 0.008	< 0.057	< 0.044
03-23-23	279	< 0.13	< 0.009	< 0.020	< 0.015	< 0.009	< 0.014	< 0.048	< 0.037
03-30-23	278	< 0.15	< 0.013	< 0.005	< 0.013	< 0.010	< 0.006	< 0.022	< 0.058
04-06-23	275	0.27 ± 0.16	< 0.011	< 0.014	< 0.019	< 0.012	< 0.012	< 0.035	< 0.042
04-13-23	280	0.34 ± 0.14	< 0.006	< 0.010	< 0.017	< 0.013	< 0.014	< 0.022	< 0.064
04-20-23	276	0.21 ± 0.10	< 0.010	< 0.006	< 0.023	< 0.011	< 0.011	< 0.008	< 0.046
04-27-23	283	0.18 ± 0.09	< 0.008	< 0.005	< 0.014	< 0.009	< 0.007	< 0.017	< 0.048
05-04-23	277	0.19 ± 0.11	< 0.005	< 0.006	< 0.016	< 0.009	< 0.008	< 0.019	< 0.048
05-11-23	279	0.24 ± 0.11	< 0.011	< 0.006	< 0.015	< 0.009	< 0.004	< 0.016	< 0.043
05-18-23	279	< 0.10	< 0.008	< 0.004	< 0.015	< 0.009	< 0.006	< 0.014	< 0.036
05-25-23	279	0.17 ± 0.10	< 0.006	< 0.009	< 0.018	< 0.010	< 0.006	< 0.058	< 0.038
06-01-23	279	0.32 ± 0.14	< 0.009	< 0.006	< 0.017	< 0.008	< 0.009	< 0.027	< 0.037
06-08-23	278	0.39 ± 0.13	< 0.008	< 0.007	< 0.013	< 0.010	< 0.007	< 0.029	< 0.037
06-15-23	274	0.27 ± 0.12	< 0.008	< 0.008	< 0.018	< 0.008	< 0.008	< 0.023	< 0.039
06-22-23	277	0.20 ± 0.10	< 0.010	< 0.005	< 0.015	< 0.009	< 0.003	< 0.045	< 0.037
06-29-23	273	< 0.08	< 0.004	< 0.004	< 0.016	< 0.009	< 0.006	< 0.047	< 0.033

^a Iodine-131 concentrations are < 0.07 pCi/m³ unless noted otherwise.

Table 1. Air particulates and charcoal cartridges, analyses for gamma-emitting isotopes and I-131^a.

Collection: Continuous, weekly exchange.
Units: pCi/m³

Location		CA-A-010 (cont.)							
		⁷ Be	⁵⁸ Co	⁶⁰ Co	⁹⁵ Zr	¹³⁴ Cs	¹³⁷ Cs	¹⁴⁰ BaLa	¹⁴⁴ Ce
Required LLDs		-	-	-	-	0.050	0.060	-	-
Date									
Collected	Vol.								
07-06-23	272	< 0.12	< 0.008	< 0.009	< 0.021	< 0.009	< 0.006	< 0.140	< 0.042
07-13-23	277	< 0.10	< 0.008	< 0.005	< 0.021	< 0.011	< 0.006	< 0.096	< 0.040
07-30-23	270	< 0.11	< 0.007	< 0.010	< 0.023	< 0.010	< 0.006	< 0.051	< 0.038
07-27-23	272	< 0.09	< 0.009	< 0.009	< 0.015	< 0.009	< 0.006	< 0.051	< 0.039
08-03-23	267	0.16 ± 0.09	< 0.009	< 0.010	< 0.017	< 0.007	< 0.007	< 0.052	< 0.038
08-10-23	263	< 0.13	< 0.010	< 0.025	< 0.018	< 0.013	< 0.018	< 0.021	< 0.046
08-17-23	261	< 0.07	< 0.007	< 0.013	< 0.019	< 0.010	< 0.007	< 0.056	< 0.038
08-24-23	258	< 0.08	< 0.009	< 0.011	< 0.018	< 0.007	< 0.006	< 0.019	< 0.037
08-31-23	254	< 0.08	< 0.008	< 0.007	< 0.019	< 0.011	< 0.007	< 0.026	< 0.036
09-07-23	261	0.17 ± 0.10	< 0.010	< 0.008	< 0.022	< 0.011	< 0.005	< 0.049	< 0.041
09-14-23	266	0.24 ± 0.11	< 0.006	< 0.010	< 0.016	< 0.012	< 0.007	< 0.048	< 0.040
09-21-23	266	0.21 ± 0.11	< 0.007	< 0.010	< 0.017	< 0.010	< 0.008	< 0.034	< 0.044
09-28-23	266	0.15 ± 0.08	< 0.006	< 0.008	< 0.015	< 0.011	< 0.007	< 0.010	< 0.039
10-05-23	267	0.22 ± 0.13	< 0.008	< 0.009	< 0.019	< 0.009	< 0.007	< 0.028	< 0.040
10-12-23	267	< 0.12	< 0.011	< 0.006	< 0.019	< 0.010	< 0.009	< 0.025	< 0.062
10-19-23	269	< 0.07	< 0.010	< 0.009	< 0.017	< 0.010	< 0.008	< 0.031	< 0.035
10-26-23	266	0.19 ± 0.10	< 0.007	< 0.011	< 0.018	< 0.012	< 0.006	< 0.015	< 0.040
11-02-23	271	< 0.07	< 0.008	< 0.009	< 0.012	< 0.010	< 0.007	< 0.015	< 0.036
11-08-23	246	< 0.13	< 0.008	< 0.007	< 0.024	< 0.011	< 0.010	< 0.043	< 0.043
11-16-23	330	0.15 ± 0.09	< 0.004	< 0.009	< 0.013	< 0.007	< 0.005	< 0.031	< 0.028
11-22-23	268	< 0.08	< 0.009	< 0.006	< 0.020	< 0.012	< 0.007	< 0.036	< 0.038
11-30-23	338	< 0.08	< 0.006	< 0.006	< 0.012	< 0.008	< 0.005	< 0.014	< 0.030
12-07-23	291	< 0.08	< 0.008	< 0.007	< 0.015	< 0.008	< 0.006	< 0.043	< 0.034
12-14-23	292	< 0.08	< 0.009	< 0.006	< 0.012	< 0.011	< 0.006	< 0.066	< 0.041
12-20-23	256	< 0.07	< 0.010	< 0.008	< 0.016	< 0.014	< 0.008	< 0.040	< 0.039
12-28-23	326	0.16 ± 0.09	< 0.008	< 0.004	< 0.010	< 0.008	< 0.006	< 0.026	< 0.032

^a Iodine-131 concentrations are < 0.07 pCi/m³ unless noted otherwise.

Table 1. Air particulates and charcoal cartridges, analyses for gamma-emitting isotopes and I-131^a.

Collection: Continuous, weekly exchange.
Units: pCi/m³

Location		CA-A-011							
		⁷ Be	⁵⁸ Co	⁶⁰ Co	⁹⁵ Zr	¹³⁴ Cs	¹³⁷ Cs	¹⁴⁰ BaLa	¹⁴⁴ Ce
Required LLDs		-	-	-	-	0.050	0.060	-	-
Date									
Collected	Vol.								
01-05-23	303	< 0.11	< 0.006	< 0.006	< 0.019	< 0.008	< 0.006	< 0.047	< 0.041
01-12-23	309	< 0.07	< 0.009	< 0.007	< 0.012	< 0.009	< 0.007	< 0.047	< 0.032
01-19-23	289	< 0.08	< 0.009	< 0.006	< 0.015	< 0.006	< 0.006	< 0.050	< 0.031
01-26-23	289	< 0.09	< 0.006	< 0.018	< 0.013	< 0.008	< 0.014	< 0.037	< 0.048
02-02-23	289	< 0.10	< 0.004	< 0.016	< 0.009	< 0.008	< 0.012	< 0.025	< 0.039
02-09-23	292	0.17 ± 0.09	< 0.005	< 0.007	< 0.014	< 0.007	< 0.004	< 0.023	< 0.041
02-16-23	295	0.22 ± 0.11	< 0.008	< 0.006	< 0.012	< 0.010	< 0.005	< 0.041	< 0.036
02-23-23	287	< 0.07	< 0.007	< 0.008	< 0.014	< 0.010	< 0.008	< 0.021	< 0.034
03-02-23	288	< 0.08	< 0.007	< 0.006	< 0.013	< 0.010	< 0.004	< 0.033	< 0.031
03-09-23	283	0.10 ± 0.04	< 0.005	< 0.007	< 0.007	< 0.003	< 0.005	< 0.033	< 0.016
03-16-23	274	< 0.15	< 0.012	< 0.010	< 0.021	< 0.010	< 0.009	< 0.130	< 0.048
03-23-23	277	< 0.11	< 0.009	< 0.004	< 0.011	< 0.008	< 0.008	< 0.029	< 0.036
03-30-23	280	< 0.14	< 0.011	< 0.010	< 0.024	< 0.009	< 0.010	< 0.051	< 0.053
04-06-23	278	< 0.12	< 0.010	< 0.020	< 0.016	< 0.010	< 0.017	< 0.028	< 0.041
04-13-23	286	< 0.14	< 0.015	< 0.009	< 0.016	< 0.012	< 0.006	< 0.027	< 0.043
04-20-23	242	0.27 ± 0.13	< 0.009	< 0.009	< 0.015	< 0.011	< 0.013	< 0.017	< 0.055
04-27-23	230	0.18 ± 0.11	< 0.007	< 0.007	< 0.019	< 0.009	< 0.007	< 0.017	< 0.031
05-04-23	220	0.20 ± 0.10	< 0.011	< 0.009	< 0.018	< 0.011	< 0.009	< 0.012	< 0.054
05-11-23	272	0.17 ± 0.08	< 0.005	< 0.005	< 0.009	< 0.007	< 0.008	< 0.021	< 0.034
05-18-23	278	0.17 ± 0.09	< 0.010	< 0.008	< 0.017	< 0.009	< 0.007	< 0.058	< 0.037
05-25-23	285	< 0.08	< 0.007	< 0.009	< 0.017	< 0.007	< 0.007	< 0.018	< 0.032
06-01-23	294	0.34 ± 0.09	< 0.007	< 0.006	< 0.016	< 0.010	< 0.008	< 0.032	< 0.033
06-08-23	300	0.21 ± 0.10	< 0.007	< 0.005	< 0.011	< 0.007	< 0.007	< 0.039	< 0.033
06-15-23	306	0.22 ± 0.09	< 0.009	< 0.009	< 0.015	< 0.006	< 0.007	< 0.030	< 0.034
06-22-23	317	0.21 ± 0.09	< 0.007	< 0.007	< 0.017	< 0.008	< 0.006	< 0.028	< 0.031
06-29-23	323	0.18 ± 0.11	< 0.007	< 0.008	< 0.014	< 0.007	< 0.005	< 0.040	< 0.030

^a Iodine-131 concentrations are < 0.07 pCi/m³ unless noted otherwise.

Table 1. Air particulates and charcoal cartridges, analyses for gamma-emitting isotopes and I-131^a.

Collection: Continuous, weekly exchange.
Units: pCi/m³

Location		CA-A-011 (cont.)							
		⁷ Be	⁵⁸ Co	⁶⁰ Co	⁹⁵ Zr	¹³⁴ Cs	¹³⁷ Cs	¹⁴⁰ BaLa	¹⁴⁴ Ce
Required LLDs		-	-	-	-	0.050	0.060	-	-
Date									
Collected	Vol.								
07-06-23	329	0.30 ± 0.11	< 0.006	< 0.006	< 0.019	< 0.009	< 0.006	< 0.120	< 0.032
07-13-23	339	0.20 ± 0.10	< 0.007	< 0.004	< 0.017	< 0.007	< 0.004	< 0.046	< 0.032
07-20-23	315	0.26 ± 0.13	< 0.010	< 0.016	< 0.011	< 0.007	< 0.012	< 0.076	< 0.029
07-27-23	326	< 0.07	< 0.009	< 0.008	< 0.016	< 0.005	< 0.007	< 0.061	< 0.031
08-03-23	334	0.16 ± 0.09	< 0.005	< 0.004	< 0.013	< 0.008	< 0.007	< 0.066	< 0.029
08-10-23	332	0.23 ± 0.10	< 0.012	< 0.006	< 0.010	< 0.012	< 0.009	< 0.015	< 0.056
08-17-23	337	< 0.07	< 0.006	< 0.004	< 0.016	< 0.006	< 0.005	< 0.022	< 0.029
08-24-23	315	0.19 ± 0.08	< 0.005	< 0.006	< 0.013	< 0.008	< 0.005	< 0.039	< 0.031
08-31-23	319	< 0.08	< 0.007	< 0.004	< 0.013	< 0.009	< 0.005	< 0.022	< 0.032
09-07-23	331	< 0.10	< 0.008	< 0.010	< 0.013	< 0.007	< 0.005	< 0.039	< 0.033
09-14-23	336	0.15 ± 0.09	< 0.006	< 0.006	< 0.013	< 0.007	< 0.006	< 0.019	< 0.032
09-21-23	336	0.18 ± 0.07	< 0.004	< 0.010	< 0.014	< 0.007	< 0.007	< 0.019	< 0.031
09-28-23	270	0.21 ± 0.09	< 0.008	< 0.009	< 0.011	< 0.010	< 0.007	< 0.012	< 0.035
10-05-23	286	0.24 ± 0.13	< 0.008	< 0.007	< 0.021	< 0.011	< 0.007	< 0.050	< 0.041
10-12-23	300	< 0.06	< 0.007	< 0.009	< 0.014	< 0.006	< 0.005	< 0.039	< 0.034
10-19-23	312	0.14 ± 0.07	< 0.006	< 0.007	< 0.011	< 0.009	< 0.004	< 0.027	< 0.032
10-26-23	317	< 0.06	< 0.008	< 0.010	< 0.015	< 0.008	< 0.006	< 0.028	< 0.033
11-02-23	333	< 0.05	< 0.005	< 0.004	< 0.013	< 0.005	< 0.006	< 0.019	< 0.026
11-08-23	286	< 0.08	< 0.008	< 0.006	< 0.012	< 0.010	< 0.008	< 0.027	< 0.040
11-16-23	339	0.14 ± 0.08	< 0.006	< 0.003	< 0.011	< 0.007	< 0.005	< 0.012	< 0.030
11-22-23	225	0.20 ± 0.12	< 0.009	< 0.009	< 0.019	< 0.012	< 0.009	< 0.031	< 0.041
11-30-23	309	0.19 ± 0.10	< 0.005	< 0.008	< 0.012	< 0.007	< 0.005	< 0.012	< 0.031
12-07-23	269	< 0.07	< 0.006	< 0.008	< 0.013	< 0.013	< 0.008	< 0.018	< 0.035
12-14-23	271	< 0.07	< 0.009	< 0.006	< 0.006	< 0.009	< 0.007	< 0.035	< 0.037
12-20-23	238	< 0.09	< 0.009	< 0.011	< 0.014	< 0.013	< 0.011	< 0.031	< 0.041
12-28-23	301	0.19 ± 0.08	< 0.006	< 0.007	< 0.012	< 0.008	< 0.006	< 0.039	< 0.035

^a Iodine-131 concentrations are < 0.07 pCi/m³ unless noted otherwise.

Table 2. Milk, analyses for iodine-131 and gamma-emitting isotopes.

Collection: Semimonthly during grazing season, monthly otherwise.

Units: pCi/L

Location		CA-MLK-M9					
Date	Lab	Concentration (pCi/L)					
Collected	Code	I-131	K-40	Zn-65	Cs-134	Cs-137	Ba-La-140
Required LLDs		1	-	-	15	18	15

Collection discontinued.^a

^a Milk sampling discontinued in 2018.

Table 3. Vegetation, analyses for iodine-131 and gamma-emitting isotopes.

Collection: Monthly, during growing season

Units: pCi/kg wet

Lab Code	Collection		Concentration (pCi/kg wet)						
	Date	Sample Type	⁴⁰ K	⁵⁴ Mn	⁵⁸ Co	⁶⁰ Co	¹³¹ I	¹³⁴ Cs	¹³⁷ Cs
Location: CA-FPL-V9									
	April '23			NS ^a					
	May '23			NS ^b					
CAVE- 1510	6/6/2023	Kale	4644 ± 371	< 8.2	< 8.9	< 23.3	< 36.8	< 12.8	< 19.8
CAVE- 1511	6/6/2023	Collard Greens	5840 ± 639	< 27.7	< 29.7	< 19.2	< 47.3	< 25.6	< 22.2
CAVE- 1512	6/6/2023	Spinach	8675 ± 479	< 11.8	< 16.5	< 12.5	< 19.2	< 12.0	< 13.4
CAVE- 1513	6/6/2023	Swiss Chard	5990 ± 258	< 9.1	< 6.9	< 16.0	< 28.3	< 7.9	< 11.8
CAVE- 1514	6/6/2023	Lettuce	4358 ± 417	< 14.6	< 8.4	< 7.4	< 25.5	< 13.9	< 11.2
CAVE- 1515	6/6/2023	Turnip Greens	4625 ± 550	< 26.6	< 26.2	< 15.3	< 32.4	< 20.6	< 18.7
CAVE- 1516	6/6/2023	Mustard Greens	4908 ± 330	< 10.0	< 7.0	< 19.7	< 16.3	< 10.7	< 15.3
CAVE- 1517	6/6/2023	Cabbage	4144 ± 291	< 6.0	< 5.5	< 19.3	< 13.2	< 9.3	< 16.3
CAVE- 1800	7/5/2023	Cabbage	5298 ± 542	< 22.1	< 24.5	< 22.5	< 27.5	< 22.4	< 13.4
CAVE- 1801	7/5/2023	Swiss Chard	9141 ± 439	< 12.6	< 11.4	< 22.5	< 14.1	< 12.1	< 18.6
CAVE- 1802	7/5/2023	Collard Greens	4937 ± 586	< 22.9	< 19.8	< 15.5	< 20.5	< 18.3	< 13.4
CAVE- 1803	7/5/2023	Lettuce	8199 ± 455	< 14.1	< 13.1	< 22.2	< 22.5	< 11.4	< 18.8
CAVE- 1804	7/5/2023	Kale	5791 ± 574	< 16.2	< 27.6	< 20.8	< 25.4	< 18.7	< 16.8
CAVE- 2283	8/1/2023	Turnip Greens	4714 ± 496	< 11.1	< 11.2	< 26.5	< 36.3	< 19.3	< 23.9
CAVE- 2285	8/1/2023	Swiss Chard	4210 ± 317	< 8.1	< 10.3	< 17.1	< 19.9	< 11.0	< 13.7
CAVE- 2286	8/1/2023	Cabbage	4703 ± 596	< 18.0	< 10.4	< 32.5	< 47.6	< 20.6	< 23.0
CAVE- 2287	8/1/2023	Kale	4167 ± 373	< 13.9	< 13.0	< 21.6	< 26.2	< 12.5	< 19.0
CAVE- 2288	8/1/2023	Collard Greens	3764 ± 288	< 6.4	< 10.8	< 17.9	< 15.6	< 10.1	< 15.5
CAVE- 2625	9/6/2023	Kale	5550 ± 816	< 25.6	< 24.3	< 27.5	< 20.8	< 37.1	< 31.2
CAVE- 2626	9/6/2023	Collard Greens	5532 ± 491	< 11.2	< 8.1	< 25.5	< 14.3	< 17.1	< 24.6
CAVE- 2627	9/6/2023	Swiss Chard	5126 ± 639	< 20.5	< 23.3	< 13.5	< 20.2	< 22.2	< 22.2
CAVE- 2998	10/3/2023	Collard Greens	4567 ± 693	< 28.2	< 23.2	< 12.3	< 22.9	< 24.7	< 27.6
CAVE- 2999	10/3/2023	Kale	5960 ± 484	< 14.3	< 15.1	< 21.6	< 18.5	< 15.3	< 22.5
CAVE- 3000	10/3/2023	Swiss Chard	7821 ± 753	< 13.4	< 14.1	< 30.0	< 23.2	< 17.6	< 30.6
CAVE- 3001	10/3/2023	Mustard Greens	5476 ± 852	< 24.6	< 22.1	< 26.8	< 20.0	< 34.8	< 25.5
CAVE- 3002	10/3/2023	Lettuce	4679 ± 737	< 19.5	< 17.7	< 12.9	< 13.9	< 24.3	< 16.8

^a "NS" = No sample; see Part I Table 5.5 Missed Collections and Analyses (CR#202320405).

^b "NS" = No sample; see Part I Table 5.5 Missed Collections and Analyses (CR#202303264).

Table 3. Vegetation, analyses for iodine-131 and gamma-emitting isotopes.

Collection: Monthly, during growing season

Units: pCi/kg wet

Lab Code	Collection		Concentration (pCi/kg wet)						
	Date	Sample Type	⁴⁰ K	⁵⁴ Mn	⁵⁸ Co	⁶⁰ Co	¹³¹ I	¹³⁴ Cs	¹³⁷ Cs
<u>Location: CA-FPL-V16</u>									
	April '23		NS ^a						
CAVE- 1184	5/9/2023	Kale	4712 ± 500	< 13.5	< 12.5	< 12.7	< 20.4	< 15.4	< 18.0
CAVE- 1185	5/9/2023	Chinese Lettuce	3644 ± 267	< 9.6	< 7.3	< 6.7	< 8.1	< 9.6	< 6.0
CAVE- 1187	5/9/2023	Lettuce	3791 ± 392	< 19.5	< 11.7	< 8.6	< 22.2	< 15.4	< 15.6
CAVE- 1518	6/5/2023	Kale	6208 ± 625	< 20.8	< 28.9	< 17.7	< 48.7	< 24.4	< 15.1
CAVE- 1519	6/5/2023	Swiss Chard	5924 ± 557	< 21.0	< 15.9	< 17.4	< 22.4	< 19.6	< 23.1
CAVE- 1520	6/5/2023	Cabbage	5833 ± 369	< 12.4	< 7.4	< 3.5	< 14.0	< 11.3	< 9.0
CAVE- 1805	7/4/2023	Cabbage	5747 ± 651	< 14.1	< 11.9	< 17.9	< 50.1	< 22.3	< 32.3
CAVE- 1806	7/4/2023	Swiss Chard	7061 ± 420	< 6.9	< 6.0	< 20.9	< 20.5	< 11.6	< 19.9
CAVE- 1807	7/4/2023	Kale	6225 ± 449	< 13.0	< 18.1	< 27.7	< 20.4	< 16.8	< 21.7
CAVE- 2289	7/31/2023	Chinese Cabbage	4603 ± 479	< 16.8	< 13.3	< 31.9	< 58.6	< 17.4	< 28.7
CAVE- 2290	7/31/2023	Swiss Chard	4751 ± 407	< 12.8	< 12.4	< 24.2	< 19.1	< 13.7	< 20.4
CAVE- 2291	7/31/2023	Kale	4902 ± 546	< 12.8	< 10.3	< 30.8	< 40.8	< 17.2	< 24.5
CAVE- 2628	9/6/2023	Swiss Chard	5630 ± 848	< 24.4	< 18.9	< 37.1	< 19.9	< 28.3	< 31.7
CAVE- 2629	9/6/2023	Kale	4406 ± 838	< 44.2	< 19.1	< 22.5	< 25.7	< 35.6	< 32.5
CAVE- 3003	10/2/2023	Swiss Chard	7356 ± 892	< 35.2	< 45.3	< 19.4	< 38.9	< 30.3	< 29.6
<u>Location: CA-FPL-V19</u>									
	April '23		NS ^a						
CAVE- 1188	5/8/2023	Lettuce	4886 ± 483	< 20.7	< 9.1	< 21.5	< 21.9	< 18.1	< 24.1
CAVE- 1521	6/6/2023	Lettuce	7456 ± 394	< 14.6	< 12.2	< 28.7	< 58.7	< 15.6	< 22.7
CAVE- 1808	7/5/2023	Cabbage	3655 ± 329	< 7.1	< 10.8	< 18.1	< 20.8	< 11.0	< 17.3
CAVE- 2292	7/31/2023	Cabbage	2704 ± 328	< 6.0	< 10.0	< 21.3	< 16.0	< 13.1	< 15.5
CAVE- 2624	9/5/2023	Lettuce	6124 ± 324	< 11.1	< 10.9	< 12.2	< 12.8	< 16.4	< 11.9
CAVE- 2997	10/3/2023	Lettuce	5032 ± 597	< 23.5	< 19.7	< 51.1	< 44.8	< 24.6	< 40.3

^a "NS" = No sample; see Part I Table 5.5 Missed Collections and Analyses (CR#202320405).

Table 3. Vegetation, analyses for iodine-131 and gamma-emitting isotopes.

Collection: Monthly, during growing season

Units: pCi/kg wet

Lab Code	Collection		Concentration (pCi/kg wet)						
	Date	Sample Type	⁴⁰ K	⁵⁴ Mn	⁵⁸ Co	⁶⁰ Co	¹³¹ I	¹³⁴ Cs	¹³⁷ Cs
<u>Location: CA-FPL-V20</u>									
	April '23		NS ^a						
CAVE- 1189	5/8/2023	Mustard Greens	3002 ± 327	< 10.7	< 8.0	< 5.6	< 23.3	< 13.0	< 14.1
CAVE- 1522	6/6/2023	Kale	3022 ± 274	< 9.0	< 10.7	< 20.5	< 15.3	< 10.3	< 19.1
CAVE- 1523	6/6/2023	Cabbage	2592 ± 304	< 9.6	< 10.3	< 6.9	< 17.8	< 14.2	< 11.5
CAVE- 1524	6/6/2023	Mustard Greens	6334 ± 458	< 18.2	< 12.8	< 6.7	< 24.7	< 14.3	< 11.2
CAVE- 1525	6/6/2023	Swiss Chard	4516 ± 514	< 24.6	< 19.3	< 13.0	< 31.6	< 20.9	< 25.6
CAVE- 1527	6/6/2023	Lettuce	4283 ± 408	< 18.9	< 10.5	< 17.3	< 17.9	< 16.2	< 17.5
CAVE- 1809	7/5/2023	Kale	4146 ± 377	< 16.0	< 9.9	< 24.7	< 19.6	< 13.8	< 25.1
CAVE- 1810	7/5/2023	Swiss Chard	4074 ± 340	< 7.5	< 10.5	< 19.1	< 20.8	< 12.4	< 16.7
CAVE- 1811	7/5/2023	Cabbage	2510 ± 402	< 18.0	< 11.9	< 12.0	< 16.6	< 16.8	< 16.8
CAVE- 1812	7/5/2023	Lettuce	6155 ± 426	< 12.0	< 11.2	< 24.0	< 14.2	< 14.5	< 23.1
CAVE- 1813	7/5/2023	Mustard Greens	5409 ± 485	< 23.1	< 23.5	< 15.9	< 28.6	< 19.0	< 17.9
CAVE- 2293	7/31/2023	Cabbage	1738 ± 279	< 8.1	< 11.7	< 21.6	< 28.7	< 14.4	< 19.6
CAVE- 2294	7/31/2023	Collard Greens	1938 ± 356	< 18.7	< 17.1	< 20.1	< 41.6	< 20.4	< 25.8
CAVE- 2295	7/31/2023	Kale	5582 ± 726	< 23.3	< 23.1	< 16.3	< 29.2	< 27.4	< 28.5
CAVE- 2296	7/31/2023	Swiss Chard	4942 ± 477	< 9.9	< 13.7	< 25.3	< 21.3	< 16.7	< 22.1
CAVE- 2630	9/3/2023	Swiss Chard	7288 ± 672	< 17.5	< 18.0	< 32.7	< 22.2	< 20.0	< 31.8
CAVE- 2631	9/6/2023	Collard Greens	5304 ± 663	< 24.3	< 13.1	< 41.7	< 21.7	< 23.0	< 37.5
CAVE- 2632	9/5/2023	Poke	9876 ± 1054	< 22.9	< 20.1	< 22.1	< 20.1	< 34.4	< 21.5
CAVE- 2633	9/6/2023	Cabbage	2481 ± 583	< 31.5	< 27.5	< 17.2	< 22.6	< 27.6	< 25.2
CAVE- 2634	9/6/2023	Kale	6375 ± 116	< 25.6	< 27.4	< 26.7	< 30.6	< 38.1	< 41.8
CAVE- 3004	10/3/2023	Kale	4387 ± 572	< 10.6	< 8.4	< 31.6	< 35.8	< 23.0	< 34.4
CAVE- 3005	10/3/2023	Poke	9544 ± 1039	< 42.7	< 29.9	< 29.2	< 43.2	< 38.0	< 21.9
CAVE- 3006	10/3/2023	Collard Greens	2882 ± 395	< 11.9	< 10.7	< 25.4	< 16.6	< 16.8	< 21.6

^a "NS" = No sample; see Part I Table 5.5 Missed Collections and Analyses (CR#202320405).

Table 4. Soil, analyses for gamma-emitting isotopes.

Collection: Annually

Collection		Concentration (pCi/kg dry)								
Lab Code	Date	⁴⁰ K	⁵⁴ Mn	⁵⁹ Fe	⁵⁸ Co	⁶⁰ Co	⁹⁵ ZrNb	¹³⁴ Cs	¹³⁷ Cs	¹⁴⁰ BaLa
<u>Location: SOL-F-002</u>										
CASO- 3932	12/13/2023	11786 ± 285	< 12.4	< 29.7	< 14.0	< 16.2	< 26.8	< 11.4	187 ± 17	< 105.0
<u>Location: SOL-F-006</u>										
CASO- 3933	12/13/2023	10426 ± 276	< 12.2	< 34.0	< 13.3	< 10.4	< 28.0	< 9.7	281 ± 13	< 110.6
<u>Location: SOL-PR-003</u>										
CASO- 3934	12/13/2023	10381 ± 282	< 12.1	< 31.3	< 14.0	< 11.2	< 22.9	< 9.3	255 ± 12	< 109.2
<u>Location: SOL-PR-007</u>										
CASO- 3935	12/13/2023	10350 ± 729	< 29.0	< 46.7	< 41.8	< 44.6	< 69.0	< 29.0	163 ± 45	< 186.8
<u>Location: SOL-M-009</u>										
CASO- 3939	12/13/2023	10618 ± 633	< 30.5	< 73.7	< 34.4	< 37.1	< 59.4	< 25.4	< 31.0	< 165.7
<u>Location: SOL-W-001</u>										
CASO- 3936	12/15/2023	8332 ± 627	< 24.3	< 40.6	< 20.7	< 17.1	< 44.7	< 21.4	< 26.8	< 105.5
<u>Location: SOL-W-002</u>										
CASO- 3937	12/15/2023	14870 ± 673	< 28.9	< 76.5	< 42.4	< 32.2	< 66.0	< 25.4	< 28.9	< 315.8
<u>Location: SOL-W-005</u>										
CASO- 3938	12/15/2023	15748 ± 753	< 25.2	< 72.3	< 28.0	< 26.7	< 55.3	< 24.4	47 ± 25	< 256.0
<u>Location: SOL-W-006</u>										
CASO- 3940	12/13/2023	13047 ± 623	< 25.0	< 72.4	< 28.5	< 12.6	< 54.4	< 19.6	92 ± 19	< 136.2

Table 5. Surface water, analyses for tritium and gamma-emitting isotopes.

Collection: Monthly

Location: CA-SWA-S01

Units: pCi/L

Lab Code	Required	CASW- 211	CASW- 407	CASW- 694	CASW- 1005
Date Collected	LLD	01-31-23	02-27-23	03-28-23	04-25-23
H-3	3000	< 160	< 163	< 174	< 167
Mn-54	15	< 0.9	< 5.0	< 3.2	< 2.8
Fe-59	30	< 2.2	< 11.6	< 7.5	< 3.4
Co-58	15	< 0.9	< 5.1	< 4.9	< 2.6
Co-60	15	< 1.1	< 4.0	< 2.2	< 5.6
Zn-65	30	< 2.6	< 5.5	< 8.1	< 6.2
Zr-Nb-95	15	< 1.2	< 3.5	< 6.0	< 3.0
I-131	1000	< 1.3	< 5.0	< 4.9	< 7.0
Cs-134	15	< 1.0	< 5.2	< 4.3	< 3.0
Cs-137	18	< 1.0	< 3.2	< 4.2	< 4.7
Ba-La-140	15	< 1.3	< 3.4	< 5.5	< 4.7

Lab Code	Required	CASW- 1355	CASW- 1748	CASW- 2220	CASW- 2600
Date Collected	LLD	05-30-23	06-27-23	07-25-23	08-29-23
H-3	3000	< 157	< 158	< 161	< 160
Mn-54	15	< 3.5	< 3.0	< 2.4	< 6.3
Fe-59	30	< 5.1	< 3.7	< 2.9	< 10.0
Co-58	15	< 2.2	< 3.3	< 2.9	< 6.3
Co-60	15	< 6.5	< 6.8	< 6.7	< 5.8
Zn-65	30	< 2.4	< 2.9	< 3.3	< 6.9
Zr-Nb-95	15	< 2.5	< 3.1	< 3.5	< 6.0
I-131	1000	< 3.8	< 4.2	< 8.2	< 8.3
Cs-134	15	< 3.8	< 3.5	< 3.1	< 8.4
Cs-137	18	< 5.8	< 5.6	< 5.4	< 5.3
Ba-La-140	15	< 3.4	< 3.0	< 4.1	< 6.3

Lab Code	Required	CASW- 2885	CASW- 3400	CASW- 3749	CASW- 3966
Date Collected	LLD	09-26-23	10-31-23	11-28-23	12-26-23
H-3	3000	< 167	< 171	< 173	< 171
Mn-54	15	< 2.0	< 3.2	< 2.8	< 5.9
Fe-59	30	< 3.9	< 4.8	< 3.6	< 5.1
Co-58	15	< 2.7	< 1.9	< 2.2	< 4.7
Co-60	15	< 6.1	< 3.1	< 6.2	< 4.5
Zn-65	30	< 3.9	< 3.9	< 7.5	< 12.1
Zr-Nb-95	15	< 3.4	< 2.0	< 5.7	< 3.7
I-131	1000	< 3.5	< 3.0	< 6.7	< 5.9
Cs-134	15	< 2.8	< 2.4	< 4.6	< 5.5
Cs-137	18	< 6.0	< 2.5	< 6.8	< 5.0
Ba-La-140	15	< 3.4	< 2.9	< 2.2	< 4.2

Table 5. Surface water, analyses for tritium and gamma-emitting isotopes.

Collection: Monthly

Location: CA-SWA-S02

Units: pCi/L

Lab Code	Required	CASW- 212	CASW- 408	CASW- 695	CASW- 1006
Date Collected	LLD	01-31-23	02-27-23	03-28-23	04-25-23
H-3	3000	< 160	< 163	< 174	469 ± 107 ^a
Mn-54	15	< 0.8	< 2.4	< 1.3	< 2.9
Fe-59	30	< 2.9	< 7.5	< 2.3	< 4.4
Co-58	15	< 1.4	< 2.8	< 0.8	< 2.5
Co-60	15	< 2.8	< 1.8	< 1.3	< 7.6
Zn-65	30	< 2.8	< 3.4	< 2.4	< 5.0
Zr-Nb-95	15	< 1.4	< 1.7	< 1.5	< 2.1
I-131	1000	< 2.2	< 2.5	< 1.7	< 11.1
Cs-134	15	< 1.3	< 3.4	< 1.0	< 3.4
Cs-137	18	< 2.5	< 2.9	< 1.2	< 5.9
Ba-La-140	15	< 1.2	< 4.3	< 1.4	< 4.7

Lab Code	Required	CASW- 1356	CASW- 1749	CASW- 2222	CASW- 2601
Date Collected	LLD	05-30-23	06-27-23	07-25-23	08-29-23
H-3	3000	380 ± 94 ^b	641 ± 107	562 ± 105	1163 ± 130 ^c
Mn-54	15	< 2.5	< 5.7	< 6.7	< 2.7
Fe-59	30	< 4.4	< 4.9	< 9.7	< 4.9
Co-58	15	< 1.6	< 3.1	< 4.5	< 4.3
Co-60	15	< 2.0	< 5.2	< 4.1	< 9.1
Zn-65	30	< 4.6	< 7.8	< 4.7	< 6.7
Zr-Nb-95	15	< 2.3	< 5.2	< 5.2	< 4.6
I-131	1000	< 2.7	< 4.4	< 9.9	< 4.7
Cs-134	15	< 2.6	< 5.5	< 6.2	< 5.5
Cs-137	18	< 2.8	< 6.2	< 4.9	< 7.7
Ba-La-140	15	< 1.3	< 3.9	< 3.6	< 5.4

Lab Code	Required	CASW- 2773 ^d	CASW- 2886	CASW- 3401	CASW- 3750
Date Collected	LLD	08-29-23	09-26-23	10-31-23	11-28-23
H-3	3000	925 ± 120	471 ± 101	395 ± 100	205 ± 92
Mn-54	15	< 1.1	< 5.5	< 2.5	< 3.3
Fe-59	30	< 2.8	< 9.3	< 4.3	< 4.4
Co-58	15	< 1.2	< 6.1	< 1.5	< 2.4
Co-60	15	< 2.6	< 4.5	< 2.2	< 2.1
Zn-65	30	< 2.1	< 7.8	< 3.9	< 5.2
Zr-Nb-95	15	< 1.2	< 6.6	< 2.6	< 2.3
I-131	1000	< 5.7	< 8.4	< 2.9	< 6.1
Cs-134	15	< 1.4	< 6.5	< 2.4	< 2.2
Cs-137	18	< 2.3	< 3.9	< 2.9	< 3.6
Ba-La-140	15	< 3.9	< 8.4	< 2.3	< 4.2

^a Recount = 418 ± 108 pCi/L.

^c Recount = 1166 ± 136 pCi/L. Reanalysis 1062 ± 132 pCi/L.

^b Duplicate = 257 ± 88 pCi/L.

^d Backup sample

Table 5. Surface water, analyses for tritium and gamma-emitting isotopes.

Collection: Monthly

Location: CA-SWA-S02

Units: pCi/L

Lab Code	Required	CASW- 3967
Date Collected	LLD	12-26-23
H-3	3000	< 171
Mn-54	15	< 2.5
Fe-59	30	< 5.2
Co-58	15	< 2.5
Co-60	15	< 2.0
Zn-65	30	< 4.8
Zr-Nb-95	15	< 2.5
I-131	1000	< 4.6
Cs-134	15	< 2.7
Cs-137	18	< 2.2
Ba-La-140	15	< 4.0

6. Surface Water (Ponds), analyses for tritium and gamma-emitting isotopes.

Collection		Concentration (pCi/L)									
Lab Code	Date	³ H	⁵⁴ Mn	⁵⁹ Fe	⁵⁸ Co	⁶⁰ Co	⁶⁵ Zn	⁹⁵ ZrNb	¹³⁴ Cs	¹³⁷ Cs	¹⁴⁰ BaLa
Location: CA-SWA-POND 01											
CASW- 656	03/27/23	< 174	< 2.2	< 5.3	< 2.2	< 1.9	< 5.5	< 2.0	< 3.1	< 3.8	< 1.5
CASW- 2670	09/05/23	< 163	< 7.7	< 8.2	< 8.3	< 4.8	< 17.0	< 7.4	< 8.1	< 4.4	< 7.1
Location: CA-SWA-POND 02											
CASW- 657	03/27/23	< 174	< 3.3	< 6.2	< 3.4	< 7.4	< 4.4	< 3.8	< 3.9	< 6.2	< 2.8
CASW- 2671	09/05/23	< 163	< 5.3	< 11.6	< 4.6	< 4.2	< 10.8	< 6.3	< 6.3	< 7.2	< 3.2
Location: CA-SWA-SLUDGE LAGOON #5											
CASW- 662	03/27/23	< 174	< 1.2	< 2.5	< 1.5	< 2.9	< 2.3	< 1.7	< 1.4	< 2.3	< 1.2
CASW- 2675	09/05/23	< 163	< 3.9	< 3.2	< 3.9	< 7.2	< 4.5	< 3.1	< 4.0	< 6.9	< 5.9
Location: CA-SWA-OUTFALL 010											
CASW- 658	03/27/23	< 174	< 2.2	< 5.3	< 2.2	< 1.9	< 5.5	< 2.0	< 3.1	< 3.8	< 1.5
CASW- 2674	9/5/2023	< 163	< 7.7	< 15.8	< 5.8	< 4.7	< 8.4	< 8.0	< 8.2	< 9.9	< 6.1
Location: CA-SWA-WETLANDS 01											
CASW- 660	03/27/23	< 174	< 4.2	< 2.7	< 4.9	< 1.9	< 4.0	< 2.1	< 4.7	< 3.1	< 4.2
CASW- 2672	9/5/2023	< 163	< 2.4	< 4.8	< 3.2	< 7.0	< 6.4	< 4.3	< 3.6	< 5.6	< 3.5
Location: CA-SWA-WETLANDS 02											
CASW- 661	03/27/23	< 174	< 4.1	< 4.2	< 2.2	< 7.5	< 6.1	< 2.5	< 3.5	< 6.8	< 2.6
CASW- 2673	9/5/2023	< 163	< 3.0	< 3.8	< 3.9	< 8.6	< 6.5	< 3.6	< 5.1	< 7.7	< 3.1

Table 7. Drinking Water Wells, analysis for tritium and gamma-emitting isotopes.

Collection		Concentration (pCi/L)									
Lab Code	Date	³ H	⁵⁴ Mn	⁵⁹ Fe	⁵⁸ Co	⁶⁰ Co	⁶⁵ Zn	⁹⁵ ZrNb	¹³⁴ Cs	¹³⁷ Cs	¹⁴⁰ BaLa
CA-DWA-003 (Ward)											
CADW- 306	2/6/2023	< 154	< 1.2	< 4.1	< 2.2	< 1.8	< 4.7	< 3.7	< 2.4	< 2.5	< 2.3
CADW- 1133	5/2/2023	< 162	< 2.9	< 3.2	< 2.0	< 2.2	< 7.2	< 3.3	< 3.9	< 2.5	< 4.8
CADW- 2223	7/25/2023	< 159	< 2.2	< 2.4	< 1.6	< 8.0	< 4.3	< 3.9	< 4.9	< 6.3	< 4.7
CADW- 3483	11/7/2023	< 171	< 2.0	< 4.4	< 1.7	< 3.5	< 4.9	< 2.5	< 2.7	< 2.9	< 3.6
CA-DWA-004 (Miller)											
CADW- 319	2/7/2023	< 160	< 1.7	< 3.6	< 1.5	< 0.8	< 2.5	< 1.2	< 1.5	< 1.7	< 2.1
CADW- 1132	5/2/2023	< 162	< 2.0	< 5.8	< 1.5	< 1.7	< 4.8	< 3.1	< 3.0	< 3.3	< 2.1
CADW- 2236	7/26/2023	< 159	< 4.2	< 3.1	< 2.9	< 7.1	< 5.2	< 2.7	< 3.6	< 7.3	< 4.0
CADW- 3484	11/6/2023	< 171	< 2.3	< 4.4	< 1.9	< 5.5	< 6.0	< 5.2	< 3.4	< 5.1	< 2.6
CA-DWA-005 (Brucker Bros.)											
CADW- 307	2/6/2023	< 154	< 2.8	< 3.7	< 2.2	< 2.8	< 5.4	< 2.5	< 2.0	< 2.3	< 3.0
CADW- 1145	4/25/2023	< 162	< 2.4	< 4.4	< 1.9	< 2.0	< 5.0	< 3.6	< 2.3	< 3.0	< 2.9
CADW- 2224	7/25/2023	< 159	< 6.1	< 5.9	< 5.9	< 5.2	< 6.5	< 4.4	< 7.4	< 3.9	< 6.7
CADW- 3485	11/6/2023	< 171	< 1.6	< 4.3	< 2.7	< 2.8	< 1.4	< 2.1	< 2.5	< 2.6	< 3.5
CA-DWA-007 (Kriete)											
CADW- 308	2/6/2023	< 154	< 2.6	< 5.5	< 2.3	< 2.5	< 5.2	< 3.9	< 2.5	< 3.0	< 1.9
CADW- 1130	5/2/2023	< 162	< 2.1	< 4.3	< 4.0	< 7.5	< 4.5	< 2.9	< 3.3	< 6.2	< 3.7
CADW- 2225	7/25/2023	< 159	< 3.8	< 6.1	< 1.9	< 7.7	< 7.0	< 4.2	< 4.2	< 7.0	< 2.9
CADW- 3486	11/7/2023	< 171	< 1.8	< 3.9	< 1.6	< 4.7	< 5.4	< 3.7	< 3.0	< 4.6	< 3.1
CA-DWA-008 (Curry)											
CADW- 321	2/6/2023	< 154	< 3.2	< 4.1	< 1.9	< 2.5	< 5.3	< 2.1	< 3.4	< 3.6	< 4.5
CADW- 1134	5/2/2023	< 162	< 2.5	< 4.5	< 3.0	< 5.7	< 4.6	< 3.2	< 3.1	< 4.8	< 2.4
CADW- 2237	7/26/2023	< 159	< 5.5	< 7.2	< 5.0	< 3.6	< 3.8	< 4.9	< 5.3	< 5.5	< 5.0
CADW- 3487	11/7/2023	< 171	< 1.9	< 4.0	< 1.7	< 3.2	< 4.8	< 3.5	< 2.4	< 2.7	< 3.4

Table 7. Drinking Water Wells, analysis for tritium and gamma-emitting isotopes.

Lab Code	Collection Date	Concentration (pCi/L)									
		³ H	⁵⁴ Mn	⁵⁹ Fe	⁵⁸ Co	⁶⁰ Co	⁶⁵ Zn	⁹⁵ ZrNb	¹³⁴ Cs	¹³⁷ Cs	¹⁴⁰ BaLa
CA-DWA-009 (Clardy)											
CADW- 310	2/6/2023	< 154	< 2.6	< 7.0	< 3.6	< 6.3	< 4.8	< 2.3	< 3.3	< 5.4	< 3.7
CADW- 1136	5/2/2023	< 162	< 2.5	< 2.6	< 1.8	< 6.3	< 5.9	< 2.8	< 2.9	< 5.0	< 2.7
CADW- 2226	7/25/2023	< 159	< 7.2	< 12.3	< 6.1	< 4.2	< 4.8	< 6.3	< 7.2	< 4.7	< 5.7
CADW- 3488	11/7/2023	< 171	< 2.5	< 3.8	< 2.2	< 1.3	< 4.2	< 2.8	< 2.7	< 2.3	< 3.0
CA-DWA-010 (Dillon, Susan)											
CADW- 311	2/6/2023	< 154	< 1.9	< 4.2	< 2.9	< 6.6	< 5.2	< 2.8	< 3.4	< 5.1	< 3.6
CADW- 1137	5/2/2023	< 162	< 3.5	< 5.6	< 2.6	< 3.9	< 8.9	< 5.3	< 4.2	< 3.5	< 6.6
CADW- 2227	7/25/2023	< 159	< 1.7	< 2.4	< 2.6	< 6.2	< 3.0	< 2.7	< 3.2	< 4.9	< 2.2
CADW- 3489	11/7/2023	< 171	< 3.1	< 4.5	< 2.6	< 4.5	< 3.7	< 2.5	< 2.4	< 4.8	< 2.1
CA-DWA-012 (Dillon, Joe)											
CADW- 312	2/6/2023	< 154	< 0.9	< 2.2	< 1.0	< 1.3	< 2.6	< 1.6	< 1.1	< 1.3	< 1.9
CADW- 1138	5/2/2023	< 162	< 2.6	< 2.3	< 2.8	< 6.7	< 4.8	< 3.1	< 3.0	< 5.1	< 4.7
CADW- 2228	7/25/2023	< 159	< 5.1	< 8.8	< 5.5	< 4.2	< 6.4	< 5.8	< 5.0	< 4.0	< 3.7
CADW- 3490	11/7/2023	< 171	< 1.5	< 4.0	< 1.4	< 1.3	< 4.3	< 2.8	< 2.4	< 2.4	< 3.6
CA-DWA-21											
CADW- 314	2/6/2023	< 154	< 1.9	< 4.7	< 2.6	< 2.5	< 2.7	< 3.4	< 2.1	< 1.7	< 2.0
CADW- 1131	5/2/2023	< 162	< 3.5	< 4.0	< 2.7	< 6.6	< 4.2	< 2.4	< 3.2	< 5.7	< 2.3
CADW- 2229	7/25/2023	< 159	< 3.0	< 3.5	< 2.7	< 7.0	< 3.7	< 3.5	< 3.8	< 6.0	< 5.1
CADW- 3491	11/7/2023	< 171	< 2.0	< 4.3	< 2.7	< 3.2	< 3.1	< 2.0	< 2.1	< 2.8	< 3.8
CA-DWA-022 (Plummer)											
CADW- 315	2/6/2023	< 154	< 2.7	< 5.5	< 2.2	< 1.3	< 2.6	< 4.5	< 4.1	< 3.1	< 5.3
CADW- 1139	5/2/2023	< 162	< 4.2	< 4.1	< 4.1	< 1.5	< 6.0	< 2.3	< 3.6	< 3.1	< 4.8
CADW- 2230	7/25/2023	< 159	< 7.3	< 9.6	< 4.2	< 4.6	< 8.6	< 8.5	< 6.2	< 5.2	< 4.3
CADW- 3492	11/7/2023	< 171	< 3.0	< 6.6	< 3.0	< 3.9	< 3.9	< 4.6	< 3.5	< 3.5	< 5.2

Table 7. Drinking Water Wells, analysis for tritium and gamma-emitting isotopes.

Lab Code	Collection	Concentration (pCi/L)									
	Date	³ H	⁵⁴ Mn	⁵⁹ Fe	⁵⁸ Co	⁶⁰ Co	⁶⁵ Zn	⁹⁵ ZrNb	¹³⁴ Cs	¹³⁷ Cs	¹⁴⁰ BaLa
CA-DWA-PW1 (Plant Cafeteria)											
CADW- 320	2/7/2023	< 160	< 3.7	< 5.3	< 3.4	< 3.6	< 3.0	< 3.7	< 3.5	< 3.9	< 4.3
CADW- 1143	5/2/2023	< 162	< 3.2	< 2.2	< 1.5	< 5.9	< 4.8	< 2.9	< 2.8	< 4.9	< 2.3
CADW- 2238	7/26/2023	< 159	< 2.1	< 4.2	< 3.3	< 6.8	< 5.7	< 3.9	< 4.0	< 5.6	< 3.8
CADW- 3498	11/7/2023	< 171	< 2.6	< 3.4	< 2.6	< 5.4	< 2.9	< 2.2	< 2.9	< 4.3	< 2.8
CA-DWA-V16											
CADW- 318	2/7/2023	< 154	< 6.0	< 6.9	< 3.2	< 4.0	< 8.8	< 3.9	< 5.9	< 5.7	< 3.9
CADW- 1142	5/2/2023	< 162	< 2.4	< 3.8	< 2.2	< 4.5	< 4.2	< 2.6	< 2.3	< 4.0	< 3.2
CADW- 2234	7/25/2023	< 159	< 3.5	< 3.7	< 2.2	< 7.2	< 5.8	< 4.5	< 4.1	< 5.8	< 4.5
CADW- 3496	11/7/2023	< 171	< 2.6	< 3.2	< 2.6	< 2.0	< 3.8	< 3.1	< 2.5	< 3.0	< 3.5
CA-DWA-D23											
CADW- 316	2/6/2023	< 154	< 3.6	< 8.2	< 1.9	< 1.9	< 5.6	< 2.5	< 3.9	< 3.1	< 5.0
CADW- 1140	5/2/2023	< 162	< 2.0	< 3.3	< 3.5	< 6.7	< 3.0	< 1.8	< 3.1	< 5.1	< 3.1
CADW- 2231	7/25/2023	< 159	< 2.2	< 3.9	< 1.5	< 4.9	< 4.6	< 2.9	< 2.8	< 4.5	< 3.1
CADW- 3493	11/7/2023	< 171	< 4.4	< 4.0	< 3.5	< 4.0	< 5.1	< 4.8	< 4.2	< 4.4	< 3.1
CA-DWA-024											
CADW- 317	2/6/2023	< 154	< 2.8	< 3.4	< 1.2	< 6.4	< 2.4	< 3.5	< 3.0	< 5.0	< 3.6
CADW- 1135	5/2/2023	< 162	< 2.4	< 4.1	< 2.7	< 2.5	< 4.8	< 2.6	< 2.5	< 2.5	< 1.7
CADW- 2232	7/25/2023	< 159	< 5.5	< 5.4	< 3.8	< 4.2	< 9.3	< 3.1	< 4.9	< 2.7	< 5.2
CADW- 3494	11/7/2023	< 171	< 1.3	< 3.9	< 1.4	< 1.5	< 5.5	< 1.8	< 2.3	< 2.2	< 3.1
CA-DWA-025											
CADW- 322	2/9/2023	< 160	< 6.6	< 5.9	< 6.0	< 3.6	< 8.5	< 3.6	< 6.2	< 5.3	< 8.8
CADW- 1129	5/2/2023	< 162	< 2.3	< 4.3	< 2.5	< 4.9	< 5.3	< 3.2	< 2.5	< 3.7	< 2.0
CADW- 2233	7/25/2023	< 159	< 2.5	< 6.9	< 3.8	< 8.2	< 5.7	< 4.4	< 4.7	< 7.2	< 7.1
CADW- 3495	11/7/2023	< 171	< 2.0	< 4.6	< 1.7	< 2.6	< 3.3	< 1.8	< 2.1	< 2.7	< 3.6
CA-DWA-V19 (Dillon, Amy)											
CADW- 313	2/6/2023	< 154	< 6.3	< 8.8	< 5.3	< 5.3	< 11.6	< 5.5	< 5.7	< 4.9	< 7.1
CADW- 1141	5/2/2023	< 162	< 2.7	< 2.8	< 2.9	< 2.8	< 4.8	< 3.7	< 3.4	< 3.7	< 6.2
CADW- 2235	7/25/2023	< 159	< 5.6	< 5.6	< 5.3	< 5.8	< 8.0	< 10.0	< 7.3	< 5.1	< 5.0
CADW- 3497	11/7/2023	< 171	< 2.6	< 5.2	< 1.5	< 2.8	< 2.9	< 2.4	< 2.1	< 3.3	< 4.0

Table 8. Wells (non-potable), analyses for tritium and gamma-emitting isotopes.

Collection		Concentration (pCi/L)									
Lab Code	Date	³ H	⁵⁴ Mn	⁵⁹ Fe	⁵⁸ Co	⁶⁰ Co	⁶⁵ Zn	⁹⁵ ZrNb	¹³⁴ Cs	¹³⁷ Cs	¹⁴⁰ BaLa
Location: CA-WWA-937B											
CAWW- 53	1/9/2023	< 161	< 1.7	< 2.5	< 1.3	< 1.4	< 3.2	< 1.6	< 1.5	< 1.8	< 1.9
CAWW- 350	2/13/2023	< 160	< 1.9	< 2.5	< 1.4	< 0.8	< 3.4	< 2.0	< 1.6	< 1.6	< 2.8
CAWW- 589	3/15/2023	< 164	< 2.3	< 3.7	< 2.0	< 5.4	< 4.3	< 1.9	< 2.8	< 4.7	< 2.9
CAWW- 888	4/11/2023	< 161	< 2.8	< 6.4	< 4.2	< 1.9	< 8.1	< 3.2	< 3.5	< 2.0	< 4.6
CAWW- 1293	5/15/2023	< 161	< 1.0	< 1.9	< 1.3	< 0.9	< 2.6	< 1.5	< 1.0	< 1.3	< 2.4
CAWW- 1616	6/12/2023	< 162	< 6.1	< 12.5	< 5.4	< 2.8	< 3.7	< 3.8	< 5.0	< 4.7	< 7.9
CAWW- 2001	7/12/2023	< 163	< 5.8	< 6.4	< 4.0	< 5.6	< 8.7	< 7.3	< 6.5	< 7.2	< 7.7
CAWW- 2471	8/14/2023	< 158	< 8.2	< 7.9	< 4.7	< 8.1	< 7.5	< 7.5	< 7.5	< 3.9	< 5.2
CAWW- 2719	9/11/2023	< 163	< 2.8	< 5.0	< 2.4	< 9.3	< 6.2	< 5.2	< 6.7	< 9.4	< 4.9
CAWW- 3255	10/17/2023	< 169	< 6.2	< 5.1	< 4.2	< 4.5	< 12.0	< 7.4	< 9.4	< 6.2	< 4.5
CAWW- 3590	11/14/2023	< 172	< 1.6	< 7.0	< 2.9	< 2.9	< 2.4	< 2.2	< 3.3	< 3.5	< 5.2
CAWW- 3905	12/11/2023	< 171	< 3.8	< 5.2	< 3.1	< 1.6	< 6.8	< 3.7	< 4.2	< 4.0	< 3.1
Location: CA-WWA-937D											
CAWW- 54	1/9/2023	210 ± 91	< 2.3	< 3.2	< 2.0	< 1.7	< 4.3	< 2.2	< 2.2	< 2.5	< 4.1
CAWW- 355	2/13/2023	242 ± 92	< 0.7	< 2.6	< 1.1	< 1.1	< 2.7	< 1.4	< 1.1	< 1.4	< 0.9
CAWW- 587	3/15/2023	294 ± 95	< 2.8	< 3.7	< 2.3	< 2.4	< 5.9	< 3.0	< 2.4	< 2.6	< 1.7
CAWW- 889	4/11/2023	242 ± 89	< 2.2	< 4.2	< 2.9	< 7.0	< 5.1	< 3.2	< 3.6	< 6.0	< 4.1
CAWW- 1294	5/15/2023	233 ± 93	< 1.1	< 2.2	< 1.6	< 2.8	< 2.2	< 1.5	< 1.3	< 2.2	< 1.9
CAWW- 1617	6/12/2023	302 ± 101	< 2.2	< 5.1	< 1.4	< 5.0	< 3.6	< 2.3	< 2.5	< 4.1	< 3.6
CAWW- 2002	7/12/2023	179 ± 86	< 5.7	< 11.1	< 5.1	< 4.0	< 5.1	< 5.8	< 4.7	< 5.0	< 8.4
CAWW- 2473	8/14/2023	211 ± 88	< 5.9	< 11.4	< 5.4	< 7.1	< 7.6	< 6.6	< 7.1	< 6.8	< 3.5
CAWW- 2717	9/11/2023	< 163	< 3.8	< 4.9	< 2.4	< 8.3	< 4.1	< 4.0	< 4.3	< 7.0	< 3.2
CAWW- 3256	10/17/2023	< 169	< 3.1	< 4.1	< 2.2	< 7.8	< 3.4	< 4.3	< 5.1	< 7.1	< 2.9
CAWW- 3591	11/14/2023	< 172	< 2.2	< 6.1	< 2.1	< 5.6	< 5.5	< 3.6	< 3.4	< 5.1	< 3.2
CAWW- 3900	12/11/2023	< 171	< 3.2	< 5.8	< 3.6	< 3.3	< 3.5	< 4.0	< 3.5	< 3.7	< 4.2

Table 8. Wells (non-potable), analyses for tritium and gamma-emitting isotopes.

Collection		Concentration (pCi/L)									
Lab Code	Date	³ H	⁵⁴ Mn	⁵⁹ Fe	⁵⁸ Co	⁶⁰ Co	⁶⁵ Zn	⁹⁵ ZrNb	¹³⁴ Cs	¹³⁷ Cs	¹⁴⁰ BaLa
Location: CA-WWA-939R											
CAWW- 55	1/10/2023	622 ± 110	< 0.9	< 2.5	< 1.0	< 1.1	< 2.7	< 1.6	< 1.1	< 1.2	< 1.2
CAWW- 356	2/14/2023	378 ± 94	< 1.2	< 2.8	< 1.4	< 2.7	< 2.9	< 1.6	< 1.4	< 2.3	< 1.6
CAWW- 588	3/15/2023	1109 ± 129	< 3.2	< 4.5	< 2.5	< 2.6	< 7.5	< 4.1	< 3.4	< 3.3	< 4.4
CAWW- 884	4/11/2023	817 ± 116	< 1.9	< 3.5	< 1.4	< 0.7	< 2.7	< 1.8	< 1.6	< 1.4	< 1.9
CAWW- 1295	5/15/2023	708 ± 115	< 2.4	< 3.6	< 2.1	< 1.8	< 5.9	< 2.1	< 2.5	< 2.8	< 4.3
CAWW- 1618	6/12/2023	760 ± 121	< 1.2	< 2.8	< 1.1	< 2.8	< 2.7	< 1.0	< 1.3	< 2.3	< 1.5
CAWW- 2003	7/12/2023	791 ± 115	< 2.9	< 3.5	< 3.3	< 5.9	< 4.6	< 3.0	< 3.1	< 5.3	< 3.4
CAWW- 2474	8/14/2023	947 ± 122	< 2.1	< 4.2	< 3.2	< 9.3	< 3.8	< 3.9	< 4.6	< 7.7	< 2.7
CAWW- 2718	9/11/2023	768 ± 113	< 8.7	< 8.4	< 6.8	< 5.9	< 11.8	< 4.7	< 8.1	< 6.0	< 4.1
CAWW- 3257	10/17/2023	614 ± 109	< 6.7	< 6.5	< 8.6	< 5.0	< 8.8	< 10.4	< 9.2	< 6.8	< 5.7
CAWW- 3592	11/14/2023	526 ± 108	< 2.6	< 5.3	< 1.7	< 1.8	< 4.5	< 2.6	< 2.6	< 2.0	< 3.9
CAWW- 3902	12/11/2023	859 ± 120	< 2.9	< 5.0	< 1.9	< 2.6	< 4.4	< 2.1	< 4.6	< 3.2	< 3.0
Location: CA-WWA-940											
CAWW- 52	1/9/2023	222 ± 92	< 1.0	< 2.2	< 0.9	< 2.8	< 2.3	< 1.8	< 1.4	< 2.3	< 0.9
CAWW- 353	2/13/2023	221 ± 86	< 5.3	< 6.9	< 5.4	< 3.5	< 9.3	< 6.6	< 6.1	< 3.7	< 5.2
CAWW- 591	3/15/2023	218 ± 91	< 2.7	< 4.4	< 2.9	< 2.9	< 6.2	< 5.7	< 3.0	< 4.2	< 4.7
CAWW- 886	4/11/2023	206 ± 87	< 3.4	< 5.1	< 3.8	< 1.6	< 4.6	< 3.7	< 4.0	< 3.0	< 4.3
CAWW- 1296	5/15/2023	178 ± 90	< 2.0	< 5.0	< 3.7	< 6.6	< 5.1	< 2.9	< 3.2	< 5.1	< 4.0
CAWW- 1619	6/12/2023	223 ± 97	< 5.8	< 6.8	< 5.2	< 4.9	< 4.5	< 4.1	< 5.1	< 4.7	< 4.4
CAWW- 2004	7/12/2023	271 ± 91	< 6.9	< 6.9	< 4.2	< 5.1	< 7.9	< 6.4	< 6.0	< 3.8	< 5.4
CAWW- 2475	8/14/2023	230 ± 89	< 7.5	< 10.5	< 7.2	< 6.2	< 6.7	< 5.7	< 6.3	< 5.3	< 7.7
CAWW- 2721	9/11/2023	< 163	< 2.1	< 3.5	< 3.3	< 7.3	< 5.1	< 3.7	< 3.7	< 6.8	< 3.7
CAWW- 3258	10/17/2023	< 169	< 2.3	< 3.5	< 3.1	< 6.6	< 4.3	< 6.0	< 4.3	< 6.8	< 3.3
CAWW- 3593	11/14/2023	< 172	< 1.8	< 5.6	< 2.5	< 5.6	< 5.8	< 3.5	< 3.4	< 5.3	< 3.4
CAWW- 3903	12/11/2023	< 171	< 2.1	< 4.0	< 1.1	< 4.4	< 7.9	< 4.3	< 2.7	< 3.9	< 4.1
Location: CA-WWA-941											
CAWW- 51	1/9/2023	< 161	< 2.4	< 2.5	< 2.0	< 2.5	< 5.3	< 3.2	< 2.4	< 1.7	< 1.8
CAWW- 354	2/13/2023	< 154	< 1.7	< 3.4	< 3.2	< 2.8	< 4.9	< 4.1	< 2.6	< 3.3	< 1.6
CAWW- 592	3/15/2023	< 164	< 2.3	< 4.1	< 2.1	< 6.7	< 5.4	< 3.9	< 3.5	< 5.1	< 3.6
CAWW- 887	4/11/2023	< 161	< 1.8	< 5.9	< 2.3	< 2.7	< 5.1	< 2.8	< 2.5	< 1.9	< 1.6
CAWW- 1297	5/15/2023	< 175	< 5.6	< 10.4	< 4.7	< 3.8	< 7.8	< 4.4	< 5.5	< 5.6	< 8.3
CAWW- 1620	6/12/2023	< 162	< 3.2	< 5.2	< 3.8	< 7.3	< 4.2	< 3.3	< 3.1	< 5.5	< 8.6
CAWW- 2005	7/12/2023	< 163	< 2.0	< 6.5	< 3.2	< 6.7	< 4.1	< 3.4	< 3.4	< 5.7	< 3.9
CAWW- 2476	8/14/2023	< 158	< 5.2	< 4.1	< 3.6	< 8.9	< 6.1	< 2.6	< 5.6	< 8.4	< 4.3
CAWW- 2722	9/11/2023	< 163	< 7.7	< 12.5	< 4.1	< 4.0	< 12.0	< 4.6	< 7.5	< 5.6	< 4.7
CAWW- 3259	10/17/2023	< 169	< 7.1	< 12.5	< 7.0	< 6.9	< 9.8	< 7.4	< 7.5	< 8.4	< 8.7
CAWW- 3594	11/14/2023	< 172	< 2.7	< 5.5	< 1.9	< 1.6	< 4.7	< 3.0	< 3.1	< 2.6	< 5.1
CAWW- 3904	12/11/2023	< 171	< 3.8	< 3.1	< 1.9	< 7.9	< 6.1	< 2.6	< 4.2	< 8.0	< 3.0

Table 8. Wells (non-potable), analyses for tritium and gamma-emitting isotopes.

Collection		Concentration (pCi/L)									
Lab Code	Date	³ H	⁵⁴ Mn	⁵⁹ Fe	⁵⁸ Co	⁶⁰ Co	⁶⁵ Zn	⁹⁵ ZrNb	¹³⁴ Cs	¹³⁷ Cs	¹⁴⁰ BaLa
Location: CA-WWA-GWS											
CAWW- 56	1/10/2023	194 ± 90	< 0.9	< 3.8	< 2.6	< 2.3	< 5.6	< 2.6	< 2.1	< 3.0	< 3.4
CAWW- 352	2/13/2023	< 154	< 2.9	< 4.0	< 3.0	< 6.1	< 5.0	< 4.2	< 3.6	< 5.0	< 2.6
CAWW- 590	3/15/2023	230 ± 92	< 2.9	< 4.9	< 2.1	< 2.3	< 4.5	< 2.1	< 2.9	< 3.0	< 3.8
CAWW- 885	4/11/2023	257 ± 90	< 5.0	< 5.6	< 3.3	< 3.5	< 5.6	< 5.7	< 6.9	< 3.4	< 6.3
CAWW- 1298	5/16/2023	359 ± 99	< 3.8	< 3.5	< 2.7	< 3.0	< 4.1	< 5.4	< 3.7	< 2.6	< 5.7
CAWW- 1621 ^a	6/12/2023	2410 ± 169	< 5.0	< 10.3	< 6.7	< 3.3	< 6.7	< 8.5	< 5.8	< 3.6	< 8.6
CAWW- 2170 ^b	6/12/2023	2352 ± 168	< 2.5	< 6.8	< 3.9	< 6.1	< 5.2	< 4.8	< 3.5	< 5.8	< 25.2
CAWW- 2006	7/12/2023	1423 ± 138	< 5.8	< 12.4	< 6.1	< 4.9	< 7.2	< 6.3	< 5.7	< 4.7	< 4.3
CAWW- 2477	8/14/2023	575 ± 106	< 8.5	< 7.3	< 3.9	< 5.3	< 13.4	< 7.2	< 10.8	< 5.1	< 6.7
CAWW- 2720	9/11/2023	296 ± 92	< 7.0	< 10.0	< 6.2	< 6.2	< 14.6	< 8.1	< 11.2	< 5.4	< 9.6
CAWW- 3260 ^c	10/17/2023	1567 ± 144	< 3.4	< 5.2	< 2.0	< 2.4	< 4.8	< 4.0	< 3.1	< 2.9	< 3.3
CAWW- 3595	11/14/2023	367 ± 101	< 3.1	< 4.6	< 3.0	< 2.8	< 4.7	< 3.6	< 2.8	< 2.5	< 5.2
CAWW- 3906	12/11/2023	262 ± 94	< 5.7	< 5.7	< 1.9	< 3.0	< 7.5	< 3.7	< 4.3	< 4.1	< 4.1

^a Recount = 2171 ± 168 pCi/L. Reanalysis = 2448 ± 176 pCi/L.

^b Backup sample. Unable to meet LLD due to late arrival.

^c Reanalysis = 1337 ± 144 pCi/L.

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CAWW- 448	2/13/2023	214 ± 88
CAWW- 1406	5/26/2023	206 ± 85
CAWW- 2553	8/16/2023	< 160
CAWW- 3659	11/14/2023	< 172

Location: CA-WWA-U1MW-004

CAWW- 449	2/15/2023	< 164	< 1.4	< 2.6	< 1.4	< 1.0	< 2.5	< 1.9	< 1.1	< 1.3	< 1.5
CAWW- 1362	5/23/2023	< 157	< 1.4	< 2.4	< 1.2	< 2.7	< 2.9	< 1.8	< 1.4	< 2.2	< 2.2
CAWW- 2574	8/16/2023	< 160	< 7.1	< 8.9	< 6.8	< 5.6	< 8.7	< 4.7	< 6.9	< 7.2	< 5.4

Table 8. Wells (non-potable), analyses for tritium and gamma-emitting isotopes.

Lab Code	Collection Date	Concentration (pCi/L)									
		³ H	⁵⁴ Mn	⁵⁹ Fe	⁶⁰ Co	⁶⁰ Co	⁶⁵ Zn	⁹⁰ ZrNb	¹³⁴ Cs	¹³⁷ Cs	¹⁴⁰ BaLa
Location: CA-WWA-U1MW-005											
CAWW- 450	2/15/2023	< 164	< 1.5	< 3.0	< 1.6	< 2.8	< 2.2	< 1.8	< 1.4	< 2.4	< 2.9
CAWW- 1363	5/25/2023	< 157	< 2.4	< 5.0	< 2.6	< 2.4	< 5.3	< 1.6	< 2.3	< 2.1	< 3.4
CAWW- 2575	8/16/2023	< 160	< 1.7	< 5.1	< 2.7	< 6.0	< 2.8	< 2.4	< 3.4	< 5.8	< 3.5
Location: CA-WWA-U1MW-006											
CAWW- 451	2/21/2023	< 163	< 2.5	< 6.2	< 2.7	< 2.1	< 4.5	< 3.3	< 2.5	< 2.3	< 3.1
CAWW- 1364	5/24/2023	< 157	< 1.7	< 3.7	< 1.6	< 1.5	< 2.5	< 1.6	< 1.6	< 1.4	< 3.3
CAWW- 2569	8/21/2023	< 160	< 2.4	< 4.4	< 3.2	< 9.1	< 6.5	< 3.6	< 4.5	< 6.5	< 3.1
CAWW- 3652	11/15/2023	< 172	< 1.4	< 4.4	< 2.1	< 4.0	< 4.6	< 3.6	< 2.4	< 3.7	< 2.4
Location: CA-WWA-U1MW-010											
CAWW- 452	2/21/2023	< 163	< 1.6	< 2.3	< 1.7	< 1.7	< 3.2	< 1.9	< 1.5	< 1.0	< 2.4
CAWW- 1365	5/22/2023	< 157	< 4.4	< 6.2	< 5.8	< 4.5	< 5.6	< 6.1	< 5.6	< 4.0	< 3.2
CAWW- 2568	8/21/2023	< 160	< 6.4	< 6.5	< 4.8	< 3.6	< 5.0	< 5.1	< 6.1	< 4.0	< 4.1
CAWW- 3653	11/15/2023	< 172	< 4.6	< 8.2	< 5.3	< 4.9	< 6.2	< 4.7	< 4.2	< 3.5	< 4.3
Location: CA-WWA-U1MW-013 (New Location)											
CAWW- 453	2/15/2023	< 164	< 3.1	< 6.7	< 2.1	< 6.2	< 6.2	< 4.0	< 3.3	< 5.8	< 9.4
CAWW- 1366	5/22/2023	< 157	< 2.6	< 5.9	< 4.0	< 2.5	< 6.2	< 4.3	< 3.5	< 3.4	< 4.2
CAWW- 2572	8/22/2023	< 160	< 5.6	< 6.7	< 4.6	< 5.1	< 7.5	< 6.3	< 7.3	< 6.0	< 5.1
CAWW- 3654	11/15/2023	< 172	< 2.1	< 3.2	< 2.0	< 2.1	< 4.2	< 2.5	< 1.9	< 2.2	< 3.9
Location: CA-WWA-U1MW-014											
CAWW- 454	2/24/2023	238 ± 89	< 4.6	< 7.1	< 4.7	< 4.0	< 7.6	< 3.9	< 5.7	< 6.3	< 4.5
CAWW- 1367	5/23/2023	288 ± 89	< 1.1	< 2.2	< 0.7	< 1.2	< 2.3	< 1.7	< 1.0	< 1.2	< 1.8
CAWW- 2570	8/21/2023	252 ± 90	< 6.4	< 9.4	< 5.4	< 4.6	< 8.2	< 10.2	< 8.6	< 5.5	< 5.9
CAWW- 3655	11/9/2023	< 172	< 3.1	< 3.4	< 3.2	< 5.7	< 7.4	< 6.0	< 3.6	< 5.4	< 8.9
Location: CA-WWA-U1MW-015											
CAWW- 455	2/15/2023	< 164	< 2.4	< 8.1	< 3.4	< 1.9	< 5.0	< 4.5	< 3.5	< 3.9	< 7.1
CAWW- 1368	5/22/2023	< 157	< 1.6	< 1.5	< 1.1	< 2.8	< 2.7	< 1.3	< 1.4	< 2.2	< 1.8
CAWW- 2573	8/22/2023	< 160	< 3.4	< 5.8	< 3.3	< 7.5	< 5.1	< 3.5	< 4.7	< 5.9	< 3.8
CAWW- 3656	11/13/2023	< 172	< 1.9	< 4.1	< 3.8	< 2.4	< 6.5	< 3.2	< 3.0	< 2.0	< 9.2

Table 8. Wells (non-potable), analyses for tritium and gamma-emitting isotopes.

Lab Code	Collection	Concentration (pCi/L)									
	Date	³ H	⁵⁴ Mn	⁵⁹ Fe	⁵⁸ Co	⁶⁰ Co	⁶⁵ Zn	⁹⁵ ZrNb	¹³⁴ Cs	¹³⁷ Cs	¹⁴⁰ BaLa
Location: CA-WWA-U1MW-016											
CAWW- 457	2/15/2023	234 ± 89	< 5.3	< 5.6	< 4.5	< 3.2	< 9.0	< 7.2	< 4.4	< 4.0	< 7.9
CAWW- 1369	5/24/2023	< 157	< 2.6	< 2.2	< 2.4	< 1.8	< 2.2	< 3.1	< 2.1	< 2.6	< 3.3
CAWW- 2576	8/16/2023	< 160	< 4.6	< 4.8	< 6.1	< 5.0	< 9.1	< 6.0	< 5.5	< 4.5	< 5.0
CAWW- 3657	11/13/2023	< 172	< 1.9	< 6.2	< 2.0	< 3.1	< 6.6	< 5.5	< 3.2	< 3.5	< 8.6
Location: CA-WWA-U1MW-17											
CAWW- 458	2/21/2023	< 163	< 2.2	< 4.3	< 1.4	< 2.2	< 4.1	< 2.5	< 2.2	< 2.9	< 2.3
CAWW- 1370	5/23/2023	< 157	< 1.8	< 3.7	< 1.3	< 0.9	< 3.3	< 1.7	< 1.5	< 1.8	< 2.5
CAWW- 2571	8/21/2023	< 160	< 3.0	< 5.1	< 3.5	< 6.7	< 5.0	< 2.8	< 3.7	< 5.0	< 3.6
CAWW- 3658	11/9/2023	< 172	< 1.1	< 2.7	< 1.3	< 1.3	< 2.2	< 1.9	< 1.0	< 1.1	< 4.5
Location: CA-WWA-U1MW-18											
CAWW- 434	2/21/2023	233 ± 89 ^a									
CAWW- 1407	5/23/2023	< 157									
CAWW- 2565	8/21/2023	< 160									
CAWW- 3660	11/9/2023	< 172									
^a Duplicate 169 ± 86 pCi/L.											
Location: CA-WWA-U1MW-19											
CAWW- 436	2/23/2023	< 163									
CAWW- 1408	5/23/2023	< 157									
CAWW- 2564	8/21/2023	< 163									
CAWW- 3661	11/9/2023	< 172									
Location: CA-WWA-U1MW-20											
CAWW- 437	2/24/2023	< 163									
CAWW- 1409	5/25/2023	< 157									
CAWW- 2563	8/21/2023	< 160									
CAWW- 3662	11/9/2023	< 172									
Location: CA-WWA-U1MW-31											
CAWW- 438	2/10/2023	356 ± 96									
CAWW- 1410	5/17/2023	311 ± 91									
CAWW- 2557	8/15/2023	277 ± 91									
CAWW- 3663	11/17/2023	195 ± 91									

Table 8. Wells (non-potable), analyses for tritium and gamma-emitting isotopes.

		Collection	Concentration (pCi/L)									
Lab Code		Date	³ H	⁵⁴ Mn	⁵⁹ Fe	⁵⁸ Co	⁶⁰ Co	⁶⁵ Zn	⁹⁵ ZrNb	¹³⁴ Cs	¹³⁷ Cs	¹⁴⁰ BaLa
<u>Location: CA-WWA-U1MW-34</u>												
CAWW-	439	2/15/2023	370 ± 96									
CAWW-	1411	5/19/2023	221 ± 86									
CAWW-	2561	8/15/2023	262 ± 91									
CAWW-	3664	11/17/2023	261 ± 95									
<u>Location: CA-WWA-U1MW-36</u>												
CAWW-	440	2/15/2023	234 ± 89									
CAWW-	1412	5/19/2023	221 ± 86									
CAWW-	2558	8/15/2023	214 ± 88									
CAWW-	3665	11/17/2023	< 172									
<u>Location: CA-WWA-U1MW-39</u>												
CAWW-	441	2/10/2023	< 164									
CAWW-	1413	5/19/2023	< 158									
CAWW-	2552	8/16/2023	< 160									
CAWW-	3275	10/23/2023	< 166	< 3.4	< 4.4	< 2.6	< 5.3	< 5.1	< 4.2	< 3.2	< 4.7	< 1.8
CAWW-	3666	11/15/2023	< 172									

Table 8. Wells (non-potable), analyses for tritium and gamma-emitting isotopes.

Collection		Concentration (pCi/L)										
Lab Code	Date	³ H	⁵⁴ Mn	⁵⁹ Fe	⁵⁸ Co	⁶⁰ Co	⁶⁵ Zn	⁹⁵ ZrNb	¹³⁴ Cs	¹³⁷ Cs	¹⁴⁰ BaLa	
<u>Location: CA-WWA-U1MW-47</u>												
CAWW- 2554	2/24/2023						ND ^a					
	5/31/2023						ND ^a					
	8/16/2023	< 161										
	11/13/2023						ND ^a					
<u>Location: CA-WWA-U1MW-48</u>												
CAWW- 442	2/15/2023	210 ± 88										
CAWW- 1414	5/17/2023	202 ± 85										
CAWW- 2559	8/16/2023	209 ± 88										
CAWW- 3667	11/17/2023	< 172										
<u>Location: CA-WWA-U1MW-59</u>												
CAWW- 443	2/21/2023	< 163										
CAWW- 1415	5/19/2023	< 158										
CAWW- 2562	8/21/2023	< 160										
CAWW- 3668	11/17/2023	< 172										

^a"ND" = No data, see Table 2.0, Listing of Missed Samples.

Table 8. Wells (non-potable), analyses for tritium and gamma-emitting isotopes.

Lab Code	Collection Date	Concentration (pCi/L)									
		³ H	⁵⁴ Mn	⁵⁹ Fe	⁵⁸ Co	⁶⁰ Co	⁶⁵ Zn	⁹⁵ ZrNb	¹³⁴ Cs	¹³⁷ Cs	¹⁴⁰ BaLa
<u>Location: CA-WWA-U2MW-2S</u>											
CAWW- 444	2/23/2023	< 163									
CAWW- 1416	5/26/2023	< 157									
CAWW- 2567	8/22/2023	< 160									
CAWW- 3678	11/15/2023	< 172									
<u>Location: CA-WWA-U2MW-5S</u>											
CAWW- 445	2/16/2023	< 163									
CAWW- 1417	5/26/2023	< 157									
CAWW- 2555	8/16/2023	< 160									
CAWW- 3679	11/15/2023	< 172									
<u>Location: CA-WWA-U2MW-8</u>											
CAWW- 446	2/10/2023	< 164									
CAWW- 1418	5/17/2023	< 158									
CAWW- 2560	8/15/2023	< 160									
CAWW- 3680	11/15/2023	< 172									
<u>Location: CA-WWA-U2MW-16</u>											
CAWW- 447	2/24/2023	< 163									
CAWW- 1419	5/24/2023	< 157									
CAWW- 2566	8/22/2023	< 160									
CAWW- 3681	11/17/2023	< 172									
<u>Location: CA-WWA-F-005</u>											
CAWW- 115	1/17/2023	< 160	< 2.0	< 4.7	< 2.4	< 2.1	< 5.0	< 3.0	< 2.4	< 2.6	< 2.4
CAWW- 777	4/3/2023	< 173	< 2.1	< 3.7	< 1.1	< 2.3	< 4.5	< 2.5	< 1.9	< 2.0	< 1.9
CAWW- 2008	7/11/2023	< 163	< 4.6	< 10.4	< 3.4	< 2.9	< 3.7	< 4.1	< 3.8	< 4.2	< 3.2
CAWW- 3043	10/6/2023	< 170	< 5.2	< 6.1	< 6.1	< 4.4	< 6.5	< 4.4	< 7.6	< 5.5	< 4.0
<u>Location: CA-WWA-F-015</u>											
CAWW- 116	1/17/2023	< 160	< 0.8	< 1.8	< 1.2	< 1.3	< 2.3	< 1.5	< 1.1	< 1.2	< 0.8
CAWW- 778	4/3/2023	< 173	< 3.3	< 5.6	< 3.0	< 2.0	< 4.5	< 3.2	< 2.8	< 1.8	< 3.8
CAWW- 2007	7/10/2023	< 163	< 6.1	< 6.3	< 6.0	< 4.7	< 14.2	< 5.7	< 5.6	< 6.4	< 4.0
CAWW- 3042	10/6/2023	< 170	< 2.5	< 4.6	< 2.1	< 6.0	< 5.4	< 2.3	< 3.5	< 5.8	< 2.4

Table 9. Shoreline sediments, analyses for gamma-emitting isotopes.

Collection: Semiannually

Units: pCi/kg dry

Location		CA-AQS-A	
Lab Code	Req. LLD	CASS- 1252	CASS- 2944
Date Collected	-	05-10-23	09-28-23
K-40	-	11820 ± 633	13909 ± 689
Mn-54	-	< 22.3	< 19.9
Fe-59	-	< 71.6	< 47.1
Co-58	-	< 22.0	< 21.9
Co-60	-	< 15.7	< 18.7
Zr-Nb-95	-	< 38.9	< 25.1
Cs-134	150	< 17.0	< 20.5
Cs-137	180	< 13.8	53.4 ± 21.3 ^a
Ba-La-140	-	< 186.1	< 62.5

Location		CA-AQS-C	
Lab Code	Req. LLD	CASS- 1253	CASS- 2945
Date Collected	-	05-10-23	09-28-23
K-40	-	13238 ± 720	13466 ± 710
Mn-54	-	< 28.9	< 27.4
Fe-59	-	< 75.3	< 51.0
Co-58	-	< 35.3	< 32.1
Co-60	-	< 20.1	< 17.8
Zr-Nb-95	-	< 52.2	< 27.4
Cs-134	150	< 22.5	< 21.4
Cs-137	180	< 17.4	52.0 ± 20.4 ^b
Ba-La-140	-	< 256.7	< 74.0

^a Recount = 42.4 ± 7 pCi/kg.^b Recount = 48.3 ± 7 pCi/kg.

Table 10. Fish, analyses for gamma-emitting isotopes.

Collection: Semiannually

Units: pCi/kg wet

Location		CA-AQF-A				
Lab Code	Req. LLD	CAF- 1241	CAF- 1242	CAF- 1243	CAF- 1244	CAF- 1245
Date Collected		05-10-23	05-10-23	05-10-23	05-10-23	05-10-23
Sample Type		Common Carp CC	River Carpsucker RC	Silver Carp SC	Smallmouth Buffalo SB	Freshwater Drum FD
K-40	-	3083 ± 349	3198 ± 373	2750 ± 307	3190 ± 379	3535 ± 402
Mn-54	130	< 11.7	< 15.6	< 9.1	< 11.9	< 10.1
Fe-59	260	< 51.4	< 70.7	< 57.4	< 74.6	< 72.8
Co-58	130	< 19.1	< 18.1	< 17.5	< 20.6	< 13.9
Co-60	130	< 8.5	< 11.1	< 3.8	< 10.9	< 7.0
Zn-65	260	< 19.5	< 28.0	< 25.4	< 25.5	< 26.7
Cs-134	130	< 14.7	< 7.7	< 13.7	< 14.8	< 12.3
Cs-137	150	< 10.0	< 9.7	< 9.7	< 8.9	< 13.6

Location		CA-AQF-A				
Lab Code	Req. LLD	CAF- 2934	CAF- 2935	CAF- 2936	CAF- 2937	CAF- 2938
Date Collected		09-28-23	09-28-23	09-28-23	09-28-23	09-28-23
Sample Type		Common Carp CC	River Carpsucker RC	Silver Carp SC	Smallmouth Buffalo SB	Freshwater Drum FD
K-40	-	3028 ± 526	3105 ± 427	3335 ± 552	2966 ± 390	2467 ± 590
Mn-54	130	< 19.7	< 13.7	< 23.3	< 9.2	< 25.8
Fe-59	260	< 65.7	< 52.0	< 36.4	< 30.6	< 52.3
Co-58	130	< 15.3	< 13.4	< 19.7	< 17.8	< 17.2
Co-60	130	< 26.5	< 32.6	< 20.3	< 34.5	< 15.8
Zn-65	260	< 66.9	< 23.2	< 20.1	< 23.0	< 58.5
Cs-134	130	< 24.8	< 17.4	< 24.4	< 18.7	< 23.3
Cs-137	150	< 25.9	< 26.8	< 15.9	< 25.8	< 18.5

Table 10. Fish, analyses for gamma-emitting isotopes.

Collection: Semiannually

Units: pCi/kg wet

Location		CA-AQF-C				
Lab Code	Req. LLD	CAF- 1246	CAF- 1247	CAF- 1248	CAF- 1250	CAF- 1251
Date Collected		05-10-23	05-10-23	05-10-23	05-10-23	05-10-23
Sample Type		Common Carp CC	River Carpsucker RC	Silver Carp SC	Smallmouth Buffalo SB	Freshwater Drum FD
K-40	-	3538 ± 381	3261 ± 379	3123 ± 386	3149 ± 375	3476 ± 398
Mn-54	130	< 8.5	< 13.3	< 9.6	< 8.4	< 11.2
Fe-59	260	< 49.9	< 59.6	< 66.4	< 64.4	< 67.8
Co-58	130	< 17.1	< 19.9	< 14.4	< 17.1	< 10.4
Co-60	130	< 10.5	< 8.8	< 10.0	< 16.7	< 9.1
Zn-65	260	< 20.0	< 22.5	< 23.4	< 19.9	< 32.0
Cs-134	130	< 17.0	< 10.7	< 14.5	< 15.4	< 11.8
Cs-137	150	< 10.2	< 13.8	< 10.2	< 11.6	< 8.3

Location		CA-AQF-C				
Lab Code	Req. LLD	CAF- 2939	CAF- 2940	CAF- 2941	CAF- 2942	CAF- 2943
Date Collected		09-28-23	09-28-23	09-28-23	09-28-23	09-28-23
Sample Type		Common Carp CC	River Carpsucker RC	Silver Carp SC	Smallmouth Buffalo SB	Freshwater Drum FD
K-40	-	3124 ± 509	3389 ± 635	3259 ± 421	3444 ± 442	3798 ± 470
Mn-54	130	< 31.4	< 32.6	< 10.4	< 9.6	< 15.4
Fe-59	260	< 52.6	< 88.3	< 38.7	< 27.6	< 59.9
Co-58	130	< 20.5	< 14.6	< 17.7	< 19.3	< 16.5
Co-60	130	< 7.3	< 22.4	< 9.1	< 12.2	< 37.4
Zn-65	260	< 76.8	< 38.8	< 15.3	< 27.7	< 19.1
Cs-134	130	< 25.9	< 26.1	< 17.7	< 14.3	< 15.5
Cs-137	150	< 23.9	< 23.8	< 12.0	< 17.0	< 31.0

Table 11a. Direct Radiation (quarterly exposure)

Location	Gamma Dose (mrem/90 days)			
	QTR 1	QTR 2	QTR 3	QTR 4
CA-IDM-1A	15.51	15.51	15.33	15.80
CA-IDM-3	16.44	15.91	15.80	17.18
CA-IDM-5	13.53	14.98	12.75	13.69
CA-IDM-6	15.53	14.62	14.49	15.31
CA-IDM-7	15.43	14.25	15.32	15.13
CA-IDM-9	14.42	14.61	14.35	14.08
CA-IDM-10	NS ^a	16.67	16.18	17.20
CA-IDM-11A	16.15	15.79	15.86	16.62
CA-IDM-14	15.63	14.86	15.36	15.41
CA-IDM-17	15.23	15.09	14.39	15.45
CA-IDM-18A	15.89	15.35	15.91	15.43
CA-IDM-20	15.54	14.94	15.62	15.35
CA-IDM-21	15.80	14.54	15.22	15.43
CA-IDM-22A	13.52	11.96	11.73	12.66
CA-IDM-23	16.29	16.93	15.90	16.24
CA-IDM-26 (C)	11.51	9.89	9.79	10.54
CA-IDM-27 (C)	17.47	15.82	15.71	16.83
CA-IDM-30A	15.11	14.88	14.63	15.21
CA-IDM-31A	16.34	16.05	16.69	16.69
CA-IDM-32	15.68	16.90	15.49	16.70
CA-IDM-32A	14.69	15.53	14.22	14.85
CA-IDM-33	14.77	16.19	14.50	15.48
CA-IDM-34	14.35	14.25	15.00	15.09
CA-IDM-35	14.12	14.09	13.43	13.55
CA-IDM-36	14.22	13.48	12.77	14.59
CA-IDM-37	15.16	15.30	15.00	15.47
CA-IDM-38	10.90	10.20	10.82	10.68
CA-IDM-39	14.07	14.90	14.42	15.00
CA-IDM-39A	15.31	15.53	14.33	15.22
CA-IDM-40	15.50	15.98	15.24	16.25
CA-IDM-41	14.12	15.29	14.45	14.97
CA-IDM-42	13.83	14.21	12.82	13.32
CA-IDM-43	14.86	15.63	15.13	15.38
CA-IDM-44	14.92	15.33	15.45	15.56
CA-IDM-45	13.87	13.83	13.66	14.30
CA-IDM-46	16.51	14.95	14.70	16.38
CA-IDM-47	14.69	14.66	14.54	14.85
CA-IDM-48	15.57	15.50	15.88	16.62
CA-IDM-49	14.46	14.67	13.83	14.38
CA-IDM-50	15.35	15.26	15.11	15.42
CA-IDM-51A	16.68	16.37	15.75	17.20
CA-IDM-52	15.75	15.19	15.65	16.44
CA-IDM-60 (C)	14.78	15.76	15.21	15.70
CA-IDM-61	14.25	14.26	14.28	14.59

^a "NS" = No sample; see Table 2.0, Listing of Missed Samples.

Table 11b. Direct Radiation Neutron (quarterly exposure)

Location	Neutron Dose (mrem/90 days)			
	QTR 1	QTR 2	QTR 3	QTR 4
CA-IDM-60N (C)	0.0 ± 1.0	0.0 ± 1.7	0.0 ± 1.7	0.0 ± 1.1
CA-IDM-61N	0.0 ± 2.4	0.0 ± 1.6	0.0 ± 0.8	0.0 ± 1.0
CA-IDM-62N	0.0 ± 2.3	0.0 ± 1.8	0.0 ± 0.8	0.0 ± 1.6
CA-IDM-63N	0.0 ± 1.7	0.0 ± 1.8	0.0 ± 1.2	0.0 ± 1.4
CA-IDM-64N	0.0 ± 0.6	0.0 ± 1.5	0.0 ± 1.0	0.0 ± 1.4