

ENVIRONMENTAL

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DATA

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## Preface

*Environmental Radiation Data* (ERD) contains data from the RadNet monitoring system (formerly ERAMS), which is operated by the Office of Radiation and Indoor Air's National Analytical Radiation Environmental Laboratory (NAREL) in Montgomery, Alabama. ERD is published in electronic format, which is available online at <http://www.epa.gov/narel>. RadNet data are also available online in a searchable database at:

<http://www.epa.gov/enviro/facts/radnet>

The United States Environmental Protection Agency established RadNet in 1973 with an emphasis on identifying trends in the accumulation of long-lived radionuclides in the environment. RadNet is comprised of a nationwide network of sampling stations that provide air particulate, precipitation, and drinking water samples.

Sampling locations are selected to provide population and geographic coverage for the United States. The radiation analyses performed on RadNet samples may include gross alpha and gross beta analysis, gamma analyses, and radionuclide-specific analyses for isotopes of uranium, plutonium, strontium, iodine, and radium, and for tritium. This monitoring effort also provides information on natural background levels and possible releases into the environment.

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## **Acknowledgments**

All sampling for the RadNet monitoring system (formerly ERAMS) is performed by volunteer collectors who are frequently members of health departments or related environmental agencies of their respective states. The National Analytical Radiation Environmental Laboratory (NAREL), on behalf of the U.S. Environmental Protection Agency, would like to acknowledge the time and effort of these volunteer collectors, who are so essential to the successful operation of RadNet. The efforts of the sample collectors are especially appreciated during times of emergency operation when sampling frequencies are increased and schedules are sometimes demanding.

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## Data Reporting Conventions

Every laboratory measurement involves uncertainty. When there is little or no radioactivity in a sample, one consequence of measurement uncertainty is the possibility of obtaining a measured value that is less than zero. Such a negative result occurs when random effects in the measurement process cause the measured value for the sample to be less than that of the blank or background, which is subtracted from it. From April 1991 to December 1995, negative results were reported as “not detected” or “ND,” and gamma analysis results that were less than their estimated measurement uncertainties were also reported as “ND.” In January 1996, both of these practices were discontinued. Although negative activities are physically impossible, the inclusion of negative results in the report allows better statistical analysis of the data.

Results of gamma analyses are still reported as “ND” when gamma-emitting radionuclides are not detected.

### Measurement Uncertainty

Each measured value  $y$  is reported with an expanded uncertainty  $U = k u_c(y)$ , which is determined from the combined standard uncertainty  $u_c(y)$  and the coverage factor  $k = 2$ . The interval from  $y - U$  to  $y + U$  is estimated to have a level of confidence of approximately 95 %.

### Significant Figures

Expanded uncertainties are reported to two significant figures. Measurement results are rounded to the corresponding number of decimal places.

### Detection Capability

The minimum detectable concentrations (MDCs) for each radionuclide are shown in Table 1. The MDC is defined as the minimum concentration that gives a 95 % probability of detection when the detection criteria are chosen to give only a 5 % probability of false detection in a sample that is analyte-free.

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**Table 1****Reporting Units and Minimum Detectable Concentrations  
for Radionuclide Analyses**

Radionuclide	Media	Reporting Unit	Minimum Detectable Concentration
Gross Alpha	Water	pCi/L	2
Gross Beta	Air	pCi/m <sup>3</sup>	0.0006
	Water	pCi/L	2
Tritium	Water	pCi/L	150
* Plutonium-238,239/240	Air	aCi/m <sup>3</sup>	6
	Water	pCi/L	0.3
† Uranium-234,238	Air	aCi/m <sup>3</sup>	7.5
	Water	pCi/L	0.35
† Uranium-235	Air	aCi/m <sup>3</sup>	9
	Water	pCi/L	0.4
Radium-226	Water	pCi/L	0.02
Strontium-90	Water	pCi/L	1
‡ Iodine-131	Water (gamma)	pCi/L	4
	Water	pCi/L	0.3
Cesium-137	Water	pCi/L	5
‡ Barium-140	Water	pCi/L	15
Potassium-40	Water	pCi/L	50

\* The MDC for air is based on an assumed total sample volume of 10,000 m<sup>3</sup>. Measurement by alpha spectrometry includes combined activities of <sup>239</sup>Pu and <sup>240</sup>Pu, since the relative contributions of these two isotopes cannot be determined.

† The MDCs for air are based on an assumed total sample volume of 10,000 m<sup>3</sup>.

‡ Activity as of the day of counting.

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# **1. Air Program**

## **Airborne Particulates and Precipitation**

Gross beta radioactivity measurements and certain specific analyses are performed on air particulates and precipitation samples as indicator measurements in assessing the general (national) impact of all contributing sources on environmental levels of radiation. Continuous air samplers collect airborne particulates at field stations representing wide geographic coverage throughout the United States.

Filters (10 cm diameter synthetic fiber) from air samplers are changed routinely, and the exposed filters are sent to NAREL for analysis in a gas proportional counter. Gamma scans are performed on all filters showing gross beta activity greater than 1 pCi/m<sup>3</sup>.

All stations routinely submit precipitation samples as rainfall, snow, or sleet occurs. The precipitation samples are composited at NAREL into single monthly samples for each station. Each month that precipitation occurs, an aliquant of the composited sample is analyzed for gamma-emitting radionuclides.

**Table 2**  
**Gross Beta in Airborne Particulates**  
**July 2014**

Location	Number of Samples	NAREL Lab Measurement		
		Max	Min (pCi/m <sup>3</sup> )	Avg
AK: Anchorage	3	0.002	0.001	0.001
AK: Fairbanks	9	0.005	0.002	0.003
AK: Juneau	7	0.003	0.001	0.002
AL: Birmingham	8	0.021	0.006	0.011
AL: Montgomery/408	9	0.016	0.006	0.009
AR: Little Rock	6	0.018	0.007	0.011
AZ: Phoenix/956	5	0.010	0.005	0.007
AZ: Tucson	6	0.012	0.007	0.009
CA: Anaheim	9	0.005	0.003	0.004
CA: Eureka	2	0.001	0.001	0.001
CA: Fresno	1	0.010	0.010	0.010
CA: Los Angeles	8	0.011	0.004	0.007
CA: Richmond	5	0.002	0.001	0.002
CA: Riverside	8	0.009	0.006	0.008
CA: San Bernardino Cty.	6	0.011	0.007	0.009
CA: San Diego	1	0.007	0.007	0.007
CA: San Francisco	8	0.003	0.001	0.002
CA: San Jose	8	0.007	0.001	0.003
CO: Colorado Springs	3	0.012	0.012	0.012
CO: Denver	6	0.020	0.012	0.016
CO: Grand Junction	1	0.013	0.013	0.013
CT: Hartford	9	0.009	0.006	0.007
DC: Washington	9	0.012	0.006	0.008
DE: Dover	1	0.008	0.008	0.008
FL: Jacksonville	7	0.010	0.004	0.008
FL: Orlando	7	0.009	0.003	0.005
FL: Tallahassee	4	0.011	0.006	0.008
FL: Tampa	6	0.008	0.003	0.006
GA: Atlanta	4	0.011	0.006	0.008
GA: Augusta	4	0.007	0.005	0.006
HI: Honolulu	6	0.002	0.001	0.002
IA: Des Moines	9	0.010	0.004	0.007
IA: Mason City	4	0.008	0.005	0.007
ID: Idaho Falls	7	0.012	0.006	0.010
IL: Aurora	5	0.013	0.006	0.008
IL: Champaign	8	0.009	0.002	0.006
IL: Chicago	10	0.012	0.003	0.007
IN: Fort Wayne	3	0.010	0.007	0.008



**Table 2 (continued)**  
**Gross Beta in Airborne Particulates**  
**July 2014**

Location	Number of Samples	NAREL Lab Measurement		
		Max	Min (pCi/m <sup>3</sup> )	Avg
IN: Indianapolis	8	0.013	0.004	0.008
KS: Kansas City	7	0.013	0.009	0.011
KS: Wichita	9	0.016	0.006	0.010
KY: Lexington	8	0.017	0.005	0.010
KY: Louisville	8	0.013	0.006	0.009
KY: Paducah	8	0.016	0.006	0.011
LA: Baton Rouge	8	0.012	0.007	0.009
LA: Shreveport	2	0.012	0.010	0.011
MA: Boston	8	0.008	0.004	0.006
MA: Worcester	8	0.010	0.005	0.008
ME: Orono	4	0.004	0.003	0.004
ME: Portland	8	0.009	0.005	0.007
MI: Bay City 48708	7	0.006	0.003	0.004
MI: Detroit	9	0.013	0.005	0.009
MI: Grand Rapids	3	0.009	0.005	0.007
MN: Duluth	2	0.007	0.004	0.005
MN: St. Paul	2	0.009	0.008	0.009
MO: Jefferson City	6	0.016	0.006	0.010
MO: Springfield	10	0.016	0.005	0.011
MO: St. Louis	5	0.011	0.006	0.008
MS: Jackson/Deq	3	0.014	0.007	0.011
MT: Billings	3	0.009	0.006	0.007
NC: Charlotte	9	0.016	0.007	0.011
NC: Greensboro	2	0.021	0.009	0.015
NC: Raleigh	1	0.005	0.005	0.005
NC: Wilmington	4	0.005	0.003	0.004
ND: Bismarck	7	0.010	0.004	0.007
NE: Kearney	8	0.012	0.006	0.009
NE: Lincoln	7	0.010	0.005	0.008
NE: Omaha	4	0.013	0.008	0.010
NH: Concord	6	0.008	0.003	0.006
NJ: Edison	6	0.007	0.005	0.006
NM: Carlsbad	5	0.014	0.009	0.011
NV: Las Vegas/913	2	0.016	0.008	0.012
NV: Reno	1	0.008	0.008	0.008
NY: Albany	6	0.010	0.004	0.008
NY: Lockport	8	0.010	0.005	0.008
NY: New York City	4	0.008	0.006	0.007

**Table 2 (continued)**  
**Gross Beta in Airborne Particulates**  
**July 2014**

Location	Number of Samples	NAREL Lab Measurement		
		Max	Min (pCi/m <sup>3</sup> )	Avg
NY: Rochester	8	0.011	0.003	0.008
NY: Syracuse	2	0.009	0.006	0.007
NY: Yaphank	5	0.005	0.002	0.004
OH: Cincinnati	8	0.011	0.004	0.008
OH: Cleveland	5	0.013	0.007	0.010
OH: Toledo	9	0.012	0.004	0.006
OK: Oklahoma City	8	0.021	0.005	0.013
OK: Tulsa	9	0.029	0.000	0.011
OR: Corvallis	9	0.004	0.002	0.002
OR: Portland	7	0.002	0.001	0.002
PA: Bloomsburg	7	0.008	0.005	0.006
PA: Philadelphia	4	0.009	0.006	0.007
PA: Pittsburgh	4	0.012	0.008	0.010
PR: San Juan	7	0.012	0.003	0.006
RI: Providence	6	0.009	0.006	0.007
SC: Columbia	2	0.010	0.009	0.009
SD: Pierre	7	0.014	0.006	0.009
SD: Rapid City	8	0.013	0.005	0.009
TN: Knoxville	4	0.015	0.012	0.013
TN: Memphis	4	0.017	0.007	0.012
TN: Nashville	8	0.014	0.005	0.008
TN: Oak Ridge/Bethel	8	0.012	0.006	0.008
TN: Oak Ridge/K25	8	0.015	0.006	0.010
TN: Oak Ridge/Y12 E	8	0.012	0.007	0.009
TN: Oak Ridge/Y12 W	8	0.014	0.007	0.009
TX: Amarillo	7	0.021	0.010	0.013
TX: Austin	4	0.014	0.010	0.012
TX: Dallas	4	0.018	0.014	0.015
TX: El Paso	1	0.016	0.016	0.016
TX: Ft. Worth	5	0.011	0.007	0.009
TX: Harlingen	4	0.011	0.010	0.010
TX: Houston	9	0.015	0.008	0.011
TX: Lubbock	7	0.014	0.006	0.009
TX: San Angelo	2	0.012	0.009	0.010
TX: San Antonio	8	0.015	0.007	0.011
UT: Salt Lake City	10	0.014	0.005	0.009
UT: St. George	4	0.008	0.006	0.006
VA: Harrisonburg	9	0.014	0.007	0.010

**Table 2 (continued)**  
**Gross Beta in Airborne Particulates**  
**July 2014**

Location	Number of Samples	NAREL Lab Measurement		
		Max	Min (pCi/m <sup>3</sup> )	Avg
VA: Lynchburg	5	0.006	0.004	0.005
VA: Richmond	7	0.011	0.007	0.009
VA: Virginia Beach	9	0.011	0.005	0.007
VT: Burlington	8	0.007	0.005	0.006
WA: Olympia	7	0.003	0.001	0.002
WA: Richland	7	0.010	0.001	0.006
WA: Seattle	3	0.002	0.001	0.002
WA: Spokane	7	0.012	0.003	0.007
WI: Lacrosse	4	0.007	0.004	0.005
WI: Madison	9	0.019	0.003	0.010
WI: Milwaukee	5	0.011	0.007	0.009
WI: Shawano	8	0.009	0.003	0.006
WV: Charleston	3	0.009	0.003	0.006
WY: Casper	2	0.010	0.009	0.010

**Table 3**  
**Gross Beta in Airborne Particulates**  
**August 2014**

Location	Number of Samples	NAREL Lab Measurement		
		Max	Min (pCi/m <sup>3</sup> )	Avg
AK: Anchorage	4	0.003	0.001	0.001
AK: Fairbanks	7	0.006	0.002	0.004
AK: Juneau	4	0.003	0.001	0.002
AL: Birmingham	8	0.022	0.010	0.013
AL: Montgomery/408	8	0.016	0.005	0.010
AR: Little Rock	6	0.022	0.011	0.014
AZ: Phoenix/956	8	0.011	0.005	0.007
AZ: Tucson	9	0.011	0.005	0.009
CA: Anaheim	9	0.007	0.004	0.005
CA: Eureka	2	0.002	0.002	0.002
CA: Fresno	1	0.012	0.012	0.012
CA: Los Angeles	8	0.011	0.007	0.008
CA: Richmond	4	0.003	0.003	0.003
CA: Riverside	7	0.013	0.008	0.010
CA: Sacramento	7	0.008	0.003	0.005
CA: San Bernardino Cty.	8	0.013	0.009	0.011
CA: San Diego	3	0.009	0.006	0.008
CA: San Francisco	9	0.004	0.002	0.003
CA: San Jose	8	0.008	0.003	0.005
CO: Colorado Springs	3	0.013	0.009	0.011
CO: Denver	7	0.021	0.011	0.015
CO: Grand Junction	1	0.010	0.010	0.010
CT: Hartford	9	0.008	0.003	0.006
DC: Washington	9	0.014	0.007	0.008
DE: Dover	3	0.006	0.004	0.005
FL: Jacksonville	8	0.012	0.004	0.009
FL: Orlando	7	0.009	0.003	0.006
FL: Tallahassee	4	0.011	0.008	0.009
FL: Tampa	5	0.013	0.003	0.007
GA: Atlanta	2	0.011	0.009	0.010
GA: Augusta	5	0.012	0.005	0.009
HI: Honolulu	3	0.003	0.002	0.003
IA: Des Moines	7	0.017	0.004	0.011
IA: Mason City	5	0.011	0.009	0.011
ID: Boise	2	0.008	0.007	0.007
ID: Idaho Falls	7	0.013	0.006	0.011
IL: Aurora	4	0.013	0.009	0.011
IL: Champaign	8	0.014	0.005	0.009

**Table 3 (continued)**  
**Gross Beta in Airborne Particulates**  
**August 2014**

Location	Number of Samples	NAREL Lab Measurement		
		Max	Min (pCi/m <sup>3</sup> )	Avg
IL: Chicago	7	0.016	0.004	0.009
IN: Fort Wayne	4	0.016	0.010	0.013
IN: Indianapolis	8	0.018	0.006	0.012
KS: Kansas City	5	0.018	0.009	0.014
KS: Wichita	8	0.018	0.009	0.013
KY: Lexington	7	0.027	0.012	0.016
KY: Louisville	4	0.015	0.010	0.012
KY: Paducah	9	0.023	0.011	0.016
LA: Baton Rouge	7	0.016	0.005	0.010
LA: Shreveport	5	0.016	0.009	0.011
MA: Boston	9	0.008	0.003	0.005
MA: Worcester	9	0.010	0.004	0.006
MD: Baltimore	1	0.009	0.009	0.009
ME: Orono	4	0.005	0.002	0.004
ME: Portland	9	0.010	0.003	0.006
MI: Bay City 48708	7	0.008	0.004	0.006
MI: Detroit	8	0.017	0.007	0.011
MI: Grand Rapids	4	0.019	0.010	0.014
MN: Duluth	8	0.008	0.002	0.005
MO: Jefferson City	9	0.017	0.007	0.013
MO: Springfield	8	0.021	0.008	0.014
MO: St. Louis	3	0.016	0.009	0.013
MS: Jackson/Deq	3	0.015	0.009	0.013
MT: Billings	4	0.015	0.007	0.011
NC: Charlotte	8	0.022	0.009	0.013
NC: Greensboro	2	0.010	0.007	0.009
NC: Raleigh	3	0.011	0.005	0.008
NC: Wilmington	4	0.008	0.003	0.006
ND: Bismarck	7	0.016	0.006	0.011
NE: Kearney	8	0.022	0.006	0.012
NE: Lincoln	8	0.018	0.006	0.010
NE: Omaha	4	0.016	0.011	0.013
NH: Concord	6	0.004	0.003	0.004
NJ: Edison	6	0.007	0.004	0.006
NM: Albuquerque	2	0.012	0.011	0.012
NV: Las Vegas/913	8	0.013	0.007	0.009
NV: Reno	6	0.012	0.008	0.009
NY: Albany	7	0.011	0.004	0.007

**Table 3 (continued)**  
**Gross Beta in Airborne Particulates**  
**August 2014**

Location	Number of Samples	NAREL Lab Measurement		
		Max	Min (pCi/m <sup>3</sup> )	Avg
NY: Lockport	9	0.013	0.004	0.008
NY: New York City	3	0.006	0.005	0.006
NY: Rochester	8	0.016	0.005	0.009
NY: Syracuse	1	0.006	0.006	0.006
NY: Yaphank	3	0.005	0.004	0.004
OH: Cincinnati	8	0.016	0.006	0.012
OH: Cleveland	9	0.016	0.007	0.011
OH: Columbus	1	0.016	0.016	0.016
OH: Toledo	7	0.010	0.005	0.008
OK: Oklahoma City	9	0.021	0.008	0.014
OK: Tulsa	8	0.021	0.008	0.013
OR: Corvallis	8	0.006	0.003	0.004
OR: Portland	9	0.003	0.002	0.003
PA: Bloomsburg	7	0.007	0.004	0.005
PA: Philadelphia	4	0.008	0.006	0.007
PA: Pittsburgh	4	0.012	0.008	0.010
PR: San Juan	7	0.007	0.004	0.005
RI: Providence	4	0.007	0.006	0.006
SC: Columbia	5	0.013	0.006	0.011
SD: Pierre	8	0.015	0.005	0.010
SD: Rapid City	7	0.016	0.007	0.013
TN: Knoxville	3	0.022	0.013	0.016
TN: Memphis	8	0.024	0.007	0.015
TN: Nashville	9	0.019	0.008	0.012
TN: Oak Ridge/Bethel	8	0.017	0.007	0.011
TN: Oak Ridge/K25	8	0.018	0.008	0.012
TN: Oak Ridge/Melton	6	0.012	0.006	0.008
TN: Oak Ridge/Y12 E	8	0.019	0.008	0.013
TN: Oak Ridge/Y12 W	8	0.020	0.008	0.012
TX: Amarillo	9	0.022	0.010	0.014
TX: Austin	4	0.012	0.007	0.010
TX: Dallas	7	0.017	0.011	0.013
TX: El Paso	7	0.010	0.005	0.008
TX: Ft. Worth	4	0.011	0.007	0.009
TX: Harlingen	2	0.010	0.008	0.009
TX: Houston	8	0.013	0.008	0.010
TX: Laredo	6	0.013	0.007	0.010
TX: Lubbock	9	0.012	0.007	0.009

**Table 3 (continued)**  
**Gross Beta in Airborne Particulates**  
**August 2014**

Location	Number of Samples	NAREL Lab Measurement		
		Max	Min (pCi/m <sup>3</sup> )	Avg
TX: San Angelo	2	0.011	0.011	0.011
TX: San Antonio	8	0.013	0.007	0.010
UT: Salt Lake City	8	0.011	0.006	0.008
UT: St. George	4	0.007	0.006	0.007
VA: Harrisonburg	8	0.014	0.007	0.012
VA: Richmond	9	0.017	0.007	0.010
VA: Virginia Beach	7	0.011	0.006	0.009
VT: Burlington	8	0.009	0.003	0.005
WA: Olympia	3	0.005	0.003	0.004
WA: Richland	7	0.009	0.005	0.007
WA: Seattle	5	0.004	0.002	0.003
WA: Spokane	8	0.014	0.005	0.010
WI: Lacrosse	2	0.011	0.006	0.009
WI: Madison	8	0.024	0.006	0.015
WI: Milwaukee	1	0.014	0.014	0.014
WI: Shawano	8	0.015	0.004	0.008
WV: Charleston	6	0.021	0.008	0.012
WY: Casper	4	0.012	0.007	0.010

**Table 4**  
**Gross Beta in Airborne Particulates**  
**September 2014**

Location	Number of Samples	NAREL Lab Measurement		
		Max	Min (pCi/m <sup>3</sup> )	Avg
AK: Anchorage	5	0.007	0.001	0.003
AK: Fairbanks	7	0.004	0.001	0.003
AK: Juneau	5	0.002	0.001	0.002
AL: Birmingham	7	0.014	0.006	0.009
AL: Montgomery/408	9	0.010	0.005	0.007
AR: Fort Smith	5	0.013	0.006	0.009
AR: Little Rock	8	0.017	0.006	0.010
AZ: Phoenix/956	6	0.011	0.005	0.007
AZ: Tucson	7	0.011	0.005	0.008
CA: Anaheim	9	0.009	0.003	0.006
CA: Eureka	4	0.009	0.003	0.006
CA: Los Angeles	6	0.015	0.005	0.009
CA: Richmond	5	0.008	0.003	0.006
CA: Riverside	6	0.015	0.008	0.010
CA: Sacramento	9	0.011	0.004	0.007
CA: San Bernardino Cty.	8	0.015	0.009	0.012
CA: San Diego	4	0.013	0.007	0.010
CA: San Francisco	9	0.011	0.003	0.006
CA: San Jose	8	0.013	0.004	0.007
CO: Colorado Springs	3	0.017	0.010	0.013
CO: Denver	6	0.023	0.009	0.016
CO: Grand Junction	3	0.014	0.012	0.013
CT: Hartford	9	0.010	0.004	0.006
DC: Washington	8	0.011	0.004	0.007
DE: Dover	3	0.007	0.002	0.005
FL: Jacksonville	3	0.008	0.003	0.005
FL: Orlando	8	0.007	0.002	0.004
FL: Tallahassee	5	0.009	0.003	0.005
FL: Tampa	9	0.009	0.003	0.006
GA: Atlanta	3	0.014	0.006	0.009
GA: Augusta	6	0.011	0.003	0.006
HI: Honolulu	7	0.003	0.002	0.003
IA: Des Moines	7	0.018	0.005	0.010
IA: Mason City	6	0.012	0.005	0.007
ID: Boise	1	0.005	0.005	0.005
ID: Idaho Falls	8	0.019	0.007	0.011
IL: Aurora	4	0.012	0.010	0.011
IL: Champaign	7	0.009	0.003	0.006



**Table 4 (continued)**  
**Gross Beta in Airborne Particulates**  
**September 2014**

Location	Number of Samples	NAREL Lab Measurement		
		Max	Min (pCi/m <sup>3</sup> )	Avg
IL: Chicago	6	0.012	0.007	0.009
IN: Fort Wayne	4	0.014	0.006	0.010
IN: Indianapolis	9	0.012	0.002	0.009
KS: Kansas City	2	0.009	0.006	0.007
KS: Wichita	7	0.014	0.006	0.008
KY: Lexington	8	0.015	0.008	0.010
KY: Louisville	2	0.011	0.009	0.010
KY: Paducah	9	0.017	0.005	0.011
LA: Baton Rouge	7	0.011	0.005	0.008
LA: Shreveport	5	0.011	0.006	0.009
MA: Boston	9	0.009	0.002	0.005
MA: Worcester	9	0.010	0.003	0.007
ME: Orono	2	0.004	0.003	0.003
ME: Portland	9	0.013	0.003	0.006
MI: Bay City 48708	8	0.009	0.004	0.007
MI: Detroit	9	0.013	0.002	0.010
MI: Grand Rapids	4	0.015	0.007	0.011
MN: Duluth	8	0.012	0.003	0.007
MN: St. Paul	2	0.011	0.010	0.011
MO: Jefferson City	9	0.014	0.004	0.008
MO: Springfield	9	0.016	0.004	0.010
MO: St. Louis	4	0.010	0.006	0.008
MS: Jackson/Deq	4	0.019	0.010	0.012
MT: Billings	4	0.012	0.006	0.009
NC: Charlotte	9	0.019	0.005	0.010
NC: Greensboro	1	0.009	0.009	0.009
NC: Raleigh	4	0.008	0.003	0.006
NC: Wilmington	3	0.006	0.002	0.004
ND: Bismarck	7	0.023	0.005	0.010
NE: Kearney	9	0.014	0.005	0.009
NE: Lincoln	9	0.016	0.005	0.008
NE: Omaha	4	0.018	0.005	0.010
NH: Concord	7	0.008	0.002	0.006
NJ: Edison	6	0.009	0.004	0.007
NM: Albuquerque	2	0.010	0.007	0.008
NM: Carlsbad	1	0.008	0.008	0.008
NM: Navajo Lake St Park	3	0.006	0.005	0.006
NV: Las Vegas/913	8	0.018	0.006	0.009

**Table 4 (continued)**  
**Gross Beta in Airborne Particulates**  
**September 2014**

Location	Number of Samples	NAREL Lab Measurement		
		Max	Min (pCi/m <sup>3</sup> )	Avg
NV: Reno	5	0.011	0.006	0.009
NY: Albany	7	0.011	0.007	0.009
NY: Lockport	9	0.016	0.003	0.009
NY: New York City	4	0.009	0.005	0.007
NY: Rochester	7	0.016	0.006	0.010
NY: Syracuse	1	0.003	0.003	0.003
NY: Yaphank	5	0.007	0.003	0.005
OH: Cincinnati	3	0.008	0.006	0.007
OH: Cleveland	9	0.013	0.004	0.009
OH: Columbus	2	0.013	0.009	0.011
OH: Toledo	8	0.009	0.002	0.006
OK: Oklahoma City	9	0.016	0.005	0.010
OK: Tulsa	8	0.016	0.006	0.009
OR: Corvallis	9	0.015	0.002	0.006
OR: Portland	9	0.008	0.002	0.004
PA: Bloomsburg	9	0.008	0.002	0.005
PA: Philadelphia	5	0.009	0.004	0.008
PA: Pittsburgh	5	0.013	0.003	0.008
PR: San Juan	9	0.008	0.003	0.005
RI: Providence	6	0.010	0.003	0.007
SC: Columbia	9	0.015	0.004	0.008
SD: Pierre	9	0.013	0.005	0.009
SD: Rapid City	6	0.016	0.003	0.011
TN: Knoxville	4	0.013	0.011	0.012
TN: Memphis	8	0.018	0.005	0.010
TN: Nashville	8	0.013	0.004	0.008
TN: Oak Ridge/Bethel	8	0.017	0.006	0.010
TN: Oak Ridge/K25	8	0.018	0.007	0.011
TN: Oak Ridge/Melton	8	0.015	0.004	0.008
TN: Oak Ridge/Y12 E	8	0.020	0.006	0.011
TN: Oak Ridge/Y12 W	8	0.017	0.008	0.011
TX: Amarillo	6	0.015	0.007	0.011
TX: Austin	5	0.011	0.004	0.007
TX: Dallas	7	0.015	0.006	0.011
TX: El Paso	2	0.006	0.004	0.005
TX: Ft. Worth	4	0.009	0.005	0.007
TX: Harlingen	3	0.007	0.005	0.006
TX: Houston	5	0.010	0.004	0.006

**Table 4 (continued)**  
**Gross Beta in Airborne Particulates**  
**September 2014**

Location	Number of Samples	NAREL Lab Measurement		
		Max	Min (pCi/m <sup>3</sup> )	Avg
TX: Laredo	6	0.009	0.003	0.006
TX: Lubbock	9	0.014	0.004	0.007
TX: San Angelo	4	0.010	0.005	0.008
TX: San Antonio	7	0.006	0.004	0.005
UT: Salt Lake City	6	0.009	0.003	0.007
UT: St. George	3	0.011	0.006	0.009
VA: Harrisonburg	8	0.017	0.005	0.009
VA: Richmond	6	0.010	0.004	0.007
VA: Virginia Beach	9	0.012	0.003	0.008
VT: Burlington	7	0.012	0.004	0.007
WA: Olympia	8	0.011	0.002	0.004
WA: Richland	9	0.013	0.003	0.007
WA: Seattle	4	0.008	0.003	0.005
WA: Spokane	9	0.020	0.004	0.008
WI: Lacrosse	1	0.006	0.006	0.006
WI: Madison	9	0.022	0.006	0.013
WI: Milwaukee	3	0.013	0.006	0.010
WI: Shawano	7	0.013	0.005	0.008
WV: Charleston	5	0.019	0.008	0.012
WY: Casper	5	0.014	0.007	0.010

**Table 5**  
**Gamma-Emitters in Precipitation**  
**July 2014**

Location	Nuclide	pCi/L $\pm$ 2u	
AL: Montgomery/408	Be-7	27	16
AR: Little Rock	Be-7	52	20
	K-40	22	10
CT: Hartford	Be-7	64	18
FL: Jacksonville	Be-7	29	17
GA: Atlanta	Be-7	55	20
HI: Honolulu		ND	
KS: Kansas City		ND	
MA: Boston	Be-7	51	12
MI: Lansing	Be-7	36	18
MN: St. Paul		ND	
MN: Welch/510	Be-7	30	15
NC: Charlotte	Be-7	38	12
NC: Wilmington		ND	
NY: Albany	Be-7	57	20
NY: Yaphank		ND	
OR: Portland		ND	
PA: Harrisburg	Be-7	33	15
TN: Nashville	Be-7	17	16
TN: Oak Ridge/K25	Be-7	80	24
TN: Oak Ridge/Melton	Be-7	55	18
TN: Oak Ridge/Y12 E	Be-7	46	19
TX: Austin		ND	
UT: Salt Lake City	Be-7	92	32
VA: Lynchburg		ND	
WA: Olympia	Be-7	52	29
	K-40	11.3	9.9

**Table 6**  
**Gamma-Emitters in Precipitation**  
**August 2014**

Location	Nuclide	pCi/L $\pm$ 2u	
AL: Montgomery/408		ND	
AR: Little Rock		ND	
CT: Hartford		ND	
FL: Jacksonville	Be-7	56	27
HI: Honolulu	Be-7	24	21
	K-40	15	13
ID: Idaho Falls	Be-7	49	26
KS: Kansas City		ND	
MA: Boston	Be-7	102	26
MI: Lansing	Be-7	25	21
	K-40	19	10
MN: St. Paul		ND	
MN: Welch/510		ND	
NC: Charlotte		ND	
NC: Wilmington		ND	
NH: Concord		ND	
NY: Albany	Be-7	79	29
	K-40	18	13
NY: Yaphank		ND	
PA: Harrisburg		ND	
TN: Nashville	Be-7	30	20
TN: Oak Ridge/K25	Be-7	63	23
	K-40	12	11
TN: Oak Ridge/Melton	Be-7	67	23
TN: Oak Ridge/Y12 E	Be-7	38	20
UT: Salt Lake City	Be-7	65	29
VA: Lynchburg	K-40	13	10
WA: Olympia	Be-7	33	23

**Table 7**  
**Gamma-Emitters in Precipitation**  
**September 2014**

Location	Nuclide	pCi/L $\pm 2u$	
AL: Montgomery/408		ND	
AR: Little Rock	Be-7	41	26
CA: Richmond	Ra-228	0.39	0.35
CT: Hartford	Be-7	53	19
FL: Jacksonville		ND	
GA: Atlanta	Be-7	46	17
HI: Honolulu	Be-7	44	25
ID: Idaho Falls		ND	
KS: Kansas City		ND	
MA: Boston	Be-7	99	24
MI: Lansing		ND	
MN: St. Paul		ND	
MN: Welch/510		ND	
NC: Charlotte	Be-7	24	10
NC: Wilmington		ND	
NY: Albany	Be-7	30	15
NY: Yaphank		ND	
OR: Portland		ND	
PA: Harrisburg	Be-7	25	14
TN: Nashville	Be-7	47	19
TN: Oak Ridge/K25	Be-7	66	28
TN: Oak Ridge/Melton	Be-7	71	24
TN: Oak Ridge/Y12 E	Be-7	40	22
TX: Austin		ND	
UT: Salt Lake City		ND	
VA: Lynchburg		ND	
WA: Olympia		ND	

## **Plutonium and Uranium in Airborne Particulates**

Environmental radiation levels of plutonium and uranium are determined by the analysis of annually composited samples (air filters) collected from the airborne particulate samplers. Plutonium and uranium results are published in the ERD for the third quarter of the following year.

Concentrations of plutonium-238, combined plutonium-239 and 240, and uranium-234, 235, and 238 are determined by alpha-particle spectrometry following chemical separation. The total volume of air represented by all the samples received from one sampling location during a year typically ranges from 120,000 m<sup>3</sup> to 500,000 m<sup>3</sup>. The aliquot analyzed is a fraction of the total volume and is typically between 5,000 m<sup>3</sup> and 30,000 m<sup>3</sup>.

**Table 8**  
**Plutonium and Uranium in Airborne Particulates**  
**January–December 2013 Composites**

Location	<sup>238</sup> Pu		<sup>239–240</sup> Pu		<sup>234</sup> U		<sup>235</sup> U		<sup>238</sup> U	
	aCi/m <sup>3</sup>	± 2u	aCi/m <sup>3</sup>	± 2u	aCi/m <sup>3</sup>	± 2u	aCi/m <sup>3</sup>	± 2u	aCi/m <sup>3</sup>	± 2u
AK: Anchorage	0.4	1.0	0.7	1.2	6.0	3.1	0.00	0.83	4.8	2.8
AK: Fairbanks	-0.36	0.56	0.29	0.79	5.6	2.5	0.00	0.61	9.0	3.3
AK: Juneau	0.25	0.93	-0.06	0.75	2.8	1.4	0.00	0.36	2.4	1.3
AL: Birmingham	-0.15	0.72	0.15	0.66	13.1	3.6	0.38	0.81	16.0	4.1
AL: Montgomery/408	0.53	0.64	0.18	0.46	6.5	1.9	0.13	0.38	5.8	1.8
AZ: Phoenix	-0.2	1.1	0.3	1.5	28.1	8.1	3.1	2.9	33.6	9.0
AZ: Phoenix/956	-1.0	1.3	0.5	1.4	36	11	0.2	2.3	35	11
AZ: Tucson	-0.3	2.4	-1.0	2.6	40	11	1.2	2.6	27.2	9.1
AZ: Yuma	-2.5	5.1	-0.5	4.7	88	23	2.9	5.2	64	19
CA: Anaheim	0.0	3.9	-0.4	1.5	23.0	7.8	0.0	1.4	32.1	9.4
CA: Bakersfield	-1.7	2.0	-0.9	1.8	82	20	2.7	4.2	58	16
CA: Eureka	0.6	1.2	-0.37	0.69	3.1	2.0	0.33	0.96	2.2	1.8
CA: Fresno	0.0	3.0	1.5	3.3	41	11	1.1	2.5	41	11
CA: Los Angeles	0.0	1.9	0.2	1.8	27.1	8.4	0.4	1.9	24.5	8.0
CA: Richmond	-0.4	1.0	0.10	0.94	4.5	2.6	0.2	1.1	7.2	3.2
CA: Riverside	1.1	2.4	0.0	1.2	37	11	-0.2	1.6	31.6	9.9
CA: Sacramento	-0.1	1.5	-0.1	1.2	12.3	5.3	1.2	2.1	12.9	5.6
CA: San Bernardino Cty.	0.7	6.1	0.0	4.2	36	14	2.5	4.5	48	16
CA: San Diego	0.7	1.3	0.36	0.99	17.7	5.4	0.4	1.5	18.7	5.6
CA: San Francisco	0.08	0.69	0.38	0.97	7.0	3.2	1.1	1.5	8.2	3.5
CA: San Jose	-0.26	0.87	-0.26	0.63	15.9	5.4	0.5	1.3	11.9	4.7
CO: Colorado Springs	-0.4	1.4	-0.14	0.91	31.0	8.5	1.0	2.1	29.2	8.1
CO: Denver	0.43	0.77	0.22	0.63	25.3	5.6	1.4	1.3	18.1	4.5
CO: Grand Junction	-0.28	0.67	0.8	1.1	26.4	6.5	0.32	0.94	21.3	5.6
CT: Hartford	0.28	0.58	-0.24	0.33	7.5	2.6	0.8	1.1	6.1	2.3
DC: Washington	-0.07	0.41	0.07	0.31	6.1	1.9	0.98	0.86	6.5	2.0
DE: Dover	0.15	0.56	0.00	0.36	3.0	1.0	0.26	0.41	4.0	1.2
FL: Jacksonville	0.05	0.45	0.30	0.52	8.6	2.6	0.75	0.85	9.9	2.9
FL: Miami	0.68	0.95	0.56	0.78	9.2	2.7	1.2	1.1	11.1	3.0
FL: Orlando	0.20	0.44	0.57	0.62	8.9	2.6	0.74	0.87	8.0	2.4
FL: Tallahassee	-0.04	0.27	0.24	0.43	7.2	1.9	0.71	0.63	7.1	1.9
FL: Tampa	0.42	0.89	0.00	0.45	34.9	7.1	3.2	2.0	33.8	7.0
GA: Atlanta	-0.15	0.29	-0.04	0.26	11.3	2.6	0.66	0.64	9.3	2.3
GA: Augusta	0.36	0.75	-0.07	0.25	7.9	2.2	0.56	0.64	7.0	2.1
HI: Hilo	-0.20	0.69	-0.10	0.66	4.5	2.6	0.1	1.1	2.2	1.8
HI: Honolulu	-0.51	0.69	-0.09	0.57	3.0	2.0	0.00	0.83	2.5	1.7
IA: Des Moines	-0.59	0.92	0.1	1.1	18.9	6.1	1.0	1.7	18.5	6.0
IA: Mason City	-0.73	0.98	0.7	1.3	18.9	6.2	-0.5	2.6	14.5	5.3
ID: Boise	-0.10	0.98	0.5	1.1	15.4	4.7	0.9	1.4	13.4	4.4
ID: Idaho Falls	0.2	2.0	-0.9	1.6	25.6	9.5	2.6	3.6	30	10

Note: NA = No Analysis



**Table 8 (continued)**  
**Plutonium and Uranium in Airborne Particulates**  
**January–December 2013 Composites**

Location	<sup>238</sup> Pu		<sup>239–240</sup> Pu		<sup>234</sup> U		<sup>235</sup> U		<sup>238</sup> U	
	aCi/m <sup>3</sup>	± 2u	aCi/m <sup>3</sup>	± 2u	aCi/m <sup>3</sup>	± 2u	aCi/m <sup>3</sup>	± 2u	aCi/m <sup>3</sup>	± 2u
IL: Aurora	0.1	1.5	0.9	1.7	18.6	5.7	0.8	1.5	13.5	4.9
IL: Champaign	-0.16	0.57	0.08	0.75	5.6	2.1	-0.07	0.44	6.6	2.3
IL: Chicago	-0.18	0.90	-0.18	0.64	10.3	3.5	2.1	1.9	11.8	3.8
IN: Fort Wayne	0.5	1.1	-0.43	0.68	15.0	5.5	1.0	1.7	13.6	5.1
IN: Indianapolis	0.00	0.54	0.00	0.54	9.6	3.1	0.64	0.99	8.0	2.8
KS: Topeka	0.6	2.1	0.5	1.4	15.9	5.6	0.7	1.8	15.9	5.6
KY: Lexington	-0.08	0.76	0.40	0.86	7.7	2.4	0.86	0.86	7.6	2.3
KY: Louisville	0.12	0.45	0.08	0.36	7.4	1.9	0.17	0.36	7.6	1.9
LA: Baton Rouge	-0.3	2.3	0.2	1.5	22.4	6.4	1.1	1.9	26.0	6.9
LA: Shreveport	-0.15	0.37	-0.10	0.35	8.0	2.7	-0.07	0.72	7.7	2.6
MA: Boston	0.13	0.54	0.20	0.42	5.3	1.8	0.32	0.56	3.8	1.5
MA: Worcester	2.6	2.2	0.5	1.1	22.1	6.4	1.2	1.7	26.5	7.1
MD: Baltimore	0.70	0.74	0.14	0.38	6.3	2.1	0.00	0.51	6.7	2.1
ME: Orono	-0.15	0.51	0.00	0.46	8.8	3.2	0.7	1.2	7.2	2.8
ME: Portland	0.0	1.2	0.8	1.1	36.0	8.8	1.4	2.0	36.2	8.7
MI: Bay City 48708	0.4	1.5	0.29	0.80	9.4	3.4	0.20	0.90	7.6	3.0
MI: Detroit	0.00	0.84	0.18	0.81	11.8	4.4	0.4	1.8	9.1	3.9
MI: Grand Rapids	0.3	1.6	-0.35	0.66	6.3	2.3	0.44	0.78	5.3	2.1
MI: Lansing	-0.08	0.56	-0.08	0.56	10.2	3.3	1.2	1.2	7.0	2.6
MN: Duluth	0.00	0.35	0.05	0.50	4.1	1.5	0.00	0.30	4.6	1.6
MN: St. Paul	-0.7	1.1	0.23	0.86	10.5	3.4	0.35	0.96	12.9	3.8
MO: Jefferson City	0.5	1.3	0.0	1.2	7.9	2.9	0.8	1.1	6.7	2.7
MO: Springfield	0.7	1.5	0.00	0.98	11.2	3.5	1.2	1.3	6.4	2.6
MS: Jackson/Deq	0.8	1.2	0.18	0.79	8.0	2.8	0.25	0.73	9.6	3.2
MT: Billings	-0.10	0.94	0.5	1.3	19.9	5.7	0.8	1.3	20.8	5.9
NC: Charlotte	0.63	0.87	0.14	0.59	9.6	2.7	1.7	1.2	7.3	2.3
NC: Greensboro	-0.22	0.38	-0.07	0.35	4.8	1.5	0.28	0.44	5.0	1.5
NC: Raleigh	-0.27	0.43	-0.17	0.26	9.8	2.2	0.32	0.45	8.1	2.0
NC: Wilmington	0.51	0.39	0.08	0.26	5.5	1.7	0.66	0.63	4.3	1.4
ND: Bismarck	0.0	1.4	0.00	0.97	24.3	7.8	1.8	2.4	21.6	7.4
NE: Kearney	-0.40	0.95	-0.26	0.91	21.8	5.9	-0.1	1.1	22.9	6.0
NE: Lincoln	-0.5	1.8	0.8	2.3	18.2	7.0	0.8	2.9	24.7	8.2
NH: Concord	0.38	0.49	-0.03	0.26	7.5	2.0	0.67	0.65	7.2	2.0
NJ: Edison	0.21	0.44	0.16	0.45	6.6	2.2	0.76	0.91	4.9	1.8
NM: Albuquerque	-0.8	1.6	0.6	1.8	19.1	6.7	1.1	2.0	27.0	8.1
NV: Las Vegas/913	0.6	1.7	-0.11	0.76	35.6	9.6	1.1	2.0	28.2	8.2
NV: Reno	2.8	3.6	0.9	2.6	30	10	3.2	4.0	22.9	8.9
NY: Albany	-0.13	0.46	0.33	0.71	10.1	3.5	1.9	1.7	9.1	3.3
NY: Lockport	-0.10	0.25	0.03	0.32	5.3	1.5	0.31	0.43	5.8	1.6
NY: New York City	-0.05	0.46	-0.10	0.34	7.6	2.2	0.15	0.43	7.7	2.2

Note: NA = No Analysis

**Table 8 (continued)**  
**Plutonium and Uranium in Airborne Particulates**  
**January–December 2013 Composites**

Location	<sup>238</sup> Pu		<sup>239–240</sup> Pu		<sup>234</sup> U		<sup>235</sup> U		<sup>238</sup> U	
	aCi/m <sup>3</sup>	± 2u	aCi/m <sup>3</sup>	± 2u	aCi/m <sup>3</sup>	± 2u	aCi/m <sup>3</sup>	± 2u	aCi/m <sup>3</sup>	± 2u
NY: Rochester	-0.15	0.45	0.33	0.45	5.8	1.8	0.55	0.63	4.2	1.5
NY: Syracuse	0.32	0.49	0.06	0.28	4.4	1.4	0.24	0.43	4.9	1.5
NY: Yaphank	-0.09	0.43	0.35	0.62	4.7	1.7	0.20	0.55	6.1	2.0
OH: Cincinnati	-0.2	1.0	-0.15	0.52	8.9	2.8	0.20	0.75	6.4	2.3
OH: Cleveland	-0.7	1.3	0.5	2.0	16.0	6.0	-0.2	1.8	11.9	5.1
OH: Columbus	-0.09	0.62	0.8	1.1	14.3	3.8	0.29	0.81	15.1	3.9
OH: Painesville	0.06	0.54	-0.12	0.58	5.3	1.7	0.41	0.56	4.0	1.5
OH: Toledo	-0.27	0.66	0.09	0.83	8.7	2.7	0.76	0.87	10.0	2.9
OK: Oklahoma City	0.00	0.85	0.8	1.1	16.6	5.2	1.2	1.6	13.4	4.6
OK: Tulsa	-0.3	1.1	-0.2	1.0	1.78	0.59	0.08	0.17	1.75	0.59
OR: Corvallis	0.06	0.63	-0.06	0.37	2.4	1.3	0.11	0.49	3.0	1.4
OR: Portland	0.31	0.80	0.00	0.58	6.9	2.5	0.23	0.66	8.8	2.9
PA: Bloomsburg	0.00	0.39	0.04	0.38	7.6	2.3	0.10	0.78	7.4	2.2
PA: Philadelphia	0.45	0.68	0.08	0.36	9.7	2.7	0.48	0.65	6.9	2.2
PA: Pittsburgh	0.27	0.57	-0.09	0.31	10.4	2.7	1.8	1.2	7.9	2.3
PR: San Juan	0.6	1.0	0.50	0.90	8.6	3.5	0.1	1.0	8.6	3.4
RI: Providence	0.22	0.43	0.19	0.34	6.5	2.1	1.5	1.1	8.7	2.5
SC: Barnwell	-0.10	0.57	0.10	0.54	7.6	5.0	1.4	2.9	9.5	5.1
SC: Columbia	0.23	0.58	-0.14	0.33	15.5	3.7	1.19	0.99	12.5	3.2
SD: Pierre	0.2	2.2	0.7	2.1	15.0	6.1	2.1	2.9	19.3	7.0
SD: Rapid City	-0.4	1.2	-0.4	1.2	27.4	8.6	0.4	1.9	30.1	9.1
TN: Knoxville	0.40	0.62	0.33	0.52	6.1	1.7	0.38	0.53	6.3	1.7
TN: Memphis	0.32	0.69	0.06	0.59	12.0	3.4	0.07	0.65	10.8	3.2
TN: Nashville	0.04	0.51	0.00	0.52	9.4	2.7	0.62	0.78	8.6	2.5
TN: Oak Ridge/Bethel	-0.21	0.37	0.21	0.44	13.4	3.1	1.35	0.94	6.5	2.0
TN: Oak Ridge/K25	-0.03	0.31	-0.08	0.19	43.2	6.9	2.9	1.1	10.4	2.3
TN: Oak Ridge/Melton	0.26	0.33	0.00	0.22	5.1	1.5	0.81	0.61	4.0	1.3
TN: Oak Ridge/Y12 E	-0.07	0.45	0.37	0.52	20.3	3.8	1.86	0.98	8.2	2.0
TN: Oak Ridge/Y12 W	-0.26	0.41	0.26	0.56	46.3	8.5	2.0	1.4	23.6	5.1
TX: Austin	0.5	1.1	-0.08	0.51	13.1	4.2	1.2	1.5	10.4	3.7
TX: Dallas	-0.21	0.71	-0.10	0.68	19.7	5.8	1.2	1.7	17.5	5.5
TX: El Paso	-1.4	2.9	-1.7	2.3	51	16	5.7	6.1	58	18
TX: Ft. Worth	0.35	0.96	1.3	1.6	24.8	6.7	0.8	1.7	23.0	6.5
TX: Harlingen	0.2	1.1	0.2	1.1	16.8	5.1	0.7	1.3	16.7	5.1
TX: San Antonio	0.1	1.0	-0.2	1.1	14.9	4.5	0.32	0.93	19.4	5.3
UT: Salt Lake City	0.2	1.5	0.5	1.4	25.4	7.7	0.9	2.0	23.3	7.3
UT: St. George	0.4	1.6	1.1	1.5	34.3	8.7	4.9	3.5	27.0	7.4
VA: Harrisonburg	0.23	0.63	-0.11	0.40	4.4	1.6	0.28	0.49	4.7	1.6
VA: Lynchburg	0.05	0.60	0.09	0.40	24.0	4.8	1.19	0.97	6.8	2.1
VA: Richmond	-0.03	0.39	0.29	0.46	7.4	2.0	0.61	0.62	9.0	2.3

Note: NA = No Analysis

**Table 8 (continued)**  
**Plutonium and Uranium in Airborne Particulates**  
**January–December 2013 Composites**

Location	<sup>238</sup> Pu		<sup>239–240</sup> Pu		<sup>234</sup> U		<sup>235</sup> U		<sup>238</sup> U	
	aCi/m <sup>3</sup>	± 2u	aCi/m <sup>3</sup>	± 2u	aCi/m <sup>3</sup>	± 2u	aCi/m <sup>3</sup>	± 2u	aCi/m <sup>3</sup>	± 2u
VA: Virginia Beach	0.32	0.40	-0.14	0.22	7.4	2.1	0.27	0.48	7.5	2.1
VT: Burlington	0.28	0.82	-0.05	0.56	5.2	2.1	0.37	0.80	5.7	2.3
WA: Olympia	0.12	0.80	-0.06	0.40	1.46	0.96	0.00	0.32	2.1	1.1
WA: Richland	0.2	1.9	0.2	1.9	13.3	5.2	0.8	1.8	16.3	5.8
WA: Seattle	0.12	0.51	0.12	0.43	2.6	1.1	0.18	0.44	1.25	0.72
WA: Spokane	-0.5	2.3	0.2	2.7	9.7	4.8	1.6	2.5	6.1	4.0
WI: Lacrosse	0.08	0.46	-0.08	0.28	5.3	1.9	0.43	0.76	5.2	1.8
WI: Madison	-0.21	0.74	0.00	0.68	9.4	4.8	1.0	2.2	12.8	5.6
WI: Milwaukee	0.1	1.1	0.3	1.0	5.9	2.5	0.7	1.1	4.6	2.2
WI: Shawano	0.3	1.1	0.09	0.87	7.5	2.6	0.22	0.64	7.5	2.6
WV: Charleston	0.14	0.41	0.14	0.41	9.7	2.5	1.6	1.0	10.4	2.6
WY: Casper	0.18	0.99	0.0	1.0	11.3	3.8	0.8	1.9	13.5	4.1

Note: NA = No Analysis

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## **2. Drinking Water Program**

The RadNet drinking water program provides data on radionuclide concentrations in the nation's drinking water supplies. Sampling sites are either major population centers or selected nuclear facility environs.

Drinking water data are used to assess trends and anomalies in concentrations. The analysis scheme for RadNet samples is similar to that of EPA's "National Interim Primary Drinking Water Regulations." The analyses include (a) tritium on a quarterly basis; (b) gross alpha, gross beta, and gamma on annual composites; (c) radium-226 if the gross alpha exceeds 2 pCi/L and radium-228 if the radium-226 falls between 3 and 5 pCi/L on annual composites; (d) iodine-131 on one quarterly sample per year for each station; (e) plutonium-238, combined plutonium-239 and 240, and uranium-234, 235, and 238 for stations that demonstrate gross alpha levels greater than 2 pCi/L on annual composites; and (f) strontium-90 on one-fourth of the annual composites on a four year rotating schedule. Composite results are published in the ERD for the third quarter of the following year.

RadNet drinking water data should not be used to monitor compliance with drinking water regulations or for comparisons to those data since different procedures for collection and analysis may be used.

**Table 9**  
**Tritium in Drinking Water**  
**July–September 2014**

Location	Date Collected	<sup>3</sup> H pCi/L ± 2 <i>u</i>
AK: Fairbanks	07/21/14	6 86
AL: Dothan	07/01/14	42 80
AL: Montgomery	09/11/14	-25 82
AL: Muscle Shoals	07/09/14	268 97
AL: Scottsboro	07/08/14	12 86
AR: Little Rock	07/08/14	39 88
CT: Hartford	07/02/14	2 77
DE: Dover	07/28/14	-61 83
FL: Miami	09/23/14	19 85
HI: Honolulu	08/12/14	29 86
ID: Idaho Falls	07/28/14	-18 83
KS: Topeka	07/29/14	-2 85
LA: New Orleans	09/23/14	55 87
MD: Baltimore	07/07/14	59 79
MD: Conowingo	07/01/14	40 79
MI: Detroit	07/22/14	116 91
MN: St. Paul	07/08/14	37 87
MN: St. Paul	09/30/14	21 84
MN: Welch	07/08/14	-39 84
MN: Welch	09/30/14	39 86
MS: Jackson	07/28/14	-43 83
MS: Port Gibson	07/28/14	2 86
NE: Lincoln	07/08/14	24 79
NH: Concord	07/16/14	-49 83
NJ: Trenton	07/21/14	-31 84
NJ: Waretown	07/22/14	-21 84
NY: New York City	09/19/14	-35 81
NY: Niagara Falls	09/30/14	330 110
OH: E. Liverpool	09/03/14	35 85
OH: Painesville	08/12/14	159 91
OH: Toledo	07/03/14	127 83
OK: Oklahoma City	07/09/14	-37 83
PA: Columbia	07/01/14	55 81
PA: Harrisburg	07/01/14	44 80
PA: Pittsburgh	09/02/14	-14 83
RI: Providence	09/06/14	10 84
SC: Barnwell	09/04/14	6 84
SC: Columbia	07/22/14	-51 84
TN: Oak Ridge/#360	07/01/14	88 83
TN: Oak Ridge/#371	07/01/14	-4 78

**Table 9 (continued)**  
**Tritium in Drinking Water**  
**July–September 2014**

Location	Date Collected	<sup>3</sup> H pCi/L ± 2 <i>u</i>
TN: Oak Ridge/#4442	07/01/14	–37 84
TN: Oak Ridge/#768	07/01/14	117 82
TN: Oak Ridge/#772	07/01/14	15 81
TX: Austin	07/21/14	–45 83
TX: Austin	09/08/14	16 84
WA: Richland	08/06/14	6 84
WI: Madison	07/07/14	20 78

**Table 10**  
**Plutonium and Uranium Analyses**  
**Selected Drinking Water Composite Samples**  
**January–December 2013**

Location	<sup>238</sup> Pu pCi/L ± 2u	<sup>239–240</sup> Pu pCi/L ± 2u	<sup>234</sup> U pCi/L ± 2u	<sup>235</sup> U pCi/L ± 2u	<sup>238</sup> U pCi/L ± 2u
GA: Baxley	-0.016 0.052	0.021 0.057	0.031 0.054	0.018 0.053	0.046 0.071
HI: Honolulu	-0.010 0.036	0.005 0.047	0.113 0.098	0.007 0.062	0.085 0.084
MD: Conowingo	-0.010 0.036	0.005 0.047	3.11 0.52	0.12 0.10	1.84 0.38
MS: Port Gibson	-0.011 0.037	-0.016 0.039	0.024 0.066	0.022 0.063	0.030 0.065
NE: Lincoln	-0.022 0.055	0.011 0.049	3.87 0.60	0.052 0.080	1.93 0.39
NJ: Waretown	0.030 0.063	-0.005 0.033	0.017 0.064	0.000 0.065	0.046 0.071
NM: Santa Fe	0.016 0.060	0.004 0.038	5.00 0.71	0.082 0.096	2.27 0.43
OH: Toledo	0.025 0.060	-0.017 0.031	0.16 0.10	0.019 0.054	0.062 0.071
SC: Jenkinsville	-0.015 0.036	0.000 0.031	2.37 0.44	0.052 0.080	1.05 0.28
WI: Madison	0.021 0.053	0.000 0.026	1.10 0.28	-0.006 0.041	0.26 0.13

Note: NA = No Analysis



**Table 11**

<b>Location</b>	<b>Gross Beta pCi/L ± 2u</b>	<b>Gross Alpha pCi/L ± 2u</b>	<b><sup>90</sup>Sr pCi/L ± 2u</b>
AK: Fairbanks	5.7 3.3	0.9 4.1	
AL: Dothan	2.1 1.6	0.8 2.6	0.15 0.39
AL: Montgomery	2.4 2.8	0.0 2.8	-0.14 0.36
AL: Muscle Shoals	-0.5 2.5	1.0 3.3	0.04 0.32
AL: Scottsboro	1.9 1.3	1.3 2.2	
AR: Little Rock	0.7 1.3	0.2 1.5	
CA: Richmond	2.5 1.6	1.0 2.1	
CO: Denver	2.5 3.0	1.2 3.5	
CT: Hartford	1.5 2.6	-0.1 2.6	
DE: Dover	4.0 3.1	0.0 3.8	
FL: Tampa	1.2 2.9	1.7 4.8	
GA: Baxley	0.8 2.9	5.1 5.0	
GA: Savannah	1.1 1.3	0.1 2.5	
HI: Honolulu	-0.7 2.9	2.0 4.7	
IA: Cedar Rapids	5.3 3.2	-0.2 3.2	
ID: Boise	3.2 3.1	0.9 3.0	
ID: Idaho Falls	2.9 3.0	0.8 4.9	
IL: W. Chicago	8.0 3.3	0.7 3.9	
KS: Topeka	7.4 3.5	1.4 6.5	
LA: New Orleans	2.7 3.0	0.4 3.9	
MD: Baltimore	1.0 2.6	-0.7 3.0	
MD: Conowingo	4.2 3.1	7.0 4.4	
MI: Detroit	4.2 5.6	-0.9 5.1	
MN: St. Paul	2.0 2.7	-0.3 3.1	
MN: Welch	4.8 3.3	1.7 6.1	
MO: Jefferson City	5.1 3.2	1.5 4.1	
MS: Jackson	2.0 1.2	0.3 1.5	
MS: Port Gibson	4.8 3.3	3.1 5.3	
MT: Helena	0.0 2.6	-0.1 3.1	
ND: Bismarck	5.1 3.2	0.5 4.5	
NE: Lincoln	8.4 3.6	9.6 6.5	
NH: Concord	1.3 1.4	-0.2 1.8	
NJ: Trenton	2.7 2.9	-0.3 3.2	
NJ: Waretown	3.3 2.9	2.0 3.7	
NM: Santa Fe	8.0 3.6	9.8 6.4	
NY: Albany	2.9 5.5	-0.1 5.1	
NY: New York City	1.6 1.5	0.3 1.6	

**Table 11 (continued)**

<b>Location</b>	<b>Gross Beta pCi/L <math>\pm 2u</math></b>	<b>Gross Alpha pCi/L <math>\pm 2u</math></b>	<b><sup>90</sup>Sr pCi/L <math>\pm 2u</math></b>
NY: Niagara Falls	1.1 1.4	-0.6 2.5	
NY: Syracuse	1.7 2.9	1.7 3.6	
OH: Cincinnati	4.1 3.0	-0.2 3.5	
OH: Columbus	4.6 3.2	0.4 4.0	
OH: E. Liverpool	1.6 2.7	-0.1 3.4	
OH: Painesville	3.4 3.0	1.3 3.6	
OH: Toledo	1.9 2.8	2.4 3.6	
OK: Oklahoma City	2.0 2.9	0.3 2.9	
OR: Portland	1.2 1.2	0.4 1.2	
PA: Columbia	1.1 1.5	0.8 2.4	
PA: Harrisburg	2.1 1.5	-0.6 1.9	
PA: Pittsburgh	1.5 1.6	0.4 2.6	-0.30 0.79
RI: Providence	1.5 1.5	0.3 1.7	
SC: Barnwell	1.6 1.2	0.6 1.6	
SC: Columbia	2.5 1.3	0.5 1.5	
SC: Jenkinsville	5.6 3.1	4.1 4.0	
SC: Seneca	0.7 1.1	-0.2 1.1	
TN: Chattanooga	2.4 2.9	0.0 3.2	
TN: Knoxville	2.0 1.3	-0.1 2.0	
TN: Oak Ridge/#360	0.6 2.6	-0.5 3.0	0.11 0.31
TN: Oak Ridge/#371	-0.3 2.7	-0.3 3.3	0.33 0.36
TN: Oak Ridge/#4442	2.9 2.9	-0.9 3.3	0.12 0.41
TN: Oak Ridge/#768	1.3 2.8	0.1 3.4	-0.15 0.38
TN: Oak Ridge/#772	1.5 2.8	-0.3 3.5	-0.11 0.39
TX: Austin	4.6 3.0	-0.4 3.3	
VA: Ashland	4.2 1.7	0.2 2.0	0.13 0.55
VA: Lynchburg	1.0 1.3	-0.6 1.4	0.25 0.64
WA: Richland	0.7 1.5	1.2 2.0	
WI: Madison	3.0 5.9	4.8 7.5	

**Table 12**  
**Drinking Water**  
**Radium and Gamma-Emitting Radionuclides**  
**Composites**  
**January–December 2013**

Location	<sup>226</sup> Ra pCi/L ± 2u	<sup>228</sup> Ra pCi/L ± 2u	Gamma-Emitting Radionuclides	
			Nuclide	pCi/L ± 2u
AK: Fairbanks	NA	NA	Co-60	0.33 0.80
			Cs-137	0.14 0.95
			K-40	-10 15
			Ra-226	-12 63
			Ra-228	-1.6 5.7
AL: Dothan	NA	NA	Co-60	0.22 0.63
			Cs-137	-0.5 4.6
			K-40	-0.5 9.5
			Ra-228	-3.5 4.6
AL: Montgomery	NA	NA	Co-60	-0.6 1.6
			Cs-137	0.53 0.86
			K-40	4 16
			Ra-228	-4.7 9.9
AL: Muscle Shoals	NA	NA	Co-60	0.11 0.60
			Cs-137	-0.2 7.9
			K-40	3 12
			Ra-228	-0.8 4.1
AL: Scottsboro	NA	NA	Co-60	0.65 0.80
			Cs-137	0.01 0.87
			K-40	-17 22
			Ra-228	-2.8 7.9
AR: Little Rock	NA	NA	Co-60	-0.09 0.81
			Cs-137	0.01 0.94
			K-40	8 12
			Ra-228	-1.4 4.3
CA: Richmond	NA	NA		ND
CO: Denver	NA	NA	Co-60	0.45 0.83
			Cs-137	-0.1 4.2
			K-40	-6 15
			Ra-228	-0.3 3.6
CT: Hartford	NA	NA	Co-60	0.38 0.80
			Cs-137	-0.8 1.7
			K-40	-16 22
			Ra-228	-2.4 6.4
DE: Dover	NA	NA	Co-60	0.00 0.17

Note: ND = Not Detected  
NA = No Analysis

**Table 12 (continued)**  
**Drinking Water**  
**Radium and Gamma-Emitting Radionuclides**  
**Composites**  
**January–December 2013**

Location	<sup>226</sup> Ra pCi/L ± 2u	<sup>228</sup> Ra pCi/L ± 2u	Gamma-Emitting Radionuclides	
			Nuclide	pCi/L ± 2u
DE: Dover (continued)			Cs-137	-0.6 2.0
			K-40	-4 11
			Ra-228	-1.1 4.8
FL: Tampa	NA	NA	Co-60	0.9 1.8
			Cs-137	-1 71
			K-40	-4 28
			Ra-228	1 11
GA: Baxley	2.85 0.48	NA	Co-60	-0.36 0.87
			Cs-137	0.62 0.82
			K-40	-6 20
			Ra-228	-3.1 7.8
GA: Savannah	NA	NA	Co-60	0.0 1.2
			Cs-137	0.52 0.89
			K-40	6 10
			Ra-228	0.3 3.8
HI: Honolulu	0.064 0.081	NA	Co-60	-0.12 0.74
			Cs-137	0.00 0.88
			K-40	-5 15
			Ra-226	-8 50
			Ra-228	-0.2 3.9
IA: Cedar Rapids	NA	NA	Co-60	0.62 0.79
			Cs-137	0.25 0.90
			K-40	2 12
			Ra-228	0.1 3.4
ID: Boise	NA	NA	Co-60	-0.06 0.69
			Cs-137	-0.13 0.89
			K-40	-3 14
			Ra-226	-17 93
			Ra-228	3.0 4.4
ID: Idaho Falls	NA	NA	Co-60	-0.32 0.85
			Cs-137	0.61 0.81
			K-40	-12 17
			Ra-226	-10 58
			Ra-228	-1.7 5.7
IL: Morris	NA	NA		ND

Note: ND = Not Detected  
NA = No Analysis

**Table 12 (continued)**  
**Drinking Water**  
**Radium and Gamma-Emitting Radionuclides**  
**Composites**  
**January–December 2013**

Location	<sup>226</sup> Ra	<sup>228</sup> Ra	Gamma-Emitting Radionuclides	
	pCi/L ± 2 <i>u</i>	pCi/L ± 2 <i>u</i>	Nuclide	pCi/L ± 2 <i>u</i>
IL: W. Chicago	NA	NA	Co-60	-0.41 0.90
			Cs-137	0.0 1.7
			K-40	-6 12
			Ra-228	3.8 4.3
KS: Topeka	NA	NA	Co-60	0.26 0.76
			Cs-137	0.06 0.65
			K-40	5 12
			Ra-228	-1.4 4.7
LA: New Orleans	NA	NA	Co-60	-0.10 0.93
			Cs-137	-0.89 0.98
			K-40	-1 12
			Ra-228	-2.2 6.5
MD: Baltimore	NA	NA	Co-60	0.0 1.1
			Cs-137	0 15
			K-40	4 13
			Ra-228	-1.3 4.3
MD: Conowingo	0.40 0.18	NA	Co-60	0.05 0.80
			Cs-137	-0.3 3.5
			K-40	-14 21
			Ra-228	-1.5 4.7
MI: Detroit	NA	NA	Co-60	0.38 0.78
			Cs-137	0.34 0.96
			K-40	-12 17
			Ra-228	0.2 3.4
MN: St. Paul	NA	NA	Co-60	0.04 0.79
			Cs-137	0.20 0.91
			K-40	-7 14
			Ra-228	-0.8 3.7
MN: Welch	NA	NA	Co-60	0.49 0.73
			Cs-137	-0.1 3.5
			K-40	-9 14
			Ra-228	0.9 3.1
MO: Jefferson City	NA	NA	Co-60	0.45 0.75
			Cs-137	0.25 0.95
			K-40	6 11

Note: ND = Not Detected  
NA = No Analysis

**Table 12 (continued)**  
**Drinking Water**  
**Radium and Gamma-Emitting Radionuclides**  
**Composites**  
**January–December 2013**

Location	<sup>226</sup> Ra pCi/L ± 2u	<sup>228</sup> Ra pCi/L ± 2u	Gamma-Emitting Radionuclides	
			Nuclide	pCi/L ± 2u
MO: Jefferson City (continued) MS: Jackson	NA	NA	Ra-228	-0.2 4.4
			Co-60	0.21 0.64
			Cs-137	-0.5 1.3
			K-40	-7 14
			Ra-228	0.7 3.3
MS: Port Gibson	0.19 0.12	NA	Co-60	-0.01 0.26
			Cs-137	0.72 0.88
			K-40	13 12
			Ra-228	0.5 3.5
			Co-60	-0.17 0.86
MT: Helena	NA	NA	Cs-137	0.0 1.7
			K-40	-13 19
			Ra-228	0.9 4.3
			Co-60	0.03 0.86
			Cs-137	-0.1 2.7
ND: Bismarck	NA	NA	K-40	6 14
			Ra-228	-0.6 4.8
			Co-60	0.14 0.73
			Cs-137	0.41 0.93
			K-40	-5 11
NE: Lincoln	0.30 0.15	NA	Ra-228	4.1 4.2
			Co-60	-0.22 0.80
			Cs-137	0.01 0.85
			K-40	-3 15
			Ra-228	0.7 3.9
NH: Concord	NA	NA	Co-60	-0.05 0.91
			Cs-137	0.0 1.1
			K-40	3 11
			Ra-228	1.3 4.3
			Co-60	0.11 0.65
NJ: Trenton	NA	NA	Cs-137	-0.5 7.7
			K-40	8.4 8.7
			Ra-228	-1.2 3.0
			Co-60	-0.9 8.9
			Cs-137	-0.1 2.5
NJ: Waretown	0.42 0.16	NA	Co-60	-0.9 8.9
			Cs-137	-0.1 2.5
			K-40	8.4 8.7
			Ra-228	-1.2 3.0
			Co-60	-0.9 8.9
NM: Santa Fe	0.085 0.036	NA	Co-60	-0.9 8.9
			Cs-137	-0.1 2.5
			Cs-137	-0.1 2.5

Note: ND = Not Detected  
NA = No Analysis

**Table 12 (continued)**  
**Drinking Water**  
**Radium and Gamma-Emitting Radionuclides**  
**Composites**  
**January–December 2013**

Location	<sup>226</sup> Ra pCi/L ± 2u	<sup>228</sup> Ra pCi/L ± 2u	Gamma-Emitting Radionuclides	
			Nuclide	pCi/L ± 2u
NM: Santa Fe (continued)			K-40	6 38
			Ra-228	-9 16
NY: Albany	NA	NA	Co-60	0 23
			Cs-137	0.6 2.3
			K-40	-1 28
			Ra-228	-2.5 9.7
			Co-60	0.20 0.80
NY: New York City	NA	NA	Cs-137	0.21 0.87
			K-40	-17 23
			Ra-228	-1.5 4.6
			Co-60	0 14
			Cs-137	0.72 0.85
NY: Niagara Falls	NA	NA	K-40	-5 16
			Ra-228	-3.1 6.6
			Co-60	0.20 0.78
			Cs-137	-0.2 9.3
			K-40	-6 13
NY: Syracuse	NA	NA	Ra-228	-2.8 7.5
			Co-60	-0.57 0.89
			Cs-137	0.01 0.64
			K-40	-3 12
			Ra-228	2.5 4.8
OH: Cincinnati	NA	NA	Co-60	0.18 0.84
			Cs-137	0.07 0.92
			K-40	0 11
			Ra-228	0.2 3.3
			Co-60	-0.06 0.59
OH: Columbus	NA	NA	Cs-137	0 13
			K-40	-5 12
			Ra-228	0.0 3.6
			Co-60	0.12 0.70
			Cs-137	-0.4 1.1
OH: E. Liverpool	NA	NA	K-40	-17 23
			Ra-228	-2.2 6.6
			Co-60	0.24 0.76
			Cs-137	-0.4 1.1
			K-40	-5 12
OH: Painesville	NA	NA	Ra-228	0.0 3.6
			Co-60	0.12 0.70
OH: Toledo	0.13 0.12	NA	Co-60	0.24 0.76

Note: ND = Not Detected  
NA = No Analysis

**Table 12 (continued)**  
**Drinking Water**  
**Radium and Gamma-Emitting Radionuclides**  
**Composites**  
**January–December 2013**

Location	<sup>226</sup> Ra pCi/L ± 2 <i>u</i>	<sup>228</sup> Ra pCi/L ± 2 <i>u</i>	Gamma-Emitting Radionuclides	
			Nuclide	pCi/L ± 2 <i>u</i>
OH: Toledo (continued)			Cs-137	-0.3 1.3
			K-40	8 11
			Ra-228	-5 17
OK: Oklahoma City	NA	NA	Co-60	0 120
			Cs-137	0 100
			K-40	3 34
OR: Portland	NA	NA	Ra-228	12 13
			Co-60	0.31 0.83
			Cs-137	-0.01 0.95
PA: Columbia	NA	NA	K-40	-15 19
			Ra-226	-14 72
			Ra-228	-2.4 7.8
PA: Harrisburg	NA	NA	Co-60	0.12 0.81
			Cs-137	0 61
			K-40	-3 16
PA: Pittsburgh	NA	NA	Ra-228	-0.7 3.5
			Co-60	0.25 0.80
			Cs-137	-0.1 3.7
RI: Providence	NA	NA	K-40	0 12
			Ra-228	-0.9 3.7
			Co-60	0 16
SC: Barnwell	NA	NA	Cs-137	-0.4 2.2
			K-40	10 12
			Ra-228	-2.0 5.2
SC: Columbia	NA	NA	Co-60	0.09 0.78
			Cs-137	0.08 0.88
			K-40	1 13
SC: Columbia	NA	NA	Ra-228	-3.4 8.6
			Co-60	-0.29 0.83
			Cs-137	-0.4 1.2
SC: Columbia	NA	NA	K-40	-1 13
			Ra-228	-1.2 4.4
			Co-60	0.02 0.84
SC: Columbia	NA	NA	Cs-137	0.45 0.78
			K-40	-17 24

Note: ND = Not Detected  
NA = No Analysis



**Table 12 (continued)**  
**Drinking Water**  
**Radium and Gamma-Emitting Radionuclides**  
**Composites**  
**January–December 2013**

Location	<sup>226</sup> Ra pCi/L ± 2u	<sup>228</sup> Ra pCi/L ± 2u	Gamma-Emitting Radionuclides	
			Nuclide	pCi/L ± 2u
SC: Columbia (continued) SC: Jenkinsville	0.064 0.090	NA	Ra-228	0.6 3.2
			Co-60	0.02 0.82
			Cs-137	-0.4 1.2
			K-40	-14 21
			Ra-228	-3.3 8.8
SC: Seneca	NA	NA	Co-60	0.41 0.64
			Cs-137	0.17 0.64
			K-40	-12 13
			Ra-228	-1.5 3.6
			Co-60	-1 25
TN: Chattanooga	NA	NA	Cs-137	0.1 2.4
			K-40	14 32
			Ra-228	3 11
			Co-60	0.57 0.77
			Cs-137	0 12
TN: Knoxville	NA	NA	K-40	2 11
			Ra-228	-2.4 6.2
			Co-60	0.44 0.80
			Cs-137	-0.5 1.1
			K-40	-14 19
TN: Oak Ridge/#360	NA	NA	Ra-228	1.1 3.9
			Co-60	0.01 0.72
			Cs-137	-0.4 1.1
			K-40	-16 21
			Ra-228	0.0 3.8
TN: Oak Ridge/#371	NA	NA	Co-60	-0.21 0.87
			Cs-137	-0.1 2.9
			K-40	8 12
			Ra-228	1.5 3.7
			Co-60	0.24 0.78
TN: Oak Ridge/#4442	NA	NA	Cs-137	-0.2 1.5
			K-40	-1 13
			Ra-228	-2.6 7.2
			Co-60	0.23 0.78
			Cs-137	0.08 0.94
TN: Oak Ridge/#768	NA	NA	Co-60	0.23 0.78
			Cs-137	0.08 0.94
			K-40	-1 13
			Ra-228	-2.6 7.2
			Co-60	0.23 0.78
TN: Oak Ridge/#772	NA	NA	Cs-137	0.08 0.94
			K-40	-1 13
			Ra-228	-2.6 7.2
			Co-60	0.23 0.78
			Cs-137	0.08 0.94

Note: ND = Not Detected  
NA = No Analysis

**Table 12 (continued)**  
**Drinking Water**  
**Radium and Gamma-Emitting Radionuclides**  
**Composites**  
**January–December 2013**

Location	<sup>226</sup> Ra pCi/L ± 2 <i>u</i>	<sup>228</sup> Ra pCi/L ± 2 <i>u</i>	Gamma-Emitting Radionuclides	
			Nuclide	pCi/L ± 2 <i>u</i>
TN: Oak Ridge/#772 (continued)			K-40	-4 17
TX: Austin	NA	NA	Ra-228	-2.7 6.8
			Co-60	0.30 0.82
			Cs-137	0.10 0.80
			K-40	6 11
VA: Ashland	NA	NA	Ra-228	-4 10
			Co-60	0.11 0.69
			Cs-137	0.44 0.87
			K-40	1 11
VA: Lynchburg	NA	NA	Ra-228	-2.5 6.9
			Co-60	0.00 0.17
			Cs-137	-0.4 2.6
			K-40	4 12
WA: Richland	NA	NA	Ra-228	-3.8 9.7
			Co-60	0.16 0.81
			Cs-137	0.38 0.90
			K-40	-9 18
			Ra-226	0 1000
WI: Madison	1.05 0.27	NA	Ra-228	1.4 4.4
			Co-60	0.37 0.80
			Cs-137	0.0 1.7
			K-40	-4 12

Note: ND = Not Detected  
NA = No Analysis

### **3. Milk Program**

#### **Pasteurized Milk**

The U.S. Environmental Protection Agency is no longer sampling milk as part of the radiological monitoring network, RadNet. EPA completed its final quarterly milk sample collection in April 2014 and the results from analyzing those samples, along with historical milk sampling results, will continue to be available on Envirofacts (<http://www.epa.gov/enviro/>).

EPA stopped milk sampling because it is redundant of U.S. Food and Drug Administration programs, and FDA has the authority and responsibility for food safety, including monitoring radiation in milk.

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## **For More Information**

*Environmental Radiation Data* (ERD) is published quarterly by the U.S. Environmental Protection Agency's Office of Radiation and Indoor Air.

Requests for information concerning the operation of RadNet and the data that are generated should be directed as follows:

Requests for information concerning the operation of RadNet, the data that are generated, or publication and distribution of ERD should be directed to:

Charles M. Petko  
Office of the Director  
National Analytical Radiation Environmental Laboratory  
540 South Morris Avenue  
Montgomery, Alabama 36115-2601  
email: [petko.charles@epa.gov](mailto:petko.charles@epa.gov)

Requests for information concerning policies of the Office of Radiation and Indoor Air should be directed to:

Jonathan Edwards  
USEPA - ORIA  
Radiation Protection Division (MC6608J)  
1200 Pennsylvania Ave. N.W.  
Washington, DC 20460  
email: [edwards.jonathan@epa.gov](mailto:edwards.jonathan@epa.gov)

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