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Idaho National Engineering and Environmental Laboratory Offsite Environmental Surveillance Program Report: Third Quarter 2001

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EXECUTIVE SUMMARY

This report for the third quarter 2001 (July 1 through September 30, 2001), consists of results from the Environmental Surveillance, Education, and Research (ESER) Program's monitoring of the Department of Energy's Idaho National Engineering and Environmental Laboratory's (INEEL) offsite environment. All sample types (media) and the sampling schedule followed during 2001 are listed in Appendix A. Specifically, this report contains results for the following:

- Air sampling, including particulate filters, charcoal cartridges, PM_{10}, and atmospheric moisture;
- Precipitation, and;
- Agricultural products and wildlife sampling, including milk, wheat, lettuce, and large game animals.

Radioactivity, associated with airborne particulates, was monitored continuously by 18 ESER Program air samplers at 16 locations during the third quarter of 2001. Particulate filters and charcoal cartridges were sampled weekly. The gross alpha and gross beta concentrations measured in air at Boundary locations were not statistically greater than those measured at Distant locations during any of the 13 weeks evaluated. This indicates that the INEEL was not a significant source of offsite concentrations.

No ^{131}I was detected in any of the weekly charcoal cartridges during the third quarter. Weekly particulate filters for the third quarter of 2001 were composited by location. All samples were analyzed for gamma emitting radionuclides including cesium-137 (^{137}Cs). Cesium-137 was not detected in any third quarter composite samples. Composites are also analyzed by location for the human-made radionuclides strontium-90 (^{90}Sr), or plutonium-238 (^{238}Pu), plutonium-239/240 ($^{239/240}Pu$), and americium-241 (^{241}Am) as determined by a schedule that rotates quarterly. Strontium-90, ^{238}Pu, $^{239/240}Pu$, and ^{241}Am were detected in some samples. However the concentrations were consistent with measurements made in the last ten years.

Strontium-90 was detected in the Mud Lake, Atomic City, Arco, Dubois, and Arco Q/A-1 quarterly air particulate filter composite samples. Plutonium-238 was detected at Monteview, Craters of the Moon, Van Buren Gate and Rexburg CMS locations. Plutonium-239/240 was detected at the Idaho Falls, Howe, and Federal Aviation Administration (FAA) Tower locations. Americium-241 was detected only in the Experimental Field Station (EFS) sample.

Levels of ^{90}Sr measured in quarterly composite particulate air filters were well below the associated Derived Concentration Guide (DCG) value. The DCG values are established by the Department of Energy to ensure protection of the public and the environment from potential releases of radionuclides. Levels of $^{239/240}Pu$ were far less than the associated DCG value. Levels of ^{238}Pu were well below than the associated DCG value. The level of ^{241}Am detected was many times lower than its associated DCG value.

Fourteen atmospheric moisture samples for the third quarter of 2001 were obtained as follows: two from Atomic City, four from the Blackfoot Community Monitoring Station (CMS), three from Idaho Falls, and five from the Rexburg CMS. The samples were analyzed for tritium using liquid scintillation. Tritium was detected in seven of the samples with results that were significantly less than the DCG value for tritium in air.

Three PM_{10} samplers collect particulate matter less than 10 microns at Rexburg CMS, Blackfoot CMS, and Atomic City. PM_{10} concentrations for the third quarter of 2001 were below all air quality standard levels. The maximum 24-hour concentration was 47.1 $\mu g/m^3$ on July 5, in Atomic City, which is 3 times less than the applicable EPA air quality standard.

When adequate precipitation occurred, samples were taken on a monthly interval from Idaho Falls and Central Facilities Area (CFA), and on a weekly interval from EFS and analyzed for tritium. For the third quarter of 2001, there was enough precipitation for a total of seven samples – three from Idaho Falls, three from CFA, and one from EFS. Tritium was detected in three samples, one from Idaho Falls and two from CFA. While there is no regulatory restriction on tritium in precipitation, the DOE DCG and maximum contaminant level (MCL) set by the EPA for tritium in drinking water can be used as a measure. The highest value was many times below the DOE DCG and much lower than the EPA MCL.

A total of 39 milk samples were collected during the third quarter, 2001. All samples were analyzed for gamma emitting radionuclides. The September sample from Roberts had initial detections of both ^{131}I and ^{137}Cs. However, reanalysis could not support either detection, suggesting these were false positives.

Five mule deer, one elk, and one pronghorn killed by vehicle collisions on the INEEL were sampled during the third quarter, 2001. Thyroid, muscle, and liver tissue were collected from each and analyzed for gamma emitting radionuclides. Cesium-137 was detected in the muscle of two mule deer (collected on 07/09/01 and 08/07/01) and the liver of another mule deer (collected on 08/30/01). The level of ^{137}Cs detected in big game on the INEEL during the third quarter was very low and indistinguishable from fallout, nuclear weapons tests or Chernobyl.

Nine lettuce samples were collected from private gardens and analyzed for gamma emitting radionuclides and ^{90}Sr. Cesium-137 was the only gamma emitting radionuclide detected, and then in only the Arco samples. Strontium-90 was detected in three samples, those from Carey, Firth, and Idaho Falls, all at very low levels.

A total of 14 wheat samples were collected during the third quarter. All samples were analyzed for gamma-emitting radionuclides and ^{90}Sr. The only human-made radionuclide detected was ^{137}Cs in the sample from American Falls.

There were no radionuclides measured in third quarter, 2001, ESER samples that could be directly linked with INEEL activities. Levels of detected radionuclides were below regulatory limits and were not different from values measured at other locations across the United States. Based on these results, it is the conclusion of the ESER Program that the INEEL did not measurably contribute to offsite radionuclide concentrations during the third quarter of 2001 for constituents sampled.

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LIST OF ABBREVIATIONS

AEC	Atomic Energy Commission
Bq	becquerel
CFA	Central Facilities Area
CMS	community monitoring station
Ci	curie
DCG	Derived Concentration Guide
DOE	Department of Energy
DOE – ID	Department of Energy Idaho Operations Office
EAL	Environmental Assessment Laboratory
EFS	Experimental Field Station
EPA	Environmental Protection Agency
ERAMS	Environmental Radiation Ambient Monitoring System
ESER	Environmental Surveillance, Education, and Research
FAA	Federal Aviation Administration
g	gram
INEL	Idaho National Engineering Laboratory
INEEL	Idaho National Engineering and Environmental Laboratory
ISU	Idaho State University
L	liter
MDA	minimum detectable activity
MDC	minimum detectable concentration
M&O	Management and Operations
µCi	microcurie
mL	milliliter
mR	milliroentgens
mrem	millirem (rem = unit of dose equivalent [roentgen-equivalent-man])
mSv	millisieverts
NRTS	National Reactor Testing Station
pCi	picocurie
PM_{10}	particulate matter less than 10 micrometers in diameter
QA	Quality Assurance
R	Roentgen
SI	Systeme International d'Unites
UI	University of Idaho
µSv	microseiverts
WSU	Washington State University

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1. ESER PROGRAM DESCRIPTION

Operations at the Idaho National Engineering and Environmental Laboratory (INEEL) are conducted under requirements imposed by the U.S. Department of Energy (DOE) under authority of the Atomic Energy Act, and the U.S. Environmental Protection Agency (EPA) under a number of acts (e.g. the Clean Air Act and Clean Water Act). The requirements imposed by DOE are specified in DOE Orders. These requirements include those to monitor the effects, of DOE activities onsite and offsite of the INEEL (DOE Order 5400.1). During calendar year 2001, environmental monitoring within the INEEL boundaries was primarily the responsibility of the INEEL Management and Operating (M&O) contractor, while monitoring outside the INEEL boundaries was conducted under the Environmental Surveillance, Education, and Research (ESER) Program. The ESER Program is led by the S.M. Stoller Corporation in cooperation with its team members, including: the University of Idaho (UI) and Washington State University (WSU) for research, Montgomery Watson Harza and North Wind Environmental for technical support. This report contains monitoring results from the ESER Program for samples collected during the third quarter of 2001 (July 1 – September 30, 2001).

The surveillance portion of the ESER Program is designed to satisfy the following program objectives:

- Verify compliance with applicable environmental laws, regulations, and DOE Orders;
- Characterize and define trends in the physical, chemical, and biological condition of environmental media on and around the INEEL;
- Assess the potential radiation dose to members of the public from INEEL effluents, and;
- Present program results clearly and concisely through the use of reports, presentations, newsletter articles, and press releases.

The goal of the surveillance program is to monitor several different media points within potential pathways, including air, water, agricultural products and wildlife, and soil, that could potentially contribute to the dose received by the public.

Air samples are taken at 16 locations on and around the INEEL; surface water at 5 locations on the Snake River; drinking water at 14 locations around the INEEL; agricultural and wildlife products, which includes milk at 10 dairies around the INEEL, potatoes from at least 5 local producers, wheat from approximately 10 local producers, lettuce from approximately 9 home-owned gardens around the INEEL, soil from 13 locations biennially, sheep from 2 operators which graze their sheep on the INEEL, environmental dosimeters from 15 locations semi-annually, and various numbers of wildlife including big game (pronghorn, mule deer, and elk), waterfowl, doves, and marmots sampled on and near the INEEL. Fish are also sampled as available (i.e., when there is flow in the Big Lost River). Table A-1 in Appendix A lists samples, sampling locations and collection frequency for the ESER Program.

Once samples have been collected and analyzed, the ESER Program has the responsibility for quality control of the data and preparing quarterly reports on results from the environmental surveillance program. The quarterly reports are then combined into the *INEEL*

Annual Site Environmental Report for each calendar year. Annual reports also include data collected by other INEEL contractors.

The ESER Program used two laboratories to perform analyses on environmental samples for the quarter reported here. The Idaho State University (ISU) Environmental Assessment Laboratory (EAL) performed routine gross alpha, gross beta, tritium, and gamma spectrometry analyses. Analyses requiring radiochemistry, including ^{90}Sr, ^{238}Pu, $^{239/240}Pu$, and ^{241}Am were performed by Severn-Trent, Inc. Samples collected by the ESER Program on behalf of the EPA (detailed in the next paragraph) are sent to the EPA's Eastern Environmental Radiation Facility.

In the event of non-routine occurrences, such as suspected releases of radioactive material, the ESER Program may increase the frequency of sampling and/or the number of sampling locations based on the nature of the release and wind distribution patterns. In the event of any suspected worldwide nuclear incidents, like the Chernobyl accident, the EPA may request additional sampling be performed through the Environmental Radiation Ambient Monitoring System (ERAMS) network of which the ESER Program operates air and precipitation sampling equipment in Idaho Falls. The EPA established the ERAMS network 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. Any data found to be outside historical norms in the ESER Program are thoroughly investigated to determine if an INEEL origin is likely. Investigation may include re-sampling and/or re-analysis of prior samples.

For more information concerning the ESER Program, contact the S.M. Stoller Corporation at (208) 525-9358, or visit the Program's web page (http://www.stoller-eser.com).

2. THE INEEL

The Idaho National Engineering and Environmental Laboratory (INEEL) is a nuclear energy research and environmental management facility. It is owned and administered by the U.S. Department of Energy, Idaho Operations Office (DOE-ID) and occupies about 2,300 km^2 (890 mi^2) of the upper Snake River Plain in Southeastern Idaho. The history of the INEEL began during World War II when the U.S. Naval Ordnance Station was located in Pocatello, Idaho. This station, one of two such installations in the U.S., retooled large guns from U.S. Navy warships. The facility tested the retooled guns on the nearby-uninhabited plain, known as the Naval Proving Ground. In the aftermath of the war, as the nation worked to develop nuclear power, the Atomic Energy Commission (AEC), predecessor to the DOE, became interested in the Naval Proving Ground and made plans for a facility to build, test, and perfect nuclear power reactors.

The Naval Proving Ground became the National Reactor Testing Station (NRTS) in 1949, under the AEC. By the end of 1951, a reactor at the NRTS became the first to produce useful electricity. The facility evolved into an assembly of 52 reactors, associated research centers, and waste handling areas. The NRTS was renamed the Idaho National Engineering Laboratory (INEL) in 1974 and the Idaho National Engineering and Environmental Laboratory (INEEL) in January 1997. Activities at the INEEL center on environmental cleanup and research and development.

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3. AIR SAMPLING

The primary pathway by which radionuclides can move off-site is through the air and is the primary focus of monitoring on and around the INEEL. Particulates and iodine-131 (^{131}I) in air were measured weekly at 16 locations using low-volume air samplers for the duration of the quarter. Moisture in the atmosphere is sampled at four locations around the INEEL and analyzed for tritium. Concentrations of EPA size-targeted particulates in air are measured using samplers that collect particulates less than 10 microns (PM_{10}) at three locations. Air sampling activities and results for the third quarter, 2001 are discussed below.

3.1 Low-Volume Air Sampling

Radioactivity associated with airborne particulates was monitored continuously by 18 ESER Program air samplers at 16 locations during the third quarter of 2001 (Figure 1). Three of these samplers are located on the INEEL, seven are located off the INEEL near the boundary, and six are at locations distant the INEEL. These locations allow samplers to be divided into INEEL, Boundary and Distant groups to determine if there is a gradient of radionuclide concentrations, increasing towards the INEEL. One replicate sampler was located at Arco (Arco Q/A-1) and one at Howe (Howe Q/A-2) during the third quarter of 2001. On June 27, 2001 the sampler located at Birch Creek (Reno Ranch) was moved to a NOAA enclosure near Blue Dome because the Birch Creek landowner planned construction at the sampler location. The sampler at the Blackfoot NOAA enclosure was moved to Dubois. The Blackfoot NOAA location had become redundant with the results from the Blackfoot CMS. Placement of a station at Dubois provides better distant coverage in the predominant wind direction (from the south west). Also, on June 13th one additional sampler was added to Jackson, Wyoming based on local concerns. An average of 11,938 ft^3 (338 m^3) of air was sampled at each location, each week, at an average flow rate of 1.18 ft^3/min (0.03 m^3/min). Particulates in air were collected on filters (1.2-µm pore size), while gases were pulled through activated charcoal cartridges.

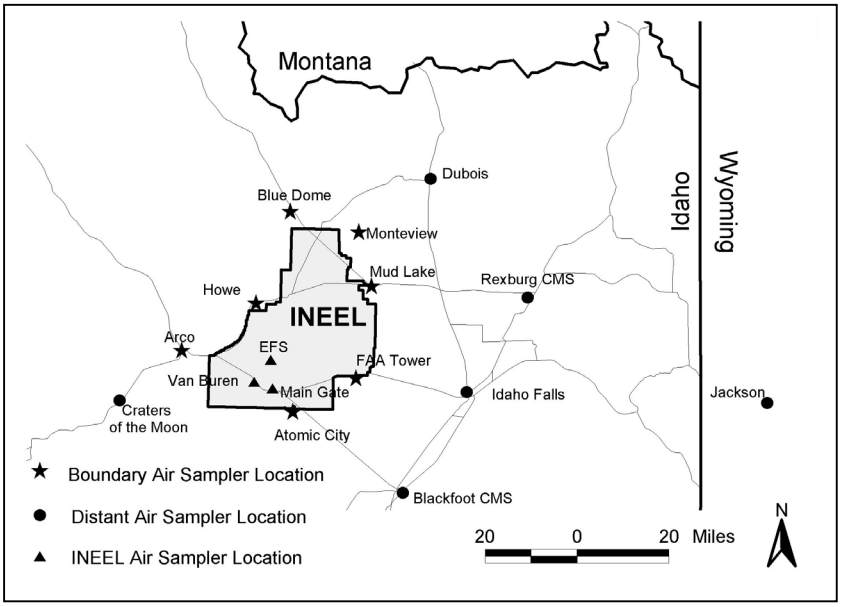

FIGURE 1. Continuous air sampling locations.

Filters and charcoal cartridges were changed weekly at each station during the quarter. Each filter was screened for gross alpha and gross beta radioactivity using thin-window gas flow proportional counting systems after waiting about four days for naturally-occurring daughter products of radon and thorium to decay. See the *Gross versus Specific Analyses* portion of the *Helpful Information* section of this report for more information concerning gross alpha and beta radioactivity. Charcoal cartridges were analyzed for gamma-emitting radionuclides, specifically ^{131}I. Iodine-131 is of great interest because it is produced in relatively large quantities by nuclear fission, is readily accumulated in human and animal thyroids, and has a half-life of eight days. This means any ^{131}I that is detected would be from a recent release of fission products. Finally, the 13 weekly filters for each location collected during the quarter are composited and analyzed for gamma-emitting radionuclides. Composites are also analyzed by location for strontium-90 (^{90}Sr), or plutonium-238 (^{238}Pu), plutonium-239/240 ($^{239/240}Pu$), and americium-241 (^{241}Am) as determined by a schedule that rotates quarterly.

Weekly gross alpha concentrations in air for INEEL, Boundary, and Distant locations are shown in Figure 2. The data were tested for normality prior to statistical analyses and were not found to be normally or lognormally distributed. Box and whiskers plots are commonly used when there is no assumed distribution. Each data group is presented as a box and whiskers plot, with a median, a box representing 25th and 75th percentiles, and whiskers representing the minimum and maximum values. Note that outliers and extreme values are plotted separately from the box and whiskers. Outliers and extreme values are atypical, infrequent observations; data points which are far from the middle of the distribution of data. Outliers are defined mathematically as values that are equal to 1.5 times the height of the box, above or below the box. Extreme values are equal to 2 times the height of the box, above or below the box. Outliers and extreme values may reflect inherent variability, or may be due to errors associated with transcription or measurement or other anomalies. A careful review of the data indicates that the outliers and extreme values were not due to mistakes in collection, analysis, or reporting procedures, but rather reflect natural variability in the measurements. The outliers and extreme values lie within the range of measurements made within the past five years. Thus, rather than dismissing the outliers, they were included in the subsequent statistical analyses. Further discussion of box plots may be found in the *Determining Statistical Differences* portion of the *Helpful Information.*

The graphs in Figure 2 visually show that the gross alpha measurements made at INEEL, Boundary, and Distant locations are similar and tend to demonstrate comparable patterns over time (i.e., increases or decreases in one set of data are tracked by increases or decreases in the other two sets of data). There do not appear to be any differences in the data sets. This hypothesis was tested statistically.

If the INEEL were a significant source of offsite contamination, concentrations of contaminants would be statistically greater at Boundary locations than at Distant locations. Because the data were determined not to be normally or lognormally distributed, nonparametric (distribution-free) tests of significance were used to compare data collected at Boundary with data collected at Distant locations. The use of nonparametric tests gives less weight to outliers and extreme values thus allowing a more appropriate comparison of data groups. The Mann-Whitney U test was used to compare the Boundary and Distant data because it is the most powerful nonparametric alternative to the t test for independent samples. INEEL sample results were not included in this analysis because the onsite data would not aid in determining offsite impacts. The INEEL air monitoring stations were established in the past primarily to assess concentrations in the predominant wind directions downwind from the INTEC facility. At that time the INTEC facility was the primary source of radionuclide releases at the INEEL. This is no

longer the case, since radionuclide releases are now more evenly distributed between the major facilities. As such, the three onsite locations do not adequately represent the near field impact of facility releases.

The comparisons between Boundary and Distant locations were made on a weekly basis. The gross alpha concentrations measured at Boundary locations were not statistically greater than those measured at Distant locations in any of the thirteen weeks of data evaluated. See the *Determining Statistical Differences* portion of the *Helpful Information* for more detail on the statistical tests used.

Weekly median gross beta concentrations in air for INEEL, Boundary, and Distant locations are shown in Figure 3. Box and whiskers plots were used because the data are not normally or lognormally distributed. Outliers and extreme values were retained in subsequent statistical analyses because they are within the range of measurements made in the past five years, and because these values could not be attributed to mistakes in collection, analysis, or reporting procedures. As in the case of alpha activity, the data for each group appear to be similar and to track each other over time. Comparison of weekly Boundary and Distant data sets, using the Mann Whitney U test, indicates no differences between the two location groups. The INEEL data were not included in the analysis for the reasons presented in the previous discussion on gross alpha measurements.

Monthly median gross alpha and beta concentrations in air at each sampling location are shown in Figures 4 – 9. The graphs show similar results between locations and over time.

A summary of approximate minimum detectable concentrations (MDC) for radiological analyses and DOE Derived Concentration Guide (DCG) values is provided in Appendix B, while gross alpha and beta results for individual filters are listed in Table C-1 of Appendix C.

No ^{131}I was detected in any of the weekly charcoal cartridges during the third quarter. Weekly ^{131}I results for each location are listed in Table C-2 of Appendix C.

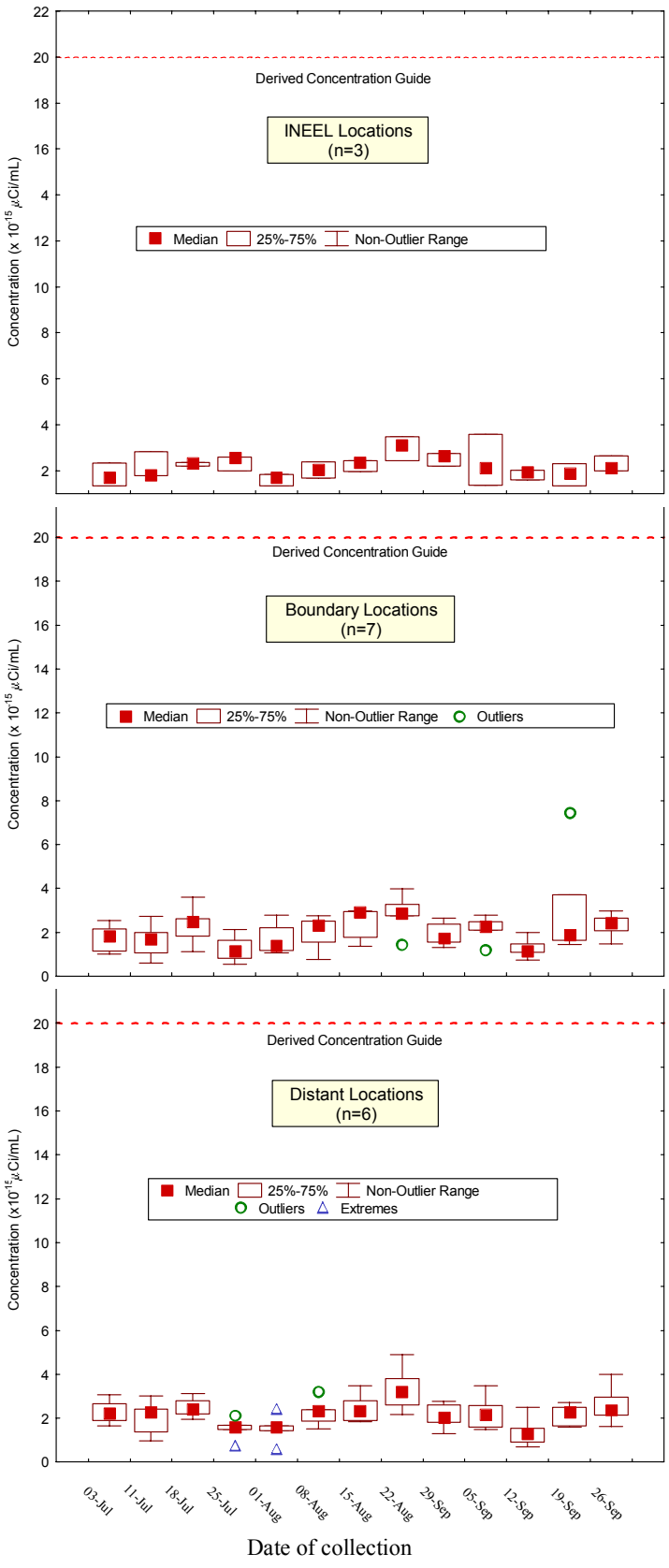

FIGURE 2. Weekly median gross alpha concentrations in air at INEEL, boundary, and distant locations.

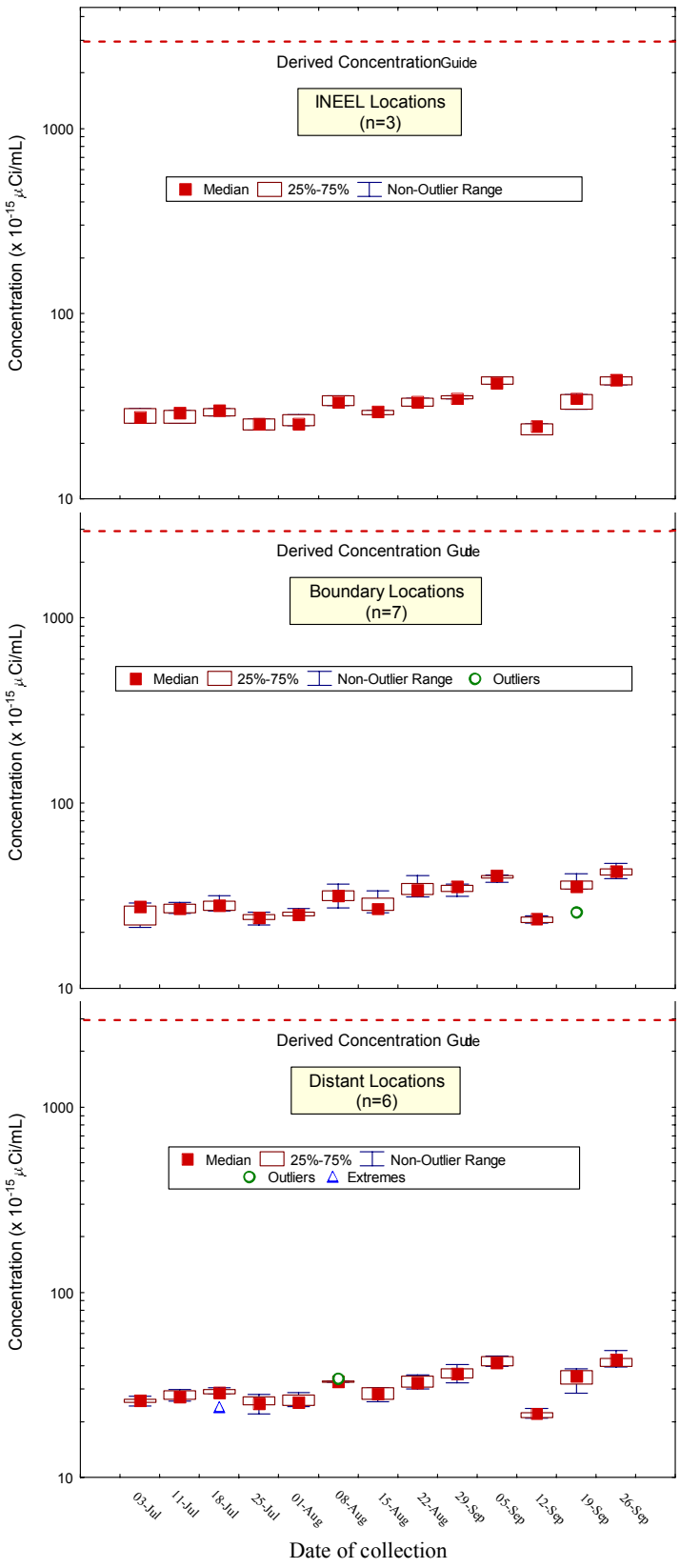

FIGURE 3. Weekly median gross beta concentrations in air at INEEL, boundary, and distant locations.

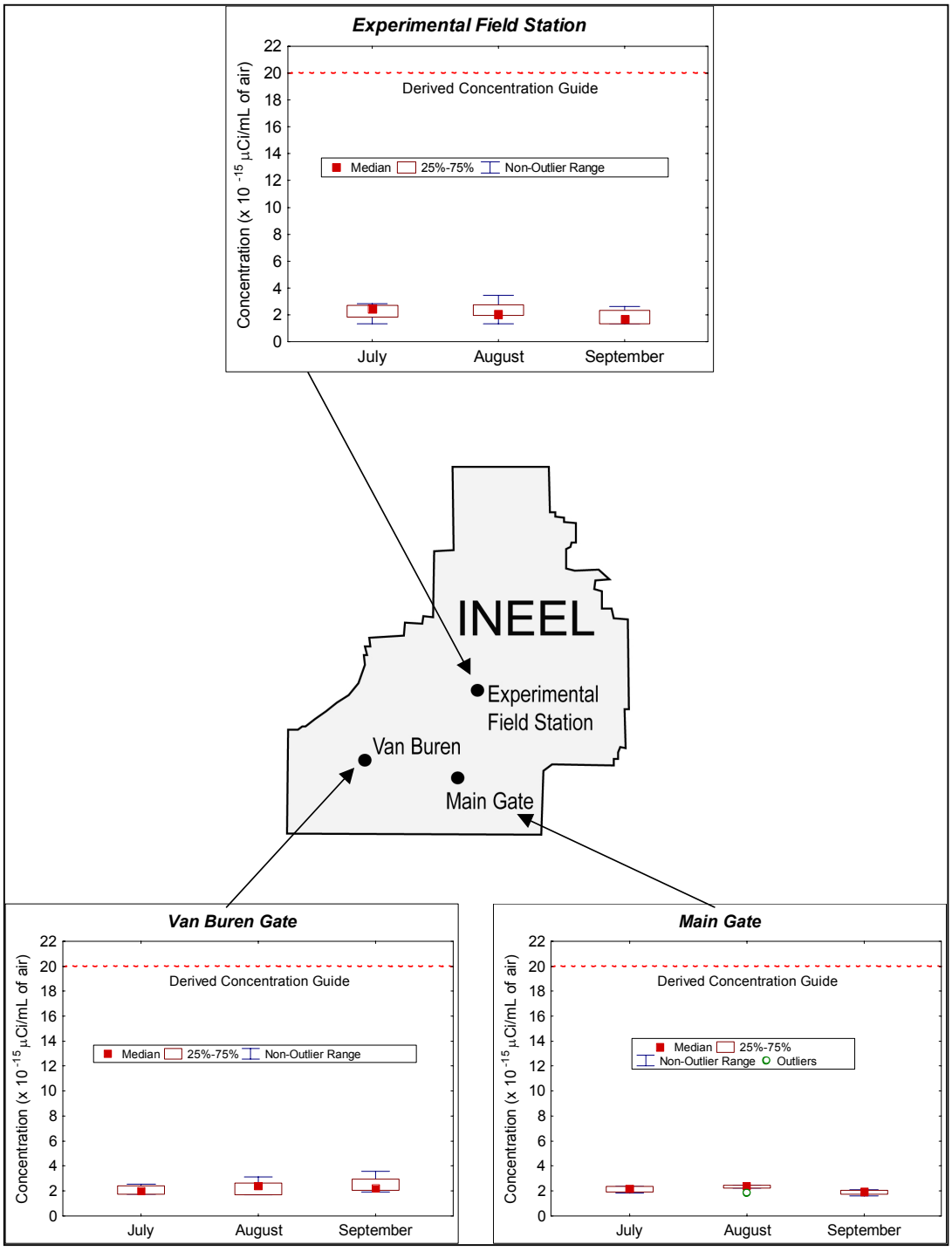

FIGURE 4. Monthly median gross alpha concentrations in air at INEEL locations.

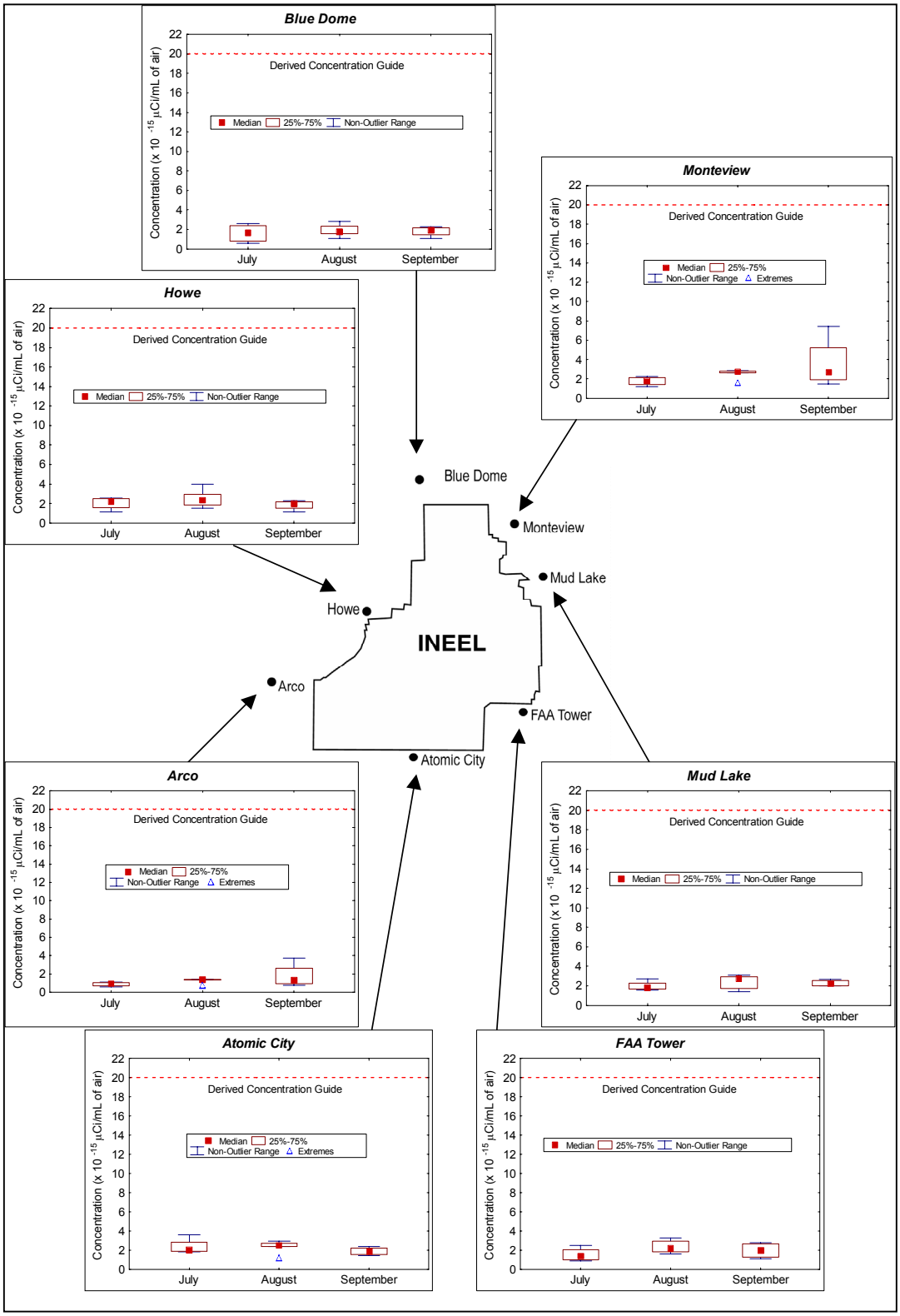

FIGURE 5. Monthly median gross alpha concentrations in air at Boundary locations.

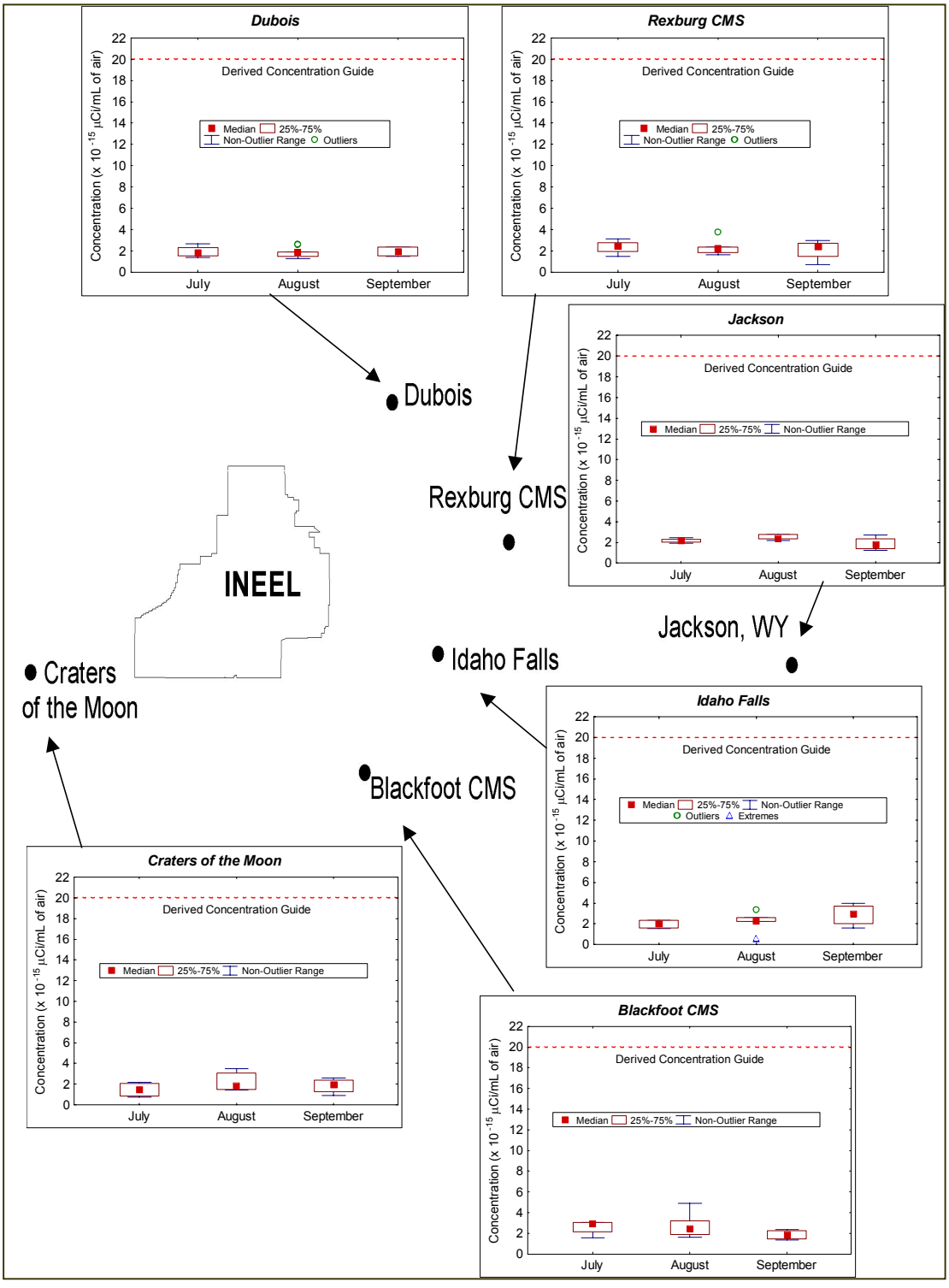

FIGURE 6. Monthly median gross alpha concentrations in air at Distant locations.

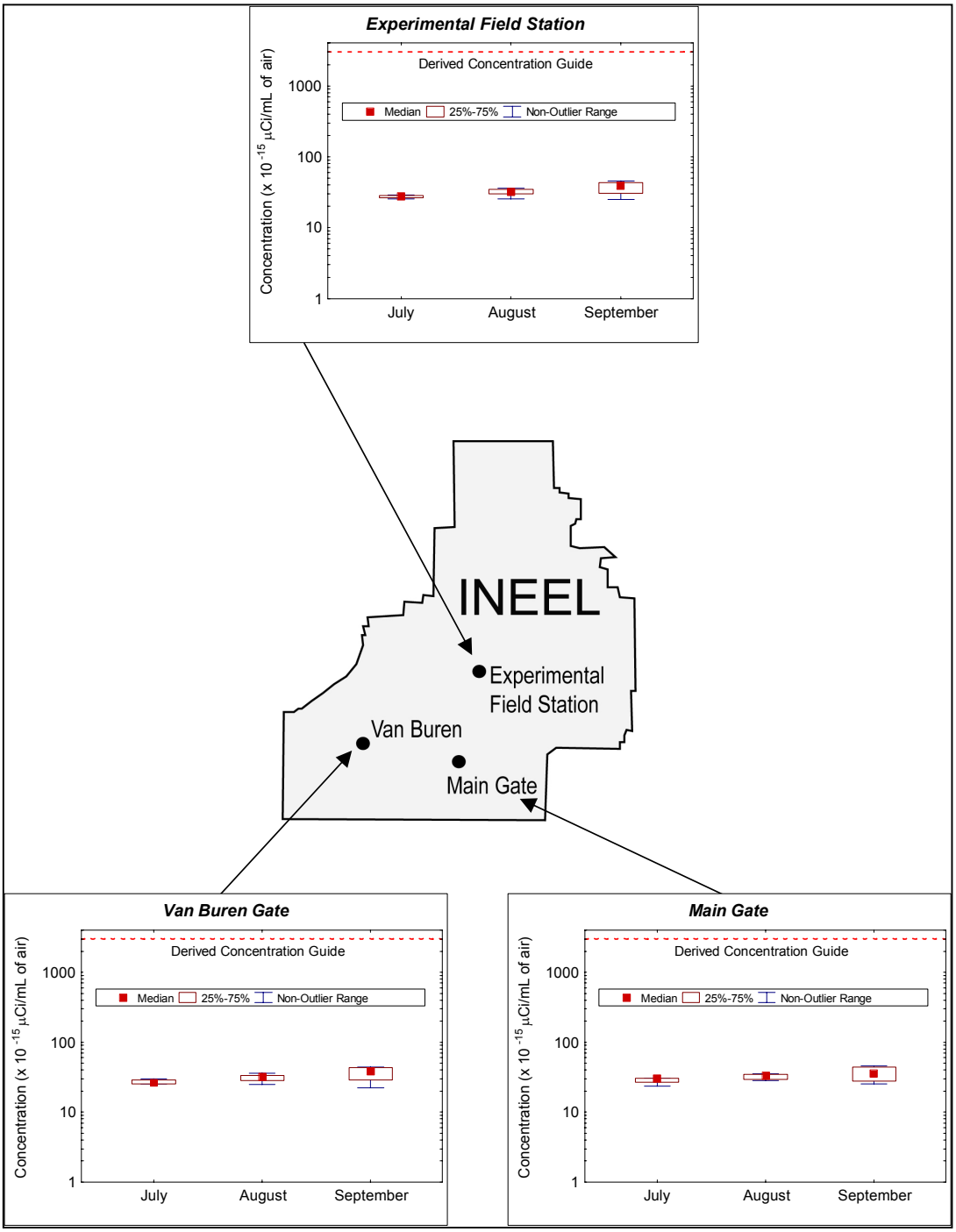

FIGURE 7. Monthly median gross beta concentrations in air at INEEL locations.

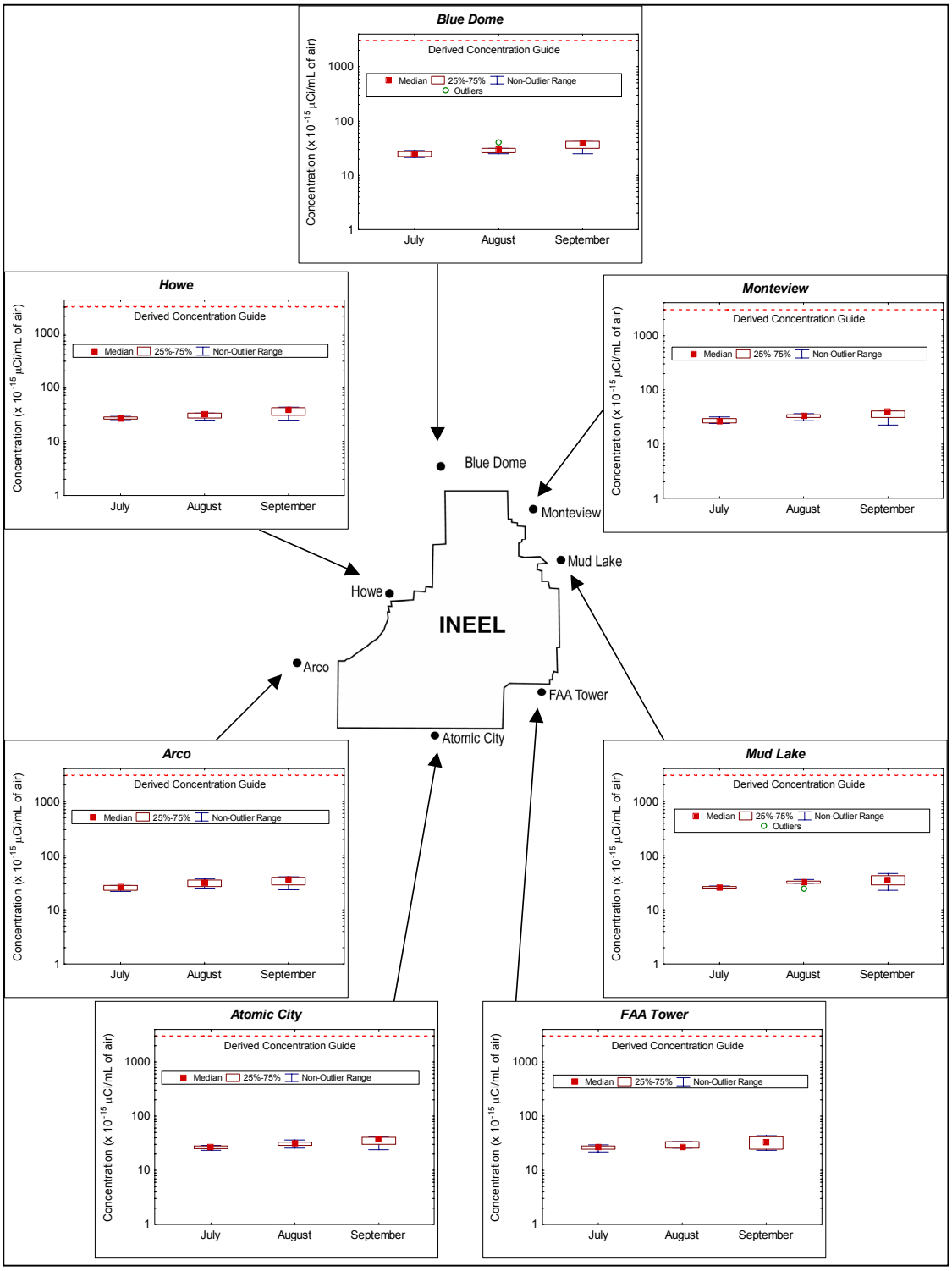

FIGURE 8. Monthly median gross beta concentrations in air at Boundary locations.

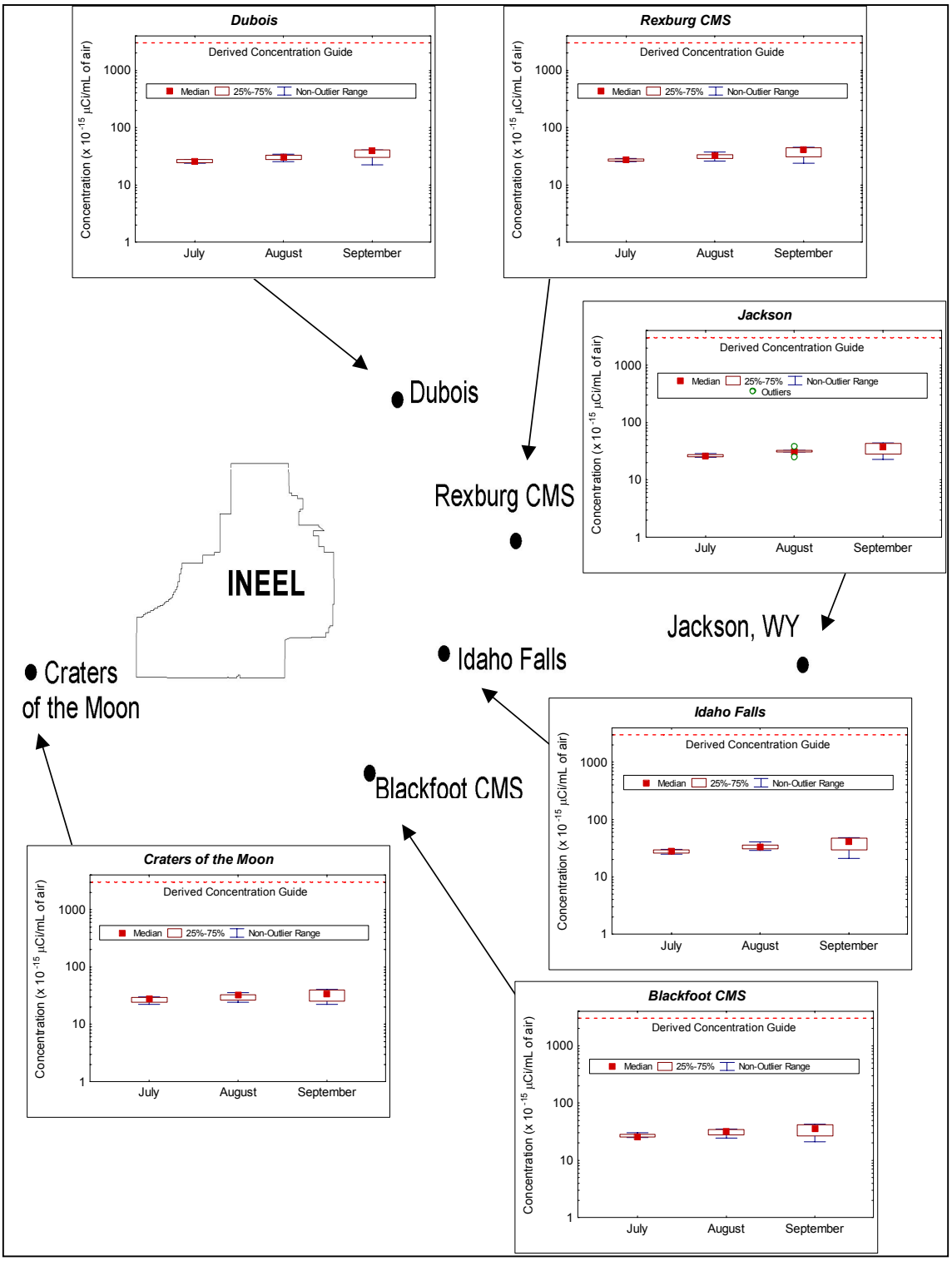

FIGURE 9. Monthly median beta gross beta concentrations in air at Distant locations.

Weekly filters for the third quarter of 2001 were composited by location. All samples were analyzed for gamma emitting radionuclides including ^{137}Cs. Composites are also analyzed by location for ^{90}Sr, or ^{238}Pu, $^{239/240}Pu$, and ^{241}Am as determined by a schedule that rotates quarterly. Cesium-137 was not detected in any of the third quarter composite samples. Several human-made radionuclides were detected including ^{90}Sr, ^{238}Pu, $^{239/240}Pu$, and ^{241}Am.

Strontium-90 was detected in the Mud Lake, Atomic City, Arco, Dubois, and Arco Q/A-1 samples. Plutonium-238 was detected in all of the locations except Idaho Falls, EFS, and Howe Q/A-2. Plutonium-239/240 was detected in only the Idaho Falls, Howe, and FAA Tower locations. Americium-241 was detected only in the EFS sample. Samples with detected radionuclides are shown in Figure 12.

Levels of ^{90}Sr were significantly lower than the associated DCG value. Levels of $^{239/240}Pu$ were much lower than the associated DCG value. Levels of ^{238}Pu were well below the associated DCG value. The level of ^{241}Am detected was many times lower than its associated DCG value.

Strontium-90, ^{238}Pu, $^{239/240}Pu$, and ^{241}Am were deposited around the world from atmospheric nuclear weapons testing, so the measurements of these radionuclides do not necessarily indicate releases from the INEEL. Concentrations are within the range of values reported in past quarterly reports (Table B-1), and within the range of values reported throughout the world (EPA, 2002). Results for all composite filter samples are shown in Table C-3 of Appendix C.

3.2 Atmospheric Moisture Sampling

Fourteen atmospheric moisture samples for the third quarter of 2001 were obtained as follows: two from Atomic City, four from the Blackfoot CMS, three from Idaho Falls, and five from the Rexburg CMS. The samples were analyzed for tritium using liquid scintillation.

Tritium was detected in seven of fourteen samples with results that were well below the Derived Concentration Guide (DCG) value of 1×10^{-7} µCi/mL (3.7×10^{-3} Bq/mL) for tritium in air. While an INEEL source cannot be discounted for contributing to this, the measured levels were within the range of values observed in past quarters. Low levels of tritium exist in the environment at all times and we conclude that the values detected are within the range of values expected naturally. The major, natural source of tritium is cosmic ray reactions in the upper atmosphere. Tritium results for all atmospheric moisture samples are listed in Table C-4 (Appendix C).

3.3 PM_{10} Air Sampling

In 1987, the EPA began using a standard (40 CFR 50.6) for concentrations of airborne particulate matter less than 10 micrometers in diameter (PM_{10}). Particles of this size can reach the lungs and are considered to be responsible for most of the adverse health effects associated with airborne particulate pollution.

ESER Program personnel operate three PM_{10} samplers, one at Rexburg CMS, one at Blackfoot CMS, and one at Atomic City. A sample was collected for a period of 24 hours, once every six days. This interval yields 15 samples per location, per quarter. However due to

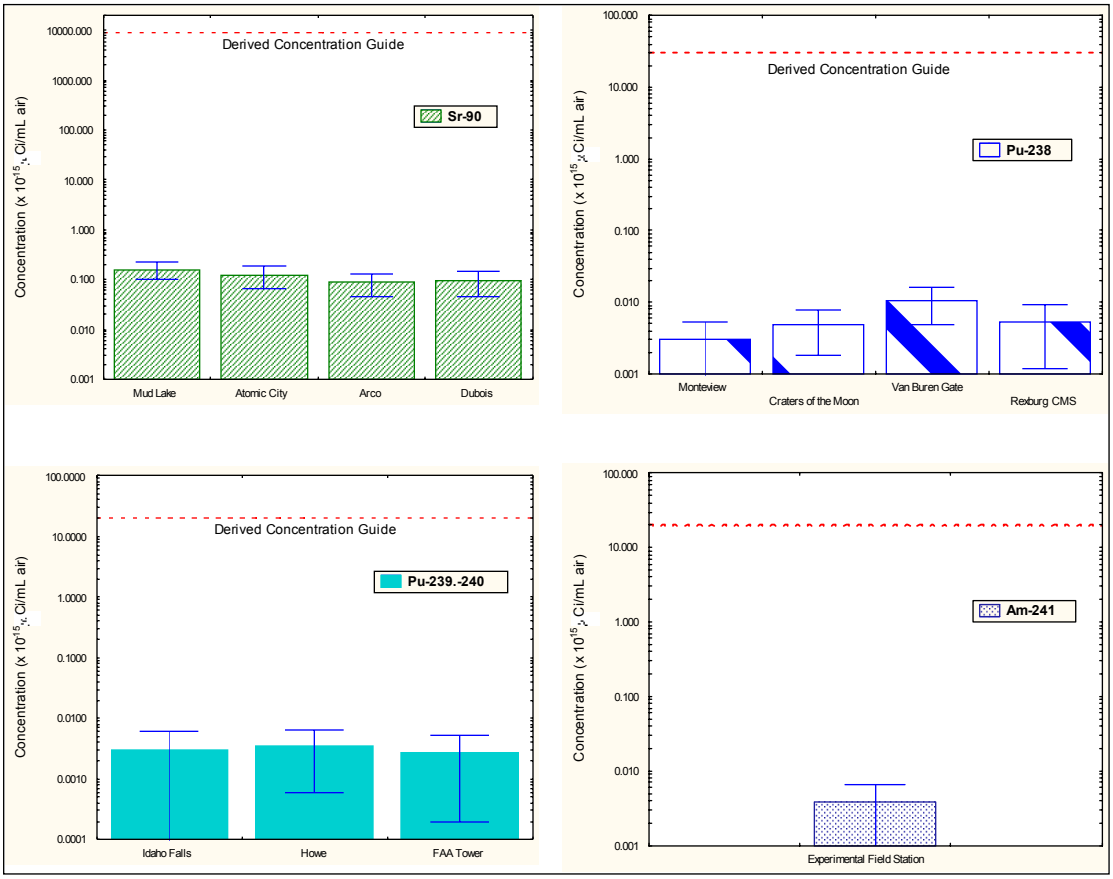

FIGURE 10. Specific radionuclides detected in quarterly composite air filters (by location). Each bar represents a measurement. Error bars (± 2 standard deviations) encompass each measurement.

equipment failures, insufficient run time (24 hrs ± 1 hour), and/or filter problems, several samples were invalid during the 3rd quarter including three from the Blackfoot CMS location (July 11, July 17, and September 21) and five samples from the Rexburg CMS location (July 5, August 16, August 22, August 4, and September 21). The average, maximum, and minimum results of the 24-hour samples are shown in Table 3. Results for all PM_{10} samples are listed in Table C-5, Appendix C.

The air quality standards for PM_{10} are an annual average of 50 µg/m^3, with a maximum 24-hour concentration of 150 µg/m^3. PM_{10} concentrations for the third quarter of 2001 were well below all air quality standard levels. The maximum 24-hour concentration was 47.1 µg/m^3 on July 5, in Atomic City.

TABLE 3. Summary of 24-hour PM_{10} Values (µg/m^3) for each station.

	Average	Maximum	Minimum
Atomic City	23.9	47.1	8.8
Blackfoot CMS	24.6	38.0	9.9
Rexburg CMS	26.0	46.8	12.6

Air quality PM_{10} standards permit an annual average of 50 µg/m^3, and a maximum 24-hour concentration of 150 µg/m^3.

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4. WATER SAMPLING

The ESER program samples surface water, drinking water and precipitation. Surface and/or drinking water are sampled twice each year in the second and fourth quarters at 19 locations around the INEEL (see Appendix A). Monthly composite precipitation samples are collected from Idaho Falls and the Central Facilities Area (CFA) on the INEEL. Weekly precipitation samples are collected from the Experimental Field Station (EFS) on the INEEL. This section discusses precipitation samples collected during the third quarter of 2001.

4.1 Precipitation Sampling

When adequate precipitation occurred, samples were taken of a monthly composite from Idaho Falls and CFA, and weekly from the EFS. A minimum sample volume of approximately 20 mL of precipitation is needed for a single sample. Precipitation samples are analyzed for tritium. For the third quarter of 2001, there was enough precipitation for a total of seven samples – three from Idaho Falls, three from CFA, and one from EFS.

Tritium was detected in three samples, one from Idaho Falls for August and two from CFA (August and September). While there is no regulatory restriction on tritium in precipitation, the DOE DCG and maximum contaminant level (MCL) set by EPA for tritium in drinking water can be used as a measure. The highest value was the September CFA sample with a value of 125.2 ± 63.7 pCi/L (4.64 ± 2.36 Bq/L). This value is many times below the DOE DCG and 160 times lower than the EPA MCL. Low levels of tritium exist in the environment at all times. The major natural source of tritium is cosmic ray reactions in the upper atmosphere. From 1978 to 2001 the EPA, as part of its Environmental Radiation Ambient Monitoring System (ERAMS), measured tritium from -2.00×10^2 to 7.38×10^6 pCi/L (-7.4 to 2.7×10^5 Bq/L) in precipitation samples across the United States (EPA, 2002). Data for all precipitation samples for the third quarter 2001 are listed in Table C-6 (Appendix C).

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5. AGRICULTURAL PRODUCTS AND WILDLIFE SAMPLING

Another potential pathway for contaminants to reach humans is through the food chain. The ESER Program samples multiple, important agricultural products, game animals, and garden lettuce around the INEEL and Southeast Idaho. Specifically, milk, wheat, potatoes, sheep, garden lettuce, big game, waterfowl, and doves are sampled. Fish are also sampled as available (i.e., when there is flow in the Big Lost River). Milk is sampled throughout the year. Sheep are sampled during the second quarter. Lettuce and wheat are sampled during the third quarter while potatoes and waterfowl are collected during the fourth quarter. Big game and fish are sampled as they come available. See Table A-1, Appendix A, for more details on agricultural and wildlife product sampling. This section discusses results from milk, large game, lettuce and wheat sampling during third quarter, 2001.

5.1 Milk Sampling

Milk samples were collected from dairies weekly in Idaho Falls and monthly at nine other locations around the INEEL (Figure 13). A total of 39 milk samples were collected during the third quarter, 2001. All samples were analyzed for gamma emitting radionuclides. Only the September sample from Roberts had initial detections of both ^{131}I and ^{137}Cs. However, reanalysis could not support either detection, suggesting these were false positives. Data for all ESER milk samples taken during the third quarter, 2001, are listed in Table C-7 (Appendix C).

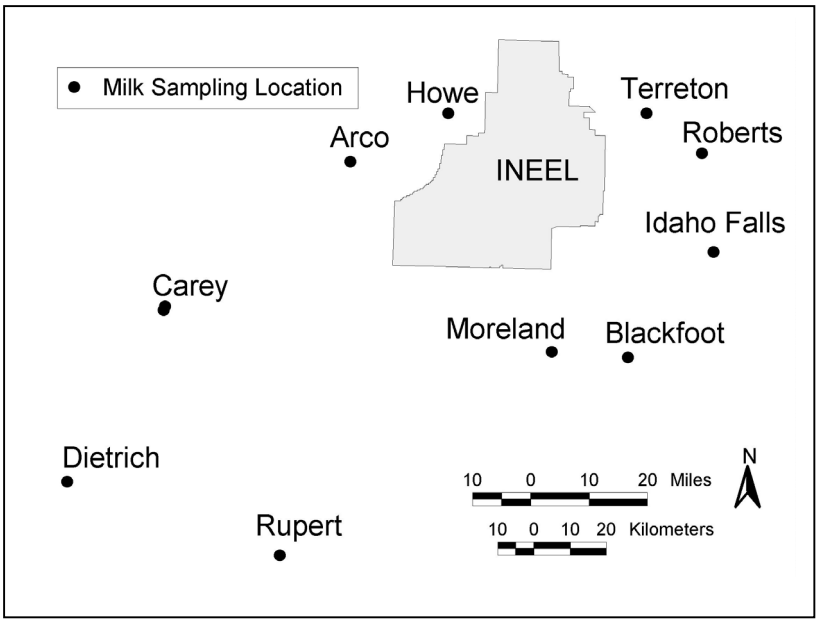

FIGURE 11. ESER Program milk sampling locations.

5.2 Large Game Animal Sampling

Five mule deer, one elk, and one pronghorn killed by vehicle collisions on the INEEL were sampled during the third quarter, 2001. Thyroid, muscle, and liver tissue were collected from each and analyzed for gamma emitting radionuclides.

Cesium-137 was detected in the muscle of two mule deer (collected on 7/9/01 and 8/7/01) and the liver of two other mule deer (collected on 8/7/01 and 8/30/01).

Cesium-137 is an analog of potassium and is readily incorporated in muscle and organ tissues. The level of ^{137}Cs detected in big game on the INEEL during the third quarter was very low and indistinguishable from that available from fallout from nuclear weapons tests or Chernobyl. Big game animals sampled in Colorado, Idaho (distant the INEEL), Montana, Oregon, Utah, and Wyoming, 1998 – 1999, had average ^{137}Cs concentrations in muscle tissue of 20 pCi/kg (0.74 Bq/kg) wet weight [range: -10 to 152 pCi/kg (-0.37 to 5.6 Bq/kg) wet weight].

Data for all big game sampled during the third quarter are listed in Table C-8 (Appendix C).

5.3 Lettuce Sampling

Nine lettuce samples were collected from private gardens and analyzed for gamma emitting radionuclides and ^{90}Sr. Cesium-137 was the only gamma emitting radionuclide detected in any of the samples. The sample from Arco had measurable ^{137}Cs at a level of 624.0 ± 500.8 pCi/kg (dry) (23.1 ± 18.5 Bq/kg [dry]). Strontium-90 was detected in three samples, those from Carey, Firth, and Idaho Falls. The Firth sample contained the highest level of ^{90}Sr at 160.0 ± 110.0 pCi/kg (dry) (5.92 ± 4.07 Bq/kg [dry]). The ^{90}Sr and ^{137}Cs concentrations fell within the range of values measured over the past 10 years and can be attributed to fallout from past weapons testing and from the Chernobyl accident.

Data for ^{137}Cs in all lettuce samples taken during the third quarter are listed in Table C-9 and ^{90}Sr data for all lettuce samples are listed in Table C-10 (Appendix C).

5.4 Wheat Sampling

A total of 14 wheat samples were collected from local grain elevators. All samples were analyzed for gamma-emitting radionuclides and ^{90}Sr. Cesium-137 was detected in the sample from American Falls at a level of 3.3 ± 3.1 pCi/kg (dry) (0.12 ± 0.11 Bq/kg [dry]). The concentration fell within the range of values measured during the past 10 years.

Data for ^{137}Cs in all wheat samples taken during the third quarter are listed in Appendix C, Table C-9, and ^{90}Sr data for all wheat samples are listed in Appendix C, Table C-10. Statement about how this compares to bkg or DCG.

6. SUMMARY AND CONCLUSIONS

Statistical analyses of Boundary and Distant gross alpha and beta air concentrations collected with low volume air samplers indicated that the INEEL did not increase radionuclide concentrations above background at Boundary and Distant locations. Radionuclides measured in third quarter, 2001, in ESER samples could not be directly linked with INEEL activities. Levels of detected radionuclides were below regulatory limits and were not different from values measured at other locations across the United States. Based on these results, it is the conclusion of the ESER Program that the INEEL did not measurably contribute to offsite radionuclide concentrations of constituents sampled during the third quarter of 2001.

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EPA. 2002, *Environmental Radiation Ambient Monitoring System Database*, United States Environmental Protection Agency, Montgomery, AL. Data file sent via e-mail communication from Tonya Hudson to Ron Warren on 1/11/02.

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APPENDIX A

SUMMARY OF SAMPLING MEDIA & SCHEDULE

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TABLE A-1: Summary of the ESER Program's Sampling Schedule

Sample Type & Analysis Method	*Collection Frequency*	*LOCATIONS*		
		Distant	*Boundary*	*INEEL*
LOW-VOLUME AIR				
Gross Alpha & Gross Beta Gamma Spectrometry (I-131)	Weekly	Blackfoot CMS, Blue Dome, Craters of the Moon, Dubois, Idaho Falls, Jackson WY, Rexburg CMS	Arco, Arco (Q/A-1), Atomic City, FAA Tower, Howe, Howe (Q/A-2), Monteview, Mud Lake	Experimental Field Station, Main Gate, Van Buren
Gamma Spectrometry (Cs-137)	Quarterly	Blackfoot CMS, Blue Dome, Craters of the Moon, Dubois, Idaho Falls, Jackson WY, Rexburg CMS	Arco, Arco (Q/A-1), Atomic City, FAA Tower, Howe, Howe (Q/A-2), Monteview, Mud Lake	Experimental Field Station, Main Gate, Van Buren
Strontium-90	Quarterly	Rotating Schedule	Rotating Schedule	Rotating Schedule
Transuranics	Quarterly	Rotating Schedule	Rotating Schedule	Rotating Schedule
ATMOSPHERIC MOISTURE				
Tritium	4 to 13 weeks	Blackfoot CMS, Idaho Falls, Rexburg CMS	Atomic City	N/A
PM-10				
Particulate Mass	every 6th day	Blackfoot CMS, Rexburg CMS	Atomic City	N/A
ENVIRONMENTAL RADIATION (TLDs)				
Gamma Radiation	semiannually	Aberdeen, Blackfoot NOAA, Blackfoot CMS, Craters of the Moon, Idaho Falls, Jackson WY, Minidoka, Rexburg CMS, Roberts	Arco, Atomic City, Howe, Monteview, Mud Lake, Birch Creek	N/A
SURFACE WATER				
Gross Alpha & Gross Beta, Tritium	semiannually	Buhl, Bliss, Hagerman, Idaho Falls, Twin Falls	N/A	N/A
DRINKING WATER				
Gross Alpha & Gross Beta, Tritium	semiannually	Aberdeen, Blackfoot, Carey, Idaho Falls, Fort Hall, Minidoka, Roberts, Shoshone	Arco, Atomic City, Howe, Monteview, Mud Lake, Birch Creek	N/A
PRECIPITATION				
Tritium	monthly	Idaho Falls	N/A	Central Facilities Area
Tritium	weekly	N/A	N/A	Experimental Field Station
MILK				
Gamma Spectrometry (I-131)	weekly	Idaho Falls	N/A	N/A
	monthly	Blackfoot, Carey, Dietrich, Rupert, Roberts, Moreland	Howe, Terreton, Arco	N/A
Tritium Strontium-90	semiannually	Rotating Schedule	Rotating Schedule	N/A

TABLE A-1: Summary of the ESER Program's Sampling Schedule

POTATOES				
Gamma Spectrometry (Cs-137)	annually	Arco, Blackfoot, Idaho Falls, Rupert, Taber, occasional samples across the U.S.	Howe, Monteview	N/A
Strontium-90				
WHEAT				
Gamma Spectrometry (Cs-137)	annually	American Falls, Blackfoot, Carey, Idaho Falls, Kosota, Minidoka, Monteview, Roberts, Taber	Mud Lake, Terreton	N/A
Strontium-90				
LETTUCE				
Gamma Spectrometry (Cs-137)	annually	Arco, Carey, Firth, Idaho Falls, Pocatello	Atomic City, Howe, Monteview, Mud Lake	N/A
Strontium-90				
BIG GAME				
Gamma Spectrometry (Cs-137 & I-131)	varies	Occasional samples across the U.S.	varies	INEEL roads & facility grounds
SHEEP				
Gamma Spectrometry (Cs-137 & I-131)	annually	Blackfoot or Dubois	N. INEEL, S. INEEL	N/A
WATERFOWL				
Gamma Spectrometry	annually	Fort Hall or Other distant locations	N/A	ANL-W Sewage Lagoon, ANL-W Industrial Waste Pond, INTEC Perc PondMarket Lake, TRA East Pond
Strontium-90				
Transuranics				
DOVES				
Gamma Spectrometry	annually	Rigby or Other distant locations	N/A	INTEC Perc Pond, Market Lake, TRA Evaporation Ponds
Strontium-90				
Transuranics				
MARMOTS				
Gamma Spectrometry	annually	Craters of the Moon, Idaho Falls	N/A	RWMC
Strontium-90				
Transuranics				
FISH				
Gamma Spectrometry	varies	N/A	N/A	Big Lost River
SOIL				
Gamma Spectrometry	biennially	Carey, Blackfoot, St. Anthony, Aberdeen	Atomic City, Butte City, FAA Tower, Howe, Monteview, Mud Lake #1, Mud Lake #2, Birch Creek	RWMC
Strontium-90				
Transuranics				

APPENDIX B

SUMMARY OF MDCs, DCGs, AND SDWA LIMITS

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TABLE B-1: Quarterly Summary of MDCs, DCGs, & SDWA Limits for Radiological Analysis

Sample Type	Analyte	Minimum Detectable Concentration [a] (MDC)	Derived Concentration Guide [b] (DCG)	Safe Drinking Water Act (SDWA) Limits	Reported Units
ATMOSPHERIC MOISTURE	TRITIUM	2.44E-13	1.00E-07		uCi/ml
CHARCOAL CARTRIDGE	IODINE-131	2.59E-15	4.00E-10		uCi/ml
DRINKING WATER	GROSS ALPHA	6.04E-01		1.50E+01	pCi/L
DRINKING WATER	GROSS BETA	2.35E+00		5.00E+01	pCi/L
DRINKING WATER	TRITIUM	1.13E+02		2.00E+04	pCi/L
FILTER	GROSS ALPHA	1.08E-15	2.00E-14		uCi/ml
FILTER	GROSS BETA	2.05E-15	3.00E-12		uCi/ml
FILTER COMPOSITES	AMERICIUM-241	1.30E-18	2.00E-14		uCi/ml
FILTER COMPOSITES	CESIUM-137	3.03E-16	4.00E-10		uCi/ml
FILTER COMPOSITES	PLUTONIUM-238	1.05E-18	3.00E-14		uCi/ml
FILTER COMPOSITES	PLUTONIUM-239/240	1.66E-18	2.00E-14		uCi/ml
FILTER COMPOSITES	STRONTIUM-90	7.94E-17	9.00E-12		uCi/ml
MILK	IODINE-131	4.27E-01	3.00E+03		pCi/L
MILK	STRONTIUM-90	4.64E-04	1.00E+03		PCI/L
MILK	TRITIUM	5.50E+01		2.00E+04	pCi/L
PRECIPITATION	TRITIUM	1.23E+02		2.00E+04	pCi/L
SURFACE WATER	GROSS ALPHA	6.04E-01		1.50E+01	pCi/L
SURFACE WATER	GROSS BETA	2.35E+00		5.00E+01	pCi/L
SURFACE WATER	TRITIUM	1.13E+02		2.00E+04	pCi/L

Note1: ***The values in this table are expressed in shorthand scientific notation as opposed to longhand scientific notation. For example 1.08 x 10^{-15} is expressed as 1.08E-15. The two forms are equivalent.***

[a] ***The MDC is an estimate of the concentration of radioactivity in a given sample type that can be quantitatively identified with a 95% level of confidence under a specified set of typical laboratory measurement conditions.***

[b] ***DCGs, set by the DOE, represent the quantity of a single radionuclide which will result in a 100 mrem/yr regulatory dose limit through ingestion, inhalation, &/or direct exposure (or any combination of these pathways). For drinking & surface water, the more conservative SDWA limit of 4 mrem/yr is used & represents the maximum quantity of a single radionuclide that can be consumed through these specific pathways.***

Note2: ***For the sample type = filter, the DCG value for Americium-241 was used for gross alpha, while the DCG value for Radium-228 was used for gross beta.***

Note3: ***There is not an SDWA limit available for tritium in precipitation or in milk, therefore we use the drinking water/ surface water limit.***

Note4: ***Since there are no DCG values for lettuce, wheat and potatoes, doses are calculated using Dose Conversion Factors (EPA 1988) .***

Note5: ***The approximate MDC for atmospheric moisture is expressed for tritium (as tritiated water) in air, and is based on the average filtered air volume of 18.4m^3.***

Note6: ***The approximate MDC for the charcoal cartridge and filters is based on the average filtered air volume (pressure corrected) of 330m^3/week.***

Note7: ***The approximate MDC for the filter composites is based on the average filtered air volume (pressure corrected) of 4428m^3/quarter.***

APPENDIX C

SUMMARY OF SAMPLE ANALYSIS RESULTS

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TABLE C-1: Weekly Gross Alpha & Gross Beta Concentrations in Air

Sample Group & Location	Sampling Date	GROSS ALPHA Concentration +/- 2s x 10 -15 µCi /mL	GROSS ALPHA Concentration +/- 2s x 10 -10 Bq /mL	GROSS BETA Concentration +/- 2s x 10 -15 µCi /mL	GROSS BETA Concentration +/- 2s x 10 -10 Bq /mL
BOUNDARY					
ARCO					
	7/3/01	2.0 ± 0.8	0.8 ± 0.3	21.2 ± 2.2	7.8 ± 0.8
	7/11/01	1.8 ± 0.7	0.7 ± 0.3	26.7 ± 2.1	9.9 ± 0.8
	7/18/01	1.8 ± 0.7	0.7 ± 0.2	28.1 ± 2.1	10.4 ± 0.8
	7/25/01	1.4 ± 1.1	0.5 ± 0.4	22.9 ± 2.5	8.5 ± 0.9
	8/1/01	1.7 ± 0.7	0.6 ± 0.3	24.7 ± 2.1	9.1 ± 0.8
	8/8/01	1.4 ± 0.7	0.5 ± 0.2	28.4 ± 2.2	10.5 ± 0.8
	8/15/01	1.8 ± 1.1	0.7 ± 0.4	25.6 ± 2.7	9.5 ± 1.0
	8/22/01	2.3 ± 0.8	0.9 ± 0.3	35.4 ± 2.6	13.1 ± 1.0
	8/29/01	3.0 ± 0.9	1.1 ± 0.3	34.2 ± 2.4	12.7 ± 0.9
	9/5/01	2.2 ± 0.9	0.8 ± 0.3	37.7 ± 2.7	13.9 ± 1.0
	9/12/01	1.4 ± 0.6	0.5 ± 0.2	21.9 ± 2.0	8.1 ± 0.7
	9/19/01	2.3 ± 1.0	0.8 ± 0.4	37.6 ± 3.2	13.9 ± 1.2
	9/26/01	1.8 ± 0.8	0.7 ± 0.3	36.9 ± 2.6	13.7 ± 1.0
ARCO (Q/A-1)					
	7/3/01	1.9 ± 0.9	0.7 ± 0.3	22.6 ± 2.5	8.4 ± 0.9
	7/11/01	2.9 ± 0.8	1.1 ± 0.3	30.2 ± 2.2	11.2 ± 0.8
	7/18/01	2.7 ± 0.8	1.0 ± 0.3	27.9 ± 2.3	10.3 ± 0.8
	7/25/01	1.2 ± 1.1	0.4 ± 0.4	25.4 ± 2.7	9.4 ± 1.0
	8/1/01	1.9 ± 0.8	0.7 ± 0.3	25.2 ± 2.3	9.3 ± 0.8
	8/8/01	2.0 ± 0.8	0.7 ± 0.3	34.6 ± 2.7	12.8 ± 1.0
	8/15/01	1.5 ± 1.1	0.5 ± 0.4	28.1 ± 2.9	10.4 ± 1.1
	8/22/01	3.4 ± 1.6	1.3 ± 0.6	38.4 ± 4.4	14.2 ± 1.6
	8/29/01	2.4 ± 0.8	0.9 ± 0.3	36.2 ± 2.5	13.4 ± 0.9
	9/5/01	1.9 ± 1.1	0.7 ± 0.4	43.1 ± 3.6	16.0 ± 1.3
	9/12/01	1.3 ± 0.9	0.5 ± 0.4	24.6 ± 3.0	9.1 ± 1.1
	9/19/01	2.4 ± 1.0	0.9 ± 0.4	31.2 ± 3.1	11.5 ± 1.1
	9/26/01	2.3 ± 1.1	0.9 ± 0.4	41.4 ± 3.4	15.3 ± 1.3
ATOMIC CITY					
	7/3/01	1.8 ± 0.9	0.7 ± 0.3	28.9 ± 2.8	10.7 ± 1.0
	7/11/01	2.0 ± 0.9	0.7 ± 0.3	27.2 ± 2.7	10.1 ± 1.0
	7/18/01	3.6 ± 1.1	1.3 ± 0.4	26.4 ± 2.8	9.8 ± 1.0
	7/25/01	2.1 ± 1.4	0.8 ± 0.5	23.6 ± 2.9	8.7 ± 1.1
	8/1/01	1.2 ± 0.7	0.4 ± 0.3	25.6 ± 2.5	9.5 ± 0.9
	8/8/01	2.5 ± 1.0	0.9 ± 0.4	33.6 ± 2.9	12.4 ± 1.1
	8/15/01	3.0 ± 1.4	1.1 ± 0.5	28.7 ± 3.2	10.6 ± 1.2
	8/22/01	2.8 ± 1.0	1.0 ± 0.4	32.1 ± 2.7	11.9 ± 1.0
	8/29/01	2.4 ± 1.0	0.9 ± 0.4	36.0 ± 2.9	13.3 ± 1.1
	9/5/01	2.1 ± 1.0	0.8 ± 0.4	40.1 ± 3.1	14.9 ± 1.2
	9/12/01	1.5 ± 0.8	0.5 ± 0.3	23.9 ± 2.4	8.9 ± 0.9
	9/19/01	1.6 ± 0.8	0.6 ± 0.3	36.1 ± 2.9	13.3 ± 1.1
	9/26/01	2.4 ± 1.0	0.9 ± 0.4	41.5 ± 3.0	15.4 ± 1.1

NOTE: Q/A-1 and Q/A-2 are replicate samplers placed at the stated location.

TABLE C-1 (cont.): Weekly Gross Alpha & Gross Beta Concentrations in Air

Sample Group & Location	Sampling Date	GROSS ALPHA		GROSS BETA	
		Concentration +/- 2s x 10^{-15} µCi /mL	Concentration +/- 2s x 10^{-10} Bq /mL	Concentration +/- 2s x 10^{-15} µCi /mL	Concentration +/- 2s x 10^{-10} Bq /mL
BLUE DOME					
	7/3/01	2.2 ± 1.1	0.8 ± 0.4	21.3 ± 2.9	7.9 ± 1.1
	7/11/01	1.1 ± 0.7	0.4 ± 0.3	26.2 ± 2.5	9.7 ± 0.9
	7/18/01	2.6 ± 0.9	1.0 ± 0.3	28.7 ± 2.7	10.6 ± 1.0
	7/25/01	0.6 ± 1.3	0.2 ± 0.5	23.6 ± 3.2	8.7 ± 1.2
	8/1/01	1.1 ± 0.8	0.4 ± 0.3	24.6 ± 2.6	9.1 ± 1.0
	8/8/01	2.3 ± 1.0	0.9 ± 0.4	29.8 ± 2.9	11.0 ± 1.1
	8/15/01	1.8 ± 1.5	0.7 ± 0.5	26.3 ± 3.3	9.7 ± 1.2
	8/22/01	2.8 ± 1.1	1.0 ± 0.4	40.5 ± 3.4	15.0 ± 1.3
	8/29/01	1.5 ± 0.9	0.6 ± 0.3	31.5 ± 3.0	11.6 ± 1.1
	9/5/01	2.3 ± 1.1	0.8 ± 0.4	40.6 ± 3.3	15.0 ± 1.2
	9/12/01	1.1 ± 0.8	0.4 ± 0.3	24.7 ± 2.6	9.1 ± 1.0
	9/19/01	1.8 ± 0.9	0.7 ± 0.3	37.9 ± 3.2	14.0 ± 1.2
	9/26/01	2.1 ± 1.0	0.8 ± 0.4	43.9 ± 3.3	16.3 ± 1.2
FAA TOWER					
	7/3/01	1.2 ± 0.9	0.4 ± 0.3	27.6 ± 3.2	10.2 ± 1.2
	7/11/01	1.7 ± 0.9	0.6 ± 0.3	26.8 ± 2.6	9.9 ± 1.0
	7/18/01	2.5 ± 0.9	0.9 ± 0.3	29.4 ± 2.7	10.9 ± 1.0
	7/25/01	0.9 ± 1.3	0.3 ± 0.5	21.9 ± 3.1	8.1 ± 1.1
	8/1/01	2.2 ± 0.9	0.8 ± 0.4	25.8 ± 2.7	9.5 ± 1.0
	8/8/01	1.8 ± 1.0	0.7 ± 0.4	27.2 ± 3.0	10.1 ± 1.1
	8/15/01	2.9 ± 1.6	1.1 ± 0.6	25.5 ± 3.3	9.4 ± 1.2
	8/22/01	3.3 ± 1.3	1.2 ± 0.5	34.3 ± 3.6	12.7 ± 1.3
	8/29/01	1.6 ± 1.1	0.6 ± 0.4	33.9 ± 3.4	12.5 ± 1.3
	9/5/01	2.8 ± 1.3	1.0 ± 0.5	40.3 ± 3.7	14.9 ± 1.4
	9/12/01	1.1 ± 0.8	0.4 ± 0.3	23.6 ± 2.6	8.7 ± 1.0
	9/19/01	1.4 ± 0.8	0.5 ± 0.3	25.8 ± 2.6	9.6 ± 1.0
	9/26/01	2.6 ± 1.1	0.9 ± 0.4	43.6 ± 3.3	16.1 ± 1.2
HOWE					
	7/3/01	2.5 ± 1.0	0.9 ± 0.4	24.6 ± 2.7	9.1 ± 1.0
	7/11/01	1.8 ± 0.8	0.7 ± 0.3	30.2 ± 2.5	11.2 ± 0.9
	7/18/01	1.9 ± 0.8	0.7 ± 0.3	28.3 ± 2.6	10.5 ± 1.0
	7/25/01	1.6 ± 1.4	0.6 ± 0.5	27.9 ± 3.2	10.3 ± 1.2
	8/1/01	1.8 ± 0.8	0.7 ± 0.3	24.8 ± 2.5	9.2 ± 0.9
	8/8/01	1.8 ± 0.9	0.7 ± 0.3	33.9 ± 3.0	12.5 ± 1.1
	8/15/01	2.1 ± 1.3	0.8 ± 0.5	28.5 ± 3.1	10.5 ± 1.2
	8/22/01	3.2 ± 1.1	1.2 ± 0.4	33.0 ± 2.9	12.2 ± 1.1
	8/29/01	2.0 ± 0.9	0.8 ± 0.3	33.4 ± 2.8	12.4 ± 1.0
	9/5/01	2.8 ± 1.1	1.0 ± 0.4	41.4 ± 3.2	15.3 ± 1.2
	9/12/01	1.5 ± 0.8	0.6 ± 0.3	25.3 ± 2.4	9.4 ± 0.9
	9/19/01	2.3 ± 0.9	0.8 ± 0.3	34.2 ± 2.8	12.7 ± 1.0
	9/26/01	2.9 ± 1.0	1.1 ± 0.4	42.1 ± 3.0	15.6 ± 1.1

NOTE: Q/A-1 and Q/A-2 are replicate samplers placed at the stated location.

TABLE C-1 (cont.): Weekly Gross Alpha & Gross Beta Concentrations in Air

Sample Group & Location	Sampling Date	GROSS ALPHA		GROSS BETA	
		Concentration +/- 2s x 10^{-15} µCi /mL	Concentration +/- 2s x 10^{-10} Bq /mL	Concentration +/- 2s x 10^{-15} µCi /mL	Concentration +/- 2s x 10^{-10} Bq /mL
HOWE (Q/A-2)					
	7/3/01	1.5 ± 0.8	0.6 ± 0.3	25.9 ± 2.6	9.6 ± 1.0
	7/11/01	1.6 ± 0.7	0.6 ± 0.3	27.7 ± 2.2	10.3 ± 0.8
	7/18/01	2.2 ± 0.8	0.8 ± 0.3	26.2 ± 2.4	9.7 ± 0.9
	7/25/01	0.3 ± 1.0	0.1 ± 0.4	23.5 ± 2.7	8.7 ± 1.0
	8/1/01	2.5 ± 0.9	0.9 ± 0.3	24.5 ± 2.3	9.1 ± 0.8
	8/8/01	1.3 ± 0.7	0.5 ± 0.3	29.8 ± 2.5	11.0 ± 0.9
	8/15/01	1.0 ± 1.1	0.4 ± 0.4	25.1 ± 2.8	9.3 ± 1.0
	8/22/01	3.3 ± 1.0	1.2 ± 0.4	33.0 ± 2.6	12.2 ± 1.0
	8/29/01	2.5 ± 0.9	0.9 ± 0.3	33.2 ± 2.7	12.3 ± 1.0
	9/5/01	2.3 ± 0.9	0.8 ± 0.3	40.5 ± 2.9	15.0 ± 1.1
	9/12/01	1.6 ± 0.8	0.6 ± 0.3	23.3 ± 2.3	8.6 ± 0.9
	9/19/01	2.0 ± 0.8	0.7 ± 0.3	36.7 ± 2.7	13.6 ± 1.0
	9/26/01	2.4 ± 0.9	0.9 ± 0.3	43.3 ± 2.9	16.0 ± 1.1
MONTEVIEW					
	7/3/01	2.0 ± 1.1	0.7 ± 0.4	27.8 ± 3.3	10.3 ± 1.2
	7/11/01	1.2 ± 1.0	0.4 ± 0.4	25.3 ± 3.1	9.4 ± 1.1
	7/18/01	2.2 ± 0.8	0.8 ± 0.3	31.7 ± 2.7	11.7 ± 1.0
	7/25/01	1.6 ± 1.4	0.6 ± 0.5	24.0 ± 3.1	8.9 ± 1.1
	8/1/01	2.8 ± 1.0	1.0 ± 0.4	27.0 ± 2.6	10.0 ± 0.9
	8/8/01	1.5 ± 0.8	0.6 ± 0.3	36.4 ± 2.9	13.5 ± 1.1
	8/15/01	2.7 ± 1.5	1.0 ± 0.6	33.6 ± 3.6	12.4 ± 1.3
	8/22/01	2.9 ± 1.0	1.1 ± 0.4	31.2 ± 2.8	11.5 ± 1.0
	8/29/01	2.6 ± 1.0	1.0 ± 0.4	35.1 ± 2.8	13.0 ± 1.0
	9/5/01	2.4 ± 1.0	0.9 ± 0.4	39.3 ± 3.1	14.5 ± 1.2
	9/12/01	1.5 ± 0.8	0.5 ± 0.3	22.4 ± 2.3	8.3 ± 0.9
	9/19/01	7.4 ± 5.0	2.8 ± 1.9	41.6 ± 13.4	15.4 ± 5.0
	9/26/01	3.0 ± 1.0	1.1 ± 0.4	40.9 ± 3.0	15.1 ± 1.1
MUD LAKE					
	7/3/01	1.8 ± 0.8	0.7 ± 0.3	27.4 ± 2.4	10.2 ± 0.9
	7/11/01	2.7 ± 0.8	1.0 ± 0.3	25.5 ± 2.0	9.4 ± 0.7
	7/18/01	1.8 ± 0.7	0.7 ± 0.2	26.1 ± 2.1	9.7 ± 0.8
	7/25/01	1.6 ± 1.1	0.6 ± 0.4	25.0 ± 2.5	9.2 ± 0.9
	8/1/01	1.4 ± 0.7	0.5 ± 0.2	24.5 ± 2.1	9.1 ± 0.8
	8/8/01	2.8 ± 0.9	1.0 ± 0.3	32.6 ± 2.5	12.1 ± 0.9
	8/15/01	2.9 ± 1.2	1.1 ± 0.5	30.6 ± 2.8	11.3 ± 1.0
	8/22/01	3.1 ± 1.0	1.1 ± 0.4	34.1 ± 2.7	12.6 ± 1.0
	8/29/01	1.7 ± 0.7	0.6 ± 0.3	36.5 ± 2.5	13.5 ± 0.9
	9/5/01	2.5 ± 0.9	0.9 ± 0.3	37.3 ± 2.6	13.8 ± 1.0
	9/12/01	2.0 ± 0.7	0.7 ± 0.3	22.7 ± 2.0	8.4 ± 0.8
	9/19/01	2.0 ± 0.7	0.7 ± 0.3	34.9 ± 2.6	12.9 ± 0.9
	9/26/01	2.6 ± 0.9	1.0 ± 0.3	47.1 ± 3.0	17.4 ± 1.1

NOTE: Q/A-1 and Q/A-2 are replicate samplers placed at the stated location.

TABLE C-1 (cont.): Weekly Gross Alpha & Gross Beta Concentrations in Air

Sample Group & Location	Sampling Date	GROSS ALPHA		GROSS BETA	
		Concentration +/- 2s x 10^{-15} µCi /mL	Concentration +/- 2s x 10^{-10} Bq /mL	Concentration +/- 2s x 10^{-15} µCi /mL	Concentration +/- 2s x 10^{-10} Bq /mL
DISTANT					
BLACKFOOT, CMS					
	7/3/01	3.1 ± 1.2	1.1 ± 0.5	25.5 ± 3.1	9.4 ± 1.1
	7/11/01	3.0 ± 1.1	1.1 ± 0.4	26.4 ± 2.6	9.8 ± 1.0
	7/18/01	2.8 ± 1.0	1.0 ± 0.4	30.4 ± 2.9	11.3 ± 1.1
	7/25/01	1.5 ± 1.4	0.6 ± 0.5	25.1 ± 3.2	9.3 ± 1.2
	8/1/01	1.6 ± 0.9	0.6 ± 0.3	24.6 ± 2.8	9.1 ± 1.0
	8/8/01	3.2 ± 1.1	1.2 ± 0.4	34.2 ± 3.1	12.7 ± 1.1
	8/15/01	2.4 ± 1.6	0.9 ± 0.6	27.5 ± 3.5	10.2 ± 1.3
	8/22/01	4.9 ± 1.4	1.8 ± 0.5	31.6 ± 3.1	11.7 ± 1.2
	8/29/01	1.9 ± 1.0	0.7 ± 0.4	35.4 ± 3.1	13.1 ± 1.2
	9/5/01	1.6 ± 2.2	0.6 ± 0.8	39.9 ± 6.4	14.8 ± 2.4
	9/12/01	1.4 ± 0.8	0.5 ± 0.3	21.1 ± 2.5	7.8 ± 0.9
	9/19/01	2.1 ± 0.9	0.8 ± 0.3	32.0 ± 2.9	11.8 ± 1.1
	9/26/01	2.4 ± 1.1	0.9 ± 0.4	42.9 ± 3.3	15.9 ± 1.2
CRATERS OF THE MOON					
	7/3/01	2.0 ± 0.9	0.7 ± 0.3	26.3 ± 2.5	9.7 ± 0.9
	7/11/01	1.0 ± 0.6	0.4 ± 0.2	29.8 ± 2.2	11.0 ± 0.8
	7/18/01	2.2 ± 0.7	0.8 ± 0.3	28.4 ± 2.2	10.5 ± 0.8
	7/25/01	0.8 ± 1.1	0.3 ± 0.4	22.0 ± 2.7	8.2 ± 1.0
	8/1/01	1.4 ± 0.8	0.5 ± 0.3	24.2 ± 2.4	8.9 ± 0.9
	8/8/01	1.5 ± 0.8	0.6 ± 0.3	32.9 ± 2.6	12.2 ± 1.0
	8/15/01	3.5 ± 3.3	1.3 ± 1.2	26.4 ± 6.4	9.8 ± 2.4
	8/22/01	3.1 ± 1.0	1.1 ± 0.4	35.4 ± 2.9	13.1 ± 1.1
	8/29/01	1.8 ± 0.9	0.7 ± 0.3	32.5 ± 2.7	12.0 ± 1.0
	9/5/01	2.6 ± 1.0	1.0 ± 0.4	40.1 ± 2.9	14.8 ± 1.1
	9/12/01	0.9 ± 0.6	0.3 ± 0.2	22.3 ± 2.2	8.3 ± 0.8
	9/19/01	1.7 ± 0.7	0.6 ± 0.3	28.7 ± 2.5	10.6 ± 0.9
	9/26/01	2.1 ± 0.9	0.8 ± 0.3	39.5 ± 2.8	14.6 ± 1.0
DUBOIS					
	7/3/01	2.7 ± 1.8	1.0 ± 0.7	24.4 ± 4.6	9.0 ± 1.7
	7/11/01	1.4 ± 0.9	0.5 ± 0.3	27.7 ± 2.9	10.2 ± 1.1
	7/18/01	1.9 ± 0.9	0.7 ± 0.3	24.1 ± 2.6	8.9 ± 1.0
	7/25/01	1.7 ± 1.9	0.6 ± 0.7	27.4 ± 4.1	10.1 ± 1.5
	8/1/01	1.5 ± 1.6	0.6 ± 0.6	28.0 ± 4.9	10.4 ± 1.8
	8/8/01	1.9 ± 0.8	0.7 ± 0.3	33.2 ± 2.6	12.3 ± 1.0
	8/15/01	1.9 ± 1.1	0.7 ± 0.4	25.6 ± 2.7	9.5 ± 1.0
	8/22/01	2.6 ± 0.9	1.0 ± 0.3	30.1 ± 2.6	11.1 ± 0.9
	8/29/01	1.3 ± 0.8	0.5 ± 0.3	34.4 ± 2.7	12.7 ± 1.0
	9/5/01	1.5 ± 0.8	0.6 ± 0.3	41.2 ± 2.9	15.3 ± 1.1
	9/12/01	1.5 ± 0.7	0.6 ± 0.3	22.2 ± 2.2	8.2 ± 0.8
	9/19/01	2.4 ± 0.8	0.9 ± 0.3	37.9 ± 2.8	14.0 ± 1.0
	9/26/01	2.3 ± 0.9	0.9 ± 0.3	39.8 ± 2.8	14.7 ± 1.0

NOTE: Q/A-1 and Q/A-2 are replicate samplers placed at the stated location.

TABLE C-1 (cont.): Weekly Gross Alpha & Gross Beta Concentrations in Air

Sample Group & Location	Sampling Date	GROSS ALPHA		GROSS BETA	
		Concentration +/- 2s x 10^{-15} µCi /mL	Concentration +/- 2s x 10^{-10} Bq /mL	Concentration +/- 2s x 10^{-15} µCi /mL	Concentration +/- 2s x 10^{-10} Bq /mL
IDAHO FALLS					
	7/3/01	1.7 ± 1.1	0.6 ± 0.4	27.5 ± 3.5	10.2 ± 1.3
	7/11/01	2.4 ± 1.1	0.9 ± 0.4	29.5 ± 3.0	10.9 ± 1.1
	7/18/01	2.4 ± 1.1	0.9 ± 0.4	29.9 ± 3.2	11.0 ± 1.2
	7/25/01	1.6 ± 1.7	0.6 ± 0.6	25.0 ± 3.8	9.2 ± 1.4
	8/1/01	0.6 ± 0.8	0.2 ± 0.3	28.9 ± 3.0	10.7 ± 1.1
	8/8/01	2.3 ± 1.1	0.9 ± 0.4	33.3 ± 3.2	12.3 ± 1.2
	8/15/01	2.2 ± 1.7	0.8 ± 0.6	30.5 ± 3.9	11.3 ± 1.5
	8/22/01	3.4 ± 1.4	1.3 ± 0.5	36.0 ± 3.9	13.3 ± 1.4
	8/29/01	2.6 ± 1.4	1.0 ± 0.5	40.8 ± 4.1	15.1 ± 1.5
	9/5/01	3.5 ± 1.6	1.3 ± 0.6	45.0 ± 4.4	16.6 ± 1.6
	9/12/01	2.5 ± 1.1	0.9 ± 0.4	21.0 ± 2.6	7.8 ± 1.0
	9/19/01	1.6 ± 0.8	0.6 ± 0.3	37.4 ± 3.2	13.8 ± 1.2
	9/26/01	4.0 ± 1.3	1.5 ± 0.5	48.6 ± 3.6	18.0 ± 1.3
REXBURG, CMS					
	7/3/01	2.4 ± 0.9	0.9 ± 0.3	25.6 ± 2.4	9.5 ± 0.9
	7/11/01	2.4 ± 0.9	0.9 ± 0.3	27.0 ± 2.4	10.0 ± 0.9
	7/18/01	3.1 ± 0.9	1.2 ± 0.3	28.7 ± 2.5	10.6 ± 0.9
	7/25/01	1.5 ± 1.2	0.6 ± 0.4	28.0 ± 2.9	10.4 ± 1.1
	8/1/01	1.6 ± 0.8	0.6 ± 0.3	26.1 ± 2.4	9.6 ± 0.9
	8/8/01	2.3 ± 0.9	0.9 ± 0.3	32.8 ± 2.6	12.1 ± 1.0
	8/15/01	1.8 ± 1.3	0.7 ± 0.5	29.0 ± 3.0	10.7 ± 1.1
	8/22/01	3.8 ± 1.1	1.4 ± 0.4	33.8 ± 2.7	12.5 ± 1.0
	8/29/01	2.2 ± 0.9	0.8 ± 0.3	37.5 ± 2.8	13.9 ± 1.0
	9/5/01	2.3 ± 0.9	0.9 ± 0.3	45.3 ± 3.1	16.7 ± 1.1
	9/12/01	0.7 ± 0.6	0.3 ± 0.2	23.7 ± 2.3	8.8 ± 0.8
	9/19/01	2.5 ± 0.9	0.9 ± 0.3	38.6 ± 2.9	14.3 ± 1.1
	9/26/01	3.0 ± 1.0	1.1 ± 0.4	43.4 ± 2.9	16.1 ± 1.1
INEEL					
EFS					
	7/3/01	1.4 ± 0.9	0.5 ± 0.3	25.6 ± 2.8	9.5 ± 1.0
	7/11/01	2.8 ± 0.9	1.0 ± 0.3	29.0 ± 2.4	10.7 ± 0.9
	7/18/01	2.3 ± 0.8	0.9 ± 0.3	28.0 ± 2.5	10.4 ± 0.9
	7/25/01	2.6 ± 1.2	1.0 ± 0.4	27.0 ± 2.6	10.0 ± 1.0
	8/1/01	1.4 ± 0.7	0.5 ± 0.2	25.5 ± 2.2	9.4 ± 0.8
	8/8/01	2.1 ± 0.8	0.8 ± 0.3	36.1 ± 2.6	13.4 ± 1.0
	8/15/01	2.0 ± 1.1	0.7 ± 0.4	30.1 ± 2.8	11.1 ± 1.1
	8/22/01	3.5 ± 1.0	1.3 ± 0.4	31.7 ± 2.6	11.7 ± 1.0
	8/29/01	2.8 ± 0.9	1.0 ± 0.3	34.6 ± 2.6	12.8 ± 1.0
	9/5/01	1.4 ± 2.0	0.5 ± 0.7	45.6 ± 6.2	16.9 ± 2.3
	9/12/01	2.0 ± 0.9	0.7 ± 0.3	24.8 ± 2.6	9.2 ± 1.0
	9/19/01	1.3 ± 0.7	0.5 ± 0.3	36.7 ± 2.9	13.6 ± 1.1
	9/26/01	2.7 ± 1.0	1.0 ± 0.4	41.2 ± 2.9	15.3 ± 1.1

NOTE: Q/A-1 and Q/A-2 are replicate samplers placed at the stated location.

TABLE C-1 (cont.): Weekly Gross Alpha & Gross Beta Concentrations in Air

Sample Group & Location	Sampling Date	GROSS ALPHA		GROSS BETA	
		Concentration +/- 2s x 10^{-15} µCi /mL	Concentration +/- 2s x 10^{-10} Bq /mL	Concentration +/- 2s x 10^{-15} µCi /mL	Concentration +/- 2s x 10^{-10} Bq /mL
MAIN GATE					
	7/3/01	2.3 ± 0.9	0.9 ± 0.3	30.7 ± 2.5	11.3 ± 0.9
	7/11/01	1.8 ± 0.7	0.7 ± 0.3	30.1 ± 2.1	11.2 ± 0.8
	7/18/01	2.4 ± 0.7	0.9 ± 0.3	30.7 ± 2.1	11.3 ± 0.8
	7/25/01	2.0 ± 1.6	0.7 ± 0.6	23.6 ± 3.4	8.7 ± 1.2
	8/1/01	1.8 ± 0.9	0.7 ± 0.3	28.5 ± 2.9	10.5 ± 1.1
	8/8/01	2.4 ± 1.0	0.9 ± 0.4	33.4 ± 3.1	12.4 ± 1.1
	8/15/01	2.4 ± 1.6	0.9 ± 0.6	29.3 ± 3.5	10.9 ± 1.3
	8/22/01	2.4 ± 1.0	0.9 ± 0.4	35.0 ± 3.1	13.0 ± 1.2
	8/29/01	2.2 ± 1.0	0.8 ± 0.4	35.0 ± 3.1	13.0 ± 1.2
	9/5/01	2.1 ± 1.0	0.8 ± 0.4	41.8 ± 3.3	15.5 ± 1.2
	9/12/01	1.6 ± 0.9	0.6 ± 0.3	25.5 ± 2.7	9.4 ± 1.0
	9/19/01	1.9 ± 0.9	0.7 ± 0.3	30.4 ± 2.9	11.2 ± 1.1
	9/26/01	2.0 ± 1.0	0.7 ± 0.4	45.7 ± 3.3	16.9 ± 1.2
VAN BUREN					
	7/3/01	1.7 ± 1.0	0.6 ± 0.4	27.4 ± 3.0	10.1 ± 1.1
	7/11/01	1.8 ± 0.9	0.7 ± 0.3	25.6 ± 2.5	9.5 ± 0.9
	7/18/01	2.2 ± 0.9	0.8 ± 0.3	29.8 ± 2.8	11.0 ± 1.0
	7/25/01	2.5 ± 1.5	0.9 ± 0.6	25.4 ± 3.2	9.4 ± 1.2
	8/1/01	1.7 ± 0.9	0.6 ± 0.3	24.8 ± 2.7	9.2 ± 1.0
	8/8/01	1.7 ± 0.9	0.6 ± 0.3	32.0 ± 2.9	11.8 ± 1.1
	8/15/01	2.4 ± 1.7	0.9 ± 0.6	28.5 ± 3.8	10.5 ± 1.4
	8/22/01	3.1 ± 1.1	1.2 ± 0.4	33.4 ± 2.9	12.3 ± 1.1
	8/29/01	2.6 ± 1.1	1.0 ± 0.4	35.9 ± 3.1	13.3 ± 1.1
	9/5/01	3.6 ± 1.2	1.3 ± 0.4	41.9 ± 3.3	15.5 ± 1.2
	9/12/01	1.9 ± 0.8	0.7 ± 0.3	22.2 ± 2.2	8.2 ± 0.8
	9/19/01	2.3 ± 0.8	0.9 ± 0.3	34.9 ± 2.6	12.9 ± 0.9
	9/26/01	2.1 ± 0.9	0.8 ± 0.3	44.0 ± 3.0	16.3 ± 1.1
OUT OF STATE					
JACKSON, WYOMING					
	7/4/01	1.9 ± 0.7	0.7 ± 0.3	26.5 ± 2.1	9.8 ± 0.8
	7/11/01	2.2 ± 0.7	0.8 ± 0.3	26.0 ± 2.0	9.6 ± 0.8
	7/18/01	2.4 ± 0.7	0.9 ± 0.3	28.6 ± 2.0	10.6 ± 0.7
	7/25/01	2.1 ± 1.0	0.8 ± 0.4	24.7 ± 2.3	9.1 ± 0.9
	8/1/01	2.4 ± 0.8	0.9 ± 0.3	24.9 ± 2.2	9.2 ± 0.8
	8/8/01	2.4 ± 1.0	0.9 ± 0.4	32.6 ± 2.8	12.1 ± 1.0
	8/15/01	2.8 ± 1.4	1.0 ± 0.5	30.5 ± 3.2	11.3 ± 1.2
	8/22/01	2.2 ± 0.9	0.8 ± 0.3	30.9 ± 2.7	11.4 ± 1.0
	8/29/01	2.8 ± 1.0	1.0 ± 0.4	38.6 ± 3.0	14.3 ± 1.1
	9/5/01	2.0 ± 0.9	0.7 ± 0.3	41.9 ± 3.1	15.5 ± 1.1
	9/12/01	1.2 ± 0.7	0.5 ± 0.3	22.5 ± 2.3	8.3 ± 0.9
	9/19/01	2.7 ± 0.9	1.0 ± 0.3	33.3 ± 2.8	12.3 ± 1.0
	9/26/01	1.6 ± 0.9	0.6 ± 0.3	43.9 ± 3.2	16.3 ± 1.2

NOTE: Q/A-1 and Q/A-2 are replicate samplers placed at the stated location.

TABLE C-2: Weekly Iodine-131 Activity in Air *

Sample Group & Location	Sampling Date	Activity +/- 2s x 10^{-6} µCi			Activity +/- 2s x 10^{-2} Bq		
BOUNDARY							
ARCO							
	7/3/01	0.46	±	2.18	1.69	±	8.07
	7/11/01	0.24	±	2.24	0.90	±	8.29
	7/18/01	-0.69	±	2.32	-2.55	±	8.58
	7/25/01	1.16	±	2.80	4.29	±	10.36
	8/1/01	1.63	±	2.52	6.03	±	9.32
	8/8/01	-1.66	±	3.76	-6.14	±	13.91
	8/15/01	0.99	±	2.78	3.67	±	10.29
	8/22/01	1.37	±	2.74	5.07	±	10.14
	8/29/01	-0.13	±	1.17	-0.46	±	4.33
	9/5/01	0.74	±	3.50	2.72	±	12.95
	9/12/01	0.24	±	1.84	0.89	±	6.80
	9/19/01	0.06	±	2.24	0.21	±	8.29
	9/26/01	0.73	±	1.80	2.71	±	6.66
ARCO (Q/A-1)							
	7/3/01	0.46	±	2.18	1.69	±	8.07
	7/11/01	0.24	±	2.24	0.90	±	8.29
	7/18/01	-0.69	±	2.32	-2.55	±	8.58
	7/25/01	1.16	±	2.80	4.29	±	10.36
	8/1/01	1.63	±	2.52	6.03	±	9.32
	8/8/01	-1.66	±	3.76	-6.14	±	13.91
	8/15/01	0.99	±	2.78	3.67	±	10.29
	8/22/01	1.37	±	2.74	5.07	±	10.14
	8/29/01	-0.13	±	1.17	-0.46	±	4.33
	9/5/01	0.74	±	3.50	2.72	±	12.95
	9/12/01	0.24	±	1.84	0.89	±	6.80
	9/19/01	0.06	±	2.24	0.21	±	8.29
	9/26/01	0.73	±	1.80	2.71	±	6.66
ATOMIC CITY							
	7/3/01	0.41	±	1.65	1.50	±	6.09
	7/11/01	-0.46	±	1.62	-1.70	±	6.00
	7/18/01	-0.34	±	2.10	-1.26	±	7.77
	7/25/01	0.03	±	2.44	0.12	±	9.03
	8/1/01	0.10	±	2.24	0.38	±	8.29
	8/8/01	-2.66	±	3.36	-9.84	±	12.43
	8/15/01	0.88	±	2.42	3.25	±	8.95
	8/22/01	-1.57	±	2.56	-5.81	±	9.47
	8/29/01	0.38	±	1.57	1.40	±	5.80
	9/5/01	-0.28	±	2.58	-1.04	±	9.55
	9/12/01	0.17	±	2.26	0.64	±	8.36
	9/19/01	-0.12	±	2.06	-0.43	±	7.62
	9/26/01	0.56	±	1.99	2.06	±	7.38

* *I-131 activity in air as measured using charcoal cartridges (activity in charcoal cartridges).*

***NOTE 1:** Q/A-1 and Q/A-2 are replicate samplers placed at the stated location.*

***NOTE 2:** Up to 9 charcoal cartridges are screened simultaneously on a gamma spectrometer, hence like results for certain locations by sample date.*

TABLE C-2 (cont.): Weekly Iodine-131 Activity in Air *

Sample Group & Location	Sampling Date	Activity +/- 2s x 10 $^{-6}$ µCi			Activity +/- 2s x 10 $^{-2}$ Bq		
BLUE DOME							
	7/3/01	0.41	±	1.65	1.50	±	6.09
	7/11/01	-0.46	±	1.62	-1.70	±	6.00
	7/18/01	-0.34	±	2.10	-1.26	±	7.77
	7/25/01	0.03	±	2.44	0.12	±	9.03
	8/1/01	0.10	±	2.24	0.38	±	8.29
	8/8/01	-2.66	±	3.36	-9.84	±	12.43
	8/15/01	0.88	±	2.42	3.25	±	8.95
	8/22/01	-1.57	±	2.56	-5.81	±	9.47
	8/29/01	0.38	±	1.57	1.40	±	5.80
	9/5/01	-0.28	±	2.58	-1.04	±	9.55
	9/12/01	0.17	±	2.26	0.64	±	8.36
	9/19/01	-0.12	±	2.06	-0.43	±	7.62
	9/26/01	0.56	±	1.99	2.06	±	7.38
FAA TOWER							
	7/3/01	0.46	±	2.18	1.69	±	8.07
	7/11/01	0.24	±	2.24	0.90	±	8.29
	7/18/01	-0.69	±	2.32	-2.55	±	8.58
	7/25/01	1.16	±	2.80	4.29	±	10.36
	8/1/01	1.63	±	2.52	6.03	±	9.32
	8/8/01	-1.66	±	3.76	-6.14	±	13.91
	8/15/01	0.99	±	2.78	3.67	±	10.29
	8/22/01	1.37	±	2.74	5.07	±	10.14
	8/29/01	-0.13	±	1.17	-0.46	±	4.33
	9/5/01	0.74	±	3.50	2.72	±	12.95
	9/12/01	0.24	±	1.84	0.89	±	6.80
	9/19/01	0.06	±	2.24	0.21	±	8.29
	9/26/01	0.73	±	1.80	2.71	±	6.66
HOWE							
	7/3/01	0.41	±	1.65	1.50	±	6.09
	7/11/01	-0.46	±	1.62	-1.70	±	6.00
	7/18/01	-0.34	±	2.10	-1.26	±	7.77
	7/25/01	0.03	±	2.44	0.12	±	9.03
	8/1/01	0.10	±	2.24	0.38	±	8.29
	8/8/01	-2.66	±	3.36	-9.84	±	12.43
	8/15/01	0.88	±	2.42	3.25	±	8.95
	8/22/01	-1.57	±	2.56	-5.81	±	9.47
	8/29/01	0.38	±	1.57	1.40	±	5.80
	9/5/01	-0.28	±	2.58	-1.04	±	9.55
	9/12/01	0.17	±	2.26	0.64	±	8.36
	9/19/01	-0.12	±	2.06	-0.43	±	7.62
	9/26/01	0.56	±	1.99	2.06	±	7.38

* *I-131 activity in air as measured using charcoal cartridges (activity in charcoal cartridges).*

***NOTE 1:** Q/A-1 and Q/A-2 are replicate samplers placed at the stated location.*

***NOTE 2:** Up to 9 charcoal cartridges are screened simultaneously on a gamma spectrometer, hence like results for certain locations by sample date.*

TABLE C-2 (cont.): Weekly Iodine-131 Activity in Air *

Sample Group & Location	Sampling Date	Activity +/- 2s x 10 $^{-6}$ µCi			Activity +/- 2s x 10 $^{-2}$ Bq		
HOWE (Q/A-2)							
	7/3/01	0.46	±	2.18	1.69	±	8.07
	7/11/01	0.24	±	2.24	0.90	±	8.29
	7/18/01	-0.69	±	2.32	-2.55	±	8.58
	7/25/01	1.16	±	2.80	4.29	±	10.36
	8/1/01	1.63	±	2.52	6.03	±	9.32
	8/8/01	-1.66	±	3.76	-6.14	±	13.91
	8/15/01	0.99	±	2.78	3.67	±	10.29
	8/22/01	1.37	±	2.74	5.07	±	10.14
	8/29/01	-0.13	±	1.17	-0.46	±	4.33
	9/5/01	0.74	±	3.50	2.72	±	12.95
	9/12/01	0.24	±	1.84	0.89	±	6.80
	9/19/01	0.06	±	2.24	0.21	±	8.29
	9/26/01	0.73	±	1.80	2.71	±	6.66
MONTEVIEW							
	7/3/01	0.41	±	1.65	1.50	±	6.09
	7/11/01	-0.46	±	1.62	-1.70	±	6.00
	7/18/01	-0.34	±	2.10	-1.26	±	7.77
	7/25/01	0.03	±	2.44	0.12	±	9.03
	8/1/01	0.10	±	2.24	0.38	±	8.29
	8/8/01	-2.66	±	3.36	-9.84	±	12.43
	8/15/01	0.88	±	2.42	3.25	±	8.95
	8/22/01	-1.57	±	2.56	-5.81	±	9.47
	8/29/01	0.38	±	1.57	1.40	±	5.80
	9/5/01	-0.28	±	2.58	-1.04	±	9.55
	9/12/01	0.17	±	2.26	0.64	±	8.36
	9/19/01	-0.12	±	2.06	-0.43	±	7.62
	9/26/01	0.56	±	1.99	2.06	±	7.38
MUD LAKE							
	7/3/01	0.41	±	1.65	1.50	±	6.09
	7/11/01	-0.46	±	1.62	-1.70	±	6.00
	7/18/01	-0.34	±	2.10	-1.26	±	7.77
	7/25/01	0.03	±	2.44	0.12	±	9.03
	8/1/01	0.10	±	2.24	0.38	±	8.29
	8/8/01	-2.66	±	3.36	-9.84	±	12.43
	8/15/01	0.88	±	2.42	3.25	±	8.95
	8/22/01	-1.57	±	2.56	-5.81	±	9.47
	8/29/01	0.38	±	1.57	1.40	±	5.80
	9/5/01	-0.28	±	2.58	-1.04	±	9.55
	9/12/01	0.17	±	2.26	0.64	±	8.36
	9/19/01	-0.12	±	2.06	-0.43	±	7.62
	9/26/01	0.56	±	1.99	2.06	±	7.38

* *I-131 activity in air as measured using charcoal cartridges (activity in charcoal cartridges).*

***NOTE 1:** Q/A-1 and Q/A-2 are replicate samplers placed at the stated location.*

***NOTE 2:** Up to 9 charcoal cartridges are screened simultaneously on a gamma spectrometer, hence like results for certain locations by sample date.*

TABLE C-2 (cont.): Weekly Iodine-131 Activity in Air *

Sample Group & Location	Sampling Date	Activity +/- 2s x 10 $^{-6}$ µCi			Activity +/- 2s x 10 $^{-2}$ Bq		
DISTANT							
BLACKFOOT, CMS							
	7/3/01	0.46	±	2.18	1.69	±	8.07
	7/11/01	0.24	±	2.24	0.90	±	8.29
	7/25/01	1.16	±	2.80	4.29	±	10.36
	8/1/01	1.63	±	2.52	6.03	±	9.32
	8/8/01	-1.66	±	3.76	-6.14	±	13.91
	8/15/01	0.99	±	2.78	3.67	±	10.29
	8/22/01	1.37	±	2.74	5.07	±	10.14
	8/29/01	-0.13	±	1.17	-0.46	±	4.33
	9/5/01	0.74	±	3.50	2.72	±	12.95
	9/12/01	0.24	±	1.84	0.89	±	6.80
	9/19/01	0.06	±	2.24	0.21	±	8.29
	9/26/01	0.73	±	1.80	2.71	±	6.66
CRATERS OF THE MOON							
	7/3/01	0.41	±	1.65	1.50	±	6.09
	7/11/01	-0.46	±	1.62	-1.70	±	6.00
	7/18/01	-0.34	±	2.10	-1.26	±	7.77
	7/25/01	0.03	±	2.44	0.12	±	9.03
	8/1/01	0.10	±	2.24	0.38	±	8.29
	8/8/01	-2.66	±	3.36	-9.84	±	12.43
	8/15/01	0.88	±	2.42	3.25	±	8.95
	8/22/01	1.37	±	2.74	5.07	±	10.14
	8/29/01	0.38	±	1.57	1.40	±	5.80
	9/5/01	-0.28	±	2.58	-1.04	±	9.55
	9/12/01	0.17	±	2.26	0.64	±	8.36
	9/19/01	-0.12	±	2.06	-0.43	±	7.62
	9/26/01	0.56	±	1.99	2.06	±	7.38
DUBOIS							
	7/3/01	0.46	±	2.18	1.69	±	8.07
	7/11/01	0.24	±	2.24	0.90	±	8.29
	7/18/01	-0.69	±	2.32	-2.55	±	8.58
	7/25/01	1.16	±	2.80	4.29	±	10.36
	8/1/01	1.63	±	2.52	6.03	±	9.32
	8/8/01	-1.66	±	3.76	-6.14	±	13.91
	8/15/01	0.99	±	2.78	3.67	±	10.29
	8/22/01	1.37	±	2.74	5.07	±	10.14
	8/29/01	-0.13	±	1.17	-0.46	±	4.33
	9/5/01	0.74	±	3.50	2.72	±	12.95
	9/12/01	0.24	±	1.84	0.89	±	6.80
	9/19/01	0.06	±	2.24	0.21	±	8.29
	9/26/01	0.73	±	1.80	2.71	±	6.66

* *I-131 activity in air as measured using charcoal cartridges (activity in charcoal cartridges).*

***NOTE 1:** Q/A-1 and Q/A-2 are replicate samplers placed at the stated location.*

***NOTE 2:** Up to 9 charcoal cartridges are screened simultaneously on a gamma spectrometer, hence like results for certain locations by sample date.*

TABLE C-2 (cont.): Weekly Iodine-131 Activity in Air *

Sample Group & Location	Sampling Date	Activity +/- 2s x 10 $^{-6}$ µCi			Activity +/- 2s x 10 $^{-2}$ Bq		
IDAHO FALLS							
	7/3/01	0.41	±	1.65	1.50	±	6.09
	7/11/01	-0.46	±	1.62	-1.70	±	6.00
	7/18/01	-0.34	±	2.10	-1.26	±	7.77
	7/25/01	0.03	±	2.44	0.12	±	9.03
	8/1/01	0.10	±	2.24	0.38	±	8.29
	8/8/01	-2.66	±	3.36	-9.84	±	12.43
	8/15/01	0.88	±	2.42	3.25	±	8.95
	8/22/01	-1.57	±	2.56	-5.81	±	9.47
	8/29/01	0.38	±	1.57	1.40	±	5.80
	9/5/01	-0.28	±	2.58	-1.04	±	9.55
	9/12/01	0.17	±	2.26	0.64	±	8.36
	9/19/01	-0.12	±	2.06	-0.43	±	7.62
	9/26/01	0.56	±	1.99	2.06	±	7.38
REXBURG, CMS							
	7/3/01	-0.35	±	1.69	-1.28	±	6.27
	7/11/01	0.24	±	2.24	0.90	±	8.29
	7/18/01	-0.69	±	2.32	-2.55	±	8.58
	7/25/01	1.16	±	2.80	4.29	±	10.36
	8/1/01	1.63	±	2.52	6.03	±	9.32
	8/8/01	-1.66	±	3.76	-6.14	±	13.91
	8/15/01	0.99	±	2.78	3.67	±	10.29
	8/22/01	1.37	±	2.74	5.07	±	10.14
	8/29/01	-0.13	±	1.17	-0.46	±	4.33
	9/5/01	0.74	±	3.50	2.72	±	12.95
	9/12/01	0.24	±	1.84	0.89	±	6.80
	9/19/01	0.06	±	2.24	0.21	±	8.29
	9/26/01	0.73	±	1.80	2.71	±	6.66
INEEL							
EFS							
	7/3/01	0.41	±	1.65	1.50	±	6.09
	7/11/01	-0.46	±	1.62	-1.70	±	6.00
	7/18/01	-0.34	±	2.10	-1.26	±	7.77
	7/25/01	0.03	±	2.44	0.12	±	9.03
	8/1/01	0.10	±	2.24	0.38	±	8.29
	8/8/01	-2.66	±	3.36	-9.84	±	12.43
	8/15/01	0.88	±	2.42	3.25	±	8.95
	8/22/01	-1.57	±	2.56	-5.81	±	9.47
	8/29/01	0.38	±	1.57	1.40	±	5.80
	9/5/01	-0.28	±	2.58	-1.04	±	9.55
	9/12/01	0.17	±	2.26	0.64	±	8.36
	9/19/01	-0.12	±	2.06	-0.43	±	7.62
	9/26/01	0.56	±	1.99	2.06	±	7.38

* *I-131 activity in air as measured using charcoal cartridges (activity in charcoal cartridges).*

NOTE 1: Q/A-1 and Q/A-2 are replicate samplers placed at the stated location.

NOTE 2: Up to 9 charcoal cartridges are screened simultaneously on a gamma spectrometer, hence like results for certain locations by sample date.

TABLE C-2 (cont.): Weekly Iodine-131 Activity in Air *

Sample Group & Location	Sampling Date	Activity +/- 2s x 10 $^{-6}$ µCi			Activity +/- 2s x 10 $^{-2}$ Bq		
MAIN GATE							
	7/3/01	0.46	±	2.18	1.69	±	8.07
	7/11/01	0.24	±	2.24	0.90	±	8.29
	7/18/01	-0.69	±	2.32	-2.55	±	8.58
	7/25/01	1.16	±	2.80	4.29	±	10.36
	8/1/01	1.63	±	2.52	6.03	±	9.32
	8/8/01	-1.66	±	3.76	-6.14	±	13.91
	8/15/01	0.99	±	2.78	3.67	±	10.29
	8/22/01	1.37	±	2.74	5.07	±	10.14
	8/29/01	0.38	±	1.57	1.40	±	5.80
	9/5/01	-0.28	±	2.58	-1.04	±	9.55
	9/12/01	0.24	±	1.84	0.89	±	6.80
	9/19/01	-0.12	±	2.06	-0.43	±	7.62
	9/26/01	0.56	±	1.99	2.06	±	7.38
VAN BUREN							
	7/3/01	0.41	±	1.65	1.50	±	6.09
	7/11/01	-0.46	±	1.62	-1.70	±	6.00
	7/18/01	-0.34	±	2.10	-1.26	±	7.77
	7/25/01	0.03	±	2.44	0.12	±	9.03
	8/1/01	0.10	±	2.24	0.38	±	8.29
	8/8/01	-2.66	±	3.36	-9.84	±	12.43
	8/15/01	0.88	±	2.42	3.25	±	8.95
	8/22/01	-1.57	±	2.56	-5.81	±	9.47
	8/29/01	0.38	±	1.57	1.40	±	5.80
	9/5/01	-0.28	±	2.58	-1.04	±	9.55
	9/12/01	0.17	±	2.26	0.64	±	8.36
	9/19/01	-0.12	±	2.06	-0.43	±	7.62
	9/26/01	0.56	±	1.99	2.06	±	7.38
OUT OF STATE							
JACKSON, WYOMING							
	7/4/01	-0.35	±	1.69	-1.28	±	6.27
	7/11/01	0.25	±	2.28	0.94	±	8.44
	7/18/01	-0.03	±	2.36	-0.13	±	8.73
	7/25/01	-0.50	±	3.36	-1.86	±	12.43
	8/1/01	-0.08	±	2.58	-0.31	±	9.55
	8/8/01	-1.56	±	4.16	-5.77	±	15.39
	8/15/01	-1.15	±	3.68	-4.26	±	13.62
	8/22/01	-1.57	±	2.56	-5.81	±	9.47
	8/29/01	-0.13	±	1.17	-0.46	±	4.33
	9/5/01	0.74	±	3.50	2.72	±	12.95
	9/12/01	0.17	±	2.26	0.64	±	8.36
	9/19/01	0.06	±	2.24	0.21	±	8.29
	9/29/01	0.73	±	1.80	2.71	±	6.66

* *I-131 activity in air as measured using charcoal cartridges (activity in charcoal cartridges).*

***NOTE 1:** Q/A-1 and Q/A-2 are replicate samplers placed at the stated location.*

***NOTE 2:** Up to 9 charcoal cartridges are screened simultaneously on a gamma spectrometer, hence like results for certain locations by sample date.*

TABLE C-3: Quarterly Cesium-137, Americium-241, Plutonium-238, Plutonium-239/240 & Strontium-90 Concentrations in Composited Air Filters

Sample Group & Location	Sampling Date	Analyte	Concentration +/- 2s x 10^{-16} µCi /mL			Concentration +/- 2s x 10^{-12} Bq /mL		
BOUNDARY								
ARCO								
	9/30/01	CESIUM-137	1.626	±	6.061	6.018	±	22.426
	9/30/01	STRONTIUM-90	0.892	±	0.440	3.300	±	1.628
ARCO (Q/A-1)								
	9/30/01	CESIUM-137	1.312	±	3.011	4.854	±	11.141
	9/30/01	STRONTIUM-90	0.884	±	0.520	3.271	±	1.924
ATOMIC CITY								
	9/30/01	CESIUM-137	0.910	±	3.024	3.366	±	11.189
	9/30/01	STRONTIUM-90	1.250	±	0.600	4.625	±	2.220
BLUE DOME								
	9/30/01	CESIUM-137	-3.267	±	8.120	-12.090	±	30.044
	9/30/01	STRONTIUM-90	0.600	±	0.570	2.220	±	2.109
FAA TOWER								
	9/30/01	AMERICIUM-241	0.015	±	0.020	0.056	±	0.074
	9/30/01	CESIUM-137	-0.961	±	3.278	-3.557	±	12.130
	9/30/01	PLUTONIUM-238	0.093	±	0.047	0.344	±	0.174
	9/30/01	PLUTONIUM-239/240	0.027	±	0.025	0.101	±	0.093
HOWE								
	9/30/01	AMERICIUM-241	0.003	±	0.010	0.010	±	0.036
	9/30/01	CESIUM-137	2.420	±	3.017	8.956	±	11.163
	9/30/01	PLUTONIUM-238	0.048	±	0.034	0.178	±	0.126
	9/30/01	PLUTONIUM-239/240	0.035	±	0.029	0.130	±	0.107
HOWE (Q/A-2)								
	9/30/01	AMERICIUM-241	-0.007	±	0.016	-0.025	±	0.059
	9/30/01	CESIUM-137	-0.432	±	2.821	-1.598	±	10.439
	9/30/01	PLUTONIUM-238	0.022	±	0.022	0.083	±	0.081
	9/30/01	PLUTONIUM-239/240	0.005	±	0.010	0.018	±	0.036
MONTEVIEW								
	9/30/01	AMERICIUM-241	0.025	±	0.024	0.092	±	0.089
	9/30/01	CESIUM-137	2.176	±	8.292	8.052	±	30.682
	9/30/01	PLUTONIUM-238	0.030	±	0.023	0.111	±	0.085
	9/30/01	PLUTONIUM-239/240	0.020	±	0.020	0.073	±	0.074
MUD LAKE								
	9/30/01	CESIUM-137	-0.062	±	2.499	-0.231	±	9.245
	9/30/01	STRONTIUM-90	1.590	±	0.600	5.883	±	2.220
DISTANT								
BLACKFOOT, CMS								
	9/30/01	CESIUM-137	-1.434	±	8.770	-5.306	±	32.449
	9/30/01	STRONTIUM-90	0.144	±	0.500	0.533	±	1.850

NOTE 1: Q/A-1 and Q/A-2 are replicate samplers placed at the stated location.

NOTE 2: Samples from specific locations were sent to Severn-Trent and either analyzed for Strontium-90 or Transuranics (Americium-241, Plutonium-238 and Plutonium-239/240). All samples were sent to EAL for Gamma Spectrometry (Cesium-137).

TABLE C-3 (cont.): Quarterly Cesium-137, Americium-241, Plutonium-238, Plutonium-239/240 & Strontium-90 Concentrations in Composited Air Filters

Sample Group & Location	Sampling Date	Analyte	Concentration +/- 2s x 10^{-16} µCi /mL			Concentration +/- 2s x 10^{-12} Bq /mL		
CRATERS OF THE MOON								
	9/30/01	AMERICIUM-241	0.000	±	0.010	0.000	±	0.036
	9/30/01	CESIUM-137	0.389	±	2.649	1.441	±	9.802
	9/30/01	PLUTONIUM-238	0.048	±	0.030	0.179	±	0.111
	9/30/01	PLUTONIUM-239/240	0.011	±	0.016	0.042	±	0.059
DUBOIS								
	9/30/01	CESIUM-137	2.312	±	3.131	8.553	±	11.585
	9/30/01	STRONTIUM-90	0.934	±	0.490	3.456	±	1.813
IDAHO FALLS								
	9/30/01	AMERICIUM-241	0.004	±	0.013	0.013	±	0.048
	9/30/01	CESIUM-137	1.319	±	3.936	4.879	±	14.562
	9/30/01	PLUTONIUM-238	0.008	±	0.015	0.028	±	0.056
	9/30/01	PLUTONIUM-239/240	0.030	±	0.030	0.111	±	0.111
REXBURG, CMS								
	9/30/01	AMERICIUM-241	-0.002	±	0.003	-0.006	±	0.012
	9/30/01	CESIUM-137	0.340	±	2.702	1.259	±	9.999
	9/30/01	PLUTONIUM-238	0.053	±	0.041	0.198	±	0.152
	9/30/01	PLUTONIUM-239/240	0.035	±	0.035	0.130	±	0.130
INEEL								
EFS								
	9/30/01	AMERICIUM-241	0.038	±	0.028	0.141	±	0.104
	9/30/01	CESIUM-137	-3.718	±	2.997	-13.757	±	11.089
	9/30/01	PLUTONIUM-238	0.026	±	0.026	0.096	±	0.096
	9/30/01	PLUTONIUM-239/240	0.021	±	0.026	0.079	±	0.096
MAIN GATE								
	9/30/01	CESIUM-137	-1.157	±	7.314	-4.280	±	27.063
	9/30/01	STRONTIUM-90	0.722	±	0.530	2.671	±	1.961
VAN BUREN								
	9/30/01	AMERICIUM-241	0.000	±	0.011	0.000	±	0.041
	9/30/01	CESIUM-137	-3.945	±	7.721	-14.595	±	28.569
	9/30/01	PLUTONIUM-238	0.104	±	0.055	0.385	±	0.204
	9/30/01	PLUTONIUM-239/240	-0.007	±	0.009	-0.027	±	0.032
OUT OF STATE								
JACKSON, WYOMING								
	9/30/01	CESIUM-137	-0.203	±	2.968	-0.751	±	10.982
	9/30/01	STRONTIUM-90	0.712	±	0.510	2.634	±	1.887

NOTE 1: Q/A-1 and Q/A-2 are replicate samplers placed at the stated location.

NOTE 2: Samples from specific locations were sent to Severn-Trent and either analyzed for Strontium-90 or Transuranics (Americium-241, Plutonium-238 and Plutonium-239/240). All samples were sent to EAL for Gamma Spectrometry (Cesium-137).

TABLE C-4: Tritium Concentrations in Atmospheric Moisture

Location	Start Date	End Date	Concentration +/- 2s x 10 -14 µCi /ml Air			Concentration +/- 2s x 10 -9 Bq /ml Air		
ATOMIC CITY								
	7/11/01	8/15/01	13.8	±	10.8	5.1	±	4.0
	8/15/01	9/19/01	4.7	±	13.6	1.7	±	5.0
BLACKFOOT, CMS								
	6/20/01	7/18/01	59.7	±	21.5	22.1	±	8.0
	7/18/01	8/15/01	-1.9	±	17.2	-0.7	±	6.4
	8/15/01	8/22/01	84.1	±	47.2	31.1	±	17.5
	8/22/01	9/12/01	-1.2	±	21.3	-0.4	±	7.9
IDAHO FALLS								
	7/3/01	7/16/01	130.5	±	38.1	48.3	±	14.1
	7/16/01	9/5/01	-6.8	±	5.0	-2.5	±	1.8
	9/5/01	9/20/01	-88.6	±	28.1	-32.8	±	10.4
REXBURG, CMS								
	6/21/01	7/11/01	64.0	±	29.6	23.7	±	11.0
	7/11/01	7/25/01	188.7	±	36.6	69.8	±	13.5
	7/25/01	8/8/01	79.3	±	60.7	29.3	±	22.4
	8/8/01	9/5/01	8.1	±	12.8	3.0	±	4.8
	9/5/01	9/26/01	17.5	±	22.8	6.5	±	8.4

TABLE C-5: PM_{10} Concentrations at Atomic City, Blackfoot CMS, & Rexburg CMS

Location	Sampling Date	Concentration µg /m^3	Comments
ATOMIC CITY			
	7/5/01	47.1	
	7/11/01	10.3	
	7/17/01	20.8	
	7/23/01	18.8	
	7/29/01	14.4	
	8/4/01	22.0	
	8/10/01	19.9	
	8/16/01	28.7	
	8/22/01	32.7	
	8/28/01	30.9	
	9/3/01	24.9	
	9/9/01	22.3	
	9/15/01	8.8	
	9/21/01	16.0	
	9/27/01	40.6	
BLACKFOOT, CMS			
	7/5/01	38.0	
	7/11/01		Invalid Sample
	7/17/01		Invalid Sample
	7/23/01	19.7	
	7/29/01	19.0	
	8/4/01	20.0	
	8/10/01	30.6	
	8/16/01	29.2	
	8/22/01	20.4	
	8/28/01	31.8	
	9/3/01	33.0	
	9/9/01	9.9	
	9/15/01	14.9	
	9/21/01		Invalid Sample
	9/27/01	28.9	

NOTE 1: Common reasons for an invalid sample are damage to the filter and equipment failure/problems.

TABLE C-5 (cont.): PM_{10} Concentrations at Atomic City, Blackfoot CMS, & Rexburg CMS

Location	*Sampling Date*	*Concentration µg /m^3*	*Comments*
REXBURG, CMS			
	7/5/01		Invalid Sample
	7/11/01	13.5	
	7/17/01	25.3	
	7/23/01	26.0	
	7/29/01	20.1	
	8/4/01		Invalid Sample
	8/10/01	29.9	
	8/16/01		Invalid Sample
	8/22/01		Invalid Sample
	8/28/01	36.2	
	9/3/01	31.8	
	9/9/01	12.6	
	9/15/01	17.9	
	9/21/01		Invalid Sample
	9/27/01	46.8	

NOTE 1: Common reasons for an invalid sample are damage to the filter and equipment failure/problems.

TABLE C-6: Weekly & Monthly Tritium Concentrations in Precipitation

Location	Start Date	End Date	Concentration +/- 2s pCi /L			Concentration +/- 2s Bq /L		
CFA								
	6/28/01	8/1/01	17.0	±	71.2	0.63	±	0.63
	8/1/01	8/30/01	99.6	±	58.8	3.68	±	3.68
	8/30/01	10/1/01	125.2	±	63.7	4.63	±	4.63
EFS								
	7/3/01	7/11/01	-17.1	±	70.0	-0.63	±	-0.63
IDAHO FALLS								
	6/28/01	8/1/01	-15.3	±	70.0	-0.57	±	-0.57
	8/1/01	8/31/01	71.8	±	58.5	2.66	±	2.66
	8/31/01	9/30/01	87.2	±	143.7	3.23	±	3.23
	8/31/01	10/1/01	53.8	±	62.7	1.99	±	1.99

TABLE C-7: Weekly & Monthly Iodine-131 & Cesium-137 Concentrations in Milk

Location	Sampling Date	Analyte	Concentration +/- 2s pCi /L			Concentration +/- 2s Bq /L		
ARCO								
	7/2/01	CESIUM-137	-0.723	±	2.640	-0.027	±	0.098
	7/2/01	IODINE-131	1.760	±	1.982	0.065	±	0.073
	8/7/01	CESIUM-137	1.050	±	1.574	0.039	±	0.058
	8/7/01	IODINE-131	1.290	±	2.640	0.048	±	0.098
	9/4/01	CESIUM-137	0.912	±	9.080	0.034	±	0.336
	9/4/01	IODINE-131	-9.560	±	15.820	-0.354	±	0.585
BLACKFOOT								
	7/2/01	CESIUM-137	5.770	±	6.180	0.213	±	0.229
	7/2/01	IODINE-131	3.080	±	5.020	0.114	±	0.186
	8/7/01	CESIUM-137	0.864	±	2.980	0.032	±	0.110
	8/7/01	IODINE-131	0.368	±	3.740	0.014	±	0.138
	9/4/01	CESIUM-137	0.184	±	1.560	0.007	±	0.058
	9/4/01	IODINE-131	-0.308	±	2.380	-0.011	±	0.088
CAREY								
	7/3/01	CESIUM-137	0.981	±	1.540	0.036	±	0.057
	7/3/01	IODINE-131	0.893	±	2.140	0.033	±	0.079
	8/7/01	CESIUM-137	0.605	±	1.564	0.022	±	0.058
	8/7/01	IODINE-131	0.608	±	2.440	0.022	±	0.090
	9/4/01	CESIUM-137	0.364	±	7.200	0.013	±	0.266
	9/4/01	IODINE-131	-0.652	±	10.520	-0.024	±	0.389
DIETRICH								
	7/2/01	CESIUM-137	-1.260	±	6.280	-0.047	±	0.232
	7/2/01	IODINE-131	6.780	±	8.700	0.251	±	0.322
	8/7/01	CESIUM-137	1.090	±	1.608	0.040	±	0.059
	8/7/01	IODINE-131	-1.890	±	1.842	-0.070	±	0.068
	9/4/01	CESIUM-137	4.110	±	8.940	0.152	±	0.331
	9/4/01	IODINE-131	6.200	±	12.320	0.229	±	0.456
HOWE								
	7/2/01	CESIUM-137	-0.156	±	1.440	-0.006	±	0.053
	7/2/01	IODINE-131	-0.580	±	1.298	-0.021	±	0.048
	8/7/01	CESIUM-137	-2.010	±	7.240	-0.074	±	0.268
	8/7/01	IODINE-131	-1.780	±	8.700	-0.066	±	0.322
	9/4/01	CESIUM-137	-3.660	±	7.220	-0.135	±	0.267
	9/4/01	IODINE-131	-1.130	±	9.820	-0.042	±	0.363

NOTE1: All locations are sampled monthly with the exception of Idaho Falls which is sampled weekly.

NOTE2: The same sampling date for a given location is the same sample analyzed for both Cesium-137 and Iodine-131.

TABLE C-7 (cont): Weekly & Monthly Iodine-131 & Cesium-137 Concentrations in Milk

Location	Sampling Date	Analyte	Concentration +/- 2s pCi /L			Concentration +/- 2s Bq /L		
IDAHO FALLS								
	7/2/01	CESIUM-137	1.480	±	6.460	0.055	±	0.239
	7/2/01	IODINE-131	-4.920	±	8.180	-0.182	±	0.303
	7/11/01	CESIUM-137	2.120	±	6.500	0.078	±	0.241
	7/11/01	IODINE-131	-5.480	±	8.320	-0.203	±	0.308
	7/18/01	CESIUM-137	1.830	±	6.200	0.068	±	0.229
	7/18/01	IODINE-131	-3.460	±	8.040	-0.128	±	0.297
	7/25/01	CESIUM-137	0.447	±	1.600	0.017	±	0.059
	7/25/01	IODINE-131	0.725	±	2.100	0.027	±	0.078
	8/1/01	CESIUM-137	0.977	±	1.546	0.036	±	0.057
	8/1/01	IODINE-131	0.598	±	1.632	0.022	±	0.060
	8/7/01	CESIUM-137	4.690	±	8.740	0.174	±	0.323
	8/7/01	IODINE-131	-2.820	±	9.180	-0.104	±	0.340
	8/16/01	CESIUM-137	1.070	±	1.546	0.040	±	0.057
	8/16/01	IODINE-131	0.760	±	1.616	0.028	±	0.060
	8/23/01	CESIUM-137	2.140	±	8.880	0.079	±	0.329
	8/23/01	IODINE-131	-0.780	±	7.820	-0.029	±	0.289
	8/30/01	CESIUM-137	2.300	±	8.820	0.085	±	0.326
	8/30/01	IODINE-131	-2.500	±	7.900	-0.093	±	0.292
	9/4/01	CESIUM-137	0.771	±	1.514	0.029	±	0.056
	9/4/01	IODINE-131	0.305	±	2.040	0.011	±	0.075
	9/12/01	CESIUM-137	2.840	±	8.800	0.105	±	0.326
	9/12/01	IODINE-131	-0.746	±	9.440	-0.028	±	0.349
	9/19/01	CESIUM-137	1.330	±	1.508	0.049	±	0.056
	9/19/01	IODINE-131	1.630	±	1.638	0.060	±	0.061
	9/27/01	CESIUM-137	1.600	±	8.620	0.059	±	0.319
	9/27/01	IODINE-131	2.280	±	7.580	0.084	±	0.280
MORELAND								
	7/2/01	CESIUM-137	0.933	±	1.560	0.035	±	0.058
	7/2/01	IODINE-131	0.666	±	1.762	0.025	±	0.065
	8/7/01	CESIUM-137	-0.723	±	2.780	-0.027	±	0.103
	8/7/01	IODINE-131	0.710	±	3.400	0.026	±	0.126
	9/4/01	CESIUM-137	-0.259	±	1.542	-0.010	±	0.057
	9/4/01	IODINE-131	-0.135	±	2.620	-0.005	±	0.097

NOTE1: All locations are sampled monthly with the exception of Idaho Falls which is sampled weekly.

NOTE2: The same sampling date for a given location is the same sample analyzed for both Cesium-137 and Iodine-131.

TABLE C-7 (cont): Weekly & Monthly Iodine-131 & Cesium-137 Concentrations in Milk

Location	Sampling Date	Analyte	Concentration +/- 2s pCi /L			Concentration +/- 2s Bq /L		
ROBERTS								
	7/2/01	CESIUM-137	-0.181	±	2.720	-0.007	±	0.101
	7/2/01	IODINE-131	-0.031	±	1.814	-0.001	±	0.067
	8/7/01	CESIUM-137	0.789	±	1.624	0.029	±	0.060
	8/7/01	IODINE-131	0.125	±	1.988	0.005	±	0.074
	9/4/01	CESIUM-137	3.130	±	2.620	0.116	±	0.097
	9/4/01	IODINE-131	8.100	±	4.380	0.300	±	0.162
RUPERT								
	7/2/01	CESIUM-137	4.320	±	5.840	0.160	±	0.216
	7/2/01	IODINE-131	1.480	±	5.240	0.055	±	0.194
	8/7/01	CESIUM-137	4.140	±	8.900	0.153	±	0.329
	8/7/01	IODINE-131	0.862	±	12.020	0.032	±	0.445
	9/4/01	CESIUM-137	-2.250	±	9.060	-0.083	±	0.335
	9/4/01	IODINE-131	7.890	±	14.220	0.292	±	0.526
TERRETON								
	8/7/01	CESIUM-137	-1.280	±	8.900	-0.047	±	0.329
	8/7/01	IODINE-131	-4.550	±	11.260	-0.168	±	0.417
	9/4/01	CESIUM-137	1.900	±	8.920	0.070	±	0.330
	9/4/01	IODINE-131	1.080	±	11.920	0.040	±	0.441

NOTE1: All locations are sampled monthly with the exception of Idaho Falls which is sampled weekly.

NOTE2: The same sampling date for a given location is the same sample analyzed for both Cesium-137 and Iodine-131.

TABLE C-8: Cesium-137 & Iodine-131 Concentrations in Game Animals

Species & Media	Sampling Date	Analyte	Concentration +/- 2s pCi/kg wet weight	Concentration +/- 2s Bq/kg wet weight
MULE DEER				
LIVER				
	7/9/01	CESIUM-137	2.0 ± 2.8	0.1 ± 0.1
	7/9/01	IODINE-131	1.9 ± 2.5	0.1 ± 0.1
MUSCLE				
	7/9/01	CESIUM-137	2.6 ± 2.0	0.1 ± 0.1
	7/9/01	IODINE-131	0.5 ± 2.3	0.0 ± 0.1
THYROID				
	7/9/01	CESIUM-137	109.1 ± 690.6	4.0 ± 25.6
	7/9/01	IODINE-131	113.4 ± 735.8	4.2 ± 27.2
ELK				
MUSCLE				
	7/23/01	CESIUM-137	1.2 ± 2.2	0.0 ± 0.1
	7/23/01	IODINE-131	12.1 ± 29.5	0.4 ± 1.1
THYROID				
	7/23/01	CESIUM-137	40.7 ± 113.8	1.5 ± 4.2
	7/23/01	IODINE-131	7.0 ± 168.6	0.3 ± 6.2
MULE DEER				
LIVER				
	7/26/01	CESIUM-137	5.2 ± 5.3	0.2 ± 0.2
	7/26/01	IODINE-131	15.6 ± 56.5	0.6 ± 2.1
MUSCLE				
	7/26/01	CESIUM-137	8.3 ± 13.1	0.3 ± 0.5
	7/26/01	IODINE-131	-52.1 ± 100.6	-1.9 ± 3.7
THYROID				
	7/26/01	CESIUM-137	-1536.4 ± 2836.4	-56.8 ± 104.9
	7/26/01	IODINE-131	-380.0 ± 1872.7	-14.1 ± 69.3
MULE DEER				
LIVER				
	8/7/01	CESIUM-137	6.4 ± 4.2	0.2 ± 0.2
	8/7/01	IODINE-131	24.8 ± 116.5	0.9 ± 4.3
MUSCLE				
	8/7/01	CESIUM-137	15.8 ± 4.2	0.6 ± 0.2
	8/7/01	IODINE-131	31.2 ± 46.2	1.2 ± 1.7
THYROID				
	8/7/01	CESIUM-137	-796.6 ± 1241.4	-29.5 ± 45.9
	8/7/01	IODINE-131	-810.3 ± 944.8	-30.0 ± 35.0

TABLE C-8 (cont): Cesium-137 & Iodine-131 Concentrations in Game Animals

Species & Media	Sampling Date	Analyte	Concentration +/- 2s pCi/kg wet weight	Concentration +/- 2s Bq/kg wet weight
PRONGHORN				
LIVER				
	8/14/01	CESIUM-137	-4.4 ± 12.6	-0.2 ± 0.5
	8/14/01	IODINE-131	15.0 ± 21.2	0.6 ± 0.8
MUSCLE				
	8/14/01	CESIUM-137	1.0 ± 2.3	0.0 ± 0.1
	8/14/01	IODINE-131	-3.2 ± 5.4	-0.1 ± 0.2
MULE DEER				
LIVER				
	8/30/01	CESIUM-137	20.5 ± 6.7	0.8 ± 0.2
	8/30/01	IODINE-131	-5.0 ± 35.6	-0.2 ± 1.3
MUSCLE				
	8/30/01	CESIUM-137	1.9 ± 12.2	0.1 ± 0.5
	8/30/01	IODINE-131	-1.0 ± 34.9	0.0 ± 1.3
THYROID				
	8/30/01	CESIUM-137	-1088.6 ± 794.3	-40.3 ± 29.4
	8/30/01	IODINE-131	-708.6 ± 634.3	-26.2 ± 23.5
MULE DEER				
LIVER				
	9/12/01	CESIUM-137	-0.8 ± 14.9	0.0 ± 0.6
	9/12/01	IODINE-131	7.1 ± 19.8	0.3 ± 0.7
MUSCLE				
	9/12/01	CESIUM-137	-7.4 ± 13.7	-0.3 ± 0.5
	9/12/01	IODINE-131	-11.8 ± 25.7	-0.4 ± 1.0
THYROID				
	9/12/01	CESIUM-137	-392.6 ± 1365.2	-14.5 ± 50.5
	9/12/01	IODINE-131	752.2 ± 1113.0	27.8 ± 41.2

TABLE C-9: Cesium-137 Concentrations in Lettuce & Wheat

Location	Sampling Date	Concentration +/- 2s pCi/kg			Concentration +/- 2s Bq/kg		
LETTUCE							
ARCO	8/7/01	624.0	±	500.8	23.09	±	18.53
ATOMIC CITY	7/31/01	361.8	±	588.2	13.39	±	21.76
CAREY	7/25/01	78.9	±	474.3	2.92	±	17.55
FIRTH	8/13/01	-149.7	±	1961.3	-5.54	±	72.57
HOWE	8/1/01	688.5	±	792.3	25.47	±	29.32
IDAHO FALLS	7/26/01	492.7	±	1478.0	18.23	±	54.69
MONTEVIEW	8/1/01	1953.8	±	2346.2	72.29	±	86.81
MUD LAKE	8/1/01	-174.7	±	993.8	-6.46	±	36.77
POCATELLO	7/20/01	-199.7	±	1040.0	-7.39	±	38.48
WHEAT							
AMERICAN FALLS	8/7/01	3.3	±	3.1	0.12	±	0.11
ARCO	8/14/01	-10.2	±	21.1	-0.38	±	0.78
ARCO	9/19/01	-4.7	±	14.3	-0.17	±	0.53
BLACKFOOT	9/20/01	0.0	±	3.5	0.00	±	0.13
BURLEY	9/4/01	-0.3	±	3.0	-0.01	±	0.11
CAREY	8/7/01	0.2	±	4.2	0.01	±	0.15
GROVELAND	9/5/01	-4.2	±	12.2	-0.16	±	0.45
IDAHO FALLS	9/21/01	3.1	±	3.9	0.12	±	0.14
MINIDOKA	9/4/01	0.1	±	3.6	0.00	±	0.13
MONTEVIEW	9/12/01	1.7	±	2.6	0.06	±	0.10
MUD LAKE	9/12/01	0.6	±	3.9	0.02	±	0.14
ROBERTS	8/20/01	-23.1	±	17.4	-0.86	±	0.64
ROBERTS	8/24/01	-2.2	±	14.9	-0.08	±	0.55
TERRETON	9/12/01	-1.6	±	12.1	-0.06	±	0.45

TABLE C-10: Strontium-90 Concentrations in Lettuce & Wheat

Location	Sampling Date	Concentration +/- 2s pCi/kg			Concentration +/- 2s Bq/kg		
LETTUCE							
ATOMIC CITY	7/31/01	110.0	±	110.0	4.07	±	4.07
CAREY	7/25/01	144.0	±	110.0	5.33	±	4.07
FIRTH	8/13/01	160.0	±	110.0	5.92	±	4.07
HOWE	8/1/01	21.0	±	110.0	0.78	±	4.07
IDAHO FALLS	7/26/01	114.0	±	110.0	4.22	±	4.07
MONTEVIEW	8/1/01	74.3	±	110.0	2.75	±	4.07
MUD LAKE	8/1/01	40.6	±	110.0	1.50	±	4.07
POCATELLO	7/20/01	5.9	±	100.0	0.22	±	3.70
WHEAT							
AMERICAN FALLS	8/7/01	-20.1	±	290.0	-0.74	±	10.73
ARCO	8/14/01	95.8	±	260.0	3.54	±	9.62
ARCO	9/19/01	58.8	±	87.0	2.18	±	3.22
BLACKFOOT	9/2/01	60.6	±	99.0	2.24	±	3.66
BURLEY	9/4/01	-69.4	±	200.0	-2.57	±	7.40
CAREY	8/7/01	49.7	±	180.0	1.84	±	6.66
GROVELAND	9/5/01	-93.2	±	280.0	-3.45	±	10.36
IDAHO FALLS	9/21/01	-37.3	±	88.0	-1.38	±	3.26
MINIDOKA	9/4/01	218.0	±	290.0	8.07	±	10.73
MONTEVIEW	9/12/01	50.3	±	97.0	1.86	±	3.59
MUD LAKE	9/12/01	19.6	±	74.0	0.73	±	2.74
ROBERTS	8/20/01	193.0	±	230.0	7.14	±	8.51
ROBERTS	8/24/01	28.6	±	190.0	1.06	±	7.03
TERRETON	9/12/01	63.6	±	130.0	2.35	±	4.81