

ENVIRONMENTAL

RADIATION

DATA

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Preface

Environmental Radiation Data (ERD) is compiled and published quarterly by the Office of Radiation and Indoor Air's National Air and Radiation Environmental Laboratory (NAREL) in Montgomery, Alabama, and contains data from the Environmental Radiation Ambient Monitoring System (ERAMS). ERD is published in both hard-copy and electronic formats. Electronic reports are available online at www.epa.gov/narel.

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

Sampling locations are selected to provide optimal population coverage while functioning to monitor fallout from nuclear devices and other forms of radioactive contamination of the environment. The radiation analyses performed on these samples include gross alpha and gross beta analyses, gamma analyses, and radionuclide-specific analyses for uranium, plutonium, strontium, iodine, radium, and tritium. This monitoring effort also provides ancillary information on natural background levels and on routine and accidental releases into the environment from stationary sources.

The radiochemical procedures used by NAREL to analyze the ERAMS samples are contained in the *Eastern Environmental Radiation Facility Radiochemistry Procedures Manual* (EPA 520/5-84-006). Station operation and sample collection are in accordance with procedures contained in the *ERAMS Manual* (EPA 520/5-84-007, 008, 009).

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Acknowledgments

All sampling for the Environmental Radiation Ambient Monitoring System (ERAMS) is performed by volunteer collectors who are frequently members of the health departments or related environmental agencies of their respective states. The National Air and 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 ERAMS. 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 blank sample.

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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 ³	0.0015
	Water	pCi/L	2
	Precipitation	pCi/L	2
Tritium	Water	pCi/L	150
	Milk	pCi/L	150
* Plutonium-238,239/240	Air	aCi/m ³	0.75
	Water	pCi/L	0.1
† Uranium-234,235,238	Air	aCi/m ³	0.75
	Water	pCi/L	0.1
Radium-226	Water	pCi/L	0.02
Strontium-90	Milk	pCi/L	2
	Water	pCi/L	1
‡ Iodine-131	Milk (gamma)	pCi/L	4
	Water (gamma)	pCi/L	4
	Water	pCi/L	0.3
Cesium-137	Milk	pCi/L	5
	Water	pCi/L	5
‡ Barium-140	Milk	pCi/L	15
	Water	pCi/L	15
Potassium	Milk	g/L	0.06
	Water	g/L	0.06
Potassium-40	Water	pCi/L	50

* The MDC for air is based on an assumed total sample volume of 120,000 m³. Measurement by alpha spectrometry includes combined activities of ²³⁹Pu and ²⁴⁰Pu, since the relative contributions of these two isotopes cannot be determined.

† The MDC for air is based on an assumed total sample volume of 120,000 m³.

‡ 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.

Airborne particulates are collected continuously at field stations representing wide geographic coverage, including present and potential sources of environmental radioactivity. Sampling sites are located throughout the United States.

Filters (10-cm diameter synthetic fiber) from air samplers are changed twice weekly and field measurements are made with a G-M survey meter at 5 hours after collection to allow for decay of natural radon isotopes and their progeny. Field estimates are reported to appropriate EPA officials by telephone or mail depending on the activity levels found.

The filters are sent to NAREL for more sensitive analyses in a low background beta counter. Gamma scans are performed on all filters showing gross beta counts greater than 1 pCi/m³. The laboratory obtained values are usually lower than the field estimates due to the decay of naturally occurring radionuclides between the times of the two measurements.

From this ERD forward and until further notification, NAREL will no longer report ²¹⁴Bi/²¹⁴Pb by gamma scan on the monthly composites of the precipitation samples.

Precipitation samples are collected at most field stations collecting air filters. These samples are also sent to NAREL where they are composited monthly for gamma scans, tritium, and gross beta activity measurements.

A compilation of individual measurements is available from the National Air and Radiation Environmental Laboratory, 540 South Morris Avenue, Montgomery, AL 36115-2601.

Table 2
Gross Beta in Airborne Particulates
October 1997

Location	Number of Samples	5-hour Field Estimate			NAREL Lab Measurement		
		Max	Min (pCi/m ³)	Avg	Max	Min (pCi/m ³)	Avg
AK: Fairbanks	1	0.0	0.0	0.0	0.008	0.008	0.008
AZ: Phoenix	4	0.8	0.2	0.5	0.023	0.012	0.018
CA: Berkeley	9	0.2	0.0	0.1	0.016	0.005	0.009
CA: Los Angeles	9	0.2	0.0	0.1	0.037	0.010	0.017
CO: Denver	6	1.2	0.2	0.7	0.015	0.008	0.011
CT: Hartford	8	0.2	0.1	0.1	0.012	0.004	0.008
DE: Wilmington	9	0.5	0.0	0.3	0.021	0.005	0.012
FL: Jacksonville	1	0.0	0.0	0.0	0.018	0.018	0.018
FL: Miami	4	0.0	0.0	0.0	0.017	0.008	0.012
HI: Honolulu	9	0.2	0.1	0.1	0.004	0.002	0.003
IA: Iowa City	8	0.7	0.2	0.4	0.023	0.005	0.015
ID: Boise	9	1.2	0.1	0.5	0.022	0.005	0.012
ID: Idaho Falls	9				0.028	0.006	0.014
IN: Indianapolis	9	0.7	0.0	0.4	0.033	0.011	0.018
KS: Topeka	8	1.3	0.4	0.7	0.021	0.007	0.014
ME: Augusta	6	0.4	0.1	0.1	0.011	0.004	0.008
MI: Lansing	9	0.4	0.1	0.2	0.031	0.005	0.013
MN: Welch	13	1.4	0.0	0.4	0.023	0.005	0.012
MS: Jackson	9	0.9	0.1	0.3	0.019	0.010	0.014
NC: Charlotte	7	0.2	0.0	0.1	0.032	0.008	0.018
NC: Wilmington	3				0.018	0.013	0.015
ND: Bismarck	3	1.3	0.1	0.7	0.013	0.008	0.010
NH: Concord	9	0.3	0.0	0.2	0.014	0.004	0.009
NV: Las Vegas	8	0.4	0.1	0.3	0.038	0.008	0.019
NY: Albany	5	0.2	0.0	0.1	0.018	0.008	0.012
NY: New York City	9	0.2	0.0	0.1	0.017	0.006	0.011
NY: Syracuse	2	0.0	0.0	0.0	0.017	0.006	0.011
NY: Yaphank	9	0.9	0.0	0.3	0.016	0.004	0.010
OH: Painesville	7	0.3	0.1	0.2	0.031	0.006	0.014
OH: Ross	9				0.031	0.008	0.017
PA: Harrisburg	9	0.6	0.2	0.4	0.030	0.005	0.014
SC: Barnwell	2	0.0	0.0	0.0	0.016	0.010	0.013
SC: Columbia	9	0.4	0.1	0.2	0.051	0.009	0.021
TN: Knoxville	9	1.7	0.1	0.8	0.043	0.010	0.025
TN: Nashville	8	0.6	0.1	0.3	0.032	0.009	0.019
TN: Oak Ridge/Bethel	9	1.2	0.1	0.7	0.033	0.010	0.017
TN: Oak Ridge/K25	9	1.9	0.1	1.0	0.029	0.008	0.018
TN: Oak Ridge/Melton	9	1.9	0.2	0.9	0.026	0.008	0.017

Table 2 (continued)
Gross Beta in Airborne Particulates
October 1997

Location	Number of Samples	5-hour Field Estimate			NAREL Lab Measurement		
		Max	Min (pCi/m ³)	Avg	Max	Min (pCi/m ³)	Avg
TN: Oak Ridge/Y12 E	9	1.7	0.1	0.9	0.029	0.008	0.017
TN: Oak Ridge/Y12 W	9	0.8	0.1	0.5	0.030	0.007	0.018
TX: Austin	9	0.3	0.0	0.2	0.018	0.007	0.012
TX: El Paso	9	1.6	0.1	1.0	0.034	0.012	0.020
VA: Lynchburg	9	1.0	0.1	0.6	0.031	0.007	0.016
WA: Olympia	3	0.0	0.0	0.0	0.005	0.002	0.004
WA: Spokane	7	0.6	0.1	0.2	0.023	0.004	0.011
WI: Madison	9	0.6	0.2	0.4	0.023	0.005	0.014

Table 3
Gross Beta in Airborne Particulates
November 1997

Location	Number of Samples	5-hour Field Estimate			NAREL Lab Measurement		
		Max	Min (pCi/m ³)	Avg	Max	Min (pCi/m ³)	Avg
AL: Montgomery	5	0.0	0.0	0.0	0.031	0.021	0.026
AR: Little Rock	1	0.4	0.4	0.4	0.035	0.035	0.035
AZ: Phoenix	4	1.0	0.7	0.8	0.034	0.020	0.028
CA: Berkeley	8	0.1	0.0	0.1	0.016	0.003	0.007
CA: Los Angeles	7	0.3	0.2	0.2	0.031	0.006	0.014
CO: Denver	7	0.8	0.2	0.4	0.020	0.010	0.014
CT: Hartford	8	0.1	0.0	0.1	0.015	0.003	0.008
DE: Wilmington	8	0.3	0.0	0.1	0.018	0.005	0.010
FL: Jacksonville	5	0.0	0.0	0.0	0.015	0.007	0.011
FL: Miami	4	0.0	0.0	0.0	0.013	0.005	0.009
HI: Honolulu	8	0.2	0.1	0.1	0.021	0.003	0.006
IA: Iowa City	5	0.8	0.0	0.3	0.046	0.009	0.020
ID: Boise	8	1.0	0.0	0.5	0.022	0.005	0.011
ID: Idaho Falls	6				0.025	0.003	0.014
IN: Indianapolis	7	0.5	0.0	0.2	0.035	0.013	0.021
KS: Topeka	7	1.8	0.2	1.0	0.041	0.009	0.019
ME: Augusta	6	0.2	0.0	0.1	0.017	0.006	0.010
MI: Lansing	8	0.3	0.1	0.1	0.028	0.007	0.017
MN: Welch	8	1.5	0.1	0.5	0.049	0.006	0.023
MS: Jackson	7	0.2	0.1	0.2	0.032	0.010	0.017
NC: Charlotte	4	0.0	0.0	0.0	0.020	0.013	0.016
NC: Wilmington	4				0.022	0.007	0.013
ND: Bismarck	6	2.2	0.2	0.9	0.075	0.012	0.031
NH: Concord	8	0.1	0.0	0.1	0.018	0.004	0.009
NV: Las Vegas	7	0.5	0.2	0.3	0.027	0.012	0.020
NY: Albany	4	0.1	0.0	0.1	0.026	0.010	0.016
NY: New York City	7	0.2	0.0	0.1	0.026	0.005	0.012
NY: Syracuse	2	0.0	0.0	0.0	0.020	0.010	0.015
NY: Yaphank	7	0.2	0.0	0.1	0.013	0.003	0.008
OH: Columbus	2				0.028	0.015	0.021
OH: Painesville	6				0.022	0.007	0.013
OH: Ross	7				0.028	0.012	0.018
PA: Harrisburg	8	0.4	0.1	0.2	0.022	0.006	0.013
SC: Barnwell	2	0.0	0.0	0.0	0.014	0.009	0.012
SC: Columbia	6	0.3	0.0	0.2	0.020	0.009	0.014
TN: Knoxville	8	1.5	0.1	0.5	0.039	0.013	0.025
TN: Nashville	7	0.2	0.1	0.1	0.036	0.009	0.020
TN: Oak Ridge/Bethel	8	0.9	0.1	0.4	0.022	0.008	0.015

Table 3 (continued)
Gross Beta in Airborne Particulates
November 1997

Location	Number of Samples	5-hour Field Estimate			NAREL Lab Measurement		
		Max	Min (pCi/m ³)	Avg	Max	Min (pCi/m ³)	Avg
TN: Oak Ridge/K25	8	4.6	0.1	0.9	0.021	0.008	0.015
TN: Oak Ridge/Melton	7	1.1	0.1	0.4	0.023	0.012	0.016
TN: Oak Ridge/Y12 E	9	0.8	0.1	0.3	0.023	0.007	0.015
TN: Oak Ridge/Y12 W	8	0.3	0.0	0.2	0.027	0.008	0.018
TX: Austin	7	0.2	0.1	0.1	0.025	0.007	0.014
TX: El Paso	7	1.5	0.2	0.9	0.033	0.015	0.022
VA: Lynchburg	7	0.6	0.1	0.3	0.019	0.006	0.010
WA: Olympia	4	0.1	0.0	0.1	0.011	0.003	0.006
WA: Spokane	8	0.3	0.1	0.1	0.032	0.004	0.013
WI: Madison	8	0.9	0.1	0.3	0.039	0.005	0.021

Table 4
Gross Beta in Airborne Particulates
December 1997

Location	Number of Samples	5-hour Field Estimate			NAREL Lab Measurement		
		Max	Min (pCi/m ³)	Avg	Max	Min (pCi/m ³)	Avg
AK: Fairbanks	2	0.0	0.0	0.0	0.017	0.016	0.017
AL: Montgomery	9	0.1	0.0	0.0	0.044	0.014	0.026
AR: Little Rock	5	0.2	0.0	0.1	0.022	0.016	0.018
AZ: Phoenix	3	0.3	0.1	0.2	0.030	0.017	0.023
CA: Berkeley	8	0.3	0.0	0.1	0.018	0.004	0.008
CA: Los Angeles	9	0.3	0.0	0.1	0.014	0.005	0.011
CO: Denver	8	0.3	0.0	0.1	0.018	0.008	0.013
CT: Hartford	9	0.1	0.0	0.1	0.016	0.004	0.008
DE: Wilmington	9	0.1	0.0	0.1	0.023	0.007	0.012
FL: Jacksonville	6	0.1	0.0	0.0	0.018	0.009	0.012
FL: Miami	5	0.0	0.0	0.0	0.010	0.006	0.008
HI: Honolulu	8	0.2	0.1	0.1	0.006	0.001	0.003
IA: Iowa City	4	0.6	0.0	0.3	0.030	0.017	0.020
ID: Boise	9	0.8	0.2	0.4	0.034	0.004	0.016
IN: Indianapolis	9	0.8	0.0	0.2	0.031	0.009	0.020
KS: Topeka	8	0.5	0.2	0.3	0.026	0.010	0.015
ME: Augusta	8	0.1	0.0	0.1	0.019	0.007	0.012
MI: Lansing	9	0.2	0.1	0.1	0.020	0.005	0.014
MN: Welch	8	0.3	0.0	0.1	0.018	0.003	0.012
MS: Jackson	8	0.3	0.0	0.1	0.020	0.013	0.015
NC: Charlotte	7	0.1	0.0	0.0	0.029	0.009	0.016
NC: Wilmington	3				0.014	0.010	0.011
ND: Bismarck	4	0.7	0.2	0.4	0.018	0.009	0.015
NH: Concord	9	0.1	0.0	0.1	0.014	0.005	0.009
NV: Las Vegas	9	0.4	0.1	0.2	0.026	0.003	0.015
NY: Albany	5	0.1	0.0	0.0	0.018	0.008	0.013
NY: New York City	5	0.1	0.0	0.0	0.018	0.007	0.011
NY: Syracuse	2	0.0	0.0	0.0	0.012	0.010	0.011
NY: Yaphank	6	0.1	0.0	0.1	0.015	0.007	0.009
OH: Columbus	5	0.0	0.0	0.0	0.025	0.013	0.018
OH: Painesville	8	0.2	0.0	0.1	0.018	0.006	0.013
OH: Ross	9				0.031	0.009	0.018
PA: Harrisburg	9	0.3	0.1	0.2	0.025	0.008	0.014
SC: Barnwell	2	0.0	0.0	0.0	0.014	0.012	0.013
SC: Columbia	8	0.4	0.0	0.1	0.019	0.009	0.013
SD: Pierre	4	0.2	0.1	0.2	0.022	0.009	0.015
TN: Knoxville	7	0.7	0.0	0.3	0.045	0.014	0.030
TN: Nashville	8	0.2	0.1	0.1	0.035	0.010	0.021

Table 4 (continued)
Gross Beta in Airborne Particulates
December 1997

Location	Number of Samples	5-hour Field Estimate			NAREL Lab Measurement		
		Max	Min (pCi/m ³)	Avg	Max	Min (pCi/m ³)	Avg
TN: Oak Ridge/Bethel	9	0.6	0.0	0.2	0.035	0.009	0.016
TN: Oak Ridge/K25	9	0.6	0.0	0.3	0.031	0.008	0.015
TN: Oak Ridge/Melton	9	0.5	0.0	0.2	0.033	0.007	0.016
TN: Oak Ridge/Y12 E	9	0.9	0.0	0.3	0.035	0.009	0.017
TN: Oak Ridge/Y12 W	9	0.3	0.0	0.1	0.036	0.009	0.017
TX: Austin	8	0.3	0.0	0.1	0.017	0.009	0.012
TX: El Paso	6	2.0	0.0	0.7	0.031	0.001	0.015
UT: Salt Lake City	5	1.1	0.0	0.3	0.021	0.004	0.015
VA: Lynchburg	7	1.3	0.2	0.4	0.024	0.006	0.013
WA: Olympia	4	0.0	0.0	0.0	0.010	0.001	0.006
WA: Spokane	8	0.1	0.1	0.1	0.033	0.004	0.014
WI: Madison	8	0.2	0.1	0.2	0.021	0.007	0.015

Table 5
Gross Beta and Specific Gamma in Precipitation
October 1997

Location	Gross Beta Activity		Specific Gamma Activity	
	pCi/L $\pm 2\sigma$		Nuclide	pCi/L $\pm 2\sigma$
CO: Denver	5.18	0.53		ND
CT: Hartford	1.03	0.28	Be7	53 53
DE: Wilmington	1.12	0.27	Be7	65 58
FL: Jacksonville	0.48	0.24		ND
FL: Miami	1.11	0.29		ND
HI: Honolulu	0.50	0.27		ND
IA: Iowa City	0.51	0.28		ND
ID: Idaho Falls	0.70	0.27		ND
ME: Augusta	0.58	0.25	Be7	137 51
MI: Lansing	0.66	0.30		ND
MN: Minneapolis	0.29	0.29		ND
NC: Charlotte	0.38	0.24		ND
NC: Wilmington	0.97	0.28		ND
ND: Bismarck	0.55	0.31	K40	19 41
			Pb212	3.4 6.3
NE: Lincoln	2.30	0.41		ND
NH: Concord	2.31	0.37		ND
NM: Santa Fe	6.18	0.58	Be7	94 68
NY: Albany	1.68	0.33	Be7	83 49
NY: Syracuse	0.37	0.23		ND
NY: Yaphank	31.8	1.2		ND
OH: Painesville	2.05	0.38	Be7	76 38
OR: Portland	1.23	0.34	Be7	35 37
PA: Harrisburg	1.25	0.29		ND
SC: Barnwell	1.77	0.36		ND
SC: Columbia	0.61	0.25	Pb212	6.1 3.2
TN: Knoxville	0.81	0.26		ND
TN: Nashville	1.49	0.32		ND
TX: Austin	0.25	0.31		ND
UT: Salt Lake City	0.97	0.30		ND
VA: Lynchburg	4.50	0.48	Pb212	6.9 3.9
WA: Olympia	0.23	0.22		ND
WI: Madison	1.05	0.33		ND

Note: ND = Not Detected

Table 6
Gross Beta and Specific Gamma in Precipitation
November 1997

Location	Gross Beta Activity		Specific Gamma Activity	
	pCi/L $\pm 2\sigma$		Nuclide	pCi/L $\pm 2\sigma$
CO: Denver	0.19	0.23	Pb212	3.8 5.2
CT: Hartford	1.45	0.32	Tl208	1.5 1.6
DE: Wilmington	1.38	0.30	Be7	27 24
			Tl208	2.6 1.5
FL: Jacksonville	1.19	0.31	Ra224	46 53
FL: Miami	1.17	0.31	Pb212	3.9 2.8
HI: Honolulu	1.87	0.34		ND
IA: Iowa City	0.51	0.24		ND
ID: Boise	1.49	0.31		ND
ID: Idaho Falls	1.86	0.36		ND
ME: Augusta	0.55	0.26	Be7	27 28
MI: Lansing	1.34	0.30	Be7	68 41
MN: Minneapolis	4.68	0.50	K40	10 13
MN: Welch	1.31	0.30		ND
NC: Charlotte	1.08	0.30	Be7	35 25
NC: Wilmington	2.19	0.38		ND
ND: Bismarck	1.69	0.33	Pb212	6.1 5.0
NH: Concord	1.93	0.35		ND
NM: Santa Fe	1.18	0.31	Be7	44 41
NV: Las Vegas	16.8	1.3	K40	39 59
NY: Albany	0.73	0.26		ND
NY: Syracuse	0.14	0.20	Pb212	4.5 3.1
			Tl208	1.6 1.7
NY: Yaphank	1.18	0.30		ND
OH: Painesville	4.79	0.48	Be7	103 28
OR: Portland	1.64	0.33	Be7	49 35
PA: Harrisburg	2.59	0.38	Be7	62 28
SC: Barnwell	1.18	0.29	Pb212	4.0 3.0
SC: Columbia	1.07	0.28	Be7	24 25
TN: Knoxville	2.97	0.41	Pb212	5.4 2.9
TN: Nashville	1.20	0.29	Be7	76 29
TX: Austin	1.11	0.29		ND
TX: El Paso	0.78	0.28		ND
VA: Lynchburg	6.18	0.54		ND
WA: Olympia	0.46	0.24		ND
WI: Madison	1.69	0.33		ND

Note: ND = Not Detected

Table 7
Gross Beta and Specific Gamma in Precipitation
December 1997

Location	Gross Beta Activity		Specific Gamma Activity	
	pCi/L $\pm 2\sigma$		Nuclide	pCi/L $\pm 2\sigma$
AR: Little Rock	0.86	0.34		ND
AZ: Phoenix	1.46	0.32		ND
CO: Denver	3.12	0.42		ND
CT: Hartford	3.97	0.50	Be7	70 38
DE: Wilmington	1.84	0.36	Be7	47 33
			Tl208	1.6 1.5
FL: Jacksonville	0.50	0.25		ND
FL: Miami	0.33	0.28		ND
HI: Honolulu	1.52	0.33		ND
IA: Iowa City	0.94	0.35		ND
ID: Idaho Falls	3.12	0.42		ND
MN: Minneapolis	6.22	0.60	Be7	93 35
MS: Jackson	1.35	0.34		ND
NC: Charlotte	0.89	0.27		ND
NC: Wilmington	0.16	0.20		ND
NM: Santa Fe	1.46	0.38	Be7	35 29
			Pb212	4.3 3.4
NY: Albany	1.06	0.29		ND
NY: Yaphank	1.34	0.31	Be7	44 27
OH: Painesville	5.29	0.54		ND
OR: Portland	0.97	0.28		ND
PA: Harrisburg	2.57	0.38	Be7	55 29
SC: Columbia	5.48	0.56		ND
TN: Knoxville	0.27	0.29		ND
TN: Nashville	1.08	0.34		ND
TX: Austin	0.63	0.30	Tl208	1.6 1.6
TX: El Paso	1.76	0.39		ND
UT: Salt Lake City	1.19	0.32		ND
VA: Lynchburg	1.76	0.34		ND
WA: Olympia	0.65	0.25		ND
WI: Madison	1.76	0.38		ND

Note: ND = Not Detected

Table 8
Tritium in Precipitation
October - December 1997

Location	October 1997		November 1997		December 1997	
	pCi/L $\pm 2u$		pCi/L $\pm 2u$		pCi/L $\pm 2u$	
AR: Little Rock	NS		NS		-2	91
AZ: Phoenix	NS		NS		-72	87
CO: Denver	-15	85	69	84	-15	90
CT: Hartford	4	90	-17	81	10	92
DE: Wilmington	23	91	278	93	58	94
FL: Jacksonville	-65	84	-27	84	-25	84
FL: Miami	4	90	-51	80	-40	90
HI: Honolulu	-22	85	38	82	-2	91
IA: Iowa City	NS		92	84	-29	90
ID: Boise	NS		-7	80	NS	
ID: Idaho Falls	-7	86	25	81	-31	89
ME: Augusta	31	91	-40	80	NS	
MI: Lansing	37	88	22	81	NS	
MN: Minneapolis	-44	84	43	83	11	91
MN: Welch	NS		7	81	NS	
MS: Jackson	NS		NS		-55	89
NC: Charlotte	-13	88	97	86	-25	90
NC: Wilmington	-12	89	2	82	-25	90
ND: Bismarck	-43	85	23	82	NS	
NE: Lincoln	-14	83	NS		NS	
NH: Concord	-54	88	-10	82	NS	
NM: Santa Fe	-5	86	-27	79	-23	90
NV: Las Vegas	NS		23	82	NS	
NY: Albany	-6	89	-31	81	6	91
NY: Syracuse	71	93	66	84	NS	
NY: Yaphank	61	92	22	83	-11	91
OH: Painesville	NS		45	83	-46	89
OR: Portland	-41	84	17	81	-44	89
PA: Harrisburg	43	92	45	84	-27	90
SC: Barnwell	133	91	990	120	NS	
SC: Columbia	-15	89	26	82	-19	91
TN: Knoxville	15	90	-33	80	-4	92
TN: Nashville	-17	89	17	83	-4	91
TX: Austin	-36	85	-8	80	-13	90
TX: El Paso	NS		-12	80	-13	90
UT: Salt Lake City	-41	84	NS		-84	87
VA: Lynchburg	8	90	25	83	-25	90
WA: Olympia	-46	84	-10	80	-23	89

Note: NS = No Sample

Table 8 (continued)
Tritium in Precipitation
October - December 1997

Location	October 1997 pCi/L $\pm 2u$	November 1997 pCi/L $\pm 2u$	December 1997 pCi/L $\pm 2u$
WI: Madison	NS	-2 81	-58 90

Note: NS = No Sample

Plutonium and Uranium in Airborne Particulates and Precipitation

Environmental radiation levels of plutonium and uranium are determined by the analysis of annually composited samples (air filters) collected from the continuously operating airborne particulate samplers.

Concentrations of plutonium-238, combined plutonium-239 and 240, and uranium-234, 235, and 238 are determined by alpha spectrometry following chemical separation. The volume of air represented by the annual composite ranges from 120,000 to 500,000 cubic meters.

Plutonium and uranium results are published when they become available.

Table 9
Plutonium and Uranium in Airborne Particulates
January - December 1997 Composites

Location	²³⁸ Pu		²³⁹⁻²⁴⁰ Pu		²³⁴ U		²³⁵ U		²³⁸ U	
	aCi/m ³	± 2u	aCi/m ³	± 2u	aCi/m ³	± 2u	aCi/m ³	± 2u	aCi/m ³	± 2u
AK: Fairbanks	-0.43	0.39	0.02	0.18	13.3	2.5	1.79	0.99	11.6	2.3
AL: Montgomery	0.30	0.93	0.48	0.61	19.7	4.2	2.5	1.6	15.7	3.7
AR: Little Rock	-0.10	0.42	0.22	0.30	22.9	4.6	1.6	1.3	21.6	4.4
AZ: Phoenix	-0.5	2.0	-0.24	0.61	66	12	6.3	3.9	50	10
CA: Berkeley	0.29	0.50	0.14	0.26	8.7	2.3	0.64	0.71	6.3	2.0
CA: Los Angeles	0.37	0.92	0.26	0.39	26.8	5.9	2.4	1.9	20.5	4.9
CO: Denver	0.20	0.58	0.49	0.44	35.6	5.3	3.7	1.8	31.9	4.9
CT: Hartford	0.43	0.40	0.03	0.13	14.0	3.0	1.9	1.1	12.3	2.7
DE: Wilmington	0.02	0.35	0.14	0.18	14.7	2.9	2.7	1.3	12.8	2.7
FL: Jacksonville	0.16	0.30	0.000	0.099	10.5	2.1	0.56	0.50	9.7	2.0
FL: Miami	0.47	0.42	0.05	0.16	10.1	2.4	0.78	0.81	9.2	2.2
HI: Honolulu	0.24	0.31	0.19	0.19	3.01	0.91	0.47	0.40	2.33	0.78
IA: Iowa City	0.32	0.49	0.22	0.24	19.1	3.1	2.5	1.2	14.9	2.7
ID: Boise	0.23	0.54	0.08	0.23	22.6	3.9	0.94	0.88	19.7	3.6
ID: Idaho Falls	-0.10	0.44	0.15	0.28	16.8	3.5	1.4	1.1	19.6	3.8
IN: Indianapolis	0.46	0.70	0.19	0.42	26.8	3.7	2.5	1.1	22.8	3.4
KS: Topeka	0.12	0.58	0.06	0.24	17.1	2.8	2.5	1.1	15.6	2.6
ME: Augusta	0.25	0.63	0.07	0.15	25.0	4.1	2.8	1.4	22.1	3.8
MI: Lansing	0.22	0.69	0.16	0.30	14.7	2.5	1.25	0.79	13.0	2.4
MN: Minneapolis	-0.11	0.38	0.09	0.21	9.3	1.6	1.04	0.55	6.6	1.3
MN: Welch	0.00	0.36	0.12	0.19	14.5	2.2	1.75	0.82	15.5	2.3
MN: Welch	0.05	0.16	0.012	0.038	4.25	0.79	0.24	0.23	4.22	0.79
MS: Jackson	0.57	0.68	-0.17	0.15	17.9	4.5	2.9	1.9	17.1	4.4
NC: Charlotte	-0.37	0.59	0.06	0.26	22.9	5.2	1.6	1.6	21.3	5.0
NC: Wilmington	-0.10	0.30	0.08	0.15	23.1	2.4	1.20	0.51	20.6	2.3
ND: Bismarck	1.21	0.87	0.11	0.24	17.1	3.4	1.7	1.2	15.9	3.3
NH: Concord	0.21	0.24	0.000	0.055	9.9	2.0	1.29	0.74	9.6	2.0
NJ: Trenton	-0.2	2.1	0.6	1.1	19.3	4.9	1.1	1.4	16.0	4.4
NM: Santa Fe	0.5	1.3	0.44	0.58	35.2	5.1	2.2	1.3	31.5	4.8
NV: Las Vegas	0.6	2.3	0.8	1.1	44.4	7.2	2.9	1.9	32.8	6.0
NY: New York City	0.05	0.30	0.09	0.14	13.1	2.9	0.47	0.55	14.5	3.0
NY: Syracuse	-0.09	0.29	-0.015	0.031	10.1	1.7	1.01	0.56	10.3	1.7
NY: Yaphank	0.44	0.33	0.15	0.15	6.9	1.4	0.41	0.36	5.7	1.3
OH: Columbus	-0.48	0.38	0.00	0.18	20.7	2.6	1.86	0.79	17.2	2.4
OH: Painesville	0.20	0.40	-0.06	0.12	11.2	1.9	0.90	0.57	9.6	1.7
OH: Ross	3.9	1.5	0.11	0.35	34.4	5.0	2.3	1.4	30.7	4.7
PA: Harrisburg	0.24	0.33	0.08	0.18	10.7	2.2	0.84	0.64	11.5	2.3
SC: Barnwell	-0.12	0.19	0.14	0.11	13.1	1.9	1.29	0.59	11.2	1.7
SC: Columbia	0.18	0.36	0.10	0.24	33.4	5.4	2.5	1.5	31.9	5.3
SD: Pierre	-0.03	0.39	0.13	0.17	14.1	2.5	0.96	0.71	11.3	2.2

Note: NA = No Analysis

Table 9 (continued)
Plutonium and Uranium in Airborne Particulates
January - December 1997 Composites

Location	²³⁸ Pu		²³⁹⁻²⁴⁰ Pu		²³⁴ U		²³⁵ U		²³⁸ U	
	aCi/m ³ ± 2u	aCi/m ³ ± 2u	aCi/m ³ ± 2u	aCi/m ³ ± 2u	aCi/m ³ ± 2u	aCi/m ³ ± 2u	aCi/m ³ ± 2u	aCi/m ³ ± 2u	aCi/m ³ ± 2u	aCi/m ³ ± 2u
TN: Knoxville	0.35	0.75	0.14	0.24	24.1	5.5	2.6	2.1	17.7	4.7
TN: Nashville	0.62	0.85	0.21	0.36	17.2	3.5	1.4	1.1	16.2	3.4
TN: Oak Ridge/Bethel	0.47	0.40	0.08	0.17	11.5	1.9	2.14	0.85	7.4	1.5
TN: Oak Ridge/K25	0.34	0.31	0.13	0.14	19.6	1.9	1.34	0.46	23.1	2.1
TN: Oak Ridge/Melton	0.007	0.099	0.022	0.043	7.6	1.1	0.40	0.27	7.0	1.0
TN: Oak Ridge/Y12 E	0.24	0.52	0.00	0.15	27.5	3.6	2.8	1.2	17.6	2.8
TN: Oak Ridge/Y12 W	0.48	0.50	0.12	0.22	84.2	6.4	5.5	1.3	29.8	3.1
TX: Austin	0.29	0.38	0.06	0.16	9.8	1.8	0.60	0.48	8.6	1.7
TX: El Paso	-0.4	1.5	0.08	0.73	57	10	2.8	2.6	48.6	9.3
UT: Salt Lake City	0.2	1.3	0.47	0.66	35.4	7.1	1.8	1.6	30.1	6.4
VA: Lynchburg	0.11	0.21	0.21	0.18	86.2	8.5	4.1	1.2	10.1	1.8
WA: Olympia	0.09	0.19	0.09	0.11	3.8	1.1	0.29	0.41	2.29	0.85
WA: Spokane	-0.17	0.70	0.14	0.39	16.6	3.4	1.8	1.2	13.4	3.0
WI: Madison	0.15	0.39	0.02	0.18	10.7	1.6	1.03	0.50	11.9	1.7

Note: NA = No Analysis

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2. Water Program

The ERAMS water program provides data on radionuclide concentrations in the nation's rivers, streams, and drinking water supplies.

Surface Water

Quarterly grab samples are taken downstream from nuclear facilities in as many as 58 stations. Surface water samples are analyzed for tritium quarterly and gamma-emitting radionuclides annually. Tritium is a primary potential radioactive pollutant from nuclear power plants and weapons production activities.

From this ERD forward and until further notification, NAREL will no longer report $^{214}\text{Bi}/^{214}\text{Pb}$ by gamma scan on the surface water samples.

Table 10
Tritium in Surface Water
October - December 1997

Location	Source	Date Collected	³ H pCi/L ± 2σ	
AL: Decatur	Tennessee River	10/07/97	12	86
AL: Gordon	Chattahoochee River	10/01/97	-46	86
AL: Scottsboro	Tennessee River	10/06/97	104	89
AR: Little Rock	Arkansas River	10/09/97	56	83
CA: Clay Station	Folsom S. Canal	10/14/97	-2	81
CA: Diablo Canyon	Pacific Ocean	12/29/97	73	84
CA: Eureka	Humboldt Bay	10/17/97	7	81
CA: San Onofre	Pacific Ocean	11/20/97	-29	83
CO: Platteville	South Platte River	10/10/97	101	86
CT: E. Haddam	Connecticut River	10/21/97	93	82
CT: Waterford	Long Island Sound	10/21/97	51	81
FL: Crystal River	Gulf Of Mexico	11/03/97	-15	83
FL: Ft. Pierce	Atlantic Ocean	10/27/97	-21	83
FL: Homestead	Biscayne Bay	10/15/97	-57	81
GA: Baxley	Altamaha River	10/07/97	89	84
IA: Cedar Rapids	Cedar River	10/07/97	10	83
ID: Buhl	Snake River	10/08/97	115	84
IL: Morris	Illinois River	10/20/97	269	96
IL: Zion	Lake Michigan	12/31/97	62	80
LA: New Orleans	Mississippi River	10/31/97	-17	82
MA: Plymouth	Cape Cod Bay	10/08/97	34	81
MD: Conowingo	Susquehanna River	10/21/97	105	83
MD: Lusby	Chesapeake Bay	10/14/97	26	83
ME: Wiscasset	Montseway Bay	10/14/97	19	83
MI: Bridgman	Lake Michigan	10/13/97	153	85
MI: Charlevoix	Lake Michigan	10/08/97	69	82
MI: Monroe	Lake Erie	10/13/97	157	87
MI: S. Haven	Lake Michigan	10/13/97	1720	130
MN: Monticello	Mississippi River	10/27/97	-27	83
MN: Red Wing	Mississippi River	10/20/97	178	89
MS: Port Gibson	Mississippi River	10/07/97	73	82
NC: Charlotte	Catawba River	10/08/97	110	85
NC: Southport	Atlantic Ocean	10/09/97	5	81
NV: Boulder City	Colorado River	10/31/97	-6	83
NY: Chelsea	Hudson River	10/22/97	102	83
NY: Croton-On-Hudson	Hudson River	10/24/97	65	87
NY: Oswego	Lake Ontario	11/05/97	156	91
OR: Bradwood	Columbia River	10/28/97	-4	84
PA: Danville	Susquehanna River	10/22/97	73	81
PA: Philadelphia	Delaware River - Baxter	10/24/97	54	81

Table 10 (continued)
Tritium in Surface Water
October - December 1997

Location	Source	Date Collected	³ H pCi/L ± 2 <i>u</i>	
PA: Philadelphia	Schuylkill River - Belmont	10/24/97	363	92
PA: Philadelphia	Schuylkill River - Queen	10/24/97	730	110
SC: Columbia	Broad River	10/20/97	140	85
SC: Columbia	Broad River	10/21/97	268	89
TN: Daisy	Tennessee River	11/07/97	-17	83
TN: Oak Ridge	Clinch River	10/09/97	86	84
TN: Oak Ridge	Clinch River	11/15/97	151	88
TX: Matagorda	Colorado River	10/08/97	39	83
VA: Doswell	North Anna River	10/01/97	2360	150
VA: Newport News	James River	10/13/97	10	84
VT: Vernon	Connecticut River	11/26/97	-19	83
WA: Northport	Columbia River	11/18/97	115	84
WA: Richland	Columbia River	10/06/97	27	85
WI: Two Creeks	Lake Michigan	10/14/97	87	85
WI: Victory	Mississippi River	10/13/97	39	83
WV: Wheeling	Ohio River	10/07/97	-58	80

Table 11
Surface Water Annual Gamma Analysis
January - December 1997

Location	Source	Date Collected	Specific Gamma Activity	
			Nuclide	pCi/L $\pm 2u$
AL: Decatur	Tennessee River	04/22/97		ND
AL: Gordon	Chattahoochee River	04/09/97	K40	202 46
AL: Scottsboro	Tennessee River	04/21/97		ND
AR: Little Rock	Arkansas River	04/07/97		ND
CA: Clay Station	Folsom S. Canal	04/22/97		ND
		07/29/97		ND
CA: Diablo Canyon	Pacific Ocean	04/08/97	K40	387 47
CA: Eureka	Humboldt Bay	04/17/97	K40	321 92
			Pb212	3.6 8.2
CA: San Onofre	Pacific Ocean	04/22/97	K40	352 60
			Tl208	2.4 1.8
CO: Platteville	South Platte River	04/14/97	Tl208	2.9 3.2
CT: E. Haddam	Connecticut River	04/17/97		ND
CT: Waterford	Long Island Sound	04/17/97	K40	253 58
			Tl208	3.7 2.2
FL: Crystal River	Gulf Of Mexico	04/08/97		ND
FL: Ft. Pierce	Atlantic Ocean	04/07/97		ND
FL: Homestead	Biscayne Bay	04/10/97	K40	363 47
GA: Baxley	Altamaha River	04/22/97	Tl208	6.9 4.7
IA: Cedar Rapids	Cedar River	04/15/97		ND
ID: Buhl	Snake River	04/11/97	K40	16 39
IL: Moline	Mississippi River	06/20/97		ND
IL: Morris	Illinois River	04/07/97	K40	42 58
			Pb212	7.1 5.5
			Tl208	2.4 2.7
IL: Zion	Lake Michigan	05/15/97		ND
KS: Le Roy	Neosho River	06/24/97		ND
LA: New Orleans	Mississippi River	04/28/97		ND
MA: Plymouth	Cape Cod Bay	04/15/97		ND
MD: Conowingo	Susquehanna River	04/08/97		ND
MD: Lusby	Chesapeake Bay	04/08/97	K40	36 45
ME: Wiscasset	Montseway Bay	04/15/97	K40	162 57
MI: Bridgman	Lake Michigan	04/13/97		ND
MI: Charlevoix	Lake Michigan	04/09/97		ND
MI: Monroe	Lake Erie	04/07/97	Pb212	2.0 5.4
MI: S. Haven	Lake Michigan	04/13/97		ND
MN: Monticello	Mississippi River	04/14/97		ND

Note: ND = Not Detected

Table 11 (continued)
Surface Water Annual Gamma Analysis
January - December 1997

Location	Source	Date Collected	Specific Gamma Activity	
			Nuclide	pCi/L $\pm 2u$
MN: Red Wing	Mississippi River	04/07/97		ND
MS: Port Gibson	Mississippi River	04/15/97	Pb212	7.2 8.1
NC: Charlotte	Catawba River	04/16/97	Pb212	4.4 5.5
			Tl208	2.0 4.2
			K40	190 110
NC: Southport	Atlantic Ocean	04/04/97	K40	190 110
NE: Rulo	Missouri River	04/29/97	Ra224	59 47
NJ: Bayside	Delaware River	06/24/97	K40	43 89
			Tl208	2.7 2.1
			K40	242 62
NJ: Oyster Creek	Oyster Creek	06/23/97	K40	242 62
NY: Chelsea	Hudson River	04/07/97		ND
NY: Croton-On-Hudson	Hudson River	06/24/97	K40	54 52
			Pb212	7.6 7.7
			Ra224	54 44
NY: Oswego	Lake Ontario	06/18/97		ND
OH: Toledo	Lake Erie	04/02/97	Pb212	7.1 5.9
			Tl208	2.6 3.6
				ND
OR: Bradwood	Columbia River	04/09/97		ND
PA: Danville	Susquehanna River	04/09/97		ND
PA: Philadelphia	Schuylkill River - Belmont	04/11/97		ND
	Delaware River - Baxter	04/11/97	Pb212	5.3 7.6
	Schuylkill River - Queen Lane	04/11/97	K40	31 53
			Tl208	1.8 2.0
			Pb212	4.1 7.2
SC: Allendale	Savannah River	04/29/97	Ra224	44 45
				ND
SC: Columbia	Broad River	04/14/97		ND
SC: Hartsville	Lake Robinson	04/08/97		ND
TN: Kingston	Clinch River	04/07/97	K40	29 39
TN: Oak Ridge	Clinch River	06/03/97		ND
TX: Matagorda	Colorado River	04/03/97	Pb212	7.0 7.0
VA: Doswell	North Anna River	05/14/97		ND
VA: Newport News	James River	04/03/97		ND
VT: Vernon	Connecticut River	04/09/97		ND
WA: Northport	Columbia River	04/08/97		ND
WA: Richland	Columbia River	04/14/97		ND
WI: Two Creeks	Lake Michigan	04/15/97	K40	17 39
WI: Victory	Mississippi River	04/07/97	Pb212	4.1 8.4
			Tl208	4.2 2.9

Note: ND = Not Detected

Table 11 (continued)
Surface Water Annual Gamma Analysis
January - December 1997

Location	Source	Date Collected	Specific Gamma Activity	
			Nuclide	pCi/L $\pm 2u$
WV: Wheeling	Ohio River	04/03/97		ND

Note: ND = Not Detected

Drinking Water

This program monitors ambient radiation levels in drinking water in as many as 78 sites. These data serve to assess trends and anomalies in concentrations, and to compare with standards set forth in the EPA "National Interim Primary Drinking Water Regulations." These regulations provide for approval of supplies when the combined radium-226 and radium-228 levels do not exceed 5 pCi/L, when the gross alpha (excluding radon and uranium) levels do not exceed 15 pCi/L, when tritium levels do not exceed 20,000 pCi/L, when the strontium-90 levels do not exceed 8 pCi/L, and when the gross beta levels do not exceed 50 pCi/L.

Grab samples are taken at the 78 sites which are either major population centers or selected nuclear facility environs.

The analyses include (a) tritium on a quarterly basis; (b) gross alpha, gross beta, strontium-90, 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; (d) iodine-131 on one quarterly sample per year for each station; and (e) an annual composite for 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.

From this ERD forward and until further notification, NAREL will no longer report $^{214}\text{Bi}/^{214}\text{Pb}$ by gamma scan on the annual composites of the drinking water samples.

Table 12
Tritium in Drinking Water
October - December 1997

Location	Date Collected	³ H pCi/L ± 2 <i>u</i>	
AK: Fairbanks	11/04/97	-29	83
AL: Dothan	10/01/97	-76	85
AL: Montgomery	10/23/97	40	85
AL: Muscle Shoals	10/07/97	77	88
AL: Scottsboro	10/06/97	26	87
AR: Little Rock	10/09/97	58	83
CA: Berkeley	10/07/97	-58	83
CA: Los Angeles	10/06/97	-41	82
CO: Denver	10/10/97	98	86
CO: Denver	10/10/97	36	84
CT: Hartford	10/06/97	14	89
DE: Dover	10/14/97	163	87
FL: Miami	10/07/97	-36	84
FL: Tampa	10/30/97	-17	83
GA: Baxley	10/07/97	-86	82
GA: Savannah	11/20/97	300	91
HI: Honolulu	10/03/97	-50	86
IA: Cedar Rapids	10/13/97	12	81
ID: Boise	10/06/97	-62	83
ID: Idaho Falls	10/20/97	0	85
IL: Morris	10/03/97	-97	83
IL: W. Chicago	11/03/97	-34	82
KS: Topeka	10/03/97	10	84
LA: New Orleans	10/03/97	-35	86
MA: Lawrence	10/09/97	-19	80
MD: Baltimore	10/03/97	-29	83
ME: Augusta	10/07/97	9	84
MI: Detroit	10/09/97	168	88
MI: Grand Rapids	10/16/97	40	86
MN: Minneapolis	10/20/97	-25	80
MN: Minneapolis	10/27/97	63	81
MO: Jefferson City	10/06/97	-46	77
MS: Jackson	10/08/97	-43	84
MS: Port Gibson	10/07/97	-94	83
MT: Helena	10/22/97	87	82
NC: Charlotte	10/08/97	274	92
NC: Raleigh	10/09/97	69	84
ND: Bismarck	10/07/97	-63	78
NE: Lincoln	10/24/97	75	82
NH: Concord	10/03/97	-22	83

Table 12 (continued)
Tritium in Drinking Water
October - December 1997

Location	Date Collected	³ H pCi/L ± 2 <i>u</i>	
NJ: Trenton	12/16/97	-16	80
NJ: Waretown	12/16/97	-38	80
NM: Santa Fe	10/28/97	4	84
NV: Las Vegas	10/06/97	37	78
NY: Niagara Falls	10/20/97	123	84
NY: Syracuse	10/20/97	35	86
OH: Cincinnati	12/01/97	-30	82
OH: Columbus	12/10/97	38	82
OH: E. Liverpool	11/26/97	7	84
OH: Painesville	10/06/97	108	88
OH: Toledo	10/06/97	72	88
OK: Oklahoma City	10/22/97	31	80
OR: Portland	10/06/97	-70	81
PA: Columbia	10/24/97	21	85
PA: Harrisburg	10/21/97	111	86
PA: Harrisburg	10/24/97	4	84
PA: Philadelphia - Belmont	10/24/97	579	98
PA: Philadelphia - Baxter	10/24/97	29	80
PA: Philadelphia - Queen	10/24/97	620	100
PA: Pittsburgh	11/26/97	29	84
PC: Corozal	10/07/97	-87	82
RI: Providence	10/03/97	26	81
SC: Columbia	10/06/97	400	100
SC: Columbia	10/13/97	-29	81
SC: Jenkinsville	10/08/97	111	84
SC: Seneca	10/02/97	29	89
TN: Chattanooga	10/06/97	27	89
TN: Knoxville	10/06/97	-93	82
TN: Oak Ridge - Anderson Co #768	11/12/97	61	82
TN: Oak Ridge - Anderson Co #772	11/12/97	79	83
TN: Oak Ridge - Knox Co #371	11/12/97	67	82
TN: Oak Ridge - Roane Co #360	11/13/97	44	81
TN: Oak Ridge - Roane Co #4442	11/13/97	132	85
TX: Austin	10/09/97	33	82
VA: Doswell	12/29/97	28	81
WA: Richland	10/06/97	150	86
WA: Seattle	10/06/97	12	84
WI: Madison	10/08/97	-54	79
WI: Madison	10/13/97	-27	80

Table 13
Iodine-131 in Drinking Water
January - December 1997

Location	Date Collected	¹³¹ I pCi/L ± 2 <i>u</i>	
AK: Fairbanks	01/07/97	0.039	0.086
AL: Dothan	04/09/97	0.03	0.12
AL: Dothan	07/03/97	-0.04	0.11
AL: Montgomery	01/23/97	-0.02	0.16
AL: Muscle Shoals	01/22/97	-0.34	0.34
AL: Scottsboro	07/16/97	0.014	0.090
AR: Little Rock	01/03/97	0.05	0.27
CA: Berkeley	10/07/97	0.00	0.11
CA: Los Angeles	01/06/97	-0.09	0.10
CO: Denver	01/10/97	0.05	0.28
CO: Platteville	01/10/97	0.03	0.12
CT: Hartford	04/02/97	-0.10	0.14
DC: Washington	01/08/97	0.21	0.27
DE: Dover	04/09/97	0.08	0.11
DE: Dover	07/15/97	0.043	0.098
FL: Miami	01/22/97	0.08	0.13
FL: Miami	07/02/97	-0.02	0.11
FL: Tampa	10/30/97	0.13	0.14
GA: Baxley	04/22/97	-0.01	0.26
GA: Baxley	07/09/97	-0.25	0.25
GA: Savannah	03/26/97	-0.13	0.11
HI: Honolulu	10/03/97	-0.09	0.15
IA: Cedar Rapids	10/13/97	0.14	0.20
ID: Boise	04/07/97	-0.050	0.095
ID: Boise	10/06/97	0.06	0.13
ID: Idaho Falls	01/30/97	-0.017	0.092
IL: W. Chicago	01/10/97	-0.9	1.3
KS: Topeka	01/02/97	-0.03	0.23
KS: Topeka	07/02/97	0.02	0.11
LA: New Orleans	07/07/97	0.02	0.17
MA: Lawrence	02/18/97	0.11	0.13
MD: Baltimore	07/02/97	0.10	0.10
MD: Conowingo	01/21/97	0.081	0.091
ME: Augusta	01/09/97	0.21	0.14
ME: Augusta	03/20/97	-0.07	0.12
ME: Augusta	04/10/97	0.14	0.11
MI: Detroit	04/04/97	-0.03	0.12
MI: Grand Rapids	10/16/97	-0.17	0.41
MN: Minneapolis	10/20/97	-0.03	0.11
MN: Minneapolis	10/27/97	0.012	0.074
MN: Red Wing	07/14/97	-0.02	0.11

Table 13 (continued)
Iodine-131 in Drinking Water
January - December 1997

Location	Date Collected	¹³¹ I pCi/L ± 2 <i>u</i>	
MO: Jefferson City	01/02/97	0.18	0.22
MO: Jefferson City	04/02/97	0.09	0.14
MS: Jackson	01/10/97	-0.10	0.28
MS: Port Gibson	10/07/97	0.06	0.11
MT: Helena	06/04/97	0.34	0.12
MT: Helena	10/22/97	0.09	0.18
NC: Charlotte	01/08/97	-0.083	0.076
NC: Raleigh	10/09/97	0.01	0.26
NC: Wilmington	07/11/97	0.16	0.11
ND: Bismarck	01/02/97	0.05	0.32
NE: Lincoln	01/30/97	0.030	0.095
NH: Concord	01/02/97	0.15	0.28
NJ: Trenton	12/16/97	0.17	0.33
NJ: Waretown	12/16/97	0.29	0.32
NM: Santa Fe	04/09/97	0.05	0.13
NV: Las Vegas	01/06/97	-0.02	0.10
NY: Albany	07/07/97	0.03	0.15
NY: Niagara Falls	01/02/97	0.06	0.21
NY: Niagara Falls	10/20/97	0.03	0.14
NY: Syracuse	01/17/97	-0.01	0.10
OH: Cincinnati	02/25/97	-0.02	0.13
OH: E. Liverpool	02/13/97	0.43	0.11
OH: E. Liverpool	03/20/97	0.26	0.13
OH: E. Liverpool	04/18/97	0.39	0.12
OH: Painesville	01/09/97	0.17	0.13
OH: Painesville	03/20/97	0.07	0.11
OH: Painesville	04/04/97	0.19	0.18
OH: Toledo	01/03/97	0.00	0.26
OK: Oklahoma City	05/14/97	0.14	0.12
OR: Portland	01/08/97	0.05	0.14
PA: Columbia	01/23/97	0.07	0.12
PA: Harrisburg	01/23/97	0.01	0.13
PA: Philadelphia - Baxter	01/10/97	0.08	0.30
PA: Philadelphia - Queen Lane	01/10/97	-0.08	0.28
PA: Philadelphia	04/11/97	0.36	0.11
PA: Pittsburgh	02/13/97	-0.01	0.13
PC: Corozal	10/07/97	0.02	0.11
RI: Providence	04/07/97	0.01	0.10
RI: Providence	10/03/97	0.59	0.25
SC: Barnwell	01/14/97	-0.01	0.29
SC: Columbia	01/02/97	0.23	0.20

Table 13 (continued)
Iodine-131 in Drinking Water
January - December 1997

Location	Date Collected	¹³¹ I pCi/L ± 2 <i>u</i>	
SC: Columbia	04/04/97	-0.04	0.11
SC: Jenkinsville	04/24/97	0.00	0.32
SC: Jenkinsville	07/08/97	0.09	0.23
SC: Seneca	07/02/97	0.15	0.10
TN: Chattanooga	01/06/97	0.08	0.46
TN: Knoxville	01/02/97	0.14	0.26
TN: Oak Ridge - Roane Co #360	03/26/97	0.06	0.11
TN: Oak Ridge - Roane Co #4442	03/26/97	0.02	0.11
TN: Oak Ridge - Anderson Co #768	06/18/97	0.30	0.12
TN: Oak Ridge - Knox Co #371	06/18/97	0.139	0.095
TN: Oak Ridge - Anderson Co #772	11/12/97	-0.01	0.11
TX: Austin	02/24/97	0.14	0.19
VA: Doswell	01/23/97	0.00	0.11
VA: Doswell	12/29/97	0.04	0.19
WA: Richland	04/14/97	-0.045	0.089
WA: Seattle	01/02/97	-0.20	0.31
WI: Madison	04/09/97	0.02	0.11
WI: Madison	07/03/97	-0.007	0.097
WI: Madison	10/13/97	0.14	0.20

Table 14
Plutonium and Uranium Analyses
Selected Drinking Water Composite Samples
January - December 1997

Location	²³⁸ Pu		²³⁹⁻²⁴⁰ Pu		²³⁴ U		²³⁵ U		²³⁸ U	
	pCi/L ± 2u		pCi/L ± 2u		pCi/L ± 2u		pCi/L ± 2u		pCi/L ± 2u	
CA: Los Angeles	0.006	0.013	0.0000	0.0043	1.78	0.19	0.098	0.043	1.48	0.17
GA: Baxley	0.006	0.012	0.0000	0.0037	0.144	0.042	0.035	0.022	0.065	0.028
ID: Idaho Falls	-0.003	0.013	0.0018	0.0057	0.80	0.13	0.027	0.025	0.306	0.075
IL: Morris	0.009	0.018	-0.0015	0.0022	0.60	0.11	0.033	0.027	0.030	0.024
IL: W. Chicago	0.014	0.027	0.0041	0.0081	1.42	0.24	0.040	0.040	0.140	0.070
MN: Red Wing	0.033	0.031	-0.0104	0.0074	0.43	0.12	0.028	0.039	0.113	0.062
NE: Lincoln	-0.0040	0.0064	-0.0006	0.0011	5.11	0.46	0.358	0.099	3.26	0.33
NM: Santa Fe	0.009	0.013	0.0024	0.0054	6.57	0.52	0.285	0.077	3.65	0.33
NV: Las Vegas	0.0001	0.0086	0.0011	0.0035	2.76	0.32	0.061	0.043	1.55	0.22
SC: Jenkinsville	-0.0047	0.0060	0.0042	0.0056	0.596	0.089	0.027	0.020	0.277	0.059
WI: Genoa	0.010	0.011	-0.0005	0.0011	0.63	0.12	0.115	0.056	0.345	0.088
WI: Madison	0.002	0.010	0.0035	0.0054	1.25	0.17	0.016	0.018	0.255	0.069

Note: NA = No Analysis

Table 15
Drinking Water
Alpha, Beta, and Sr-90 Concentrations
January - December 1997 Composites

Location	Total Solids	Gross Beta		Gross Alpha		⁹⁰ Sr	
	(mg/L)	pCi/L ± 2u		pCi/L ± 2u		pCi/L ± 2u	
AK: Fairbanks	65.3	3.71	0.68	0.18	0.47	0.06	0.24
AL: Dothan	66.8	1.87	0.68	0.11	0.94	-0.10	0.24
AL: Montgomery	25.3	1.12	0.48	0.02	0.21	0.02	0.29
AL: Muscle Shoals	33.3	1.25	0.57	-0.17	0.27	0.31	0.32
AL: Scottsboro	42.7	1.46	0.48	-0.253	0.048	-0.09	0.27
AR: Little Rock	16.5	0.46	0.43	-0.02	0.16	0.02	0.25
CA: Berkeley	39.7	0.76	0.47	0.43	0.44	0.08	0.21
CA: Los Angeles	76.7	8.5	1.7	5.9	2.8	0.11	0.21
CO: Denver	82.0	2.09	0.60	0.52	0.76	0.16	0.24
CO: Platteville	5.0	0.3	2.0	0.7	1.8	0.35	0.26
CT: Hartford	13.1	1.04	0.46	-0.06	0.18	0.05	0.20
DC: Washington	71.0	2.08	0.58	-0.33	0.32	-0.03	0.83
DE: Dover	78.2	3.17	0.97	0.3	1.0	0.21	0.42
FL: Miami	55.4	2.05	0.71	1.05	0.81	-0.13	0.21
FL: Tampa	90.2	3.00	0.94	0.9	1.1	0.01	0.32
GA: Baxley	81.5	2.98	0.68	3.2	1.5	-0.23	0.25
GA: Savannah	54.2	1.89	0.56	0.06	0.41	NR	NR
HI: Honolulu	63.0	1.56	0.66	0.25	0.69	-0.06	0.19
IA: Cedar Rapids	60.7	2.30	0.60	-0.10	0.31	0.11	0.19
ID: Boise	36.9	1.83	0.57	0.97	0.58	-0.12	0.21
ID: Idaho Falls	85.0	4.5	1.1	4.1	2.1	-0.13	0.22
IL: Morris	67.0	13.0	2.4	11.4	4.2	-0.19	0.45
IL: W. Chicago	74.1	14.6	1.8	20.7	4.3	-0.11	0.18
KS: Topeka	86.1	7.8	1.5	0.8	1.8	0.01	0.20
LA: New Orleans	75.8	3.20	0.79	-0.31	0.95	0.06	0.24
MA: Lawrence	44.8	1.88	0.56	0.98	0.63	0.37	0.37
MD: Baltimore	44.1	2.12	0.60	0.29	0.44	-0.11	0.54
MD: Conowingo	82.4	3.15	0.89	0.73	0.96	0.10	0.23
ME: Augusta	37.5	1.46	0.55	-0.01	0.30	0.17	0.24
MI: Detroit	40.5	1.59	0.52	-0.05	0.27	0.30	0.25
MI: Grand Rapids	60.1	1.88	0.57	0.21	0.50	0.25	0.25
MN: Minneapolis	43.7	2.05	0.58	0.10	0.39	-0.01	0.21
MN: Red Wing	79.1	14.2	1.7	27.4	4.6	0.08	0.18
MO: Jefferson City	93.2	7.2	1.2	1.7	1.5	0.22	0.23
MS: Jackson	43.0	2.20	0.55	-0.08	0.21	0.27	0.25
MS: Port Gibson	57.9	1.7	1.0	1.6	1.4	-0.16	0.30
MT: Helena	34.9	1.53	0.51	0.48	0.43	0.14	0.25

Note: NR = No Result

Table 15 (continued)
Drinking Water
Alpha, Beta, and Sr-90 Concentrations
January - December 1997 Composites

Location	Total Solids	Gross Beta		Gross Alpha		⁹⁰ Sr	
	(mg/L)	pCi/L ± 2u		pCi/L ± 2u		pCi/L ± 2u	
NC: Charlotte							
NC: Wilmington	21.4	1.52	0.52	0.12	0.27	-0.17	0.30
ND: Bismarck	60.9	3.07	0.65	-0.05	0.45	0.55	0.33
NE: Lincoln	87.8	4.4	1.0	0.7	1.2	0.03	0.21
NH: Concord	79.9	10.1	1.6	9.9	3.3	0.11	0.23
NJ: Trenton	42.4	1.02	0.50	0.06	0.54	0.10	0.22
NJ: Waretown	47.4	1.75	0.56	0.65	0.54	0.30	0.37
NM: Santa Fe	27.0	2.37	0.59	0.50	0.43	-0.13	0.46
NV: Las Vegas	82.4	7.4	1.3	9.6	2.8	0.02	0.25
NY: Albany	96.1	5.9	1.9	4.8	3.6	-0.02	0.23
NY: Niagara Falls	36.5	1.06	0.51	-0.01	0.33	0.05	0.26
NY: Syracuse	49.8	2.19	0.59	0.30	0.47	-0.07	0.29
OH: Cincinnati	49.2	3.03	0.65	1.67	0.79	0.42	0.28
OH: Columbus	74.0	2.29	0.69	0.32	0.66	0.48	0.48
OH: E. Liverpool	72.9	4.6	1.2	1.4	1.4	0.35	0.94
OH: Painesville	67.3	1.66	0.65	0.27	0.59	0.20	0.87
OH: Toledo	47.0	2.37	0.71	0.16	0.74	0.60	0.51
OK: Oklahoma City	37.6	1.63	0.51	0.21	0.36	0.69	0.56
OR: Portland	32.6	2.72	0.59	0.64	0.44	0.37	0.28
PA: Columbia	11.5	1.48	0.51	0.99	0.50	0.05	0.22
PA: Harrisburg	8.6	0.53	0.58	0.30	0.37	0.20	0.21
PA: Philadelphia - Belmont	94.6	1.84	0.84	0.3	1.1	-0.02	0.19
PA: Philadelphia - Queen	82.4	1.8	1.1	-0.6	2.4	-0.06	0.19
PA: Philadelphia - Baxter	72.0	4.1	1.1	0.0	1.1	0.13	0.18
PA: Pittsburgh	35.6	1.62	0.98	0.00	0.83	0.13	0.22
PC: Corozal	61.0	2.49	0.86	0.62	0.82	0.03	0.20
RI: Providence	38.1	0.59	0.43	0.13	0.35	0.01	0.19
SC: Barnwell	32.7	1.14	0.48	0.03	0.25	0.16	0.21
SC: Columbia	25.5	1.41	0.55	0.59	0.49	0.01	0.20
SC: Jenkinsville	40.0	2.24	0.60	0.08	0.38	0.29	0.21
SC: Seneca	54.9	3.38	0.80	3.8	1.3	0.06	0.23
TN: Chattanooga	15.2	1.06	0.48	0.26	0.31	0.26	0.25
TN: Knoxville	37.1	1.89	0.57	0.71	0.49	0.05	0.20
TN: Oak Ridge - Anderson Co	47.9	2.22	0.60	0.34	0.44	0.16	0.23
#768	48.0	2.41	0.60	1.05	0.67	0.14	0.26
TN: Oak Ridge - Anderson Co	65.2	2.22	0.61	1.37	0.94	0.02	0.27
#772	55.2	3.86	0.70	0.88	0.72	0.42	0.28
TN: Oak Ridge - Roane Co #4442	35.0	2.60	0.62	0.73	0.61	-0.20	0.22
TN: Oak Ridge - Roane Co #360							

Table 15 (continued)
Drinking Water
Alpha, Beta, and Sr-90 Concentrations
January - December 1997 Composites

Location	Total Solids	Gross Beta		Gross Alpha		⁹⁰ Sr	
	(mg/L)	pCi/L $\pm 2u$		pCi/L $\pm 2u$		pCi/L $\pm 2u$	
TN: Oak Ridge - Knox Co #371	55.7	1.88	0.58	1.73	0.89	-0.06	0.23
TX: Austin	63.5	3.34	0.77	0.46	0.64	-0.01	0.19
VA: Doswell	73.1	5.17	0.90	0.39	0.83	-2.1	2.9
VA: Lynchburg	30.5	0.79	0.44	-0.06	0.17	0.57	0.52
WA: Richland	31.5	1.92	0.58	0.70	0.55	-0.15	0.28
WA: Seattle	13.3	1.34	0.52	1.07	0.51	0.04	0.24
WI: Genoa	74.0	1.63	0.55	2.5	1.1	-0.03	0.23
WI: Madison	64.9	2.41	0.94	4.5	1.9	0.11	0.22

Table 16
Drinking Water
Radium and Gamma-Emitting Radionuclides
January - December 1997 Composites

Location	²²⁶ Ra		²²⁸ Ra	Specific Gamma Activity	
	pCi/L ± 2u		pCi/L ± 2u	Nuclide	pCi/L ± 2u
AK: Fairbanks	NA		NA		ND
AL: Dothan	NA		NA		ND
AL: Montgomery	NA		NA	K40	10 13
AL: Muscle Shoals	NA		NA	Pb212	5.4 6.7
AL: Scottsboro	NA		NA		ND
AR: Little Rock	NA		NA		ND
CA: Berkeley	NA		NA		ND
CA: Los Angeles	0.146	0.015	NA		ND
CO: Denver	NA		NA		ND
CO: Platteville	NA		NA		ND
CT: Hartford	NA		NA		ND
DC: Washington	NA		NA		ND
DE: Dover	NA		NA		ND
FL: Miami	NA		NA	Tl208	4.4 4.4
FL: Tampa	NA		NA		ND
GA: Baxley	1.573	0.059	NA		ND
GA: Savannah	NA		NA		ND
HI: Honolulu	NA		NA		ND
IA: Cedar Rapids	NA		NA		ND
ID: Boise	NA		NA		ND
ID: Idaho Falls	0.087	0.011	NA	K40	57 68
IL: Morris	1.664	0.057	NA	K40	12 14
				Pb212	4.4 3.2
				Tl208	2.6 2.0
IL: W. Chicago	6.89	0.22	NA	Tl208	2.0 2.1
KS: Topeka	NA		NA		ND
LA: New Orleans	NA		NA		ND
MA: Lawrence	NA		NA		ND
MD: Baltimore	NA		NA		ND
MD: Conowingo	NA		NA		ND
ME: Augusta	NA		NA		ND
MI: Detroit	NA		NA		ND
MI: Grand Rapids	NA		NA		ND
MN: Minneapolis	NA		NA		ND
MN: Red Wing	3.77	0.11	NA		ND
MO: Jefferson City	NA		NA		ND

Note: ND = Not Detected
NA = No Analysis

Table 16 (continued)
Drinking Water
Radium and Gamma-Emitting Radionuclides
January - December 1997 Composites

Location	²²⁶ Ra		²²⁸ Ra		Specific Gamma Activity	
	pCi/L ± 2u		pCi/L ± 2u		Nuclide	pCi/L ± 2u
MS: Jackson	NA		NA			ND
MS: Port Gibson	NA		NA			ND
MT: Helena	NA		NA			ND
NC: Charlotte	NA		NA			ND
NC: Wilmington	NA		NA			ND
ND: Bismarck	NA		NA		Pb212	3.8 5.5
NE: Lincoln	0.059	0.0091	NA			ND
NH: Concord	NA		NA			ND
NJ: Trenton	NA		NA			ND
NJ: Waretown	NA		NA			ND
NM: Santa Fe	0.137	0.013	NA			ND
NV: Las Vegas	0.161	0.014	NA		K40	11 13
					Tl208	1.6 2.1
NY: Albany	NA		NA		Pb212	4.0 3.5
NY: Niagara Falls	NA		NA		Pb212	4.9 3.5
NY: Syracuse	NA		NA			ND
OH: Cincinnati	NA		NA		Tl208	1.8 2.1
OH: Columbus	NA		NA		K40	11 12
					Pb212	3.2 3.3
OH: E. Liverpool	NA		NA			ND
OH: Painesville	NA		NA			ND
OH: Toledo	NA		NA		K40	18 28
OK: Oklahoma City	NA		NA			ND
OR: Portland	NA		NA		Tl208	1.8 2.2
PA: Columbia	NA		NA			ND
PA: Harrisburg	NA		NA		K40	24 42
PA: Philadelphia - Belmont	NA		NA			ND
PA: Philadelphia - Queen	NA		NA		K40	26 37
					Tl208	2.9 4.6
PA: Philadelphia - Baxter	NA		NA			ND
PA: Pittsburgh	NA		NA			ND
PC: Corozal	NA		NA			ND
RI: Providence	NA		NA			ND
SC: Barnwell	NA		NA			ND
SC: Columbia	NA		NA			ND
SC: Jenkinsville	0.294	0.018	NA			ND

Note: ND = Not Detected
NA = No Analysis

Table 16 (continued)
Drinking Water
Radium and Gamma-Emitting Radionuclides
January - December 1997 Composites

Location	²²⁶ Ra		²²⁸ Ra		Specific Gamma Activity	
	pCi/L ± 2 <i>u</i>		pCi/L ± 2 <i>u</i>		Nuclide	pCi/L ± 2 <i>u</i>
SC: Seneca						
TN: Chattanooga	NA		NA			ND
TN: Knoxville	NA		NA		K40	23 42
TN: Oak Ridge - Anderson Co #768	NA		NA			ND
TN: Oak Ridge - Anderson Co #772	NA		NA			ND
TN: Oak Ridge - Roane Co #4442	NA		NA			ND
TN: Oak Ridge - Roane Co #360	NA		NA		K40	64 64
TN: Oak Ridge - Knox Co #371	NA		NA			ND
TX: Austin	NA		NA			ND
VA: Doswell	NA		NA			ND
VA: Lynchburg	NA		NA		K40	29 56
WA: Richland	NA		NA			ND
WA: Seattle	0.592	0.028	NA			ND
WI: Genoa	0.503	0.026	NA			ND
WI: Madison						

Note: ND = Not Detected
NA = No Analysis

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3. Milk Program

Pasteurized Milk

Milk is a reliable indicator of the general population's intake of radionuclides since it is consumed fresh by a large segment of the population and can contain several of the biologically significant radionuclides that result from environmental releases from nuclear activities. A primary function of this program is to obtain reliable monitoring data relative to current radionuclide concentrations and determine any long-term trends.

Monthly samples are collected at approximately 55 sampling sites. The samples are composited, according to production, from the major milk suppliers representing more than 80 percent of the milk consumed in a given population center.

The samples are analyzed for gamma-emitting nuclides, including iodine-131, barium-140, cesium-137, and potassium-40. Total potassium concentrations in g/L are determined from potassium-40 activities assuming natural isotopic abundances. All samples collected in July are analyzed for strontium-90.

Iodine-131, barium-140, cesium-137, and potassium-40 are determined by gamma spectral analysis. Strontium-90 is determined by beta counting a total strontium precipitate that has been chemically separated by ion exchange.

Table 17
Radionuclides in Pasteurized Milk
October 1997

Location	Date Collected	K g/L $\pm 2u$		¹³⁷ Cs pCi/L $\pm 2u$		¹⁴⁰ Ba pCi/L $\pm 2u$	¹³¹ I pCi/L $\pm 2u$
AR: Little Rock	10/08/97	1.621	0.049	ND		ND	ND
AZ: Phoenix	10/29/97	1.668	0.093	ND		ND	ND
CA: Los Angeles	10/06/97	1.704	0.093	ND		ND	ND
CA: Sacramento	10/15/97	1.644	0.093	ND		ND	ND
CA: San Francisco	10/09/97	1.668	0.050	ND		ND	ND
CO: Denver	10/14/97	1.680	0.083	ND		ND	ND
DE: Dover	10/27/97	1.609	0.082	ND		ND	ND
FL: Tampa	10/07/97	1.644	0.049	2.8	1.7	ND	ND
GA: Atlanta	10/27/97	1.656	0.082	ND		ND	ND
HI: Honolulu	10/27/97	1.56	0.12	ND		ND	ND
IA: Des Moines	10/13/97	1.632	0.049	ND		ND	ND
IN: Indianapolis	10/14/97	1.644	0.048	ND		ND	ND
KS: Wichita	10/15/97	1.656	0.049	ND		ND	ND
KY: Louisville	10/15/97	1.621	0.080	ND		ND	ND
MA: Boston	10/10/97	1.609	0.048	ND		ND	ND
MD: Baltimore	10/02/97	1.609	0.050	ND		ND	ND
MI: Detroit	10/07/97	1.656	0.049	ND		ND	ND
MI: Grand Rapids	10/06/97	1.621	0.088	ND		ND	ND
MO: Kansas City	10/14/97	1.597	0.048	ND		ND	ND
MS: Jackson	10/07/97	1.656	0.049	ND		ND	ND
NC: Charlotte	10/06/97	1.656	0.049	ND		ND	ND
ND: Minot	10/06/97	1.656	0.049	ND		ND	ND
NJ: Trenton	10/06/97	1.597	0.049	ND		ND	ND
NM: Albuquerque	10/07/97	1.585	0.048	ND		ND	ND
NV: Las Vegas	10/06/97	1.668	0.050	ND		ND	ND
NY: Buffalo	10/10/97	1.609	0.088	ND		ND	ND
NY: Syracuse	10/06/97	1.668	0.049	ND		ND	ND
OH: Cincinnati	10/15/97	1.632	0.084	ND		ND	ND
OH: Cleveland	10/06/97	1.644	0.049	ND		ND	ND
OR: Portland	10/02/97	1.716	0.050	ND		ND	ND
OR: Portland	10/31/97	1.740	0.069	ND		ND	ND
PA: Philadelphia	10/09/97	1.740	0.050	ND		ND	ND
PC: Cristobal	10/20/97	1.668	0.082	9.3	2.4	ND	ND
PR: San Juan	10/10/97	1.597	0.048	ND		ND	ND
SC: Charleston	10/08/97	1.644	0.049	ND		ND	ND
TN: Knoxville	10/21/97	1.609	0.079	ND		ND	ND
TX: Austin	10/07/97	1.644	0.049	ND		ND	ND
TX: Ft. Worth	10/20/97	1.668	0.081	ND		ND	ND
VT: Montpelier	10/22/97	1.632	0.082	ND		ND	ND

Note: ND = Not Detected

Table 17 (continued)
Radionuclides in Pasteurized Milk
October 1997

Location	Date Collected	K g/L $\pm 2u$	¹³⁷ Cs pCi/L $\pm 2u$	¹⁴⁰ Ba pCi/L $\pm 2u$	¹³¹ I pCi/L $\pm 2u$
WA: Seattle	10/06/97	1.644 0.049	ND	ND	ND
WA: Spokane	10/07/97	1.585 0.049	ND	ND	ND
WV: Charleston	10/06/97	1.63 0.15	ND	ND	ND

Note: ND = Not Detected

Table 18
Radionuclides in Pasteurized Milk
November 1997

Location	Date Collected	K g/L $\pm 2u$		¹³⁷ Cs pCi/L $\pm 2u$		¹⁴⁰ Ba pCi/L $\pm 2u$	¹³¹ I pCi/L $\pm 2u$
AL: Montgomery	11/06/97	1.597	0.048	ND		ND	ND
AR: Little Rock	11/05/97	1.597	0.080	ND		ND	ND
CA: Los Angeles	11/05/97	1.692	0.050	ND		ND	ND
CA: Sacramento	11/12/97	1.609	0.049	ND		ND	ND
CA: San Francisco	11/05/97	1.668	0.050	ND		ND	ND
CO: Denver	11/12/97	1.58	0.15	ND		ND	ND
DE: Dover	11/19/97	1.609	0.082	ND		ND	ND
FL: Tampa	11/05/97	1.668	0.084	5.1	2.4	ND	ND
GA: Atlanta	11/24/97	1.549	0.069	ND		ND	ND
HI: Honolulu	11/13/97	1.597	0.088	ND		ND	ND
IA: Des Moines	11/10/97	1.644	0.068	ND		ND	ND
IL: Chicago	11/06/97	1.585	0.080	ND		ND	ND
KS: Wichita	11/05/97	1.656	0.067	ND		ND	ND
KY: Louisville	11/10/97	1.561	0.080	ND		ND	ND
MA: Boston	11/05/97	1.644	0.049	ND		ND	ND
MD: Baltimore	11/07/97	1.68	0.15	ND		ND	ND
ME: Portland	11/13/97	1.692	0.050	ND		ND	ND
MI: Detroit	11/10/97	1.609	0.082	ND		ND	ND
MI: Grand Rapids	11/07/97	1.68	0.12	ND		ND	ND
MN: St. Paul	11/03/97	1.644	0.049	ND		ND	ND
MO: Kansas City	11/13/97	1.621	0.049	ND		ND	ND
MS: Jackson	11/04/97	1.621	0.049	ND		ND	ND
NC: Charlotte	11/04/97	1.644	0.049	ND		ND	ND
ND: Minot	11/07/97	1.621	0.081	ND		ND	ND
NJ: Trenton	11/07/97	1.621	0.048	ND		ND	ND
NV: Las Vegas	11/03/97	1.597	0.048	ND		ND	ND
NY: Buffalo	11/07/97	1.656	0.090	ND		ND	ND
NY: Syracuse	11/06/97	1.621	0.088	ND		ND	ND
OH: Cincinnati	11/10/97	1.644	0.049	ND		ND	ND
OH: Cleveland	11/12/97	1.668	0.049	ND		ND	ND
PA: Philadelphia	11/06/97	1.644	0.090	ND		ND	ND
PA: Pittsburgh	11/04/97	1.561	0.091	ND		ND	ND
PC: Cristobal	11/13/97	1.668	0.049	7.2	1.5	ND	ND
PR: San Juan	11/06/97	1.668	0.049	ND		ND	ND
SC: Charleston	11/07/97	1.609	0.048	ND		ND	ND
TN: Chattanooga	11/03/97	1.597	0.078	ND		ND	ND
TN: Knoxville	11/03/97	1.632	0.068	ND		ND	ND
TX: Austin	11/05/97	1.609	0.048	ND		ND	ND
VA: Norfolk	11/04/97	1.621	0.093	ND		ND	ND

Note: ND = Not Detected

Table 18 (continued)
Radionuclides in Pasteurized Milk
November 1997

Location	Date Collected	K g/L $\pm 2u$	¹³⁷ Cs pCi/L $\pm 2u$	¹⁴⁰ Ba pCi/L $\pm 2u$	¹³¹ I pCi/L $\pm 2u$
VT: Montpelier	11/24/97	1.609 0.081	ND	ND	ND
WA: Seattle	11/04/97	1.644 0.050	ND	ND	ND
WV: Charleston	11/04/97	1.585 0.089	ND	ND	ND

Note: ND = Not Detected

Table 19
Radionuclides in Pasteurized Milk
December 1997

Location	Date Collected	K g/L $\pm 2u$		¹³⁷ Cs pCi/L $\pm 2u$		¹⁴⁰ Ba pCi/L $\pm 2u$	¹³¹ I pCi/L $\pm 2u$
AL: Montgomery	12/03/97	1.621	0.083	ND		ND	ND
AR: Little Rock	12/03/97	1.621	0.082	ND		ND	ND
CA: Los Angeles	12/10/97	1.668	0.089	ND		ND	ND
CA: Sacramento	12/29/97	1.573	0.080	ND		ND	ND
CA: San Francisco	12/04/97	1.621	0.092	ND		ND	ND
CO: Denver	12/07/97	1.51	0.15	ND		ND	ND
CT: Hartford	12/01/97	1.632	0.069	ND		ND	ND
DE: Dover	12/09/97	1.644	0.093	ND		ND	ND
FL: Miami	12/17/97	1.561	0.091	5.5	2.6	ND	ND
FL: Tampa	12/09/97	1.680	0.084	4.3	2.6	ND	ND
GA: Atlanta	12/19/97	1.549	0.082	ND		ND	ND
HI: Honolulu	12/05/97	1.609	0.080	ND		ND	ND
IL: Chicago	12/04/97	1.561	0.089	ND		ND	ND
IN: Indianapolis	12/08/97	1.573	0.080	ND		ND	ND
KS: Wichita	12/09/97	1.644	0.069	ND		ND	ND
KY: Louisville	12/03/97	1.632	0.094	ND		ND	ND
MA: Jamaica Plains	12/08/97	1.609	0.088	ND		ND	ND
MD: Baltimore	12/05/97	1.58	0.12	ND		ND	ND
MI: Detroit	12/02/97	1.67	0.12	ND		ND	ND
MI: Grand Rapids	12/08/97	1.740	0.083	ND		ND	ND
MN: St. Paul	12/01/97	1.573	0.093	ND		ND	ND
MO: Kansas City	12/09/97	1.597	0.089	ND		ND	ND
MS: Jackson	12/02/97	1.50	0.12	ND		ND	ND
NC: Charlotte	12/02/97	1.668	0.083	ND		ND	ND
ND: Minot	12/04/97	1.609	0.083	ND		ND	ND
NJ: Trenton	12/03/97	1.704	0.070	ND		ND	ND
NM: Albuquerque	12/15/97	1.573	0.088	ND		ND	ND
NV: Las Vegas	12/04/97	1.597	0.068	ND		ND	ND
NY: Buffalo	12/04/97	1.632	0.083	ND		ND	ND
NY: Syracuse	12/08/97	1.585	0.079	ND		ND	ND
OH: Cincinnati	12/15/97	1.656	0.069	ND		ND	ND
OH: Cleveland	12/01/97	1.64	0.15	ND		ND	ND
OR: Portland	12/02/97	1.704	0.081	ND		ND	ND
PA: Philadelphia	12/04/97	1.573	0.089	ND		ND	ND
PA: Pittsburgh	12/10/97	1.585	0.092	ND		ND	ND
PR: San Juan	12/19/97	1.716	0.083	ND		ND	ND
SC: Charleston	12/15/97	1.621	0.089	ND		ND	ND
TN: Chattanooga	12/08/97	1.585	0.089	ND		ND	ND
TN: Chattanooga	12/31/97	1.716	0.081	ND		ND	ND

Note: ND = Not Detected

Table 19 (continued)
Radionuclides in Pasteurized Milk
December 1997

Location	Date Collected	K g/L $\pm 2u$		¹³⁷ Cs pCi/L $\pm 2u$	¹⁴⁰ Ba pCi/L $\pm 2u$	¹³¹ I pCi/L $\pm 2u$
TN: Knoxville	12/15/97	1.573	0.080	ND	ND	ND
TN: Knoxville	12/31/97	1.573	0.092	ND	ND	ND
TN: Memphis	12/15/97	1.585	0.089	ND	ND	ND
TX: Austin	12/23/97	1.621	0.092	ND	ND	ND
TX: Ft. Worth	12/17/97	1.573	0.082	ND	ND	ND
VA: Norfolk	12/03/97	1.56	0.15	ND	ND	ND
VT: Burlington	12/23/97	1.632	0.082	ND	ND	ND
WA: Seattle	12/02/97	1.644	0.094	ND	ND	ND
WA: Spokane	12/08/97	1.704	0.084	ND	ND	ND
WV: Charleston	12/02/97	1.57	0.15	ND	ND	ND

Note: ND = Not Detected

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