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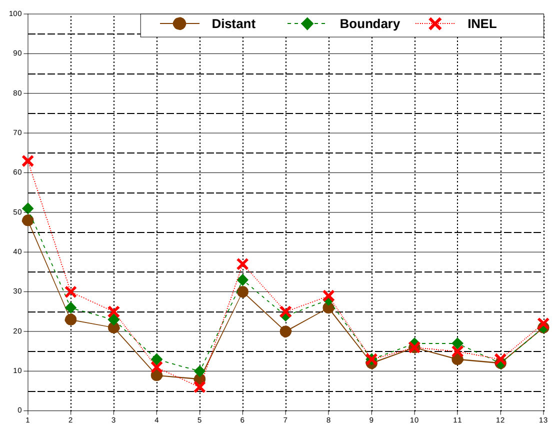

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Executive Summary

The Environmental Science and Research Foundation conducts the Idaho National Engineering and Environmental Laboratory (INEEL) Offsite Environmental Surveillance Program. The Foundation's environmental surveillance program is designed to monitor the effects, if any, of the U.S. Department of Energy's (DOE) activities on the offsite environment, to collect data to confirm compliance with applicable environmental laws and regulations, and to observe any trends in environmental levels of radioactivity. This report for the third quarter of 1996 includes the results of analyses conducted on samples of air, water, milk, lettuce, fish, and wheat. All concentrations of radioactivity found in these samples were consistent with historical levels. No evidence of radionuclides from the INEEL was found in offsite samples. Concentrations of radionuclides found in all samples were below the guidelines set by both the DOE and the U.S. Environmental Protection Agency (EPA) for radiation protection of the public.

Program Description

The Foundation collected filters weekly from low-volume air samplers at 11 offsite locations. Four were at distant locations and seven at INEEL boundary locations. An additional three samplers were operated on the INEEL. Weekly measurements were made of gross alpha and gross beta concentrations in airborne particulates. Charcoal cartridges were screened weekly for the presence of Iodine-131. At the end of the quarter, weekly filters from each location were combined to form a composite sample for each location. These composites were then analyzed for gamma-emitting radionuclides. Selected composites were also submitted for Strontium-90 and transuranic analyses (Plutonium-238, Plutonium-239/240, and Americium-241).

Six 24-hour PM-10 (fine particulate) samples were collected at the Rexburg station.

Atmospheric moisture and precipitation samples were collected to monitor for tritium. Atmospheric moisture samples were collected for a period of approximately 12 weeks. The Foundation collected two precipitation samples monthly, one onsite and one offsite, as well as a weekly onsite sample.

Drinking water samples were collected from two offsite locations; surface water samples were obtained from three sites. All of these locations are in the Magic Valley. All water samples were analyzed for gross alpha, gross beta, and tritium concentrations.

The Foundation collected a weekly milk sample from a dairy in Idaho Falls and collected monthly milk samples from eight additional dairies around the INEEL. All milk samples were analyzed for Iodine-131. Lettuce samples were collected from eight private gardens surrounding the INEEL; wheat samples were obtained from 11 grain elevators in communities around the INEEL. Lettuce and wheat were analyzed for gamma-emitting radionuclides and Strontium-90. Fish were collected from the Big Lost River (which flowed onto the INEEL during a portion of the spring and summer) and analyzed for gamma-emitting radionuclides.

Summary of Third Quarter 1996 Results

During the third quarter of 1996, gross alpha and gross beta concentrations in low-volume air samples were within the expected range of values for background radioactivity. Some of the gross beta and gross alpha concentrations were greater at INEEL locations than for distant locations, particularly during August. This was during and subsequent to the extensive fires which burned on and around the INEEL. Fires cause an increase in airborne particulates from windblown ash and fine soil particles, some of which may be trapped in the low-volume filters. These fires, however, did not burn through areas on the INEEL which contain contaminated soil. Over the third quarter, mean concentrations of both gross alpha and gross beta were similar at onsite, distant, and boundary locations. Iodine-131 was not found in any air sample. Cesium-137 was detected in the quarterly composite sample from EFS. This may be due to fallout from historic nuclear weapons testing or to INEEL activities, though no likely source of ^{137}Cs from the INEEL was identified. Strontium-90 was detected in the quarterly composite sample from Atomic City. Its source was likely from fallout from historic nuclear weapons testing.

PM-10 sampling was initiated in August at the Rexburg station. Twenty-four hour samples were collected on six different days during August and September. The average fine particulate concentration was somewhat elevated above average conditions due to dry, windy weather, agricultural activities, and windblown particulates from burned areas.

Tritium was not detected in any of the atmospheric moisture samples.

Tritium was not detected in any of the seven precipitation samples, taken from both onsite and offsite (distant) locations.

Tritium and gross alpha were not detected in any of the five water samples taken from the Magic Valley. All of the samples contained detectable concentrations of gross beta. Gross beta radioactivity in these water samples was attributed to naturally-occurring radionuclides in the earth's crust.

One of the 38 milk samples collected during the second quarter (from Howe) contained a detectable concentration of Iodine-131. This sample was analyzed again and no Iodine-131 was detected.

Cesium-137 was detected in three of nine lettuce samples from boundary and distant stations. Detectable levels of Strontium-90 occurred in one boundary and one distant sample. Detectable levels of Strontium also were measured in five of twelve wheat samples, three from boundary stations and two from distant stations. These radionuclides are commonly found in soils worldwide as a result of historic nuclear weapons testing.

No manmade gamma-emitting radionuclides were detected in the fish sample.

Helpful Information for Readers

Radionuclide Nomenclature

Radionuclides are sometimes expressed with the one- or two-letter chemical symbol for the element. A radionuclide is an unstable, or radioactive, form of an element. A given element may have many different radionuclides. Each is designated by a superscript number to the left of the chemical symbol. This number is the atomic weight of the radionuclide, equal to the number of protons and neutrons in its nucleus. Radionuclides which may be used in this report are shown in the following table:

Symbol	Radionuclide	Symbol	Radionuclide
^{3}H	Tritium	^{131}I	Iodine-131
^{7}Be	Beryllium-7	^{134}Cs	Cesium-134
^{51}Cr	Chromium-51	^{137}Cs	Cesium-137
^{54}Mn	Manganese-54	^{144}Ce	Cerium-144
^{58}Co	Cobalt-58	^{181}Hf	Hafnium-181
^{60}Co	Cobalt-60	^{238}Pu	Plutonium-238
^{65}Zn	Zinc-65	$^{239/240}Pu$	Plutonium-239/240
^{90}Sr	Strontium-90	^{241}Am	Americium-241
^{95}Nb	Niobium-95		

Scientific Notation

Scientific notation is used to express numbers which are very small and very large. A very small number will be expressed with a negative exponent, e.g., 1.3×10^{-6}. To convert this number to the more commonly used form, the decimal point must be moved left by a number of places equal to the exponent (in this case, six). The number thus becomes 0.0000013.

For large numbers, those with a positive exponent, the decimal point is moved to the right by the number of places equal to the exponent. The number 1,000,000 (or one million) can be written as 1.0×10^{6}.

Unit Prefixes

Units for very small and very large numbers are commonly expressed with a prefix. One example is the prefix *kilo,* abbreviated k, which means 1,000 of a given unit. A kilometer is therefore equal to 1,000 meters. Prefixes that may be used in this report are:

Prefix	Abbreviation	Meaning
milli	m	1/1,000 (=1 x 10^{-3})
micro	µ	1/1,000,000 (=1 x 10^{-6})
pico	p	1/1,000,000,000,000 (=1 x 10^{-12})

Units of Radioactivity and Radiation Exposure and Dose

The basic unit of radioactivity used in this report is the curie, abbreviated Ci. The curie is defined as the amount of radioactivity equivalent to 37 billion nuclear transformations per second. Historically, this was based upon the radioactivity from one gram of the radionuclide Radium-226. For any other radionuclide, one curie is the amount of that radionuclide that decays at this same rate.

Radiation exposure is expressed in terms of the Roentgen (R), the amount of ionization produced by gamma radiation in air. Dose is given in units of “Roentgen equivalent man,” or “rem,” which takes into account the effect of radiation on tissues. For the types of environmental radiation generally encountered, the unit of Roentgen is approximately numerically equal to the unit of rem.

Units of Environmental Concentrations

Concentration of radioactivity in air and milk samples is expressed in units of microcuries per milliliter (μCi/mL). Concentrations in water samples are expressed as picocuries per liter (pCi/l); federal standards are expressed in these units. Radioactivity in foodstuffs are given in microcuries per gram (μCi/g), dry weight. Radioactivity in soil samples is expressed as picocuries per gram (pCi/g), dry weight. Annual human radiation exposure, measured by environmental dosimeters, is expressed in units of milliRoentgens (mR). This is sometimes expressed in terms of dose as millirem (mrem). Not all of the above sample types may appear in this particular report.

Uncertainty of Measurements

Due to many variables, there is always an uncertainty associated with the measurement of environmental contaminants. For radioactivity, the predominant source of uncertainty is due to the inherent statistical nature of radioactive decay events, particularly at the low activity levels encountered in environmental samples. The uncertainty of a measurement is denoted by following the result with a "±" (uncertainty) term. This report follows convention in reporting the uncertainty as a 95% confidence limit (or interval), designated in the tables as “±2s." That means there is approximately a 95% level of confidence that the real concentration in the sample lies somewhere between the measured (reported) concentration minus the uncertainty term and the measured (reported) concentration plus the uncertainty term.

Negative Numbers as Results

Environmental measurements are frequently conducted at levels where the contaminant, such as radioactivity, cannot be distinguished from natural background levels. In this case, the result will still be reported by the analytical laboratory, even though it is below the measurement system's approximate minimum detectable concentration, or is less than zero. Negative values occur when the measured result is less than a pre-established average background level for the particular system and procedure used. These values, rather than "not detectable" or "zero," are reported to better enable statistical analyses and to observe trends in the data.

Gross versus Specific Analyses

Many of the radiological analyses of environmental samples yield information only about the overall, or gross, amount of a particular type of radiation (e.g., gross beta), rather than identifying and quantifying specific radionuclides. For example, rather than performing an analysis for particular gamma-emitting radionuclides, called gamma spectroscopy, one can do a gross gamma or, more commonly, a gross beta analysis, since gamma-emitting radionuclides also emit beta particles. This type of analysis is an effective screening tool and is much quicker and less costly than specific radionuclide analyses.

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1. Introduction

Consistent with requirements of applicable Department of Energy (DOE) Orders, the Foundation's environmental surveillance program is designed to monitor the effects, if any, of DOE activities on the environment surrounding the Idaho National Engineering and Environmental Laboratory (INEEL), to collect data which verifies compliance with applicable environmental laws and regulations, and to observe trends in environmental levels of radioactivity. This work is performed under DOE Contract DE-AC07-ID13268.

This quarterly report summarizes the data collected by the Foundation's INEEL Offsite Environmental Surveillance Program during the period July 1 through September 30, 1996. The scope of the Foundation's sampling program is outlined in Table 1.

Beginning this quarter, most routine analyses, including gross alpha, gross beta, tritium, and gamma spectrometry, were conducted by the newly created Environmental Assessment Laboratory at Idaho State University. This laboratory was formed when the previous Environmental Monitoring Laboratory, which had also conducted work for the State Oversight Program, was split into two independent laboratories. Strontium-90 and transuranic analyses were performed by Quanterra Laboratory, a commercial laboratory located in Richland, Washington.

A large portion of environmental results are near background levels of radioactivity; many results are near the detection limits of the laboratory procedures. Table 2 summarizes the approximate minimum detectable concentrations (MDC) of radioactivity that the laboratories can detect and quantify for a given sample type and analysis. The splitting off of the Environmental Assessment Laboratory caused a change in laboratory equipment and methods which resulted in a change in some of the MDCs. All results are reported with an associated 2s (“two sigma”) uncertainty term. The Foundation has adopted the following method for interpreting analytical results near the minimum detectable concentration. Results less than or equal to the 2s uncertainty term, which includes some results that are negative, are considered as "not detected." For results greater than 2s (the 95% confidence level), but not exceeding 3s (the 99% confidence interval), detection of the radioactivity is questionable. These results may exceed the 2s level simply due to random fluctuations caused by the inherent statistical nature of radioactive decay events. This is expected to occur approximately 2.5% of the time. Results exceeding 3s are interpreted as indicating that radioactivity was detected.

Where appropriate, the results in this report are compared to the following:

- For air, concentrations are compared to the DOE Derived Concentration Guides. This is the concentration of a radionuclide that, under conditions of continuous exposure, would result in an effective dose equivalent of 100 mrem (the DOE standard for members of the public);

- For drinking water, concentrations are compared to the Environmental Protection Agency's Maximum Contaminant Level. This is the maximum permissible level of a contaminant in water that is delivered to any user of a community water system.

Table 1
Summary of the Foundation's Environmental Surveillance Program

Sample Type Analysis	**Collection Frequency**	**Locations**		
		Distant	**Boundary**	**INEEL**
Air				
Gross Alpha	weekly	Blackfoot, Craters of the Moon, Idaho Falls, Rexburg	Arco, Atomic City, FAA Tower, Howe, Monteview, Mud Lake, Reno Ranch	Main Gate, EFS, Van Buren
Gross Beta ^{131}I	weekly	Blackfoot, Craters of the Moon, Idaho Falls, Rexburg	Arco, Atomic City, FAA Tower, Howe, Monteview, Mud Lake, Reno Ranch	Main Gate, EFS, Van Buren
Gamma Spec Particulate Mass	quarterly	Blackfoot, Craters of the Moon, Idaho Falls, Rexburg	Arco, Atomic City, FAA Tower, Howe, Monteview, Mud Lake, Reno Ranch	Main Gate, EFS, Van Buren
^{90}Sr Transuranics	quarterly	Rotating schedule	Rotating schedule	Rotating schedule
PM-10	every sixth day	Rexburg	None	None
Air Moisture				
Tritium	4 to 13 weeks	Idaho Falls	Atomic City	None
Precipitation				
Tritium	monthly	Idaho Falls	None	CFA
Tritium	weekly	None	None	EFS
Surface H_2O				
Gross Alpha, Gross Beta, ^{3}H	quarterly➞ semiannually➞	Twin Falls, Buhl, Hagerman Idaho Falls, Bliss	None	None
Drinking H_2O				
Gross Alpha Gross Beta, ^{3}H	semiannually	Aberdeen, Blackfoot, Carey, Idaho Falls, Fort Hall, Minidoka, Roberts, Shoshone	Arco, Atomic City, Howe, Monteview, Mud Lake, Reno Ranch	None
Milk				
^{131}I	weekly	Idaho Falls	None	None
^{131}I	monthly	Blackfoot, Carey, Dietrich, Minidoka, Roberts	Howe, Terreton, Arco	None
Tritium ^{90}Sr	annually	Blackfoot, Carey, Dietrich, Idaho Falls, Minidoka, Roberts	Howe, Terreton, Arco	None
Potatoes				
Gamma Spec ^{90}Sr	annually	Blackfoot, Idaho Falls, Rupert	Arco, Mud Lake	None
Wheat				
Gamma Spec ^{90}Sr	annually	American Falls, Blackfoot, Dietrich, Idaho Falls, Minidoka, Carey	Arco, Monteview, Mud Lake, Tabor, Terreton	None
Lettuce				
Gamma Spec ^{90}Sr	annually	Blackfoot, Carey, Idaho Falls, Pocatello	Arco, Atomic City, Howe, Mud Lake	None
Fish				
Gamma Spec	annually	None	None	Big Lost River
Sheep				
Gamma Spec	annually	Blackfoot	None	INEEL grazing areas
Waterfowl				
Gamma Spec ^{90}Sr Transuranics	annually	Fort Hall	None	Waste disposal ponds
Game				
Gamma Spec	varies	None	None	INEEL roads
Soil				
Gamma Spec ^{90}Sr Transuranics	biennially	Carey, Crystal Ice Caves, Blackfoot, St. Anthony	Butte City, Monteview, Atomic City, FAA Tower, Howe, Mud Lake (2), Reno Ranch	None
TLDs				
Gamma Radiation	semiannual	Aberdeen, Blackfoot, Craters of the Moon, Idaho Falls, Minidoka, Rexburg, Roberts	Arco, Atomic City, Howe, Monteview, Mud Lake, Reno Ranch	None

Table 2
Summary of Approximate Minimum Detectable Concentrations for Radiological Analyses
(Third Quarter 1996)

Sample Type	Analysis	Approximate Minimum Detectable Concentration[a] (MDC)	Derived Concentration Guide[b] (DCG)	Drinking Water Detection Limits[c]
Air (particulate filter)[d]	Gross alpha	1×10^{-15} µCi/ml	2×10^{-14} µCi/ml	--
	Gross beta	3×10^{-15} µCi/ml	3×10^{-12} µCi/ml	--
	Specific gamma (^{137}Cs)	3×10^{-16} µCi/ml	4×10^{-10} µCi/ml	--
	^{238}Pu	2×10^{-18} µCi/ml	3×10^{-14} µCi/ml	--
	$^{239/240}$Pu	3×10^{-18} µCi/ml	2×10^{-14} µCi/ml	--
	^{241}Am	2×10^{-18} µCi/ml	2×10^{-14} µCi/ml	--
	^{90}Sr	3×10^{-17} µCi/ml	9×10^{-12} µCi/ml	--
Air (charcoal cartridge)[d]	^{131}I	4×10^{-15} µCi/ml	4×10^{-10} µCi/ml	--
Air (atmospheric moisture)[e]	^{3}H	4×10^{-12} µCi/ml	1×10^{-7} µCi/ml	--
Air (precipitation)	^{3}H	1×10^{-7} µCi/ml	2×10^{-3} µCi/ml	--
Water (drinking & surface)	Gross alpha	1 pCi/l	30 pCi/l	3 pCi/l
	Gross beta	2 pCi/l	100 pCi/l	4 pCi/l
	^{3}H	100 pCi/l	2×10^{6} pCi/l	1000 pCi/l
Milk	^{131}I	3×10^{-9} µCi/ml	--	--
Wheat	Specific gamma (^{137}Cs)	4×10^{-9} µCi/g	--	--
	^{90}Sr	5×10^{-9} µCi/g	--	--
Lettuce	Specific gamma (^{137}Cs)	1×10^{-7} µCi/g	--	--
	^{90}Sr	2×10^{-7} µCi/g	--	--

a. The MDC is an estimate of the concentration of radioactivity in a given sample type that can be identified with a 95% level of confidence and a precision of plus or minus 100% under a specified set of typical laboratory measurement conditions.
b. DCGs, set by the DOE, represent reference values for radiation exposure. They are based on a radiation dose of 100 mrem/yr for exposure through a particular exposure mode such as direct exposure, inhalation, or ingestion of water.
c. These limits are required by the National Primary Drinking Water Regulations (40 CFR 141). The "detection limit" is the terminology used by the EPA and means the same as the MDC defined above.
d. The approximate MDC is based on an average filtered air volume (pressure corrected) of 570 m^3/week.
e. The approximate MDC is expressed for tritium (as tritiated water) in air, and is based on an average filtered air volume of 25 m^3, assuming an average sampling period of eight weeks.

2. Air Sampling

2.1 Sampling Methods

2.1.1 Low-Volume Air Samplers

Airborne particulate radioactivity was continuously monitored by 14 air samplers (Figure 1), designed to provide an effective network to detect INEEL releases of radioactivity. Four offsite air samplers were designated as distant, or background, stations and seven are designated as boundary stations. Three air samplers are situated on the INEEL. Distant locations were used to make comparisons of airborne concentrations of radioactivity with boundary and onsite locations. As part of the quality assurance program, two replicate samplers, located in Mud Lake and near the INEEL Main Gate, were operated adjacent to regular air samplers to provide a means of comparing data.

Each air sampler averaged a flow of approximately 50 l/min (2 ft^3/min) through a filter head consisting of two types of filters—a 1.2-micrometer pore size particulate filter and a charcoal cartridge for the monitoring of radioactive iodine. Filters on each sampler were changed weekly. In order to be considered a valid sample, each filter must sample a pressure-corrected air volume of at least 200 m^3, or about 7000 ft^3. Filters sample an average air volume of about 570 m^3 (20,000 ft^3).

Charcoal cartridges were screened in batches weekly for ^{131}I activity. If activity was detected in any batch that was greater than a preset action level, cartridges were then analyzed individually. Particulate filters were counted each week for gross (nonspecific) beta activity in a low-background beta counter after waiting a minimum of four days for the naturally occurring decay products of radon and thoron to decay. The particulate filters were also counted for gross alpha activity.

At the end of the quarter, weekly filters from each location were combined to form a composite. All composites were then analyzed by gamma spectrometry for specific radionuclides. Selected composites were also analyzed for ^{90}Sr or transuranic radionuclides (^{238}Pu, $^{239/240}Pu$, and ^{241}Am).

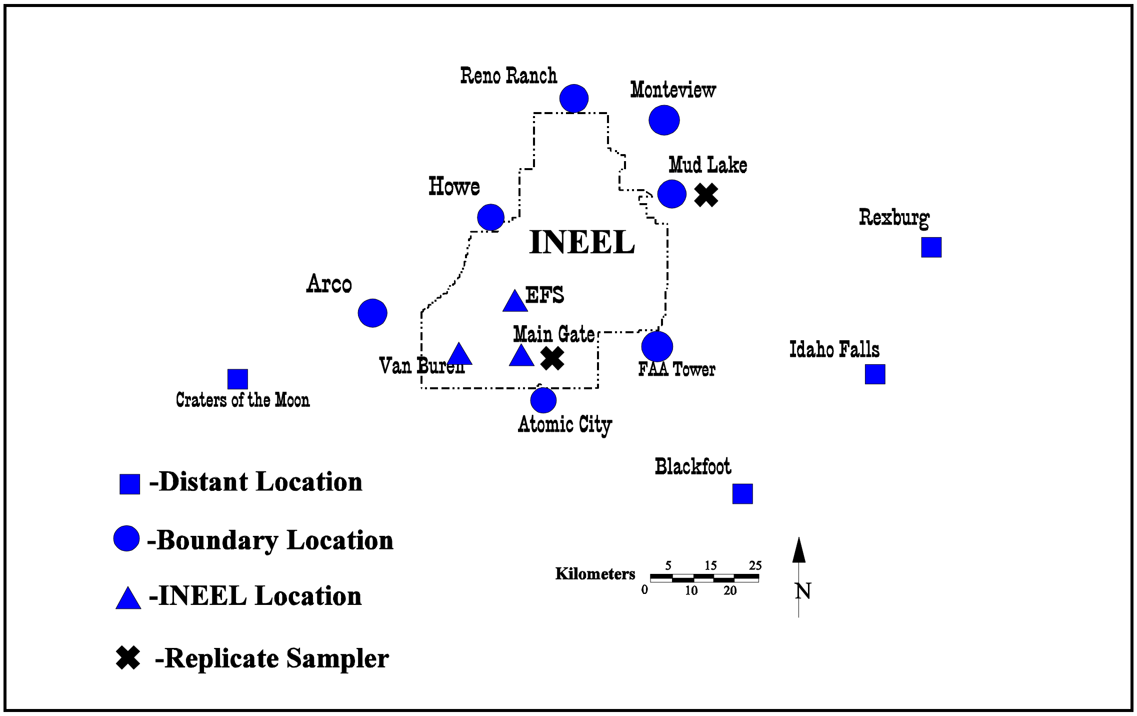

Figure 1 Air Sampling Location Map

2.1.2 PM-10 Air Samplers

During this quarter, the PM-10 air sampler at the Rexburg station began operation. This sampling serves not only to enhance the offsite environmental surveillance program, but is part of the Community Monitoring Station (CMS) established at the Madison Middle School in Rexburg. PM-10 samplers collect fine airborne particulates less than 10 microns in effective diameter (1 micron = one thousandth of a millimeter). The sampler takes a 24-hour sample every six days. The quartz fiber filter is weighed before and after sample collection by a precision laboratory balance to determine the amount of fine particles collected. The air concentration of fine particles is expressed in $\mu g/std\ m^3$. In the near future, additional PM-10 samplers will be operated at Blackfoot and Atomic City. The Blackfoot location is the CMS located at the Mountain View Middle School.

2.1.3 Atmospheric Moisture Samplers

Two air samplers, located in Atomic City and Idaho Falls, collected atmospheric moisture for tritium analysis. Air was passed through a column of silica gel that absorbs water vapor in the air. Tritium concentrations were determined by extracting water from the silica gel and counting the water sample by liquid scintillation.

2.1.4 Precipitation Samplers

When available, weekly precipitation samples were collected at the Experimental Field Station (EFS) on the INEEL. In addition, two samples were collected monthly: one at the Central Facilities Area on the INEEL and one in Idaho Falls. All precipitation samples were analyzed for tritium by liquid scintillation.

2.2 Results

2.2.1 Low-Volume Air Samplers

No ^{131}I was detected in any of the weekly charcoal cartridges during the third quarter.

All gross alpha concentrations were within the expected range of background levels (data summaries are presented in Figure 2, Table 3, and Table A-1). In general, gross alpha concentrations were greater at INEEL stations than at distant stations during August. This may have been due to the increase in concentrations of airborne ash and fine soil particles from the extensive fires that occurred on and around the INEEL during the summer months, though the fires did not burn through areas of known soil contamination such as at RWMC and ICPP. Elevated levels of gross alpha were not, however, generally seen at the boundary stations. Also, as noted below, generally no detectable manmade alpha-emitting radionuclides were detected in the quarterly composite samples from stations on and near the INEEL. Over the quarter, mean gross alpha concentrations for the onsite and boundary locations were not statistically higher than the mean for the distant locations (see Table 3).

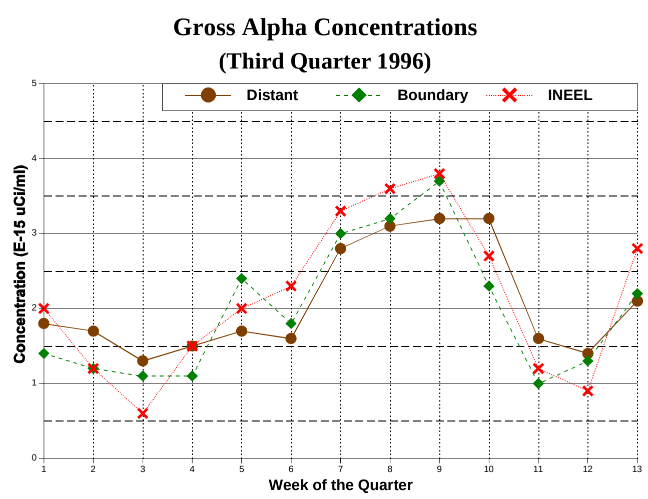

Figure 2 Weekly Gross Alpha Concentrations

Table 3
Gross Alpha Concentrations in Air
(Third Quarter 1996)

Group	Location	Number of Samples	Gross Alpha Concentration ($\times 10^{-15}$ µCi/ml) Range of Samples	Mean with 95% Confidence Interval
Distant	Blackfoot	12	1.2 - 3.4	2.3 ± 0.4
	Craters of the Moon	13	0.6 - 3.7	1.8 ± 0.6
	Idaho Falls	12	0.2 - 3.0	1.8 ± 0.5
	Rexburg	13	1.3 - 4.4	2.5 ± 0.5
			Group Mean	**2.1 ± 0.2**
Boundary	Arco	13	1.0 - 3.6	2.0 ± 0.5
	Atomic City	13	0.9 - 4.1	2.1 ± 0.6
	FAA Tower	13	-0.5 - 3.6	2.0 ± 0.8
	Howe	13	0.7 - 3.8	1.8 ± 0.6
	Monteview	13	-0.9 - 3.7	1.8 ± 0.7
	Mud Lake (Replicate)	13 (13)	0.7 - 4.0 (0.8 - 3.9)	2.0 ± 0.6 (2.0 ± 0.6)
	Reno Ranch	13	0.5 - 4.4	2.2 ± 0.8
			Group Mean	**2.0 ± 0.2**
INEEL	EFS	13	0.7 - 4.0	2.2 ± 0.6
	Main Gate (Replicate)	13 (13)	0.4 - 3.4 (0.7 - 4.6)	2.0 ± 0.6 (1.8 ± 0.7)
	Van Buren	13	0.8 - 4.8	2.2 ± 0.7
			Group Mean	**2.2 ± 0.3**
			DOE Derived Concentration Guide	20

All gross beta concentrations were also within the expected range of background levels (data summaries are presented in Figure 3, Table 4, and Table A-2). The value at FAA tower of (74 ± 6) x 10^{-15} µCi/ml during the week of July 10-17 was substantially higher than other locations. This filter was analyzed individually by gamma spectrometry, however only background levels of radionuclides were observed. In addition, gross beta concentrations were greater at INEEL stations than at distant stations during the first half of August. As discussed above, these instances may be due to the fires occurring during the summer. Except for the above instance at FAA tower, elevated levels of gross beta were not generally seen at the boundary stations. Over the quarter, means of gross beta concentrations for the onsite and boundary locations were not statistically higher than the mean for the distant locations (see Table 4).

The gross alpha and gross beta data for the Mud Lake and Main Gate quality assurance replicates assisted in evaluating data quality. The Mud Lake and Main Gate mean values were not statistically different from their respective replicate mean values (see Tables 3 and 4), including the Main Gate and its replicate for

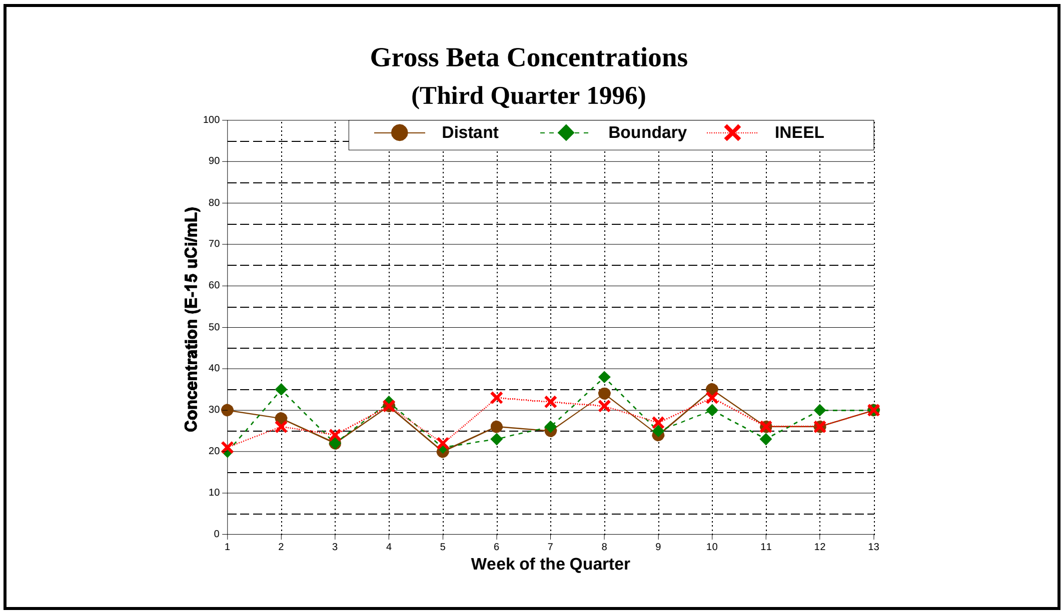

Figure 3 Weekly Gross Beta Concentrations

gross beta, as determined by a two-tailed Student's t-test. Linear correlation tests indicated the Mud Lake and Main Gate weekly gross alpha results correlated well at the 95% confidence level with their respective replicate results[1]. Correlation tests were performed only for those gross alpha data greater than their respective 2s uncertainty terms. Correlation was low for the gross beta data sets[1]. The reason for this is not known.

Quarterly composite samples from all sampling stations were analyzed for gamma-emitting radionuclides. Beryllium-7, a naturally-occurring gamma-emitting radionuclide produced by cosmic rays in the atmosphere, was detected in all of the composites. Cesium-137 was detected in one sample from EFS at $(3.4 \pm 3.1) \times 10^{-16}$ µCi/ml. Its presence may be due either to fallout from historic nuclear weapons testing or from INEEL activities, though no likely source of ^{137}Cs from INEEL was identified.

Several composite samples were also selected for analysis of ^{90}Sr and transuranics of interest (^{241}Am, ^{238}Pu, and $^{239/240}$Pu). One sample, from Atomic City, had a detectable ^{90}Sr concentration of $(5.7 \pm 5.2) \times 10^{-17}$ µCi/ml. This was likely due to fallout from historic nuclear weapons testing. None of the composite samples showed detectable concentrations of transuranics.

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[1] For Mud Lake, $r_\alpha = 0.72$ (n = 12), $r_\beta = 0.56$ (n = 13); for the Main Gate, $r_\alpha = 0.72$ (n = 8) and $r_\beta = 0.51$ (n = 13).

Table 4
Gross Beta Concentrations in Air
(Third Quarter 1996)

Group	Location	Number of Samples	Gross Beta Concentration ($\times 10^{-15}$ µCi/ml) Range of Samples	Mean with 95% Confidence Interval
Distant	Blackfoot	12	19 - 35	28 ± 3
	Craters of the Moon	13	21 - 32	27 ± 2
	Idaho Falls	12	6 - 40	26 ± 5
	Rexburg	13	20 - 39	30 ± 3
			Group Mean	**28 ± 2**
Boundary	Arco	13	11 - 38	25 ± 4
	Atomic City	13	20 - 33	26 ± 3
	FAA Tower	13	16 - 74	30 ± 9
	Howe	13	10 - 42	26 ± 5
	Monteview	13	-6 - 37	25 ± 6
	Mud Lake (Replicate)	13 (13)	22 - 46 (23 - 41)	30 ± 5 (30 ± 3)
	Reno Ranch	13	18 - 53	30 ± 5
			Group Mean	**27 ± 2**
INEEL	EFS	13	18 - 35	29 ± 3
	Main Gate (Replicate)	13 (13)	23 - 36 (16 - 34)	28 ± 2 (25 ± 3)
	Van Buren	13	17 - 32	26 ± 3
			Group Mean	**28 ± 1**
		DOE Derived Concentration Guide		3000

2.2.2 PM-10 Air Samplers

Sampling at the Rexburg CMS station began in late August. Twenty-four hour samples were collected on six different days. The results ranged from 12 to 73 µg/std m^3, with an average of 32 µg/std m^3. The EPA standard is 150 µg/std m^3 averaged over 24 hours, and 50 µg/std m^3 averaged over the entire year. Fine particulates were elevated above average conditions due to dry, windy weather, agricultural activities, and windblown particulates from burned areas.

2.2.3 Atmospheric Moisture Samplers

Four atmospheric moisture samples were obtained from Idaho Falls and Atomic City during this report period, representing moisture collected from April to July and July to October. None of the samples indicated detectable concentrations of tritium.

2.2.4 Precipitation Samplers

Seven precipitation samples were collected in the third quarter and analyzed for tritium. Tritium was not detected in any of the samples.

Figure 4 A low-volume air sampler located at Howe, Idaho.

3. Water Sampling

3.1 Methods

Water samples were collected in August from two drinking water locations and three surface water locations in the Magic Valley area (see Figure 5). Drinking water sampling locations were local businesses. Surface water locations included three springs in the Thousand Springs area (Figure 5). These springs are some of the outlets for the Snake River Plain Aquifer, which flows beneath the INEEL. Each water sample was analyzed for gross (nonspecific) alpha and gross beta activity by evaporating a portion of the sample on a stainless steel plate and counting the residue. Tritium concentrations were determined by analyzing samples using liquid scintillation.

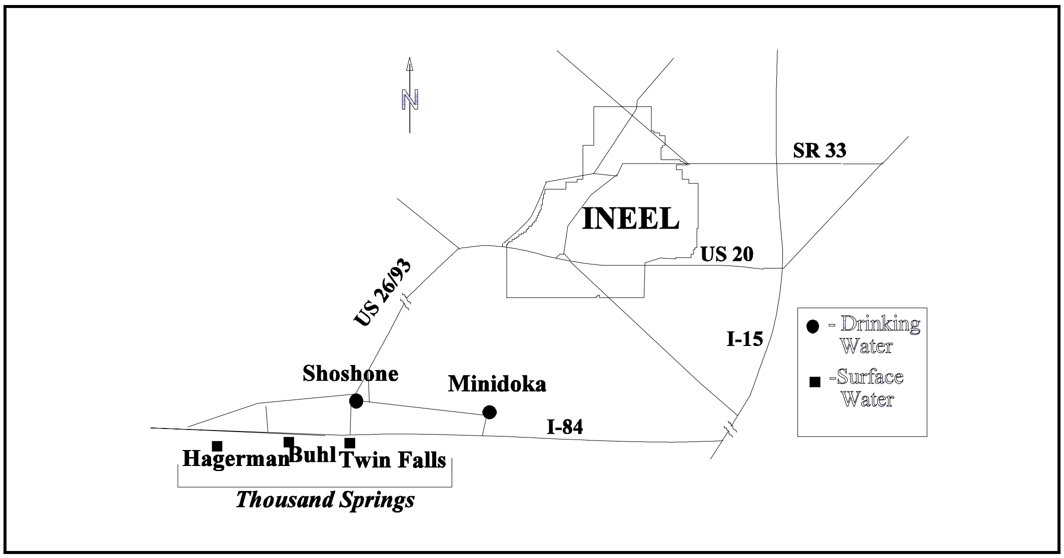

Figure 5 Water Sampling Locations

3.2 Results

None of the water samples showed measurable concentrations of ^{3}H and gross alpha (Table 5). All of the samples contained detectable gross beta concentrations. At these levels, radioactivity in water samples is generally attributed to naturally occurring decay products, primarily from primordial deposits of uranium and thorium, picked up by water as it travels through the earth's crust.

Table 5
Radionuclide Concentrations in Offsite Water Samples
(Third Quarter 1996)

Location	^{3}H (pCi/l ± 2s)	Gross Alpha (pCi/l ± 2s)	Gross Beta (pCi/l ± 2s)
Drinking Water			
Minidoka	-180 ± 110	0 ± 1	6 ± 2
Minidoka replicate	-210 ± 110	0 ± 1	4 ± 2
Shoshone	50 ± 110	0 ± 1	4 ± 2
Surface Water			
Alpheus Spring (Twin Falls)	-40 ± 110	0 ± 1	6 ± 2
Bill Jones Hatchery (Hagerman)	-160 ± 110	0 ± 1	4 ± 2
Clear Spring (Buhl)	-190 ± 110	-1 ± 1	4 ± 2
EPA Maximum Contaminant Level	20,000	15	50

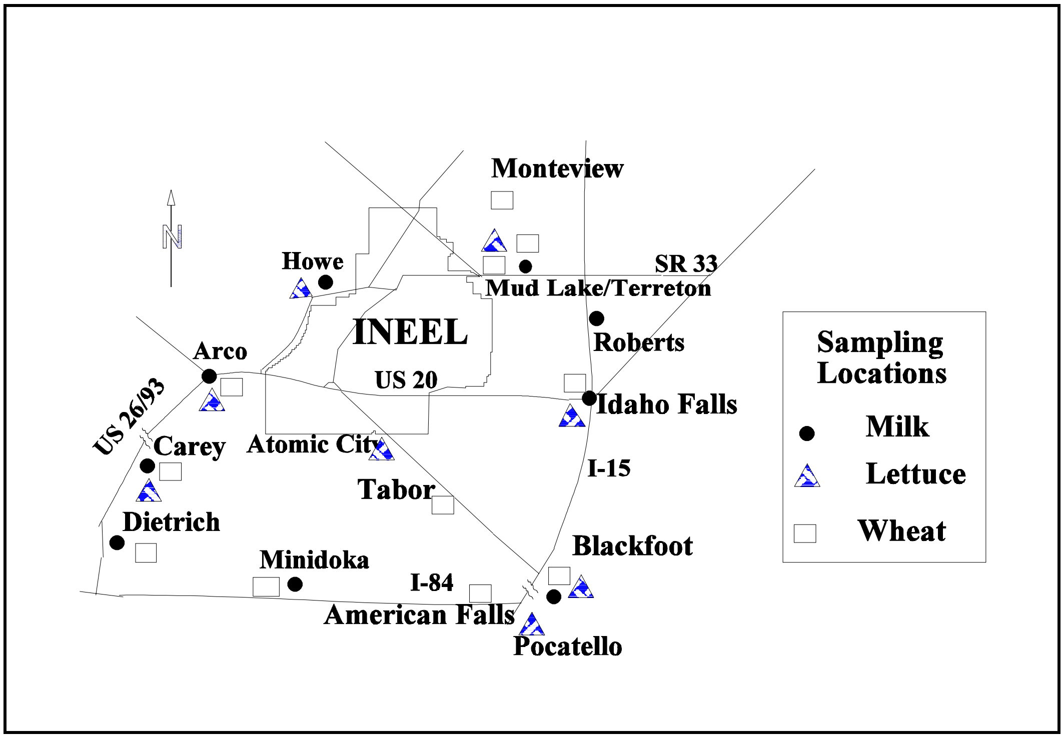

Figure 6 Foodstuff Sampling Locations

4. Foodstuff Sampling

4.1 Methods

Milk samples were collected weekly in Idaho Falls and monthly at eight other locations around the INEEL (Figure 6). Two types of locations were sampled: single family dairies and large commercial dairies. Each milk sample was analyzed for ^{131}I by placing the sample in a gamma spectrometer calibrated for the ^{131}I energy peak. Since ^{131}I has a short half-life (eight days), results are decay-corrected to the time of sample collection.

Nine lettuce samples (including one duplicate sample) were collected from eight private gardens. Twelve wheat samples (including one duplicate sample) were obtained from 11 local growers. A fish sample was collected from the Big Lost River, which flowed through the INEEL during late spring and early summer. All samples were analyzed for manmade gamma-emitting radionuclides. The lettuce and wheat samples were also analyzed for ^{90}Sr.

4.2 Results

A total of 38 milk samples were collected during the third quarter. A detectable concentration of ^{131}I at (4.4 ± 4.1) x 10^{-9} µCi/ml was initially found in a Howe milk sample collected on September 9. The sample was recounted and no ^{131}I was detected. It is likely the initial detection of ^{131}I was a result of statistical variations which are substantial when the concentrations are near the counting system's limit of detection.

Of nine lettuce samples, ^{137}Cs was detected in two samples from distant stations (Carey and Idaho Falls) and one from a boundary station (Atomic City). Three lettuce samples were lost during the ^{90}Sr analyses. One distant station (Blackfoot) and one boundary station (Atomic City) showed detectable levels of ^{90}Sr (Table 6). The mean boundary station ^{90}Sr concentration did not exceed the mean distant ^{90}Sr concentration. Both ^{137}Cs and ^{90}Sr are found in soil as a result of fallout from historic nuclear weapons testing. No manmade gamma-emitting radionuclides were found in the 12 wheat samples. Detectable ^{90}Sr concentrations were found at two distant stations (American Falls and Rupert) and at three boundary stations (Monteview replicate, Terreton, and Tabor) (Table 6). Its presence is due to nuclear weapons testing. The concentrations of ^{90}Sr in lettuce and wheat are similar to those found in previous years. A fish sample, collected from the Big Lost River while it was flowing on the INEEL, contained no detectable manmade gamma-emitting radionuclides.

Table 6
Strontium-90 Concentrations in Lettuce and Wheat (1996)

Location	Lettuce (x 10^{-9} µCi/g)	Wheat (x 10^{-9} µCi/g)
Distant Locations		
American Falls	no sample	7 ± 5
Blackfoot	270 ± 240[a]	6 ± 6
Carey	no data	5 ± 6
Carey replicate	20 ± 480	no sample
Dietrich	no sample	5 ± 5
Idaho Falls	no data	9 ± 18[a]
Pocatello	no data	no sample
Minidoka	no sample	8 ± 5
Distant Group Mean	140 ± 1600	7 ± 2
Boundary Locations		
Arco	200 ± 200[a]	16 ± 40[a]
Atomic City	120 ± 100	no sample
Howe	100 ± 160	no sample
Monteview	no sample	3 ± 4
Monteview replicate	no sample	6 ± 4
Mud Lake	160 ± 360[a]	5 ± 5
Terreton	no sample	8 ± 6
Tabor	no sample	10 ± 6
Boundary Group Mean	140 ± 70	8 ± 5

[a] Low chemical yield (<20%)

Appendix

Weekly Gross Alpha and Gross Beta

Concentrations in Air

Table A-1
Weekly Gross Alpha Concentrations in Air

Location	Weekly Collection Date	Concentration ± 2s Uncertainty (10^{-15} µCi/ml)
		Distant Locations
Blackfoot	07/10	2.3 ± 1.2
	07/17	invalid - pump failure
	07/24	2.2 ± 1.0
	07/31	2.3 ± 1.0
	08/07	1.5 ± 0.7
	08/14	2.1 ± 0.9
	08/21	2.6 ± 0.9
	08/28	3.0 ± 1.0
	09/04	3.2 ± 1.0
	09/11	3.4 ± 1.0
	09/18	1.5 ± 0.9
	09/25	1.2 ± 0.7
	10/02	2.8 ± 0.8
Craters of the Moon	07/10	1.0 ± 1.0
	07/17	1.2 ± 1.0
	07/24	0.6 ± 0.9
	07/31	1.1 ± 0.9
	08/07	1.3 ± 0.7
	08/14	1.6 ± 0.9
	08/21	2.9 ± 1.1
	08/28	3.7 ± 1.1
	09/04	3.3 ± 1.1
	09/11	2.9 ± 0.9
	09/18	1.0 ± 0.7
	09/25	0.9 ± 0.6
	10/02	1.7 ± 0.6
Idaho Falls	07/10	invalid - pump failure
	07/17	1.7 ± 0.9
	07/24	0.9 ± 0.8
	07/31	0.7 ± 0.9
	08/07	1.8 ± 0.7
	08/14	0.2 ± 0.7
	08/21	2.8 ± 1.0
	08/28	2.3 ± 0.9
	09/04	3.0 ± 1.0
	09/11	2.4 ± 0.8
	09/18	2.4 ± 1.1

Table A-1 (Cont.)
Weekly Gross Alpha Concentrations in Air

Location	Weekly Collection Date	Concentration ± 2s Uncertainty (10^{-15} µCi/ml)
	09/25	1.7 ± 0.7
	10/02	1.6 ± 0.6
Rexburg	07/10	2.2 ± 1.0
	07/17	2.0 ± 1.0
	07/24	1.3 ± 0.9
	07/31	1.9 ± 1.0
	08/07	2.4 ± 0.8
	08/14	2.6 ± 1.0
	08/21	2.7 ± 0.9
	08/28	3.3 ± 1.0
	09/04	3.5 ± 1.2
	09/11	4.4 ± 1.0
	09/18	1.7 ± 0.8
	09/25	1.8 ± 0.7
	10/02	2.3 ± 0.7
	Boundary Locations	
Arco	07/10	1.6 ± 1.0
	07/17	1.2 ± 1.1
	07/24	1.2 ± 0.9
	07/31	1.0 ± 0.8
	08/07	2.5 ± 0.8
	08/14	1.1 ± 0.8
	08/21	2.2 ± 0.9
	08/28	3.6 ± 1.2
	09/04	3.5 ± 1.0
	09/11	2.7 ± 0.9
	09/18	2.3 ± 0.9
	09/25	1.5 ± 0.7
	10/02	2.0 ± 0.6
Atomic City	07/10	1.9 ± 0.9
	07/17	1.2 ± 0.8
	07/24	1.2 ± 0.9
	07/31	0.9 ± 0.8
	08/07	1.4 ± 0.7
	08/14	2.2 ± 0.9
	08/21	3.3 ± 1.1
	08/28	2.9 ± 1.0
	09/04	4.1 ± 1.3

Table A-1 (Cont.)
Weekly Gross Alpha Concentrations in Air

Location	**Weekly Collection Date**	**Concentration ± 2s Uncertainty (10^{-15} µCi/ml)**
	09/11	2.5 ± 0.9
	09/18	1.2 ± 0.7
	09/25	1.5 ± 0.7
	10/02	2.9 ± 0.8
FAA Tower	07/10	1.9 ± 1.0
	07/17	0.0 ± 0.8
	07/24	0.6 ± 0.9
	07/31	1.2 ± 1.5
	08/07	3.0 ± 1.1
	08/14	2.2 ± 1.0
	08/21	3.6 ± 1.1
	08/28	3.3 ± 1.1
	09/04	3.4 ± 1.2
	09/11	2.5 ± 0.9
	09/18	-0.5 ± 0.5
	09/25	1.9 ± 0.9
	10/02	2.3 ± 0.7
Howe	07/10	1.8 ± 1.0
	07/17	0.7 ± 0.9
	07/24	1.2 ± 0.9
	07/31	1.2 ± 0.9
	08/07	1.9 ± 0.7
	08/14	1.3 ± 1.0
	08/21	2.7 ± 1.0
	08/28	3.5 ± 1.1
	09/04	3.8 ± 1.2
	09/11	2.2 ± 0.8
	09/18	0.8 ± 0.6
	09/25	1.0 ± 0.6
	10/02	1.7 ± 0.6
Monteview	07/10	-0.9 ± 0.6
	07/17	1.8 ± 1.1
	07/24	2.2 ± 1.0
	07/31	0.2 ± 0.8
	08/07	1.8 ± 0.8

Table A-1 (Cont.)
Weekly Gross Alpha Concentrations in Air

Location	Weekly Collection Date	Concentration ± 2s Uncertainty (10^{-15} µCi/ml)
	08/14	1.5 ± 0.9
	08/21	2.6 ± 1.0
	08/28	3.1 ± 1.0
	09/04	3.7 ± 1.2
	09/11	2.2 ± 0.8
	09/18	1.4 ± 0.8
	09/25	1.4 ± 0.7
	10/02	2.2 ± 0.7
Mud Lake	07/10	1.6 ± 1.0 (1.3 ± 1.0)
(Replicate)	07/17	1.7 ± 1.0 (1.2 ± 0.9)
	07/24	0.7 ± 0.9 (0.8 ± 0.8)
	07/31	2.2 ± 1.0 (1.4 ± 1.0)
	08/07	2.4 ± 0.8 (2.2 ± 0.9)
	08/14	2.2 ± 0.9 (2.5 ± 1.0)
	08/21	1.9 ± 0.9 (3.2 ± 1.1)
	08/28	3.1 ± 1.0 (2.7 ± 0.9)
	09/04	4.0 ± 1.3 (3.9 ± 1.3)
	09/11	1.9 ± 0.7 (3.7 ± 1.0)
	09/18	0.7 ± 0.6 (0.9 ± 0.6)
	09/25	0.8 ± 0.5 (0.8 ± 0.6)
	10/02	2.1 ± 0.6 (1.9 ± 0.6)
Reno Ranch	07/10	1.6 ± 1.0
	07/17	2.0 ± 1.0
	07/24	0.5 ± 0.8
	07/31	0.8 ± 0.9
	08/07	4.1 ± 1.1
	08/14	2.2 ± 0.9
	08/21	4.5 ± 1.2
	08/28	3.2 ± 1.0
	09/04	3.2 ± 1.0
	09/11	2.5 ± 0.8
	09/18	0.9 ± 0.6
	09/25	1.0 ± 0.6
	10/02	2.1 ± 0.7
INEEL Locations		
EFS	07/10	2.7 ± 1.2
	07/17	1.2 ± 0.9
	07/24	0.7 ± 0.9

Table A-1 (Cont.)
Weekly Gross Alpha Concentrations in Air

Location	Weekly Collection Date	Concentration ± 2s Uncertainty (10^{-15} µCi/ml)
	07/31	1.8 ± 0.9
	08/07	1.9 ± 0.8
	08/14	2.0 ± 1.1
	08/21	3.3 ± 1.1
	08/28	4.0 ± 1.1
	09/04	3.2 ± 1.2
	09/11	2.6 ± 0.9
	09/18	1.2 ± 0.7
	09/25	1.0 ± 0.6
	10/02	3.3 ± 0.8
Main Gate	07/10	1.8 ± 1.1 (0.9 ± 1.1)
(Replicate)	07/17	1.0 ± 0.8 (0.9 ± 0.9)
	07/24	0.4 ± 0.8 (0.9 ± 0.9)
	07/31	1.9 ± 1.0 (0.7 ± 0.9)
	08/07	1.9 ± 0.8 (1.8 ± 0.8)
	08/14	2.2 ± 1.0 (2.3 ± 1.0)
	08/21	3.4 ± 1.1 (2.9 ± 1.1)
	08/28	3.4 ± 1.1 (2.5 ± 0.9)
	09/04	3.4 ± 1.2 (4.6 ± 1.3)
	09/11	3.0 ± 1.0 (1.8 ± 0.8)
	09/18	1.3 ± 0.7 (1.2 ± 0.7)
	09/25	0.6 ± 0.6 (1.0 ± 0.6)
	10/02	2.2 ± 0.7 (1.4 ± 0.6)
Van Buren	07/10	1.6 ± 1.1
	07/17	1.3 ± 0.9
	07/24	0.8 ± 0.9
	07/31	1.0 ± 0.9
	08/07	2.0 ± 0.8
	08/14	2.7 ± 1.1
	08/21	3.0 ± 1.2
	08/28	3.6 ± 1.1
	09/04	4.8 ± 1.3
	09/11	2.6 ± 0.9
	09/18	1.3 ± 0.8
	09/25	1.2 ± 0.7
	10/02	2.8 ± 0.8

Table A-2
Weekly Gross Beta Concentrations in Air

Location	**Weekly Collection Date**	**Concentration ± 2s Uncertainty (10^{-15} µCi/ml)**
	Distant Locations	
Blackfoot	07/10	27 ± 6
	07/17	invalid - pump failure
	07/24	19 ± 5
	07/31	30 ± 5
	08/07	19 ± 5
	08/14	33 ± 3
	08/21	26 ± 3
	08/28	35 ± 3
	09/04	27 ± 3
	09/11	29 ± 3
	09/18	25 ± 3
	09/25	28 ± 3
	10/02	33 ± 4
Craters of the Moon	07/10	31 ± 5
	07/17	27 ± 5
	07/24	26 ± 5
	07/31	29 ± 5
	08/07	21 ± 5
	08/14	31 ± 3
	08/21	21 ± 3
	08/28	28 ± 3
	09/04	22 ± 3
	09/11	32 ± 3
	09/18	25 ± 3
	09/25	25 ± 3
	10/02	30 ± 3
Idaho Falls	07/10	invalid - pump failure
	07/17	26 ± 5
	07/24	23 ± 4
	07/31	30 ± 5
	08/07	19 ± 4
	08/14	6 ± 2
	08/21	28 ± 3
	08/28	34 ± 3
	09/04	24 ± 3
	09/11	40 ± 3

Table A-2 (Cont.)
Weekly Gross Beta Concentrations in Air

Location	**Weekly Collection Date**	**Concentration ± 2s Uncertainty (10^{-15} µCi/ml)**
	09/18	25 ± 3
	09/25	23 ± 3
	10/02	30 ± 3
Rexburg	07/10	31 ± 5
	07/17	30 ± 5
	07/24	20 ± 4
	07/31	35 ± 5
	08/07	23 ± 5
	08/14	36 ± 3
	08/21	25 ± 3
	08/28	39 ± 3
	09/04	26 ± 4
	09/11	37 ± 3
	09/18	29 ± 3
	09/25	27 ± 3
	10/02	29 ± 3
Boundary Locations		
Arco	07/10	24 ± 5
	07/17	21 ± 6
	07/24	19 ± 4
	07/31	25 ± 4
	08/07	20 ± 5
	08/14	11 ± 2
	08/21	27 ± 3
	08/28	38 ± 4
	09/04	30 ± 3
	09/11	25 ± 3
	09/18	27 ± 3
	09/25	26 ± 3
	10/02	28 ± 3
Atomic City	07/10	25 ± 4
	07/17	21 ± 4
	07/24	20 ± 4
	07/31	32 ± 4
	08/07	22 ± 4
	08/14	29 ± 3
	08/21	30 ± 3
	08/28	33 ± 3

Table A-2 (Cont.)
Weekly Gross Beta Concentrations in Air

Location	Weekly Collection Date	Concentration ± 2s Uncertainty (10^{-15} µCi/ml)
	09/04	22 ± 4
	09/11	30 ± 3
	09/18	24 ± 3
	09/25	24 ± 3
	10/02	27 ± 3
FAA	07/10	21 ± 5
Tower	07/17	74 ± 6
	07/24	20 ± 5
	07/31	42 ± 8
	08/07	25 ± 6
	08/14	25 ± 3
	08/21	23 ± 3
	08/28	35 ± 4
	09/04	19 ± 3
	09/11	26 ± 3
	09/18	16 ± 3
	09/25	34 ± 3
	10/02	27 ± 3
Howe	07/10	24 ± 5
	07/17	20 ± 5
	07/24	23 ± 5
	07/31	35 ± 5
	08/07	20 ± 4
	08/14	10 ± 2
	08/21	26 ± 3
	08/28	42 ± 4
	09/04	28 ± 4
	09/11	32 ± 3
	09/18	25 ± 3
	09/25	26 ± 3
	10/02	35 ± 3
Monteview	07/10	-6 ± 4
	07/17	29 ± 6
	07/24	25 ± 5
	07/31	33 ± 5
	08/07	20 ± 5
	08/14	28 ± 3

Table A-2 (Cont.)
Weekly Gross Beta Concentrations in Air

Location	Weekly Collection Date	Concentration ± 2s Uncertainty (10^{-15} µCi/ml)
	08/21	24 ± 3
	08/28	38 ± 3
	09/04	22 ± 3
	09/11	32 ± 3
	09/18	22 ± 3
	09/25	24 ± 3
	10/02	33 ± 3
Mud Lake	07/10	25 ± 5 (24 ± 5)
(Replicate)	07/17	27 ± 5 (29 ± 5)
	07/24	22 ± 5 (23 ± 4)
	07/31	25 ± 5 (34 ± 5)
	08/07	23 ± 5 (23 ± 5)
	08/14	32 ± 3 (32 ± 3)
	08/21	26 ± 3 (30 ± 3)
	08/28	43 ± 4 (41 ± 4)
	09/04	26 ± 4 (31 ± 4)
	09/11	34 ± 3 (35 ± 3)
	09/18	25 ± 3 (26 ± 3)
	09/25	46 ± 3 (28 ± 3)
	10/02	30 ± 3 (26 ± 3)
Reno	07/10	26 ± 5
Ranch	07/17	53 ± 5
	07/24	25 ± 5
	07/31	34 ± 5
	08/07	19 ± 5
	08/14	29 ± 3
	08/21	27 ± 3
	08/28	35 ± 3
	09/04	28 ± 3
	09/11	31 ± 3
	09/18	24 ± 3
	09/25	29 ± 3
	10/02	31 ± 3
INEEL Locations		
EFS	07/10	18 ± 5
	07/17	27 ± 5
	07/24	31 ± 5
	07/31	33 ± 5

Table A-2 (Cont.)
Weekly Gross Beta Concentrations in Air

Location	**Weekly Collection Date**	**Concentration ± 2s Uncertainty (10^{-15} µCi/ml)**
	08/07	21 ± 5
	08/14	35 ± 4
	08/21	34 ± 4
	08/28	34 ± 3
	09/04	27 ± 4
	09/11	32 ± 3
	09/18	27 ± 3
	09/25	28 ± 3
	10/02	31 ± 3
Main Gate	07/10	24 ± 6 (22 ± 6)
(Replicate)	07/17	25 ± 5 (23 ± 5)
	07/24	23 ± 5 (23 ± 5)
	07/31	32 ± 5 (28 ± 5)
	08/07	25 ± 5 (16 ± 5)
	08/14	32 ± 3 (34 ± 3)
	08/21	32 ± 4 (27 ± 3)
	08/28	30 ± 3 (28 ± 3)
	09/04	26 ± 4 (22 ± 3)
	09/11	36 ± 3 (28 ± 3)
	09/18	25 ± 3 (26 ± 3)
	09/25	26 ± 3 (24 ± 3)
	10/02	31 ± 3 (29 ± 3)
Van Buren	07/10	22 ± 5
	07/17	25 ± 5
	07/24	17 ± 5
	07/31	28 ± 5
	08/07	19 ± 5
	08/14	31 ± 3
	08/21	30 ± 4
	08/28	27 ± 3
	09/04	28 ± 4
	09/11	32 ± 3
	09/18	26 ± 3
	09/25	23 ± 3
	10/02	29 ± 3